Designing Financial Systems in East Asia and Japan

Edited by Joseph P.H. Fan, Masaharu Hanazaki and Juro Teranishi

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A distinctive feature of the last decade has been the drastic change in the financial systems of the world due to globalization and innovation. The changes have resulted in more market-oriented systems and have required redesigning of existing financial institutions and markets, corporate governance and regulatory frameworks in order to achieve sustainable economic development. The East Asian crisis and prolonged depression in Japan have heightened the need to redesign financial systems in the region.

This book deliberates on some urgent issues that face the new architecture of the financial systems in Japan and East Asia. The book is broken into three sections:

- The role of financial institutions and markets in economic development in Japan and East Asia.
- Issues in corporate governance and new technologies.
- The designing of efficient financial systems.

With contributions from leading Asian economics experts based around the world, this book will be useful to both scholars and professionals with an interest in financial systems, corporate financing and governance.

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Preface

This book is an outgrowth of the conference on "Designing Financial Systems in East Asia and Japan: Toward a Twenty-First Century Paradigm," which was held on September 24–25, 2001 at the Hitotsubashi Memorial Hall in Tokyo. The conference was co-organized by the Regional Office for Asia and the Pacific of the IMF and the Center for Economic Institutions (CEI) of Hitotsubashi University. It was attended by 40 paper presenters and discussants, as well as 60 other participants who also joined the discussions from the floor.

This book is the first publication in English of the CEI, which was established in April 2000 as an affiliate to the Institute of Economic Research of Hitotsubashi University. The CEI has two objectives; first to conduct research on economic systems and institutions in Japan and Asia; and second to become one of the leading organizations in the field of research on economic institutions. It aims to achieve these objectives in part by organizing international research networks in these fields. For this purpose the Center has chosen corporate governance and financial systems in Japan and Asia as its main research agenda, a theme that represents the point of intersection of financial theory and the new theories of economic institutions.

For the CEI, this conference was an agenda-finding conference in order to start in-depth research. To have a broad perspective on the institution building in East Asia and Japan, the topic on designing financial systems is one of the most pertinent topics that would enable us to have an overview of ongoing institutional reforms, the problems behind them, and related theoretical and empirical researches. Since the conference, the CEI has been actively engaged in intense research activities, together with workshops, database construction and the establishment of international research networks. Some of the research has already been published in academic journals as well as books, namely "Corporate Governance in Japan and Asia," which was edited by Masaharu Hanazaki and Juro Teranishi, to be published by the University of Tokyo Press in 2003 in Japanese. We hope to publish our research in English again in the near future.

The conference in 2001 took place against the background of consider-

able uncertainty and concern about the future, arising from a global economic slowdown that began in late 2000/early 2001, from the September 11 terrorist attacks in the US and from ten years of slow growth in Japan and policy muddles that paralyzed effective monetary and fiscal policies. More recently, turmoil in the region became protracted by the Iraqi war and SARS, and Japan's economic slowdown seems to be compounded by worldwide deflationary tendencies.

All this underlines the necessity to find a framework of economic and financial systems that would fit better in an increasingly globalized world, where an effective mechanism for risk transfer and institutional coordination is urgently needed. We would also like to note that the task of resolving existing problems and establishing a new economic system remains a formidable challenge. The conference in 2001 provided an opportunity for us to renew this realization. As an organizer of the conference, I hope that this book contributes to expediting work that will lay down a basis for the future.

Finally, I would like to express my sincere appreciation of the valuable support and cooperation we have received from the IMF's Regional Office for Asia and the Pacific in coorganizing the conference in 2001. My thanks are also due to Chiaki Iizuka, Chizuko Tsutsumi and Chikako Tamura for their superb secretarial assistance.

Juro Teranishi

Introduction

Globalization, financial technology and growth phase – some thoughts on redesigning financial systems in East Asia and Japan

Joseph P.H. Fan, Masaharu Hanazaki and Juro Teranishi

A distinctive feature of the last decade has been the drastic change wrought by globalization and financial innovation on the world's financial systems. With the worldwide shift toward financial systems based on global markets, attention is focusing on the need to redesign existing financial institutions and markets, corporate governance schemes and regulatory frameworks in East Asia and Japan so as to better promote the region's sustainable economic development. Interest in restructuring the region's financial systems has intensified as a result of the East Asian crisis and the prolonged depression in Japan. The purpose of this book is to discuss some basic and indeed urgent issues that bear upon the new architecture of financial systems in East Asia and Japan, referring where appropriate to European and North American experiences.

In the following section, we present some preliminary thoughts on the forces that have conditioned existing financial systems and the course that should be taken in restructuring them. A summary of the book's chapters is given at the end of this chapter.

Why, and how, should financial systems be reorganized?

The bank-centered financial system

Part I of this book deals with the past and future roles of banks in the bank-centered financial system. In both East Asia and Japan, financial systems have long been characterized by the dominance of banks. In view of the recent turmoil in the region, centered largely on the banking sector, certain questions become crucial: how and why banks have contributed to the region's growth; why banks fell into difficulties during the later half of the 1990s; and what future awaits the bank-centered financial system in the era of globalization and financial innovation.

There is a vast literature on the role played by banks in Japan's high economic growth. Aoki and Patrick (1994) developed a comprehensive

study of the role and mechanism of the main bank system in facilitating information flow and reducing agency costs in the economy. Hellmann, Murdock and Stiglitz (1996) and Aoki, Murdock and Okuno-Fujiwara (1996) emphasized the efficiency-enhancing aspects of the government's banking policy, arguing that the government's ample supply of rent to private banks – mainly through the regulation of interest rates on deposits – induced the banks to invest in monitoring capability, as the rent increased the franchise value of the banks (the financial restraint hypothesis). Takei and Teranishi (1991) and Fukuda (2001) emphasized the relationship between long-term fund supply by the banking sector and far-sighted corporate behavior, pointing to the positive effects of long-term bank loans that mitigated the banks' monopoly on inside information on borrowers and gave the banks an incentive to liquidate loans before maturity. However, the prolonged banking and currency crisis in Japan and elsewhere in East Asia has cast doubt on these views. The progressive globalization of the economy, moreover, is making the opening of financial markets increasingly important in this region.

These issues are re-examined critically and comprehensively in several chapters of this volume. In Chapter 1, Hanazaki and Horiuchi criticize the financial restraint hypothesis that emphasizes the positive effects of banking policies that extensively utilized competition-preventing measures. They argue that the inefficiency caused by insider control and the policy of protecting inefficiently managed banks far exceeds the merits postulated by the hypothesis. Several authors point to the importance of the growth phase as a backdrop to the efficiency of the bank-centered financial system. Fukuda's Chapter 2 shows that the supply of long-term funds was growth-inducing mainly during the catch-up period. Morck and Yeung (Chapter 3) suggest that the Japanese system, with its emphasis on a close government-business relationship, was effective only when the economy was in the catch-up phase. Claessens, Djankov, Fan and Lang (Chapter 8) find that the growth phase of an Asian country, measured by the degree of its economic development, affects how well its companies diversify in an effort to create internal capital markets. Incidentally, in view of the difference between Japan's growth phase and those of other East Asian countries, it seems that some elements of the Japanese experience might be effective if applied to other countries in the region, most of which are still in the catch-up phases. Since external conditions have changed so drastically, however, one must beware of any simplistic urge to transplant the Japanese system to these countries.

Apart from the innate merits and demerits of the bank-centered financial system, there is no denying that difficulties await such a system as globalization and financial innovation intensify. Through a detailed examination of bank performance in Japan, Fukao (Chapter 5) maintains that the demerits of the traditional Japanese system, such as low profitability, cross-shareholding and lack of competition, are the main reasons for the

fragility of the banking system. Japanese banks have certainly lagged behind the mainstream in financial innovation, and consequently suffer from such problems as a low level of fee-earning business, commitment to traditional risk-taking without resorting to new risk-transfer technologies, and traditional collateral-based lending practices. Japanese banks have also been significantly affected by the recent trend toward globalization.

Although globalization is not a new phenomenon in the international economy – witness the gold standard period of the nineteenth and twentieth centuries – that which has taken place in the recent decade is unprecedented in two senses.[1] First, global standards and competition among national systems have led to a rapid integration of economic institutions, so that similar rules are now followed by all. Second, products and their interfaces have been significantly standardized in both the financial and manufacturing sectors, greatly facilitating anonymous, impersonal transactions.

These two characteristics of today's economic globalization have had significant effect on the financial system. International standardization of capital adequacy requirements and other prudential regulation rules, led by the Bank for International Settlement (BIS), has influenced the international competitiveness of banking sectors in economies with differing degrees of leverage. The introduction of the market value accounting system, as promoted by the International Accounting Standard Committee, has necessitated serious adjustment for economies and companies that have practiced historical cost accounting. Further standardization, moreover, has come with the extension of the electronic data exchange system for the settlement of financial transactions, a development expected to have an important influence on the role of bank deposits as a means of settlement.

The indirect impacts of recent globalization are significant as well. The increased modularity of manufacturing products has had a considerable effect on the financial system, in that it encourages transactions without relationships, changing the concept of a "firm" from an organic entity based on an internal market to a simple sum of independent projects. At the same time, the diminishing role of national boundaries in transactions points to the increasing role of market competition in disciplining the behavior of economic units. It is inevitable, therefore, that the regulatory framework will respond to these changes by relying more on market-based regulation methods. In view of this backdrop, two chapters in this volume bear special importance in understanding the future of the bank-centered financial system. In Chapter 6, Montgomery examines the effects of the Bases Accord on bank performance. In Chapter 12, Kuroda and Hamada refer to the implications of the new international accounting standard.

In order to accommodate the burgeoning tide of globalization and financial innovation, the Japanese and East Asian financial systems must be restructured so as to become more market-based. Morck and Yeung

argue that there is no "cultural" factor that prevents the Japanese system from moving in that direction. In this regard, Chapter 4 by Kim and Nofsinger examines the interesting features of stock market behavior in Japan.

Issues of corporate governance in Japan and East Asia

Corporate governance is the main theme of Part II. Among large companies in the developed world, separation of ownership and management is ubiquitous, as Berle and Means (1932) point out. A vast literature has been devoted to finding external governance mechanisms that can be used to monitor managers in the interest of shareholders, especially since the publication of Jensen and Meckling (1976).

The system of corporate governance in postwar Japan is apparently aberrant to this trend, as Japanese managers enjoy ample autonomy owing to extensive cross-shareholding among group firms. With two additional frameworks institutionally complementary to autonomous managers – an internal labor market with rank hierarchy (Aoki 1988) or overlapping managerial structure (Allen and Gale 2000) and the main bank monitoring system – the system is regarded as having performed quite well in a second-best world featuring information asymmetry, incomplete contracts and incomplete markets. In this system, managers working to improve the probability of their projects' success are motivated by a desire to move up the company's hierarchy, and are taught to take a far-sighted view by the employees as a whole, under the lifetime employment system. This can also be achieved with banks through a long-term good customer relationship between the firm and the bank.

It is often argued that banks were important in postwar Japan, not only because they constituted an efficient conduit between ultimate savers and investors, but also because they were essential to corporate governance. This positive view of the bank-centered financial system has been made prevalent by Aoki and Patrick (1994), which clarified the concept of "main bank system." Under the system based upon not only the lender–borrower relationships but also shareholding connections between banks and firms, a firm is monitored and disciplined by the main bank. Banks sometimes second officers to borrower firms, particularly when the latter are in financial distress. The bank officers may intervene in management and play an active role in the restructuring of these firms (Hoshi, Kashyap and Scharfstein 1990). The nexus between banks and firms via loans, shareholding and personnel is regarded as a factor that mitigated the agency problems of corporate management and thereby enhanced the management efficiency of the banks' client firms (Aoki, Patrick and Sheard 1994).

There are many empirical studies that support the conventional view. For example, Hoshi, Kashyap and Scharfstein (1991) argue that the main

bank relationship (more precisely, financial *keiretsu*) reduces the agency costs of external funds, including bank credit. The main bank relationship is also held to be effective in avoiding the unnecessary liquidation of borrower firms in financial distress. From this viewpoint, the amount of debt has no bearing on the disciplinary effect of main bank relationships. Rather, the main bank relationship tends to mitigate the disciplinary effect of debt because banks can actively intervene to rescue borrower firms in financial distress. In spite of this mitigating effect, the main bank monitors its borrowers' management and may be regarded as having exerted a similar disciplinary influence on the management of Japanese firms, much as the capital market has done in the corporate governance framework of the United States (e.g. Prowse 1995).

Weinstein and Yafeh (1998), on the other hand, find that the main bank relationship has significant negative effects on corporate performance. They claim that by charging higher interest on loans, main banks extract rents from client firms in exchange for access to capital, whilst also putting pressure on client firms to take conservative (high capital intensity, low growth) investment policies. They infer that main banks can have this power because they hold a monopoly on internal information, so that the hold-up problem analyzed in Rajan (1992) is present in the Japanese firm-bank relationship. Some of the papers in this volume also cast doubt on the conventional view. Hanazaki and Horiuchi (Chapter 1) examine the effects of the main bank relationship on total factor productivity. They obtain a negative effect of the main bank variable, but significant positive effects of competitive pressure variables such as the export ratio and the import penetration ratio. Yafeh and Yosha (Chapter 9) draw attention to the disciplinary effect of debt on corporate governance, an aspect that is neglected in the conventional view. They also find that a significant governing role is played by large shareholders. In Chapter 11, Kubo examines executive compensation, exploring the deeper workings of the internal labor market in the Japanese system.

Another aberration from the Anglo-American mechanism of external governance favoring shareholders is the corporate governance system in East Asia. Unlike companies in the United States and United Kingdom, whose shares are held by diffuse entities, the shares of a typical East Asian corporation are kept tightly in the hands of one or several family members. The company is likely to be affiliated with a business group, also controlled by the family, which consists of several or numerous public and private companies. The family achieves effective control of the companies by means of stock pyramids and cross-shareholdings, which can be quite complicated in structure. The family-run business group and its member firms diversify into a wide array of businesses that often include banking and financial services, holding dominant positions in a few of these businesses. The family typically maintains close relationships with the government and politicians, in this way exerting significant influence on the economy.

The degree of ownership concentration affects the nature of contracting, creating agency problems between managers and outside shareholders. When ownership is diffuse, as is typical in the United States and the United Kingdom, agency problems stem from conflicts of interest between outside shareholders and managers owning insignificant amounts of equity in the firm (Berle and Means 1932; Jensen and Meckling 1976; Roe 1994). On the other hand, when ownership is concentrated to the point where an owner obtains effective control of the firm, as is the case in East Asia, the nature of the agency problem shifts away from manager-shareholder conflicts to conflicts between the controlling owner (who is also the manager) and minority shareholders.

Gaining effective control of a corporation enables the controlling owner to determine how profits are shared among shareholders. Although minority shareholders are entitled to cash flow rights corresponding to their share investments, they cannot be sure that an entrenched controlling owner will not opportunistically deprive them of their rights. The entrenchment problem created by the controlling owner is similar to the managerial entrenchment problem discussed by Morck, Shleifer and Vishny (1988). Increasing managerial ownership may entrench managers as they are increasingly less subject to governance by boards of directors and to discipline by the market for corporate control. If stock pyramids or cross-shareholdings were used to consolidate control in addition to the concentrated ownership that is characteristic, they would also result in a separation between ownership and control, thus exacerbating the entrenchment problem of controlling owners. A controlling owner in this situation could extract wealth from the firm and receive the entire benefit while bearing only a fraction of the cost.[2] In this volume, Khanthavit, Polsiri and Wiwattanakantang (Chapter 10) give useful information on these points. Using their original database and a detailed examination of family ownership of public firms in Thailand, they offer basic information on control and ownership structures and their changes over time.

The effects of entrenchment by the controlling shareholder include outright expropriation, whereby the controlling shareholder benefits from self-dealing transactions in which profits are transferred to other companies he or she controls. The controlling shareholder can also exercise *de facto* expropriation through the pursuit of objectives that are not profit-maximizing in return for personal utilities. Take corporate diversification and group affiliation, for example. These organizational arrangements popular in East Asia create internal markets for raw materials, intermediate inputs, labor and financial capital, and allow transactors to bypass external markets through internal transactions. These arrangements avoid transaction costs in external markets, which can be high in developing economies. However, the large internal organization associated with diversification and grouping also creates management and agency problems. In Chapter 8, Claessens, Djankov, Fan and Lang study

the performance of diversified firms before and during the Asian Financial Crisis. They find that the stock performance of diversified firms declined more dramatically than that of focused firms during the crisis. This evidence is inconsistent with the view that internal markets are beneficial, for that would predict a superior performance of diversified firms during periods when external markets are volatile. The evidence is more consistent with the view that corporate diversification in East Asia created agency problems that were manifest in the inferior performance of diversified firms during the financial crisis.

Whilst most of the debate over corporate governance has been concerned with large, established, or public firms, in Chapter 7 Mayer draws attention to governance and financing issues for new technology sectors. This is a new and important area for future research. The chapter by Mayer should be read in connection with Mayer, Schoors and Yafeh (2001) and Allen and Gale (2000). The former deals with venture capital financing and its relationship with investment behavior in an international comparative framework involving Germany, Israel, Japan and the UK. The latter discusses the relative efficiency of bank-centered and market-based financial systems in an environment of technological uncertainty, where hard data on technology are unavailable and people have diverse expectations about the future course of technological development.

Restructuring financial systems

Part III of this book deals with various issues related to the restructuring and redesign of the financial system of Japan. Redesign should be pursued so as to adapt the system to the globalization of financial markets and accommodate it to the rapid development of financial technology. As already discussed, the globalization of financial markets involved two issues: the integration of financial markets, and the sharing and standardization of economic rules. In Chapter 12, Kuroda and Hamada subject contemporary Japan's non-performing loan problem to a detailed examination, attempting to define non-performing loans in light of the global standardization of accounting rules. Chapter 13 by Ghon Rhee discusses the role of Japanese government bonds in the development of a regional capital market in Asia.

The recent development of financial technology has had significant impacts on financial systems and will continue to do so. Among other things, it has changed the main role of a financial system from risk elimination to risk trading or transfer. Traditional banking businesses, based on comparative advantage in risk elimination achieved through lower transaction costs and asymmetric information, are increasingly allowing risk to be allocated among various parties according to their preference.

Two issues should be examined in designing an Asian financial system that can respond to the challenge of new financial technology. First, we

should ask what role will be played by relationship-based lending in the world of new financial technology. This is an important question, because relationship-based lending, by encouraging far-sighted behavior by economic units, has been associated with relationship-specific investments among firms and employees – and relationship-based investing has been the main ingredient in process and product innovation by Asian firms. New financial technology, such as asset-backed securities and project finance, has reduced information asymmetry considerably. However, relationship-based lending is concerned with the credit risks of firms, which can be reduced only through daily monitoring and reputation-building. Unless new financial technology can eliminate all credit risk through bundling and unbundling, someone must bear the credit risks that are idiosyncratic to firms. This is why we need to ask about the role of traditional banking in today's new circumstances.[3]

The second issue is related to participation costs – the costs involved in learning how to use markets effectively and participate in them on a day-to-day basis (Allen and Santomero 1998). New financial technology has reduced trading cost substantially and monitoring cost to some extent. On the other hand, the growing use of new financial instruments has incurred considerable participation cost, composed not only of variable costs needed to carry out daily financial transactions, but also of the fixed set-up costs entailed in obtaining basic expertise for participating in the market. Participation costs determine the type of participants in a financial market and hence the pattern of the financial system. When participation costs are low, the main actors in new financial markets are individual investors; when costs are high, financial intermediaries can play major roles. The difference in the pattern will have significant relevance to the regulatory framework and governance structure in the new architecture of financial systems. Against this backdrop, Chapter 14 by Kitamura, Suto and Teranishi considers how the financial system of Japan might be restructured to accommodate new developments in financial technology.

What is discussed in this book?

This book comprises three parts. Part I deals with the role of banks and the past and future of the bank-centered financial system. Part II is concerned with corporate governance in the region, characterized by the main bank system and family ownership. Part III is devoted to problems relating to the actual implementation of financial restructuring.

Part I

In Chapter 1, Hanazaki and Horiuchi examine the validity of the financial restraint hypothesis advocated by Hellmann, Murdock and Stiglitz (1996) with regard to postwar Japan. According to the financial restraint hypothe-

sis, comprehensive competition-restricting regulations gave the banks excess profit opportunities which motivated them to be prudent in monitoring their client firms. The financial deregulations that began in the early 1980s undermined the banks' profitability and induced them to shirk their monitoring responsibilities. Thus, the hypothesis concluded that the Japanese banking crisis of the 1990s was a consequence of financial deregulation in the 1980s. The chapter criticizes the financial restraint hypothesis and proposes an alternate one: that the banking sector was potentially fragile even before the 1980s, because the government was unable to penalize inefficiently managed banks in credible ways. Manufacturing firms, which were disciplined by competitive pressures from abroad, reduced their reliance on bank credit in the late 1970s, whilst non-traded goods industries such as real estate became major borrowers of bank credit in the 1980s. This structural change in the bank credit market revealed the potential fragility of the Japanese banking sector. Empirical analyses based on more than 1,600 manufacturing firms support the alternative hypothesis this paper proposes.

Fukuda investigates in Chapter 2 whether long-term funds had a positive impact on investment in Japan, Korea and Taiwan. When there exists the possibility of a liquidity shortage, firms tend to make conservative investment decisions. Thus, to the extent that long-term debt makes liquidity shortage a less likely outcome, long-term loans can have a positive impact on investment. In the first part of the paper, Fukuda estimates Tobin's Q type investment functions of Japanese firms for two different sample periods. For 1972–1984, he finds that the long-term loan ratio had an additional positive effect on investment. For 1985–1996, however, he finds no evidence that higher ratios of long-term loans increased Japanese corporate investment. The result indicates that the size of long-term loans had a significant influence on firms' investments only when the financial market in Japan was in its early stage of development. In the second part of the paper, he estimates investment functions of Korean and Taiwanese firms in the late 1990s. Korea experienced a serious crisis during that period, whilst Taiwan's economic decline was relatively moderate. Fukuda finds, however, that the long-term debt ratio had a significantly positive impact on investment in both countries. This result indicates that long-term funds might have mitigated the decline of investment regardless of the magnitude of the crisis.

In Chapter 3, Morck and Yeung analyze the recent stagnation of the Japanese economy. Following spectacular performance in the decades following World War II, Japan's economy has been surprisingly weak for more than a decade. Something substantial clearly happened to it at the end of the 1980s. There was, certainly, the collapse of the Japanese stock market and real estate market. But financial and real estate markets have collapsed before, many times and in many countries, and the results have not always been a decade of economic stagnation. Indeed, the US

economy scarcely noticed the stock market collapses of 1907 and 1987. Why has the Japanese financial disarray of the late 1980s been so difficult to transcend? Their key point is that Japanese economic institutions were well suited to both postwar reconstruction and "catching up" with other advanced economies, but not to surpassing them. They argue that Japan had essentially finished "catching up" by the late 1980s. The business-government cooperation and bank-centered corporate governance that served Japan so well for decades are now, in critical ways, ill-suited to the job of guiding the nation further forward. Yet these institutions persevere with an inertia that reduces Japan's ability to find and invest in new economic opportunities, including new enterprises. In particular, the authors argue that Japan should shift away from state and bank oversight and toward greater reliance on equity markets to allocate capital. Such a shift will not be feasible, however, unless key institutional changes are made. These include dismantling intercorporate equity holdings, making corporate decision-making more transparent and making corporate governance more responsive to shareholder pressure. Finally, they are skeptical of the argument that such changes run counter to deep Japanese cultural traditions, and are therefore optimistic that they can be accomplished.

In Chapter 4, Kim and Nofsinger compare the investing behaviors of three types of Japanese institutional shareholders: securities firms, business corporations, and financial institutions. Overall, they find that all three types of institutions tend to herd, and that their herding impacts on prices in a similar fashion. Trading by these institutions, however, appears to be in different stocks. When securities firms buy or sell, they exhibit a negative feedback trading strategy; when financial firms buy or sell, their feedback trading strategy is positive.

Fukao discusses the recent fragility of the Japanese banking system in Chapter 5. The Japanese banking system still has latent unstable factors. The author estimates the probability of bank failure by applying the option-pricing theory to evaluate the risk in the net asset position of individual banks. He finds that even at the end of March 2000, a significant number of Japanese banks had a relatively high probability of failure over a one-year time horizon. He also points out that Japan still faces a number of problems in its financial system. First, the profit margin is too small to cover the increased default risk that followed the bursting of the bubble. Second, banks still have excessive stock investment. Third, the government guarantee of all banking sector liabilities should be removed. Finally, he advocates that the life insurance sector should be stabilized as soon as possible.

Montgomery's study in Chapter 6 investigates the hypothesis that stricter capital adequacy requirements introduced under the 1988 Basel Accord caused Japanese banks to restrict loan growth. Using a panel of Japanese bank balance sheets for fiscal years 1982–1999, she finds that the 1988 Basel Accord regulation requiring international banks to hold a BIS

capital to risk-weighted asset ratio of at least 8 percent increased the sensitivity of total loan growth to capitalization for international banks in Japan. A similar, but quantitatively smaller finding is reported for a group of "switcher" banks that initially pursued the 8 percent BIS capital adequacy requirement following the signing of the Basel Accord in 1988, but then later switched to pursue a domestic 4 percent Ministry of Finance capital adequacy requirement. Domestic banks, which were subject to a 4 percent capital adequacy requirement for the entire post-Basel period, show no evidence of increased sensitivity of lending to capitalization during that period.

Part II

In Chapter 7, Mayer examines financial sector preconditions for the successful development of high technology sectors. He argues that there is a close relationship between the types of activities undertaken in different countries and their institutional structures. A distinguishing characteristic of the financing of new technology firms is the evolving pattern of control by different investor groups. While stock markets are an important component in the development of the most successful firms, they are not the most common. Regulation is a significant influence on institutional structure. For the most part, Europe has opted for high levels of investor protection and low levels of diversity, while the US has placed more emphasis on entry and competition in the financial sector. Whilst most attention to date has focused on the regulation and fragility of banking systems in Japan and the Far East, careful consideration needs to be given to alternative forms of regulating other parts of the financial system as well.

The study by Claessens, Djankov, Fan and Lang in Chapter 8 examines the role of internal capital markets and corporate diversification during normal and turbulent times. The authors hypothesize that internal markets are more valuable for firms in countries with less-developed financial markets and that diversification generally reduces risk. To conduct their tests, they studied 3,000 East Asian corporations over the period before and during the 1997–1998 financial crisis. They find support for the internal market hypothesis during normal times. They find, however, that more diversified firms perform worse during a crisis, especially in less-developed countries. This suggests that more diversification and greater use of internal markets are associated with higher risk-taking, especially when external markets are less developed.

Chapter 9 by Yafeh and Yosha focuses upon the governance mechanisms of Japanese firms in the chemical industry, with particular emphasis upon the roles of large shareholders and banks. The authors show that concentrated shareholding is associated with lower expenditures on activities with scope for generating managerial private benefits. Their analysis

suggests that, at least in the chemical industry, large shareholders play a role in monitoring managers. They also find evidence for the disciplinary role of debt, which appears to limit management's free cash flow and reduces spending on activities relating to managerial private benefits. They do not, however, find as much support for the conjecture that banks are particularly important in this respect. Finally, they find that monitoring that curtails activities with scope for managerial private benefits is not present in the consumer electronics industry, either because of the different technological nature of this sector, or because intense product market competition leads to low moral hazard for management.

In Chapter 10, Khanthavit, Polsiri and Wiwattanakantang examine the ownership structure of listed Thai firms in the period after the East Asian financial crisis, compared to that in the pre-crisis period. Using a unique, comprehensive database of ownership and board structures, they find that ownership and control appear to be more concentrated in the hands of controlling shareholders following to the crisis. After the crisis, even though families remain the most prevalent owners of Thai firms and are still actively involved in the management, their role as the controlling shareholder becomes less significant. They also show that direct shareholdings are most frequently used as a means of control in both periods and that pyramids and cross-shareholdings are employed to a lesser extent after the crisis.

In Chapter 11, Kubo analyzes the determinants of executive compensation in Japan and the United Kingdom. It is widely believed that the behaviors of large Japanese companies are different from those of their British counterparts, particularly in terms of corporate governance style. Although there are many studies on executive compensation, these often take for granted the "Anglo-American style of corporate governance." The author seeks to contrast the effect of corporate governance on directors' incentives by comparing the United Kingdom and Japan. There is a positive and significant relationship between directors' pay and employees' average wages in Japan, suggesting that both directors and employees have a similar incentive system, whereas no such relationship is observed in the UK. These results suggest that the difference in corporate governance affects both the salary and incentives of directors.

Part III

Kuroda and Hamada point out in Chapter 12 a number of incentive-compatible ways of coping with Japan's ongoing non-performing loan problem and investigate the role of accounting systems in assessing this problem. Whilst there is general agreement that disposing of bad loans is a matter of the highest priority for Japan, there still remain misunderstandings and arbitrary hypotheses that may lead to an inadequate estimation of the qualitative situation and to a mistaken appraisal of the methods

of disposal. The authors give a precise definition of non-performing loans and define such crucial issues as systems and accounting methods for their disposal. They also explain the development of accounting methods for the disposal of non-performing loans, taking into account the role of international accounting standards for financial instruments that aim at the implementation of market value measurement. Finally, they explore the point of tangency between the non-performing loan problem and the wisdom obtained by the economics of information and contract.

In Chapter 13, Ghon Rhee examines Japanese government bonds markets. At the end of 1999, the value of Japanese government bonds (JGBs) issued by the central government reached ¥359 trillion (US$3.30 trillion), exceeding the United States in its outstanding Treasury securities balance of $3.28 trillion. Japan will remain the world's largest issuer of government debt for the foreseeable future. This is important news for the further development of the JGB market because the Ministry of Finance will be forced to heed the cost minimization of government debt. Any reform measures necessary to attain this goal will be adopted more expediently and decisively than ever before. The paper reviews key steps for the JGB market's further development through aligning its infrastructures with those of the US and UK government securities markets. The author assesses the capability of Japan's MOF to minimize the cost of JGBs given the current status of the market. He also identifies numerous reform measures needed to create a more effective and efficient JGB market. In the final section of the paper, he touches upon urgent policy issues that must be addressed at the regional level in order for the JGB market to effectively spearhead regional bond market activities.

In the final chapter, Kitamura, Suto and Teranishi deliberate on the redesign of Japan's seriously ailing financial system. Against the backdrop of four conditions – enhanced ability to transfer risk through financial markets; increased participation costs in financial markets; increases in probabilities in the systemic risks; and equal distribution of wealth – they argue the following:

i Risk management would make more use of risk elimination by institutional investors and risk transfers through the financial markets. Efforts are urgently needed to promote an efficient system of risk transfer through financial intermediaries.
ii Financial market transactions are an arena for institutional investors, and not for individual investors.
iii It is necessary to establish an institutional framework to induce institutional investors to conduct active corporate monitoring in their role as principal shareholders.
iv Banks will play an important role in financing small and medium sized firms, and venture firms in particular, when probabilities of systemic risks are alleviated in the future.

In this sense, banking is in a state of evolution rather than outright decline. As a policy conclusion, the authors point out the necessity of encouraging the participation of individual investors in the mechanism of security market-based risk transfer by means of intermediated ownership.

Notes

1 Other differences worth noticing are: the recent globalization has been associated with both trade and financial transactions, while the prewar globalization during 1900–1913 was most pronounced in terms of trade, and that after World War I in terms of financial integration; and that globalization during the last decade has been accompanied by a significant regionalization of the world economy, which has also exerted a positive influence on the activation of transactions.
2 Although minority shareholders appear to have been expropriated by the controlling owner, they may have been price-protected when they bought the shares. That is, if the minority shareholders purchased the shares after control existed, the stock price should be discounted for this action and the discount would on average pay for the apparent transfer.
3 Boot and Thaker (2000) examine the competition between capital markets and the banking system in a framework in which banks conduct both relationship banking and transaction loans.

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Part I

Financial institutions and financial markets in Japan and East Asia

1 Can the financial restraint theory explain the postwar experience of Japan's financial system?

Masaharu Hanazaki and Akiyoshi Horiuchi

Introduction

While Japanese banks seem to have disciplined corporate borrowers toward efficient management in the high-growth era, the enormous numbers of non-performing loans that have arisen since the early 1990s show that they are far from effective in monitoring their client firms. The sharp contrast between the banks' admirable performance during the high-growth period, when they mediated between ultimate lenders and borrower firms, and their miserable showing since the early 1990s, is a puzzle to those who are interested in how the financial system has contributed to industrial development. Can we offer a consistent explanation for the ups and downs of the Japanese banking sector through the postwar period?

One possible way to answer this question is to argue that while Japanese banks were effective in monitoring their client firms during the high-growth period, the financial deregulations introduced in the early 1980s eliminated the incentives that ensured prudent monitoring. The "financial restraint theory" advocated by Hellmann, Murdock and Stiglitz (1996) can be cited to support this argument. They argue that competition-restricting regulations typified by interest rate controls give banks opportunities for excess profit that induce them to be prudent in monitoring their client firms.

As the financial restraint theory suggests, the Japanese government imposed various competition-restricting regulations on the financial system during the high-growth era. These regulations seemed to be effective in achieving excellent corporate finance based on intimate bank-firm relationships. With the coming of the 1980s, the government introduced financial deregulations. The financial restraint theory argues that deregulation undermined the banks' profitability and induced them to shirk monitoring. According to this theory, the banking crisis that occurred in the 1990s was a consequence of the financial deregulations of the 1980s.

This chapter criticizes this explanation of the Japanese financial system's experience in the postwar period, and proposes the alternative

hypothesis that the banking sector was potentially fragile even before the 1980s. The reason for its fragility lay in the government's inability to credibly penalize inefficiently managed banks under the competition-restricting regulations and comprehensive safety net that prevailed. This fragility was not revealed until the 1980s because the major clients of bank credit were firms in the manufacturing industries, which were disciplined by competitive pressures from abroad.

Manufacturing firms reduced their reliance on bank credit in the late 1970s, and non-traded goods industries, such as real estate, became the major borrowers of the 1980s. Banks should have monitored the non-traded goods firms, because they belonged to industries that were not disciplined by competitive pressures from abroad. But the banks were not well prepared to monitor borrower firms: by concentrating loans in sectors that were not well disciplined by market competition, the banks created structural change in the bank credit market that revealed the underlying fragility of the Japanese banking sector. An empirical analysis based on more than 1,600 manufacturing firms refutes the financial restraint hypothesis and supports the alternative hypothesis proposed in this chapter.

The chapter is organized as follows: the next section explains the conventional view of how Japan's bank-centered financial system functioned during the postwar period. We place particular emphasis on how the financial restraint theory supports the conventional view in explaining the ups and downs of the banks' performance before and after the financial deregulations of the 1980s. After this, the chapter criticizes the explanation based on the financial restraint theory. Following this, the chapter proposes an alternative hypothesis to explain both the banks' apparently excellent performance in the high-growth period and their miserable performance since the late 1980s. Here we stress the importance of the disciplinary influence of competitive pressures from abroad, and the structural changes in the bank credit market since the late 1970s. The chapter goes on to statistically test the relevance of two factors in explaining the managerial efficiency of manufacturing firms: main bank relationships, and competitive pressures via international trade. If the financial hypothesis were true of Japan, the main bank relationship would have significantly explained the higher efficiency of borrower firms during the high-growth period. We would have also observed a significant decline in the main banks' contribution to the managerial efficiency of borrower firms' after 1980, when Japan started financial deregulation. However, our test does not find that the main bank relationship had a positive influence on corporate management, but does find that competitive pressures from abroad had a significantly positive influence on firms' efficiency during the high-growth period. Neither does our test support the hypothesis that the positive influence of the main bank on corporate management decreased after the start of financial regulation in the early 1980s. Thus,

the statistical analyses refute the explanation based on the financial restraint theory. The chapter concludes with a summary of the discussions contained herein.

The conventional view of Japan's financial mechanism

Banks mobilize financial resources from savers via bank deposits, which are liquid stores of value, functioning as an essential instrument of the payment system. Banks also allocate funds to fund-users (mainly firms) by examining or monitoring their credit-worthiness. Economies of scale are realized both by pooling funds from a large number of savers and by diversifying loan portfolios. Banks are delegated by a large number of small savers to economize on monitoring costs (Diamond 1984). Without doubt, banks play an important role in a market economy. Banks are believed to be particularly effective in stimulating rapid industrial development in the early stages, when efficient monitors are badly needed. Gerschenkron (1962) proposed the hypothesis that a bank-centered financial system promoted industrial development in industrially underdeveloped countries in nineteenth century Western Europe. According to his analysis, banks played only a limited role in Britain, industrially the most advanced country at that time, while their strong functioning in Germany, then an industrially backward country, helped Germany to catch up with Britain.[1] This latter situation was true of Japan in the postwar era, particularly in the so-called "high-growth period" from the late 1950s to the early 1970s. Postwar Japan achieved what many saw as "miraculous" industrial development under the bank-centered financial system.

Banks in the corporate governance structure

It is widely argued that banks were important in postwar Japan, not only because they constituted an efficient conduit between ultimate savers and investors, but also because they were essential to corporate governance. This view of the functions of a bank-centered financial system has been so prevalent that we will call it the "conventional view." The voluminous book edited by Aoki and Patrick (1994) has contributed to the circulation of the conventional view.[2] This view holds that banks monitored and disciplined the management of borrower firms via intimate, long-term relationships with the firms. These long-term connections, often called "main bank relationships," were based not only on standard loan contracts but also on cross-shareholding between banks and their client firms.

Cross-shareholding functioned to insulate managers of both banks and their client firms from the pressures of capital market. However, according to the conventional view, this did not mean that managers were entrenched. Banks were able to exert strong disciplinary influence on client firms' management as large debt holders or shareholders. Thus,

banks functioned as a substitute for the capital market in the framework of Japan's corporate governance (Aoki 1994: 122–124). Banks sometimes dispatched officers to borrower firms, particularly when the firms were in financial difficulty. The bank officers would intervene in management and play an active role in the restructuring of these firms (Hoshi, Kashyap and Scharfstein 1991; Sheard 1994). The nexus between banks and firms via loans, shareholding, and personnel is regarded as a factor that mitigated the agency problems of corporate management and thereby enhanced the management efficiency of the banks' client firms (Aoki, Patrick and Sheard 1994).

How are banks disciplined?

Theoretically, banks can monitor and discipline the management of their client firms. But banks are themselves corporations to be monitored and disciplined. Thus, we must answer the question of how bank managers are disciplined. Here, as Aoki (1994) suggests, the conventional view can fall back on the financial restraint theory. The theory holds that restricting competition in financial markets, and thereby giving the banks excess profits, is effective in motivating banks to efficiently monitor their borrower firms. Provided that the existing banks are rationally managed, they will not neglect to monitor their borrowers because to do so will lead to the loss of profit opportunities. On the other hand, if they are allowed freedom in setting the interest rates they offer on bank deposits, competition will decrease their profitability (i.e. their franchise value) and intensify their motives for risk taking behavior.[3]

In postwar Japan, the government heavily regulated the domestic financial system. The purpose of regulation was to protect banks and other financial institutions. Regulation suppressed competition in the various fields of the financial services industry, and gave excess profits to existing financial institutions, including banks. The banks appear to have effectively monitored borrowers and played an essential role in the corporate governance framework of their client firms. As Hellman *et al.* (2000) suggest, postwar Japan seems to illustrate the relevance of the financial restraint theory by showing that a bank-centered financial system, protected by competition-restricting regulations, can attain efficient financial mediation and contribute to industrial development.

How to explain the current banking crisis in Japan

The financial restraint theory thus explains the efficiency of Japan's bank-centered financial system by relating it to competition-restricting regulations. This theory could also explain the current bank crisis in Japan in the following way: At the beginning of the 1980s, Japan started to deregulate its financial system in pace with other developed countries. Financial

deregulation heightened competition in the financial system, reducing the profitability of existing financial institutions.[4] The loss of profit opportunities deprived the existing banks of incentives for prudent management. Inadequate monitoring led to excessive risk-taking on the part of banks under the comprehensive financial safety net existing in the late 1980s. The inefficiency with which the banks were being managed was revealed in the early 1990s in the form of a serious backlog of non-performing loans.

Thus, the financial restraint theory seems to consistently explain the rises and falls that the Japanese bank-centered financial system has experienced since World War II. Specifically, it seems to explain both the excellent performance of bank relationships during the pre-deregulation period and the fragility of the banking sector that has been revealed over the two decades since deregulation.[5]

Is the financial restraint theory applicable to Japan?

Can the financial restraint theory really explain the postwar experience of Japan's financial system? We doubt that it can. There are both theoretical and factual reasons for our skepticism. Theoretically, we doubt that the model proposed by Hellmann *et al.* (2000) captures the realities of bank management in Japan. The financial restraint theory assumes that bank managers try to maximize their banks' equity value. This assumption is crucial to the theory. However, if bank managers entrench themselves against the pressures of capital markets, they may pursue objectives different from the maximizing of equity value. The model then leads to a conclusion that sharply contradicts the implication derived from the financial restraint theory.

Factually, Hellmann *et al.* (2000) and those who support the conventional view seem to exaggerate the real impacts of financial deregulation in Japan. Although the Japanese government started deregulating domestic financial markets in the early 1980s, this was far from a thorough liberalization, as the government was hesitant to introduce full-scale competition into the financial system. In our view, financial deregulation cannot explain important aspects of the structural changes observed in Japan's corporate finance since the early 1980s.

Entrenched bank management and lack of credible penalties

Hellmann *et al.* (2000) assume that bank managers faithfully follow the neoclassical objective of maximizing banks' equity value. If banks are allowed the freedom to set deposit interest rates in order to attract depositors, the rise in interest rates will decrease the banks' franchise value. This decrease will induce the banks to abandon prudent risk management. This is a well-known result derived from shareholders' limited liability; i.e.

shareholders favor increases in risk because they can transfer down-side risk to debt holders. In order to ensure that banks enforce prudent risk management, the government needs to impose a ceiling on deposit interest rates so as to give banks excess profits.[6]

However, in our view, the result of cross-shareholding between banks and related corporations, and the comprehensive financial safety net that virtually protected all investors in banks' debt, was to insulate bank managers from the influence of capital markets. Although cross-shareholding did not necessarily ensure a majority of votes, it allowed incumbent managers substantial room to defend themselves from the pressures of capital markets by increasing the cost to investors of exercising their voting power.[7] Even during the current critical period in bank management, when banks' share prices have fallen astonishingly, we observed no instance in which a bank manager was replaced due to a decline in share prices (Bremer and Pettway 2002: 136). This was the phenomenon of managerial entrenchment. To bank managers and employees, securing and extending one's own job opportunities is more important than maximizing equity value. We may suppose that managerial entrenchment has allowed bank managers to pursue objectives divergent from the maximization of equity value. Free competition, then, would not necessarily induce bank managers to engage in imprudent risk management. Under free competition, imprudent risk management increases the probability of a bank falling into managerial difficulty. If the problem leads to the bank's outright failure, the bank's managers and most of its employees will lose their jobs. This is the most costly scenario for them. Thus, under managerial entrenchment, free competition tends to make risk management prudent rather than imprudent.

In contrast, competition-restricting regulations that protect existing banks and financial institutions tend to make risk management imprudent. This is because such regulations weaken the disciplinary effect of market competition on bank managers. The financial restraint theory argues that the excess profits conferred on existing banks by regulations motivate the banks to prudently manage risk. In order for this argument to apply, the managers of imprudent banks must be penalized in a credible manner. Without credible penalties for poor performance, protective regulations are most likely to induce inefficient monitoring and excessive risk-taking on the part of bank management.

In reality, as Hanazaki and Horiuchi (2001) discuss, the financial system in postwar Japan did not have credible penalties for inefficiently managed banks. The *de facto* financial safety net implemented by the government protected not only all bank depositors, but also other holders of debt issued by banks and investors in bank shares. Furthermore, the government virtually rescued the managers of troubled banks through its covert operations to promote the merger of distressed banks with sound ones. Due to this safety net mechanism, the capital market was unable to effectively penalize inefficient management in existing banks.

At least until the early 1980s, market competition in the Japanese financial system was heavily regulated. Since the system's comprehensive safety net suppressed the capital market's ability to penalize inefficiency, only the regulatory authorities responsible for supervising bank management remained as a means of doing so. Capital markets delegate to the regulatory authorities the essential role of supervising bank management, precisely because the financial safety net that protects depositors and investors from bank failures undermines the effectiveness of market discipline (Black, Miller and Posner 1978). In place of the capital market, regulatory authorities supervise bank management to ensure that banks effectively monitor their clients.

However, there is some evidence indicating that Japan's regulatory authorities did not utilize their power to achieve prudent management in the banking sector. For example, the Ministry of Finance allowed banks to increase their leverage ratios substantially during the 1980s, thereby making the banking sector even more fragile than it had been. Horiuchi and Shimizu (2001) statistically test the assumption that the regulatory authorities (the Ministry of Finance) and regulated banks collude via *amakudari* (the practice by which regulated banks offer important managerial positions to officers retiring from the regulatory authorities), and by undermining the effectiveness of the regulators' supervision. Their test, based on a sample of more than 120 regional banks, does not reject this assumption.

In our view, competition-restricting regulations did not motivate banks to prudently manage risk in postwar Japan because bank managers had entrenched themselves by means of cross-shareholding and because there were no credible penalties for inefficient management. This view suggests that the Japanese banking sector was potentially fragile even in the high-growth period. This is in sharp contrast to the conventional view which assumes that banks were efficient monitors in the high-growth period.

Delayed financial deregulation

The conventional view, based on the financial restraint theory, argues that the financial deregulation process that began in the 1980s served to heighten competition in the financial markets, thereby depriving existing banks of excess profit opportunities. The disappearance of excess profits in the banking industry forced banks to shirk their monitoring responsibilities and to take excessive risk in the latter half of the 1980s. The banks' excessive risk-taking culminated in the serious problem of non-performing loans that surfaced at the beginning of the 1990s. However, we are skeptical about this assumption regarding the influence of financial deregulation on the banks' risk-taking behavior.

Although the Japanese government started to deregulate the domestic financial sector at the beginning of the 1980s (Takeda and Turner 1992),

its fundamental strategy was to mitigate the competitive pressures that deregulation would exert on existing banks and other financial institutions. Thus, it was to protect the vested interests of existing banks and financial institutions that the government gradually proceeded with financial deregulation (Hamada and Horiuchi 1987). Liberalization of the interest rates on deposits, for example, began in 1979, when banks were first permitted to issue negotiable certificates of deposit (NCDs). But the government strictly controlled the banks' issuing of NCDs in order to prevent competition for NCDs from destabilizing the financial markets. The government took fifteen years – from the late 1970s to mid-1990s – to fully liberalize interest rates on time deposits.

From immediately after World War II through to the beginning of the 1990s, the government kept intact its policy of segmenting the financial services industry into specialized fields. The intention of this policy was to inhibit cross-segment competition. In fact, it was 1992 before Japan's financial institutions were permitted to enter peripheral fields of business by establishing subsidiaries. This was clearly a regulation that suppressed competition in the Japanese financial system. Even in the mid-1990s, Japan's end-users of financial services were complaining about the low quality of services provided by domestic financial institutions. These complaints, coupled with the fragility of the financial system revealed by the non-performing loans, forced the government to announce in 1996 its "Big Bang" financial reform plan to totally liberalize the domestic financial system (Horiuchi 2000). The conventional view, which stresses the impact of the financial deregulations of the 1980s on existing financial institutions, cannot explain why the Japanese government was criticized for its policy of delaying financial liberalization.

An alternative hypothesis

In the previous section, we criticized the conventional view, which uses the financial restraint theory to explain the rise and fall of the Japanese financial system in the postwar period. We emphasized that Japanese banks were insufficiently motivated to perform efficient monitoring even in the high-growth period. Our argument thus implies that the Japanese banking industry was potentially fragile before the 1980s, though its fragility was not revealed until later in the decade. Can we explain why the banks' fragility was only revealed in the late 1980s? In this section, we propose an alternative explanation to the financial restraint theory.

The importance of competitive pressures from abroad

Firms that face fierce market competition are forced to pursue efficient management in order to maintain a presence in their market, regardless of how the financial markets influence their management. Even if the

financial system were for some reason powerless to discipline corporate management, firms in highly competitive markets would pursue efficient management nonetheless. However, the conventional view, in emphasizing the role of banks in corporate governance, often disregards the disciplinary influence of market competition on corporate management.[8]

It is noteworthy that the Japanese government adopted the policy of liberalizing international trade as early as the beginning of the 1960s. Under the General Principle of Liberalizing International Trade and Foreign Exchange determined in June 1960, the government aimed at raising the "trade liberalization degree" (defined by the relative share of freely importable goods in the total amount of imported commodities) from about 40 percent in 1960 to 90 percent by 1963. Actually, the trade liberalization degree rose very quickly, to 92 percent in August 1963.[9]

Some economists, particularly foreign scholars, made the criticism that the apparent trade liberalization did not necessarily mean the removal of various non-tariff barriers based on *keiretsu* relationships or on implicit government intervention in free trade (for example, Bergsten and Noland 1993). Nevertheless, Japan's traded goods industries, represented by manufacturing, were coping with fierce competitive pressures from abroad as early as the 1960s. We assume that competitive pressures exerted through international trade have disciplined Japanese companies in the traded good industries toward efficient management.

During the high-growth period extending from the 1960s through the mid-1970s, the major borrowers of bank credit were manufacturing firms, which we assume were most effectively disciplined by competitive pressures from abroad (Table 1.1). In this situation, the banks' monitoring capacity did not matter very much. Even if the banks were not motivated to efficiently monitor borrower firms, as we suggested in the previous section, the potential fragility of the banking sector was not revealed during the high-growth period because the major part of bank credit was directed toward manufacturing firms.

Table 1.1 Distribution of bank credit to industries (%)

	1960	*1970*	*1980*	*1990*	*1995*
Manufacturing	49.7	44.7	32.0	15.7	14.9
Construction	2.7	4.7	5.4	5.3	6.4
Real estate	0.8	3.8	5.6	11.3	15.3
Finance	1.5	1.2	3.3	10.0	10.2
Wholesale and retail	28.9	28.8	25.5	17.4	16.1
Other services	2.3	4.5	6.8	15.4	15.5
Other	14.0	12.4	21.3	24.8	21.6
Total	100.0	100.0	100.0	100.0	100.0
(trillion yen)	(8.1)	(39.2)	(134.6)	(376.0)	(486.7)

Source: Bank of Japan.

Structural changes in bank credit

The relative share of bank credit directed toward manufacturing firms began to decline in the second half of the 1970s, just before the government started its program of financial deregulation.[10] The share of bank loans supplied to manufacturing firms declined from about 50 percent to 30 percent in the late 1970s. Table 1.2a shows breakdowns of fund-raising by major manufacturing companies surveyed by the Bank of Japan. According to the table, the major manufacturing firms sharply reduced their reliance on bank credit in the late 1970s, from more than 30 percent to less than 10 percent. These reductions have been particularly substantial since the late 1980s. By contrast, non-manufacturing firms were still depending on bank credit in the late 1980s (Table 1.2b).[11]

Thus, after Japan's miraculous economic growth came to a halt in the mid-1970s, the major part of bank credit shifted from the manufacturing

Table 1.2a Composition of fund-raising by major firms (manufacturing; %)

Period (F.Y.)	*Internal funds*	*Corporate bonds*	*Borrowing*	*Stocks*	*Other*
1961–1965	27.1	2.8	38.2	10.8	21.1
1966–1970	33.7	3.0	30.4	3.2	29.7
1971–1975	35.9	3.9	34.0	2.4	23.7
1976–1980	54.3	1.0	9.5	7.8	27.4
1981–1985	68.0	10.3	1.2	12.8	7.7
1986–1990	53.9	19.9	−9.5	19.1	16.7
1991–1995	98.2	2.0	−0.1	4.8	−4.9

Source: Bank of Japan.

Note
Trade credit accounts for the major part of "other."

Table 1.2b Composition of fund-raising by major firms (non-manufacturing; %)

Period (F.Y.)	*Internal funds*	*Corporate bonds*	*Borrowing*	*Stocks*	*Other*
1961–1965	22.7	12.3	32.7	7.9	24.3
1966–1970	46.3	10.3	65.9	6.8	−29.3
1971–1975	29.6	12.9	59.0	7.0	−8.5
1976–1980	44.9	19.3	39.1	8.5	−11.7
1981–1985	51.8	10.8	26.1	9.5	1.8
1986–1990	35.8	14.1	29.1	11.5	9.5
1991–1995	107.1	16.2	6.3	−0.4	−29.2

Source: Bank of Japan.

Note
The non-manufacturing industry includes electric power, railway companies, and other public utilities which were favorably treated in the issuing of bonds. For this reason, the relative share of bond issues was larger in non-manufacturing than in manufacturing.

sector to such non-manufacturing industries as construction, real estate, finance and various services that are not disciplined by competitive pressures from abroad. It was these non-manufacturing firms that the banks should have monitored and disciplined toward efficient management. According to our hypothesis, however, Japanese banks were not prepared to be efficient monitors in the corporate governance structure. The rapid increase in bank credit directed to non-manufacturing firms during the late 1980s uncovered the weak point in Japan's banking sector: its lack of monitoring capacity. The problem of non-performing loans that surfaced in the early 1990s was a consequence of this weakness.[12]

Which hypothesis is supported by empirical tests?

In the previous sections, we explained the conventional view regarding the effectiveness of Japanese banks in promoting postwar industrial development. After criticizing the conventional view, we proposed an alternative one regarding the relationship between the function of banks and industrial development. Our hypothesis denies the effectiveness of the banks' monitoring, which is emphasized by the conventional view, and instead stresses the disciplinary effect of competitive pressures faced by manufacturing firms after the liberalization of international trade in the early 1960s. This section seeks to learn which hypothesis is supported by statistics.

The purpose of the following investigation is to confirm which factor contributed to the efficient management of Japanese manufacturing firms in the postwar period: main bank relationships, or competitive pressures from abroad. We follow Lichtenberg and Pushner (1994) by using total factor productivity (TFP) to measure corporate managerial efficiency. Specifically, we examine which factors significantly explain TFP growth in individual firms. The explanatory factors include not only variables related to financial markets, such as the sample firms' ownership structure and their relationship with banks, but also market competition variables such as competitive pressures from abroad.[13]

Productivity growth in manufacturing

The following empirical analyses are based on financial statistics from 1,661 manufacturing firms covering the period from 1970 (fiscal year) to 1990 (fiscal year). All firms are either listed on stock exchanges or registered in the OTC market. We exclude from our sample those firms whose financial statements include abnormal figures for various reasons. Since the time span of a sampled firm depends on when the firm was listed on a stock exchange or registered in the OTC market, the number of sampled firms changes over time. Due to the huge amount of data, it was impossible to analyze it as a whole by the PANEL method. We divide the sample

Table 1.3 Main statistics of sampled firms (annual averages per period)

	1971–1980	*1981–1990*
No. of firms	994	1,330
RVAD	8.7 (23.6)	6.6 (16.2)
LABOR	−1.5 (7.4)	0.7 (5.5)
CAPITAL	6.5 (10.3)	5.8 (10.8)
SALE	54.6 (19.1)	59.8 (20.7)
EXIM	16.1 (9.6)	19.5 (11.9)
DEBT	73.6 (15.2)	63.7 (18.6)
OWNER	48.8 (15.0)	48.8 (13.8)
FOREIGN	2.9 (7.8)	4.7 (8.2)
FINST		30.8 (15.6)
CORP		30.7 (18.8)
PERSON		31.4 (15.0)

Note
RVAD: the annual growth rate of real value added. LABOR: the annual growth rate of employees. CAPITAL: the annual growth rate in real capital. (We estimate the real capital stock of a firm for each year based on the depreciation rates published by the EPA.) SALE: the ratio of sales concentration by the biggest 5 firms in each industry. EXIM: The degree of international competition defined by the formula [import/(domestic product + import − export) + export/(domestic product + import)]. DEBT: the outstanding debt per total assets. OWNER: the proportion of shares owned by the 12 largest shareholders. FOREIGN: the proportion of shares held by foreigners. FINST: the proportion of shares held by financial institutions. CORP: the proportion of shares held by non-financial companies. PERSON: the proportion of shares held by private persons. Figures in parentheses are standard deviations.

period into two sub-periods: 1971–1980, and 1981–1990. The number of sampled firms in each period is presented in Table 1.3.

Table 1.3 shows that the real value-added (RVAD) of the sampled manufacturing firms grew at an annual rate of 8.7 percent in the first period and 6.6 percent in the second period. On the input side, labor is estimated to have decreased in the first period and to have increased slightly in the second period. On the other hand, estimated capital stock grew at a rate of nearly 6 percent during both periods.[14] These figures suggest that the total factor productivity of the Japanese manufacturing industry grew substantially in the first period, but only slightly in the second period. To which factor is this development in growth rates attributable: financial factors such as the main bank relationship, or competitive pressures in the market? This is the question we address in the following analysis.

Basic production function

Firm i is assumed to produce RVAD $V_i(t)$ at t-year following a Cobb-Douglas type production function:

$$V_i(t) = T_i(t) K_i(t)^{ai} L_i(t)^{(1-ai)} \tag{1}$$

where $K_i(t)$, $L_i(t)$, and $T_i(t)$ are respectively real capital input, the number of employees, and the total factor productivity (TFP) at the t-year. The technological parameter of the production function is represented by a_i, which is assumed to be variable across industry but common for firms belonging to the same industry. The growth rate of per capita RVAD $[d(V_i(t)/L_i(t))/dt]/(V_i(t)/L_i(t))$ can be represented by the growth rate in the capital-labor ratio $[d(K_i(t)/L_i(t))/dt]/(K_i(t)/L_i(t))$ and the growth rate in TFP $[dT_i(t)/dt]/T_i(t)$ in the following way:

$$[d(V_i(t)/L_i(t))/dt]/(V_i(t)/L_i(t)) = a_i[d(K_i(t)/L_i(t))/dt]/(K_i(t)/L_i(t)) + [dT_i(t)/dt]/T_i(t) \quad (2)$$

In the following, we investigate how various factors related to the capital markets and market competition influence the efficiency of a firm's management as measured by the growth rate of TFP.

Factors of corporate governance

We assume the TFP growth of a firm to depend on its managerial efficiency. We then look at candidate variables that, according to the standard theory of corporate governance, are supposed to have an influence on management efficiency.[15] Specifically, we note the ownership structure of a firm, the debt burden and the degree of market competition to which the firm is exposed.

Capital market factors

The theory of corporate governance emphasizes the importance of the existence of large shareholders who are motivated to monitor the management of their firms. Diversified shareholding deprives investors of an incentive to monitor management, and thereby reduces the disciplinary effect of the capital market. In our analysis, the degree of ownership concentration is represented by the proportion of shares held by the largest twelve shareholders, OWNER_i.

The standard theory predicts that OWNER_i will be positively related to the efficiency of corporate management. Financial institutions, including banks, are regarded as important monitors of corporate management due to their expertise in analyzing information and data concerning management. We may assume that the proportion of shares held by financial institutions, FINST_i is positively correlated to the efficiency of corporate management measured by the growth rate of per capita RVAD. We add as well the proportions of shares held by non-financial companies (CORP_i), by foreigners (FOREIGN_i), and by private persons (PERSON_i).

Some scholars argue that the cross-shareholding prevalent in the Japanese corporate sector is effective in mitigating agency problems associated

with transactions between firms (Berglof and Perotti 1994). Others claim that cross-shareholding works to enhance the autonomy of corporate managers from capital market discipline and endangers efficient management (Lichtenberg and Pushner 1994). We add $CORP_i$ to the set of explanatory variables to examine which argument is empirically supported. Foreign ownership of Japanese companies increased gradually but steadily during the decade from the mid-1970s to the mid-1980s. After a short break during the bubble period of the late 1980s, foreign investment has resumed this upward trend. Foreign investors are sometimes regarded as having different investment targets than domestic investors in the sense that foreigners tend to give priority to profitability over the size of the business or relationships with other companies. If this is true, the relative shares held by foreign investors can be expected to positively influence managerial efficiency.

The standard theory of corporate governance does not provide us with a clear-cut relationship between managerial efficiency and debt. Here, however, we are interested in the argument by Grossman and Hart (1982) and Jensen (1986) that debt has a disciplinary impact on corporate management because it forces managers to pursue efficiency in order to make consistent repayments. According to this argument, if freed from the debt burden, managers will indulge themselves in seeking perquisites. Jensen (1989) suggests that Japanese firms were effectively disciplined during the high-growth period because they maintained a high level of leverage. He went so far as to predict that the tendency toward lower corporate dependence on debt financing (Tables 1.1 and 1.3) would endanger efficient management in Japan. However, the conventional view does not stress the importance of outstanding debt as an instrument for disciplining corporate management. According to the conventional view, it is not the amount of debt, but the persistent relationship between banks and borrower firms, that has a real bearing on corporate governance. By adding the debt-total asset ratio $DEBT_i$ to the set of explanatory variables, we can test which argument is relevant to Japan's corporate governance: the Grossman-Hart-Jensen view, or the conventional view.[16]

The main bank relationship

Since most long-term relationships between firms and banks are based on implicit contracts, it is not always easy to identify a main bank for a specific firm. The multi-dimensional function of Japanese banks makes identification even more difficult. For this paper, we identify the group of sampled firms that maintain "stable main bank relationships." We consulted Keizai Chosa-kyokai's *Study on Keiretsu* to identify the names of main banks for individual firms. Firms with stable main bank relationships are defined as those firms that did not change their main banks from 1975 to 1996. We define the firms with "unstable main bank relationships" as those that

changed their main banks more than three times during that period or whose main banks cannot be identified.

As has been explained, our sample excludes some firms due to the abnormality of their financial statistics, and sample spans of individual firms are variable in the original database. Thus, the numbers of firms classified as having "stable main bank relationships" and "unstable main bank relationships" change over the sample period (Table 1.4). For instance, 474 firms are defined as having stable main bank relationships and 283 firms as having unstable main bank relationships during the first period (1971–1980). Other firms – a surprising number, in fact – are ambiguous with respect to their main bank relationships.

Table 1.4 compares the averages of relevant variables of the firms with stable main bank relationships with those of the firms with unstable main bank relationships during two time periods: 1971–1980 and 1981–1990. The annual growth rate in real value added ($RVAD_i$) is a little higher (but not significantly so) for the firms with unstable relationships than for

Table 1.4 Comparison of firms with stable main bank relationships and those with unstable main bank relationships (%; standard deviations in parentheses)

		Firms with stable main banks (A)	*Firms with unstable main banks (B)*	*(A) = (B)*
	No. of firms	474	283	
	RVAD	8.5 (23.2)	9.2 (22.5)	
	CAPITAL	5.8 (9.2)	7.6 (11.5)	*
	LABOR	−1.7 (7.1)	−0.9 (7.5)	*
1971–1980	SALE	55.3 (18.2)	54.5 (19.4)	
	EXIM	16.6 (10.1)	15.0 (8.2)	*
	DEBT	75.7 (13.3)	68.4 (16.9)	*
	OWNER	46.5 (15.0)	51.1 (14.7)	*
	FOREIGN	2.7 (7.1)	3.0 (8.6)	
	No. of firms	517	324	
	RVAD	6.0 (15.4)	6.3 (15.9)	
	CAPITAL	3.7 (7.3)	5.1 (9.6)	*
	LABOR	0.2 (5.2)	0.8 (5.1)	*
	SALE	60.6 (20.1)	59.4 (20.5)	
1981–1990	EXIM	20.0 (12.6)	18.6 (10.0)	*
	DEBT	68.0 (16.3)	59.2 (19.1)	*
	OWNER	46.0 (13.2)	50.1 (13.9)	*
	FOREIGN	5.1 (8.1)	4.6 (8.6)	
	FINST	35.9 (15.7)	28.3 (15.0)	*
	CORP	27.8 (17.3)	32.8 (20.1)	*
	PERSON	28.6 (13.3)	32.2 (15.0)	*

Note
Asterisks appear in the right end column when the hypothesis of equality of the figure in column A to that in column B is statistically rejected.

those with stable relationships. While financial institutions held larger stakes in firms with stable main bank relationships than in those with unstable ones, the reverse was true for non-financial firms.

The $DEBT_i$ figures show that the firms with unstable main bank relationships were less dependent on debt than those with stable main bank relationships. As has been explained, however, the standard theory of corporate governance holds that debt is likely to have a disciplinary effect on the management of borrower firms. In the following statistical test, we distinguish between the influence of main bank relationships on corporate management and the disciplinary effect of debt.

Market competition

We try to measure the degree of market competition a firm faces by referring to two indexes. The first is the proportion of sales accounted for by the top five firms ($SALE_i$) in a specific industry. A lower SALE implies a higher degree of market competition in the industry. However, the contestable market hypothesis shows that a higher market concentration of sales does not necessarily mean a higher degree of monopoly (Baumol, Panzar and Willig 1982). Thus, it is ambiguous whether $SALE_i$ is a reliable measure of monopoly in a specific industry.

An alternative to $SALE_i$ is the degree of a firm's exposure to global competition. When the Japanese government started liberalizing manufacturing trade in the early 1960s, the nation's manufacturing firms were faced with fierce competition from abroad. We define the degree of a specific industry's exposure to global competition as the sum of the import penetration ratio (imports/(domestic production + imports − exports)) and the export ratio (exports/(domestic production + imports)). This competition index is represented by $EXIM_i$.[17]

Results of statistical tests

We employ the PANEL analysis (the random effects method) to test some hypotheses regarding the influence of the main bank relationship on the managerial efficiency of individual firms. Specifically, we examine the following questions:

1 Was the main bank relationship effective in raising the efficiency of corporate management as measured by growth rates in TFP?
2 Was the main bank relationship a substitute for the various disciplinary factors of the capital market that many have reported observing in the United States and the United Kingdom?

Did main banks enhance managerial efficiency in manufacturing?

Our first model for explaining the growth rate in per capita RVAD is

$$[d(V_i(t)/L_i(t))/dt]/(V_i(t)/L_i(t)) = a_i\,[(dK_i(t)/dt)/K_i(t) - (dL_i(t)/dt)/L_i(t)] + b_i\,X_i(t) + c_i\,Y_i(t) + d_i\,\mathrm{MAIN}_i + e_i\,\mathrm{DI}(t) + u_i(t) \qquad (3)$$

where $X_i(t)$ is a vector of explanatory variables related to market competition in the industry to which this firm belongs, $Y_i(t)$ is a vector containing explanatory variables related to capital market discipline, $\mathrm{DI}(t)$ is a diffusion index to control cyclical movement in the growth rate in $(V_i(t)/L_i(t))$, and MAIN_i is a dummy variable, taking one if the firm has a stable main bank relationship and taking zero otherwise. Assuming the technical parameter a_i is invariant across firms within the same industry, we use cross terms of $[(dK_i(t)/dt)/K_i(t) - (dL_i(t)/dt)/L_i(t)]$ and industry dummies in our PANEL analysis. We are principally interested in whether MAIN_i has a significantly positive coefficient, and whether there are any variables related to either market competition or capital market discipline that significantly account for the growth rate in per capita value added. In order to save space, we present the *t*-statistics of relevant explanatory variables (i.e., $X_i(t)$, $Y_i(t)$, and MAIN_i) in Table 1.5.[18]

As do many empirical analyses regarding US capital market functions, our empirical tests suggest that the ownership structure of corporations influences the efficiency of their management to some extent. The relative importance of foreign ownership ($\mathrm{FOREIGN}_i$) was positively related to TFP growth during the two sample periods. The concentration of shareholdings (OWNER_i) had a significantly positive coefficient during the first period. Ownership by financial institutions (FINST_i), however, did not show a significantly positive influence on TFP growth.[19]

Table 1.5 shows that MAIN_i did not positively influence the growth rate of per capita real value added (or TFP) at all for either of the sample periods. On the other hand, the debt-asset ratio (DEBT_i) had significantly positive coefficients in both periods, which is consistent with the Grossman-Hart-Jensen argument that debt disciplines borrower firms toward efficient management. These results suggest that debt played a disciplinary role, while the main bank relationship did not enhance the managerial efficiency of manufacturing firms. In contrast to this, EXIM_i positively correlated with TFP growth for the two periods. In sum, our PANEL analysis of equation 3 provides no support for the financial restraint hypothesis and supports the alternative hypothesis that stresses the disciplinary influence of competitive pressures from abroad.

Was the main bank a substitute for the capital market?

The conventional view claims that the main bank relationship has been a substitute for the capital market in disciplining corporate managers.

Table 1.5 Factors influencing per-capita RVAD growth (*t*-statistics)

	1971–1980		*1981–1990*				
	1	*2*	*1*	*2*	*3*	*4*	*5*
SALE	0.64	0.64	−0.85	−0.60	−0.88	−0.86	−0.87
EXIM	5.31**	5.27**	5.39**	4.98**	5.42**	5.36**	5.31**
DEBT	1.97**	2.37**	6.51**	7.30**	6.68**	6.80**	6.49**
OWNER	1.65*		0.07				
FOREIGN		1.93*		4.72**			
FINST					0.90		
CORP						−1.52	
PERSON							−2.17**
MAIN	−0.53	−0.81	−0.39	−0.72	−0.68	−0.70	−0.74
Adst.R^2	0.026	0.025	0.067	0.069	0.067	0.067	0.067
SER	22.33	22.33	15.23	15.21	15.23	15.22	15.22
NOB	7,496	7,496	10,057	10,057	10,057	10,057	10,057
No. of firms	994	994	1,330	1,330	1,330	1,330	1,330

Note
The asterisks ** and * indicate explanatory variables that are significant at 5% and 10% respectively.

According to this view, hostile takeovers, which are commonplace in both the United States and the United Kingdom, are unnecessary in Japan because banks have exerted similar disciplinary pressures on the managers of client firms via long-term relationships. In the following, we test the validity of this view. Specifically, we estimate the following equation of the growth rate in per capita RVAD for two groups of the sampled firms: those with a stable main bank relationship, and those with an unstable main bank relationship:

$$[d(V_i(t)/L_i(t))/dt]/(V_i(t)/L_i(t)) = a_i\,[(dK_i(t)/dt)/K_i(t) - (dL_i(t)/dt)/L_i(t)] + b_iX_i(t) + c_iY_i(t) + e_i\mathrm{DI}(t) + u_i(t) \quad (4)$$

Notation is the same as for equation 3. We have already compared some performance variables of the two groups in Table 1.4. Here we test whether the estimated parameters b_i's and c_i's are significantly different between these two groups of sampled firms. In order to avoid the difficulty of heteroscedasticity between the two groups, we use a two-stage estimation method. First, we estimate equation 4 for the two groups separately to obtain variances of disturbance $u_i(t)$ for the respective sample groups. Then, after adjusting the data by utilizing the estimated variances of the disturbance terms of the two groups, we estimate the following equation for the pooled sample of the two groups:[20]

$$[d(V_i(t)/L_i(t))/dt]/(V_i(t)/L_i(t)) = a_i\,[(dK_i(t)/dt)/K_i(t) - (dL_i(t)/dt)/L_i(t)] + (1+b_i\mathrm{MAIN}_i)\,c_iX_i(t) + (1+d_i\mathrm{MAIN}_i)\,e_iY_i(t) + f_i\,\mathrm{DI}(t) + v_i(t) \quad (5)$$

If, as the conventional view argues, the main bank relationship takes the place of capital market factors in disciplining borrower firms toward efficient management, MAIN_i itself would have positive coefficients and the cross terms between MAIN_i and capital market factors would have negative coefficients.

Table 1.6 summarizes the results of the estimation. The figures in the bottom line show *F* statistics of the null hypothesis that all the coefficients of cross terms $\mathrm{MAIN}_i \cdot X_i(t)$ and $\mathrm{MAIN}_i \cdot Y_i(t)$ are zero. According to the *F* statistics, the null hypothesis is not rejected, except for estimation results using the variable of individual shareholdings (PERSON_i) in the second period. DEBT_i had an especially positive influence on the managerial efficiency of borrower firms. However, we cannot discern any significant difference between the influence of DEBT_i on firms with stable main bank relationships and on those with unstable main bank relationships during the two periods. Overall, the *F*-statistics support the null hypothesis that the main bank relationship did not change the relations between the other factors of corporate governance and the growth rate in per capita RVAD.

Table 1.6 Growth in per capita RVAD and factors of corporate governance (*t*-statistics in parentheses)

	1971–1980		*1981–1990*				
	1	*2*	*1*	*2*	*3*	*4*	*5*
SALE	−0.132 (−0.41)	−0.017 (−0.52)	−0.005 (−0.37)	−0.005 (−0.38)	−0.006 (−0.40)	−0.006 (−0.42)	−0.007 (−0.47)
MAIN	0.036 (0.86)	0.041 (0.97)	−0.010 (−0.57)	−0.006 (−0.35)	−0.009 (−0.50)	0.009 (0.48)	0.007 (−0.40)
EXIM	0.222 (3.02)**	0.211 (2.86)**	0.114 (3.81)**	0.104 (3.48)**	0.114 (3.83)**	0.112 (3.77)**	0.116 (3.84)**
MAIN	−0.034 (−0.40)	−0.019 (−0.22)	−0.046 (−1.35)	−0.043 (−1.26)	−0.046 (−1.37)	−0.044 (−1.29)	−0.047 (−1.36)
DEBT	0.054 (1.51)	0.069 (1.95)*	0.041 (2.59)**	0.057 (3.70)**	0.045 (2.86)**	0.053 (3.27)**	0.045 (2.94)**
MAIN	0.010 (0.20)	−0.001 (−0.02)	0.033 (1.61)	0.027 (1.31)	0.034 (1.63)	−0.023 (−1.11)	0.033 (1.63)
OWNER	0.006 (1.15)		0.018 (0.82)				
MAIN	0.035 (0.66)		0.003 (0.11)				
FOREIGN		0.202 (2.88)**		0.128 (3.71)**			
MAIN		−0.204 (−2.16)**		−0.021 (−0.48)			
FINST					0.001 (0.05)		
MAIN					0.011 (0.45)		
CORP						−0.021 (−1.38)	
MAIN						0.024 (1.22)	
PERSON							−0.012 (−0.60)
MAIN							−0.052 (−2.06)**
CONST.	−0.063 (−0.35)	−0.109 (−0.69)	−0.724 (−6.23)**	−0.765 (−7.34)**	−0.681 (−5.95)**	−0.662 (−6.45)**	−0.640 (−5.57)**
MAIN	−0.211 (−0.89)	−0.099 (−0.46)	−0.094 (−0.66)	−0.084 (−0.65)	−0.125 (−0.87)	−0.110 (−0.86)	0.003 (0.02)
Adjusted R^2	0.023	0.023	0.071	0.075	0.071	0.071	0.073
F Value	0.107	0.398	1.493	1.731	1.691	1.883	2.676+

Note
The asterisks ** and * indicate explanatory variables that are significant at 5% and 10% respectively.

Thus, the statistical test regarding the substitutability of main bank relationships and capital market mechanisms with respect to corporate governance produces rather negative conclusions regarding the conventional view. We have been unable to find consistent evidence to support the view that the main bank relationship has been able to replace capital market discipline or that it has a positive influence on the management efficiency of client firms.

Did financial deregulation influence governance mechanisms?

The Japanese government started to deregulate the financial system at the beginning of the 1980s. The conventional view argues that financial deregulation undermined the efficient immediation the banking sector had attained in the high-growth period. We doubt the validity of this proposition, however, because the government continued to intervene in financial markets mainly in order to maintain the *status quo* established for the financial system during the high-growth period. In the last part of our empirical analyses, we test whether there were significant changes in the influence of the main bank relationship on the management of manufacturing firms in the 1980s.

The statistics summarized in Tables 1.5 and 1.6 show that the main bank relationship has not contributed to managerial efficiency since the 1970s, and therefore that its eclipse was not an outcome of the financial deregulations begun in the 1980s. In order to confirm this, we formally test structural changes over the sample period in estimated production functions such as equation 3. Unfortunately, the huge size of the database prevents full-scale tests. Here, we take up the three truncated sample periods of the early 1970s (1971–1974), the early 1980s (1981–1984) and the late 1980s (1985–1989), and test whether there existed any significant structural changes in estimated functions over the first period (the early 1970s) and the latter two periods (the early 1980s and the late 1980s). Due to the paucity of data available, the estimated equation has only a limited number of explanatory variables related to the ownership structure. The results are summarized in Table 1.7.[21] The *F*-value in each column presents a result of an *F*-test of the null hypothesis that the structure of the estimated equation is invariant between the two truncated sample periods. We can confirm which explanatory variable changes its explanatory power significantly over the two periods by using *t*-statistics for the cross term between the variable and a dummy variable assigned to a specific sample period.

We may relate this result to the non-linearity of the disciplinary influence of debt in the following way. At the higher levels of debt-asset ratio $DEBT_i$, managers of borrower firms are seriously concerned with repaying debt, so that the marginal disciplinary effect of debt is large. On the other hand, at the medium and lower levels of debt-asset ratio, the disciplinary

Table 1.7 Structural changes in the RVAD function between truncated sample periods (*t*-statistics in parentheses)

	Between periods 1 and 2		*Between periods 1 and 3*	
	1	*2*	*1*	*2*
SALE	−0.004 (−0.153)	−0.004 (−0.173)	0.005 (0.207)	−0.008 (0.300)
DUMT	−0.004 (−0.155)	−0.001 (−0.028)	−0.010 (−0.394)	−0.015 (−0.573)
EXIM	0.084 (1.411)	0.084 (1.412)	0.110 (1.896)*	0.094 (1.454)
DUMT	0.017 (0.270)	0.007 (0.116)	−0.055 (−0.922)	−0.040 (−0.658)
DEBT	0.186 (5.727)**	0.191 (5.845)**	0.169 (5.244)**	0.247 (7.104)**
DUMT	−0.133 (−3.769)**	−0.125 (−3.537)**	−0.115 (−3.342)**	−0.163 (−4.653)**
OWNER	0.034 (1.239)		0.032 (1.144)	
DUMT	−0.031 (−0.916)		−0.019 (−0.587)	
FOREIGN		0.033 (0.602)		0.054 (0.914)
DUMT		0.080 (1.297)		0.034 (0.556)
MAIN	−0.005 (−0.114)	−0.013 (−0.334)	0.004 (0.091)	−0.009 (−0.212)
DUMT	0.020 (0.374)	0.016 (0.306)	−0.025 (−0.519)	−0.037 (−0.803)
CONST.	−0.669 (−4.635)**	−0.608 (−4.528)**	0.704 (−4.941)**	−0.900 (−6.304)**
DUMT	0.104 (0.602)	−0.036 (−0.231)	0.048 (0.300)	0.153 (1.043)
Adjusted R^2	0.0748	0.0769	0.0716	0.0696
F-value	23.632 ++	22.233 ++	31.116++	29.843++

Note
DUMT represents a cross term between each explanatory variable and the dummy for a specific sample period. Periods 1, 2 and 3 are the early 1970s (1971–1974), the early 1980s (1981–1985) and the late 1980s (1985–1989) respectively. The asterisks ** and * indicate explanatory variables that are significant at 5% and 10% respectively.

effect of debt on managers is weak. Its marginal effect can be negligible at the lower range of $DEBT_i$. As has already been explained, manufacturing firms have significantly reduced their dependence on debt financing, and on bank borrowings in particular (Table 1.2a and Table 1.3), since the mid-1970s. Thus, their debt-asset ratio decreased from a range where the marginal effect of debt is large to a range where it is small or almost negligible. We need to introduce this non-linearity of the debt effect into our estimations in order to test the validity of our interpretation. This is one of our remaining tasks.[22]

Concluding remarks

Japanese manufacturing achieved remarkable growth in productivity during the postwar period. According to our empirical study, neither growth in productive inputs nor factors related to the financial system can fully account for this good performance. Our empirical analysis found that main banks did not enhance the management efficiency of manufacturing firms during either the 1970s or the 1980s. This result contradicts the conventional view that, before the government's introduction of financial deregulation in 1980, main banks successfully disciplined their client firms for efficient management. Instead, we found that market competition, measured by the degree of an industry's exposure to global markets, has consistently contributed to efficient corporate management in Japan's manufacturing industry.

Thus, we conclude that the conventional view, backed by the financial restraint theory, cannot explain the postwar experience of Japan's bank-centered financial system. The financial restraint theory is not applicable to Japan because competition-restricting regulations did not motivate bank managers to enforce prudent management, but rather induced them to engage in imprudence under conditions of managerial entrenchment. The theory neglects the fact that competition-restricting regulations deprived Japan's financial system of the credible penalties which are indispensable to disciplining bank management. It also neglects the disciplinary influence exerted on Japanese manufacturing firms by competitive pressures from abroad. As Frankel and Romer (1999) show, international trade stimulates economic growth. Our analysis suggests that this positive impact of international trade may also exert a disciplinary effect on corporate management.

What lessons can we derive from this paper's analyses regarding the financial restraint theory? The theory argues for the effectiveness of competition-restricting regulations in motivating banks to prudently monitor and discipline their borrowers. However, realizing the effects anticipated by the financial restraint theory would require the government to create penalties for inefficiently managed banks. Japan's postwar experience shows that this would be difficult for the government to accomplish.

Notes

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1 It should be noted, however, that some recent historical studies criticize Gerschenkron's proposition. See, for instance, Collins (1998) and Fohlin (1999).
2 Kester (1993) concisely summarizes the main points of the conventional view as follows: "The role of financial institutions in Germany and Japan, banks in particular, is more than that of efficient providers of capital, and their equity ownership in industrial clients represents far more than a mere portfolio investment. Through their activities as main banks or Hausbanks, they play a vital, multifaceted role in the governance of industrial enterprise in their respective countries. . . . They function effectively as centers of information gathering about client companies, and their responses to virtually any aspect of their client companies' activities represent important signals to other corporate stakeholders. As significant equity owners, they enjoy direct or *de facto* board representation through which they may exercise an active voice in the governing of corporations in which they invest (Kester 1993: 77)."
3 Keeley (1990) also stresses the importance of banks' rent (franchise value) as a means of motivating banks to enforce prudent management.
4 Aoki (1994: 135) puts the argument in the following way: "Since the mid-1970s, however, two pillars of the regulatory framework supporting the regime, regulation of interest rates and regulation of bond issue requirements, have been gradually removed. As a result, firms have increasingly had to rely on bond issues, at home and abroad, while non-competitive rent opportunities for banks have been squeezed. . . . Thus, the coherence and integrity of the regulatory framework, which was so effective in the heyday of the main bank system, have been impaired."
5 The view prevailing rather widely among scholars is that worldwide financial deregulation in the 1980s deprived existing banks of profit opportunities and decreased their "franchise value," thereby inducing them to take excessive risks. Thus, the 1980s move toward financial deregulation, accompanied by ineffective supervision by regulators, resulted in banking crises in many countries. For example, see Keeley (1990), Lindgren, Garcia and Saal (1996), Allen and Gale (1999).
6 The model proposed by Hellmann *et al.* (2000) shows that when banks are sufficiently farsighted, regulation of interest rates is sufficient for a Pareto-efficient equilibrium with banks' prudent risk management, and a minimum capital requirement is unnecessary.
7 We may cite the well known Koito episode to show how incumbent managers are protected from capital market pressures. Boone Pickens, a Texas businessman, bought 20.2 percent interest in Koito Manufacturing, Japan's largest manufacturer of automotive lighting equipment in 1989. The company belonged to the Toyota group, and Toyota owned 19 percent of Koito. Some life insurance companies and banks were also shareholders in the company, but each held an interest of less than 5 percent. However, Pickens did not succeed in persuading the other participants in Koito's shareholders' meeting to grant him three or four seats on the Board of Directors. Johnson (1993: 173–176) describes this episode concisely.

8 Theoretically it is impossible to prove that competition in product markets definitely contributes to managerial efficiency. However, Allen and Gale (2000: 108–110) suggest that in dynamic markets with constantly changing prices, products and markets, where outsiders may have trouble telling ex ante which type of management will succeed and which will fail, competition can be important in disciplining managers.

9 See the Ministry of Finance, Monthly Report on Financial and Monetary Statistics (*Zaisei Kinyu Tokei Geppo*), No. 244, June 1972, 48–49.

10 Table 1.2a shows that manufacturing firms increased the relative importance of bond financing during the 1980s. This was an undeniable result of deregulation in the domestic corporate bond market. However, it is noteworthy that manufacturing firms started decreasing their reliance on bank credit as early as the mid-1970s.

11 One reason for the decline in the number of manufacturing firms borrowing bank credit is that these firms increased their use of internal funds as they gained financial maturity. Another reason is the substantial appreciation of the yen in real terms since the early 1970s. From 1971 to 1995, the real exchange rate of the yen appreciated 2.5-fold against the US dollar (McKinnon, Ohno and Shirono 1996). The appreciation led to a reduction in the share of traded goods industries and an expansion in the share of non-traded goods industries in Japan's domestic economy. For example, while the real output of the manufacturing sector accounted for 34.8 percent of real GDP in 1970, it had declined to 23.5 percent by 1994.

12 Non-performing loans held by the "big four" financial groups (i.e. Mizuho F.G., Sumitomo-Mitsui, Tokyo-Mitsubishi F.G. and UFJ) in September 2000 amounted to ¥10.7 trillion, 86 percent of which were held by firms engaged in construction, retailing and wholesaling, real estate, finance, and other services. This shows how intensively non-performing loans are concentrated in these non-traded goods industries.

13 Nickell, Nicolitsas and Dryden (1997) conclude that market competition contributes to efficient management in UK industry. As they do, we include factors representing the degree of market competition in our empirical analysis in addition to factors related to the financial-capital market.

14 The real capital of a firm is estimated in the following way: First, we estimate real investment (I_t) of each firm by deflating its nominal amount of investment expenditure by the nonresidential investment deflator provided by the EPA's national income statistics. The obsolescence rate of real capital (d_t) for each industry is estimated from the data in the EPA's *Annual Report on Capital Stock of Private Enterprises*. Assuming that the obsolescence rate of real capital is common to all the firms in an industry, and also that real capital for each firm in the initial year is equivalent to the book value of the capital, we estimate a time series of real capital for each firm by making use of both I_t and d_t. This method produces estimated growth rates in real capital lower than those estimated by the EPA. For example, the EPA estimates the annual average growth rate in real capital to be 5.3 percent for the period of 1978–1986, whereas according to our method the corresponding figure is 3.5 percent. Our method thus seems to underrate real capital growth. The EPA's estimate may be overrated, however, because the average annual growth rate of real capital estimated by Hayashi and Inoue (1991) for the same time period is 3.1 percent, much lower than the EPA's estimate. We do not think our method of estimating real capital distorts the following analysis in this paper.

15 In particular, we consulted Allen and Gale (2000: Chapter 4) for relevant variables related to corporate governance.

16 DEBT_i includes not only outstanding bank loans but also all other debt, such as corporate bonds.

17 Articles investigating the relationship between the import penetration rate in an industry and the productivity of firms belonging to the industry include Nickell, Wadhwani and Wall (1992), Nickell, Nicolitsas and Dryden (1997), Harrison (1994), and MacDonald (1994).
18 The variables of ownership structure are closely interrelated. In order to avoid multicollinearity, we separately estimated an equation containing only one variable of ownership structure.
19 Lichtenberg and Pushner (1994) find that ownership by financial institutions has a positive influence on managerial efficiency and ownership by non-financial firms a negative one. However, our analysis did not produce the same results.
20 This method is justified only if the disturbance $v_i(t)$ in equation 5 follows the normal distribution. We assume this is the case in this paper.
21 In order to avoid the difficulty of heteroscedasticity, we adopted a two-stage PANEL estimation.
22 As footnote 11 suggests, the predominant proportion of non-performing loans consists of those extended to non-manufacturing firms in such fields as construction and real estate. Thus, this result cannot directly explain the fragility of the Japanese banking sector that surfaced in the 1990s.

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2 The role of long-term funds for economic development

Empirical evidence in Japan, Korea and Taiwan

Shin-ichi Fukuda

Introduction

Financial markets are the most prominent means of channeling investment capital to its highest return uses. These markets also provide liquidity and permit the efficient pooling of risk. Both of these activities alter social composition of savings in a way that is potentially favorable to enhanced capital accumulation. Noting these roles of financial markets, several studies have asserted that the extent of financial intermediation in an economy affects rates of economic growth.[1]

When the economy is pre-matured, the arm's length system is less likely to survive because laws are poorly drafted and contracts are not enforced. In many developing countries, it is thus the banking sector that plays a major role in the financial markets. As delegated monitors, commercial banks specialize in gathering information about firms and reduce corporate myopia through overcoming the problems associated with informational asymmetry (for example, Leland and Pyle 1977 and Diamond 1984). Commercial banks also play an important role in selecting good borrowers and in monitoring their ex-post performance (see, among others, Aoki 1994 and Hoshi, Kashyap and Scharfstein 1991).

However, to the extent that the debt maturity is short, there exists a probability of a liquidity shortage in the sense of Diamond and Dybvig (1983). When panicking external creditors become unwilling to roll over existing short-term credits, otherwise solvent borrowers may suffer from the short-run liquidity problem. The short-run liquidity problem would thus be serious at the early stage of economic development where alternative sources of funds are highly limited. In particular, the short-term liquidity problem may prevail when the financial system is vulnerable under crisis.

The purpose of this chapter is to investigate the roles of long-term funds in Japan, Korea and Taiwan by using firm level data. We focus on the role of long-term funds because they are less mobile forms of capital flow. When external debt takes the form of a long-term contract, it becomes costly for the external creditors to cancel it. Thus, if a large fraction of the

debt takes the form of long-term debt, the liquidity shortage would be a less likely outcome.

In the case of Japan, liquidity shortage was greatly mitigated under the relationship-based "main bank" system. Consequently, the short-run liquidity problem rarely arose explicitly at the early stage of economic development. However, typical main bank loans had very short terms to maturity. The borrowing firms thus tended to face the threat of loan withdrawals without paying sizeable rents to the main banks. As a result, typical Japanese firms had a high cost of capital under the "main bank" system (see Rajan 1992 and Weinstein and Yafeh 1998). Under these environments, many Japanese firms benefitted from the policy-based allocation of "long-term loans" that might have mitigated the hold-up problem under the "main bank" system.

In the first part of this chapter, we estimate investment functions of Japanese firms from 1972 to 1996. In postwar Japan, internal financing was highly limited, and issuing corporate bonds had been strictly regulated until the mid-1980s. Under such circumstances, long-term funds provided by long-term credit banks and the Japan Development Bank played an important role in high economic growth. In estimating the investment functions, we confirm this conventional view for the sample period before financial market deregulation. That is, we find that even if we allow various fundamental variables such as Tobin's Q, profit and cash flow, the long-term loan ratio had a significantly positive impact on the Japanese firms' investment for the period 1972–1984. However, for the period 1985–1996, the coefficient of the long-term loan ratio was never significantly positive. The result implies that long-term loans had an important role for investment only at the early stage of development and that they came to lose their role after the deregulation of financial markets.

In the second part of this chapter, we investigate the role of long-term loans for Korean and Taiwanese firms in the late 1990s. It is now widely recognized that a large fraction of short-term external liabilities was one of the main reasons why the East Asian countries suffered a serious crisis in 1997. A large number of studies suggest that otherwise solvent East Asian countries might have suffered from a short-run liquidity problem because the available stock of reserves was low, relative to the overall burden of external debt service (interest payments plus the renewal of loans coming to maturity).[2] In particular, the East Asian crisis occurred when foreign lenders suddenly refused to roll over their bank loans in 1997. This implies that if a large fraction of external liabilities had longer maturities, the East Asian crisis might not have taken place as the form of a liquidity shortage.

In the analysis, we examine this macroeconomic implication by the firm level data in Korea and Taiwan. Several previous studies found the existence of liquidity constraints in Korea and Taiwan in the late 1990s.[3] We investigate whether long-term funds could mitigate the constraints

under the circumstances where firms faced declines in external debt. Korea is one of the East Asian countries that experienced a serious crisis in 1997, while the decline of Taiwanese economy was relatively moderate during the crisis. We find that the long-term debt ratio had a significantly positive impact on credit availability in Korea and possibly in Taiwan. This indicates that long-term funds might have mitigated the decline of business activity under the crisis.

This chapter is organized as follows. The following section discusses the roles of long-term loans in postwar Japan. Then we set out the investment functions and explain the data in Japan. Next we explain the construction procedure of capital stock and Tobin's Q. We go on to present the estimate results of the investment functions in Japan. After that we examine whether long-term funds have any different influences on investment between keiretsu-affiliated and non-affiliated firms. This is followed by a section which discusses the role of long-term loans in other East Asian countries. The subsequent section sets out the equation to examine credit availability in Korea and Taiwan and then presents their estimation results. Finally, we summarize our main results and discuss remaining issues.

A part of empirical studies in this chapter is based on Fukuda *et al.* (2000). This research is supported by Ministry of Education Aid for Science Research on Priority Area (B) #12124203.

The roles of long-term loans in Japan

In the first part of the chapter, we examine whether the long-term loan ratio had a positive effect on the investment of Japanese firms. In postwar Japan, bank loans had been the major source of external funds for almost all firms. Until the mid-1980s, issuing corporate bonds had been strictly regulated, and internal financing had been limited, except for a few firms. The relationship-based "main bank" system greatly reduced the probability of liquidity shortage during the period. However, typical main bank loans had very short terms to maturity.[4] The borrowing firms thus tended to face the threat of loan withdrawals without paying sizeable rents to the main banks. In other words, typical Japanese firms had a high cost of capital under the "main bank" system. Under those environments, many Japanese firms benefitted from the policy-based allocation of "long-term loans" that might have mitigated the hold-up problem under the "main bank" system.

Among Japanese policymakers, there was an implicit agreement that the policy-based finance allocated to specific fields of industry was successful in supporting the postwar high-growth. In particular, it was widely believed that long-term loans provided by long-term credit banks and the Japan Development Bank played an important role in high economic growth. From the macroeconomic viewpoint, the policy-based allocation

of long-term funds is warranted, if the allocated long-term funds had great external effects in increasing capital stock and production. However, without market failure, rolling over of short-term loans are essentially the same as long-term loans. It is, thus, not self-evident whether the policy-based allocation of long-term loans could effectively increase capital stock and the production of specific corporations or not.

In previous literature, there are several empirical studies that stress the role of Japan Development Bank's loans (henceforth called "JDB loans") in increasing capital stock and production of specific industries and corporations. For example, Horiuchi and Sui (1993) carried out event studies of corporations listed in the Second Section of the Tokyo Stock Exchange and demonstrated that JDB loans increased capital investment. Calomiris and Himmelberg (1994) carried out similar studies, using company-specific data in the machinery industry, and came up with an outcome supporting the pump-priming effect of JDB loans.[5] The weights of JDB loans among total external borrowings were, however, not so high, except for a few corporations. This paper, thus, empirically examines whether the total long-term loans – not only JDB loans but also including private long-term loans – had an effect of increasing the capital investment of specific corporations in postwar Japan.

A series of papers by Teranishi (e.g. Teranishi 1982; Takei and Teranishi 1991) are outstanding studies, which prove that the policy-based allocation of long-term loans contributed to increasing capital stock and production of specific industries during the high-growth period in postwar Japan. However, the analyses by Teranishi and others rely solely on the aggregated time-series data. In contrast, the following analysis tries to examine the appropriateness of their concept by estimating standard investment functions based on the panel data of individual Japanese firms.

Our approach is similar to a large number of studies that estimate investment functions, using the panel data of Japanese firms.[6] In particular, Hoshi, Kashyap and Scharfstein (1990, 1991) estimate investment functions by taking account of the role of "main banks" and demonstrate that a company belonging to an affiliated business group ("keiretsu") is less restricted by the liquidity constraint.[7] However, these studies never focused on the role of long-term loans in reducing the cost of capital under the relation-based system in Japan. Although both the main bank and policy-based allocation of long-term funds were inherent features of Japan's financial market in the high-growth period, their mechanisms of affecting investment are intrinsically different from each other. Therefore, to the extent that there was the possibility of sizable rent extraction from main banks, the allocation of long-term loans would have had a different effect on investment through lessening the hold-up problem that may arise under the relation-based system.

The estimated equation and the data

The following four sections examine what effects long-term loans had on the investment of Japanese firms. In the analysis, we use the financial data of each Japanese firm and estimate the following investment function:

$$I_t/K_t = \text{constant term} + \alpha^* X_{t-1} + \beta^* LONG_{t-1} \quad (1)$$

where I_t = the amount of investment in period t, K_t = the amount of capital stock in period t, X_t = a fundament variable such as Tobin's Q in period t, and $LONG_t$ = the long-term loan ratio in period t.

In contrast with the standard investment functions, the long-term loan ratio ($LONG_t$) is added to the explanatory variable in equation 1. If long-term loans impose different restrictions than short-term loans on investment, long-term loans would affect the amount of investment for a given amount of total loans. Providing that the concept in the preceding section holds true, the long-term loan ratio is thus supposed to have a significantly positive impact on investment before the deregulation of Japanese financial markets. However, as the financial markets were liberalized, issuing corporate bonds as well as internal financing became possible. As a result, the hold-up problem under the relationship-based system became less relevant for many Japanese firms after financial market liberalization. We can therefore expect that the role of the long-term loan ratio declined in stimulating investment after the mid-1980s and that coefficient β becomes less significant in equation 1 for a recent sample period.

In the following analysis, bank loans are divided into long-term and short-term ones. The financial data statements classify the maturity of bank loans only into those below and above one year. We thus define loans with maturity exceeding one year as "long-term loans" and call the ratio of long-term loans to total loans "long-term loan ratio." As fundamental variables X_t's, we use Tobin's Q as well as profit and cash flow ratios. Both the profit and cash flow ratios are normalized through dividing by the market value of capital stock. In order to avoid the problem of instantaneity bias, all independent variables are included with a lag of one period.

The data are based on the data set contained in NEEDS-COMPANY by Nihon Keizai Shimbun. Those data are originally collected from individual corporations' financial reports listed in the First and the Second Sections of the Tokyo Stock Exchange. The data set covers the period from 1970 through 1996. After converting the data into the market values, the estimation period becomes 1972 through 1996.[8] The analysis covers corporations belonging to five major industries in Japan: iron and steel, non-ferrous metals, chemicals, electrical equipment and transportation equipment (including shipbuilding and automobile manufacturing). For each industry, the investment function 1 is estimated by the panel analysis

(the fixed effect model and random effect model) including corporation dummies and time dummies. Although some corporations' data were partially missing in the estimation period, we included their data by using the unbalanced panel analysis.

The conversion into the market value

In calculating the market value of capital stocks of Japanese firms, we follow Hayashi and Inoue (1991) and apply the perpetual inventory method for four types of capital stocks:

a buildings and structures
b machinery and equipment
c vessels and vehicles
d land.

We added up the converted capital stocks to calculate the aggregate capital stocks of individual corporations.[9] Except for land, the values of 1970 were taken as the benchmark, on the assumption that this year's book values of individual capital stocks are equal to their market prices.[10]

For deflators, we used the wholesale price index (WPI) of commodity *i*, that is, p_t^{Ii} for each investment goods *i*. Specifically, the WPI of construction materials is used to deflate buildings and structures, the WPI of machinery and tools to deflate machinery and equipment, and the WPI of transportation equipment to deflate vessels and vehicles. Each nominal gross investment is calculated by summing the increments of the book values of each fixed asset and their capital depreciation.[11] Dividing the nominal gross investment by the investment goods deflator results in the real gross investments ($I_{i,t}$) of each individual tangible fixed asset. The physical depreciation rates of each capital stock *i*, that is, δ^i follows Hulten and Wykoff (1981). The rate of asset depreciation for buildings and adjunctive equipment is 0.047, that for machinery and equipment is 0.09489, and that for vessels and vehicles and transportation equipment is 0.1470.[12]

Based on these bench marks for capital stocks, real gross investments, and depreciation rates, we calculate the real values of each individual capital stock *i* as follows:

$$K_{i,t} = (1-\delta^i) K_{i,t-1} + I_{i,t} \tag{2}$$

The market value of capital stocks ($p_t^{Ii} K_{i,t}$) can be obtained by multiplying the real stock values by the deflector of capital goods (p_t^{Ii}). The series of land stock are also calculated using the perpetual inventory method. The benchmark year is 1970, as is the case with other stocks. However, since the discrepancies between the market prices and book values were large,

the benchmark for the market prices of land was obtained by multiplying the book values in 1970 by 5.27. The value of 5.27 is the average ratio of market price to book value in 1970, calculated by Ogawa and Kitasaka (1998). They obtained the ratio based on *the Annual Report on National Accounts* by the Economic Planning Agency and *the Quarterly Corporations Statistics* by the Ministry of Finance in Japan.

The increases in the market value of land are calculated by the increases in the book values. However, the decreases in the book value of land, i.e. sold-out land, are converted into market prices based on the LIFO (last-in-first-out) assumption that the sold-out land was purchased at the last purchase point of time. Hoshi and Kashyap (1990) and Ogawa and Suzuki (1997) used the similar assumption in previous studies.

The land price (p_t^L) used for the deflator is the "national index of urban land" (the average price for overall purposes), excluding six major cities, based on *the Index of Urban Land Price* by the Japan Real Estate Institute. We will define the increase in the book value of land by $ILAND_t$ and its decrease by $DLAND_t$. We can then calculate the market value of land investment ($NILAND_t$), the market value of land stock ($LANDY_t = p_t^L L_t$), and the real value of land net investment (IL_t) by the following equations:

$$NILAND_t = ILAND_t - (p_t^L / p_{t-1}^L) * DLAND_t \tag{3}$$

$$LANDY_t = (p_t^L / p_{t-1}^L) * DLAND_{t-1} + NILAND_t \tag{4}$$

$$IL_t = (ILAND_t / p_t^L) - (DLAND_t / p_{t-1}^L) \tag{5}$$

On the other hand, Tobin's average Q in period t is calculated as follows:

$$\text{Tobin's } Q_t = \frac{V_t + LIB_t - CUR_t - CONSR_t - INTAN_t - OTHER_t - DEF_t}{\Sigma_i P_t^{Ii} K_{i,t}} \tag{6}$$

where V_t = corporation's market price represented by its share price, LIB_t = total liabilities, CUR_t = current asset, $CONSR_t$ = construction in process, $INTAN_t$ = intangible fixed asset, $OTHER_t$ = financial investment and other assets, and DEF_t = deferred asset.[13]

In the following analysis, we use the market value of capital stock with and without land. When we use the market value of capital stock without land, we calculate the Tobin's Q by deducting the market value of land ($p_t^L L_t$) from both numerator and denominator in 6.

Table 2.1 reports average values and standard deviations of estimated Tobin's Qs with and without land in the five industries of iron and steel (50 companies), non-ferrous metals (76 companies), chemicals (125 companies), electrical equipment (186 companies) and transport equipment (79 companies, including shipbuilding and automobile manufacturing). It indicates that Tobin's Q without land has a smaller standard deviation

Table 2.1 Descriptive statistics of Tobin's Q in Japan

1 The case of capital stock including land

	Average	*Standard deviation*	*Number of samples*
Iron and steel			
1971–1984	1.036	1.665	643
1975–1984	1.057	1.903	471
1985–1996	1.357	1.050	596
Non-ferrous metals			
1971–1984	1.106	1.095	877
1975–1984	1.060	0.970	641
1985–1996	1.835	2.109	861
Chemicals			
1971–1984	1.294	1.803	1,549
1975–1984	1.289	1.841	1,127
1985–1996	1.603	1.629	1,456
Electrical equipment			
1971–1984	3.674	8.054	2,004
1975–1984	3.838	8.820	1,466
1985–1996	2.908	4.993	2,088
Transportation equipment			
1971–1984	1.248	1.658	954
1975–1984	1.123	1.369	690
1985–1996	1.173	0.990	896

2 The case of capital stock not including land

	Average	*Standard deviation*	*Number of samples*
Iron and steel			
1971–1984	1.010	2.196	643
1975–1984	1.022	2.468	471
1985–1996	1.575	1.693	596
Non-ferrous metals			
1971–1984	1.021	2.216	877
1975–1984	0.890	2.130	641
1985–1996	2.484	4.494	861
Chemicals			
1971–1984	1.424	2.877	1,549
1975–1984	1.380	2.696	1,127
1985–1996	1.948	2.559	1,456
Electrical equipment			
1971–1984	5.362	13.804	2,004
1975–1984	5.352	14.394	1,466
1985–1996	4.031	8.503	2,088
Transportation equipment			
1971–1984	1.335	2.512	954
1975–1984	1.118	1.929	690
1985–1996	1.361	1.724	896

than Tobin's Q with land, which suggests that Tobin's Q's have small dispersions without land in each industry. Regardless of whether land is included or not, the average value of Tobin's Q's is close to one in four industries (iron and steel, non-ferrous metals, chemicals and transportation equipment), which is consistent with the economic theory. By contrast, in the electrical equipment industry, the values of Tobin's Q, as well as standard deviations are large in general.

The results of estimation in Japan

This section estimates the investment function 1, using the data series of "capital stock" and "Tobin's Q" prepared in the preceding section. In previous studies, Fukuda, Ji and Nakamura (1998) found that the flow of long-term funds showed a substantial structural change in the mid-1980s. We thus split the period of estimation into 1972–1984 (before deregulation of financial markets) and 1985–1996 (after deregulation of financial markets). For these two sample periods, we estimate the fixed effect model and the random effect model, including a corporation dummy and time dummy, with respect to each of the five industries (iron and steel, non-ferrous metals, chemicals, electrical equipment and transport equipment).[14]

Table 2.2 shows the results of estimation, using capital stocks including land. The results for the period of 1972–1984 are summarized in Table 2.2 and those for the period of 1985–1996 in Table 2.2. In the tables, the estimated coefficients of the fundamental variable are always positive both before and after the financial deregulation. The *t*-values are statistically significant, except for the random effect model of the iron and steel industry. The result remains the same regardless of the choice of the fundamental variable, implying that better fundamentals increase investment.

The estimated coefficients of the long-term loan ratio are, however, completely different depending on the sample period. That is, the estimates are all positive in 1972–1984. In particular, *t*-values are significantly different from zero except for chemicals. The result supports the hypothesis that even with the total amount of loans being given, the long-term loans had an additional positive impact on investment before the deregulation of financial markets. In 1985–1996, by contrast, the estimates never take a significantly positive value. In two industries (that is, iron/steel and non-ferrous metals), they are positive but are not statistically significant. In the other three industries, (that is, chemicals, electrical equipment and transportation equipment), they become negative. This means that long-term loans came to have no significantly positive impact on investment after the mid-1980s when financial liberalization progressed.

The above results are robust even when we use capital stocks without land. Table 2.3 reports the results of estimation when we use capital stocks without land. The comparison between Table 2.2 and Table 2.3 shows

Table 2.2 Estimation of the investment function in Japan – the case of capital stocks including land

1 The period of estimation: 1972–1984

Iron and steel	*Fixed effect model*		*Random effect model*	
Explanatory variables	*Estimate*	t-*value*	*Estimate*	t-*value*
Tobin's Q	0.020	3.369***	0.004	1.214
Long-term loan ratio	0.159	4.006***	0.086	3.329***
Hausman test (Chi Sq.)			0.001	
Profit rate	0.239	5.926***	0.240	6.608***
Long-term loan ratio	0.134	3.810***	0.077	3.347***
Hausman test (Chi Sq.)			0.091	
Cash flow	0.483	6.887***	0.493	7.822***
Long-term loan ratio	0.125	3.583***	0.077	3.434***
Hausman test (Chi Sq.)			0.193	
Non-ferrous metals	*Fixed effect model*		*Random effect model*	
Explanatory variables	*Estimate*	t-*value*	*Estimate*	t-*value*
Tobin's Q	0.029	7.404***	0.021	6.766***
Long-term loan ratio	0.122	5.491***	0.052	3.577***
Hausman test (Chi Sq.)			0.000	
Profit rate	0.045	4.256***	0.061	6.219***
Long-term loan ratio	0.100	4.522***	0.045	3.272***
Hausman test (Chi Sq.)			0.000	
Cash flow	0.032	3.100***	0.045	4.476***
Long-term loan ratio	0.102	4.592***	0.049	3.415***
Hausman test (Chi Sq.)			0.000	
Chemicals	*Fixed effect model*		*Random effect model*	
Explanatory variables	*Estimate*	t-*value*	*Estimate*	t-*value*
Tobin's Q	0.018	6.126***	0.015	7.742***
Long-term loan ratio	0.013	0.673	0.003	0.256
Hausman test (Chi Sq.)			0.416	
Profit rate	0.238	6.632***	0.237	8.618***
Long-term loan ratio	0.026	1.339	0.022	1.723*
Hausman test (Chi Sq.)			0.971	
Cash flow	0.645	10.164***	0.604	12.273***
Long-term loan ratio	0.003	0.174	0.002	0.154
Hausman test (Chi Sq.)			0.570	

(*Continued*)

Table 2.2 Continued

Electrical equipment	*Fixed effect model*		*Random effect model*	
Explanatory variables	*Estimate*	t-*value*	*Estimate*	t-*value*
Tobin's Q	0.007	9.096***	0.003	8.286***
Long-term loan ratio	0.057	4.331***	0.031	3.682***
Hausman test (Chi Sq.)			0.000	
Profit rate	0.090	10.171***	0.105	19.192***
Long-term loan ratio	0.037	2.944***	0.027	3.249***
Hausman test (Chi Sq.)			0.056	
Cash flow	0.127	8.782***	0.183	19.078***
Long-term loan ratio	0.041	3.243***	0.023	2.867***
Hausman test (Chi Sq.)			0.000	
Transportation equipment (including shipbuilding)	*Fixed effect model*		*Random effect model*	
Explanatory variables	*Estimate*	t-*value*	*Estimate*	t-*value*
Tobin's Q	0.014	5.514***	0.008	5.227***
Long-term loan ratio	0.060	3.076***	0.016	1.373
Hausman test (Chi Sq.)			0.000	
Profit rate	0.500	11.845***	0.383	10.881***
Long-term loan ratio	0.053	25.943***	0.027	2.372**
Hausman test (Chi Sq.)			0.000	
Cash flow	0.385	7.676***	0.351	8.744***
Long-term loan ratio	0.064	3.391***	0.028	2.343**
Hausman test (Chi Sq.)			0.030	
Transportation equipment (excluding shipbuilding)	*Fixed effect model*		*Random effect model*	
Explanatory variables	*Estimate*	t-*value*	*Estimate*	t-*value*
Tobin's Q	0.013	5.463***	0.008	5.029***
Long-term loan ratio	0.047	2.381**	0.013	1.109
Hausman test (Chi Sq.)			0.001	
Profit rate	0.525	11.077***	0.384	10.063***
Long-term loan ratio	0.045	2.480**	0.026	2.292**
Hausman test (Chi Sq.)			0.000	
Cash flow	0.441	8.104***	0.380	8.891***
Long-term loan ratio	0.052	2.787***	0.023	1.929*
Hausman test (Chi Sq.)			0.035	

Note
*** significant at a 1% level, ** significant at a 5% level and * significant at a 10% level.

(*Continued*)

Table 2.2 Continued

2 The period of estimation: 1985–1996

Iron and steel	*Fixed effect model*		*Random effect model*	
Explanatory variables	*Estimate*	t-*value*	*Estimate*	t-*value*
Tobin's Q	0.021	4.726***	0.020	5.301***
Long-term loan ratio	0.013	0.507	0.018	1.203
Hausman test (Chi Sq.)			0.802	
Profit rate	0.337	6.352***	0.300	6.895***
Long-term loan ratio	0.016	0.658	0.020	1.337
Hausman test (Chi Sq.)			0.449	
Cash flow	0.415	4.608***	0.419	5.547***
Long-term loan ratio	0.008	0.313	0.017	1.137
Hausman test (Chi Sq.)			0.899	
Non-ferrous metals	*Fixed effect model*		*Random effect model*	
Explanatory variables	*Estimate*	t-*value*	*Estimate*	t-*value*
Tobin's Q	0.023	12.051***	0.016	13.276***
Long-term loan ratio	−0.006	−0.384	0.003	0.305
Hausman test (Chi Sq.)			0.000	
Profit rate	0.220	11.382***	0.245	15.416***
Long-term loan ratio	0.001	0.075	0.003	0.303
Hausman test (Chi Sq.)			0.074	
Cash flow	0.552	7.033***	0.617	10.313***
Long-term loan ratio	0.003	0.191	−0.002	−0.200
Hausman test (Chi Sq.)			0.394	
Chemicals	*Fixed effect model*		*Random effect model*	
Explanatory variables	*Estimate*	t-*value*	*Estimate*	t-*value*
Tobin's Q	0.016	10.625***	0.015	11.842***
Long-term loan ratio	−0.028	−2.922***	−0.014	−2.304**
Hausman test (Chi Sq.)			0.027	
Profit rate	0.563	13.994***	0.414	14.005***
Long-term loan ratio	−0.037	−3.915***	−0.012	−1.899*
Hausman test (Chi Sq.)			0.000	
Cash flow	0.824	13.217***	0.595	14.524***
Long-term loan ratio	−0.031	−3.269***	−0.014	−2.272**
Hausman test (Chi Sq.)			0.000	

(*Continued*)

Table 2.2 Continued

Electrical equipment	*Fixed effect model*		*Random effect model*	
Explanatory variables	*Estimate*	t-*value*	*Estimate*	t-*value*
Tobin's Q	0.007	16.314***	0.005	15.377***
Long-term loan ratio	−0.058	−6.153***	−0.040	−5.680***
Hausman test (Chi Sq.)			0.000	
Profit rate	0.013	3.316***	0.031	9.474***
Long-term loan ratio	−0.075	−7.424***	−0.045	−5.998***
Hausman test (Chi Sq.)			0.000	
Cash flow	0.035	4.504***	0.071	10.900***
Long-term loan ratio	−0.076	−7.456***	−0.045	−6.045***
Hausman test (Chi Sq.)			0.000	
Transportation equipment (including shipbuilding)	*Fixed effect model*		*Random effect model*	
Explanatory variables	*Estimate*	t-*value*	*Estimate*	t-*value*
Tobin's Q	0.026	9.731***	0.023	9.457***
Long-term loan ratio	−0.074	−5.590***	−0.034	−3.751***
Hausman test (Chi Sq.)			0.000	
Profit rate	0.308	5.438***	0.331	7.006***
Long-term loan ratio	−0.092	−6.916***	−0.039	−4.568***
Hausman test (Chi Sq.)			0.000	
Cash flow	0.382	7.344***	0.429	9.762***
Long-term loan ratio	−0.094	−7.190***	−0.037	−4.601***
Hausman test (Chi Sq.)			0.000	
Transportation equipment (excluding shipbuilding)	*Fixed effect model*		*Random effect model*	
Explanatory variables	*Estimate*	t-*value*	*Estimate*	t-*value*
Tobin's Q	0.027	9.010***	0.023	8.953***
Long-term loan ratio	−0.078	−5.676***	−0.031	−3.322***
Hausman test (Chi Sq.)			0.000	
Profit rate	0.479	6.961***	0.456	8.305***
Long-term loan ratio	−0.095	−6.980***	−0.036	−4.230***
Hausman test (Chi Sq.)			0.000	
Cash flow	0.418	7.645***	0.451	9.421***
Long-term loan ratio	−0.099	−7.375***	−0.039	−4.641***
Hausman test (Chi Sq.)			0.000	

Note
*** significant at a 1% level, ** significant at a 5% level and * significant at a 10% level.

Table 2.3 Estimation of the investment function in Japan – the case of capital stock not including land

1 The period of estimation: 1972–1984

Iron and Steel	*Fixed effect model*		*Random effect model*	
Explanatory variables	*Estimate*	t-*value*	*Estimate*	t-*value*
Tobin's Q	0.021	4.005***	0.003	1.185
Long-term loan ratio	0.187	3.873***	0.069	2.515**
Hausman test (Chi Sq.)			0.000	
Profit rate	0.195	6.311***	0.195	7.128***
Long-term loan ratio	0.163	3.792***	0.089	3.104***
Hausman test (Chi Sq.)			0.066	
Cash flow	0.373	6.726***	0.388	7.870***
Long-term loan ratio	0.151	3.527***	0.085	3.046***
Hausman test (Chi Sq.)			0.127	
Non-ferrous metals	*Fixed effect model*		*Random effect model*	
Explanatory variables	*Estimate*	t-*value*	*Estimate*	t-*value*
Tobin's Q	0.013	5.344***	0.010	5.412***
Long-term loan ratio	0.157	5.649***	0.080	4.223***
Hausman test (Chi Sq.)			0.000	
Profit rate	0.019	2.405**	0.027	3.555***
Long-term loan ratio	0.129	4.668***	0.071	3.658***
Hausman test (Chi Sq.)			0.001	
Cash flow	0.011	1.523	0.016	2.255**
Long-term loan ratio	0.131	4.745***	0.072	3.649***
Hausman test (Chi Sq.)			0.002	
Chemicals	*Fixed effect model*		*Random effect model*	
Explanatory variables	*Estimate*	t-*value*	*Estimate*	t-*value*
Tobin's Q	0.015	5.905***	0.013	7.380***
Long-term loan ratio	0.020	0.818	0.001	0.050
Hausman test (Chi Sq.)			0.346	
Profit rate	0.299	11.746***	0.234	13.096***
Long-term loan ratio	0.045	1.927*	0.031	2.196**
Hausman test (Chi Sq.)			0.001	
Cash flow	0.664	14.718***	0.613	16.730***
Long-term loan ratio	0.010	0.443	0.004	0.277
Hausman test (Chi Sq.)			0.140	

(*Continued*)

Table 2.3 Continued

Electrical equipment	*Fixed effect model*		*Random effect model*	
Explanatory variables	*Estimate*	t-*value*	*Estimate*	t-*value*
Tobin's Q	0.004	9.023***	0.002	7.612***
Long-term loan ratio	0.062	3.893***	0.035	3.339***
Hausman test (Chi Sq.)			0.000	
Profit rate	0.094	13.228***	0.074	18.250***
Long-term loan ratio	0.045	2.984***	0.038	3.649***
Hausman test (Chi Sq.)			0.001	
Cash flow	0.147	11.782***	0.140	19.261***
Long-term loan ratio	0.053	3.466***	0.033	3.366***
Hausman test (Chi Sq.)			0.158	
Transportation equipment (including shipbuilding)	*Fixed effect model*		*Random effect model*	
Explanatory variables	*Estimate*	t-*value*	*Estimate*	t-*value*
Tobin's Q	0.012	6.535***	0.008	5.819***
Long-term loan ratio	0.073	3.042***	0.024	1.606
Hausman test (Chi Sq.)			0.000	
Profit rate	0.375	14.412***	0.297	13.076***
Long-term loan ratio	0.060	2.786***	0.045	2.967***
Hausman test (Chi Sq.)			0.000	
Cash flow	0.348	9.717***	0.320	10.813***
Long-term loan ratio	0.073	3.187***	0.039	2.605***
Hausman test (Chi Sq.)			0.054	
Transportation equipment (excluding shipbuilding)	*Fixed effect model*		*Random effect model*	
Explanatory variables	*Estimate*	t-*value*	*Estimate*	t-*value*
Tobin's Q	0.012	6.501***	0.007	5.666***
Long-term loan ratio	0.055	2.282**	0.019	1.313
Hausman test (Chi Sq.)			0.000	
Profit rate	0.371	13.092***	0.283	11.713***
Long-term loan ratio	0.049	2.226**	0.042	2.757***
Hausman test (Chi Sq.)			0.000	
Cash flow	0.387	10.088***	0.342	10.928***
Long-term loan ratio	0.057	2.497**	0.033	2.199**
Hausman test (Chi Sq.)			0.050	

Note
*** significant at a 1% level, ** significant at a 5% level and * significant at a 10% level.

(*Continued*)

Table 2.3 Continued

2 The period of estimation: 1985–1996

Iron and steel	*Fixed effect model*		*Random effect model*	
Explanatory variables	*Estimate*	t-*value*	*Estimate*	t-*value*
Tobin's Q	0.015	3.551***	0.014	3.866***
Long-term loan ratio	0.012	0.316	0.016	0.676
Hausman test (Chi Sq.)			0.891	
Profit rate	0.240	5.171***	0.239	6.188***
Long-term loan ratio	0.011	0.288	0.019	0.860
Hausman test (Chi Sq.)			0.956	
Cash flow	0.283	3.704***	0.323	4.765***
Long-term loan ratio	0.006	0.164	0.019	0.822
Hausman test (Chi Sq.)			0.499	
Non-ferrous metals	*Fixed effect model*		*Random effect model*	
Explanatory variables	*Estimate*	t-*value*	*Estimate*	t-*value*
Tobin's Q	0.009	8.630***	0.007	9.618***
Long-term loan ratio	0.006	0.300	–0.003	–0.222
Hausman test (Chi Sq.)			0.040	
Profit rate	0.102	9.043***	0.107	11.360***
Long-term loan ratio	0.019	0.977	0.004	0.297
Hausman test (Chi Sq.)			0.386	
Cash flow	0.426	9.420***	0.424	11.218***
Long-term loan ratio	0.024	1.245	0.007	0.554
Hausman test (Chi Sq.)			0.491	
Chemicals	*Fixed effect model*		*Random effect model*	
Explanatory variables	*Estimate*	t-*value*	*Estimate*	t-*value*
Tobin's Q	0.009	8.007***	0.008	8.966***
Long-term loan ratio	−0.021	−1.788*	−0.011	−1.441
Hausman test (Chi Sq.)			0.214	
Profit rate	0.380	12.035***	0.284	12.194***
Long-term loan ratio	−0.028	−2.470**	−0.005	−0.639
Hausman test (Chi Sq.)			0.000	
Cash flow	0.590	14.071***	0.526	15.963***
Long-term loan ratio	−0.019	−1.735*	−0.010	−1.271
Hausman test (Chi Sq.)			0.022	

(*Continued*)

Table 2.3 Continued

Electrical equipment	*Fixed effect model*		*Random effect model*	
Explanatory variables	*Estimate*	t-*value*	*Estimate*	t-*value*
Tobin's Q	0.004	13.794***	0.003	13.152***
Long-term loan ratio	−0.041	−3.681***	−0.026	−3.456***
Hausman test (Chi Sq.)			0.000	
Profit rate	0.030	10.643***	0.035	15.362***
Long-term loan ratio	−0.055	−4.785***	−0.028	−3.537***
Hausman test (Chi Sq.)			0.000	
Cash flow	0.054	10.933***	0.067	15.945***
Long-term loan ratio	−0.056	−4.872***	−0.029	−3.669***
Hausman test (Chi Sq.)			0.000	
Transportation equipment (including shipbuilding)	*Fixed effect model*		*Random effect model*	
Explanatory variables	*Estimate*	t-*value*	*Estimate*	t-*value*
Tobin's Q	0.016	8.839***	0.014	8.303***
Long-term loan ratio	−0.074	−4.610***	−0.031	−2.861***
Hausman test (Chi Sq.)			0.000	
Profit rate	0.301	7.729***	0.289	8.666***
Long-term loan ratio	−0.087	−5.551***	−0.036	−3.564***
Hausman test (Chi Sq.)			0.000	
Cash flow	0.325	8.734***	0.371	11.197***
Long-term loan ratio	−0.089	−5.696***	−0.031	−3.401***
Hausman test (Chi Sq.)			0.000	
Transportation equipment (excluding shipbuilding)	*Fixed effect model*		*Random effect model*	
Explanatory variables	*Estimate*	t-*value*	*Estimate*	t-*value*
Tobin's Q	0.016	7.968***	0.014	7.764***
Long-term loan ratio	−0.083	−5.002***	−0.026	−2.458**
Hausman test (Chi Sq.)			0.000	
Profit rate	0.365	7.449***	0.340	8.549***
Long-term loan ratio	−0.092	−5.729***	−0.031	−3.109***
Hausman test (Chi Sq.)			0.000	
Cash flow	0.335	8.491***	0.367	10.291***
Long-term loan ratio	−0.098	−6.143***	−0.033	−3.449***
Hausman test (Chi Sq.)			0.000	

Note
*** significant at a 1% level, ** significant at a 5% level and * significant at a 10% level.

slight differences in the estimates of individual coefficient. However, the estimates in both tables are similar.

In Table 2.4, we set out the results of estimation in the case where both Tobin's Q and profit (or cash flow) are used as explanatory variables to estimate equation 1.[15] The theory implies that Tobin's Q is a sufficient statistic for investment if the market works perfectly. Previous empirical studies, however, showed that profits and cash flows have an important explanatory power in estimating an investment function even if Tobin's Q is included in the explanatory variable. The results in Table 2.4 reconfirm this in any industry and in any period, suggesting the existence of liquidity constraints throughout the periods.

The inclusion of plural fundamental variables, however, did not change our basic estimation results on the coefficient of the long-term loan ratio. Table 2.4 shows that as in Table 2.2, the estimates of "β" are all positive in the 1972–1984 period, while those in the 1985–1996 period never take significantly positive values. This indicates that although profit or cash flow might ease the short-term liquidity constraints, they could never help reducing the constraints of long-term funds before financial market deregulation.

The role for the keiretsu corporate grouping

In the preceding section, we have demonstrated that up to the mid-1980s, a higher ratio of long-term loans had a positive effect on investment, even when we take into account the effects of fundamental variables such as Tobin's Q. We have also shown that the effect of the long-term loan ratio has nothing to do with the size of profit or cash flow. The result implies that the constraints mitigated by long-term funds are essentially different from short-term liquidity constraints caused by a shortage of cash flow.

This section examines the robustness of the latter implication by looking at whether the effect of long-term loan ratio on investment is different between keiretsu-affiliated corporations and non-affiliated ones. Previous studies suggest that keiretsu-affiliated corporations face lesser short-term liquidity constraints. If allocation of long-term loans can ease the liquidity constraints, then the allocated long-term loans would have had a stronger effect on investment for non-affiliated corporations than for an affiliated one. However, previous studies also show that keiretsu-affiliated corporations have a high cost of capital. If allocated long-term loans can reduce the threat of loan withdrawals without paying sizeable rents, the allocated long-term loans would have had a stronger effect on investment for affiliated corporations.

Splitting corporations into two groups of keiretsu-affiliated corporations and non-affiliated ones, we estimate the investment function 1 with respect to each group. We then compare the estimates of "β" that indicate the effects of long-term fund ratio on investment between keiretsu-

Table 2.4 Estimation of the investment function in Japan – the case of Tobin's Q and other fundamental variables being included together

1 The period of estimation: 1972–1984

Iron and steel	*Fixed effect model*		*Random effect model*	
Explanatory variables	*Estimate*	t-*value*	*Estimate*	t-*value*
Tobin's Q	0.015	2.521**	0.001	0.222
Profit rate	0.189	4.216***	0.209	5.196***
Long-term loan ratio	0.149	3.810***	0.083	3.341***
Hausman test (Chi Sq.)			0.010	
Tobin's Q	0.015	2.556**	0.001	0.198
Cash flow	0.392	5.073***	0.432	6.195***
Long-term loan ratio	0.141	3.621***	0.084	3.427***
Hausman test (Chi Sq.)			0.015	
Non-ferrous metals	*Fixed effect model*		*Random effect model*	
Explanatory variables	*Estimate*	t-*value*	*Estimate*	t-*value*
Tobin's Q	0.030	7.643***	0.022	7.071***
Profit rate	0.034	3.216***	0.041	3.904***
Long-term loan ratio	0.116	5.264***	0.047	3.318***
Hausman test (Chi Sq.)			0.000	
Tobin's Q	0.031	7.755***	0.023	7.268***
Cash flow	0.031	3.091***	0.038	3.800***
Long-term loan ratio	0.117	5.276***	0.047	3.288***
Hausman test (Chi Sq.)			0.000	
Chemicals	*Fixed effect model*		*Random effect model*	
Explanatory variables	*Estimate*	t-*value*	*Estimate*	t-*value*
Tobin's Q	0.014	5.005***	0.011	5.193***
Profit rate	0.209	5.491***	0.174	5.741***
Long-term loan ratio	0.024	1.214	0.014	1.030
Hausman test (Chi Sq.)			0.117	
Tobin's Q	0.013	4.440***	0.008	4.091***
Cash flow	0.628	9.345***	0.532	9.746***
Long-term loan ratio	0.005	0.266	−0.002	−0.133
Hausman test (Chi Sq.)			0.014	

(*Continued*)

Table 2.4 Continued

Electrical equipment	*Fixed effect model*		*Random effect model*	
Explanatory variables	*Estimate*	t-*value*	*Estimate*	t-*value*
Tobin's Q	0.005	6.201***	0.001	2.759***
Profit rate	0.144	8.668***	0.133	9.934***
Long-term loan ratio	0.049	3.751***	0.028	3.489***
Hausman test (Chi Sq.)			0.000	
Tobin's Q	0.006	7.784***	0.002	4.783***
Cash flow	0.135	5.739***	0.177	8.741***
Long-term loan ratio	0.056	4.247***	0.026	3.297***
Hausman test (Chi Sq.)			0.000	
Transportation equipment (including shipbuilding)	*Fixed effect model*		*Random effect model*	
Explanatory variables	*Estimate*	t-*value*	*Estimate*	t-*value*
Tobin's Q	0.008	3.420***	0.006	3.178***
Profit rate	0.450	10.083***	0.343	8.863***
Long-term loan ratio	0.057	3.094***	0.024	1.948**
Hausman test (Chi Sq.)			0.000	
Tobin's Q	0.012	4.900***	0.006	3.938***
Cash flow	0.329	6.527***	0.283	6.901***
Long-term loan ratio	0.062	3.245***	0.014	1.310
Hausman test (Chi Sq.)			0.000	
Transportation equipment (excluding shipbuilding)	*Fixed effect model*		*Random effect model*	
Explanatory variables	*Estimate*	t-*value*	*Estimate*	t-*value*
Tobin's Q	0.008	3.342***	0.005	3.013***
Profit rate	0.466	9.151***	0.338	7.880***
Long-term loan ratio	0.048	2.608***	0.022	1.776*
Hausman test (Chi Sq.)			0.000	
Tobin's Q	0.011	4.766***	0.006	3.814***
Cash flow	0.377	6.870***	0.305	6.923***
Long-term loan ratio	0.050	2.629***	0.011	0.995
Hausman test (Chi Sq.)			0.000	

Note
*** significant at a 1% level, ** significant at a 5% level and * significant at a 10% level.

(*Continued*)

Table 2.4 Continued

2 The period of estimation: 1985–1996

Iron and steel	*Fixed effect model*		*Random effect model*	
Explanatory variables	*Estimate*	t-*value*	*Estimate*	t-*value*
Tobin's Q	0.010	1.942*	0.008	1.851*
Profit rate	0.287	4.730***	0.256	4.974***
Long-term loan ratio	0.017	0.687	0.020	1.368
Hausman test (Chi Sq.)			0.545	
Tobin's Q	0.016	3.267***	0.014	3.312***
Cash flow	0.302	3.118***	0.313	3.653***
Long-term loan ratio	0.011	0.464	0.016	0.929
Hausman test (Chi Sq.)			0.875	
Non-ferrous metals	*Fixed effect model*		*Random effect model*	
Explanatory variables	*Estimate*	t-*value*	*Estimate*	t-*value*
Tobin's Q	0.019	8.664***	0.013	8.770***
Profit rate	0.247	4.797***	0.203	4.770***
Long-term loan ratio	−0.007	−0.444	0.006	0.573
Hausman test (Chi Sq.)			0.000	
Tobin's Q	0.021	10.223***	0.014	10.440***
Cash flow	0.301	3.752***	0.285	4.673***
Long-term loan ratio	−0.005	−0.310	0.005	0.554
Hausman test (Chi Sq.)			0.000	
Chemicals	*Fixed effect model*		*Random effect model*	
Explanatory variables	*Estimate*	t-*value*	*Estimate*	t-*value*
Tobin's Q	0.009	5.998***	0.009	6.923***
Profit rate	0.523	11.165***	0.361	9.648***
Long-term loan ratio	−0.035	−3.779***	−0.014	−2.216**
Hausman test (Chi Sq.)			0.000	
Tobin's Q	0.012	7.877***	0.010	8.135***
Cash flow	0.715	11.063***	0.502	10.578***
Long-term loan ratio	−0.029	−3.100***	−0.017	−2.697***
Hausman test (Chi Sq.)			0.000	

(*Continued*)

Table 2.4 Continued

Electrical equipment	*Fixed effect model*		*Random effect model*	
Explanatory variables	*Estimate*	t-*value*	*Estimate*	t-*value*
Tobin's Q	0.004	8.941***	0.003	7.615***
Profit rate	0.207	11.354***	0.209	13.016***
Long-term loan ratio	−0.053	−5.834***	−0.038	−5.708***
Hausman test (Chi Sq.)			0.000	
Tobin's Q	0.006	13.301***	0.004	11.626***
Cash flow	0.163	9.453***	0.189	11.628***
Long-term loan ratio	−0.055	−6.017***	−0.038	−5.825***
Hausman test (Chi Sq.)			0.000	
Transportation equipment (including shipbuilding)	*Fixed effect model*		*Random effect model*	
Explanatory variables	*Estimate*	t-*value*	*Estimate*	t-*value*
Tobin's Q	0.024	8.529***	0.020	7.738***
Profit rate	0.159	2.778***	0.174	3.469***
Long-term loan ratio	−0.075	−5.727***	−0.034	−3.827***
Hausman test (Chi Sq.)			0.000	
Tobin's Q	0.024	9.056***	0.020	8.800***
Cash flow	0.306	6.067***	0.364	8.324***
Long-term loan ratio	−0.077	−5.969***	−0.029	−3.577***
Hausman test (Chi Sq.)			0.000	
Transportation equipment (excluding shipbuilding)	*Fixed effect model*		*Random effect model*	
Explanatory variables	*Estimate*	t-*value*	*Estimate*	t-*value*
Tobin's Q	0.022	6.972***	0.017	6.310***
Profit rate	0.287	3.943***	0.271	4.393***
Long-term loan ratio	−0.080	−5.835***	−0.031	−3.464***
Hausman test (Chi Sq.)			0.000	
Tobin's Q	0.024	8.279***	0.020	8.211***
Cash flow	0.342	6.387***	0.378	7.936***
Long-term loan ratio	−0.081	−6.094***	−0.029	−3.437***
Hausman test (Chi Sq.)			0.000	

Note
***significant at a 1% level, **significant at a 5% level and *significant at a 10% level.

affiliated corporations and non-affiliated ones. Based on the 1995 version of *Keiretsu no Kenkyu* by the Economic Research Institute, the corporations belonging to the four corporate groupings or the six corporate groupings are assorted into "keiretsu-affiliated companies" and the others are assorted into "non-affiliated companies." The period of time covered by the following analysis is 1972–1984. This is because the preceding section observed that long-term loans had a positive effect on investment in this period. Since the sample size is largely reduced when splitting corporations into two groups, we pool all the data of corporations belonging to the five industries.

Table 2.5 reports the results of estimation when we use capital stock including land. The estimates of "α," which is the coefficient of fundamental variables, take positive values regardless of whether corporations

Table 2.5 Investment functions of keiretsu-affiliated and non-affiliated groupings

All industries (fixed effect model)

1 Four major keiretsu groupings

Explanatory variables	*Keiretsu-affiliated grouping*		*Non-affiliated grouping*	
	Estimate	t-*value*	*Estimate*	t-*value*
Tobin's Q	0.019	13.250***	0.006	6.842***
Long-term loan ratio	0.085	6.958***	0.059	4.641***
Explanatory variables	*Estimate*	t-*value*	*Estimate*	t-*value*
Tobin's Q	0.014	8.626***	0.006	6.474***
Profit rate	0.155	7.922***	0.058	5.752***
Long-term loan ratio	0.084	6.895***	0.055	4.305***

2 Six major keiretsu groupings

Explanatory variables	*Keiretsu-affiliated grouping*		*Non-affiliated grouping*	
	Estimate	t-*value*	*Estimate*	t-*value*
Tobin's Q	0.014	12.747***	0.005	4.766***
Long-term loan ratio	0.075	7.093***	0.064	3.949***
Explanatory variables	*Estimate*	t-*value*	*Estimate*	t-*value*
Tobin's Q	0.012	11.531***	0.004	3.516***
Profit rate	0.645	7.143***	0.187	7.208***
Long-term loan ratio	0.073	6.908***	0.051	3.183***

Note
***significant at a 1% level, **significant at a 5% level and *significant at a 10% level.

belong to keiretsu corporate groupings or not, and their *t*-values are all significantly different from zero. However, the coefficients of Tobin's Q are bigger for keiretsu-affiliated companies than for non-affiliated companies, implying that investment is more closely related with Tobin's Q in keiretsu-affiliated companies.

The estimates of "β," which is the coefficient of "long-term fund ratio," take positive values regardless of whether corporations belong to keiretsu-affiliated groupings or not. The estimated coefficients are, however, a little larger for keiretsu-affiliated companies than for non-affiliated ones. These results clearly do not support the hypothesis that long-term funds had greater effects on the investment of non-affiliated companies than on the investment of keiretsu-affiliated companies. We can thus conclude that long-term funds had not served as an alternative to ease short-term liquidity constraints in non-affiliated companies.

Our findings, in contrast, indicate that long-term funds have a slightly greater effect on the investment of keiretsu-affiliated companies than on those of non-affiliated ones. The difference is not statistically significant. However, if any, it suggests that allocated long-term loans could reduce the threat of loan withdrawals without paying sizeable rents for affiliated corporations at least until the mid-1980s. The result is consistent with that of Horiuchi and Sui (1993) who reached a similar conclusion based on an event study of Japan Development Bank Loans.

The role of long-term funds in other East Asian countries

The purpose of the following sections is to investigate the role of long-term funds in Korea and Taiwan in the late 1990s. During 1977–1998, the sharp exchange rate collapse and the associated circumstances triggered severe monetary tightening and a pervasive financial crisis in several East Asian countries. It is widely recognized that a large number of short-term external liabilities was one of the main reasons why the East Asian countries suffered this serious crisis. In particular, the East Asian crisis occurred when foreign lenders suddenly refused to roll over their bank loans in 1997. This implies that if a large number of external liabilities had longer maturities, the East Asian crisis might not have taken place in the form of a liquidity shortage.

When we look at the time-series data of international bank loans based on the BIS data, the degree of capital mobility was quite different in different terms to maturity. Table 2.6 shows the semi-annual growth rates of international bank loans to the East Asian economies before and after the crisis in three different types of maturities: maturities up to one year (short-term loans), maturities over one year and up to two years (medium-term loans), and maturities over two years (long-term loans).[16] It suggests that until 1997, bank loans to the East Asian economies had steadily increased in almost all terms to maturity. In Thailand from 1994 to 1995,

Table 2.6 Semi-annual growth rates of international bank loans to the East Asian economies for different terms to maturity (%)

1 Maturities up to and including one year

	Thailand	*Indonesia*	*Korea*	*Malaysia*	*Philippines*	*Taiwan*	*China*	*Hong Kong*	*Singapore*
94.6	27.03	0.14	18.95	10.94	12.17	7.34	−5.84	10.83	6.51
94.12	14.06	13.12	15.00	−19.80	19.84	11.90	25.13	8.58	1.46
95.6	23.21	18.69	28.14	10.58	7.44	23.87	−4.87	7.16	23.65
95.12	14.29	9.13	5.51	8.52	19.37	−16.72	33.18	−8.13	−12.34
96.6	9.70	7.28	14.84	26.55	46.25	−1.25	6.25	−13.76	−1.96
96.12	−4.46	15.75	8.30	11.88	30.08	−2.76	9.85	−5.05	−0.48
97.6	−0.31	1.22	5.02	45.37	11.41	16.41	12.12	7.19	11.88
97.12	−14.86	2.07	−16.12	−10.06	38.34	−2.57	12.15	−8.32	−8.65
98.6	−28.42	−21.83	−44.23	−23.37	−14.72	−13.14	−8.77	−20.90	−31.64

2 Maturities over one year up to two years

	Thailand	*Indonesia*	*Korea*	*Malaysia*	*Philippines*	*Taiwan*	*China*	*Hong Kong*	*Singapore*
94.6	−3.21	8.05	13.96	−20.03	21.46	53.74	4.98	13.39	−39.26
94.12	18.39	16.41	9.43	77.05	−15.55	3.15	5.26	1.11	122.22
95.6	38.91	−9.88	−6.63	61.71	0.00	13.06	8.63	−7.97	40.13
95.12	20.93	2.43	−6.11	−15.66	44.35	59.71	14.94	6.33	−0.93
96.6	15.47	10.01	34.67	−27.29	53.91	−10.00	15.19	4.77	26.61
96.12	18.27	3.34	19.46	−13.55	6.40	−17.44	1.23	2.52	−33.54
97.6	−4.91	−1.31	0.78	−14.70	−42.30	−51.14	−10.74	−15.83	−4.45
97.12	−9.30	4.46	26.17	48.94	31.29	23.31	2.88	32.15	8.90
98.6	2.64	0.68	77.40	7.31	92.29	33.33	0.60	17.23	73.34

(*Continued*)

Table 2.6 Continued

3 Maturities over two years

	Thailand	*Indonesia*	*Korea*	*Malaysia*	*Philippines*	*Taiwan*	*China*	*Hong Kong*	*Singapore*
94.6	17.51	2.39	−6.13	6.90	−2.21	−1.70	8.40	10.10	21.23
94.12	42.20	12.35	21.95	13.30	12.66	73.73	7.79	11.90	25.52
95.6	13.13	18.53	32.35	−2.81	5.55	−7.49	10.95	5.17	10.17
95.12	25.84	11.97	11.35	21.59	5.26	44.16	−2.47	0.04	11.73
96.6	9.79	14.97	11.70	29.65	7.82	13.33	2.53	−0.58	−11.04
96.12	9.46	8.14	18.24	−1.33	10.81	14.09	9.95	9.72	21.76
97.6	0.89	10.94	3.03	12.57	−2.68	−0.08	−0.62	9.71	4.27
97.12	−16.16	1.77	0.45	14.14	57.34	42.65	7.24	12.00	10.32
98.6	−7.49	−0.41	15.08	−8.75	−7.83	−6.48	−3.96	−6.91	2.33

Sources: Data sources of BIS data.
96.6–97.12: *The Maturity, Sectoral and Nationality Distribution of International Bank Lending*, various issues.
98.6: *International Banking and Financial Market Development*, August 1998.

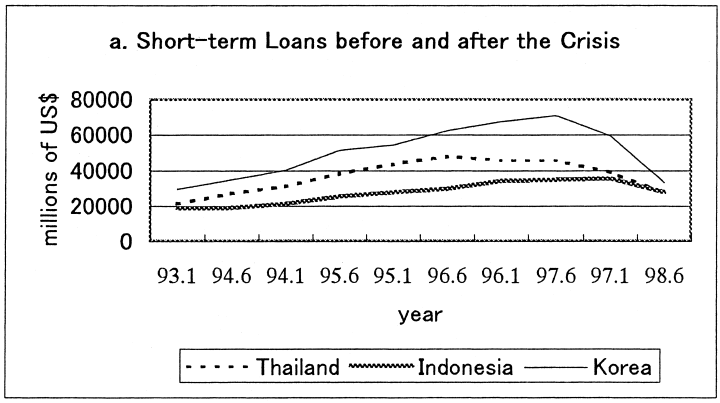
the average semi-annual growth rates of short-term loans were close to 20 percent and those of middle-term and long-term loans were slightly higher than 20 percent. Similarly, both short-term and long-term loans grew about 10 percent in Indonesia and about 15 percent in Korea, on average from 1994 to 1996.

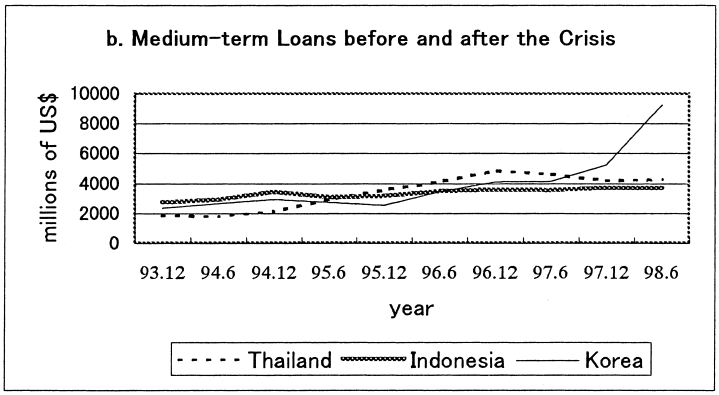
In contrast, after the crisis, bank loans declined sharply only in short-term loans. Almost all of the other East Asian economies experienced significant declines in short-term loans from December 1997 to June 1998. In Korea, the semi-annual growth rate of short-term loans was −16.12 percent in December 1997 and −44.23 percent in June 1998 (see Figure 2.1a). During the same period, however, the semi-annual growth rates of middle-term and long-term loans were still significantly positive in Korea (see Figures 2.1b and 2.1c). Except for Thailand in December 1997, other East Asian economies had no serious decline in middle-term and long-term loans for the same period. Instead, several East Asian economies experienced significant increases in middle-term and long-term loans during this period (see Figures 2.1b and 2.1c).

In general, liquidity problems emerge when panicking external creditors become unwilling to roll over existing credits. Thus, if panicking external creditors could cancel their long-term contracts, liquidity problems might have happened even when external liabilities were financed by long-term loans. However, the above evidence in the East Asian economies suggests that like direct investment, long-term commercial loans were less mobile forms of capital flows. This implies that if a large fraction of international commercial bank debt took the form of long-term loans, the East Asian crisis might not have taken place, at least as a liquidity shortage. The purpose of the following two sections is to examine whether we can confirm this implication by the firm level data in Korea and Taiwan.

The estimation of the firm-level data in Korea and Taiwan

In the following sections, we investigate what effects long-term loan funds had on the availability of credit for Korea and Taiwan in the late 1990s. In the case of Korea, both the corporate and banking sectors faced extensive distress under the pervasive financial crisis during 1997–1998. Under such circumstances of generalized liquidity constraints, it was highly important for borrowers to have access to external finance without large potential depletion of corporate value. Most of the liquidity problems, however, emerged when panicking external creditors became unwilling to roll over existing credits. To the extent that long-term loans were less mobile forms of external funds, it is thus likely that Korean firms with larger long-term loans faced less of a shortage of external funds. In the case of Taiwan, distress in the corporate and banking sectors was relatively moderate during the Asian financial crisis. However, even in Taiwan, the impact of Asian





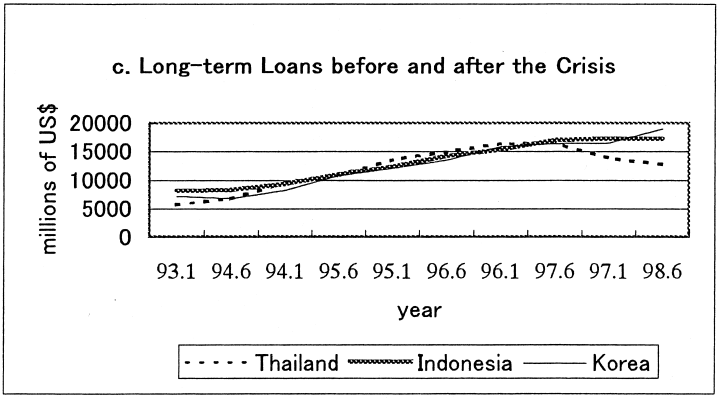


Figure 2.1 Loans and the crisis.

crisis was far from negligible. In addition, it is interesting to compare the effects of long-term loan funds on the availability of credit in countries with serious and moderate financial distresses.

By using the financial data of non-financial companies, we can investigate the effects of long-term loan funds on growth rates of external debt for Korean and Taiwanese firms from 1995 through 1999. We estimate the following function:

$$\Delta D_t/D_t = \text{constant term} + \gamma^* II_t + \delta^* DSALE_t + \varepsilon^* DEBT_t + \phi^* LONGD_t \quad (7)$$

where $\Delta D_t/D_t$ = the growth rate of external debt in period t, II_t = the profit rate in period t, $DSALE_t$ = the growth rate of sales in period t, $DEBT_t$ = the debt-asset ratio at the beginning of period t, and $LONGD_t$ = the long-term debt ratio at the beginning of period t.

In our panel estimations, both fundamental factors and the constraint of long-term debt are supposed to affect the growth rate of external debt. To capture the impacts of fundamental factors, we include the profit rate (i.e. the profit normalized by total asset), the growth rate of sales, and the debt-asset ratio (i.e. the total debt divided by the total asset). The expected impacts of these fundamental factors are mixed. If the firm reduces the amount of external debt when it contracts its activity, the impacts of the profit and sales would be positive. The impacts of the profit and sales would, however, be negative if higher profits and sales increase internal financing. If the debt-asset ratio exceeds its desirable level, the impacts of the debt-asset ratio would be negative. The desirable debt-asset ratio, however, differs across firms. If the debt-asset ratio captures the firm's characteristics with heavy reliance on the external debt, a high debt-asset ratio may have a positive impact on the growth rate of external debt.

The long-term debt ratio ($LONGD_t$) is an explanatory variable to capture the effect of the long-term funds on the growth rate of external debt. It is defined by the ratio of long-term debt to total liability.[17] To the extent that long-term funds were less mobile forms of external debt, the firm with a large fraction of long-term funds tends to have a smaller possibility of liquidity shortage. We can thus expect that the coefficient "ϕ" will have a positive sign. The constraint of long-term debt is, however, relevant when the firm faces debt reduction. We therefore estimate equation 7 by using the data of firms that had a negative growth rate of external debt in a year.

All the data used for estimation is based on the data set contained in *the World Scope*. The data set is originally based on the financial reports of the firms in Korea and Taiwan. The data was taken from non-financial corporations for which relevant data are available for at least two consecutive years. Except for the profit data, the data are comparable in Korea and Taiwan. However, because of the data constraints, we use different definitions for the profit in Korea and Taiwan. In Korea, we use the ordinary

Table 2.7 The percentages of firms that experienced declines of external debt (%)

1 *Korea*					
Year	*1995*	*1996*	*1997*	*1998*	*1999*
$\Delta D/D < 0\%$	14.05	14.76	12.35	60.00	75.96
$\Delta D/D < -5\%$	9.73	9.05	8.64	50.83	68.27
$\Delta D/D < -10\%$	7.03	5.24	6.17	40.42	62.50
$\Delta D/D < -20\%$	3.24	3.81	2.47	27.08	43.75
Number of sampled firms	185	210	243	240	208
2 *Taiwan*					
Year	*1995*	*1996*	*1997*	*1998*	*1999*
$\Delta D/D < 0\%$	40.00	36.46	28.50	35.47	32.93
$\Delta D/D < -5\%$	37.00	33.15	24.50	27.09	28.66
$\Delta D/D < -10\%$	32.00	28.73	21.00	25.12	22.56
$\Delta D/D < -20\%$	24.00	20.44	17.00	15.76	14.02
Number of sampled firms	100	181	200	203	164

Note
The table shows percentages of firms that experienced some decline of external debt, 5% or more decline of debt, 10% or more decline of debt and 20% or more decline of debt respectively.

profit that represents the operating profit plus any non-operating net income. In Taiwan, we use the general income that represents the difference between sales or revenues minus cost of goods sold and depreciation.

Table 2.7 summarizes the number of the sampled firms and the percentages of the firms that experienced declines in external debt from 1995 through 1999. In the case of Korea, the percentages of the firms that experienced declines in external debt were moderate before 1997. The percentages, however, rose dramatically in 1998 and 1999. In particular, the percentage of firms that experienced 10 percent or more declines in debt exceeds 40 percent in 1998 and 60 percent in 1999. The increased percentages suggest what a dramatic impact the financial crisis had on Korean firms. By contrast, in the case of Taiwan, the percentages show no significant changes before and after the crisis. The percentages rose slightly from 1997 to 1998, but the percentages, which had already been high in the mid-1990s, remained almost stable throughout the rest of the 1990s.

In the following analysis, we estimate equation 7 by using the firm level data, only when the firm had a decline in debt in a year or when it had 5 percent or more decline in debt in a year. The sample period is from 1995 through 1999. Pooling all available data of the relevant firms in the

period, we estimate equation 7 by the ordinary least square, the fixed effect model and the random effect model. Since corporations' data were partially missing in the estimation period, we use the unbalanced panel analysis.

The estimation results

Korea

Table 2.8 reports the results of estimation for Korea. The coefficient of the profit rate took positive values, while the coefficient of the growth rate of sales took negative values. The result implies that profitable firms had a relatively smaller decline of debt, but that the firms with high sales growth did not. The sign of the coefficient of the debt-asset ratio was negative, although it is not significant. During the crisis, Korea experienced the debt overhang problem, where the firms with heavy external debt were forced to contract their activities. The negative coefficient of the debt asset-ratio may partially capture the problem, although it is not significant.

Table 2.8 The determinants of debt reduction in Korea

1 Estimation for the firms that had declines of debt in the year

Explanatory variables	*Ordinary least square*		*Fixed effect model*		*Random effect model*	
	Estimate	t-*value*	*Estimate*	t-*value*	*Estimate*	t-*value*
Profit rate	0.173	2.155**	0.083	0.374	0.186	2.304**
Sales growth	−0.037	−1.271	−0.093	−2.690***	−0.047	−1.716*
Debt-asset ratio	−0.009	−0.239	−0.017	−0.262	−0.019	−0.485
Long-term loan ratio	0.229	3.429***	0.385	3.437***	0.246	3.647***
Hausman test (Chi Sq.)					10.114	
Number of observations	389		389		389	

2 Estimation for the firms that had 5% or more declines of debt in the year

Explanatory variables	*Ordinary least square*		*Fixed effect model*		*Random effect model*	
	Estimate	t-*value*	*Estimate*	t-*value*	*Estimate*	t-*value*
Profit rate	0.165	1.992**	0.272	1.080	0.173	2.082**
Sales growth	−0.043	−1.436	−0.141	−2.776*	−0.049	−1.708*
Debt-asset ratio	−0.027	−0.578	−0.168	−1.829*	−0.067	−1.440
Long-term loan ratio	0.216	2.962**	0.366	2.835**	0.238	3.290***
Hausman test (Chi Sq.)					11.952	
Number of observations	322		322		322	

Note
***significant at a 1% level, **significant at a 5% level and *significant at a 10% level.

Throughout the estimations, the coefficient of the long-term debt ratio was always significantly positive. The result supports the view that with fundamental factors being given, long-term funds had significantly mitigated the declines in external debt for Korean firms in the late 1990s. Korea was one of the East Asian countries that had experienced a serious crisis in 1997. A large number of Korean companies had suffered from a short-run liquidity problem since foreign lenders suddenly refused to roll over their bank loans in November 1997. Our result implies that even under such panicked circumstances, Korean companies with a large fraction of long-term external debt had a smaller risk of a liquidity shortage, and had relatively mild declines of external debt.

Taiwan

Table 2.9 reports the estimation results in Taiwan. When estimating by the ordinary least squares or by the random effect model, the estimated results are similar to those in Korea except for the debt-asset ratio. The coefficient of the profit rate took positive values, while the coefficient of

Table 2.9 The determinants of debt reduction in Taiwan

1 Estimation for the firms that had declines of debt in the year

Explanatory variables	*Ordinary least square*		*Fixed effect model*		*Random effect model*	
	Estimate	t-*value*	*Estimate*	t-*value*	*Estimate*	t-*value*
Profit rate	0.136	0.789	−0.577	−1.183	0.119	0.671
Sales growth	−0.040	−1.017	0.133	1.357	−0.035	−0.907
Debt-asset ratio	0.791	7.851***	0.114	0.323	0.757	7.194***
Long-term loan ratio	0.269	3.959***	0.057	0.313	0.257	3.685***
Hausman test (Chi Sq.)					10.525	
Number of observations	281		281		281	

2 Estimation for the firms that had 5% or more declines of debt in the year

Explanatory variables	*Ordinary least square*		*Fixed effect model*		*Random effect model*	
	Estimate	t-*value*	*Estimate*	t-*value*	*Estimate*	t-*value*
Profit rate	0.199	1.119	−0.318	−0.630	0.190	1.034
Sales growth	−0.041	−1.023	0.142	1.375	−0.035	−0.878
Debt-asset ratio	0.818	7.392***	0.133	0.352	0.776	6.684**
Long-term loan ratio	0.246	3.274***	0.050	0.247	0.228	2.965***
Hausman test (Chi Sq.)					9.587	
Number of observations	240		240		240	

Note
***significant at a 1% level, **significant at a 5% level and *significant at a 10% level.

the growth rate of sales took negative values. Throughout the estimations, the sign of the coefficient of the debt-asset ratio was positive.

More importantly, the coefficient of the long-term debt ratio was significantly positive when estimating by the ordinary least squares or by the random effect model. The result suggests a possibility that the long-term funds had significantly mitigated the declines in external debt in Taiwan in the late 1990s. Compared with Korea, Taiwan had relatively moderate economic downturns during the crisis. However, large declines in external debt had frequently occurred in Taiwan throughout the late 1990s. Our result implies that under such circumstances, long-term funds had some beneficial impact in mitigating drastic declines in external debt in the late 1990s.

However, when estimated by the fixed effect model, the estimation results are less significant. In particular, we can see no significant impact from the long-term debt ratio on the growth rate of external debt. The result may have arisen because dummy variables in the fixed effect model explained most of declines in external debt of the firms in Taiwan. If this is the case, large declines in external debt might not be a consequence of macroeconomic downturns, but instead result from some firm specific environments. Our conclusion is thus tentative in the case of Taiwan in the late 1990s. We probably need some further investigations to derive a definitive answer on the role of long-term funds in Taiwan.

Concluding remarks

In this paper, we investigated the roles of long-term funds for economic growth in Japan, Korea and Taiwan by using the firm level data. When the long-term debt makes liquidity shortage a less likely outcome, long-term loans can have a positive impact on investment. In the first part, we explored the role of long-term loans under the relation-based system in Japan. Our estimations in Japan demonstrated that investment was significantly larger for corporations with a higher ratio of long-term loans before the mid-1980s. The result implies that a higher ratio of long-term loans gave an incentive to make significantly large amounts of investment before financial market deregulation.

In the second part, we examined whether the long-term debt ratio had a significantly positive impact on credit availability in Korea and Taiwan in the late 1990s. Korea is one of the East Asian countries that had experienced a serious crisis in 1997, whilst the decline of the Taiwanese economy was relatively moderate during the crisis. Our estimation results imply that the long-term loan ratio might have mitigated declines in economic activities under the crisis, strongly in Korea, and possibly in Taiwan. The result in Korea supports a view that if a large fraction of external liabilities had longer maturities, the East Asian crisis might not have taken place as the form of a liquidity shortage by the firm level data.

In interpreting our estimation results, however, we need to keep in mind several limitations of our analysis. First, because of corporation-specific data, our analysis does not necessarily identify how large an impact the long-term funds had on the rates of macroeconomic growth. From the macroeconomic viewpoint, the allocation of long-term funds is warranted, if the allocated long-term funds had great external effects in increasing capital stock and production. To measure the external effects, we thus need to analyze not only corporation-specific investment, but also the interaction of investment among firms and industries. Second, even though the long-term debt ratio had a positive impact on investment, it does not necessarily mean that a source of the impact is the reduction of the liquidity risk. The long-term funds can affect the investment in various respects. We need further research to identify that long-term funds really enhance economic growth through reducing the potential liquidity risk in the economy.

Notes

1 See Fry (1995) for classical literature and Rajan and Zingales (2001) for a recent literature survey. Empirical studies such as King and Levine (1993) support their views and document a positive correlation between a variety of measures of financial activity and economic development. However, the empirical findings are indecisive on causality between financial activity and economic development.
2 For example, Corsetti, Pesenti and Roubini (1998), Radelet and Sachs (1998), Furman and Stiglitz (1998) and Ito (1999).
3 For example, Ferri and Kang (1999) and Ferri, Kang and Kim (2000) examined liquidity constraints in Korea by using micro-data at the individual bank level. Shen (2002) explored the existence of credit rationing in Taiwan by using banks loans' transaction data.
4 During the high growth period, average terms to maturity in the main bank loans were a few months. The average terms to maturity increased in the 1970s. However, even in the early 1980s, the average terms to maturity were less than a year.
5 See also Horiuchi and Otaki (1987) and Packer (1994). On the contrary, Beason and Weinstein (1996) came to a paradoxical conclusion that the more dependent industry was on JDB loans, the lower its growth rate.
6 For example, see Asako, Kuninori, Inoue and Murase (1997) and Hayashi and Inoue (1991).
7 The conclusions of Hoshi *et al.* were confirmed by, for example, Okazaki and Horiuchi (1992) and Ogawa and Suzuki (1997). Hayashi (1997), however, asserts that the conclusions of Hoshi *et al.* are not robustly supported when excluding some outliners.
8 Many companies close their books in March, but not all the companies covered by the analysis did so. Data are, thus, arranged on the basis of a calendar year when books were closed.
9 Tools, apparatus and fixtures are not included in capital stocks, because their values are much smaller than those of other capital stocks.
10 For example, discrepancies at the time of 1970, if any, would have less substantial effect on estimation, since the estimation periods start from 1972.

11 The data from the NIKKEI NEEDS do not tell the book values of capital stock-specific depreciation. The book values of capital stock-specific depreciation were thus calculated by allocating the total book values of capital stock depreciation (net of land) in proportion to the book values of each individual capital stock.
12 For the depreciation rate of structures, estimated at 0.0564 by Hulten and Wykoff, we used a 0.047 rate, identical to that of buildings and adjunctive equipment.
13 Except for stock prices, any of the variables are based on the financial data of individual corporations. Share prices in period t are those at the end of period t that are adjusted for dividend off.
14 Since shipbuilding is peculiar in the transportation industry, estimations were attempted for both of the cases including and excluding shipbuilding firms.
15 Without loss of generality, we reported the case where capital stocks include land in Table 2.4.
16 The data sources are BIS, *The Maturity, Sectoral and Nationality Distribution of International Bank Lending*, various issues, from 96.6 to 97.12 and BIS, *International Banking and Financial Market Development*, August 1998, for 98.6.
17 In the analysis, "the long-term debt" is defined by all interest bearing financial obligations, excluding amounts due within one year.

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3 Japanese economic success and the curious characteristics of Japanese stock prices

Randall Morck and Bernard Yeung

Introduction

The Japanese economy, after spectacular performance in the decades following World War II, has been surprisingly weak now for more than a decade. Figure 3.1 shows this remarkable contrast. From 1961 to 1989, Japan's Gross Domestic Product (GDP) averaged a remarkable 6.37 percent annual growth rate. From then on, Japan's GDP has posted only a 1.67 percent average growth rate. Something substantial clearly happened to the Japanese economy at the end of the 1980s. Certainly, the Japanese stock market and real estate market both collapsed spectacularly. But financial and real estate markets have collapsed before many times and in many countries, and the results are not always a decade of economic stagnation. Indeed, the US economy scarcely noticed the stock market collapses of 1907 and 1987. Why is the Japanese financial disarray of the late 1980s so difficult to transcend?

Our key point is that Japanese economic institutions were well suited to both postwar reconstruction and "catching up" with other advanced economies, but not to surpassing them. We argue that Japan's "catch up" was essentially complete by the late 1980s. The business-government cooperation and bank-centered corporate governance that served Japan well for decades are now ill-suited in critical ways to guiding Japan further forward. Yet these institutions continue with an inertia that reduces Japan's ability to find and invest in new economic opportunities, including new enterprises.

In particular, we argue that a shift away from state and bank oversight and toward greater reliance on equity markets to allocate capital is desirable for Japan. However, such a shift is not feasible unless certain key institutional changes are made. These include the dismantling of intercorporate equity holdings, more transparent corporate decision-making, and corporate governance that is more responsive to shareholder pressure. Finally, we are skeptical of arguments that such changes run counter to deep Japanese cultural traditions, and are therefore optimistic that they can be accomplished.

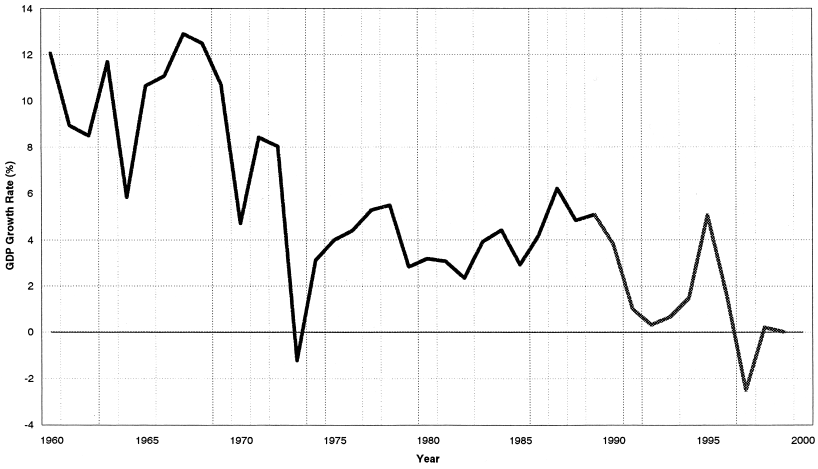

Figure 3.1 Japanese GDP growth, 1961 to 1999.

The remarkable triumph of the Japanese economy

Economic growth is a complicated phenomenon, and Japan's economic history since the Meiji Restoration suggests that the Japanese know more about achieving and sustaining economic growth than most others. Japan's political, financial, and business leaders have presided over what is probably the greatest "rags to riches" story in the history of the world. Japan in 1878 was an impoverished and backward feudal country, little different from the most backward regions in the world in terms of the standard of living it provided for its people. Japan in 2001 is one of the richest countries in the world, having accomplished in little more than a century what took many times longer for the United Kingdom, the United States, and other Western economies. Even Germany, though also late to industrialization, started from a higher base when Bismarck orchestrated its economic advancement in the late nineteenth century. Economists from other countries should therefore speak cautiously when advising Japan about her economic policy. This analysis of the current economic situation of Japan is offered in this spirit, as a way of thinking that might perhaps be useful, that Japanese policy makers and business leaders will take or leave as they see fit.

In our view, Japan's very success is the key to understanding the prolonged economic discord that began in the late 1980s. Figure 3.2 graphs the difference between Japan's per capita GDP, measured at purchasing power parity in current US dollars, and the average per capita GDP of other leading free market economies (the other six G7 countries less Germany), measured in the same way.[1] Although Japan began the process

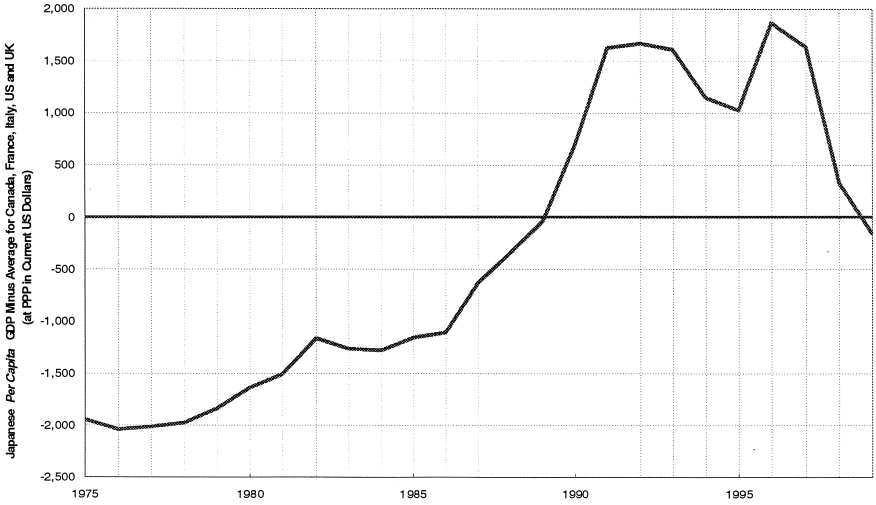

Figure 3.2 Japanese *per capita* GDP relative to that of other rich countries, at purchasing power parity, 1961 to 1999.

of industrialization in the late nineteenth century, its economic development lagged behind that of the leading Western countries until 1989. In the early 1970s, Japan's per capita GDP was $5,960 versus $8,190 for the US and some $2,000 below the average for the leading Western Countries. In short, 1989 is the year when the Japanese economy unambiguously and indisputably "caught up" with the West.

We argue that economic growth requires different institutions, depending on an economy's scope to grow by applying existing knowledge. When an economy has great potential to grow by applying techniques and technology developed elsewhere, its main constraint is the availability of capital. Consequently, institutions that promote investment and channel it into capital spending are needed. Since many countries have passed through this phase of economic growth, many institutional arrangements exist for accomplishing this. In contrast, when an economy has exhausted the potential of existing practices and technology, it can only grow further by devising new and superior practices or technology. At this stage, the economy's growth is constrained by its stock of knowledge. Consequently, institutions that facilitate the rapid development and application of new technology and practices are needed. The range of institutions that are known to promote this sort of growth (creative destruction) is much more limited.

Different companies in Japan have employed each method of growth with considerable success. For example, Japan's great *zaibatsu* families built their prewar corporate empires largely by applying technology

developed elsewhere in Japan. But Sony, one of Japan's great technology leaders, has built its fortune by developing new technology, especially in the field of miniaturization. Because of this, we argue that the seeds of a creative destruction-based economy exist in Japan.

The growth of businesses

In free enterprise economies like Japan, national economic growth depends on the growth of private sector businesses, including listed corporations, private corporations, partnerships, private cooperatives, etc. Therefore, to understand the nature of economic growth, we must begin with corporate growth, which includes both the growth of existing companies and the creation of new companies. This section presents a simplified analysis of how corporations decide whether or not to grow which captures the essence of what is taught in most business schools. The same techniques are used to assess the viability of new businesses seeking financial backing. In doing this, we are not departing from traditional macroeconomic thinking, we are merely going back to its root: macroeconomic performance is the sum of microeconomic performance.

Moreover, King and Levine (1993) and a huge subsequent literature confirm that the sophistication of a country's financial system is closely correlated with macroeconomic performance. La Porta *et al.* (1997, 1998, 1999), Morck *et al.* (1998), and others also show that traditional financial management concerns such as corporate governance laws and the standing of investors in court, also matter to macroeconomic performance. Consequently it is useful to connect standard ways of thinking about corporate finance issues to macroeconomics. This is the conceptual objective of this section.

Two caveats are in order before we proceed further. First, in a real economy, not all growth is generated by private sector businesses. Government, state-owned enterprises, and not-for-profit enterprises account for a large fraction of GDP in many advanced economies, and Japan is no exception. The objectives that direct the growth of these enterprises may differ substantially from the economic profit-seeking behavior that governs corporate growth. However, the role of private sector businesses is arguably more fundamental. Government organs and public sector enterprises exist because the private sector generates the tax revenue that let them survive without concern for economic profits. Non-profit enterprises exist because of donations from businesses, governments, and individuals. Personal incomes derive either from employment in the private sector or from employment by government, public sector enterprises, or non-profits. The ultimate source of these funds is therefore also private sector businesses.

Second, it is well known that all businesses do not follow the economic profit-seeking behavior mandated by corporate finance theory. This is

because the individuals who run businesses are wont to maximize their own utility, not economic profits, which accrue to others, such as the shareholders who legally own the firm. Because this situation involves a breakdown in the duty of legal agents (managers) to act for the firm's owners or principals (shareholders), it is called an *agency problem*. An important consideration in designing economic institutions is their ability to constrain agency problems. We shall return to this issue later in the paper.

The corporate finance foundations of macroeconomics

An economy's gross national product is by definition the sum of its firms' revenue minus outsourcing purchases, that is, its firms' total value added, which is the compensation to workers and to capital owner.

$$Y_t = \Sigma_j \, (R_{j,t} - P_{j,t}) \tag{1}$$

where Y_t = GNP, $R_{j,t}$ = firm j's revenue in period t and $P_{j,t}$ = firm j's outside purchase.

With offsets in the purchases of intermediate inputs (which = other firms' value added), Y_t is the economy's total value added, i.e. its total labor earnings and capital earnings, which can be broken into two components: normal capital returns and economic profits.

Conceptually, we can write:

$$(R_{j,t} - P_{j,t}) = w_{j,t}L_{j,t} + r_{j,t}K_{j,t} + \pi_{j,t} \tag{2}$$

Here, $w_{j,t}L_{j,t}$ is labor cost, $r_{j,t}K_{j,t}$ is the rental price of capital, and $\pi_{j,t}$ is firm j's economic profits in period t. When a business considers undertaking a new project i (expanding), it calculates the *net present value* (NPV) of doing so as:

$$NPV_{ijt} = \sum_{s=t+1}^{T} \frac{\mathbf{E}[f_{ijs}\Psi_t]}{(1 + r_t)^{s-t}} - K_{ijt} \tag{3}$$

where the discount rate, r_t, is the cost of capital in period t, $f_{i,j,t}$ is the increased net cash flow investment project i will generate for firm j in future period s, K_{ijt} is the capital spending needed in period t to finance project i, $\mathbf{E}$ is the expectations operator and Ψ_t is the information set known at time t to the decision maker. We assume that all investment projects are paid for in one period and provide returns in the form of increased cash flows in subsequent periods. Note that:

$$f_{ijt} = R_{ijt} - P_{ijt} - w_{ijt}L_{ijt}. \tag{4}$$

To connect standard corporate finance models to standard economics models, we can take the additional cash flows from firm j setting up project i in period t to be a constant perpetuity, f_{ij}, beginning in period $t+1$. Consequently, we can write:

$$NPV_{ijt} = \frac{\mathbf{E}[f_{ij}|\Psi_t]}{r_t} - K_{ijt}. \tag{5}$$

The firm's expected economic profit in each subsequent period is then exactly:

$$\mathbf{E}[\pi_{ijt}\Psi_t] = \mathbf{E}[f_{ij}|\Psi_t] - r_t K_{\mathrm{ijt}} \tag{6}$$

and is positive (negative) if the marginal revenue from the new project, f_{ij}, exceeds (is less than) the marginal cost of the current capital expenditure, $r_t K_{ijt}$. This simplification is not necessary to our argument, but perhaps does connect it to standard microeconomics more clearly.

In standard corporate finance theory, each firm j is assumed to confront a declining *investment opportunity schedule*, of the sort illustrated in Figure 3.3, so that for each successive project i costing K_{jit}, the additional perpetual subsequent cash flow f_{ij} is smaller. Economic efficiency means the firm should invest in all projects that have positive NPVs (positive economic profits in the perpetuity simplification) and then stop.

If we take the cost of capital, r_t, as constant, and the level of technology and other relevant features of the economy as fixed, all firms come to a steady state where $\mathbf{E}[f_{ij}|\Psi_t] - rK_{ijt} = 0$.

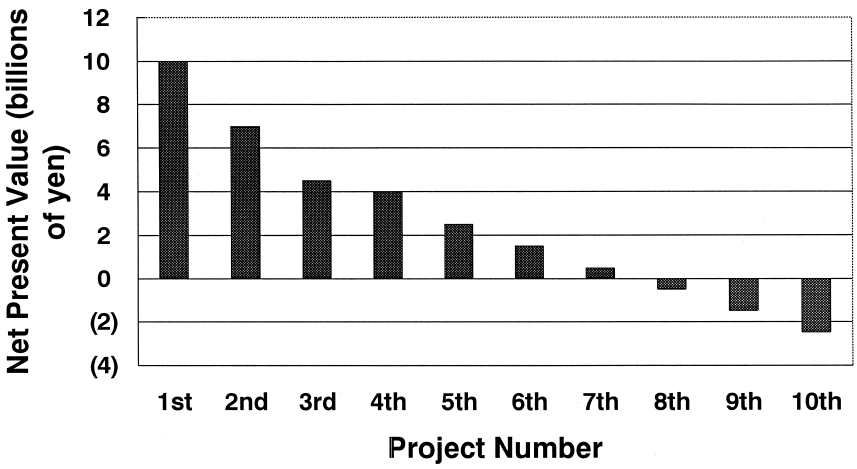

Figure 3.3 A stylized example of a firm's capital investment opportunity schedule.

We can rewrite this as

$$q_{jt} \equiv \frac{1}{K_{ijt}} \left(\frac{\mathbf{E}[f_{ij}|\Psi_t]}{r} \right) = 1 \tag{7}$$

for project i the marginal capital investment firm j undertakes. That is, q_{jt} is the marginal Tobin's Q ratio of firm j at time t, for $\frac{\mathbf{E}[f_{ij}|\Psi_t]}{r}$ is the market value investors in financial markets, using the information set $\hat{\Psi}_t$ available to them, assign to the marginal investment project; while K_{ijt} is that project's replacement cost.

Economic efficiency means that firms should undertake further investment projects as long as their marginal q ratios exceed one, and stop investing when their marginal q ratios fall to one. Note that this works only if $\Psi_t = \hat{\Psi}_t$; that is, if the information available to investors is the same as the information available to investors.

Implications

Several messages follow from this simple algebraic restatement of economic identities:

1. Corporate growth is treated as a *disequilibrium phenomenon* in standard corporate finance classes at business schools throughout the world. This is because NPVs are positive only where economic profits (quasi-rents) are positive, and corporations are not supposed to undertake additional capital investment unless the NPV of doing so is positive.
2. Poor corporate governance leads firms to stop either too soon or too late along their *investment opportunity schedules*. This causes the macroeconomy's total output to be suboptimal.
3. Firms *investment opportunity schedules* are usually taken as given, or as shifting due to exogenous factors. For example, an exogenous technological breakthrough (an exogenous increase in the information set Ψ_t to $\Psi_{t+1} > \Psi_t$) shifts a firm upwards, stimulating investment and growth, as does an exogenous surge in demand for the firm's products.
4. In the absence of an exogenous technological breakthrough, corporate growth must come from investment in knowledge at a rate that is compatible with the expected cash flows newly created knowledge can generate. That is, $\Psi_{t+1} = g(R\&D, \Psi_t)$. This is the gist of Schumpeter's (1912) theory of creative destruction as the engine of growth in a free enterprise economy, as modeled by Romer (1986) and others.

Exogenous technological change and "catch up" growth

Technological change in the western world has primarily been embodied in capital. Because of this, any emerging market economy that seeks to grow by absorbing knowledge developed in other economies requires considerable capital accumulation.

We incorporate *knowledge* into our model by denoting the level of knowledge available by Ψ_t. We use the term *knowledge* to mean not just scientific and engineering knowledge, but managerial know-how, marketing ability, and all the other types of knowledge that contribute to economic prosperity in developed economies.

The nature of "catch up" growth

"Catch up" growth comes about when knowledge from outside the economy becomes available, increasing Ψ_t by $\Delta\Psi_t$. A discrete increase in Ψ_t causes an across the board increase in the additional cash flows the company can achieve from its whole investment opportunity schedule of possible expansion projects.[2] That is,

$$\frac{\Delta}{\Delta\Psi_t}\left(\frac{\mathbf{E}[f_{ij}|\Psi_t]}{K_{ijt}}\right) > 0$$

for all investment projects i that firm j might undertake in period t.

This raises the NPVs of a generic capital investment project to

$$NPV_{ijt} = \frac{\mathbf{E}[f_{ij}|\Psi_t + \Delta\Psi_t]}{r_t} - K_{ijt} \gg 0 \tag{8}$$

and firms consequently acquire new capital goods to grow because projects that were not economically sound in the past now make sense. Positive NPVs abound, and pure economic profits or *quasirents* $\pi_{ijt} = f_{ij} - r_t K_{ijt} \gg 0$ are expected to be plenteous for those with access to capital.

Who gets the quasirents of economic growth?

Corporate finance theory posits that shareholders are residual claimants of the firm's economic profits. Economic profits may indeed accrue to shareholders. But they could also flow to creditors, managers, workers, or the state. Their precise ultimate disposition probably depends on complicated bargaining models that are beyond the scope of this study.

Certainly, top corporate executives did well as Japan caught up. Despite their relatively low base salaries, the top executives of Japan's greatest corporations presided over "entertainment spending" budgets. Morck and Nakamura (1999) report that the entertainment expenses of Japanese

firms totaled ¥6.14 in 1991. In comparison, total R&D spending that year was ¥9.74 trillion. Some students of Japanese business stress the importance of networking and view entertainment costs as a prudent investment. We are skeptical of this interpretation, and are unaware of any hard evidence to back it up. It seems more plausible to interpret corporate entertainment spending as consumption by top executives. The employees of Japan's largest firms also did well, with job security far in excess of that available to their North American peers. Politicians and powerful lobby groups, like farmers, probably ended up with large portions of these economic profits too. Certainly, in countries earlier along the path of catch up growth, such as the Philippines and Indonesia, Marcos and Suharto relatives appear to have served as quasirent sinks.

In Japan, banks probably also captured substantial quasirents. Caves and Uekusa (1976) show that main banks charge their client firms higher than market interest rates. For keiretsu firms, this premium is proportional to dependence on group financial institutions. Yet Nakatani (1984) shows keiretsu firms to be more levered than independent firms. Aoki (1988) describes these high debt costs as an agency fee paid by individual shareholders [for bank monitoring]. However, Morck and Nakamura (1999) find no evidence that bank monitoring benefits shareholders, and Morck, Nakamura and Shivdasani (2000) find evidence of a negative effect on share value for most Japanese firms.

Japanese banks may also have organized transfers of these quasirents between companies. Hoshi *et al.* (1990) and Morck and Nakamura (1999) argue that banks also orchestrated transfers from profitable firms to firms in financial distress. Hoshi *et al.* emphasize the positive aspects of this intercorporate insurance. Morck and Nakamura argue that these transfers amounted to economically suspect bail outs of poorly governed firms closely associated with bank keiretsu groups, and had little stabilizing effect on other firms. They argue instead that these transferred quasirents served to obfuscate corporate governance problems in the firms that received them.

Economic institutions for catch-up growth

Note that $\mathbf{E}[\pi_{ijt}|\Psi_t] = \mathbf{E}[f_{ij}|\Psi_t] - r_t K_{ijt} \geqslant 0$, so firms need only raise new capital at the historic cost r, or at a cost not greatly higher, to expand profitably and capture the readily available streams of quasirents $\{\pi_{ijt}\}$. Access to large quantities of cheap capital is critical, so the economic institutions necessary to support "catch up" growth are those that facilitate a high savings rate and ready financing for business expansion.

Corporate governance, or the quality of the individual capital budgeting decisions, is only of secondary importance, for the abundant quasirents make virtually any expansion profitable. The future cash flows project i will produce for firm j in period t are estimated with an error, π_{ijt}, so $\pi_{ijt} = f_{ij} - r_t K_{ijt} + \eta_{ijt}$.

First, who runs the company is unimportant because keeping π_{ijt} from being too large is easy. The technology and business practices needed are known, and must only be replicated. Practical problems in setting up the productive facilities needed have been solved elsewhere. Selling the products is straightforward, as their usefulness has been demonstrated in other countries. Second, who makes the decision matters little because $\mathbf{E}[\pi_{ijt}|\Psi_t] = \mathbf{E}[f_{ij}|\Psi_t] - r_t K_{ijt} \gg 0$. Even a big error in π_{ijt} still leaves $\pi_{ijt} = f_{ij} - r_t K_{ijt} + \eta_{ijt} \gg 0$ most of the time. Third, the appropriation of cash flows by management or other parties can be quite large, biasing π_{ijt} deep into negative values, yet π_{ijt} can remain well above zero.

Because of these factors, firm-level corporate governance is unimportant as long as huge errors and gross theft by corporate insiders are avoided. Brilliant managers are unnecessary. Any reasonably honest person can do a workmanlike job as a corporate decision-maker, and the firm can capture at least some of the quasirents that are there for the taking.

This wide leeway is probably why different countries have successfully used very different corporate governance systems while "catching up." Bismarck encouraged large banks to take an active role in developing Germany. Malaysia's government entrusts its corporate assets to politically anointed corporate executives to fulfill carefully balanced racial representation objectives. Japan entrusted its economic development to powerful families in the prewar period, and to bankers and MITI bureaucrats in the postwar period. Great Britain absorbed foreign, primarily Dutch, technology and business practices after the Glorious Revolution, and used a stock market to allocate capital. Businesses in the United States relied heavily on various banking regimes, the stock market, preferred equity, and traded bonds as it caught up with Britain during the nineteenth century.

This kaleidoscope of institutions suggests that anything able to bring about the rapid accumulation of capital can support catch-up growth. Japan's banks and MITI industrial policies worked as well as any other alternative – and perhaps better than many. They were probably helped along by Japan's policies of keeping saving within the country and in the banking system by banning corporate bonds. The result was a large flow of capital channeled toward corporations at an artificially low cost.

Approaching the knowledge frontier

Once an economy has absorbed all the readily available knowledge other economies can provide, further "catch up" growth, due to the exogenous arrival of new knowledge, is not possible. The individual firms in other countries that develop new products and new processes keep these competitive edges secret, and intellectual property laws protect their rights to do so. "Catch up" growth would only become possible again if the

country stagnated for a decade or two while other economies generated new knowledge, and then caught up again.

Having reached the frontiers of knowledge, firms must prudently expend resources on research and development, market research, advertising, and the like, so as to increase Ψ_t themselves. Further growth that involves simply raising capital and investing it in more projects using current technology causes the firms to move too far out along their investment opportunity schedules, and to undertake projects with negative net present values. That is, firms undertake an increasing number of projects with $f_{ij} < r_t K_{ijt}$ and so with $\pi_{ijt} < 0$. As the returns to further expansion grow ever more meager, strains appear in the country's economic institutions. Are some of these systems better than others at dealing with these strains?

Concentrated banking and the exploitation of cheap capital

When a country has applied almost all the exogenously available additional knowledge, $\mathbf{E}[\pi_{ijt}|\Psi_t + \Delta\Psi_t] = \mathbf{E}[f_{ij}|\Psi_t + \Delta\Psi_t] - r_t K_{ijt} \to 0$. If the future is estimated with a large error π_{ijt}, the firm can increasingly often end up with economic profits $\pi_{ijt} = f_{ij} - r_t K_{ijt} + \eta_{ijt} < 0$. The quality of the individual capital budgeting decisions starts to matter more, for quasirents are now less juicy. The appropriation of cash flows by management or other parties can, biasing π_{ijt} so that $\mathbf{E}[\eta_{ijt}|\Psi_t] < 0$, is increasingly likely to leave π_{ijt} below zero. One solution is to improve corporate decision-making and to find ways to expand the set of available knowledge further. But this requires major changes in the way firms are run. Is there a simpler solution?

Japan and other East Asian countries have relied heavily on a concentrated banking industry to oversee their "catch up" growth, and both grew quite quickly. This may not be a coincidence. If firms' increase in demand for capital pushes up the cost of capital, r_t, this would lower the present value of the additional cash flow that the new technology makes possible and stops the firm's expansion more sharply than if r_t did not rise. Taking this line of argument further, if r_t can be pushed to an artificially low level, $\pi_{ijt} = f_{ij} - r_t K_{ijt} + \eta_{ijt}$ can rise above zero, even if it would be negative at freely set cost of capital. This observation may explain the seemingly inordinate importance many Asian economies, including Japan, have put on keeping interest rates low while at the same time encouraging high savings rates. Cheap and abundant capital extends the life expectancy of profitable "catch up" growth.

Indeed, a quasi-monopolistic banking system that keeps interest rates low might be quite useful to those in charge of a country's existing large firms in the final stages of "catch up" growth. Bismarck is thought to have initially sanctioned deposit rate price fixing by banks to keep down the cost of capital for politically powerful *Junker* feudal landowners, who regularly borrowed and repaid funds over the agricultural cycle of planting and harvesting. However, the German banking system proved extremely

resistant to change over subsequent decades – and in the postwar reconstruction decades. Perhaps political lobbying by those in charge of Germany's existing large firms played a role in this. Concern about agricultural lending also contributed political support to capping interest rates in the US in the 1930s. These *Regulation Q* caps may have made post-depression reconstruction, a sort of "catch up growth" in which the civilian economy absorbed military technology such as jets and synthetic fabrics, economically viable for a longer period of time after World War II than would have been the case were interest rates in that country free to rise.

Figure 3.4 shows that Japan's real interest rates were comparable to those of the United States until 1976 (with the exception of a downward spike in Japanese real rates in the early 1970s due to a spurt of high inflation). However, after 1976, Japanese interest rates have generally been one to two percentage points below US rates. Note also that Japanese *per capita* GDP growth dropped in the early 1970s – from the 8 to 10 percent range of the previous decade to the 3 to 5 percent range that persisted until the late 1980s.

The approaching end of catch up growth must have been apparent to Japanese top corporate executives and government officials some years in advance. Perhaps strains to the viability of "catch up" growth, in the form of ever more marginal NPVs, began to show in Japan in the mid-1970s. Government and corporate leaders may have found depressed interest rates an effective macroeconomic stimulus because this prolonged the economic viability of catch up growth. The cost of this was that firms moved further out on their investment opportunity schedules than would

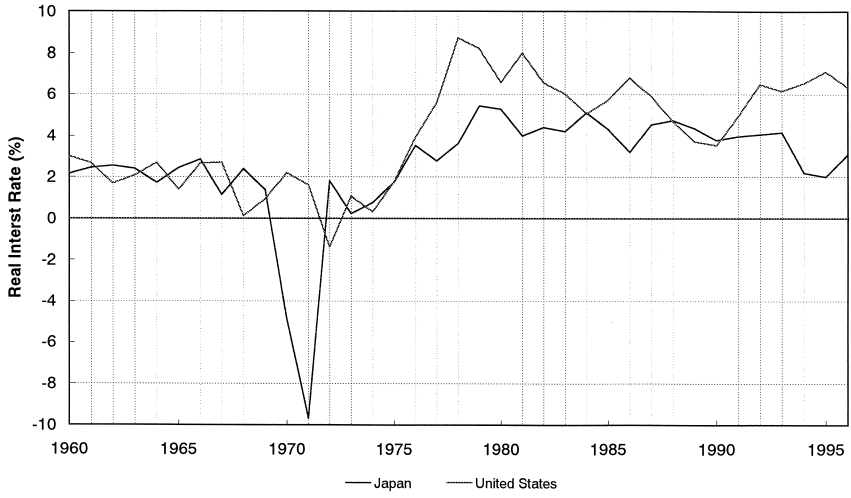

Figure 3.4 Japanese and US real interest rates, 1960 to 1996.

have been economically feasible had Japanese firms faced global market costs of capital.

This renewed growth lasted to the late 1980s, when Japan's economy settled into its current doldrums. This ultimate slowdown should not have been unexpected, for low interest rates do not cure the problems associated with approaching the technological frontier, but only delay the critical adjustments by prolonging the economic viability of "catch up" economics. By the late 1980s, Japan had unambiguously reached the technological frontier, and Japanese firms had moved beyond the efficient points of their investment opportunity schedules. Interest rate price fixing could no longer help, and banks were left stretched by what, in retrospect, seemed an excessively generous granting of credit.

A bubbly toast to success

Interestingly, Japan's real estate and stock market bubbles also occurred as Japan's economy approached the global technological frontier, as Figure 3.5 illustrates. Perhaps bankers and corporate executives began to find further unprofitable investment in plant and equipment increasingly hard to justify, and so sought alternative investments for the funds they could still obtain so cheaply from Japan's great banks. Stocks and real estate are obvious places to invest money whilst waiting for other opportunities to appear, and this doubtless occurred to many people simultaneously. The result of this increased demand for stocks and real estate was to push stock and real estate prices higher, which served to justify the wisdom of those who invested in these assets and to attract

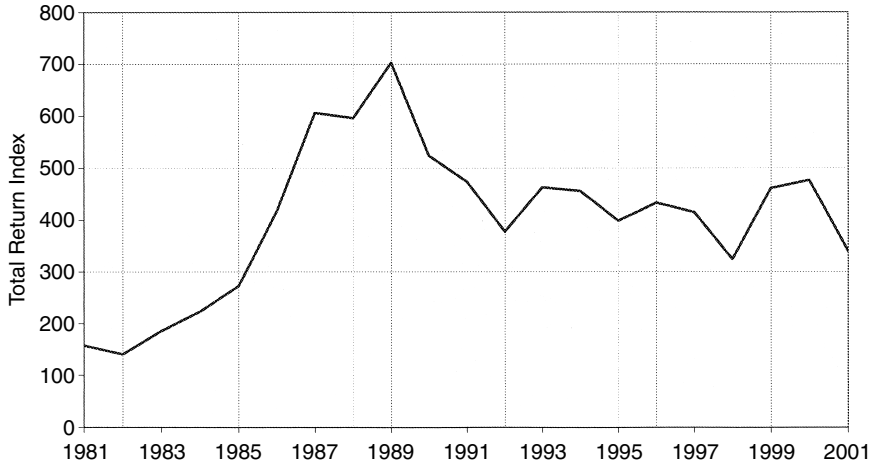

Figure 3.5 The Japanese stock market total return index for the Japan stock market value, 1981 to 2001.

further investment funds Kindleberger (1978) proposes that financial crises typically follow periods of abundant quasirents.[3] These periods of abundant quasirents are created by economic "displacements," such as the beginnings of wars, armistices, revolutions, the erection of trade barriers, the lowering of trade barriers, free trade, crop failures, extraordinarily abundant crops, and virtually any other sudden large change that leaves the economy in a profound disequilibrium. Kindleberger mentions radically new technology as a common source of such economic displacement.

Certainly, the inflow of foreign technology into Japan on a vast scale over the past century and a quarter must have had profound effects of this sort. Of course, Japan's economy did not steadily absorb this technology in a continuous prosperity. Political factors, wars, trade barriers, and wrenching institutional changes associated with postwar reconstruction were all important, and Japan experienced recessions, depressions, and asset price fluctuations like any other country. However, the potential for earning economic profits by further developing Japan along the lines of the richest Western economies was never in serious doubt.

According to Kindleberger, these profound disequilibria create abundant quasirents; and those who capture these quasirents become very rich very quickly. These high returns create a financial and monetary expansion, often in the form of vastly increased bank credit, and a general expectation of very high returns. These general expectations may be legitimate for a time, as the economy adjusts to the new equilibrium, but they are not rational in the longer run. That irrationally high expected returns become pervasive is, however, consistent with recent work in behavioral finance, summarized in Shleifer (2000), showing that people give excessive weight to recent experience in performing Baysian-style updates of their expectations. In the case of Japan, more than a century of catch up economic growth convinced business and government decision-makers to expect an abundance of profit opportunities as long as basic criteria of monetary stability, capital availability, and institutional predictability were satisfied.

When quaisrents become scarce as the necessary economic adjustments near completion, the now overextended financial system and irrationally high expected returns give rise to what Kindleberger calls "overtrading." Overtrading is the bidding up of asset prices caused by a continued search for high returns that can no longer be justified by the real economy. Overtrading engenders speculative bubbles – expectations of high capital gains – that, for a time, are self-fulfilling. This period of overtrading eventually creates fertile ground for confidence artists. When genuine high real return investments begin to dry up, swindlers join the fray, promising high returns that no investor would have taken seriously under normal circumstances, but that now seem plausible to investors, given their excessively optimistic expectations. Ponzi schemes and other financial chicanery abound. Eventually, though, as more and more money seeking high

returns pushes asset price rises to increasingly dizzy heights, the disconnection of asset prices from the real economy becomes obvious. Also, the inevitable exposure of frauds and swindles undermines investor confidence and triggers a reappraisal of expected returns and asset prices back to levels consistent with realistic long-term economic growth.

Since much of the overtrading in genuine assets and investment in swindles of various sorts was financed with credit, Kindleberger argues that a stock market collapse, banking crisis, or the like, often follows. If the financial system and the country's corporate sector are unable to regroup and reinitiate normal economic growth, a prolonged economic crisis can also ensue. If the real economy is able to carry on unscathed, the financial crisis passes quickly. Kindleberger (1978) establishes the general validity of this model with a detailed historical account of financial crises. He investigates every significant economic and financial crisis in European and American economic history, and fits all of them to this pattern.

We argue that the economic crisis that beset Japan at the end of the 1980s is an example of this process. Japan's current problems follow a bout of overtrading, a classical bubble of the sort Kindleberger describes, and a financial crisis of the sort that he argues typically follows. However, Japan's situation is not a typical case like the dozens of others Kindleberger reviews. Japan cannot simply regroup its financial system and continue as before because Japan has now caught up – fully, completely and finally. Further economic growth must now be qualitatively different, and requires different institutions. Hence, the lingering and apparently intractable nature of Japan's economic doldrums.

Transcending the knowledge frontier

As Figure 3.2 shows, Japan's *per capita* GDP surpassed the average for other rich countries in 1989, clearly marking the end of "catch up" growth. This transition means that further growth by replicating existing property, plants and equipment will not generate positive economic profits. Further growth instead requires investment in new technology, new products, new processes and other innovations that can generate growth by creative destruction, which is the process that is believed to fuel continuing economic growth in the advanced industrial economies.

Growth by creative destruction replaces growth by capital accumulation

Creative destruction was identified as playing this role by Schumpeter (1912). Entrepreneurs create innovations such as new products or production processes. Since these innovations are not known to others, the entrepreneur has a monopoly on their use, and this monopoly generates economic profits for the entrepreneur and thus allows for the growth of his business. Indeed, the maximum social return on his innovation is

achieved if his firm grows as rapidly as possible, for Marshall (1890), Jacobs (1985), Romer (1986), Porter (1990) and others argue that innovations typically have increasing returns to scale. The return on the innovation is therefore largest if it is applied on the largest scale feasible.

Schumpeter (1912) argues that new firms are often required as vehicles through which innovations can be generally applied across the economy. This is because those in charge of established firms have a vested interest in preserving the value of the (old) capital goods their firms own. Innovations often make past investments in property, plants and equipment obsolete. Schumpeter chose the term "creative destruction" to encapsulate this destruction of the value of old capital goods by innovators' creativity.

Schumpeter (1942), apparently influenced by the Great Depression and the apparent success of Soviet Communism and German National Socialism in the 1930s, qualified his earlier views somewhat, and argued that large established oligopolistic or monopolistic firms might instead be the best vehicles for generating and applying innovations. This is because their monopoly profits can be used to fund innovation R&D while preserving corporate cultures and other intangible assets associated with the survival of the corporate entity.

In all likelihood, both versions of creative destruction have some validity. Acs *et al.* (1997) argue that each has advantages and disadvantages. Innovation in large firms is held back because employees know that the benefits of any innovation they create accrue to the firm, not to themselves. If the innovator owns his or her own small firm, his or her property rights over the innovation are more secure. However, small firms may have difficulty obtaining financial backing because the innovators who own them may have difficulty assessing their innovations' economic viability and communicating this to potential backers. Big firms flush with cash from quasi-monopolistic markets are in better positions to fund R&D. But Betz (1997) raises another problem: the managers of large firms may feel their dominant position threatened by new technology or business practices they do not understand. Betz argues that top IBM managers delayed that firm's entrance into the personal computer business because, as mainframe computer engineers, they feared a loss of personal power if mainframes became less important to the company.

Empirically, new firms seem to be important. He *et al.* (2001) find that greater turnover in the list of a country's largest corporations is empirically associated with higher productivity growth, and thus argue that the vested interests of those in charge of established corporations must be more economically important than the assets associated with corporate survival. They conclude that productivity enhancing growth, which they associate with creative destruction, requires the emergence of new firms.

Regardless of whether creative destruction occurs via the formation of new innovative firms or via the continual R&D investment of established

firms, corporate governance now takes on a primary importance it lacked during catch up growth. Finding investments with $\pi_{ijt} = f_{ij} - r_t K_{ijt} + \eta_{ijt} > 0$ requires investing to expand the information set available to the corporate decision-makers running firm j from $\Psi_t + \Delta\Psi_t$ to $\Psi_{j,t+1}$ ($R\&D_{jt}$, $\Psi_t + \Delta\Psi_t$) where Ψ_t is the country's initial supply of knowledge, $\Delta\Psi_t$ is the now fully exhausted exogenous increase in knowledge that allowed catch up growth, and $R\&D_{jt}$ is firm j's investment in innovation. Finding quasirents is now expensive, and the quasirents depend on firm j possessing a unique knowledge advantage over other firms. Such advantages are likely to be fleeting, even when protected by patents or secrecy. Large forecast errors in η_{ijt} due to sloppy financial control and negative biases in η_{ijt} due to agency problems are very likely to leave π_{ijt} below zero.

Profitable innovation is difficult. It requires rare people of unusual ability, both to come up with innovations themselves, and to create markets for new products. Ordinary people were able to run corporations, banks and government economic ministries well during catch up growth because the path ahead was clear and well illuminated. Extraordinary people are needed in critical decision-making positions in economies growing by creative destruction. The quality of capital allocation decisions now matters at least as much as the quantity of capital available for investment. In short, corporate governance matters.

Anglo-American institutions and corporate governance

The institutional system in which the quality of corporate governance attains the greatest importance is the Anglo-American system.[4] In the Anglo-American system, innovative new firms can be financed readily – either via venture capital pools or via initial public offerings (IPOs) in equity markets. Junk bonds also allow debt market financing for these firms. This system allows entrepreneurs to quickly start and expand their own new firms. This route has been followed recently by firms such as Microsoft, Sun Computers and Intel. These companies did not exist a couple of decades ago.

The Anglo-American system also punishes the executives of poorly performing established firms. Morck *et al.* (1989) find that US CEOs are fired by their boards when their firms do poorly, and that when boards fail to act, the firms become takeover targets. Corporate takeovers are, of course, another way to remove the underperforming firm's top managers. Increasingly, executive and director pay is in the form of stock options, so that poor firm performance has immediate and personally important consequences for those responsible. Outside directors, institutional investors, and shareholder rights activists all act to expose and oust inept or dishonest top managers. All of these corporate governance mechanisms matter because, when growth by creative destruction is essential for continued prosperity, the quality of each major capital allocation decision is important.

Alternatives to the Anglo-American system

What are the alternatives? In the Anglo-American system, the leading role of the stock market comes at the expense of banks and government ministries. In principle, banks and government officials might be able to identify and finance innovative entrepreneurs as well as markets can. In practice, this is not observed. Beason and Weinstein (1996) show that Japanese government money tended to flow to the least economically viable segments of the economy, not to those with the greatest potential. This is probably because governments are properly concerned with redistributive welfare. However, this concern undermines their ability to fund creative destruction, which necessarily entails being responsible for "destruction." Morck, Nakamura and Shivdasani (2000) show that those Japanese firms most dependent on bank financing are also the most economically weak.

Romano (1993), La Porta *et al.* (1998) and others argue that Anglo-American institutions are superior to the alternatives. Nonetheless, the long-term economic success of countries like France and Germany, which rely heavily on state industrial policies and banks, respectively, for capital allocation and corporate governance oversight is undeniable. If Anglo-American institutions *per se* are not at the crux of growth by creative destruction, what is?

The functional efficiency of the stock market

The key to the Anglo-American system is the use of the stock market as a central information processing device. IPO financing and the corporate governance mechanisms listed above depend critically on stock prices accurately measuring the present value of the business activities the firm is undertaking. That is, the stock market must be informationally efficient. If stock prices are too high or too low, too much or too little money will flow into new businesses via IPOs. If stock prices rise irrationally, corporate executives are rewarded, and if stock prices fall irrationally, corporate executives are punished. The Anglo-American system then fails to deliver economically efficient corporate governance.

Defining functional efficiency

Tobin (1982) refers to the stock market as "functionally efficient" if it delivers economically efficient corporate governance. Durnev *et al.* (2003) call the hypothesis that stock price fluctuations cause economically efficient corporate governance the "functional form of the efficient markets hypothesis."

Some critics of stock markets, most notably Porter (1990), argue that stock prices are often "wrong" because of a shareholder myopia effect. Stock prices are said to rise and fall with short-term earnings rather than

with the long-term prospects of the firm, and this causes an inordinate concern in board rooms with the short-term and a neglect of long-term investments. This contention is flatly false. McConnell and Muscarrella (1985) and Chan *et al.* (1990) find that US firms' share prices rise sharply when they announce increases to long-term investment by raising either capital spending or R&D spending. Hall (1993) finds US firms' stock market values to be elevated in proportion to their R&D spending. In short, US shareholders rush to buy the stocks of firms that undertake long-term investments. Shareholders clearly like it when firms take a more long-term perspective, and rush to buy the stock of firms that do so.

Other critics of stock markets like to emphasize the market frenzies and crashes that periodically afflict stock markets as economies adjust to the sorts of economic dislocations Kindleberger (1978) studies. This critique deserves more respect. These events clearly occur, and have certainly been associated with economic instability. It seems plausible that stock market manias and crashes reflect deviations from rationality of the sort Kindleberger posits.

However, the issue at hand is not that stock markets are perfectly efficient, but that they are better mechanisms for financing growth through creative destruction that the alternatives. The stock market need not be perfectly functionally efficient. It must only be more functionally efficient than the alternatives. It is useful in this context to consider different forms of functional efficiency. Our original definition, given above, is quite strong, and is unlikely to be true. We therefore refer to it as:

> THE STRONG FUNCTIONAL FORM OF THE EFFICIENT MARKETS HYPOTHESIS: Stock price fluctuations cause economically efficient capital allocation.

Restatements of this more likely to fit the real world are:

> THE WEAK FUNCTIONAL FORM OF THE EFFICIENT MARKETS HYPOTHESIS: The stock market is *at least as good* at delivering economically efficient capital allocation as alternative institutional arrangements.

Finally, there is an alternative restatement, which we dub:

> THE SEMI-STRONG FUNCTIONAL FORM OF THE EFFICIENT MARKETS HYPOTHESIS: The stock market is *better* at delivering economically efficient capital allocation as alternative institutional arrangements.

The precise definitions of "at least as good" and "better" are best left vague at this point, although a definition having to do with the sizes of Harberger triangles lies behind these words.

The curious characteristics of Japanese stock prices

Financial economists often find it convenient to partition the variation in firms' stock returns into systematic variation and firm-specific variation. Systematic variation is variation common to all stocks in the economy, while firm-specific variation is variation unique to the individual firm's stock. This partition is usually operationalized with an "asset pricing model." The simplest asset pricing model is the market model, which posits that firm *j*'s stock return at time *t*, denoted r_{jt} is given by

$$r_{jt} = \alpha_j + \beta_j r_{mt} + \varepsilon_{jt} \tag{9}$$

where r_{mt} is the return of the market, the parameters α_j and β_j are fixed for firm *j*, and ε_{jt} is a residual. The variance of r_{jt} then consists of

$$\text{var}(r_{jt}) = \beta_j^2 \text{var}(r_{mt}) + \text{var}(\varepsilon_{jt}) \tag{10}$$

We refer to the first term of the right-hand side of this equality as the systematic variation in stock *j*'s return, denoted $\sigma_{mj}^2 = \beta_j^2 \text{var}(r_{mt})$. We call the second term the firm-specific variation in stock *j*'s return, and denote this $\sigma_{\varepsilon j}^2 = \text{var}(\varepsilon_{jt})$.

The fraction of the variation in r_{jt} that is systematic is the R^2 of (11) estimated as an ordinary least squares linear regression, for

$$R_j^2 = \frac{\sigma_{mj}^2}{\sigma_{mj}^2 + \sigma_{\varepsilon j}^2} \tag{11}$$

Morck, Yeung and Yu (2000) perform this variance decomposition for a large number of stocks in a large cross section of countries. Their basic findings are illustrated in Figure 3.6. Almost all the variation in US stocks is firm-specific, and the same is true in almost all other advanced industrial countries. In contrast, a very large fraction of stock return variation in emerging economies is systematic variation.

Indeed, ranking countries by market model R^2 and by *per capita* GDP give very similar orderings with one prominent exception: Japan. Although Japan has the *per capita* GDP of a developed economy, its stock prices resemble those in less developed country stock markets. Japan is marked in black in Figure 3.6 to distinguish it from all other countries, which are shown in gray.

Morck, Yeung and Yu (2000) show that their finding is clearly not an artifact of country size, stock market size, macroeconomic volatility, economy diversification, or even the systematic component of firm-level earnings variation. This is because *per capita* GDP continues to explain their average return decomposition, with higher *per capita* GDP linked to less synchronous stock returns, after exhaustively controlling for these and

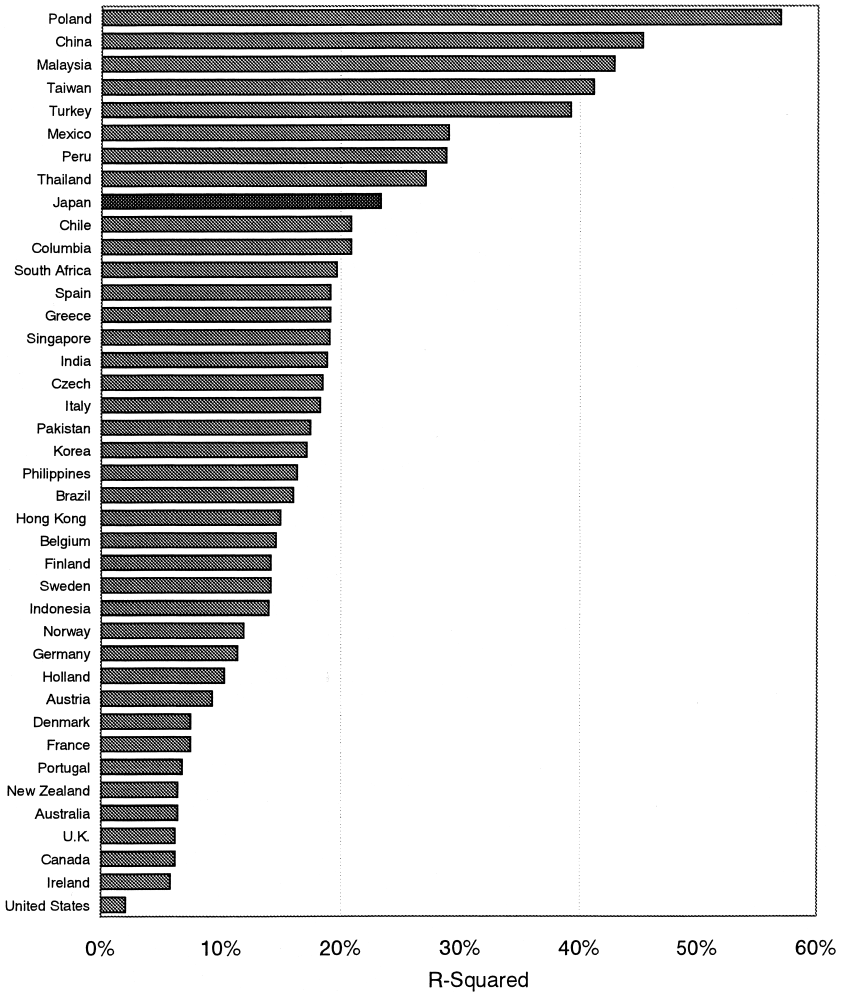

Figure 3.6 Variance decomposition of Japanese stock returns. Systematic variation as a fraction of total variation for the average Japanese stock in 1995.

other effects. They do, however, find that measures of the quality of institutions, such as government corruption, respect for the rule of law, efficiency of the judicial system and the like, explain returns variation decomposition better than *per capita* GDP, with low corruption associated. They interpret their result as indicating that low corruption is associated with less synchronous stock returns.

Stock price synchronicity and functional efficiency

Wurgler (2000) measures the tendency of capital to flow toward higher value added industries in a cross-section of countries, and interprets a high tendency as indicative of high quality capital budgeting. He finds that countries with more developed financial markets allocate capital more efficiently. Intriguingly, using the market model R^2 measure of Morck, Yeung and Yu (2000), he also finds that capital is allocated more efficiently in countries whose stock prices more asynchronously.

Durnev *et al.* (2003) estimate marginal q ratios, as defined in equation 7 directly for US industries, and correlate them with synchronicity, measured as in equation 11. They find that marginal q ratios tend to cluster near one in industries where stocks' R^2s are low, and to spread out both above and below one in industries where R^2s are high. Their findings are summarized in Figures 3.7 and 3.8.

It follows from Wurgler (2000) and Durnev *et al.* (2003) that more asynchronous stock returns are associated with a more functionally efficient stock market. In short, the worse the fit of the asset pricing model, the more functionally efficient the stock market.

Why is this apparently paradoxical outcome economically sensible? Morck, Yeung and Yu (2000) and Durnev *et al.* (2003) argue that a functionally efficient stock market must distinguish well run firms from poorly run firms so as to direct capital to the former rather than the latter, so

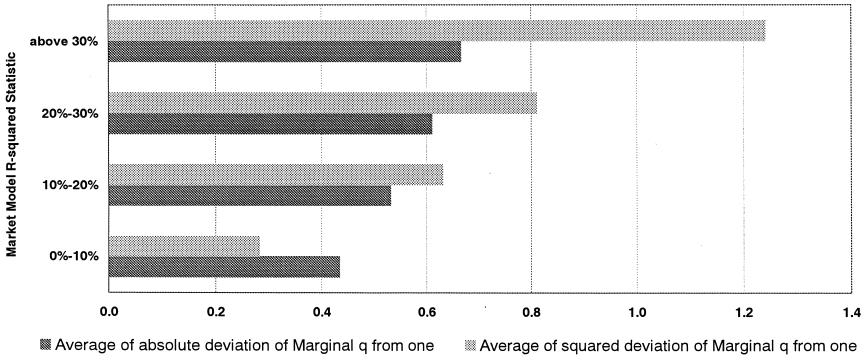

Figure 3.7 The quality of capital budgeting across US industries, as measured by the deviation of marginal Tobin's Q from one with industries grouped by industry-average firm-level market model R^2. A low R^2 indicates high firm-specific return variation relative to market and industry-related variation.

Source: Durnev *et al.* (2001).

Note
This figure presents the relationship between the quality of capital budgeting variables ($(\dot{q}-1)^2$ and $|\dot{q}-1|$) and relative firm-specific stock return variation. The length of a bar is equal to the group average value of the corresponding variable.

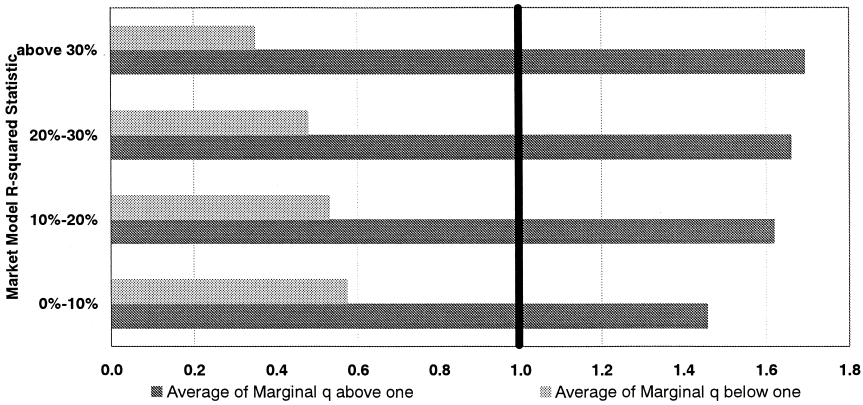

Figure 3.8 The quality of capital budgeting across US industries, as measured by the deviation of marginal Tobin's Q from one with industries grouped by industry-average firm-level market model R^2. A low R^2 indicates high firm-specific return variation relative to market and industry-related variation.

Source: Durnev *et al.* (2001).

Note
This figure presents the relationship between the quality of capital budgeting variables ($(\dot{q}-1)^2$ and $|\dot{q}-1|$) and relative firm-specific stock return variation. The length of a bar is equal to the proportion of corresponding variable significantly below or above 1 at 10% level.

that corporate governance mechanisms can reward the managers of the former and punish or oust the managers of the latter, and so that managers can reassess their decisions in light of shareholders' opinions. All of this requires that the stock prices of some firms rise as those of other firms fall. If stocks tend to rise and fall en masse, the stock market provides scant help in allocating capital to one firm rather than another.

But this begs the question of why stock returns are less synchronous in some countries than others, after controlling for fundamentals such as synchronicity, macroeconomic instability, etc. French and Roll (1986) and Roll (1988) find that firm-specific information enters stock prices primarily via the trades of informed private investors. This leads Morck, Yeung and Yu (2000) to speculate that traders possessing information about specific firms are rarer in some countries than others. They propose that more widespread corruption, less respect for the rule of law, and less efficient judicial systems make gathering and processing information about individual companies less remunerative. This environment renders corporate information releases less trustworthy, raising the cost of estimating fundamental values. This raises the costs of firm-specific stock arbitrage. It also breaks the link between earnings and dividends, so that even

if investors could predict the prospects of individual firms, that information might not help in predicting stock prices. This lowers the return of firm-specific stock arbitrage. Finally, an absence of informed trading leaves noise traders free to move prices. De Long *et al.* (1990) show that a noise trader dominated stock market should exhibit heightened systematic returns variation relative to systematic fundamentals variation. This is because noise traders are prone to herding, and tend to either buy en masse or sell en masse. Thus, more information-laden stock prices move more asynchronously.

The high degree of synchronicity in Japanese stock returns can therefore be taken as a sign of "information lite" stock prices. To the extent that Japanese capital allocation depends on stock price movements, this is indicative of poor quality capital allocation. Even if capital budgeting decisions in Japan have been little influenced by stock prices in the past, during Japan's catch up growth, they may become more important in the future. Certainly, if Japan begins to rely more on its stock market and less on banks and governments for capital allocation, the information content of its stock prices is important.

Policy implications for Japan

We do not necessarily propose that Japan adopt Anglo-American institutions. Romano (1993) rightly points out that a country cannot pick and choose particular institutional arrangements from other countries, for laws, regulations, and customs are all interdependent. One cannot adopt American corporate governance laws without a stock market, legal system, disclosure rules, and general corporate governance behavior code that match those of the US. As many emerging economies are discovering, finely crafted laws and regulations quickly become dead letters without a supportive environment. Instead, we cautiously point out what we think to be the key problems facing Japan now.

First, Japan's institutions experienced stress as the country approached the knowledge frontier, and Japan's banks and government responded by artificially depressing the cost of capital for many years to prolong catch up growth. Much of this growth was probably value destroying, with negative NPVs and negative economic profits when evaluated at true costs of capital. This short-term fix leaves Japan's macroeconomy with pervasive excess capacity problems. Since this excess capacity is extensive and was probably never economically justifiable, it is unlikely that conventional macroeconomic stimuli can reduce it greatly in the short or even medium terms.

Second, because Japan's great banking houses financed much of this excess capacity, they are also severely overextended. This leaves them unable to move into venture capital funds, high tech start-ups, or other vehicles used elsewhere to finance creative destruction.

Third, since Japan has clearly converged with the world's most advanced industrial economies, further catch-up growth through capital accumulation is not possible. Pushing interest rates down is not a solution, and is likely to cause more trouble in the future as the economy must absorb even more uneconomic excess capacity.

Fourth, Japan needs more informed capital allocation decisions in the future. A more functionally efficient stock market is one way to bring this about. Figure 3.6 shows that the most asynchronous stock prices are to be found in the United States. The next most asynchronous stock returns are those of Ireland, followed by those of Canada, the United Kingdom, Australia and New Zealand. All six of these low R^2 economies have legal traditions based on British Common Law and use stock markets to allocate capital. However, many countries without Anglo-American institutions, such as France, Denmark, Austria, and Holland also have asynchronous stock prices and consequently, can be expected to have relatively high quality capital allocation decisions. Morck, Yeung and Yu (2000) show that shareholder rights laws, combined with a general climate of honesty in government and the judiciary, seem sufficient to induce the information gathering and informed trading that makes stock markets more functionally efficient.

Finally, Japan must prepare itself for creative destruction. Regardless of whether it moves closer to Anglo-American institutions or not, corporate governance must become a central focus of institutions throughout the Japanese economy. In the past, the qualifications for being a top corporate executive sensibly included the skills needed to raise capital from banks or the government. Networking, social sophistication and other such skills were paramount. Being able to tell a good investment from a bad one was rightly seen as less important. Being innovative was, again rightly, seen as irrelevant.

Now, the situation has inverted, and top executives critically need to be able to tell good investments from bad ones, to be innovative, and to encourage innovation by others. These two skill sets are radically different. This would seem to imply that Japan desperately needs an extensive turnover of corporate leaders, so that people with the right skills are in charge of capital allocation. If the government and the banks are to retain their key roles in capital allocation, the same applies to them. Unfortunately, the easily available quasirents of catch-up growth let Japan's corporations, banks, and government become inflexible and rife with entrenched, but unproductive, layers of management. The elite of Japan's corporate world are probably best regarded as entrenched vested interests, for instances of CEOs being fired notwithstanding, the positions of most top executives in Japan are very secure by world standards. Hostile takeovers are unknown, institutional investors are quiescent, boards are consensus-oriented, and shareholder rights are weak.

The current tendency to remove intercorporate cross holdings is a start. But this is only a single step. The ultimate goal must be new corpor-

ate, banking and government decision-makers with new skills appropriate to creative destruction. Some means must be found to remove these entrenched past leaders. Adopting more of an Anglo-American institutional framework is one possible way of doing this. But Japanese ingenuity may construct another.

Notes

1 The G7 countries are Canada, France, Germany, Japan, Italy, the United States and the United Kingdom. We drop Germany because, like Japan, it had to rebuild its economy after the war and because the unification of East and West Germany affects German data during this period. Data are from the World Bank.
2 An alternative definition of increased knowledge is the replacement of the firm's old investment opportunity schedule of cash flow perpetuities generated by possible investment projects with a new schedule. Some of the firm's old projects might then become unviable as new projects become viable. This situation would require us to consider disinvestment and downsizing for some firms, and is clearly a more realistic definition of technological development. However, for the moment, we restrict ourselves to this more limited definition.
3 Kindleberger attributes this model to Minsky (1972), who attributes it to Keynes (1935). The statement of it by Kindleberger is the clearest statement, and is also the most carefully supported with historical documentation.
4 See La Porta *et al.* (1998) for a detailed comparison of corporate governance practices in different countries.

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4 Japanese securities firms, business corporations and financial institutions

A comparison of their investing behavior

Kenneth A. Kim and John R. Nofsinger

Introduction

There is increasing empirical evidence that institutional investors engage in feedback trading strategies. For example, Nofsinger and Sias (1999) find a positive relationship between the firm's annual ownership-change by institutional investors and their annual holding-period stock returns. Based on this observation, they contend that institutional investor herding impacts stock prices. Further, by examining the year prior to institutional buy-herding, they find that institutions increase their stakes in firms that had prior positive abnormal returns. When examining the year after herding, they find that these same firms continue to experience positive abnormal returns. The former finding suggests that institutions are positive feedback (or momentum) traders and the latter finding suggests that institutional herding is stabilizing.

In a recent study by Kim and Nofsinger (2002), they find that Japanese institutional investors herd, and that their herding is positively related to contemporaneous stock returns. While their evidence is consistent with US evidence, they find weak evidence that Japanese institutional investors feedback trade. In this study, we examine subgroups of Japanese institutional investors to identify and compare their investing, herding, and feedback trading strategies. Prior studies examine aggregate institutional ownership (Nofsinger and Sias 1999 for the US and Kim and Nofsinger 2002 for Japan) or one type of institutional investor like US mutual funds (Wermers 1999). In our study, we differentiate Japanese institutional shareholders into one of three types: securities firms, business corporations, and financial firms. We find that these different types of institutions demonstrate some similar, but usually very different, investment strategies. For example, the three types of institutions tend to own different firms and trade in different firms. Second, we also find that all three types of owners exhibit herding tendencies, and that their herding impacts stock prices. Finally, we note that the three types of institutional investors

exhibit different types of feedback-trading behavior. Securities firms exhibit negative feedback-trading, business corporations exhibit no feedback-trading, and financial firms exhibit positive feedback-trading. Overall, by differentiating by the type of institutional shareholder, our findings provide important new insights into institutional herding and feedback trading.

The next section reviews the existing herding literature and differentiates this study. After that we describe our data and methods. The herding and feedback-trading tests are conducted in the next section and the last section offers a summary and a conclusion.

The prior evidence on herding and feedback trading

US institutional investors are positive feedback traders. For example, Nofsinger and Sias (1999) study annual firm level ownership and find that the general category of institutions purchased stocks that performed well during the prior year, and that they sold stocks that did poorly during the prior year. Their test was conducted using aggregate institutional ownership. Other studies have investigated one type of US institutional investor. For example, tests using equity mutual funds also find positive feedback trading characteristics on a quarterly basis (Grinblatt, Titman and Wermers 1995; and Wermers 1999). Lakonishok, Shliefer and Vishny (1992) study the quarterly holdings of pension fund managers and conclude that their trading is only weakly associated with feedback trading and herding.

The relationship between US institutions and the firms they own may be different than the relationship between Japanese institutions and the firms they own (see Prowse 1990, 1992). Overall, Japanese institutions have closer relationships with firms in which they own shares. Kim and Nofsinger (2002) suggest that this relationship has two important outcomes. First, this closer relationship allows institutional investors access to better information. Second, the teamwork relationship reduces their ability to use the information in trading. Using annual firm level data and aggregate institutional ownership, they find weak evidence that Japanese institutions are negative feedback traders and strong evidence that herding is associated with stock price changes.

These extant studies examine either aggregate institutional ownership or one type of institution (mutual funds or pension funds). Our study extends the literature in an important way by comparing three types of institutional investors. That is, not all types of institutions trade in the same manner. We are aware of one other study that compares different types of Japanese institutional investors. Kamesaka, Nofsinger and Kawakita (2003) use aggregate weekly investment flow in and out of the Japanese stock market to examine how successfully each investor type times the market. Our paper focuses on herding and feedback trading. The next section discusses the data and empirical methods used in our study.

Data and methods

Our monthly stock returns, annual institutional ownership and firm capitalization data for Japanese firms come from the Pacific-Basin Capital Markets (PACAP) Research Center. For each firm, annual ownership data is reported at the end of each fiscal year (usually March 31) for the years 1975–1997. The sample of firms with ownership data, monthly returns and market-capitalization varies from 1,232 (in 1975) to 1,669 (in 1997). The total sample comprises 31,002 firm years of data. The abnormal returns reported in this study are capitalization-adjusted returns. To compute abnormal returns, we sort each firm (each year) into ten portfolios by their beginning of year market-capitalization. The abnormal return for each month during the year is the firm's return, less the return on the capitalization portfolio for which the firm belongs. This procedure controls for the size bias in returns.

We examine the ownership of three types of institution, which are securities firms, business corporations, and financial institutions. The other primary shareholders in Japan are individuals, foreign investors, and the government. Panel A of Table 4.1 shows the mean level of ownership for each of the three types of institutional investors. On average, securities firms own 1.8 percent of each firm. This is small in relation to the 30.6 percent owned by business corporations and the 32 percent owned by financial firms. The ownership level among firms appears to be highly varied. The high standard deviation of ownership and extreme levels in the 10th and 90th percentile levels of ownership suggests that these

Table 4.1 Institutional ownership

Panel A: Sample statistics

Type of investor	*Mean ownership (%)*	*Std. deviation (%)*	*10th percentile (%)*	*90th percentile (%)*
Securities firms	1.82	2.46	0.13	4.53
Corporations	30.57	18.51	9.10	57.66
Financial firms	32.04	15.88	10.78	53.38

Panel B: Correlation coefficients*

	Securities firms	*Corporations*	*Financial firms*
Securities firms	1		
Corporations	−0.113	1	
Financial firms	0.044	−0.626	1

Notes
N = 31,002.
*All correlation coefficient estimates are significantly different from zero at the 1 percent level.

institutions are pursuing an active investment strategy. That is, a passive strategy of owning the market portfolio would require owning the same fraction of ownership in each firm. However, this does not describe the large variation in ownership levels among firms. For example, financial firms own an average of 32 percent of each firm, but the standard deviation of ownership level is 15.9 percent and the 10th and 90th percentiles are 10.8 percent and 53.4 percent, respectively.

We compare the ownership levels of the three institutional types in Panel B of Table 4.1. Specifically, we report the correlation coefficients among the ownership levels of securities firms, business corporations, and financial firms. The ownership level correlation coefficient between securities firms and business corporations is −0.113. This indicates that securities firms and corporations tend to own slightly different firms. Although the correlation of 0.044 between securities firms and financial firms is statistically significant, the low magnitude suggests that these institutions have different investment strategies. Finally, the correlation of −0.626 between corporations and financial firms suggests that they own nearly opposite firms. That is, a firm that is largely owned by financial firms will have very little ownership by business corporations.

Herding and feedback trading tests

Several herding models posit that herding and positive feedback trading is the result of a group of investors trading on the same (or correlated) information signals (see Froot, Scharfstein and Stein 1992; Bihkchandani, Hirshleifer and Welch 1992; and Hirshleifer, Subrahmanyam and Titman 1994). Such herding can move prices toward equilibrium values and thus not be destabilizing to the market. To examine the impact of herding, we study the relationship between annual changes in institutional ownership and their contemporaneous abnormal returns.

The change in ownership for each institutional investor type from the beginning of the herding year to the end of the herding year is reported in Panel A of Table 4.2. The mean annual change in ownership by securities firms is −0.01 percent. The mean change for corporations and financial firms are −0.04 percent and 0.43 percent, respectively. Over the 23 year sample period, firm ownership by securities firms and financial firms slightly decreased, whilst average ownership by financial firms increased nearly 10 percent from 1975 to 1997. Our first indication of institutional herding is shown by the relatively high standard deviation of ownership changes. The standard deviation estimates of 2–3 percent are large compared to the mean changes. This shows that some of the firms experienced large changes in ownership during the year. This is borne out in the 10th and 90th percentile ownership changes. For example, business corporation ownership changed −2.4 percent and 3.7 percent in the 10th and 90th percentile, respectively.

Table 4.2 Annual changes in institutional ownership

Panel A: Sample statistics

Type of investor	*Mean change (%)*	*Std. deviation (%)*	*10th percentile (%)*	*90th percentile (%)*
Securities firms	−0.01	1.86	−1.39	1.32
Corporations	−0.04	3.29	−2.25	1.96
Financial firms	0.43	2.95	−2.43	3.70

Panel B: Correlation coefficients of annual changes*

	Securities firms	*Corporations*	*Financial firms*
Securities firms	1		
Corporations	−0.114	1	
Financial firms	−0.055	−0.203	1

Notes
N = 30,774.
*All correlation coefficient estimates are significantly different from zero at the 1 percent level.

Panel B of Table 4.2 investigates whether these institutions are herding in the same firms. The correlation coefficient between the change in securities firms' ownership and the change in corporations' ownership is −0.114. The negative estimate indicates that securities firms and business corporations herd in different firms. This is also the case between securities firms and financial firms (correlation = −0.055) and between business corporations and financial firms (correlation = −0.203). These findings indicate that different institutions tend to herd in different firms. This is not too surprising because these three types of institution tend to own different firms.

We test for the impact of herding by comparing the change in annual institutional ownership for each firm with the contemporaneous annual abnormal return for the firm. First, consider the relationship between ownership changes and abnormal return for herding. An increase in a firm's institutional ownership during a year in which the firm experienced a positive abnormal return indicates that institutional buy-herding positively impacts prices (Nofsinger and Sias 1999). Alternatively, a decrease in ownership during a year of negative abnormal returns indicates that sell-herding negatively impacts prices. Notice that a positive relation between ownership change and abnormal return suggests the presence of institutional herding in both buying and selling behavior. We use correlation coefficients to test the relationship between ownership changes and abnormal returns. A positive correlation indicates that herding impacts stock prices.

The second column in Table 4.3 shows the correlation coefficients between annual ownership changes and the contemporaneous abnormal returns. Note that the estimate between ownership change and herding year abnormal return for all three of the institutional investors are positive and significant at the 1 percent level. This suggests that the herding (buying and selling) of all three investor groups moves stock prices in the same direction. This evidence suggests that all three investor types exhibit herding tendencies, and that their impact is similar.

Finally, we study feedback-trading behavior by examining the relation between the abnormal returns prior to the herding period ($t=-1$) and the ownership change during the herding period ($t=0$). Traders who increase ownership after high returns and decrease ownership after low returns are considered to be positive feedback (or momentum) traders (see Jegadeesh and Titman 1993; Grinblatt, Titman and Wermers 1995). Alternatively, traders who increase ownership after low returns are considered to be negative feedback (or contrarian) traders (see Lakonishok, Shleifer and Vishny 1994; Nofsinger and Sias 1999). A positive (negative) relation between herding (i.e. the ownership change) and the prior year's return is defined as positive (negative) feedback trading (see Grinblatt, Titman and Wermers 1995). To determine the existence of feedback trading, and whether it is momentum or contrarian based, we compute the correlation coefficients between the change in ownership of the firm and the firm's abnormal return during the prior year. These results are reported in the last column of Table 4.3.

The correlation coefficient between securities firm ownership changes and those stock's prior year's abnormal return is a significant −0.085. The negative estimate indicates that securities firms are negative feedback, or contrarian, traders. The correlation coefficient is not significant for business corporations, indicating that they are neither positive, nor negative, feedback traders. Finally, the estimate for financial firms is a significant 0.073. The positive estimate suggests that financial firms are positive feedback, or momentum, traders.

Table 4.3 Correlation coefficients of annual returns with ownership changes

Ownership change for	*Abnormal return* (t = *0)*	*Abnormal return* (t = *–1)*
Securities firms	0.195*	−0.085*
Corporations	0.025*	0.004
Financial firms	0.119*	0.073*

Notes
N=30,774.
*Significant at the 1 percent level.
Abnormal return is an annual capitalization-adjusted return where $t=0$ denotes the herding year and $t=-1$ denotes the year prior to the herding year.

Summary

Prior papers on institutional herding and feedback trading usually characterize institutional investors as a single investor type. This implicitly assumes that all institutional shareholders are the same. In this paper, we study Japanese institutional shareholders. More importantly, we sub-divide the general class of Japanese institutional investors into three groups: securities firms, business corporations, and financial firms. With regard to their investing behavior, we find some similarities among the three different types of institutions, but we mostly observe differences.

We find that ownership levels of firms are quite varied among investor types. In addition, the cross-sectional ownership level among firms is quite different, which suggests that institutions employ some active investment strategy. However, the investment strategies of these three types of investors are also different. In particular, different types of institutions tend to herd in different firms. However, the herding appears to impact stock prices in a similar manner, regardless of which investor type is trading. Specifically, whenever there are increases (decreases) in the ownership of any institutional investor type, we also see contemporaneous stock price increases (decreases). With regard to feedback trading strategies, securities firms' ownership changes show a negative feedback trading pattern while financial firms' ownership changes show a positive feedback trading pattern. Trading by business corporations is unrelated to prior returns, and thus does not exhibit any kind of feedback trading.

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5 Financial deregulations, weakness of market discipline and market development

Japan's experience

Mitsuhiro Fukao

Introduction and summary of the paper

As a result of a prolonged weak economy and the declining asset prices in the 1990s, the Japanese financial sector faced an enormous bad loan problem. When a few financial institutions failed in 1996, Deposit Insurance Law was amended to allow the Deposit Insurance Corporation (DIC) to fully protect all deposits until March 2001. In spite of the full protection of all the deposits beyond the limit of normal coverage, public concern over the soundness of the financial system became extremely intense after the successive failures of Sanyo Securities, Hokkaido Takushoku Bank and Yamaichi Securities in late 1997.

Depositors and investors of bank debentures issued by long-term credit banks imposed some market discipline. Deposits flew out of banks with low credit ratings because depositors feared that they would not be able to withdraw deposits quickly if their banks were closed. LTCB and Nippon Credit Bank faced a rapid early redemption of their debentures because debentures are not explicitly covered by the deposit insurance system. Stock prices of weaker banks fell sharply and triggered mild bank runs in some cases.

In view of this severe problem, the government and politicians finally moved. The government put up ¥30 trillion of public money for the protection of depositors, the injection of capital for weak banks and the resolution of failed financial institutions. Initial capital injections of ¥1.8 trillion to major banks in the spring of 1998 were too small relative to the size of the problem. In the summer of 1998, the stock price of LTCB fell sharply when Sumitomo Trust and Banking effectively refused the merger with LTCB. In October 1998, just before the LTCB went bankrupt, the Financial Revitalization Act and Bank Recapitalization Act were enacted in a disorderly atmosphere.

Under the Bank Recapitalization Act, ¥7.5 trillion of capital was injected to 15 major banks at the end of March 1999. Unlike the former

attempt, this program was much better designed, succeeding in eliminating the persistent Japan premium that started in late 1997. The gradual recovery of the Japanese economy and the announcements of big mergers among major banks have also contributed to calm public concern over the financial system.

Although banks issued a large amount of preferred shares to the government, diluting the ownership of existing shareholders, there was no public outcry from bank shareholders. In spite of the near collapse of major banks, all the shareholder meetings that approved the issuance of preferred shares to the government were generally calm. No major shareholders objected to the deal. This is because the management of major banks are well protected by extensive cross shareholdings with friendly life-insurance companies and industrial companies. While healthy industrial companies sold badly performing bank shares, weaker companies bought bank shares so as to be protected by banks. The corporate governance structure of major Japanese life-insurance companies is weak because they are organized as mutual companies where representative policyholders in policyholders meetings are effectively chosen by the management themselves.

Japan still faces a number of problems in its financial system. First, the profit margin is too small to cover the increased default risk after the crush of the bubble. Many firms have not overcome their debt overhang and are surviving with the help of their banks. Banks have not succeeded in increasing their lending margin under a strong competitive pressure from government-backed financial institutions. They are also facing a strong pressure from the FSA to increase lending to small and medium sized firms. This is because banks were obliged to increase such lending as a condition of capital injection by the government in 1999. As a result, banks cannot raise capital by promising a good return to investors. In order to allow the capital market to function as the source of recapitalization of the Japanese banking sector, it is necessary to remove market distortions created by the government-backed financial institutions and the FSA requirements on new lending to small and medium sized companies. Without strong market discipline on banks from shareholders, we may not be able to overcome the bad loan problem.

Second, banks still have excessive stock investment. Although banks show ¥30.2 trillion of capital on their balance sheet at the end of March 2002, this figure is inflated with ¥10.7 trillion of deferred tax asset (present value of future tax shelter) and ¥7.2 trillion of capital injection by the government. Since banks pledge that they will repay the injected capital, the remaining net capital is only ¥12.3 trillion. This permanent capital is small compared with their stock portfolio of ¥31.3 trillion and ¥67.8 trillion problem loans. It is necessary to unwind cross-holding of shares between banks and other companies that had also weakened the market discipline on entrenched management.

Third, we still have to remove the government guarantee of most banking sector liabilities. The government decided to postpone the removal of full protection of payment deposits at the end of 2002. This measure has weakened the market discipline on banks. As soon as we can stabilize the financial system, we have to introduce a risk-adjusted deposit insurance premium so as to strengthen market discipline on banks. Here, we also take account of the existence of the huge postal saving system that is fully guaranteed by the government. In order to remove market distortion by the postal saving system, we have to privatize the system to have a level playing field among deposit-taking financial institutions.

Finally, we have to stabilize the life insurance sector, exemplified by the failures of Chiyoda Life and Kyoei Life in 2000. Life insurance companies promised high minimum returns on their long-lasting life insurance and annuity policies in the 1980s and early 1990s. Since they did not match the duration of their assets and liabilities, they faced an enormous negative yield gap when Japan experienced very low nominal interest rates in the late 1990s. Life insurance policies are an important savings instrument in Japan and this sector controls about ¥160 trillion of asset. Moreover, banks provide subordinated credit and surplus notes to mutual life insurance companies amounting to ¥2.3 trillion at the end of March 2000. On the other hand, life-insurance companies provide ¥6.7 trillion of subordinated credit to banks and own ¥7.7 trillion of bank stocks. Given this double gearing between life insurance companies and banks, the systemic risk of the Japanese financial system remains high and the capital market cannot provide adequate discipline for the management of banks.

The real estate bubble and financial crisis

In this section, we briefly review the process of the asset price bubble and the development of the financial crisis in the 1990s.

The origin of the problem

In order to examine the origin of the Japanese financial problems, we briefly review the magnitude of the Japanese asset price bubble in the 1980s. The market value of the Tokyo Stock Exchange 1st section as a ratio to nominal GDP had stayed between the 20 to 40 percent range from the early 1950s to the early 1980s. However, the stock prices started to rise in the mid-1980s and reached 140 percent by the end of 1989. After the crash of the bubble, this ratio fell to about the 50 to 80 percent range. In relation to nominal GDP, the residential land price almost doubled in the second half of 1980s and the commercial land price tripled in the same period. After the bubble, the fall of the commercial land price index is extremely sharp, falling to less than 20 percent of the peak level relative to nominal GDP.

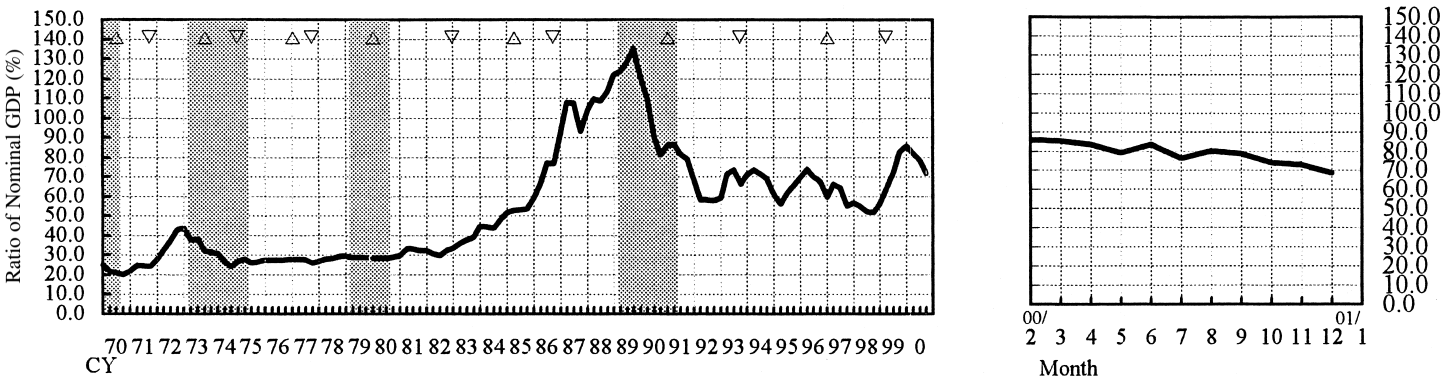

Figure 5.1 Total market value of stocks on the Tokyo Stock Exchange 1st section.

Source: Bank of Japan CD-ROM, 2000.

Notes
1 Quarterly average of end-of-month.
2 Data until 79/4Q = 68SNA basis, data from 80/1Q = 93SNA basis.

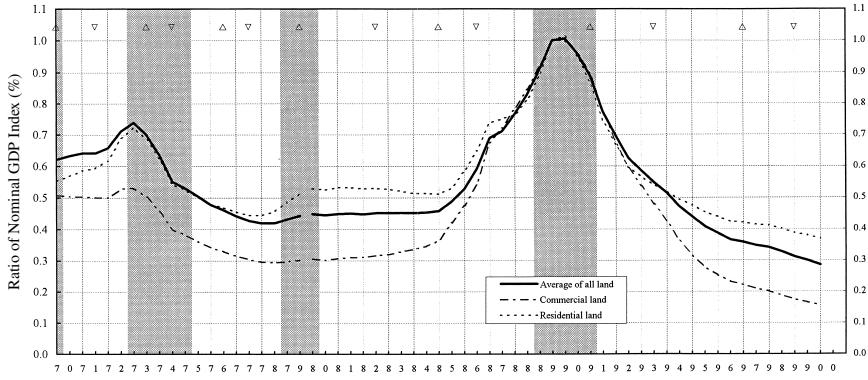

Figure 5.2 Land price indexes of urban areas.

Source: Bank of Japan CD-ROM, 2000.

Notes

1 Land price indexes or urban areas (six large cities, second half of fiscal 1989 <end Mar. 1990> = 100)/Nominal GDP index (second half of fiscal 1989 = 100).

2 Data until second half of fiscal 1979 = 68SNA basis. Data from first half of fiscal 1980 = 93SNA basis.

The asset price bubble was created by the following three factors; loose monetary policy, tax distortions, and financial deregulations.[1] In countries where these three factors were in place, asset price inflation was often observed. In this respect, the Japanese case was not a singular phenomenon. However, the magnitude of the asset price bubble in Japan was enormous and the impact of its collapse was extremely severe.

Easy monetary policy

Japanese monetary policy in the late 1980s was clearly too loose. Policy makers put too much weight on stabilizing the appreciating yen and too little weight on stabilizing the asset price inflation and the overheating economy. The Bank of Japan tried to tighten monetary policy in late 1987 so as to counter the overheating economy and rising asset prices. However, the sharp fall in stock prices on Black Monday in the United States in October prevented this move. The Bank did not raise its discount rate until May 1989, and failed to stop the asset price inflation at an early stage. The stock prices defied the intentions of the Bank of Japan and it continued to rise until the end of 1989. The land prices hit a peak in early 1990. If the Bank had acted in late 1987 or early 1988, it could have alleviated the severity of asset price deflation in the 1990s.

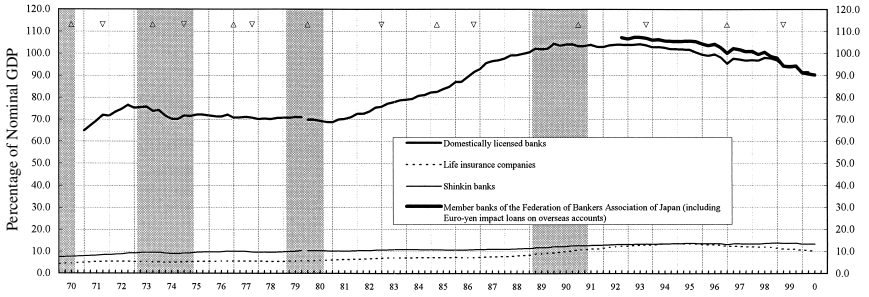

Figure 5.3 Loans and discounts outstanding by type of financial institutions.

Source: Bank of Japan CD-ROM, 2000.

Notes

1 Domestically licensed banks: banking accounts of domestically licensed banks + trust accounts of domestically licensed banks. Prior to 77/1Q, banking accounts of member banks of the Federation of Bankers Association of Japan are banking accounts of former member banks of the Federation of Bankers Association of Japan + accounts of sougo banks. Prior to 93/3Q, banking accounts of member banks of the Federation of Bankers Association of Japan (domestic accounts) + trust accounts of member banks of the Federation of Bankers Association of Japan.
2 Prior to 91/4Q, 27 companies basis; from 92/1Q, all insurance companies basis; Source: Total Life Insurance Association of Japan.
3 Domestically licensed banks, Life insurance companies and Shinkin banks = data until 79/4Q = 68SNA basis, data from 80/1Q = 93SNA basis.

Tax distortions

The Japanese tax system favored debt financed real estate investment until the end of the bubble. Since tax distortions on real estate investment are extensive, only major factors are illustrated.

1 The marginal rate of inheritance tax has been very high in Japan. It was 75 percent over ¥500 million until 1988 and it is still 70 percent over ¥2 billion. However, the evaluation of land for taxation used to be about one half of the market value and the debt was evaluated at its face value during the bubble period. As a result, wealthy individuals borrowed money to buy land so as to reduce inheritance tax.
2 Capital gain on land is not taxed until the time of its sale and the interest rate payments can be deducted from taxable income for companies and for those individuals who are investing in condominiums and offices. Moreover, the effective property tax rate on land was very low, about 0.1 percent of the market value, until the early 1990s. As a result, a large number of real estate investments were carried out for tax planning purposes.

Financial deregulations

The financial system in Japan was liberalized very gradually. Driving forces behind this liberalization process were the massive issuance of government bonds in the late 1970s and the increasing internationalization of financial markets. Ceilings on bank deposit interest rates were liberalized gradually from large-denomination to smaller ones from 1985 to 1994. Restrictions on the issuance of corporate bonds were gradually liberalized during the 1980s. As a result, large listed companies, which are traditional customers of Japanese banks, gradually shifted their funding from banks to the capital market. Banks faced the prospect of profit squeeze due to rising funding cost and a declining customer base.

In view of the declining rent from the traditional business of retail deposit taking and commercial lending to large firms, banks tried to increase middle-market business. Most banks started to increase real estate lending. In expanding such lending, banks exclusively relied on collateral and paid little attention to the cash flow of underlying business. This was because the nominal land price in Japan was on a rising trend since the end of World War II and the pace of land price inflation was higher than government bond interest rates on average. This land price performance created a general perception to bankers that they can always avoid loan losses as long as loans are secured by real estate. This was certainly true until the collapse of the bubble in the 1990s. Many banks solicited loans to customers by providing information on real estate investment opportunities. During the bubble period, even an ordinary salaried worker living in Tokyo could easily borrow up to ¥100 million for any purpose at the long-term prime rate, if his house could be used as collateral. Thus, financial liberalization created a perfect environment for the asset price bubble where firms and households could easily acquire real estate with borrowed money in the 1980s.

Financial intermediation by banks expanded significantly in the 1980s. The bank lending GDP ratio rose from 70 percent of GDP in late 1970s to 108 percent by 1990. The composition of loan portfolios by Japanese banks also changed dramatically. The share of the manufacturing sector in the loan portfolio declined from 25 percent in 1977 to less than 15 percent by the end of 1980s. On the other hand, the share of loans to real estate and financing companies rose sharply in the same period. Since lending to financing companies such as Jusen (housing loan companies) is often re-invested in real estate, the involvement of banks in real estate related lending was very large in the 1980s.

Slow-moving financial crisis: 1991–1996

Increasing problem loans

Reflecting a successive tightening of monetary policy from May 1989 until February 1991, stock and real estate prices started to decline rapidly. The

ratio of land price index and nominal GDP index declined twice in the past 30 years (see Figure 5.2). In the early 1970s when this ratio declined, the nominal land price did not decline much and this fall was induced by a sharp inflation of goods and services. However, in the 1990s, the fall in this ratio was induced by a fall in nominal land prices. These differences are important in evaluating the fallout from the collapse of the bubble. In the first episode, investors who bought land with borrowed money could repay their debt. On the other hand, in the second episode, the real estate investors could not honor their debt obligations.

At first, bankers and bank supervisors thought that the fall in land prices would be temporary. They expected that by waiting for a recovery of the economy, banks could eventually recover most of their bad loans. However, the wait and see strategy did not work this time and the real estate prices continued to fall. The understatement of bad loan problems by some banks rapidly became a falsification of financial statements. Since the falsification of financial statements of listed companies carries a stiff criminal penalty, the management of banks with large bad loans faced a difficult choice: covering up the extent of their problem to keep their bank open, or face a bank run by disclosing the reality, and they chose the first option. Apparently, bank supervisors actively supported this choice by banks until early 1997.

Declining credit ratings and Japan premium

Reflecting the increasing loan losses and declining stock prices, the credit rating of Japanese banks declined rapidly. In the mid-1980s, Japanese banks enjoyed their highest credit ratings under regulated interest rates and huge unrealized capital gains in their equity portfolio. However, financial deregulations and asset-price deflation completely changed the relative credit worthiness position of Japanese banks. By 1992, Japanese banks had the lowest average credit rating among major countries.

Against this dire picture, both the Ministry of Finance (MOF) and the Bank of Japan (BOJ) denied the severity of the bad loan problem and collaborated to postpone the costly resolution of insolvent financial institutions. There are several reasons for the slow response of policy makers:

1 A number of large financial institutions were either insolvent or severely undercapitalized.
2 In order to resolve the crisis, public money is necessary. However, using taxpayers' money is not popular.
3 High officials of the Banking Bureau of the MOF rotate every few years. As a result, there is a strong incentive for them to postpone the resolution of politically difficult problems.

One important factor in this context was the mismanagement of the Jusen crisis. Jusen companies are non-bank financial institutions and they were

affiliates of groups of banks. Jusen started their business as housing-loan companies, but their business was limited by two factors: Japan Housing Loan Corporation, a governmental loan company, provided subsidized loans with prime collateral. Parent banks also started to provide housing loans in the late 1970s. As a result, the Jusen companies became gradually marginalized in the housing loan market. In the 1980s, Jusen companies started to shift their business to more risky real estate loans. Jusen companies often took second-rated collateral to make high-risk loans.

After the collapse of the bubble, Jusen companies quickly became insolvent. This became obvious for related parties by the 1992–1993 period, but parent banks and MOF officials decided to wait for a recovery of real estate prices. By 1995, it became a serious political problem. Since Jusen companies financed their real estate loans with borrowed money from small agricultural credit unions, the failure of Jusen companies would induce failures of a number of such unions. Since agricultural unions had a strong lobby in the Diet, the national congress of Japan, politicians put strong pressures on the MOF to resolve the Jusen crisis without inducing failures of agricultural credit unions. As a result, ¥680 billion of public money was used to cover a part of the losses of unions without bankruptcy procedures or asking the managers to take responsibility. Seven of the eight Jusen companies were liquidated and most of the losses were borne by parent banks. Against this rather skewed loss-sharing scheme of the Jusen resolution by the MOF and politicians, public opinion was extremely critical, making it politically impossible to discuss the further use of public money to resolve the financial crisis. As a result, a further postponement of resolution was carried out. Market participants were well aware of Japan's problem. As the asset price deflation continued, the funding cost of Japanese banks started to increase relative to European and American banks, due to the rising credit-risk of the Japanese bank. Even the most sound banks had to pay a risk premium (so-called Japan premium) for their inter-bank borrowings.

Japanese financial crisis since 1997

In November 1997, the failure of Sanyo Securities, Hokkaido Takushoku Bank and Yamaichi Securities sharply increased financial instability. These events generated a severe credit crunch in the Japanese financial market, inducing an extremely serious recession. So what has caused this enormous problem for Japan? In my opinion, there are two factors behind this financial crisis.

One is the crash of the stock and real estate market bubble in the 1990s. The second is the lost confidence in the accounting and auditing system in Japan. We note that the actual amount of bad loans discovered at failed financial institutions has been far larger than the amount published prior to the failure. The Hokkaido Takushoku Bank was forced into

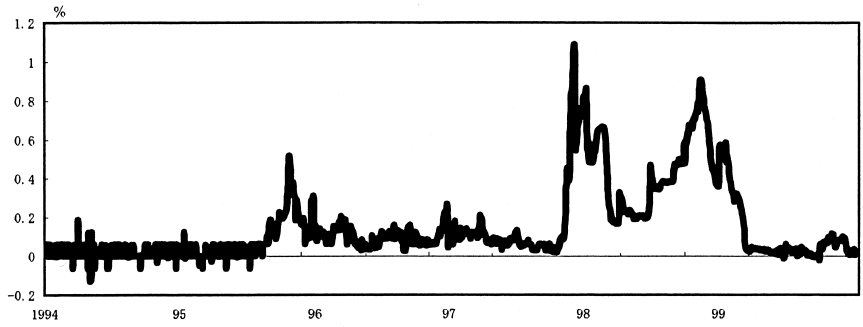

Figure 5.4 Japan premium (3-month Tibor-Libor).
Source: QUICK.

bankruptcy even though it posted profits and paid dividends for the year to March 1997. Financial statements for that year reported ¥0.3 trillion in capital; inspections after the failure found a negative equity of ¥1.2 trillion as of March 31, 1998. This indicates a window-dressing of almost ¥1.5 trillion. Likewise, Yamaichi Securities were hiding ¥260 billion of losses on securities investments – worth more than one half of its equity capital – which neither Ministry of Finance inspections nor Bank of Japan examinations were reportedly able to uncover.

Depositors and investors of bank debentures issued by long-term credit banks imposed some market discipline. Deposits flew out of banks with low credit ratings because depositors feared that they would not be able to withdraw deposits quickly if their banks were closed. LTCB and Nippon Credit Bank faced a rapid early redemption of their debentures in 1997 because their debentures were not covered explicitly by the deposit insurance system. Stock prices of weaker banks fell sharply and triggered mild bank runs in some cases.

These financial institution failures have exacerbated suspicions both at home and abroad regarding the financial statements and regulatory supervision of Japanese financial institutions. It was this mistrust of financial statements that widened the "Japan premium" charged in overseas markets, blocked the domestic call market (which is used for short-term inter-bank loans), and multiplied the number of cash-pressed financial institutions turning to the Bank of Japan for loans. Japanese financial markets clearly experienced a kind of credit crunch because of a rash of failures, declining asset prices, and growing mistrust of financial statements and regulators. This credit crunch in turn cut into corporate investment and hiring, increased bankruptcy rates, and reduced consumption and housing investments because workers feared losing their jobs. That resulted in a further contraction of credit in what became a vicious cycle.

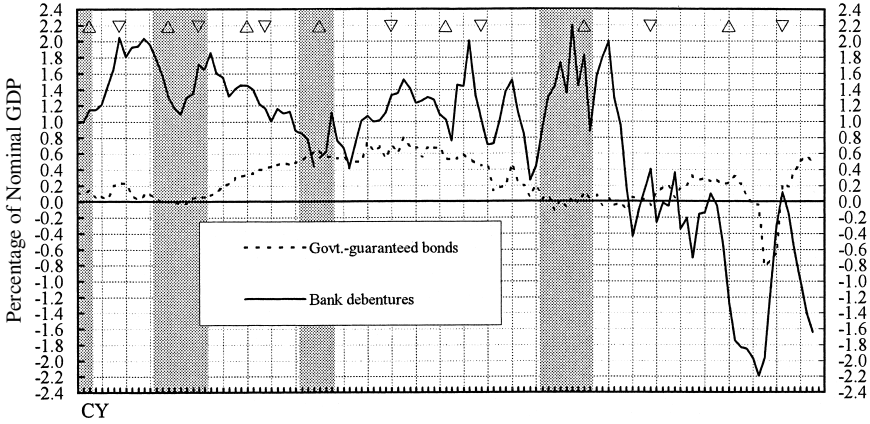

Figure 5.5 Net amount of Bonds Issues.

Notes

1 Data for the Issuance of "Local government bonds," Issuance and Redemption of "Government-guaranteed bonds," and "Yen-dominated foreign bonds" are not seasonally adjusted.
2 Local govt. bonds, Govt.-guaranteed bonds and Bank debentures: data until 79/4Q = 68SNA basis, data from 80/1Q = 93SNA basis.

In other words, unreliable financial statements had proved a serious impediment to the functioning of a market economy.

The contraction was somewhat abated by the Emergency Economic Package announced by the Liberal Democratic Party and Ministry of Finance at the end of 1997. The government prepared ¥13 trillion for the capital injection to solvent banks and ¥17 trillion for the protection depositors of failed banks. The Ministry of Finance should have used the fund effectively: by forcing banks to write off all the bad loans, the financial institutions and the financial oversight by the government could have regained public confidence. However, most of the money was left unused. Only ¥1.8 trillion of ¥13 trillion was thinly injected to 21 large banks at the end of March 1998, without any complete examination or comprehensive cleanup of bank balance sheets.

The failure of capital injection became apparent only a few months later. In the summer of 1998, the stock price of the Long-Term Credit Bank of Japan (LTCB) fell sharply when Sumitomo Trust and Banking effectively refused the merger with LTCB. LTCB was a big bank with ¥26.2 trillion of assets at the end of March 1998. In October 1998, just before the LTCB went bankrupt, the Financial Revitalization Act and Bank Recapitalization Act were enacted in disorderly atmosphere. This time, the government prepared ¥60 trillion, about 12 percent of GDP: ¥25 trillion for capital injection into solvent banks under Bank Recapitalization Act; ¥18 trillion for the resolution of failing banks under Financial Revital-

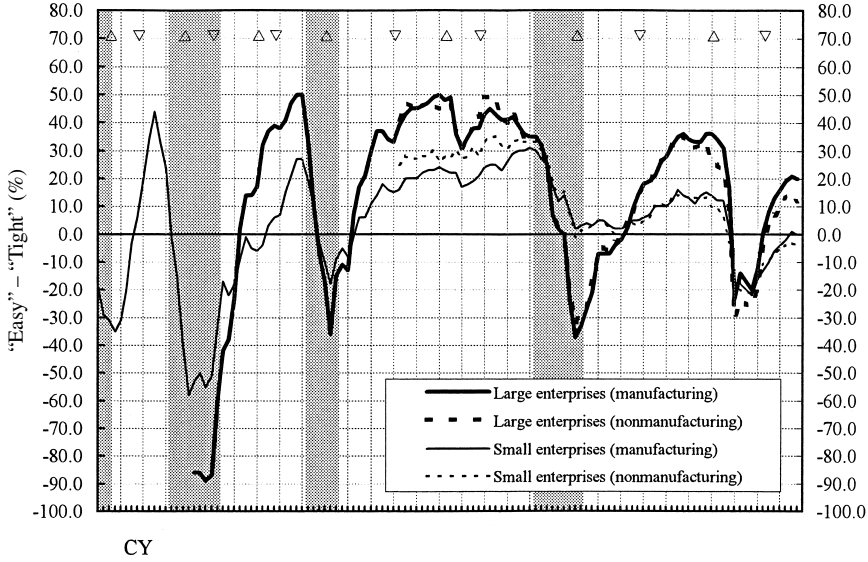

Figure 5.6 Diffusion index of the lending attitude of financial institutions.

Source: Bank of Japan CD-ROM, 2000.

Note
Based on the short-term economic survey of all enterprises in Japan.

ization Act such as capital injection into rescue banks, bridge banks and the disposition of bad loans, and ¥17 trillion for the protection of depositors by DIC.[2]

Under the Financial Revitalization Act, the LTCB and Nippon Credit Bank were nationalized in October and December 1998. Under the Bank Recapitalization Act, ¥7.5 trillion of capital was injected to 15 major banks at the end of March 1999. Unlike the former attempt, this program was much better designed, succeeding in eliminating the persistent Japan premium that started in late 1997. The gradual recovery of the Japanese economy and the announcements of big mergers among major banks have also contributed to calm public concern over the financial system.

The total net cost of these measures will not be known for years to come because the government may recover some of these costs from the sales of bad loans and stocks of banks. The gross cost of these operations from 1992 until the summer of 2000 is about ¥27 trillion and can be broken downs as follows:[3]

- Cost of Capital Injection: ¥10 trillion
- Cost of Grant to Buyer of Failed Institutions: ¥13 trillion
- Cost of Purchasing Bad Loans: ¥4 trillion.

Evolving the Japanese deposit insurance system

The Deposit Insurance Law established the DIC in 1971. Its initial role was to protect depositors of failed financial institutions up to ¥1 million per person by direct payout of insured deposits. The limit of coverage was gradually increased to ¥10 million in 1986 and the DIC obtained a new power to assist mergers of a failed institution and a sound one in order to protect depositors. After a few failures of small financial institutions in 1994 and 1995, the law was amended in 1996 to allow the DIC to fully protect depositors beyond the normal ¥10 million limit as a temporary emergency measure until March 2001. At the same time, the "general" deposit insurance premium was raised from 1.2 BP (basis points) to 4.8 BP, which covers the cost of protection up to the ¥10 million limit. In addition, "special" deposit insurance premium of 3.6 BP was introduced to cover the cost of deposit protection beyond the ¥10 million limit. At the end of 1997, the DIC obtained the power to purchase bad loans from failing financial institutions when they collectively created a new bank.[4] The borrowing limit of DIC from the Bank of Japan and private financial institutions was also raised from ¥1 trillion to ¥10 trillion.

In spite of the full protection of all the deposits beyond the limit of normal coverage, public concern over the soundness of financial system became extremely intense after the successive failures of Sanyo Securities, Hokkaido Takushoku Bank and Yamaichi Securities in late 1997. Depositors were not sure that the DIC had enough money to honor the commitment of the government to protect all the deposits.

In October 1998, just before the LTCB went bankrupt, the Financial Revitalization Act and Bank Recapitalization Act were enacted in a disorderly atmosphere. At this time, Deposit Insurance Law was also amended. As a result, a principle of the resolution of failed financial institutions was established, as was a new mechanism for rehabilitating solvent but undercapitalized ones. The DIC obtained the following temporary roles in this process: to act as an administrator of failing institutions, to establish bridge banks to keep failed institutions running, to own stocks of temporarily nationalized institutions and choose directors for them, to purchase bad loans from financial institutions, and to purchase shares of undercapitalized institutions so as to bolster their capital position.

In May 2000, Deposit Insurance Law was amended so as to prepare the permanent resolution scheme for failing banks because the Financial Revitalization Act and Bank Recapitalization Act expired at the end of March 2001. In this amendment the bridge bank scheme and a procedure of systemic exception from the minimum cost principle became a permanent feature of the system. The termination of the full protection of deposits was postponed for one year from the end of March 2001. In March 2002, whilst the full protection of time deposits was removed, the government postponed the removal of the full protection of payment

deposits once again. ¥10 trillion was added to the ¥17 trillion fund for the protection of depositors. While the government pledges to remove the full protection payment deposits in March 2004, they introduced a permanent protection of all the zero-interest payment deposits at the end of 2002.

The weak Japanese banking system

Since the sharp decline of asset prices in 1990, more than a decade has passed. The acute financial crisis in 1998 was abated more than three years ago. However, we are still facing an increasing amount of bad loans and a very fragile economy. We also have to stabilize the weakened life insurance sector, exemplified by the recent failures of Chiyoda, Kyoei, and Tokyo Life Insurance. Life insurance policies are an important savings instrument in Japan and this sector controls about ¥160 trillion of assets. Life insurance companies promised high minimum returns on their long-lasting life insurance and annuity policies in the 1980s and early 1990s. Since they did not match the duration of their assets and liabilities, they faced an enormous negative yield gap when Japan experienced very low nominal interest rates in the late 1990s. However, we do not discuss this problem in detail because it would require a book rather than a section of this chapter.[5]

Bad loan situations in Japan

Table 5.1 shows the historical data of problem loans of Japanese banks. Since the disclosure of the bad loan situation improved gradually, the data are not consistent over the years. For example, the definition of bad loan outstanding has been widened twice and, as a result, the disclosed figures jumped up due to this discontinuity. Until FY 1995, only major banks disclosed loan loss figures. Japanese banks lost ¥66 trillion due to bad loans from March 1992 to March 2000. In spite of this enormous loss amounting 13 percent of GDP in 2000, Japanese banks still have more than ¥30 trillion of disclosed bad loans, or about 6 percent of a loan portfolio. According to the FSA, the total classified loans of banks (not disclosed on a individual basis) amount to ¥63 trillion. The classified loans are more than twice as much as the disclosed bad loan figure.

Figure 5.7 shows that, while the bad-loan/total loan ratio has stabilized for city banks, the ratio of first tier and second tier regional banks has been increasing rapidly. This is partly due to the application of a tougher classification standard by the FSA but also due to the deteriorating loan quality of smaller financial institutions.

Figure 5.8 compares the bad loan situations in Japan and the United States. While US bad loan/total loan ratio has declined from 3 percent in 1992 to 1 percent in 1999, the corresponding Japanese ratio has risen

Table 5.1 Problem loans of Japanese banks (all commercial banks) (¥100 million)

Financial year	*Mar. 1993*	*Mar. 1994*	*Mar. 1995*	*Mar. 1996*	*Mar. 1997*	*Mar. 1998*	*Mar. 1999*	*Mar. 2000*	*Mar. 2001*	*Mar. 2002*
	<—— Only for major banks ——>									
Loss from bad loans (A)	16,398	38,722	52,322	133,692	77,634	132,583	136,309	69,441	61,076	97,221
Specific reserves	9,449	11,461	14,021	70,873	34,473	84,025	81,181	25,313	27,319	51,959
Write-off and loan sales	4,235	20,900	28,085	59,802	43,158	39,927	47,093	38,646	30,717	39,745
Losses										*
Cumulative amount of (A)	16,398	55,120	107,442	241,134	318,768	451,351	587,660	657,101	718,177	815,398
Bad loans outstanding (B)	127,746	135,759	125,462	285,043	217,890	297,580	296,270	303,660	325,150	420,280
	<——————>			<——————>		<—————————————————————>				
(Definition of B)	defaulted loans and loans with arrears			defaulted loans, loans with arrears for more than 6 months and loans with concessional interest rates below ODR.		defaulted loans, loans with arrears for more than 90 days and loans with concessional terms (similar to SEC rule)				
Normal loans					5,500,000	5,448,140	4,875,000	4,723,880	4,706,690	4,405,370
Classified loans					767,000	717,000	642,580	633,860	656,710	710,870
Substandard					653,000	655,000	610,240	605,390	631,180	677,870
Doubtful					87,000	61,000	31,600	28,350	25,530	33,000
Estimated loss					27,000	1,000	740	120	0	0

(*continued*)

Table 5.1 Continued

Financial year	*Mar. 1993*	*Mar. 1994*	*Mar.1995*	*Mar. 1996*	*Mar. 1997*	*Mar. 1998*	*Mar. 1999*	*Mar. 2000*	*Mar. 2001*	*Mar. 2002*
Estimated required loan loss reserves (C)					273,500	229,181	193,658	188,282	191,174	202,728
Total loan loss reserves outstanding (D)	36,983	45,468	55,364	132,940	123,340	178,150	147,970	122,300	115,550	133,530
Estimated under-reserving (C–D)					150,160	51,031	45,688	65,982	75,624	69,198
Total loan outstanding (all domestic banks)				4,827,009	4,823,121	4,779,785	4,726,096	4,634,849	4,569,652	4,406,096

Source: Financial Services Agency and the Bank of Japan.

Notes

*Losses are annualized.

Classified loan figures for March 1997 are rough estimates of the author from the MOF announcements. Estimated required loan loss reserves is defined as follows: 1% of normal loan + 20% of substandard loan + 70% of doubtful loan + 100% of estimated loss loan.

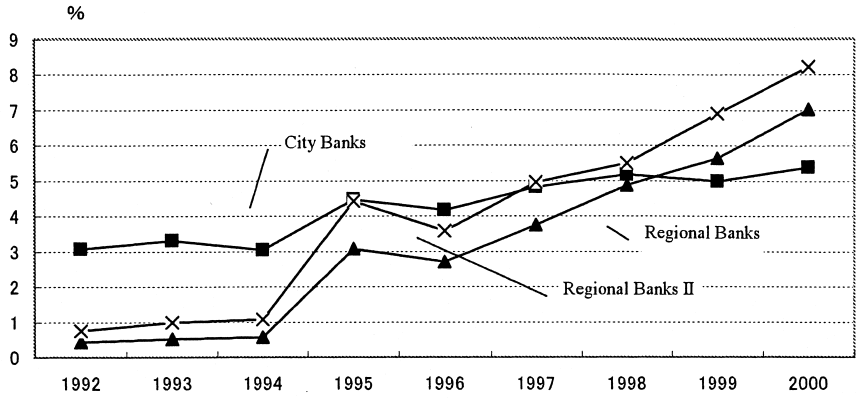

Figure 5.7 Bad loan-total loan ratios.

from 2 percent to 6 percent. Loan-loss reserve/bad loan ratio in the US has been above 160 percent since 1994, while the similar ratio in Japan has been in the 40 to 60 percent range. We can clearly see that while the US banking sector recovered quickly from the bad loan problems in early 1990s, the Japanese situation has been deteriorating even after the capital injection by the government in 1998.

The cause of this increasing amount of bad loans without loan-loss reserves is the low profitability of Japanese banking sector. Since banks do

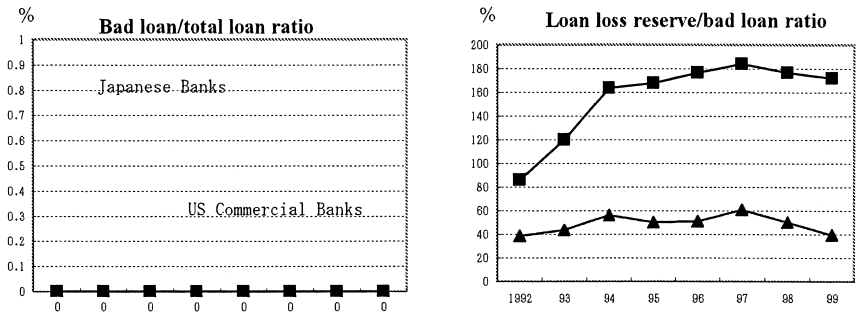

Figure 5.8 Comparison of bad loan situations in Japan and the United States.

Source: Japan Center for Economic Research, Monetary Policy Under Deflation, March 2001.

Notes

1 Japan: fiscal year, US: calendar year.
2 Figures after FY 1997 do not include data of Hokkaido Takushoku Bank, Tokuyo City Bank, Kyoto Kyoei Bank, Naniwa Bank, Fukutoku Bank, and Midori Bank.
3 Japanese bad loan ratio = Risk control loans/total loans. US bad loan ratio = (loans with arrears for more than 90 days + loans that do not count accrued interest rates as asset + restructured loans)/total loans.

not earn enough profit to write-off all the bad loans, they try to postpone the recognition of losses so as to show a relatively high capital position. If they write-off bad loans immediately, most banks would not be able to comply with BIS capital requirements and they may even have to show a negative equity position.

Bank profitability

Table 5.2 shows the profit structure of the Japanese banking sector. The gross lending margin (A), which is the difference between interest and dividend income received and the interest paid, has been about ¥10 trillion in the 1990s. Other revenue (B) that includes fees, dealing profit of fixed income securities, and foreign exchange operations, was about ¥3.5 trillion from 1995 until 1998. However, these figures exaggerate the underlying profitability of these activities because bond prices rose sharply under falling interest rates. We think that the underlying profitability of other revenue is probably about ¥2.5 trillion.

On the other hand, the operating cost has been declining over the past two years because of cost-cutting measures by Japanese banks. Here again, we think that it is rather difficult to continue the recent pace of cost cutting. Certainly, Japanese banks may cut salaries and wages further by reducing employees and cutting average compensation. On the other hand, the computer system of Japanese banks is outdated. Banks could not invest in the system adequately because they have been preoccupied with the bad loan problem since the early 1990s. In the retail banking sector, banks cannot compete with national convenience store chains in payment services because banks cannot keep up with the sophisticated POS (point of sales) terminals of convenience shops.[6] Since banks have to invest heavily in information technology for the future, it would be difficult to cut total operating cost further.

Given these profit and cost figures, the gross profit before taking account of loan losses is about ¥5 trillion. On the other hand, the loan loss has exceeded the gross profit ever since FY 93. Since FY 94, the loan loss has been ¥6 to 14 trillion. Compared with the outstanding loan portfolio of about ¥500 trillion during this period, the loan loss rate has been 1.2 to 2.8 percent. In other words, the Japanese banking sector has not been able to earn enough profit to cover loan losses. When they reported profit at the bottom line, they realized capital gains on their stocks and real estates with low book values.

The weak capital position of the Japanese banking sector

Corresponding to these flow figures of profits, the capital position of Japanese banks has been deteriorating. Under the Japanese accounting rules on banks and lenient application by the regulators, BIS capital ratios

Table 5.2 Profitability of Japanese banking sector (trillion yen)

Financial year	*1989*	*1990*	*1991*	*1992*	*1993*	*1994*	*1995*	*1996*	*1997*	*1998*	*1999*	*2000*
Lending margin (A)	7.5	7.1	8.9	9.8	9.2	9.7	10.8	10.7	10.0	9.6	9.7	9.4
Other revenue (B)	2.5	2.6	2.2	2.5	2.8	2.1	3.3	3.7	3.6	3.1	2.5	3.0
Operating costs (C)	6.6	7.1	7.5	7.7	7.7	7.8	7.8	8.0	8.0	7.5	7.3	7.1
Salaries and wages	3.5	3.7	3.9	4.0	4.0	4.0	4.0	4.0	4.0	3.6	3.5	3.4
Gross profit (D) = (A) + (B) − (C)	3.3	2.6	3.5	4.5	4.3	4.0	6.3	6.4	5.6	5.2	4.9	5.3
Loan loss (E)	1.4	0.8	1.0	2.0	4.6	6.2	13.3	7.3	13.5	13.5	6.3	6.6
Net operating profit (F) = (D) − (E)	1.9	1.8	2.5	2.5	−0.4	−2.2	−7.0	−1.0	−7.9	−8.3	−1.4	−1.3
Realized capital gains (G)	2.8	2.0	0.7	0.0	2.0	3.2	4.4	1.2	3.6	1.4	3.8	1.4
Net profit (F) + (G)	4.7	3.8	3.3	2.5	1.7	1.0	−2.6	0.2	−4.2	−6.9	2.3	0.1
Asset	944	928	914	859	850	845	848	856	848	760	737	804.3
Outstanding loans (domestic banks)		424.3	445.8	460.3	472.3	477.8	482.7	482.3	477.9	472.6	463.4	456.9

Note
Financial statement of all commercial banks. Other revenue (B) includes all the other profit such as dealing profits and fees but excludes realized capital gains of stocks and real estates. Realized capital gains includes gains of stocks and real estates.

have been manipulated in many ways. Banks often used historical cost book keeping of equity portfolio, under reserving against bad loans, and subordinated debts from friendly life insurance companies so as to raise BIS ratios. As a result, most failed banks could maintain more than 8 percent of BIS capital ratios just before their bankruptcy. Therefore, we tried to estimate simple leverage ratios of major banks and adjusted the simple core capital (tier 1 capital) by taking account of unrealized capital gains and losses.

Table 5.3 shows the adjusted core capital/total asset ratios for major Japanese banks since 1998. In this estimation, we added unrealized capital gains and loan-loss reserves and subtracted the standardized estimated loan-losses from disclosed bad loan figures. This particular estimate of capital is used because this variable worked well in predicting bank failures over a one year time horizon with a regression model of various financial indicators.[7] According to this estimated distribution of core capital/asset ratio of banks, the leverage ratio fell to 0.93 percent in March 1998. According to this estimation, as many as eight banks had a negative equity position while only two banks were nationalized. The capital ratio recovered one year later by ¥7.5 trillion capital injection by the government. The capital ratio recovered further to 3.48 percent by March 2000 as the stock prices recovered. However, it started to fall as banks continued to lose money by bad loans and stock prices started to fall again. By the end of February 2001, the capital ratio fell to 1.86 percent.

As we can see from Table 5.3, the capital position of banks is quite sensitive to stock prices. Table 5.4 shows the capital structure of all the commercial banks. In this table, the core capital based on the traditional historical cost accounting is adjusted for unrealized capital gain on stocks, deferred tax asset, and public capital injection but not adjusted for under reserving for loan losses. Although banks show ¥35.2 trillion of capital on their balance sheet, this figure is inflated with ¥8.2 trillion of deferred tax asset (present value of future tax shelter) and ¥7.5 trillion of capital injection by the government. Since banks pledge that they will repay the injected capital, the remaining net capital is only ¥25.6 trillion even if we take account of the after-tax unrealized capital gain in their stock portfolio. This permanent capital is small compared with their stock portfolio of ¥54.5 trillion and ¥63.4 trillion problem loans (Table 5.4).

Because the market value of stocks held by banks is about twice their net capital account, about a 10 percent fall in stock price index wipes out 20 percent of their net capital. In the late 1980s and early 1990s, the unrealized capital gain (the difference between column A and B) was very large and they could withstand the fluctuations in stock prices. However, in the 1990s, banks gradually realized the gains so as to show paper profit to cover the huge loan losses. As a result, the unrealized capital gain was depleted when the Nikkei index fell below 15,000 in late 2000.

Table 5.3 Distribution of adjusted capital/asset ratio of major Japanese banks

	Total	*Number of banks*					*Weighted average %*	*Nikkei 225 index*
		Less than −2%	*−2% to 0%*	*0% to 2%*	*2% to 4%*	*4% to 6%*		
March 1998	19	2	6	8	3	0	0.93	16,527
March 1999	17	0	2	10	5	0	2.07	15,837
March 2000	17	0	0	4	9	4	3.48	20,337
September 2000	15	0	0	5	10	0	2.36	15,747
March 2001	15	1	0	8	6	0	1.83	12,883
September 2001	15	1	3	11	0	0	0.86	9,774

Source: Japan Center for Economic Research, *Monetary Policy Under Deflation*, March 2001 (in Japanese).

Notes
Adjusted Capital = Core Capital + Unrealized Capital Gains and Losses + Loan Loss Reserves − Estimated Loan Losses − Deferred Tax Asset.
Estimated Loan Losses = 100% of defaulted loans + 70% of risk loans + 20% of doubtful loans + 1% of normal loans.
Adjusted Capital/Asset Ratio = Adjusted Capital/Gross Asset.

Table 5.4 Stock portfolios and capital in the banking sector (trillion yen)

	Market value of shares	*Book value of shares*	*Capital account (core capital)*	*Deferred tax asset*	*Estimated under-reserving*	*Equity capital held by the the government*	*Net capital account*	*Nikkei 225 index*
	A	*B*	*C*	*D*	*E*	*F*	$C+(A-B)\times 0.6-D-E-F$	
March 1986	*46.9*	11.9	12.3	0.0	NA	0.0	33.3	15,860
March 1987	*63.7*	13.4	13.8	0.0	NA	0.0	44.0	21,567
March 1988	*77.6*	17.6	17.2	0.0	NA	0.0	53.2	26,260
March 1989	*97.1*	23.2	22.5	0.0	NA	0.0	66.8	32,839
March 1990	*88.6*	29.7	28.6	0.0	NA	0.0	63.9	29,980
March 1991	77.7	33.1	30.2	0.0	NA	0.0	57.0	26,292
March 1992	56.4	34.5	31.3	0.0	NA	0.0	44.4	19,346
March 1993	56.4	34.5	31.8	0.0	NA	0.0	44.9	18,591
March 1994	61.9	36.5	32.3	0.0	NA	0.0	47.5	19,112
March 1995	52.0	39.8	32.3	0.0	NA	0.0	39.6	15,140
March 1996	64.3	43.0	27.9	0.0	NA	0.0	40.7	21,407
March 1997	54.1	42.9	28.5	0.0	15.0	0.0	20.2	18,003
March 1998	50.8	45.7	24.5	0.0	5.1	0.0	27.6	16,527
March 1999	47.1	42.7	33.7	8.9	4.6	7.5	20.0	15,837
March 2000	54.5	44.4	35.2	8.2	6.6	7.5	25.6	20,337
March 2001	54.5	44.4	35.2	8.2	7.6	7.5	25.6	20,337

Source: Federation of Bankers Associations of Japan, "Analysis of Bank Financial Statements," various issues; securities reports for individual banks. Note that both market and book values represent listed shares only.

Note

Tables represent amounts on the banking accounts of all banks in Japan.The market value of stock portfolios was not published prior to March 1990, so we have estimated backwards using the Nikkei 225 share price index from the end of March 1991. However, the tables for 1985–1986 should be discounted, because bank stock portfolios have been gradually increasing, so that values estimated from the end of fiscal 1990 will have an upwards bias the farther back one goes. Net capital is not adjusted for bad loans. 40% corporate tax rate is assumed.

Causes of an unprofitable banking sector

The profit margin of Japanese banks is too small to cover the increased default risk after the crush of the bubble. Many firms have not overcome their debt overhang and are surviving with the help of their banks. Banks have not succeeded in increasing their lending margin under a strong competitive pressure from government-backed financial institutions. Moreover, under the terms and conditions of government capital injection in March 1999, banks are required to maintain and increase loans to small and medium sized firms. Because of this condition, banks often disregard the internal model-based required lending margin to make new loans to small companies. In the remainder of this section, we will look into the effect of financial deregulations and the presence of government sponsored financial institutions on the profit margin of private banks.

Effects of deregulation

The average lending rate of Japanese banks was 2.1 percent in FY 1999. On the other hand, the average funding cost was 0.3 percent and the average intermediation cost was 1.3 percent. As a result, the lending spread was only 50 basis points. Since the average credit rating of borrowers from banks is about BB level, the annual loan loss rate is well over 1 percent per year. Although a part of this negative profit margin is offset by other revenues, such as dealing profit and fees from customers, banks are making losses from lending business (see Table 5.2).

One of the reasons for this low lending spread is the overhang of deposit interest rate control until the early 1990s. When the government controlled deposit interest rates, banks could easily make money from deposit taking. On average, banks could get a 1.5 percent point margin between the average funding rate and the short-term money market rate. The average lending rate was almost equal to short-term market rates. This fact probably indicates that banks passed a part of regulatory rent of interest-rate control to borrowers. As the deposit-rate control was phased out in the late 1980s and early 1990s, banks tried to keep profit margins by increasing the lending rate relative to short-term market rates. Figure 5.9 shows that average lending rate rose relative to 3–month CD rate at the turn of the decade.

Figure 5.10 shows the decomposition of the lending margin into regulatory rent, which is the spread between the short-term market rate and average funding cost, and the true profit margin, which is the spread between the average lending rate and the market rate. This figure indicates that banks have only replaced the lost regulatory rent with the pure profit margin and have not succeeded in increasing their traditional thin margin under a high growth period with rising asset prices.

While the banks have not raised the profit margin, borrowers are paying a higher interest rate in relation to the money market rate. Figure 5.11 shows

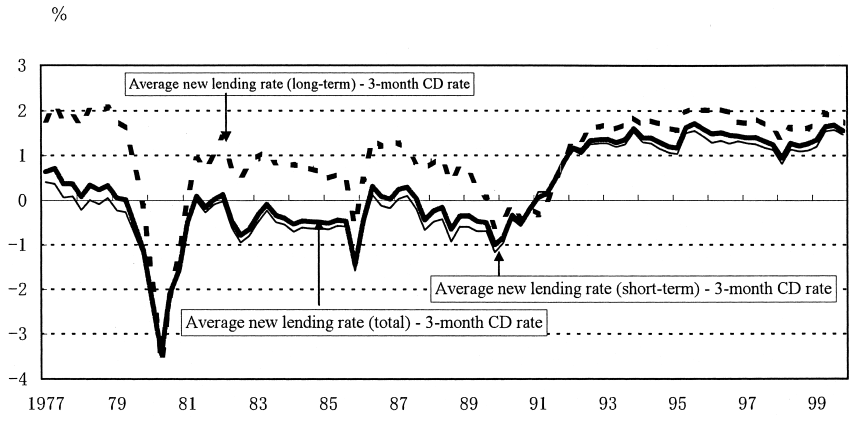

Figure 5.9 New lending rate and short-term market rate.

Note
Estimated by Ikuko Fuedo of Japan Center for Economic Research.

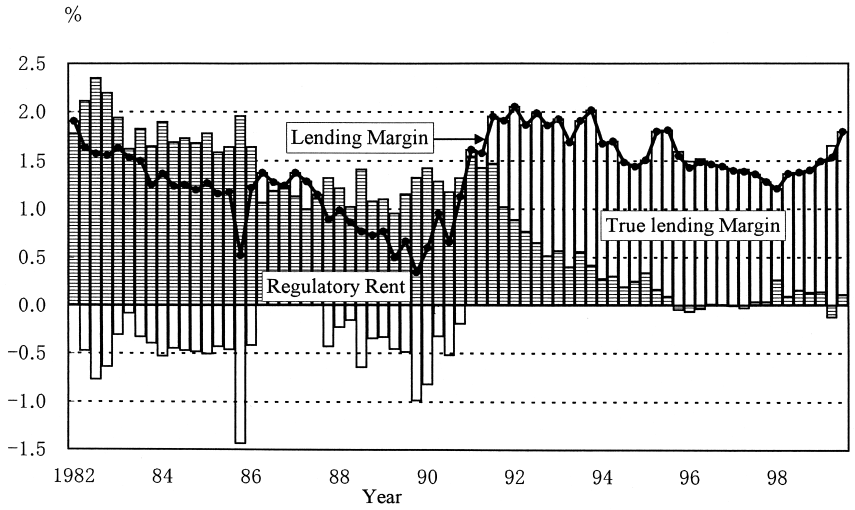

Figure 5.10 Decomposition of lending margins.

Source: Ikuko FUEDA, "Financial liberalization, asset bubble and bank behavior" in M. Fukao and JCER (ed.), "Empirical Analysis of Financial Recession," *Japan Economic Journal*, 2000.

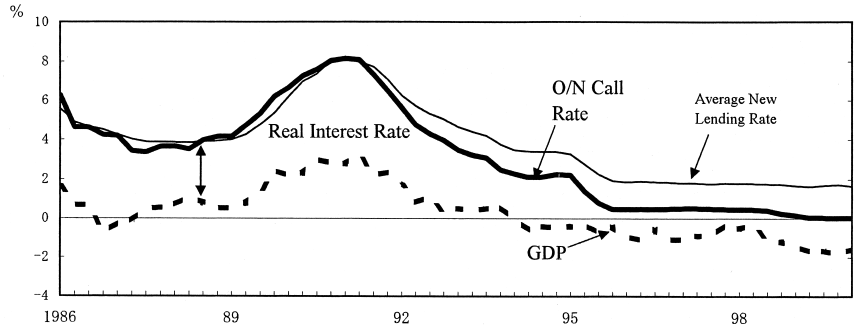

Figure 5.11 Interest rates and inflation rates.

Source: Japan Center for Economic Research, Monetary Policy Under Deflation, March 2001 (in Japanese).

Note:
GDP deflator inflation rate is adjusted for changes in consumption tax rate in 1989 and 1997.

the past movements of average new lending rate, overnight call rate and the GDP deflator inflation rate. The gap between the interest rates and the inflation rate is the real interest rate. Reflecting the loose monetary policy of the Bank of Japan, the real interest rate of call rate has fallen from 1991 until 1998. On the other hand, the real interest rate of new lending rate has not fallen much because of the increasing gap between the new lending rate and the call rate. While the opportunity cost of borrowing for large credit worthy companies is close to the call rate, the cost for small and medium sized companies is close to the new lending rate. Therefore, smaller companies could enjoy less of the expansionary effect of loose monetary policy than larger ones in the 1990s. This fact may have contributed the relatively weak recovery of the small business sector in this decade.

The presence of government sponsored financial institutions

In the Japanese financial market, the presence of government-sponsored financial institutions (GSFIs) is extremely large. Table 5.5 shows the market share of private banks and GSFIs at the end of year 2000. GSFIs have about one quarter of the loan market, one third of the deposit market and 40 percent of the life-insurance market.

In the loan market, GSFIs make very long-term loans at about a 2 percent interest rate. They are especially dominant in the housing loan market, holding more than half of the outstanding housing loans. Table 5.6 shows the central lending rates of GSFIs on February 9, 2001. While their new lending rates are similar to short-term loans of private banks,

Table 5.5 Relative size of government sponsored financial institutions (end of 2000)

Loan	*Asset (trillion yen)*	*Share (%)*	*GDP ratio (%)*
Government sponsored agencies	163	26	32
Private banks	464	74	90
Total	627	100	122
Deposit			
Postal Saving System	255	34	50
Private banks	486	66	95
Total	741	100	144
Life Insurance (asset)			
Postal Life Insurance	119	40	23
Private life insurance companies	180	60	35
Total	299	100	58

Note
Prepared by the author from the data in the Bank of Japan, *Financial and Economic Statistics Monthly*, March 2001.

Table 5.6 Lending rates of government sponsored agencies (interest rates on February 9, 2001)

Government lending agencies	*Basic loan rate (%)*	*Average terms (years)*
Japan Development Bank	2.05	16.7
People's Finance Corporation	2.05	7.3
Japan Finance Corporation for Small Business	2.05	8.9
Japan Finance Corporation for Municipal Enterprises	1.9	NA
Housing Loan Corporation	2.7	25.4
Memorandum		
Average loan rate of all banks	2.12	Less than 1
Fixed rate housing loan of Fuji Bank	4.65	20

Source: Japan Center for Economic Research, *Monetary Policy Under Deflation*, March 2001 (in Japanese).

Note
Loan rates are fixed.

the average term to maturity of GSFIs is much longer. Since government agencies usually accept prepayments of their loans without penalties, their loans are more attractive to borrowers. While the market share of GSFIs in the loan market is smaller than in other markets, they have a 30 to 40 percent share in rural prefectures. As a result, banks cannot set significantly higher lending rates over those of government agencies. Since government agencies obtain subsidies of about ¥1 trillion per year as direct subsidy and indirect subsidy of zero-cost capital, they can cover the losses from credit and other risks in making loans. Compared with the outstanding domestic loans of GSFIs, this subsidy amounts to 0.6 percent point of cost advantage relative to private financial institutions.[8]

In the deposit market, the Postal Saving System (PSS) is a dominant player. The deposit of the System is fully guaranteed by the government. The deposit interest rates are set competitively against those of private deposit taking institutions. PSS has more than 24,000 offices and this branch network is by far the largest as a single financial institution in Japan. Even the largest private banking group, Mizuho, has about only 600 offices. Since, PSS does not charge account-maintenance fee on customers, it is difficult for private banks to charge such a fee without alienating a large number of customers. Under the zero-interest rate policy of the Bank of Japan, banks cannot get any profit margin even between zero-interest demand deposit and the market rate.

Weak governance of banking sector

While we have investigated the reason of unprofitable banking sector, an important question still remains: Why do banks not stop unprofitable lending activities? In the following, we will introduce a few hypotheses: absence of shareholder control and the skewed incentive structure for the bank management due to negative equity position.

Absence of control by bank shareholders

Although banks issued large amounts of preferred shares to the government in March 1999, diluting the ownership of existing shareholders, there were no public outcry of bank shareholders. In spite of the near collapse of major banks, all the shareholder meetings that approved the issuance of preferred shares to the government were generally calm. No major shareholders objected to the deal. This is because the management of major banks are well protected by friendly shareholders such as life-insurance companies and industrial companies. Table 5.7 shows the list of top five shareholders of ten major Japanese banks. Out of 50 listed top shareholders in the list, 25 are life-insurance companies.

Since all major life-insurance companies are mutual companies, there is no formal cross holding of shares. However, life-insurance companies

Table 5.7 Top five shareholders of major Japanese banks (at the end of September 2000)

	1st	*2nd*	*3rd*	*4th*	*5th*
Mizuho Holdings	*Daiichi Life: 4.1*	*Nippon Life: 2.7*	Sumitomo Trust: 2.1	*Yasuda Life: 2.0*	*Asahi Life: 1.9*
Sakura Bank	*Mitsui Life: 3.6*	*Taiyo Life: 3.6*	*Nippon Life: 3.6*	State St.: 3.2	Chuo-Mitsui Trust: 3.0
Sumitomo Bank	*Sumitomo Life: 4.5*	*Nippon Life: 4.0*	Matsushita: 3.3	Sumitomo Trust: 2.4	Sanyo Electric: 2.0
Sumitomo Trust	*Sumitomo Life: 2.5*	State St.: 2.4	Sumitomo Bank: 2.2	Sumitomo Trust: 2.1	Mitsubishi Trust: 1.9
Bank of Tokyo Mitsubishi	*Meiji Life: 5.0*	*Nippon Life: 3.6*	Sumitomo Trust: 2.7	Tokyo Marine: 2.7	*Daiichi Life: 2.5*
Mitsubishi Trust	BOTM: 4.1	*Meiji Life: 3.9*	Mitsubishi Heavy: 2.7	Sumitomo Trust: 2.4	Asahi Glass: 2.2
Sanwa Bank	Toyo Trust: 4.1	*Nippon Life: 4.0*	Sumitomo Trust: 3.3	*Daido Life: 3.0*	*Meiji Life: 2.7*
Tokai Bank	Toyota: 5.0	*Chiyoda Life: 3.7*	*Nippon Life: 3.0*	Toyoshima: 2.4	*Daiichi Life: 1.7*
Asahi Bank	*Daiichi Life: 4.1*	*Chiyoda Life: 3.2*	*Yasuda Life: 2.8*	*Asahi Life: 2.1*	Sumitomo Trust: 2.0
Daiwa Bank	Nomura Sec: 3.2	*Tokyo Life: 2.9*	Fuji Fire Ins: 2.6	Osaka Gas: 2.5	Nichido Fire Ins: 1.8

Source: Nikkei Kaisha Joho, spring 2001.

Note
Italics are life insurance companies. BOTM; Bank of Tokyo Mitsubishi.
Chiyoda Life failed in October 2000 and Tokyo Life failed in March 2001.

often relied on banks to cultivate new corporate customers. Moreover, banks and life insurance companies relied on each other to raise broadly defined capital. As shown in Table 5.8, banks provide subordinated credit and surplus notes to life-insurance companies amounting to ¥2.3 trillion at the end of March 2000. On the other hand, life-insurance companies provide ¥6.7 trillion of subordinated credit to banks and own ¥7.7 trillion of bank stocks. Given this effective double gearing between the two, it is difficult to expect strong governance pressure on banks from life-insurance companies.

As mutual companies, the corporate governance structure of Japanese major life-insurance companies is also weak. In Japanese mutual life companies, "representative policyholders meeting" play the role of shareholders meeting in joint stock companies. Each representative policyholder has one vote. They are effectively chosen by the management themselves. Sometimes, they become policyholders after being asked to be representative policyholders by the management. In other cases, the managers of a company to which the insurance company lend money are asked to become representative policyholders.

According to a series of interviews of top managers of major banks and large institutional investors by the author conducted in 1997–1998, we found the following points:

1 When banks reported a loss for the first time in decades to the shareholders' meeting there were almost no reactions from even large shareholders.
2 The bank management generally secures the majority of votes as signed proxy cards before shareholder meetings. In addition, the management makes sure that friendly shareholders send representatives to the meeting with more than two third majority votes of the meeting.
3 A former senior director of a major life-insurance company stated that his company had never voted against the management in shareholders meetings. However, in some rare occasions, his company abstained from voting so as to indicate its dissatisfaction with the current management.
4 Ministry of Finance regulation and surveillance was strong, so there was little incentive for shareholders to monitor bank managements.
5 The industrial companies that entered into cross shareholding relationships with banks raised their fund primarily through bank borrowings, which made their position as shareholders weak.

Skewed incentive for bank management

Another possible reason of lack of profit of Japanese banks is the skewed incentive structure for bank managers. In order to set the incentive

Table 5.8 Cross holding structure among life insurance companies and banks (100 million)

		DKB	*Sakura*	*Fuji*	*BTM*	*Asahi*	*Sanwa*	*Sumitomo*	*Daiwa*	*Tokai*	*IBJ*	*Other banks*	*Sub-total*	*Sub-debt of LIs*	*Sub-debt of banks*	*Total*
Nippon	S notes	235	235	235	235	n.a.	235	235	n.a.	235	n.a.	1,055	2,700	0	–	2,700
	Shares	1,115	1,326	632	2,804	291	1,376	2,151	n.a.	470	754	9,866	20,785	–	10,762	31,547
Daiichi	S notes	88	88	88	88	88	88	88	n.a.	88	88	708	1,500	1,000	–	2,500
	Shares	1,077	516	899	2,197	666	699	685	n.a.	242	1,728	5,150	13,858	–	7,964	21,823
Sumitomo	S notes	n.a.	100	100	100	n.a.	n.a.	600	n.a.	100	150	540	1,690	3,950	–	5,640
	Shares	n.a.	121	34	325	n.a.	n.a.	2,281	n.a.	168	137	5,199	8,266	–	6,716	14,982
Meiji	S notes	n.a.	n.a.	n.a.	150	n.a.	90	n.a.	n.a.	60	90	210	600	0	–	600
	Shares	n.a.	n.a.	n.a.	3,708	n.a.	884	n.a.	n.a.	204	941	7,153	12,890	–	8,496	21,386
Asahi	S notes	300	n.a.	n.a.	n.a.	80	n.a.	n.a.	n.a.	80	n.a.	30	490	2,730	–	3,220
	Shares	1,387	n.a.	n.a.	n.a.	350	n.a.	n.a.	56	209	257	1,931	4,189	–	6,632	10,820
Yasuda	S notes	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	300	300	1,113	–	1,413
	Shares	n.a.	n.a.	1,805	n.a.	454	n.a.	n.a.	n.a.	n.a.	n.a.	2,755	5,014	–	5,148	10,162
Mitsui	S notes	n.a.	100	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	30	210	340	1,450	–	1,790
	Shares	n.a.	1,154	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	70	1,378	2,602	–	4,177	6,779
Taiyo	S notes	0	250	0	0	0	50	0	0	0	0	0	300	850	–	1,150
	Shares	n.a.	1,154	n.a.	924	n.a.	291	512	n.a.	n.a.	n.a.	400	3,282	–	3,423	6,705
Daido	S notes	20	n.a.	20	20	n.a.	24	20	n.a.	n.a.	12	20	136	0	–	136
	Shares	16	n.a.	19	32	n.a.	952	11	n.a.	n.a.	13	856	1,900	–	1,697	3,597
Fukoku	S notes	0	0	0	0	0	0	0	0	0	0	0	0	325	–	325
	Shares	430	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	820	1,251	–	1,710	2,961
Kyoei	S notes	0	0	0	0	0	0	0	0	0	0	0	0	455	–	455
	Shares	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	391	391	–	3,514	3,905
Chiyoda	S notes	n.a.	n.a.	n.a.	n.a.	160	n.a.	n.a.	n.a.	460	n.a.	280	900	879	–	1,779
	Shares	n.a.	n.a.	n.a.	n.a.	506	n.a.	n.a.	n.a.	503	n.a.	751	1,759	–	2,700	4,459
Nichidan	S notes	0	0	0	0	0	0	0	0	0	0	0	0	450	–	450
	Shares	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	265	265	–	3,108	3,373
Tokyo	S notes	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	120	n.a.	n.a.	170	290	400	–	690
	Shares	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	181	n.a.	n.a.	250	431	–	850	1,281
Total	S notes	643	773	443	593	328	487	943	120	1,023	370	3,523	9,246	13,602	–	22,848
	Shares	4,024	4,271	3,390	9,990	2,268	4,202	5,640	237	1,796	3,900	37,165	76,883	–	66,896	143,779

Source: Fukao and Japan Center for Economic Research [2000]. Data are taken from disclosure materials of individual financial institutions.

Note
S notes: Surplus Notes.

structure right for corporate management and shareholders, it is necessary to maintain significantly positive capital position. When there is no capital or a negative amount of capital, there is a skewed incentive for the management to invest in excessively risky projects. The management would also try to conceal negative equity position to keep control of the company as long as possible.

After the successive failure of Japanese financial institutions, very large gaps opened up between before-failure and after-failure equity values as we have explained in Section 2 on Hokkaido Takushoku Bank and Yamaichi Securities. Similarly, LTCB and Nippon Credit Bank were found that each of them had negative equity of more than ¥3 trillion after their failures.

I suspect that the top managements of most major banks know that their banks are either insolvent or very marginally capitalized. Under such circumstances, the only safe exit from their position is to keep their banks running without disclosing the realty; i.e. postponing the recognition of bad loans. They also have to comply with any irrational regulations by the FSA including the requirement of making new loans to small and medium sized companies with very thin spread.

Remaining problems in the Japanese financial system

In this chapter, we showed that the stock market still indicates a strong skepticism against the soundness of Japanese banking sector. Banks are regarded to be under-capitalized and the estimated average fair deposit insurance premium is almost three times that of the current premium. We believe that this market skepticism reflect the number of remaining problems in the Japanese financial system.

We can learn a number of lessons from the bitter Japanese experience:

1 Disclosure and recognition of the depth of the problem is essential. By concealing the true picture, Japan lost a decade of the growth and still struggling to get out from the slowly accelerating rate of deflation.
2 Regulators should not allow banks with negative equity to operate under the protection by the government. These zombie banks undercut the lending rate and weakened the healthy banks. Moreover, zombie banks can help firms with negative equity. These bank-supported firms also under price their products and create more zombie firms.

Deflation is very dangerous. The financial system cannot function well under deflation. Even with zero market interest rate in Japan, the real lending rate is too high for small firms to survive under 2 percent deflation.

Notes

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1 See Shigemi (1995) and BIS (1993) on the causes of asset price inflation in major countries.
2 See Fukao (2000) for details of the Bank Recapitalization Act and Financial Revitalization Act.
3 See Horie (2001).
4 Since this measure is likely to preserve weak financial institutions as a new bank, under largely unchanged management structure, this method of assistance was abolished in March 1999 after the assisted merger of Fukutoku Bank and Naniwa Bank was carried out in October 1998.
5 See Fukao, Mitsuhiro and Japan Center for Economic Research (2000b).
6 In the Zengin electronic fund transfer system, which is the main payment system among customers of banks, the user cannot send his name and messages in Chinese characters because the system cannot handle 2-byte codes. Because of the outdated Bank payment system, more and more cash payments are handled by convenience store chains rather than banks.
7 See Fukao, Mitsuhiro and Japan Center for Economic Research (2000a).
8 See Higo (2001) on the role of GSFIs and their institutional details.

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6 Macroeconomic effects of capital adequacy regulation in Japan

Heather Montgomery

Introduction

The introduction of stricter capital adequacy regulations in Japan under the Basel Accord is often blamed for bringing on a "capital crunch": a reduction in bank lending in response to stricter regulations on bank capital. The capital positions of Japanese banks have been under pressure from several factors throughout the 1990s and pressure on banks to raise their BIS (Bank for International Settlements) capital adequacy ratios has been cited as a cause of the reduction in aggregate lending in the 1990s.

Tight credit conditions have in turn been blamed for Japan's "lost decade" of low economic growth in the 1990s. Despite the Bank of Japan's zero interest rate policy, the Japanese economy has remained stagnant throughout most of this decade. Although real "headwinds," overbuilt commercial real estate and balance sheet adjustment pressure on firms, undoubtedly hampered economic recovery in both countries, the failure of financial intermediaries to play their traditional role in the transmission of monetary policy is often blamed for the ineffectiveness of loose monetary policy.

Fears of a "credit crunch" in the banking sector began surfacing as the economy slipped into recession in 1991. Bank of Japan officials responded to criticism of slow monetary growth rates by pointing to restrictive bank lending policies and faulted pressure to meet the new capital adequacy requirements rather than BOJ policy for sluggish growth (Brauchli 1991). In early 1992, Finance Minister Tsutomu Hata called on government affiliated financial institutions to increase lending to small businesses in order to counteract the credit crunch facing small manufacturers (Hardy 1992). Nissho Iwai Corporation Chairman and future Bank of Japan Governor Masaru Hayami called for a suspension of BIS capital adequacy requirements, citing fears of a credit crunch (Chandler 1992).

Even as the Japanese economy began a short-lived recovery in 1993, the Bank of Japan reported in its Quarterly Economic Outlook that "in comparison with previous phases of monetary ease, bank lending is expected to supply a limited stimulus" (BOJ 1993).

By 1998, *The Economist* proclaimed that "It is a truth universally acknowledged that Japan is in the grip of a credit crunch" (although the article goes on to say that there is a dearth of evidence). In his first public address after taking office in 1998, BOJ Governor Hayami recognized that financial institutions were finding it difficult to extend new loans because of the contraction in their capital base. Responding to criticism of the Banks' failure to effectively stimulate monetary growth, Hayami pointed out that further stimulus either in the form of further interest rate cuts or government bond purchases would be ineffective given the inability of Japan's weak financial sector to increase lending (Hayami 1998).

This chapter explores the effect of regulatory change on real economic activity, in particular examining the effect of stricter bank capital adequacy standards introduced under the Basel Accord on the economy of Japan in the 1990s. Addressing this issue requires both microeconomic and macroeconomic analysis. At the micro level, this chapter investigates whether Japan's banks experienced a "capital crunch"; whether the introduction of stricter capital adequacy standards under the Basel Accord caused banks to cut back on lending. At the macro level, this chapter analyzes to what extent Japan's "lost decade" of the 1990s can be attributed to a "credit crunch" in the banking sector.

The question of whether real economic activity was affected by the capital crunch is an important one. Even if banks in Japan facing pressure to meet capital requirements reduced the supply of loans, if borrowers had access to close substitutes for bank credit or were able to switch easily to lenders that were not facing capital pressure, real economic activity may not have been much affected by the reduction in bank credit. Thus, this study addresses the question of how important the health of the banking sector is to the performance of the overall economy and what real economic repercussions changes in banking regulation had in Japan in the 1990s.

Literature review

Much of the "credit crunch" research has used cross sectional data on banks to investigate the relationship between risk-based capital ratios and lending. The literature on the United States experience generally report that banks experienced a "capital crunch" in the early 1990s: pressure on bank capital has had significant effects on bank portfolios.[1] Existing evidence on the behavior of Japanese banks also points to the conclusion that the introduction of the BIS capital standards prompted banks to reduce loans, resulting in a "capital crunch."[2] For example, Peek and Rosengren (1997) find evidence that capital constraints brought on by the decline in the Japanese stock market was associated with a decrease in lending by Japanese banks in the United States. Ito and Sasaki (2002) shows that banks with lower capital ratios tended to issue more subordinated debts

and reduced lending. A study by Horiuchi and Shimizu (1998) looking at the "top 20" Japanese banks finds a negative statistical relationship between capitalization and loan growth. However, the authors conclude that the recapitalization via subordinated debt issues, which is also documented in Ito and Sasaki (2002), produced a conservative lending attitude by banks. Honda (2002) takes a different approach, investigating the effect of a dummy variable signifying the Basel Accord regulatory change on the ratio of credit to total assets. The result provides evidence that the Basel Accord reduced the ratio of credit to total assets between 1988 and 1995, and that the effect of the accord was stronger on international banks than on domestic banks.

However, there has not been much research linking the micro-level capital crunch in either the United States or Japan, to aggregate economic activity. Bernanke and Lown (1991) conducted one of the earliest macroeconomic studies of the credit crunch in the United States. The authors do find a positive relationship between bank lending and employment growth in a cross section of US states, but the results are not robust when bank capital is used to instrument for bank lending. The authors conclude that although a credit crunch probably did occur, imposing costs on some borrowers, their regression may be too crude to measure the resulting macroeconomic effects. Hall (1993) combines both a macroeconomic and cross sectional approach. Hall (1993) begins by examining aggregate portfolio changes from 1988–1992, the transition period for implementing the Basel Accord. Comparing portfolio changes during the transition period to changes in five earlier recessions, he shows that the growth rate of bank lending during the transition period is lower than in earlier economic downturns. Hall (1993) then regresses loans on industrial production and personal income for the period 1959–1992 and finds that loans for the period 1989–1992 were less than out-of-sample forecasts, providing evidence in support of the credit crunch hypothesis. Hancock and Wilcox (1998) present estimates of how much real economic activity in the United States declined when bank loans declined in 1990. The authors find that real economic activity was reduced more by capital and that loan declines at small banks were greater than declines at large banks.

One of the few studies to analyze macroeconomic data for Japan, Kim and Moreno (1994), focus on the effect of stock price movements on bank lending. Using a vector autoregression model, the authors show that the response of bank loans to innovations in the stock market index became positive and significant in a post-1984 sub-sample. Their findings provide evidence that bank lending in Japan is sensitive to fluctuations in one type of capital; asset prices, on aggregate, but do not link this to the real economy. Thus, this study fills a void in the current literature by linking regulatory changes to bank credit and bank credit in turn to real economic activity in Japan.

Microeconomic analysis

The microeconomic analysis presented in this section explores whether stricter capital adequacy requirements on banks, introduced under the Basel Accord of 1988, resulted in a "capital crunch": a reduction in bank credit as a result of pressure on capital adequacy ratios.

The Basel Accord of 1988

The Basel Committee on Banking Supervision, originally comprised of representatives of the central banks and supervisory authorities of the G-10 countries (Belgium, Canada, France, Germany, Italy, Japan, Netherlands, Sweden, Switzerland, United Kingdom, United States) and Luxembourg, was formed to secure international convergence of supervisory regulations on capital adequacy (Wagster 1996). The Basel Committee is under the aegis of the Bank for International Settlements, but has no formal authority. The agreement is carried out on a voluntary basis by signatory countries, which now number over 100.

Calls to standardize capital adequacy regulations were prompted in large part by the aggressive expansion of Japanese banks in the 1980s. Prior to the Basel Accord, a comparatively lenient regulation requiring all banks to maintain capital of at least 4 percent of deposits had been enforced in Japan by the Ministry of Finance. There were complaints from the international banking community that this regulatory leniency gave Japanese banks an unfair advantage in gaining market share.

Although the Basel Accord was agreed upon in principle in 1988, banks in Japan were given a 5 year transition period in which to adjust to the new standards before the Accord was written into domestic law and became binding in fiscal year 1992. The agreement requires internationally active banks to maintain a BIS (Bank for International Settlements) ratio of capital to risk weighted assets of at least 8 percent.

$$BIS = \frac{Tier\,1 + Tier\,2 + Tier\,3 - Goodwill}{RWA}$$

- Tier 1, or Core, Capital is basically shareholder's equity, with some adjustment for goodwill. Tier 1 Capital includes perpetual preferred stock.
- Tier 2 Capital in Japan includes up to 45 percent of the latent capital gains banks hold on equities, 45 percent of any revaluation of land held on their books,[3] up to 1.25 percent of General Loan Loss Provisions, Dated Preferred Stock and Dated Subordinated Debt dated at more than 5 years. Dated Preferred Stock and Subordinated Debt are counted at full value up to 50 percent of the value of Tier 1 capital.
- Tier 3 Capital includes short-term (more than 2 years but less than 5 years) subordinated debt.

Risk Weighted Assets (RWA) are calculated as a weighted sum of assets held by the bank. "Riskless" assets such as government bonds, receive a 0 percent weighting, while "risky" assets such as loans, corporate bonds and equities receive a 100 percent weighting. Mortgages and local government bonds fall in between.

Japanese regulators allowed Japanese banks with purely domestic business the option of maintaining a MOF (Ministry of Finance) ratio of capital to assets of at least 4 percent.[4]

$$MOF = \frac{Tier\,1 + Tier\,2(MOF) - Goodwill}{RWA\ (MOF)}$$

Most components of the MOF ratio are calculated similarly to the BIS ratio for international banks, but Tier 2 Capital does not include latent capital gains on securities and short-term subordinated debt is not counted as Tier 3 capital.

Table 6.1[5] identifies the number of banks subject to the 4 percent MOF and 8 percent BIS capital adequacy ratio, as well as the number of banks that succeeded in meeting each standard in the years following the signing of the Basel Accord. Domestic banks in Japan are required to maintain at least a 4 percent MOF capital adequacy ratio, but domestic banks may choose to pursue the 8 percent BIS capital adequacy ratio. Several banks seem to have struggled to meet the 8 percent or 4 percent standard in the years between 1988, when the Basel Accord was reached, and 1992, when the requirement became effective. After 1992, with the exception of one bank which was nationalized,[6] all "international" banks met the 8 percent requirement. Note however, that many banks switched from pursuing the 8 percent standard to the 4 percent standard. The

Table 6.1 Banks subject to BIS 8% and MOF 4% ratio

Year	*No. banks aiming for 4% MOF*	*MOF ratio <4%*	*MOF ratio ≧4%*	*No. banks aiming for 8% BIS*	*BIS ratio <8%*	*BIS ratio ≧8%*
1988	53	21	32	85	10	75
1989	53	16	37	85	18	67
1990	53	18	34	85	2	83
1991	53	11	42	85	4	81
1992	53	9	44	85	0	85
1993	53	9	44	85	0	85
1994	54	6	48	84	0	84
1995	55	6	49	83	0	83
1996	58	7	51	79	0	79
1997	94	0	94	44	0	44
1998	102	2	100	36	0	36
1999	106	0	106	25	0	25

number of banks aiming for 8 percent remained constant at around 85 for the first half of the sample, but by 1997 the number had fallen to 44, and in the most recent fiscal year only 25 banks were still pursing the 8 percent BIS standard. Appendix 1 provides a list of the banks that switched from pursuing the 8 percent BIS ratio to the 4 percent MOF ratio in each year.

A bank needing to raise its capital ratio in order to meet either the 8 percent BIS or 4 percent MOF requirement can either adjust risk-weighted assets (the denominator) or capital (the numerator). It is generally easier and less costly for banks to adjust their risk-weighted assets. Thus, capital constrained banks may be inclined to substitute out of heavily weighted "risky" assets such as loans and equities into lower weighted assets such as government bonds. Or, conversely, banks receiving a capital injection from the government may be inclined to shift their portfolios by shifting out of government bonds into loans. This section investigates whether this incentive to shift away from heavily risk weighted assets in order to reduce risk weighted assets and boost capital to asset ratios may have resulted in a "capital crunch," reducing the supply of bank loans.

Model of representative bank behavior

This sub-section presents a rational expectations model of bank behavior in which a representative bank maximizes the present discounted value of future profits. In this simplified model, the bank earns revenue on loans net of the costs of obtaining funds in the form of deposits. It is assumed that the bank views itself as a price taker, so interest rates earned on loans or paid on deposits are exogenously given at the prevailing market rate. The bank also earns a benefit for maintaining a high ratio of capital to assets relative to some target level. This benefit may depend upon the regulatory state. The banks' capital stock at time t is assumed to be exogenously given in each time period, so banks wishing to adjust their capital to asset ratio do so through loans. However, banks face adjustment costs on any changes to the rate of loan growth.

A Taylor series approximation of the capitalization term yields an intercept term and a slope term, implying that banks react to a regulatory change by adjusting the level of the target capital ratio and/or the sensitivity of loan growth to capitalization. Other operating costs are assumed proportional to total loans and are absorbed in the loan adjustment costs term.

Taking these revenues and costs into account, a representative bank chooses loans so as to maximize the expected present discounted value of its future stream of profits. This dynamic maximization yields an Euler equation for loan growth in terms of lagged loan growth, interest rates, capitalization and the regulatory state, which will later be empirically estimated.

Revenues

Let a simplified bank balance sheet in which loans are the only asset and deposits the only liability,[7] be represented by the following:

Assets	Liabilities
A	D
	K

where $L =$ Loans, $D =$ Deposits, and $K =$ Capital (Shareholders' Equity), and shareholders' equity is calculated according to the accounting identity $L - D = K$. Capital, K, and the interest rates on loans, r^L, and deposits, r^D, are assumed to be exogenously given in each time period t.[8] The revenue of an individual bank at any given point in time is determined by the gross return on loans minus the amount paid for deposits.

$$R_{i,t} = r_t^A \mathrm{A}_{i,t} - r_t^D D_{i,t} \tag{1}$$

Or, substituting in the short run capital constraint:

$$R_{i,t} = (r_t^A - r_t^D) A_{i,t} - r_t^D K_{i,t} \tag{2}$$

Costs

There is some benefit, B_t, to high capitalization (a high capital to loan ratio), which depends upon the (discrete) regulatory state θ, which takes the value 0 or 1, representing pre- and post-Basel.

$$B_{i,t} = K_{i,t} h_\theta \left(\frac{K_{i,t}}{A_{i,t}} \right) \tag{3}$$

This benefit may come in the form of decreased regulatory scrutiny, reputational benefits for existing equity holders, or simply the benefit of being able to make decisions on loan supply independent of capital constraints once the required capital ratio is cleared. Although bank capital is assumed to be exogenously determined, banks can adjust the capital ratio, and therefore the costs or benefits associated with it, by adjusting loan growth.[9]

However, there are some adjustment costs A_t associated with any change in loans.[10]

$$A_{i,t+1} = L_{i,t} f \left(\frac{L_{i,t+1} - L_{i,t}}{L_{i,t}} \right) \tag{4}$$

The source of these costs when banks are increasing the rate of loan

growth may seem fairly intuitive: the costs of hiring new staff or seeking out new borrowers. However, there may also be significant costs to cutting back on loans, the phenomenon that was observed in response to the Basel Accord capital adequacy standards. These are costs associated with altering the time structure of the banks' portfolio, the increased risk of default when loans are called in early, or the costs of damage to a long-term business relationship when existing lines of credit are closed (loans are not rolled over).

As presented here, $h(.)$ and $f(.)$ are general, non-specified concave and convex functions, respectively. As stated above, the bank views the stock of capital, K_t, and interest rates, r^L_t and r^D_t as exogenously given. Banks select loans at time t in order to maximize expected present discounted value π_t:

$$\max_{Lt} \pi_{i,t} = E_t \Sigma b^j \left[(r^L_{i+j} - r^D_{i+j}) L_{i,t+j} + r^D_{i+j} K_{i,t+j} - L_{i,t+j-1} f \left(\frac{L_{i,t+j} - L_{i,t+j-1}}{L_{i,t+j-1}} \right) + K_{i,t} h_\theta \left(\frac{K_{i,t}}{L_{i,t}} \right) \right] \tag{5}$$

where $0 < b < 1$ is the rate of discount.

Maximization with respect to L_t yields the Euler equation:

$$E_t \left[(r^L_{t+j} - r^D_{t+j}) + h'_\theta \left(\frac{K_{i,t+j}}{L_{i,t+j}} \right) - L_{i,t+j-1} f' \left(\frac{L_{i,t+j} - L_{i,t+j-1}}{L_{i,t+j-1}} \right) \right] \tag{6}$$

$$= E_t \left[-bL_{i,t+j} f' \left(\frac{L_{i,t+j+1} - L_{i,t+j}}{L_{i,t+j}} \right) - bf \left(\frac{L_{i,t+j+1} - L_{i,t+j}}{L_{i,t+j}} \right) \right]$$

Letting

$$-L_{i,t+j-1} f' \left(\frac{L_{i,t+j} - L_{i,t+j-1}}{L_{i,t+j-1}} \right) = \Psi(\Delta \log(L_{i,t+j})) \tag{7}$$

$$-bL_{i,t+j} f' \left(\frac{L_{i,t+j+1} - L_{i,t+j}}{L_{i,t+j}} \right) - bf \left(\frac{L_{i,t+j+1} - L_{i,t+j}}{L_{i,t+j}} \right) = \Upsilon(\Delta \log(L_{i,t+j+1})) \tag{8}$$

$$h'_\theta \left(\frac{K_{i,t+j}}{L_{i,t+j}} \right) = \Phi_\theta \left(\log \left(\frac{K_{i,t+j}}{L_{i,t+j}} \right) \right) \tag{9}$$

The Euler equation can be represented in the following log-linearized form:

$$E_t[\Delta \log(L_{t+j+1})] = E_t \left[\beta_1 \Delta \log(L_{t+j}) + \beta_2 (r^L_{t+j} - r^D_{t+j}) + \beta_{3,\theta} + \beta_{4,\theta} \log \left(\frac{K_{i,t}}{L_{i,t}} \right) \right] \tag{10}$$

Note that the constant term, β_3, and the coefficient on capitalization, β_4, may change depending upon the regulatory environment, θ.

Empirical methodology

The model presented above provides a framework for testing whether loan growth became more sensitive to capitalization after the Basel Accord of 1988. This section outlines the methodology and data used in empirically testing the implications of the model presented above.

Replacing conditional expectations in the log-linearized Euler equation 10 with actual values yields an equation of the form:

$$\Delta\log(L_{t+j+1}) = \beta_1\Delta\log(L_{t+j}) + \beta_2(r^L_{t+j} - r^D_{t+j}) + \beta_{3,\theta} + \beta_{4,\theta} \log\left(\frac{K_{i,t}}{L_{i,t}}\right) + \varepsilon_{i,t+1} \tag{11}$$

Where $\varepsilon_{i,t+1}$ is a rational expectations error term, which is serially uncorrelated and orthogonal to information available at time t. The expectation conditional on time t information, I_t, is $E[\varepsilon_{i,t+1} \mid I_t] = 0$, suggesting that period t instruments are valid. However, to address concerns that the capital to asset ratio, $K_{i,t}/L_{i,t}$, may be correlated with the error term $\varepsilon_{i,t+1}$, equation 11 is estimated by 2-stage least squares using lagged instrumental variables.

Since the model presented here only incorporates loan supply, there may be omitted variables, such as macroeconomic events or loan demand conditions, that affect loan growth in each time period. Two empirical specifications are estimated to account for these omitted variables. In one specification, lagged GDP growth is included in the empirical specification as a "Z" variable[11] to account for macroeconomic conditions. However, since it is impossible to include an exhaustive list of "Z" variables that will adequately account for credit demand and macroeconomic conditions, an empirical specification including time fixed effects is also estimated. The estimation results of both empirical specifications are reported below. In addition, the results of an estimation including individual fixed effects in addition to time fixed effects are reported.

Data

A panel of data from 131 Japanese banks' balance sheets and income statements for fiscal years 1982–1999 is used in a empirical estimation based upon the above model. As explained above, international and domestic banks in Japan are held to different standards. Under the Basel Accord, an international bank, defined as any bank with an overseas branch office, is subject to an 8 percent BIS ratio requirement. In Japan,

domestic banks are only required to maintain a 4 percent MOF ratio requirement, but they may self-select to pursue the 8 percent BIS ratio requirement. Initially, several purely domestic banks that did not have an overseas office and did not engage in international lending elected to report the BIS capital adequacy ratio and hold themselves to the 8 percent standard. However, all but two of these banks, Michinoku Bank and Iyo Bank, have since switched to pursuing the domestic 4 percent MOF ratio target. In addition, since 1988 several internationally active banks chose to close their international offices and switch from pursuing the 8 percent BIS ratio to the 4 percent MOF ratio. These regulatory differences likely affected how different types of Japanese banks respond to changes in their regulatory capital ratio.

These potential differences are allowed for in the estimation by separating the sample into three sub-samples: domestic banks, international banks and "switcher" banks. The three sub-samples are comprised of 47 "domestic" banks that have been aiming for a 4 percent MOF ratio continuously throughout the post-Basel Accord period, 25 "international" banks that have been aiming for an 8 percent BIS ratio continuously throughout the post-Basel Accord period, and 59 "switcher" banks that originally reported a BIS ratio but switched sometime in the post-Basel Accord period to reporting a domestic MOF ratio. 21 banks are excluded from the analysis due to nationalization, failure, or because they were established mid-sample. The appendix presents a detailed list of the banks included in each group.

Mergers are accounted for by treating the merged bank as one entity for the entire sample period. For example, Tokyo-Mitsubishi bank is treated as one bank throughout the sample period, with the balance sheets of Tokyo Bank and Mitsubishi Bank being combined even in the years before the merger took place. Balance sheet data is reported at book value and on a unconsolidated basis. In fiscal year 1997 many large banks began reporting on a consolidated basis and all banks are now required to do so, but unconsolidated data is used in order to construct a continuous time series.

Loans are the sum of domestic loans to all industries plus international loans and trust account loans as reported in the annual yukashoken hokokusho reports. Comment: A Lagrange Multiplier test (Durbin's h test) for serial correlation in the presence of a lagged dependent variable as proposed by Godfrey (1978) and Breusch (1978) failed to reject the null hypothesis of no serial correlation.[12] The growth rate of loans seems to be well approximated as a stationary process.

The measure of capital used in the empirical analysis is meant to approximate the Basel definition of Tier 1 capital. Since an exact measure of Tier 1 capital is not available prior to fiscal year 1988, the book value of each banks' net worth as reported in the annual yukashoken hokokusho is used. Tier 1 capital as defined in the Basel Accord is adjusted for minority

interest in consolidated subsidiaries, but mostly consists of shareholders equity, as would be reported in the yukashoken filing.

There are several advantages to using this measure of capital rather than the actual BIS capital ratio. The first is data availability. Actual BIS ratios and measures of Tier 1 and Tier 2 capital are only available from 1988 and it is of interest to know how bank behavior may have changed after the introduction of new regulations stemming from the Basel Accord rather than to simply look at the empirical relationship between loans and capital ratios after the Accord was signed.

Second, this measure of capital is advantageous because it does not include subordinated debt issues. In recent years, the Japanese government has made direct purchases of subordinated debt as a way in recapitalizing the troubled banking sector. These capital injections, initiated in March of 1998, 1999 and 2000 amounted to over 8 trillion yen, or approximately 80 billion dollars. Even prior to these overt policy actions, the Ministry of Finance often arranged subordinated debt purchases for troubled banks. Non-bank finance companies or insurance companies affiliated with large banks were pressured by the Ministry of Finance to purchase subordinated debt issues in order to help troubled banks meet the 8 percent BIS ratio required under the Basel Accord. Thus, measures of capital including subordinated debt are likely to be negatively correlated with the banks "core" capital measure. As pointed out indirectly by Horiuchi and Shimizu (1998), the findings of moral hazard behavior in previous studies of the relationship between bank capital and lending in Japan may be due to the fact that the measure of capital used in these studies includes Tier 2 capital, and therefore subordinated debt issues. Even if capital constrained banks in Japan react by cutting back on loans in order to boost BIS ratios, the fact that the government regularly intervenes by supplying Tier 2 capital to weak banks at the close of the fiscal year could yield the opposite statistical relationship if the measure of capital used includes subordinated debt issues.

In all the data series, log changes are used to approximate growth rates. GDP and the average interest rate on loans and deposits are aggregated up to annual averages from the monthly statistics reported by the research and statistics department of the Bank of Japan.

Empirical results

Table 6.2 reports the results of an estimation of equation 11, including lagged GDP growth as a "Z" variable to account for macroeconomic conditions. For all 3 bank groups – international, domestic and "switcher" – the parameter estimate on lagged loan growth is statistically significantly positive at the 5 percent level and less than 1 as would be expected. Parameter estimates for GDP loan growth and the interest rate spread are also positive, as would be expected for a loan supply equation, and statistically

Table 6.2 Instrumental variables estimation of equation 11

Dependent variable $\Delta L_{i,t+1}/L_{i,t}$			
Sample	*International*	*Domestic*	*"Switcher"*
Observations	*449*	*845*	*1060*
$\frac{\Delta L_{i,t}}{L_{i,t-1}}$	0.465* (0.050)	0.179* (0.039)	0.348* (0.034)
$\frac{\Delta GDP_t}{GDP_{t-1}}$	0.221 (0.150)	0.451* (0.113)	0.239* (0.111)
$\gamma^L_{t-1}-\gamma^D_{t-1}$	2.109* (0.641)	2.532* (0.505)	2.366* (0.492)
$\frac{K_{i,t-1}}{L_{i,t-1}}$	−0.601 (0.338)	−1.656* (0.350)	−0.846* (0.278)
Basel	−7.607* (2.063)	−4.844* (0.512)	−5.120* (1.838)
$\frac{K_{i,t-1}}{L_{i,t-1}} \cdot$ *Basel*	0.985* (0.420)	1.653* (0.411)	0.813* (0.371)
$\frac{K_{i,t-1}}{L_{i,t-1}} \cdot$ *SwitchYR*			0.104 (0.412)
SwitchYR			−1.242 (2.454)

Note
*Indicates significance at 5% level.

significant at the 5 percent level. The parameter estimate on the capital to asset ratio is not statistically significantly different from zero in the pre-Basel period for international banks. For the domestic and switcher banks, the coefficient on the capital to asset ratio in the pre-Basel period is actually negative, suggesting that less well capitalized banks may have grown loans relatively faster.

Turning to the post-Basel period, the "Basel" dummy variable is negative and statistically significant at the 5 percent level for all the bank groups, indicating that banks of all types have reduced loan growth in the post-Basel period since FY 1988. Quantitatively, this coefficient is largest for the international banks, followed by the "switcher" banks and domestic banks.

Finally, the parameters of most interest, the coefficient estimates for capital to asset ratios in the post-Basel period, are positive and statistically significant for all three bank groups. This indicates that the sensitivity of lending to capital to asset ratios changed significantly for all three types of banks in the post-Basel period.

However, closer inspection of the coefficient estimates reveals some important differences in the behavior of the 3 bank groups. For domestic

and "switcher" banks, the positive coefficient estimates on capital ratios in the post-Basel period are not very large relative to the negative coefficient estimates on capital ratios in the pre-Basel period. This means that the net effect of capital ratios on loan growth may be negligible for banks in these groups.

For the "switcher" banks, a dummy term is included for the period after the switch year when each bank switched from pursuing the 8 percent BIS capital adequacy requirement to pursuing the domestic 4 percent MOF requirement. This switch year dummy is also interacted with the capital to asset ratio. Neither coefficient estimate is statistically significantly different from zero, suggesting that the switch from pursuing the 8 percent BIS ratio to pursuing the 4 percent MOF ratio did not significantly affect the sensitivity of lending to capitalization for these banks. In this empirical specification the switcher banks do not appear to have acted very differently from domestic banks to begin with – as stated above lending by both domestic and switcher banks appears relatively insensitive to capitalization – so this is not surprising. On the contrary, the coefficient estimate on capital ratios in the post-Basel period for international banks is large, and the coefficient estimate on pre-Basel capital ratios was not significantly different from zero to start with.

Overall, we may conclude that although all bank groups were affected by the regulatory change, the net effect was much larger for international banks in Japan. This result is consistent with the observation that required capital ratios were higher for international banks than domestic banks in the post-Basel period.[13] In addition, capital requirements for international banks were likely more strictly enforced by regulatory authorities and international banks may have had stronger individual incentives to meet the requirement.

Table 6.3 presents the results of a specification including time fixed effects.[14] The results reported in Table 6.3 largely confirm the findings above. Similar to the results reported in Table 6.2, the parameter estimate on lagged loan growth is statistically significantly positive at the 5 percent level and less than 1 for all 3 bank groups. Once macroeconomic factors are accounted for using fixed time effects, the coefficient estimates for the capital to asset ratios are not statistically significantly different from zero in the pre-Basel period for any of the bank groups.

For domestic banks, the coefficient estimates on capital to asset ratios in the post-Basel period are also not statistically significantly different from zero, indicating that the change in regulatory regime did not affect the sensitivity of loan growth to capitalization for domestic banks.

Loan growth for the "switcher" banks is sensitive to capitalization, as demonstrated by the positive and statistically significant coefficient estimate on capitalization in the post-Basel period for the "switcher" banks. However, as in the previous specification, the behavior of the "switcher" bank group does not seem to have changed once these banks switched

Table 6.3 Instrumental variables estimation with time fixed effects

Dependent variable $\Delta L_{i,t+1}/L_{i,t}$			
Sample	*International*	*Domestic*	*"Switcher"*
Observations	*449*	*845*	*1061*
$\frac{\Delta L_{i,t}}{L_{i,t-1}}$	0.429*	0.147*	0.299*
	(0.044)	(0.037)	(0.033)
$\frac{K_{i,t-1}}{L_{i,t-1}}$	−0.460	−0.464	−0.520
	(0.295)	(0.388)	(0.292)
$\frac{K_{i,t-1}}{L_{i,t-1}} \cdot Basel$	1.260*	0.745	0.826*
	(0.354)	(0.434)	(0.340)
$\frac{K_{i,t-1}}{L_{i,t-1}} \cdot SwitchYR$			0.188
			(0.157)

Note
*Indicates significance at the 5% level.

from pursuing the 8 percent BIS capital adequacy ratio to pursuing the domestic 4 percent MOF capital adequacy ratio. This is illustrated by the statistically insignificant coefficient estimate on the capitalization – "switch year" interaction term.

For international banks, the coefficient estimate on capital to asset ratios in the post-Basel period are positive and statistically significant at the 5 percent level. In addition, the coefficient estimate on capitalization is quantitatively larger for the international banks, suggesting that the Basel Accord affected international banks pursuing an 8 percent BIS requirement more than eventual "switcher" banks pursuing the same goal. As reported above, the Accord appears not to have affected the lending behavior of domestic banks pursuing the 4 percent MOF ratio at all.

Overall, the results of both empirical specifications indicate that lending in the post-Basel period is significantly linked to capitalization for international banks, but not for domestic banks. The positive parameter estimates on capital ratios in the post-Basel period for international banks indicate that relatively well capitalized banks tended to grow loans relatively quickly (or that less well capitalized banks tended to grow loans relatively slowly). Although there is evidence of a shift in behavior in the post-Basel period for "switcher" banks that originally opted to pursue the 8 percent BIS capital requirement as well, the shift seems to have been largest for international banks. The parameter estimate on capitalization in the post-Basel period is larger for the international banks that for the "switcher" banks, indicating that the effects of the regulatory change were bigger for the international banks. However, the coefficient estimate on capitalization in the post-Basel period is still quantitatively as well as

Table 6.4 Instrumental variables estimation with time and individual fixed effects

Dependent variable $\Delta L_{i,t+1}/L_{i,t}$			
Sample	*International*	*Domestic*	*"Switcher"*
Observations	*449*	*845*	*1060*
$\frac{\Delta L_{i,t}}{L_{i,t-1}}$	0.413*	0.068	0.202*
	(0.047)	(0.039)	(0.035)
$\frac{K_{i,t-1}}{L_{i,t-1}}$	0.194	−0.305	−0.811*
	(0.388)	(0.466)	(0.364)
$\frac{K_{i,t-1}}{L_{i,t-1}} \cdot Basel$	1.548*	0.894	1.191*
	(0.375)	(0.456)	(0.349)
$\frac{K_{i,t-1}}{L_{i,t-1}} \cdot SwitchYR$			0.230
			(0.164)

Note
*Indicates significance at 5% level.

statistically significant for both international and "switcher" bank groups. Capital ratios for Japanese banks varied between 2 percent to 11 percent over the sample period, so a parameter estimate of around 1 (0.8), as estimated for the international (switcher) bank group, indicates that capitalization has an economically significant effect on loan growth of these banks in the post-Basel period. On the contrary, coefficient estimates on capitalization for the domestic banks are found to be either statistically or quantitatively insignificant in both empirical specifications.

Macroeconomic analysis

A natural question following the results of the microeconomic analysis above, is whether the "capital crunch" experienced by the international banks after the implementation of the Basel Accord was manifested on a more aggregate level as a "credit crunch." This section addresses that question as well as the related one of whether or not shocks to aggregate bank credit were transmitted to the real economy, affecting overall economic growth.

Monetary aggregates in Japan

Before moving on the more rigorous vector autoregression analysis, it is instructive to look at the movement of some monetary aggregates in Japan in the 1990s. Figure 6.1 illustrates the movements in monetary aggregates in Japan since 1970. At the start of the 1990s, the money base, money supply (M2), and aggregate loans, declined. Note, however, that the ratio of loans to money was actually rising in Japan until 1993. Apparently loans

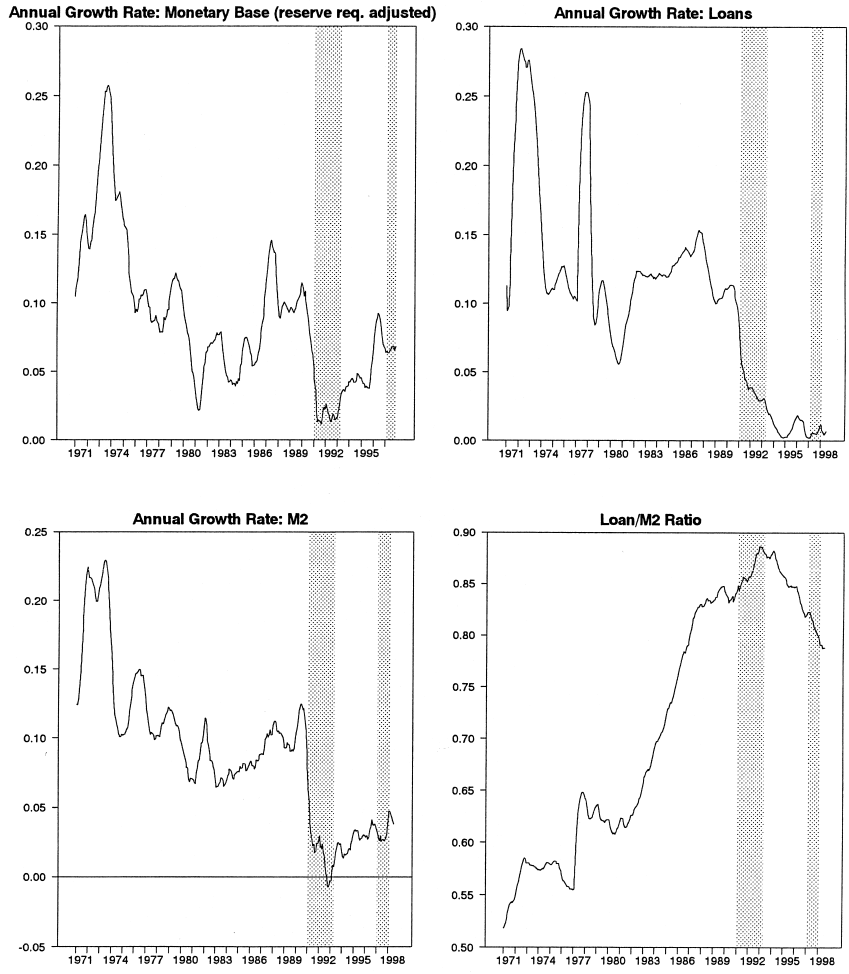

Figure 6.1 Monetary aggregates in Japan.

did not fall off as quickly as M2. After 1993, the ratio of loans to money, fell and has continued to do so through the most recent recession.

Figure 6.2 graphs the money multiplier (m) and its components: the currency to deposit ratio (cr) and the reserve to deposit ratio (rr). The standard textbook definition of the money multiplier is:

$$m = \frac{M}{MB} \tag{12}$$

where money supply M is defined here as M2 (including CDs) and the monetary base MB, or high-powered money, is defined as currency plus

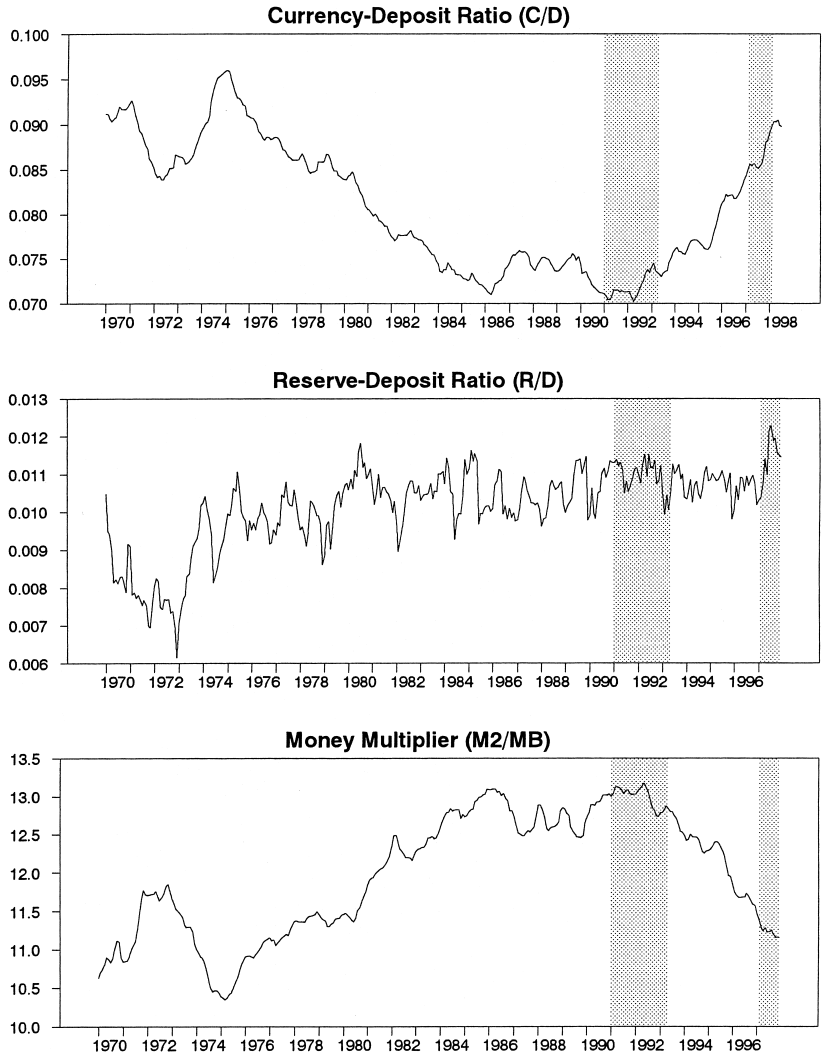

Figure 6.2 The money multiplier in Japan.

reserves. The multiplier can alternatively be written as a function of the currency-deposit and reserve-deposit ratios:

$$m = \frac{cr + 1}{cr + rr} \tag{13}$$

The currency to deposit ratio, *cr*, reflects the preferences of the public and *rr*, the reserve to deposit ratio, reflects the behavior of the banking system. In general, the central bank controls the money supply through

the monetary base, which it influences via open market operations or changes in the discount rate. The monetary authority can also influence the money multiplier through reserve requirements, which influence the reserve to deposit ratios maintained by banks, but this is generally avoided. Therefore, changes in the money multiplier are usually attributed to changes in household or financial sector behavior. For example, the money multiplier in the United States fell sharply in the 1930s when decreased confidence in banks led households to withdraw their deposits and increase their currency holdings, increasing the currency to deposit ratio (cr), and cautious banks raised their excess reserves relative to deposits, increasing the reserve to deposit ratio (rr).

Looking at Japan in the 1990s, the money multiplier did not begin to fall until well into the recession, and its eventual fall resulted from a sharp rise in the currency to deposit ratio (cr). The reserve to deposit ratio (rr) was fairly stable during the post-bubble recession. However, the reserve to deposit ratio has begun to rise sharply during the second official recession of the 1990s, which began in 1997.

The movement of macroeconomic variables does not seem to provide much support for the claim that a credit crunch was responsible for Japan's fall into recession in 1991. The money multiplier was stable until well into the recession, so despite a sharp fall in the growth rate of loans, the fall in M2 is more likely due to the failure of the BOJ to stimulate the monetary base, not to problems in the financial sector. To the extent that the falling money multiplier contributed to the slow growth of M2, its fall should be attributed to the behavior of the public, the rise in the currency to deposit ratio, rather than to the behavior of financial intermediaries.

Empirical methodology

A more rigorous test of the hypothesis that a "credit crunch" was transmitted to the real economy in Japan, contributing to chronic low growth in the "lost decade" of the 1990s is conducted in this section using vector autoregression analysis.

The dynamic multivariate framework considered in this chapter has the following structural moving average representation:

$$Y_t = \Theta(L)\varepsilon_t \tag{14}$$

Where Y_t is an N-dimensional vector of observed endogenous variables, $\Theta(L)$ is a matrix polynomial in the lag operator L, and ε_t is the vector of unobserved structural innovations. These structural innovations are independently identically distributed Gaussian shocks with covariance matrix Σ_ε.

$$E[\varepsilon_t \varepsilon_t'] = \Sigma_\varepsilon \tag{15}$$

Since these underlying structural innovations are mutually and serially uncorrelated, the covariance matrix Σ_ε is diagonal.

Under standard regularity conditions, the system also has a structural vector autoregressive form:

$$B(L)\, y_t = \varepsilon_t \tag{16}$$

Where $B(L) = \Theta(L)^{-1}$ is also a polynomial in the lag operator L.

Since the structural model of equation 16 cannot be directly estimated, for forecasting purposes the structural model above must be transformed into the reduced form:

$$A(L)\, Y_t = u_t \tag{17}$$

Where u_t is a vector of N reduced-form residuals and $A(L)$ is a coefficient matrix, a polynomial in the lag operator L of order ρ. Thus equation 17 can be written as:

$$y_t = \Sigma_\rho^L = 1 A_\rho y_{t-\rho} + u_t \tag{18}$$

Here ρ is selected according to the results of an Akaike Information Criterion (AIC) test to be 4. The covariance matrix of the reduced-form residuals u_t:

$$E[\, u_t u_t' \,] = \Sigma_u \tag{19}$$

is not in general diagonal.

Equation by equation ordinary least squares yields consistent estimates of the coefficient matrix $A(L)$, and the covariance matrix Σ_u.

To more formally investigate how the economy of Japan reacted during periods of recession, the path of each variable is compared to out of sample forecasts values.

$$\hat{Y}_{t+1} = \hat{A}(L)\, Y_t \tag{20}$$

Particular attention is paid to the behavior of bank credit relative to predicted values. A finding that actual values of credit were significantly lower than the expected path of credit when the behavior of other fundamental economic variables is taken into account would confirm the presence of a credit crunch: a backward shift in the supply of credit from banks.

If the value of credit during recession is indeed found to be lower than forecast values, the next step will be to recover the underlying structural innovations to credit in order to test how these innovations affected the real economy.

The observed reduced-form errors, u_t are a combination of the underlying structural innovations ε_t. Identifying the structural innovations requires finding a matrix P such that $u_t = P\varepsilon_t$. From the above, we know that:

$$\Sigma_u = E[u_t u_t'] \tag{21}$$

$$\Sigma_u = PE[\varepsilon_t \varepsilon_t']P' \tag{22}$$

$$\Sigma_u = P\Sigma_\varepsilon P' \tag{23}$$

Since the structural errors ε_t are orthogonal by definition, the diagonal covariance matrix Σ_ε can be normalized to the identity matrix I. Thus, $PP' = \Sigma_u$.

Identification is achieved here by imposing restrictions on B_0^{-1}, the contemporaneous correlation of the variables in the model. Writing out the structural autoregressive form of equation 16 shows how the restrictions on B_0^{-1} allow identification of the underlying structural innovations from the estimated reduced form errors:

$$B_0 y_t = B_1 y_{t-1} + B_2 y_{t-2} + \ldots + B_\rho y_{t-\rho} + \varepsilon_t \tag{24}$$

or

$$y_t = B_0^{-1} B_1 y_{t-1} + B_0^{-1} B_2 y_{t-2} + \ldots + B_0^{-1} B_\rho y_{t-\rho} + B_0^{-1} \varepsilon_t \tag{25}$$

The reduced form equation 18 can be written as:

$$y_t = A_1 y_{t-1} + A_2 y_{t-2} + \ldots + A_\rho y_{t-\rho} + u_t \tag{26}$$

Implying that restrictions can be placed on B_0^{-1} such that $u_t = B_0^{-1}\, \varepsilon_t$. This in turn implies that $P = B_0^{-1}$.

In order to construct conditional forecasts of GDP, it is necessary to identify the structural shocks to the variables one is interested in conditioning the forecasts upon. Here, we are interested in how standard forecasts of GDP compare to forecasts conditioned upon shocks to bank credit. The structural error of credit is recovered using a lower triangular Choleski decomposition of P with the variables ordered such that credit is last. Since P is lower triangular, the Choleski decomposition imposes a causal chain upon the variables. Ordering credit last allows bank credit to respond contemporaneously to all other variables in the system.

Once these underlying structural innovations to credit are recovered using the methodology outlined above out of sample forecasts of GDP conditioned upon these innovations will be compared to the standard unconditional out of sample forecasts of GDP derived earlier. If the

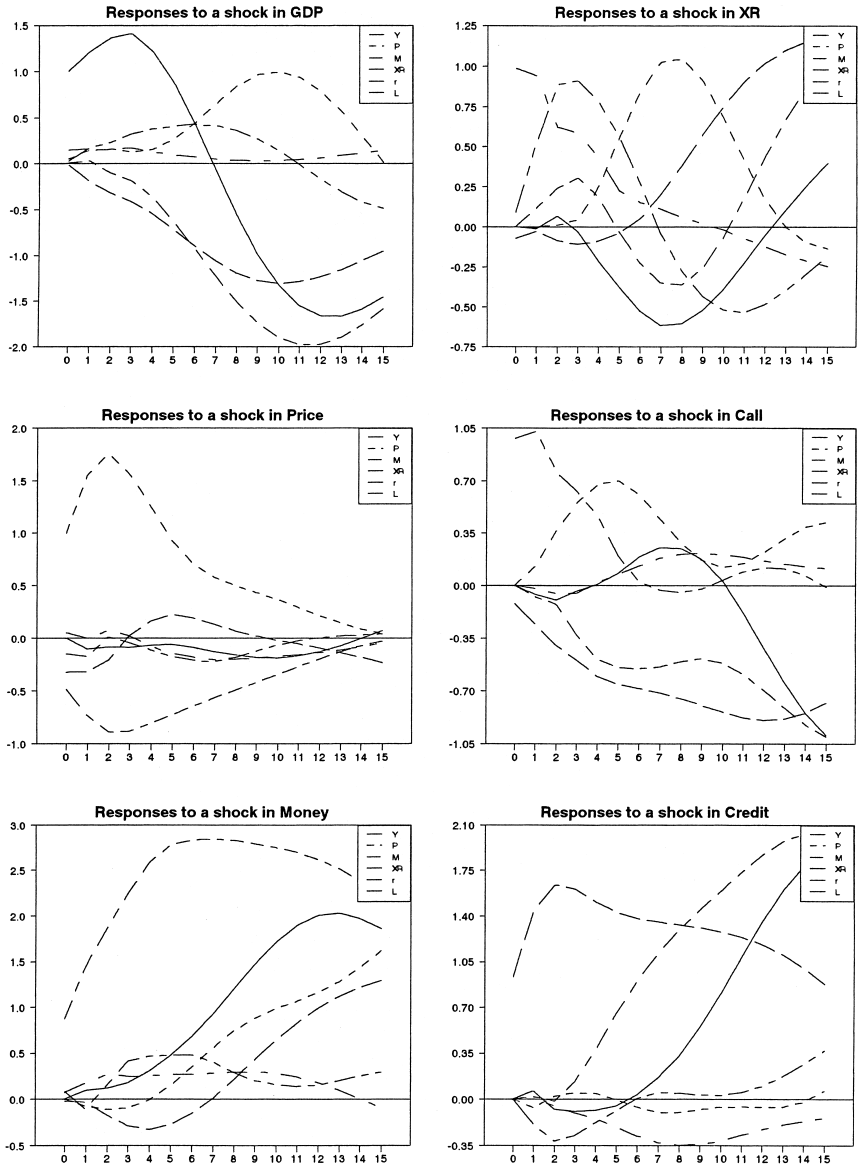

Figure 6.3 Impulse response functions.

conditional forecast of GDP differs substantially from the unconditional forecast of GDP, we may conclude that the structural shocks to credit were in fact transmitted to the real economy. This exercise is carried out using the methodology of Waggoner and Zha (1999) and Zha (1999).

Using the notation of Waggoner and Zha (1999), an h-step out of sample forecast at time t can be written as:

$$\hat{Y}_{t+h} = \Sigma_{\phi=1}^{\rho}\, Y(t-\phi)\, N_{\phi}(h) + \Sigma_{j=1}^{h}\, \varepsilon(t+j)\, M_{h-j} \tag{27}$$

Where

$$N_{\phi}\,(1) = A_{\phi}$$

$$\text{for } \phi = 1, \ldots \rho$$

$$N_{\phi}\,(h) = \Sigma_{j=1}^{\min(\rho, h-1)}\, N_{\phi}(h-j)\, A_j + \phi(h \leq \rho)\phi(\phi \leq \rho - h + 1)\, A_{h+\phi-1}$$

$$\text{for } \phi = 1, \ldots \rho;\ h = 2, 3, \ldots$$

$$M_0 = B_0^{-1}$$

$$M_j = \Sigma_{j}^{\min(\rho, i)=1}\, M_{i-j} A_j \text{ for } i = 1, 2, \ldots$$

Note that $\phi(.)$ is an indicator function, which returns 1 if the statement in parenthesis is true and 0 otherwise.

Equation 27 is comprised of 2 parts. The first term in equation 27 gives the unconditional forecast of Y_{t+h} from equation 20. The second term is the dynamic impact of various structural shocks, which affect the future outcome of the variables in Y through the matrix M_j, the matrix of impulse responses.

Data

Variables included in the vector auto-regression analysis were selected to capture the underlying state of the economy. Estimation is carried out using post-Bretton Woods quarterly data on GDP, the GDP deflator, M2 (+CDs), the exchange rate, the call rate, and aggregate loans. The exchange rate is included since previous research indicates that the exchange rate should be included in the central bank reaction function and the long-run money demand function for Japan (Bryant 1991; Bahmani-Oskooee and Shabsigh 1996).

The data used are quarterly from 1973:1 to 1998:2. Monthly data were converted using the last observation of the quarter. All variables are real, seasonally adjusted, and all except for the interest rate are in logarithms. Quarterly data are used because GDP, the most accurate measure of output, is only available on a quarterly basis. The start data of 1973:1 was selected since this is the first time Japan's exchange rate broke from its Bretton Woods value of 360 yen per dollar.

The measure for loans is taken from the aggregated assets of all banks loans outstanding. The call rate is the widely used indicator of monetary

policy. Other measures, such as the ratio of non-borrowed reserves, are not appropriate here as the BOJ does not target bank reserves. Japan has a combination lagged and contemporaneous reserve system which requires the BOJ to extend enough credit to insure that reserve deposits (which are deposited with the BOJ) match the average amount of legal reserve requirements.

Empirical results

The reduced form equation 17 is estimated from the first quarter of 1973 to the beginning of the recessions: the first quarter of 1991 and the second quarter of 1997.[15] Note that this sample includes data from previous recessions (the first and second oil shocks), when credit fell sharply and businesses reported in the quarterly *tankan* survey that the lending attitude of financial institutions was very tight. Estimates from this model are then used to forecast out of sample values of all the variables from the beginning of the recessions to the official end date. These out of sample forecasts are then compared to the actual values to evaluate how the economy and in particular credit, behaved in the 1990s relative to previous recessions.

Figure 6.4 shows that realized values of the call rate, exchange rate, M2 and the deflator were below forecast values during the early 1990s. However, forecasts of GDP are relatively accurate until early 1992 and the actual realized value of credit is slightly *above* forecast values for the 1991–1993 period. In interpreting Figure 6.4, it should be noted that credit is reported in logs, so the difference between actual and forecast is not as large as it may appear. Even at the most disparate point, the actual value of credit is only 5.7 percent higher than the forecast values.

Continuing with the forecasting exercise, conditional forecasts of GDP confirm that negative innovations in bank credit did not contribute to the recession in Japan in the early 1990s. Figure 6.5 plots actual GDP in Japan during the 1991–1993 recession along with out of sample forecasts of GDP based upon the estimated VAR model, and out of sample forecasts conditioned upon structural shocks to credit. Both the standard out of sample forecasts and the conditional forecast values are fairly accurate through mid-1992. Late into the recession conditional GDP forecasts are higher than actual GDP, indicating that structural innovations to credit contributed positively to GDP in the early 1990s.

The above exercise is repeated for Japan's most recent recession, which began in the second quarter of 1997. Here the results, displayed in Figure 6.6, are quite different. During the 1997 recession, credit fell far short of forecasted values. As was suggested by the rising reserve-deposit ratio illustrated above, it appears that bank credit may have played a role in Japan's current recession. This hypothesis is tested by forecasting GDP conditioned upon the structural shocks to credit during the period. The fore-

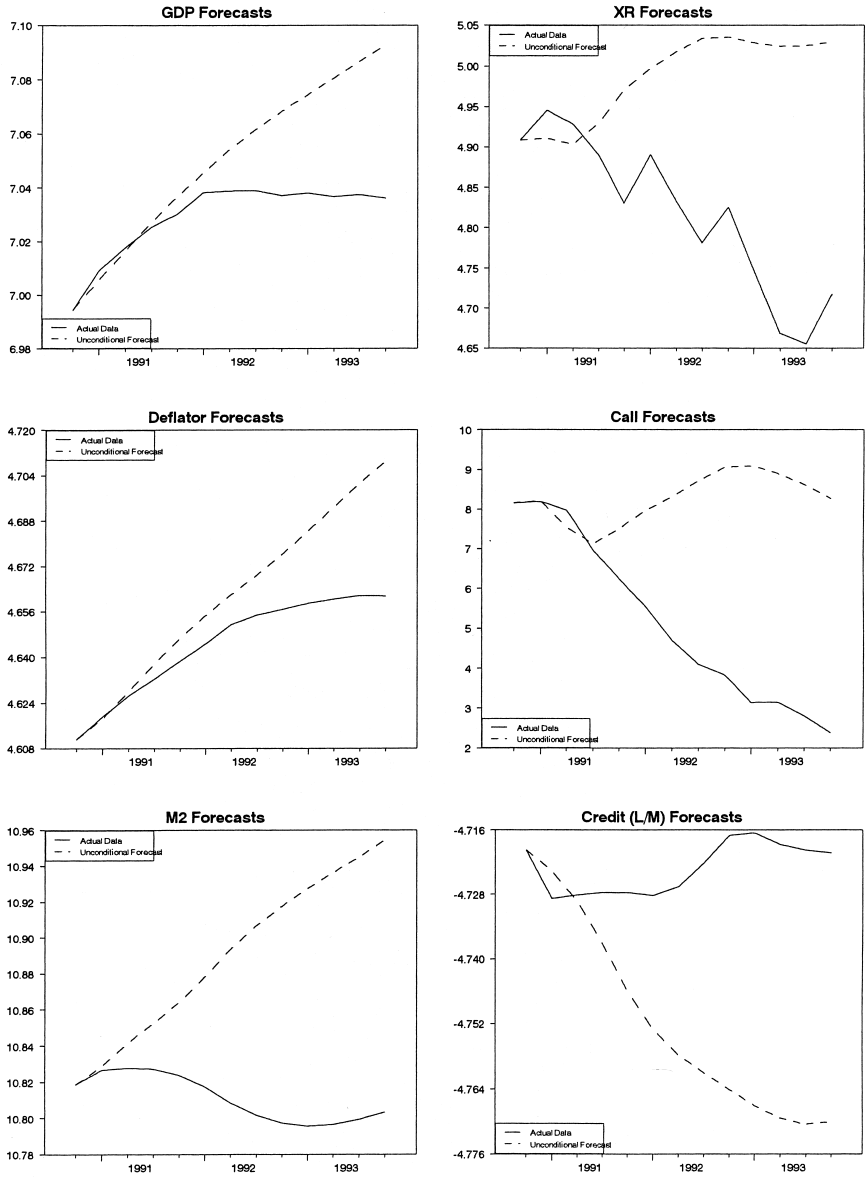

Figure 6.4 1991:1–1993:4 forecasts.

casted trajectory of GDP conditional upon innovations in credit is compared to the unconditional out of sample forecasts of GDP in Figure 6.7. The results illustrate that shocks to bank credit did contribute significantly to Japan's recession in 1997: 1 year into the recession, actual credit is

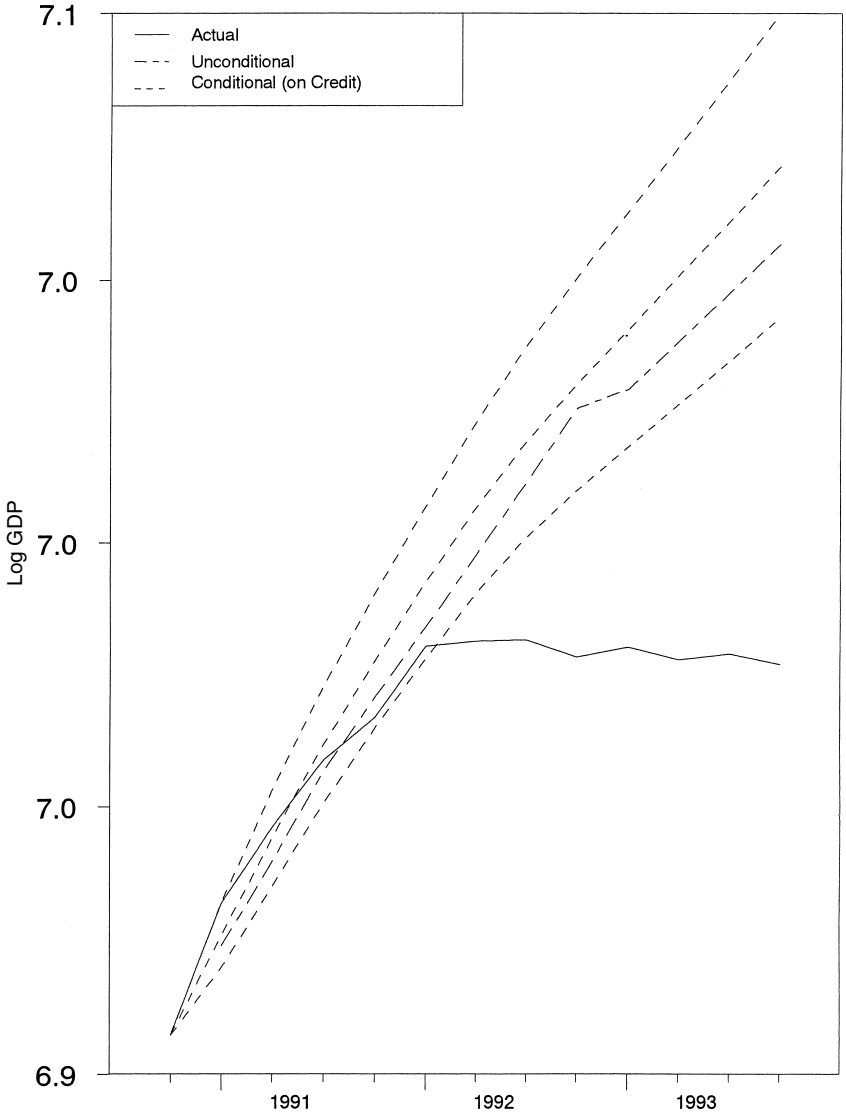

Figure 6.5 GDP forecasts 1991:1–1993:4.

below its forecasted path, and conditioning forecasts of GDP on these negative innovations in bank credit improve out of sample forecasting accuracy significantly. This suggests that Japan's economy is experiencing a credit crunch. Furthermore, there is evidence that this reduced supply of credit is being transmitted to the real economy, affecting aggregate economic performance.

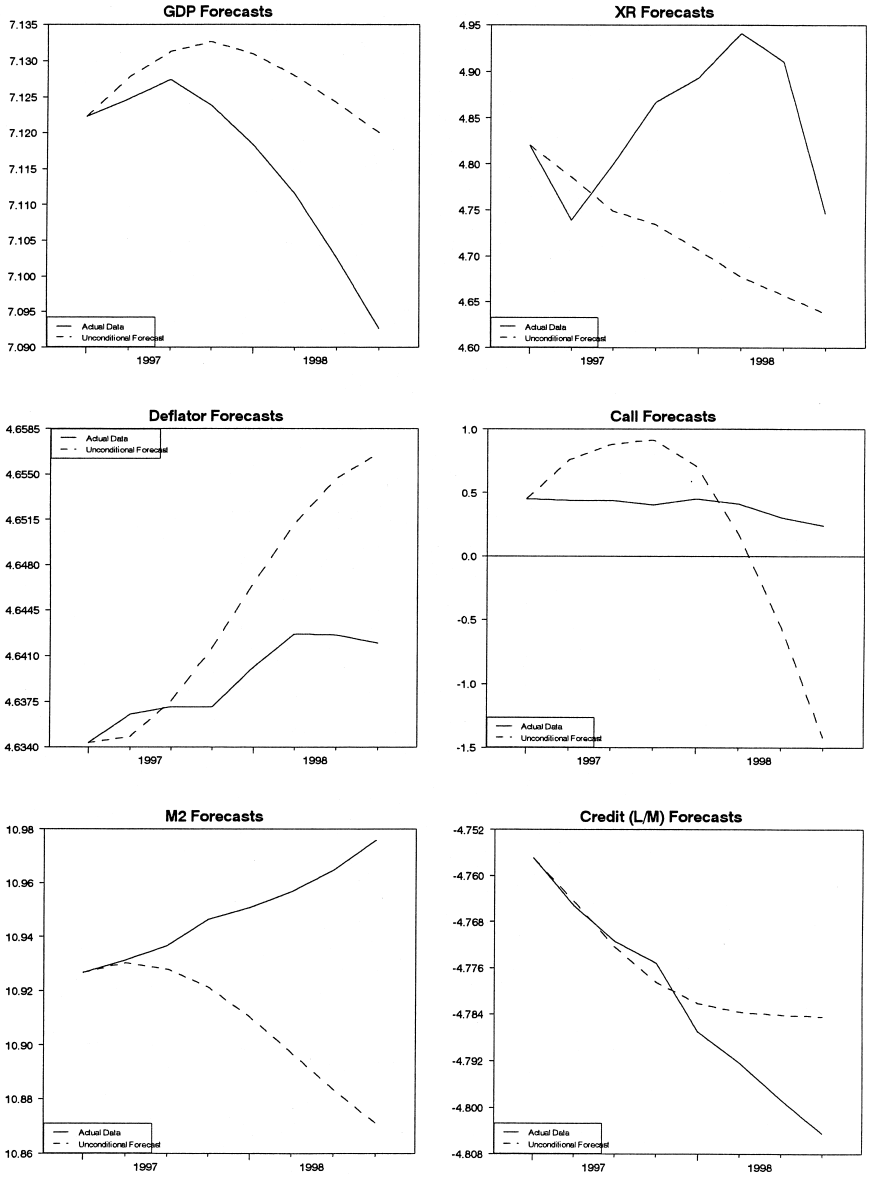

Figure 6.6 1997:2–1999:1 forecasts.

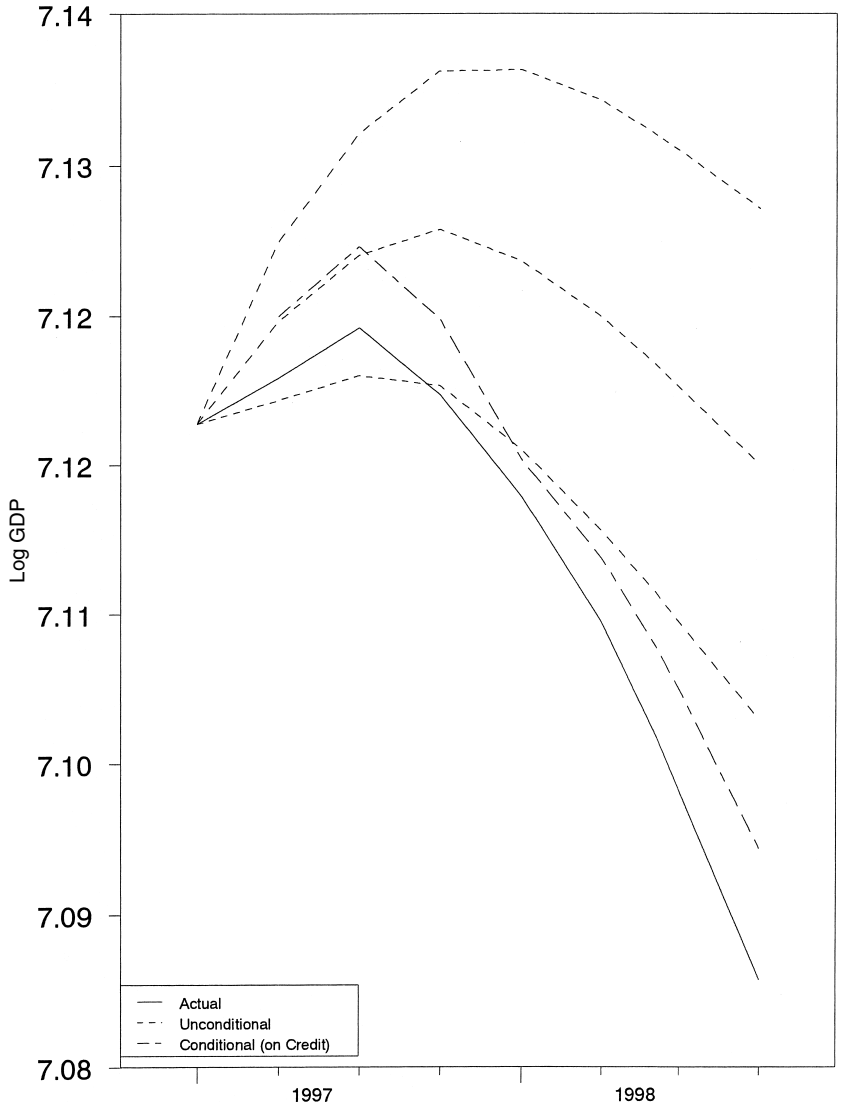

Figure 6.7 GDP forecasts 1997:2–1998:2.

Conclusions

The objective of this study was to investigate the effect of stricter bank regulation on real economic activity in Japan in the 1990s. The microeconomic analysis demonstrated that stricter capital adequacy regulation and declines in bank capital help explain the decline in bank lending in Japan

in the early 1990s. The macroeconomic analysis then goes on to show that the "capital crunch" experienced by the banks was manifested as a "credit crunch" in the late 1990s. Together, the analysis here shows how regulatory changes on Japanese banks were transmitted to the aggregate economy, affecting real economic activity in the late 1990s.

The microeconomic analysis presented here provides evidence that the response to stricter capital adequacy ratios introduced under the Basel Accord of 1988 was different for international and domestic banks in Japan. This study first provides an analytic framework for addressing this question that is consistent with observed behavior of Japanese banks. A rational expectations model of profit maximization incorporating adjustment costs to changes in loan growth provides a theoretical framework for empirically estimating the effect of regulatory changes brought on by the Basel Accord on bank lending. Empirical evidence is found that for international banks in Japan, the sensitivity of loan growth to capitalization has increased in response to stricter capital adequacy requirements introduced under the Basel Accord of 1988. A similar finding is reported for a group of "switcher" banks that initially pursued the same 8 percent capital adequacy requirement as international banks, but then later switched to pursuing a domestic 4 percent MOF ratio. However, for domestic banks, which were consistently pursuing the 4 percent MOF capital adequacy ratio in the post-Basel period, there is no evidence of a shift in the sensitivity of lending to capitalization. These findings are consistent with the fact that the domestic MOF capital adequacy requirement is less stringent than the international BIS capital adequacy requirement, therefore requiring less of a behavioral shift on the part of banks. In addition, the requirement for domestic banks is likely less rigorously enforced, as evidenced by differential timing of inspections and application of prompt corrective action legislation.

The macroeconomic analysis then goes on to explore to what extent the "capital crunch," uncovered in the microeconomic analysis, was passed on to the aggregate economy. The empirical findings demonstrate that a "credit crunch" in Japan mainifested itself in the late 1990s, but not when the Japanese economy first entered recession in 1991. These negative shocks to bank credit in that latter part of the "lost decade" are shown to have significantly affected real economic activity in Japan

A close look at the movement of various monetary aggregates foreshadowed this result. Loan growth in Japan fell in the early 1990s and that trend has continued to the present. The monetary base growth rate began to fall sharply just before loan growth began to decline, but the money multiplier remained buoyant. These trends suggest that faulty monetary policy contributed more to Japan's 1991 economic downturn than did the behavior of private financial intermediaries. In contrast, by the time Japan entered recession for the second time in early 1997, the monetary base had been growing for several years but the reserve to deposit ratio of

private banks had begun to rise, contributing to a sharp fall in the money multiplier which hampered the transmission mechanism.

To address this question more rigorously, a 6 variable vector autoregression model was estimated and used to construct out of sample forecasts for the early 1990s. Surprisingly, the actual quantity of credit was above forecasted values in the early 1990s. However, when this analysis is applied to the later recession, which began in the second quarter of 1997, the results are overturned. Actual credit in Japan was much lower than forecasted values in 1997–1998.

Further analysis demonstrates that these negative shocks to bank credit were transmitted to the real economy. The underlying structural shocks to bank credit are recovered and used to construct out of sample forecasts of GDP conditional upon these innovations. The conditional forecasts perform significantly better than the standard out of sample forecasts, confirming that the decline in bank credit depressed real economic activity.

Thus, only in the most recent recession is there evidence of a credit crunch in Japan. The sharp fall in loans during the post-bubble recession can be attributed to the failure of the central monetary authority to stimulate the monetary base and to sudden shifts in household preferences, as seen in the sharp rise in the currency-deposit ratio. Restrictive lending on the part of financial institutions does not seem to have been a significant factor early in the decade.

Notes

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1 See Haubrich and Wachtel (1993), Brinkmann and Horvitz (1995), Berger and Udell (1993), Hall (1993), Hancock and Wilcox (1995), Peek and Rosengren (1995a and 1995b).
2 Other studies on this issue include Ueda (1993), Yoshikawa and Ike (1994) and Baba (1995), which are written in Japanese.
3 Currently, land holdings are recorded at book value on the balance sheet. Banks may choose between the book value or fair value (lower of book or market) method for recording the value investment account equity holdings on their balance sheets. Banks that choose the fair value method may count 45 percent of unrealized gains toward Tier 2 Capital. There are plans to introduce mark-to-market accounting for these items in fiscal year 2001.
4 Capital for the MOF ratio is calculated slightly differently than in the BIS ratio. The MOF ratio does not include short term subordinated debt as Tier 3 capital and latent capital gains are not included in Tier 2 capital.

5 Table 6.1 does not include failed or nationalized banks, so the total number of banks falls in years in which there was a bank failure.
6 Nippon Credit, which had never had overseas branches but had voluntarily aimed to meet the 8 percent capital adequacy standard, failed to meet the 8 percent standard in fiscal year 1996. In fiscal year 1997 Nippon Credit switched to the 4 percent benchmark. The bank was later nationalized in January of 1999.
7 This simplification incorporates the major elements of the aggregate bank balance sheet: loans, deposits and shareholders' equity.
8 The assumption that capital is exogenous is a short run simplifying assumption. In reality, banks can boost capital by either issuing equity or retaining earnings. Although Japanese banks issued equity actively in the 1980s, new issues were prohibited by the Ministry of Finance for much of the 1990s. Given the accounting identity, the assumption that capital is exogenously given in each time period amounts to an assumption that banks decide upon loans and then are able to obtain the necessary deposits to fund those loans at the prevailing market interest rate. Although there were fears of a flight to postal savings from bank deposits in response to the failure of several small credit cooperatives in the early 1990s, in 1995 the government announced a complete deposit guarantee through March 2001. Regarding exogenous interest rates: although banks' may in fact hold market power, it is assumed that they view themselves as price takers, and offer loans and deposits at prevailing market rates.
9 Again, the assumption that capital is exogenously determined is a short run simplifying assumption. In reality banks can also adjust leverage by adjusting capital, but this option is more costly due to the tax treatment of debt relative to equity and the "lemons" problem that bank managers have an incentive to issue equity only when the stock is overpriced.
10 As shown above, many Japanese banks were below the 4 percent or 8 percent requirement when the Basel Accord was reached in late 1987. However, banks were able to adjust their balance sheets gradually over the 5 year transition period between 1988 and 1993, and by 1993 almost all were above the required BIS ratio. The fact that the banks adjusted slowly over the transition period rather than suddenly cutting leverage ratios when the accord was implemented in 1993 suggests that there are costs of adjustment associated with changes in loan growth. Empirical support for this observation is given by Hancock and Wilcox (1995), who report that whilst it takes banks only about a year to adjust securities in response to capital shocks, adjustments of most loan categories require two to three years.
11 Similar results were obtained when lagged growth in exchange rates or the Nikkei Index were included in the regression analysis.
12 The chi-squared test statistic for first order serial correlation was 1.70, with a *p*-value of 0.19, for international banks and 3.69, with a *p*-value of 0.06, for domestic banks.
13 Prior to the Basel Accord, domestic banks and international banks in Japan faced the same domestic regulatory constraint of maintaining a 4 percent capital to deposit ratio.
14 Since the interest rate spread only varies by time, not across banks, it is not included in this specification. Results of a specification including fixed time and individual effects, which are consistent with those reported here, are reported in Table 6.4.
15 Impulse response functions for each of the 6 variables in the VAR are in Figure 6.3.

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Part II

Issues in governance of corporate sector and new technology

7 The financing and governance of new technologies

Colin Mayer

Introduction

What are the financial sector preconditions for the successful development of a high technology sector? The conventional answer is straightforward: an active venture capital industry combined with a liquid domestic stock market. The development of venture capital firms and stock markets is regarded as a priority for the growth of high tech industries. Is this correct? How do high tech firms finance themselves and what role do stock markets play in their development?

There is accumulating evidence of a relationship between financial development and economic growth. Several studies report a relation between the size of financial systems at the start of a period and subsequent economic growth. Controlling for other considerations, financial development appears to contribute to growth. A range of measures of financial development are relevant – the volume of monetary assets, the size of banking systems and the size of stock markets.

To the extent that it is possible to establish the channel by which financial development contributes to growth, it appears to be through the external financing of firms. Comparing the growth of different industries across countries or different companies suggests that there is an interrelationship between their growth rates, the extent to which they are dependent on external finance and the development of financial systems in which they are operating. In other words, financial development confers particular advantages on industries and companies that are especially dependent on external finance.

These results are consistent with the view that a primary function of financial institutions is to improve allocation of funds within an economy. Corporate, industrial and economic growth are assisted by institutions that direct financing to activities that are most dependent on external finance. The studies therefore provide empirical confirmation at an aggregate or industry level of the theoretical underpinning of financial institutions.

However, the question that these studies leave unanswered is which institutions are particularly well suited to performing these functions. Do

all institutions serve companies equally well or are some institutions particularly well-suited to the financing of high technology?

The second set of issues concerns the policies that can be used to influence the development of institutions. Over the last few years a literature has emerged emphasizing the important role that legal and regulatory structures play in influencing institutional development. This literature has emphasized protection of investors as being a crucial determinant of the development of financial systems. Since, as noted above, the development of financial systems is in turn related to the external financing of firms, this points to a key role for investor protection in promoting the external financing and growth of firms. The policy message that appears to emerge from these studies is clear: improve investor, in particular minority investor, protection, and financial development; investment and growth will follow.

This raises the question of what precisely is the relation between legal systems, regulation and the structure of financial institutions. Is there, as the above literature suggests, a straightforward relation between regulation and the development of institutions? In particular, are certain regulatory rules suited to the financing of high technology activities?

The next section of this chapter reviews evidence on comparative financial systems. This is followed by a discussion of ownership and control. The next section describes emerging theories that point to a comparative advantage of different financial and governance systems in promoting particular types of activities. The chapter then turns to an illustration of this in the context of high technology industries, with, first, a discussion of the pre-initial public offering (IPO) stage, and then post-IPOs. The subsequent section considers policy implications and lessons for Japan and Far Eastern economies. This is followed by a conclusion.

Comparative financial systems

There has been extensive comparison of the performance of different financial systems.[1] These analyses have focused on the contrast between bank oriented and market oriented systems. Most of the studies compare a small number of countries, focusing in particular on the UK and US on the one hand, and Germany and Japan on the other.[2]

The criteria by which systems are categorized include corporate financing, bank ownership of corporate equity and the exercise of corporate control by banks. Bank oriented systems are thought to display high levels of bank finance, equity holding by banks, long-term relations, close monitoring and active corporate governance by banks.

In practice, the distinction between bank and market oriented systems is fragile.[3] While bank lending to corporations has been high in Japan in comparison to the UK and US, it has not in Germany. Bank holdings of corporate equity are modest in most countries. While banks are thought

to have been actively involved in corporate activity and in particular restructurings in Japan, they have not in Germany. In addition, although early studies of Japan pointed to the advantages of close bank-firm relations in Japan, more recent ones have noted their defects in displaying excessive conservatism in corporate lending and inhibiting restructuring.[4]

The influence of financial systems on measures of corporate governance is also unclear. Close relations between financial institutions and companies might have been thought to influence incentives and disciplining of management. Systems with close relations have better information flows and thus a firmer basis on which to reward and discipline management. But they might lack the powerful incentive and disciplining devices of stock markets. In fact, to the extent that there is evidence on this, it does not point to a clear difference in either incentive arrangements or disciplining across financial systems.[5]

Ownership and control

The standard bank-market orientation distinction is neither particularly robust nor insightful. In contrast, there are striking differences in the ownership and control of companies that do bear close scrutiny.[6] This is normally discussed in terms of comparisons of concentration of ownership in the UK and US on the one hand, and Continental Europe and the Far East on the other. For example, in France and Germany, in more than 80 percent of the largest 170 listed companies, there is a single shareholder owning more than 25 percent of shares and in more than 50 percent of these companies, there is a single majority shareholder. In contrast in the UK, in only 16 percent of the largest 170 listed companies is there a single shareholder owning more than 25 percent of shares and in only 6 percent is there a single majority shareholder. Concentration of ownership is appreciably higher on the Continent of Europe than in the UK. High levels of ownership concentration have also been reported for the Far East and South America and ownership is as dispersed in the US as in the UK.

Not only does the level of ownership differ appreciably between the UK and US and most of the rest of the world but so too does the nature of that ownership. In the UK and US, the shares of listed companies are primarily held by institutions, such as pension funds, life insurance firms and mutual funds, and individual investors. Ownership is dispersed in the sense that no one institution or individual holds a large stake in a single company. This is described as an "outsider system."[7]

On the Continent and in the Far East, the large share blocks are primarily held by families (or family holding companies) and other firms. Inter-corporate holdings of large blocks of shares are commonplace, frequently in the form of pyramids of shareholdings, cross-shareholdings or complex webs. As noted above, in most countries, bank holdings of shares

are modest and holdings by the government vary appreciably across countries. This is described as an "insider system."

Comparative institutional advantage

A theoretical literature is emerging suggesting a relation between the institutional structure of countries and the *types* of activities that are undertaken in those countries. There are several strands of theory pointing in this direction. These can be classified under the headings of information, renegotiation and corporate governance. In the information theories (see, for example, Allen 1993 and Allen and Gale 1999) new technologies, where there are legitimate grounds for diverse expectations, benefit from securities markets. More traditional investments, which are prone to asymmetries of information between borrower and lender benefit from the economies of monitoring that banks can provide. In the renegotiation theories (see, for example, Dewatripont and Maskin 1995), fragmented banking systems are associated with short-term investments and concentrated banking systems with long-term investments. Similarly, dispersed ownership systems are associated with high-risk R&D investments and concentrated ownership systems with lower risk, more imitative investments. In the corporate governance theories (see, for example, Burkhart, Gromb and Panunzi 1997), concentrated ownership is required to provide active governance of firms by investors but might result in excessive interference. Some activities benefit from the active monitoring of management; others are disadvantaged and require dispersed ownership to discourage investor intervention.

All of the above observations and theories therefore suggest a relation between financial systems and the ownership and control of companies and the types of activities that they undertake. As Carlin and Mayer (2001) argue, they suggest that there is an association between the institutional structure of a country and the activities undertaken in that country. They first provide a empirical assessment of this thesis. They examine the relation between growth and investment in 27 industries in 11 OECD countries over the period 1970 to 1995 with the interaction of the institutional structure of the countries and the characteristics of the industries. They find a close relation between growth and investment of different industries in different countries and the interaction of the structure of countries' financial institutions with the dependence of industries on a variety of financial and other inputs. The relation is particularly significant in the case of R&D. Investment in R&D is closely related to the dependence of industries on equity finance and highly skilled labour and is large in countries with good information disclosure, as measured by accounting standards. The relation between R&D and a high level of skills is pronounced, pointing to the significance of human capital in R&D activities.

The case of high tech and the financing of new economy illustrates how

this relation between financial systems, governance arrangements, legal systems and investment and growth might operate. Germany has a large banking system, a two-tier board structure and a civil law code. The USA has a large stock market, a unitary board and a common law system. The rankings of industries by the intensity of patent registrations for Germany (relative to a 12 country average) are almost inversely related to those for the USA. Information technology, semi-conductors and biotechnology, for example, are in the top 6 (of 30) industries by patent registrations for the USA and in the bottom 4 for Germany. Germany's patent specialization is highest in civil engineering and transport equipment, which are in the bottom 3 industries for the USA.[8]

The question that this raises is whether the difference in patent activity in the 2 countries is related to institutional differences between Germany and the USA. Does the concentration of patent activity in "science based" industries reflect the advantage of, for example, funding these activities through stock markets and does the more production oriented patenting activity in Germany relate to its highly concentrated ownership and large banking system? The question that this raises is whether there is an association between these differences in technological activity and the structure of countries' financial institutions. A detailed consideration of the way in which high tech firms are financed and governed provides some evidence on this.

The financing of high technology industries

The pre-IPO stage

The development of high tech firms involves several phases (see Figure 7.1). The first is the seed stage when a concept has still to be proven and developed. The second is the start-up phase when products are developed and initial marketing takes place. The firm may be a year old or younger at this stage. The third is the early stage development when the firm is expanding and producing but may well remain unprofitable; it is often less than 5 years old at this stage. During the fourth stage of expansion it might go public after 6 months or a year.

The initial development almost invariably comes from savings and relatives. Initial external equity financing does not generally come from venture capital firms but from business angels. In the US it is estimated that the venture capital industry invested around $5 billion in 1998 in 1,000 early stage firms. In comparison, business angels (wealthy or reasonably wealthy private investors) are estimated to invest $15 billion annually in 60,000 early stage firms. In the UK, it is estimated that about 5 percent of small firms receive business angel support as against 1 percent receiving venture capital finance (quoted in Osnabrugge 1998).

What accounts for the different contribution of business angels and venture capitalists to start-up financing? One of my former doctoral

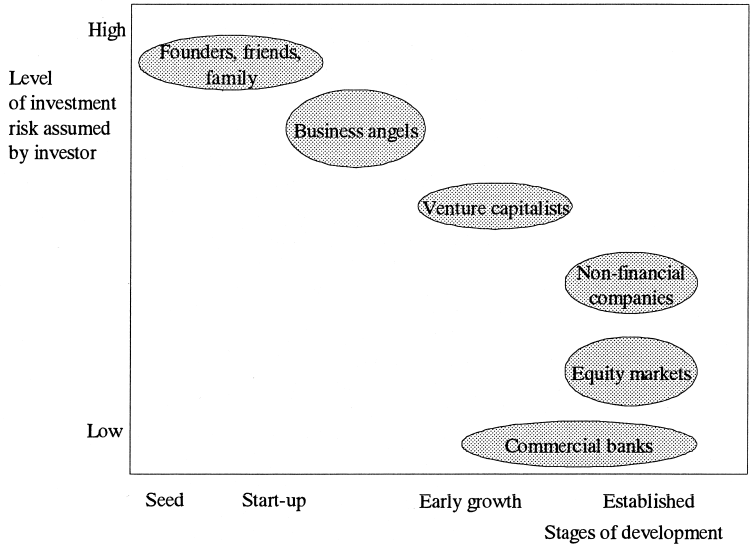

Figure 7.1 The development and financing of entrepreneurial firms.
Source: Van Osnabrugge and Robinson (2000).

students, Mark van Osnabrugge, undertook a detailed comparison of the way in which venture capitalists and business angels operate. He compared the initial screening, due diligence, investment criteria, contracts, monitoring and exit routes employed by the different types of investor.

The results were striking. Venture capitalists are highly rule based using careful screening of applicants and due diligence. Business angels place more emphasis on ex-post involvement in investments to reduce risks, such as their ability to contribute to the management of the business. Venture capitalists therefore act like institutions following principal-agent relations of limiting risks through monitoring. Indeed, since in the UK they are frequently subsidiaries of institutions, such as pension funds, that is not surprising. Business angels are more actively involved in the subsequent management of activities, exerting more direct control.

From the outset, venture capitalists are focused on exit, business angels much less so. Venture capitalists in general look for rates of return of between 30–40 percent, business angels in the UK between 20 and 30 percent. Initial public offerings are the preferred route of exit for investors, since they yield the highest return, but they are not the most common. It is estimated that fewer than one in a thousand new ventures have an IPO. However, entrepeneurs are much more optimistic than this record would warrant. One study estimated that 70 percent of new technology firms believed that a public stock offering was "highly likely" or

"probable." Trade sales are the most common exit route of business angels, accounting for over 40 percent of exits, followed by sales of shares to other shareholders and sales to third parties. IPO's account for just over 10 percent of business angel exits.

In the US, around 25 percent of venture capital funds are invested in early stage firms. In the UK, start-up and early stage investments also accounted for around a quarter of venture capital investments in 1984 but this has fallen to a figure of around 4 percent at present. MBOs and MBIs have substituted for start-up financing increasing from 20 percent to 70 percent of UK funds' investment.

An important reason for the greater success of US venture capital in funding start-up businesses is the structure of the US industry. Venture capital comprises two parties (see Figure 7.2) – the limited partners which are the institutional and individual investors and the general partners which are the venture capital firms investing in individual companies and entrepreneurs. The general partners manage portfolios of companies and are frequently successful entrepreneurs themselves who want to manage larger portfolios of investments. They therefore provide intermediate technical expertise between the investing institutions on the one hand and the entrepreneurs on the other. Venture capital industries in other countries, including the UK, frequently lack the pool of entrepreneurial scientists on which to draw to provide this intermediary function.

The picture that emerges is that the financing of new high tech firms is highly reliant on own funds, families and friends. Once these are exhausted, external equity initially comes from private investors who are actively involved in the management of the investment. Venture capitalists come in at a later stage, acting at more arms-length than business angels and seeking higher returns over short periods. A small fraction of the most successful firms are floated on stock markets; most are sold as trade

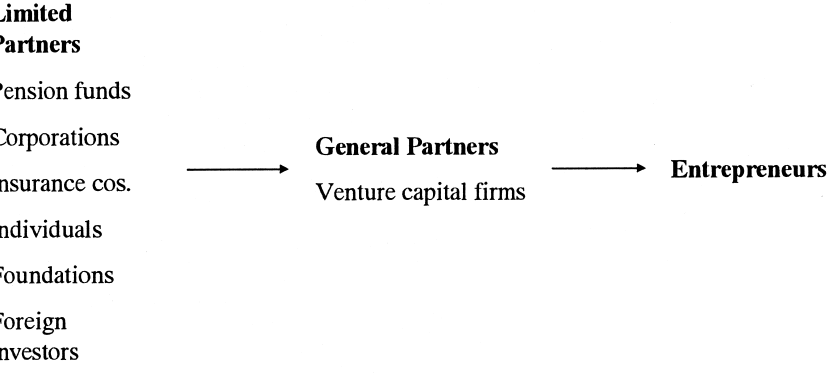

Figure 7.2 The structure of the US venture capital industry.

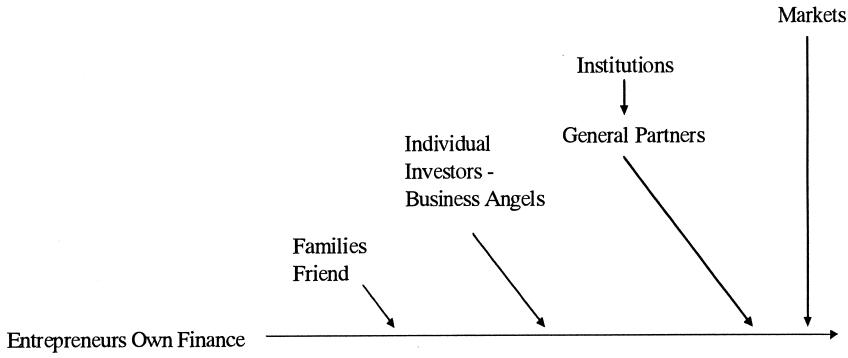

Figure 7.3 Stages of entrepreneurial finance.

sales and sales to other investors. Much venture capital finance in particular in the UK is not associated with funding new investments but management buy-outs.

To understand high tech finance, it is therefore important to appreciate it as being intimately connected to the control of firms (Figure 7.3). The transition from personal to business angel to venture capital to stock market finance involves a gradual broadening of the investor base. This moves rapidly from the entrepreneur to single outside investors who are active managers, to financial institutions who use intermediary venture capital firms to screen and manage their investments, to stock markets with largely passive investors.

The financing of Amazon.com illustrates this (see Figure 7.4). The firm was initially funded out of Jeff Bezos' own savings and some borrowings. The family then invested a quarter of a million dollars. Two business angels then came in followed by a larger business angel syndicate. There was a further small family investment followed by a substantial venture capital injection of $8 million. A year later the firm went public with an IPO of $49 million.

The post-IPO stage

What happens after the IPO? Another former doctoral student of mine, Marc Goergen, has undertaken an interesting comparison of the changing pattern of control of UK and German firms after they have gone public. Goergen notes that historically the average age of a firm coming to the German stock market has been 50 years. In the UK it is around 12 and in the US around 6 years. German firms have typically been about twice as large as UK firms on coming to the stock market. At the time of the IPO in general there is either no change in control in Germany with the

Time Line	Price/ Share	Sources of Funds
1994 - July to Nov	$.001	*Founder:* Jeff Bezos starts Amazon. Com with $10,000, borrows $44,000.
1995 - Febr to July	$.1717	*Family:* Founder's father and mother invest $245,500.
1995 - Aug to Dec	$.1287-.3333	*Business Angels:* 2 angels invest $54,408.
1995/6 - Dec to May	$.3333	*Business Angels:* 20 angels invest $937,000
1996 - May	$.3333	*Family:* Founder's siblings invest $20,000.
1996 - June	$2.3417	*Venture Capitalists:* 2 venture capital funds invest $8 million.
1997 - May	$18	*IPO:* 3 million shares issued raising $49.1 million
1997/8 - Dec to May	$52.11	*Bond issue:* $326 million bond issue.

Source: Smith and Kiholm (2000)

Figure 7.4 The financing of Amazon.com (1994–1999).

original investors retaining control or control is transferred as a block to a new investor. Even 6 years after the IPO, families hold majority stakes in nearly 50 percent of German firms. In the UK families control a majority of votes in only 11 percent of firms; most are either taken over or become widely held.

This difference even persists in the Neuer Markt firms. As Vittols (2000) documents, the typical Neuer Markt firm adheres to what is described as the "Herr im Hause" ("Master of the House") model where the founder/CEO has a controlling stake in the firm and dominates the company board. The innovation strategy is the incremental development of existing products in contrast to that of a venture capital dominated "Silicon Valley" firm, which seeks the development of a block buster product.

Similarly, in Japan the average age of companies coming to the stock market is significantly greater than in the US. Sako (2001) reports, for the population of Japanese IPOs in 2000, that the average age of firms coming to the Mothers Market is 8 years, 15 years on Nasdaq Japan and 27 years on JASDAQ. The sectoral composition of Japanese IPOs is also quite different from US IPOs. Internet and IT sectors dominate Mothers and Nasdaq Japan while a large majority of JASDAQ IPOs were in the retail sector.

This further emphasizes the important control differences not only between old and new economy firms but also between different types of new economy firms. There is a much more rapidly changing control structure in new than old economy firms. Dominant control structures in old economy firms are concentrated and slowly evolving. Dominant control structures of new economy firms shift rapidly between entrepreneurs and different investor groups as the production process and financing needs of firms change.

Examining what happens once firms are established on the stock market further reinforces this observation. Work that I have been doing with Marc Goergen has compared the characteristics of companies listed on the UK stock market with equivalent sized firms that are privately owned. Consistent with the above observations on the importance of stock markets for high tech firms, listed firms are concentrated in R&D intensive sectors of the economy. Listed firms obviously raise much more equity finance but this is not used to fund internal investment. Instead, what clearly distinguishes listed from unlisted firms is the extent to which they engage in acquisitions. Access to stock markets primarily provides firms with the opportunity to expand through acquisition. Stock market listings and dispersed share ownership are important not only in making firms subject to the discipline of the takeover market but in providing them with the opportunity of expanding through acquisitions themselves. Again it is the potential for rapidly evolving patterns of control that mark out the new economy firms.

Financial institutions and venture capital financing

We return to the question of the relation of the structure of financial systems to corporate activities in the context of the financing of entrepreneurial firms. To date, very little is known about this. Black and Gilson (1998) have argued that stock markets are a pre-requisite to the successful development of a venture capital market and that IPOs provide an important exit route for venture capital funds. But even this assertion is open to question as a comparison of venture capital in Israel and the UK illustrates. Even though the IPO market has not been active in Israel in recent years, there is widespread investment in firms in their early stages. Instead of using the Tel Aviv market, most high-tech companies go public in the US on NASDAQ (Blass and Yafeh 2001). In the UK, where the stock exchange is much larger and more liquid than the Tel Aviv stock exchange, investments in early stages of technological developments are comparatively rare. In addition, according to the venture capital associations, IPOs are nearly as important as an "exit" mechanism in bank-dominated Germany as they have been in the UK in recent years – 7.5 percent of all venture capital backed companies in Germany as against 9 percent in the UK.[9]

Mayer, Schoors and Yafeh (2001) have undertaken one of the first analyses of the relation between institutional structure and venture capital finance. They examine venture capital industries in four countries: Germany, Japan, Israel and the UK. Their analysis differs from much of the preceding literature in:

a providing an international comparison of countries outside the US
b examining the funds themselves rather than the venture capital firms.

The question that the paper poses is, to what extent can differences in venture capital activities (in particular, stages of finance and sector focus) be associated with the venture capital firms sources of finance. Do venture capital firms that are funded through banks invest in firms at different stages of their development from those that are funded by private individuals? Do pension and insurance fund backed venture capital firms have a different sector focus from corporate backed funds?

To answer these questions, Mayer, Schoors and Yafeh collect data on venture capital firms and their sources of finance from venture capital associations. The results were striking. First, they report substantial differences across countries in terms of the stage of finance of venture capital firms. In some countries, notably Israel, funds are much more focused on early stage investments than in others, in particular Japan. There is a remarkably close similarity in stage of finance between Germany and the UK despite the differences in their financial systems noted above.

Second, there are significant differences in venture capital firms' sector focus. While biotechnology and life sciences receive a substantial level of attention in all 4 countries, a much larger fraction of venture capital firms in Israel and Japan invest in information technology, software and electronics than in Germany and the UK, where the manufacturing sector receives more attention.

Third, the paper reports substantial variations in the sources of finance of venture capital firms. Banks are a major source of external finance in all countries, particularly in Germany and Japan.[10] Pension funds are much more significant in the UK than in the other 3 countries. Corporations are a more important source of finance of venture capital firms in Israel than elsewhere.

Fourth, the paper reports that there are significant relations between sources of finance of venture capital firms and their investment activities within countries. In particular, banks and pension funds backed venture capital firms invest in later stage, while venture capital firms relying on private individual investors favour earlier stage activities. Industry and privately backed funds are focused towards IT, software and electronics and away from manufacturing sectors, while the reverse holds for pension funds.

Fifth, the paper records significant differences in the relation between financing and investment stage in different countries. While bank backed venture capital firms in Israel and the UK invest in later stage activities relative to other sources of finance, bank backed funds in Germany and Japan are no different from other venture capital funds. Later stage investing by pension funds is a feature of the UK but not of Israel, the only other country where pension funds are a significant source of venture capital finance.

Institutional differences are therefore associated with significant differences in venture capital activities within countries. But the paper also reports that institutional differences only account for a small proportion of the differences in venture capital activities across countries. This suggests that a majority of international differences are attributable either to demand for funds (i.e. supply of entrepreneurs) rather than supply of financial institutions or to the availability of alternative sources of entrepreneurial finance, for example, business angels referred to above. The implication is that while there may be a matching of institutions with types of entrepreneurial activities within countries, international differences in entrepreneurial activity are primarily driven by other considerations.

Policy implications and lessons for the Far East

With the collapse of the internet bubble and retrenchment of VC firms in the US and Europe, it might be thought that a discussion of the financing of new technology is largely redundant. But what we are currently experiencing is, of course, precisely what a theory of a relation between institutional structure and corporate activity would predict. Some financial systems are suited to the initial phases of technological innovation that we are currently witnessing and others are suited to the subsequent implementation stages which we are about to observe. Not only are there cross-sectional variations in the relative performance of different systems at a particular point in time but there are also variations in performance of different systems over time.

This is what has been repeatedly observed in the past. The most important periods of stock market expansion have coincided with major technological innovations when returns to investment were exceptionally high. In the UK, these were associated with financing of the canals at the end of the eighteenth century and investment in railways in the nineteenth century. But stock markets were less well suited to financing activities that offered more modest returns, most notably investment in manufacturing.

What are the policy implications of this and in particular, what are the lessons for Far Eastern economies? Inevitably, most attention has been focused on banking systems and banking crises. As Table 7.1 records, Far Eastern economies remain highly dependent on bank lending: they still in

general have substantially higher levels of bank lending and lower levels of corporate bond and stock market value as a proportion of GDP than the US. The Japanese banking crisis has been variously attributed to asset price declines, deregulation and deepening of capital markets, imbalances in deregulation between savings and corporate borrowing, moral hazard from deposit insurance, and a slow response to the crisis by the regulatory authorities (Corbett 2000; Hoshi and Kashyap 1999; Hutchison and McDill 1999 and Kanaya and Woo 2000). A variety of prescriptions have been proposed for dealing with the crisis which suggest a marked contraction in the banking sector, mergers of banks, write-off of loans, improved governance of banks and greater transparency.

What has received much less discussion to date is the appropriate structure of financial regulation outside of banking. Is there, as the literature in the introduction suggests, a straightforward relation between regulation and the development of institutions? Becht and Mayer (2000) have recently argued in the context of an analysis of the ownership and control of European corporations that regulation affects the structure of financial and corporate systems. There is evidence that regulatory differences across European countries and between the UK and US bias institutional arrangements in particular directions.

The regulation of the high tech sector illustrates this well. While the UK and US are generally classified under similar common law systems, there are actually pronounced differences between the 2 countries in their approach to the regulation of non-bank financial institutions, such as pension funds and fund managers. One of the important contributors to the development of venture capital in the US was the relaxation of the "prudent man" rule on pension funds at the end of the 1970s. This stimulated a substantial expansion in investment in venture capital activities during the 1980s. US regulation emphasizes the importance of disclosure of information to investors, auditing of the behavior of institutions and the imposition of penalties, in the event of failure being uncovered.

Table 7.1 Bank loans, corporate bonds and stock markets as a percentage of GDP, end 2000

	Bank loans	*Corporate bonds*	*Stock market value*
Indonesia	20.9	1.7	20
Japan	109.3	12.9	70.9
Malaysia	91.6	41.3	124.9
The Philippines	39.6	N/A	77.6
South Korea	88.4	25.8	36.4
Thailand	86.1	10.2	26.2
USA	48.6	45.2	124.2

Source: IMF, International Financial Statistics, reproduced in Japanese Ministry of Finance, "Challenges of the Asian Economy and Financial Markets" (2001).

In the UK, investor protection has relied more heavily on public compensation schemes and the imposition of detailed conduct of business rules. For example, to protect pensioners from the types of losses that were incurred in pension fund scandals during the 1990s, rules were imposed that encouraged pension funds to invest heavily in government securities. These had the effect of discouraging investment in more risky investments such as venture capital funds.

US regulation therefore promotes private contracting, UK regulation relies more heavily on public contracting. Private contracting systems do not require institutions to amass capital before they are allowed to transact. They do not presume that there is a single best way of transacting business and they do not seek to impose common rules of conduct. Instead, they allow institutions and investors to choose how to organize their business and where to invest. If malpractice is uncovered then there is a significant probability that it will be uncovered through auditing and penalized through the courts.

A critical question that this comparison raises is the extent to which reliance should be placed on public versus private contracting to provide protection in non-bank financial institutions. The advantage of private over public contracting is that it does not prejudge what is acceptable. It allows for a greater degree of diversity of institutional form. It permits institutions to adapt more rapidly in the face of changing requirements of both investors and firms. It has therefore made it easier for institutions to respond to the changing financing and control needs of high technology firms in the US than in the UK.

On the other hand, it relies on "caveat emptor" and in general provides investors with less protection than public contracting schemes. It places considerable emphasis on private agents, such as analysts, accountants and auditors, to collect and process information. It relies on the courts to enforce contracts. All of these are better developed in the US than elsewhere and it is questionable therefore whether the US model is the appropriate one for the Far East.

Conclusions

This paper has argued that there is a close relation between the types of activities undertaken in different countries and their institutional structures. Certain types of institutional arrangement, in particular information disclosure, appear to be related to growth of R&D activities. More generally, there is a relation between the structure of institutions and the types of high tech activities undertaken. The contrast between German and US patenting and the greater success of the general-limited partnership arrangements in the US than the captive funds in the UK in funding start-up activities are illustrative of this. So too is the relation between the source of funding of venture capital firms in different countries and the types of activities that they fund.

A distinguishing characteristic of the financing of new economy firms is its evolving pattern of control by different investor groups. Participation in successful firms moves rapidly from own investments to families, individual investors, small groups of investors and to venture capitalists funded by financial institutions. While stock markets are an important component of the development of the most successful firms, they are not by any means the most common. Where initial public offerings occur, they involve rapid changes in control from original to new investors and dispersed ownership. Stock market finance is important in allowing control of and by high tech firms to alter.

Regulation is a significant influence on the ability of financial institutions to be able to respond to the changing needs of corporate borrowers. The form in which investor protection is provided affects the degree of risk taking by financial institutions and the types of financing that they offer. This is well illustrated by differences between the public contracting systems of regulating investment management in Europe and private contracting in the US. Private contracting forms of regulation permit a greater degree of competition and variety of products in financial markets. However, they rely on caveat emptor, private firms to undertake monitoring and the courts to enforce contracts. Which form of regulation is most appropriate both for investors and companies in Japan and the Far East in the twenty-first century is something that will require careful consideration once the more immediate concerns about restructuring banking systems have subsided.

Notes

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1 For surveys, see Carlin and Mayer (2000) and Levine (1997).
2 See, for example, Edwards and Fischer (1994).
3 See, for example, Mayer (1988) and Rajan and Zingales (1995).
4 See, for example, Kang and Stulz (2000) and Weinstein and Yafeh (1998).
5 See Kaplan (1994).
6 See Barca and Becht (2001) and La Porta, Lopez-de-Silanes and Shleifer (1999).
7 See Franks and Mayer (1995).
8 Patent specialization indices for 30 industries are calculated from patents registered at the European Patent Office. The correlation between the German and US indices is −0.78 (Cusack and Soskice 2000).
9 EVCA (2000) and BVK (2000).
10 More generally, Sako (2001) notes the relationship between VC firms and old economy firms in Japan arguing that "in the future the most successful Japanese incubators will not be affiliated with free-wheeling venture capital funds. Instead, they are likely to be backed by the most forward-looking members of

Japan's old mainstream economy: trading companies and banks, manufacturers and consumer companies" (p. 12).

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8 The benefits and costs of internal markets

Evidence from Asia's financial crisis

Stijn Claessens, Simeon Djankov, Joseph P.H. Fan and Larry H.P. Lang

Introduction

There has been substantial research documenting the pattern of diversification among firms in the United States, e.g. Fan and Lang (2000). The evidence indicates that such diversification reduces firm value (Lang and Stulz 1994; Berger and Ofek 1995; Comment and Jarrell 1995; Servaes 1996, among others). The value discount has been attributed to poor resource allocation as diversified firms allocate capital to less profitable segments and increase risks. The question arises as to why corporations diversify.

One explanation pioneered by Williamson (1985) and extended by Gertner, Scharfstein and Stein (1994), Harris and Raviv (1996), and Stein (1997), is that capital-constrained firms establish internal capital markets to allocate scarce capital within the firm. This is particularly the case for projects that are not inherently fundable by external markets. Internal markets can overcome informational asymmetries involved in the selection of valuable new projects more easily than can external markets. The more costly it is for firms to obtain external capital, the more valuable internal capital markets would be. One would also expect more diversification to lead to a reduction in firms' overall performance variability. This risk reduction presumably would be even greater when external financial markets are less developed, since internal diversification is a means of reducing risk.

A test of the internal capital market hypothesis would therefore involve conditioning on a firm's access to external capital, which can be done by studying firms in countries whose financial markets are at different levels of development. Fauver *et al.* (forthcoming) do so by investigating firm values across over thirty countries. They document smaller diversification discounts for firms in less developed markets, consistent with the hypothesis. Khanna and Palepu (1997) argue that diversification is valuable in emerging markets since diversified firms mimic the beneficial functions of

market institutions in more developed countries. They find supporting evidence for this hypothesis in the case of large business groups in India and, to a lesser extent, Chile (Khanna and Palepu 1999).

While the benefits of internal markets may be higher in countries with less developed financial markets, so might be the costs. Investment projects funded by internal markets are not subject to the full degree of monitoring by external capital markets, which could mean that they are less profitable or riskier (Jensen 1986, 1989). Indeed, recent literature suggests that misallocation of resources in diversified and agglomerate organizations can arise from of agency issues (Denis, Denis and Sarin 1997; Scharfstein 1997; Shin and Stulz 1998; Rajan, Servaes and Zingales 2000 and Scharfstein and Stein 2000). Lins and Servaes (2002, forthcoming) find discounts for diversification in less-developed countries and interpret this as evidence for higher agency costs. Claessens *et al.* (forthcoming) examine the vertical relatedness and complementarity among diversified Asian firms' business segments. They report evidence consistent with the view that Asian firms are more prone to misallocate capital and hence destroy firm value when they engage in vertical integration than in diversification that explore complementarity. They argue that vertical integration are more subject to issues related to organizational complexity.

The findings by Khanna and Palepu (1997, 1999) and Fauver *et al.* (forthcoming) nevertheless suggest that the relative benefits of internal markets offset the costs associated with diversification more so in less-developed countries. The time periods covered by these studies were before 1997, when globally capital markets were not very turbulent and when economic growth was high in emerging markets. It is possible that because of these sampling periods, the benefits of diversification might have been overstated; the risk factors associated with diversification might have been understated, because these risks would only surface during economic downturns. A robustness test of the benefits of diversification could therefore be to investigate whether diversified firms performed better during economic downturns than non-diversified firms. And a test of the relative benefits of internal markets would be to investigate whether diversified firms were less affected by the economic downturn in less-developed countries because internal markets are more beneficial in such countries.

The objective of this study is to shed additional light on these questions associated with diversification and the use of internal markets. In particular, we test whether diversification leads to lower performance variability, whether greater use of internal capital markets is more valuable for firms in less-developed countries during good times – as it allows more investment in new activities, and whether greater use of internal capital markets is more valuable for firms in less-developed countries during bad times – as it reduces overall risk more than in countries with more developed financial markets.

We test these hypotheses by studying the performance of firms in East Asian countries over the 1992 to 1998 period. The selection of this sample offers several benefits. First, we study a period that comprises both economic booms and busts in the sample countries. Second, the sample spans countries with highly diverse levels of financial markets' development, thus allowing us to control for the development of external markets relative to internal markets. Third, all countries were affected by a downturn within a short window, thus limiting the influence of other variables on firm valuation. Finally, East Asian corporations have a record of significant use of internal markets when compared to companies in the United States. To conduct our tests, we collect panel data for almost 15,000 firm-year observations over the 1992–1996 pre-crisis and the 1997–1998 crisis periods. Consistent with the previous literature, we find a diversification discount. We also find support for the internal capital market hypothesis during the pre-crisis period as diversified firms in less-developed countries are valued relatively higher than in more developed countries. We find, however, that diversified firms perform worse than single-segment firms during the crisis and that diversified firms in less-developed countries perform even worse than those in more developed countries. While our results thus confirm the internal markets hypothesis during good times, we show that diversified firms take on more overall risks, a factor which only surfaces during economic downturns and is more severe in less-developed countries.

Our findings are consistent with other related works by Mitton (2002) and Lemmon and Lins (forthcoming), both of which report that the stock returns of diversified firms declined more than focused firms during the Asian Financial Crisis.

The chapter proceeds as follows. First it describes the data sample. The next section provides the performance and valuation measures we use. We then document our empirical evidence. This is followed by a conclusion.

The data

We study firms in nine countries: Hong Kong, Indonesia, South Korea, Japan, Malaysia, Philippines, Singapore, Taiwan and Thailand. Our primary data source is the Worldscope database. Worldscope contains financial and segment information on companies from 49 countries and has been used in several international studies of corporate diversification, including Lins and Servaes (2002, forthcoming) and Fauver *et al.* (forthcoming).

We initially selected all companies from the nine countries covered by the June 1991–1999 CD-Rom version of the database. In each annual dataset, Worldscope provides historical financial data and current segment information. When Worldscope segment information is missing, we complemented the segment data with data from the Autumn editions

of the 1994–1999 *Asian Company Handbook* and *Japan Company Handbook*. All financial data are converted to US dollars using fiscal year-end exchange rates.[1]

In order to determine the degree of usage of internal markets, we group company segments according to the two-digit Standard Industry Classification (SIC) system. This procedure involves two steps. In the first step, we assign the appropriate four-digit SIC codes to each segment reported by Worldscope.[2] In many cases we are able to obtain one-to-one matches between SIC codes and segments. For some companies, the number of reported SIC codes is not the same as the number of reported segments. If a segment is associated with multiple SIC codes, it is broken down equally so that each segment is associated with one SIC code. As the second step, we redefine segments at the two-digit SIC level and aggregate segment sales to that level. If a segment cannot be associated with a reported SIC code, we determine the segment's SIC code according to its business description. In such cases, only a two-digit SIC code was assigned given the more general business description provided by Worldscope.

We classify firms as single-segment if at least 90 percent of their total sales are derived from one two-digit SIC segment. Firms are classified as multi-segment if they operate in more than one two-digit SIC code industries and none of their two-digit SIC code segments accounts for more than 90 percent of total firm sales. This classification scheme is the same as in Lins and Servaes (2002) and Fauver *et al.* (forthcoming). We further define the primary segment of a multi-segment firm as the largest segment by sales. The remaining segment(s) are defined as secondary segments. In a very small number of cases two largest segments have identical sales. In such cases we select the segment with the lower two-digit SIC code as the primary segment. Our empirical results are robust if the alternative is chosen as the primary segment. We exclude multi-segment firms from the sample when they do not report segment sales and firms whose primary business segment is financial services (SIC 6000–6999).[3]

The Asian financial crisis started in mid-1997 in Thailand and spilled over to the other East Asian countries in the Fall of 1997. The beginning month of the crisis thus varies from country to country. Firms also use different fiscal years, varying from end-of-December to the middle-of-the-next-calendar year. To facilitate comparison, we define financial data reported prior to December 1997 as pre-crisis data. Since almost all firms have fiscal years ending before the middle-of-the-year, we therefore only include financial data up to mid-1997 in our pre-crisis sample. Accordingly, financial data reported on or after December 1997 are classified as crisis data and capture the period from mid-1997 to end-1998. To allow for a meaningful pre-crisis and crisis comparison of firms, we restrict our sample to those firms that survived in the crisis period. This survivorship bias means that the risks associated with internal markets are underestimated, as non-surviving firms will likely have had lower market valuation.

The sample is described in Table 8.1. For the pre-crisis period (Panel A), the sample includes 7,616 (65 percent) multi-segment firm-year observations and 4,085 (35 percent) single-segment firm-year observations. Japanese firms comprise the majority of the sample, as they account for 79 percent of the multi-segment firms and 71 percent of the single-segment firms. Across the nine countries, Hong Kong, Japan, Korea, Malaysia and Singapore have 64 to 69 percent of multi-segment firms, while Thailand, the Philippines, Taiwan and Indonesia have 27, 34, 35 and 42 percent, respectively.

The average asset size of multi-segment firms is US$2,494 million and US$1,846 million of single-segment firms. Across the nine countries, the average asset size of multi-segment firms is larger relative to those of single-segment firms, with the exception of South Korea and Singapore. In the case of both multi-segment and single-segment firms, Japanese firms have the largest average assets (US$2,901 million and US$2,279 respectively), followed by Korean and Hong Kong firms.

For the crisis period (Panel B), the sample covers 1,999 (65 percent) multi-segment firms and 1,094 (35 percent) single-segment firms. Japanese firms account for 68 percent of multi-segment firms and 56 percent of single-segment firms. Similar to the pattern in the pre-crisis period, Hong Kong, Japan, Korea, Malaysia and Singapore have between 63 to 69 percent of multi-segment firms, while Thailand, the Philippines, Taiwan and Indonesia have 27, 37, 35 and 47 percent, respectively.

Many countries in our sample experienced a sharp depreciation of their currency relative to the dollar in the crisis period. As a result, when measured in dollars, asset sizes and sales drop significantly between 1996 and 1997–1998. The average asset size of multi-segment firms in the crisis period is reduced by 22 percent to US$1,949 million and by 19 percent to US$1,504 million for single-segment firms.[4] Similar to the pattern in the pre-crisis period, the average assets of multi-segment firms are mostly larger than those of single-segment firms, except for firms in South Korea and Singapore. Of the multi-segment firms, Japanese firms have the largest average assets (US$2,357 million), followed by Korean firms. Of the single-segment firms, in contrast to the pre-crisis period, Korean firms have the largest average assets (US$2,696 million), followed by Japanese firms.

Measuring performance and financial development

Excess value

In measuring corporate performance, we use the firm's market valuation and excess profit margin.[5] In calculating valuation, we adopt the approach of Berger and Ofek (1995) by defining the excess value of a firm (EXV) as the natural logarithm of the ratio of the firm's actual market capitalization

Table 8.1 Summary statistics of single and multi-segment firms

Panel A: Pre-crisis period (1992–1996)

	Number	*Multi-segment firms (percentage of total firms)*	*Average assets (millions of US$)*	*Number*	*Single-segment firms (percentage of total firms)*	*Average assets (millions of US$)*
Hong Kong	383	66	1,181	198	34	895
Indonesia	73	42	693	101	58	393
Japan	6,053	67	2,901	2,919	33	2,279
Korea (South)	254	64	1,687	141	36	2,212
Malaysia	434	69	641	199	31	550
Philippines	31	34	533	60	66	407
Singapore	249	68	528	115	32	747
Taiwan	33	35	830	61	65	625
Thailand	106	27	460		73	342
All countries	7,616	65	2,494	4,085	35	1,846

Note
The primary data source is Worldscope, amended by the Asian and Japan Company Handbooks. The sample spans the period 1991–1998. Firms with missing segment sales data are excluded. Firms with their primary business in financial services (SIC 6000–6999) are also excluded. Company segments are defined at the two-digit SIC code level. Firms are classified as single-segment if at least 90 percent of their total sales are derived from one two-digit SIC code segment. The remaining firms are classified as multi-segment firms.

(*Continued*)

Table 8.1 Continued

Panel B: Crisis period (1997 and 1998)

	Number	*Multi-segment firms (percentage of total firms)*	*Average assets (millions of US$)*	*Number*	*Single-segment firms (percentage of total firms)*	*Average assets (millions of US$)*
Hong Kong	159	65	1,157	84	35	931
Indonesia	34	47	899	39	53	583
Japan	1,357	69	2,357	614	31	1,969
Korea (South)	113	63	2,300	66	37	2,696
Malaysia	169	67	678	82	33	575
Philippines	17	37	816	29	63	604
Singapore	97	66	595	49	34	618
Taiwan	12	35	1,268	22	65	869
Thailand	41	27	538	109	73	402
All countries	1,999	65	1,949	1,094	35	1,504

to its imputed capitalization. The actual market capitalization is the market value of common equity plus the book value of debt. The imputed capitalization is calculated following an industry-matching scheme. In particular, we first compute the median market-to-sales ratio, the market capitalization divided by firm sales, for each industry in each country using only single-segment firms. We then multiply the level of sales in each segment of a firm by its corresponding industry median market-to-sales ratio. The imputed value of the firm is obtained by summing the multiples across all segments. We also restrict the number of single-segment firms to at least three when computing the median market-to-sales ratio of an industry. When an industry has fewer than three single-segment firms, even defined broadly as Campbell (1996), we use the median of all firms in the country.

Excess profit margin

The profit margin is calculated as one minus the cost of goods sold over sales. Similar to the calculation of EXV, we first use the sub-sample of single-segment firms in each country to compute the median profit margin for each two-digit SIC code industry. We then multiply the sales share in each segment of a firm by the corresponding industry median profit margin. We sum the sales-weighted profit margin across segments to obtain the imputed profit margin of the firm. Lastly, we subtract the imputed profit margin from the actual profit margin to obtain the industry-adjusted excess profit margin (EPM).

In a manner similar to the computation of EXV, we restrict the number of single-segment firms in the computation of industry median profit margin to be at least three. In some cases, we do not have a sufficient number of firms to compute the median profit margin. In these cases, we use the median profit margin of broader industry groups as defined by Campbell (1996). This procedure avoids the loss of observations.

Weighting scheme

We construct the crisis EXV and EPM measures using the pre-crisis weights and crisis period market-to-sales ratios and profit margins. In other words, we test how EXV and EPM behave in the crisis period relative to the pre-crisis period, using the pre-crisis corporate segment structure (or distribution of sales) to calculate the imputed values in the post crisis period. One advantage of using the same corporate segment structure for each firm is that we can focus on differences in valuation effects between the two periods, as any segment change effects do not influence the imputed values. At the same time, however, for those firms that change their segment composition between the pre-crisis and crisis period, we might have a bias if, across all firms, actual value changed due to the

shedding or acquiring of business segments with relatively low or high values in a common pattern.

Our presumption is that any changes during the crisis will have led to a higher imputed valuation using the original segment structure compared to the new, actual structure as diversified firms would more likely have shed loss-making segments in the crisis period. For example, if a diversified firm sheds its car factory during the crisis, and all car firms were valued lower during the crisis period, the imputed value of the firm using pre-crisis weights would be below the imputed value of the firm using the post-crisis weights. As a result, the ratio of actual to imputed values would be higher using pre-crisis weights compared to using the post-crisis actual weights. Since our method more likely assigns higher actual relative to imputed values in the crisis period, it implies we have a bias against finding lower values for diversified firms, which would strengthen our results if we still find a lower value for diversified firms in countries affected by the crisis.

Measuring financial development

In previous studies, financial development has been measured in several ways: using per-capita GNP and the World Bank classification of income groups (Fauver *et al.* forthcoming); the ratio of banking assets to GDP and the ratio of market capitalization to GDP (Demirguc-Kunt and Levine 1999); and the number of initial public offerings, number of firms listed on the stock market as a share of total firms, and the ratio of external market capitalization to GDP (La Porta *et al.* 1997). In this study, we use all three sets of measures as alternative proxies for the level of development of financial markets. For the set of countries we study, however, these indicators are not perfectly correlated and we can thus expect different results of the effect of financial development on the degree of diversification discounts. A priori, we expect that the proxies related to capital market development will be less powerful for our sample of firms, as firms in East Asia traditionally have relied on bank financing rather than on financing from capital markets.

Empirical analysis

Panel A of Table 8.2 compares the mean and median of the excess profit margin (EPM) measure between the pre-crisis and crisis periods for all multi-segment firms and for multi-segment firms in three groups of countries classified using the World Bank income data.[6] Panel B of Table 8.2 compares the mean and median of the excess value (EXV) measure between the pre-crisis and crisis periods for all multi-segment firms by the same income group as in Panel A.[7]

The results are consistent with the internal markets hypothesis during good times. The mean and median pre-crisis EPM (Panel A) and the

Table 8.2 Comparison of performance for diversified firms pre-crisis and during the crisis

Panel A: Excess profit margin

	Mean				*Median*			
	Crisis	*Pre-crisis*	*Difference*	*T-statistic*	*Crisis*	*Pre-crisis*	*Difference*	*Z-statistic*
All countries	−0.02	−0.0118	−0.0082	–2.08**	−0.025	−0.023	−0.002	−0.64
Income group								
High-income	−0.0141	−0.0136	−0.0005	−0.13	−0.023	−0.024	0.001	0.29
Higher middle	−0.0637	−0.0074	−0.0563	−3.72***	−0.0435	−0.021	−0.0225	−1.83*
Lower middle-income	0.0079	0.0302	−0.0223	−0.72	−0.0425	0.004	−0.0465	−1.24

Panel B: Excess market value

	Mean				*Median*			
	Crisis	*Pre-crisis*	*Difference*	*T-statistic*	*Crisis*	*Pre-crisis*	*Difference*	*Z-statistic*
All countries	−0.0369	−0.0272	−0.0097	−0.56	−0.047	−0.0418	−0.0052	−0.33
Income group								
High-income	−0.0237	−0.0304	0.0067	0.36	−0.0408	−0.0444	0.0036	0.14
Higher middle	−0.0507	−0.0165	−0.0342	−0.62	−0.0747	−0.0325	−0.0422	−0.68
Lower middle-income	−0.2365	0.0434	−0.2799	−2.42**	−0.1358	0.0435	−0.1793	−1.79*

Note

This table compares the performance of diversified East Asian firms before and after the 1997 Asian Crisis. The sample includes 1999 firms from nine economies. Data reported on or after December 1997 are classified as crisis data. Data reported prior to that are classified as pre-crisis data. Performance is measured by excess profit margin (Panel A) and excess market value (Panel B). The firms are classified into three groups according to the income levels of their country origins. According to the World Bank definition, the high-income group includes firms from Hong Kong, Japan, Singapore and Taiwan. The higher middle-income group includes firms from Korea and Malaysia. The lower middle-income groups includes firms from Indonesia, the Philippines and Thailand. Significance levels at 1%, 5% and 10% are denoted by ***, ** and * respectively.

mean and median pre-crisis EXV (Panel B) exhibit a monotonic increase in the level of development, i.e. diversified firms in lower income groups have higher performance in the pre-crisis period than diversified firms in higher income countries, confirming the predictions of the internal markets hypothesis that firms in less-developed countries gain more benefits from diversification during good times.

The overall pattern is inconsistent, however, with the hypothesis that more diversification reduces risks. For all countries combined, the mean and median excess profit margin and excess value are negative in both the pre-crisis and crisis period. In other words, multi-segment firms under-performed single-segment firms in both periods. If diversification would have led to a reduction in risks, one would have expected that more diversified firms would have experienced a less dramatic decline in performance during the crisis period, and would thus have outperformed single segment firms at least in the crisis period. We find the opposite result, i.e. multi-segment firms perform worse than single-segment firms in the crisis period, and even worse compared to the pre-crisis period using all four measures (mean and median EPM and EXV), with the difference statistically significant and negative for the mean EPM. A comparison for different groups of countries shows that multi-segment firms outperform single-segment firms during the crisis period only in terms of mean EPM in lower-income countries, and even then their performance is worse in the crisis period compared to the pre-crisis period.

The results are also inconsistent with the internal markets hypothesis during bad times. The median differences of EPM and the mean and median differences of EXV exhibit a monotonic decline in the level of development as diversified firms in lower income groups experience a more dramatic decline in performance, contradicting the predictions of the internal markets hypothesis that firms in less-developed countries gain more benefits from diversification during crisis periods. The differences are statistically significant at least at the 10 percent level for lower-middle-income groups for the EXV measure (Panel B), while the difference is significant for higher-middle-income group for the EPM measure (Panel A). The mean differences of EPM exhibit a less clear pattern, with the most significant decline in the mean EPM for the higher-middle-income group. However, the results are inconsistent with the internal markets hypothesis as diversified firms in high income countries exhibit the least performance decline.

To further test the impact of the Asian financial crisis on EPM for different levels of diversification and across stages of economic development, we perform the following two regressions:

$$\text{EPM} = \alpha + \beta_1 * \text{CRISIS} + \beta_2 * \text{SEG} + \beta_3 * \text{SEG} * \text{CRISIS} + \beta_4 * \text{Log(ASSETS)} + (\text{Fixed effects}) + u \quad (1)$$

$$EPM = \alpha + \beta_1*CRISIS + \beta_2*GNP + \beta_3*SEG + \beta_4*SEG*CRISIS + \beta_5*SEG*GNP + \beta_6*SEG*GNP*CRISIS + \beta_7*Log(ASSETS) + (Fixed\ effects) + u \quad (2)$$

where CRISIS takes the value 1 for firms reporting after December 1997, and 0 otherwise. We include the number of segments, SEG, or a dummy for diversification (=1 if more than 1 segment and 0 otherwise). The explanatory variables also include, depending on the specification, several interactive variables: SEG*CRISIS, SEG*GNP, where GNP is per capita income for each country, SEG*GNP*CRISIS, and the natural logarithm of firm assets in thousands of US dollars (Log(ASSETS)) to control for any size effect.[8] Whenever we do not include per capita GNP (not interacted) in the above regressions, we also control for country effects by including country dummies. Note that we do not need to control for the size of the crisis by country or industry since, by construction, EPM and EXV already adjust for changes in country-specific industry median values, hence the impact of different degree of crisis for each country and each industry is already removed. The regression is performed on the pooled sample. Similar regressions are performed for EXV. If financial markets reflected the long-term performance of East Asian corporations less efficiently during the crisis, we would observe similar but weaker results for EXV than for EPM.[9]

Table 8.3 reports the regression results for EPM. Regression 1 reports the results for equation 1 and regression 2 for equation 2. The results indicate that corporations in East Asian countries performed worse during the financial crisis – the variable CRISIS is statistically significant negative, which is hardly a surprise. The negative significance of the diversification dummy variable SEG suggests that diversified firms perform worse than single-segment firms in normal times. However, diversified firms do not perform worse than single-segment firms during the crisis, as shown by the insignificant coefficient for the interactive variable SEG*CRISIS. This suggests that we can not reject the hypothesis that diversification reduces risks. We need to be cautious in interpreting this result, since we do not yet consider the degree of development, which has a significant impact on performance as shown in Table 8.2. In particular, the effect of the variable SEG*CRISIS needs to be further decomposed to incorporate the effect of economic development.

In the second specification, per capita GNP itself is insignificant, but SEG*CRISIS becomes significantly negative at the 5 percent level which indicates that diversified firms perform worse than single-segment firms during the crisis. This evidence demonstrates that there are no risk reduction benefits from diversification. In fact, diversification lowers profitability during the crisis, a finding that has not been documented in prior studies. It may be that the agency costs of diversified firms are higher during the crisis. It is also likely that the effects of misallocation of capital

Table 8.3 OLS regressions of excess profit margin (EPM) on diversification and economic development

	SEG = diversification dummy		*SEG = segment number*	
	1	*2*	*3*	*4*
INTERCEPT	−0.1283***	−0.1216***	−0.1273***	−0.1219***
	(−7.75)	(−7.61)	(−7.70)	(−7.41)
CRISIS	−0.0122*	−0.0124*	−0.0148*	−0.0154*
	(–1.72)	(−1.73)	(−1.78)	(−1.84)
GNP		−0.0118		0.0371
		(−0.48)		−0.12
SEG	−0.0206***	−0.0076	−0.0109***	−0.005*
	(−5.00)	(−0.74)	(−7.97)	(−1.63)
SEG*CRISIS	0.0074	−0.0376**	0.0031	−0.0094**
	−0.83	(−2.41)	−1.09	(−2.19)
SEG*GNP		−0.5448		−0.2450**
		(−1.57)		(−2.30)
SEG*GNP*CRISIS		1.6610***		0.4817***
		−3.43		−3.78
LOG(ASSETS)	0.0103***	0.0101***	0.0112***	0.0109***
	−8.52	−8.51	−9.23	−9.14
Adj. R-square	0.0099	0.0074	0.0128	0.0108
Number of Obs.	14,794	14,794	14,794	14,794

Notes
The primary data source is Worldscope, amended by Asian and Japan Company Handbooks. The sample spans the period 1991–1998. Firms with missing segment sales data are excluded. Firms with their primary business in financial services (SIC 6000–6999) are also excluded. Company segments are defined at the two-digit SIC code level. Firms are classified as single-segment if at least 90 percent of their total sales are derived from one two-digit SIC code segment. The remaining firms are classified as multi-segment firms. The dependent variable, excess profit margin, is defined in the text. Regressions 1 and 3 include country dummy variables (not reported). All regressions include year-dummies (not reported). Significance levels at 1, 5 and 10 percent are denoted by ***, ** and * respectively.

associated with more diversification (e.g. Shin and Stulz 1998, among others) become more serious during a crisis. In terms of the test of the internal markets hypothesis, we find that the interactive term SEG*GNP is negative but marginally insignificant. This evidence is weakly consistent with the internal capital market hypothesis as diversified firms in less-developed countries appear to perform relatively better than firms in more developed countries in normal times.

We argue that the evidence of increased diversification leading to lower profit margins during a period of economic downturn is consistent with the notion that risks increase with the greater use of internal markets, especially in less-developed countries. To further confirm this hypothesis, we examine the coefficient of SEG*GNP*CRISIS. The negative impact of the crisis on EPM appears higher for diversified firms in less-developed

countries as SEG*GNP*CRISIS is significantly positive at the 1 percent level. This result suggests that greater use of internal markets allows firms in less-developed countries to take on more overall risks, possibly because of the lesser degree of monitoring on investment projects funded by internal markets. This risk factor only surfaces during the economic downturn.

We repeat the regressions using the number of segments a firm is active in instead of the diversification dummy. Similar results are obtained, while the *t*-statistics are generally higher. In regression 4, per capita GNP is still insignificant, but the interactive term SEG*CRISIS is significantly negative at the 5 percent level. These results suggest that diversification does not reduce risks, i.e. in a crisis period diversification reduces profitability more. In terms of the tests of the internal markets hypothesis, we find that the interactive term SEG*GNP is significantly negative at the 5 percent level. This evidence is consistent with the internal capital market hypothesis that diversification hurts performance, but less so in countries with less-developed financial markets during normal times. The coefficient for SEG*GNP*CRISIS is significantly positive at the 1 percent level, suggesting that diversification is more harmful in a crisis in less-developed countries.

Table 8.4 reports the regression results for EXV. Regressions 1 and 2 use the diversification dummy while regressions 3 and 4 use the number of segments. The results confirm the previous findings for EPM. Diversification hurts market valuation, especially in a crisis, as evidenced by the negative and significant coefficients for SEG and SEG*CRISIS in several specifications. The negative valuation effect of diversification in a crisis is even worse for countries with less-developed financial markets, as the coefficient for SEG*GNP*CRISIS is significantly positive for both specifications. We can not confirm the internal capital market hypothesis during good times, however, as the interactive variable SEG*GNP is no longer significant.

Tables 8.5 and 8.6 report similar regressions, using the proxies for the depth of financial markets as suggested in Demirguc-Kunt and Levine (1999). The regression in Table 8.5 is as follows:

$$\begin{aligned}\text{EPM} = {} & \alpha + \beta_1\text{*CRISIS} + \beta_2\text{*FDEV} + \beta_3\text{*SEG} + \beta_4\text{*SEG*CRISIS} + \\ & \beta_5\text{*SEG*FDEV} + \beta_6\text{*SEG*FDEV*CRISIS} + \beta_7\text{*Log(ASSETS)} + \\ & \text{(Fixed effects)} + u \qquad (3)\end{aligned}$$

Where FDEV is either the ratio of bank assets to GDP ratio in columns 1 and 3, or the ratio of market capitalization to GDP in columns 2 and 4. As before, we find that diversification is associated with lower performance during the crisis since the coefficient on SEG*CRISIS is always negative and significantly so, with the exception of regression 2. The negative effect of diversification is again worse during a crisis and in countries with

Table 8.4 OLS regressions of excess market value (EXV) on diversification and economic development

	SEG = diversification dummy		*SEG = segment number*	
	1	*2*	*3*	*4*
INTERCEPT	−0.3307***	−0.2032***	−0.3342***	−0.2108***
	(−6.36)	(−4.03)	(−6.42)	(−4.06)
CRISIS	−0.0164	−0.0211	−0.0335	−0.0401
	(−0.72)	(−0.93)	(−1.27)	(−1.51)
GNP		−2.7917***		−2.3776***
		(−3.61)		(−2.60)
SEG	−0.0506***	−0.0759**	−0.0162***	−0.0144
	(−3.90)	(−2.34)	(−3.78)	(−1.48)
SEG*CRISIS	0.0113	−0.0879*	0.0098	−0.0107
	−0.4	(−1.79)	−1.1	(−0.79)
SEG*GNP		0.8136		−0.0457
		−0.74		(−0.13)
SEG*GNP*CRISIS		3.8825***		0.8603**
		−2.54		−2.14
LOG(ASSETS)	0.0260***	0.0230***	0.0268***	0.0231***
	−6.83	−6.12	−6.97	−6.11
Adj. R-square	0.0073	0.0043	0.0072	0.0034
Number of Obs.	14,702	14,702	14,702	14,702

Note
The primary data source is Worldscope, amended by the Asian and Japan Company Handbooks. The sample spans the period 1991–1998. Firms with missing segment sales data are excluded. Firms with their primary business in financial services (SIC 6000–6999) are also excluded. Company segments are defined at the two-digit SIC code level. Firms are classified as single-segment if at least 90 percent of their total sales are derived from one two-digit SIC code segment. The remaining firms are classified as multi-segment firms. The dependent variable, excess value, is defined in the text. Regressions 1 and 3 include country dummies (not reported). All regressions include year dummies (not reported). Significance levels at 1, 5 and 10 percent are denoted by ***, ** and * respectively.

less-developed financial markets, as the coefficient on SEG*FDEV*CRISIS is always positive. The effect is statistically significant for the banking sector proxy and marginally insignificant for the capital market proxy, the latter possibly because firms in East Asia generally rely more on bank than capital markets financing. The coefficients on SEG*FDEV are generally inconsistent with the internal market hypothesis in good times as firms in countries with more developed financial markets have better performance.

The regressions using EXV show a similar pattern (Table 8.6), although the results are less strong than those for EPM. We find larger diversification discounts during the crisis period, and these discounts are more prevalent in countries with less-developed financial markets. As in the previous tables, the coefficients on SEG*CRISIS are always negative, and they

Table 8.5 OLS regressions of excess profit margin (EPM) on diversification and the development of the banking system and capital markets

	SEG = diversification dummy		*SEG = segment number*	
	1	*2*	*3*	*4*
INTERCEPT	−0.0991***	−0.0814***	−0.1129***	−0.0881***
	(−5.29)	(−4.39)	(−5.43)	(−4.93)
CRISIS	−0.0136*	−0.0105	−0.0144*	−0.0159*
	(−1.89)	(−1.47)	(−1.72)	(−1.90)
FDEV	−0.0233**	−0.0354***	−0.0084	−0.0222**
	(−2.18)	(−5.16)	(−0.59)	(−2.88)
SEG	−0.0196	−0.0573***	−0.0571	−0.0172***
	(−1.04)	(−6.24)	(−0.21)	(−5.98)
SEG*CRISIS	−0.0659**	−0.0222	−0.0236***	−0.0078*
	(−2.49)	(−1.58)	(−3.14)	(−1.74)
SEG*FDEV	−0.0022	0.0388***	−0.0093*	0.0059**
	(−0.18)	−4.25	(−1.84)	−2.38
SEG*FDEV	0.0542***	0.0182	0.0219***	0.0043
*CRISIS	−2.95	−1.48	−3.83	−1.43
LOG(ASSETS)	0.0104***	0.0093***	0.0110***	0.0096*
	−8.79	−7.89	−9.34	−8.44
Adj. R-square	0.0079	0.0089	0.0109	0.0104
Number of Obs.	14,702	14,702	14,702	14,702

Notes

The primary data source is Worldscope, amended by the Asian and Japan Company Handbooks. The sample spans the period 1991–1998. Firms with missing segment sales data are excluded. Firms with their primary business in financial services (SIC 6000–6999) are also excluded. Company segments are defined at the two-digit SIC code level. Firms are classified as single-segment if at least 90 percent of their total sales are derived from one two-digit SIC code segment. The remaining firms are classified as multi-segment firms. The dependent variable is excess profit margin (EPM). FDEV in equations 1 and 3 is the ratio of bank assets to GDP and the ratio of market capitalization to GDP in equations 2 and 4. The variables come from Demirguc-Kunt and Levine (1999). All regressions include year dummies (not reported). Significance levels at 1, 5 and 10 percent are denoted by ***, ** and * respectively.

are statistically significant in regressions 1 and 3. The coefficients on SEG*FDEV*CRISIS are always positive, but again only significant in regressions 1 and 3.

For robustness purposes, we also use as proxies for financial market development the variables suggested by La Porta *et al.* (1997), i.e. the ratio of external capital to GDP, the number of initial public offerings relative to the country's population, and the number of publicly traded firms relative to the total number of firms (not reported). For all three proxies, we find consistent results, i.e. that diversification hurts corporate performance more during the crisis period, and that this pattern is more pronounced in countries with less-developed capital markets. Unlike the results we report, however, the coefficients are almost always

Table 8.6 OLS regressions of excess market value (EXV) on diversification and the development of the banking system and capital markets

	SEG = diversification dummy		*SEG = segment number*	
	1	*2*	*3*	*4*
INTERCEPT	−0.1229**	−0.2345***	−0.1353**	−0.2452***
	(−2.08)	(−4.32)	(−2.05)	(−4.36)
CRISIS	−0.0186	−0.0097	−0.0344	−0.0274
	(−0.84)	(−0.43)	(−1.32)	(−1.08)
FDEV	−0.1044***	−0.0283	−0.0882**	−0.0312
	(−3.09)	(−1.28)	(−2.16)	(−1.42)
SEG	−0.1757***	−0.1602***	−0.0324	−0.0362***
	(−2.92)	(−5.07)	(−1.62)	(−4.03)
SEG*CRISIS	−0.1692**	−0.0082	−0.0424*	−0.0058
	(−2.12)	(−0.14)	(−1.79)	(−0.36)
SEG*FDEV	0.0987**	0.1118***	0.0182	0.0181**
	−2.03	−3.86	−1.2	−2.3
SEG*FDEV	0.1619**	0.0052	0.0444**	0.0062
*CRISIS	−2.46	−0.16	−2.45	−0.26
LOG(ASSETS)	0.0208***	0.0217***	0.0204***	0.0213***
	−5.63	−5.88	−5.52	−5.82
Adj. R-square	0.0046	0.0052	0.0037	0.0039
Number of Obs.	14,702	14,702	14,702	14,702

Notes
The primary data source is Worldscope, amended by the Asian and Japan Company Handbooks. The sample spans the period 1991–1998. Firms with missing segment sales data are excluded. Firms with their primary business in financial services (SIC 6000–6999) are also excluded. Company segments are defined at the two-digit SIC code level. Firms are classified as single-segment if at least 90 percent of their total sales are derived from one two-digit SIC code segment. The remaining firms are classified as multi-segment firms. The dependent variable is excess value (EXV). FDEV in equations 1 and 3 is the ratio of bank assets and the ratio of market capitalization to GDP in equations 2 and 4. The variables come from Demirguc-Kunt and Levine (1999). All regressions include year dummies (not reported). Significance levels at 1, 5 and 10 percent are denoted by ***, ** and * respectively.

insignificant.[10] This is not surprising, since many firms in East Asian countries rely mostly on banks for their financing needs, and capital markets indicators may not be good proxies for financial market development.

Conclusions

In the context of corporate diversification, one answer to the frequently asked question why corporations diversify is that capital-constrained firms use internal capital markets to more effectively allocate scarce capital within the firm. This argument would imply that diversification would reduce risks for all levels of development, and that internal capital

markets are most valuable in countries with less-developed financial markets. Indeed, previous evidence has found smaller diversification discounts for firms in developing countries.

We argue, however, that because investment projects funded by internal markets are less subject to monitoring than those funded by external capital markets, diversified firms may allocate capital to riskier projects, especially in countries with less-developed financial markets. Empirically, we find that, while internal markets are more valuable in less-developed countries during good times, diversification leads to lower profit margins and lower valuation for firms in less-developed countries during a period of economic downturn. This suggest risks increase with greater use of internal markets, especially in less-developed countries.

Our findings suggest that internal markets are not always used to overcome financial market imperfections, while at the same time keeping risks constant or decreasing risks. Instead, they are often used to fund high-risk activities, which are more difficult to finance outside the firm. This suggests that focusing on good times and ignoring crisis periods in an analysis can underestimate the costs of internal markets in any country and can overstate the relative benefits of internal markets in less-developed countries.

Notes

1 Worldscope, the *Asian Company Handbook* and the *Japan Company Handbook* provide information on whether all subsidiaries are consolidated, whether consolidation covers only the most significant subsidiaries, or whether the report is on a cost basis (unconsolidated). If a company changes its consolidation practice, this change is also recorded in the data. To increase the sample size, we include all firms in the sample. Since non-consolidated companies are a relatively small fraction of all firms, 23 percent on average, similar results obtain if we exclude firms that have reported non-consolidated accounting data.
2 Worldscope reports SIC codes and segment information separately, hence we do a manual matching.
3 We do not exclude non-finance firms with secondary segments in financial services. Since the secondary finance segments are typically small relative to the main segment, we do not expect significant estimation errors when we compute excess value.
4 This percentage decline is computed by comparing the 1997–1998 sample with the average of the 1992–1996 sample. Since, in local currency terms, the size of firms in the early 1990s is smaller than in the late 1990s, the exchange-rate adjusted total assets in 1997–1998 is not necessarily smaller for all East Asian countries than the exchange-rate adjusted total assets for the 1992–1996 period, in spite of the large exchange rate depreciation for many countries.
5 Prior studies use excess valuation (EXV) as the sole measure of corporate performance since capital markets are assumed to be efficient in signaling long term corporate performance. In this study, we cover firms during Asian financial crisis when several stock exchanges saw large price falls and may not have measured long-term corporate performance efficiently. To avoid using EXV as the only measure of corporate performance during the crisis, we also use the

excess profit margin (EPM) as a short-term performance measure. If East Asian stock markets were indeed less efficient in valuing long-term corporate performance during the crisis, we would expect to find weaker results using EXV than using EPM.

6 The World Bank classifies countries into four categories, namely, high income, upper-middle income, lower-middle income, and low income. The lower-middle income group includes Indonesia, the Philippines and Thailand; the high income group includes Japan, Singapore, Hong Kong and Taiwan; the higher-smiddle income countries include Korea and Malaysia. There are no low income countries in our sample.

7 Note that many firms in East Asian countries are affiliated with business groups (Claessens *et al.* 2002). As suggested by Wolfenzon (1999), group structures can be associated with divergence of cash flow rights from voting rights, and allow expropriation. Claessens, Djankov, Fan and Lang (2002) document this divergence of voting from cash-flow rights in East Asian corporations and show that it is associated with stock value discount, consistent with the expropriation of minority shareholders. Khanna and Palepu (1999) in contrast argue that business groups can act as guarantors of property rights in an environment where enforcement is weak. As a result, business groups enjoy advantageous access to foreign capital and technology providers who seek to safeguard the property rights of their investments. These enhanced property rights in turn can increase value. Since there are no a priori reasons, however, to believe that the net effects of these factors would change during an economic downturn, we control for these factors by taking the differences between the crisis and pre-crisis values of EPM and EXV.

8 Morck, Shleifer and Vishny (1988) argue that firm size should be included as a control variable since it may be correlated with firm value.

9 Fauver *et al.* (forthcoming) also control for operating margin and capital expenditure over sales ratios in their regression analysis. If we include the capital expenditure over sales ratio in the EPM regressions (since excess operating margin is the dependent variable, we cannot further control for operating margin itself), the results remain the same. However, since the capital expenditure over sales ratio is never significant in the EPM regressions and since we lose more than one-third of the crisis sample firms, we omit it from the analysis. If we include both control variables in the EXV regressions, the operating margin is significantly positive, while the capital expenditure over sales ratio is not significant. For the other independent variables similar but weaker results are obtained (not reported).

10 The exception is the ratio of publicly-traded firms to the total number of firms interacted with SEG and CRISIS, which has a positive coefficient.

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9 Large shareholders and banks

Who monitors and how?

Yishay Yafeh and Oved Yosha

Introduction

Empirical studies of corporate governance have been mainly concerned with the disciplinary effect of executive compensation schemes and managerial turnover, and the relation of ownership structure and firm performance. Evidence is accumulating, and it is apparent that large shareholders play an important role in monitoring firm management.[1]

In this chapter we propose another mechanism of monitoring by large shareholders. It is often argued (e.g. Jensen 1986) that managerial moral hazard can take the form of excessive spending on projects that promote the careers and visibility of managers but are not in the best interest of shareholders. We conjecture that shareholders – and possibly other stakeholders – restrict such activities. Under the common assumption that monitoring costs are not fully shared among shareholders, the free rider problem associated with monitoring is mitigated when ownership is more concentrated. Therefore, concentrated ownership should entail lower expenditure on activities with high scope for generating managerial private benefits. Using a sample of Japanese manufacturing firms in the chemical industry, we verify this conjecture empirically. To the best of our knowledge, evidence on this type of monitoring has not been presented previously.[2]

We believe that forms of monitoring other than managerial compensation are important for two main reasons. First, performance-based managerial incentive schemes are not always effective, especially when the available measures of firm performance are noisy.[3] Indeed, we find that in our sample of Japanese firms the restraining effect of ownership concentration on activities with scope for managerial private benefits is especially strong (and more significant) in firms with highly volatile profits. Second, until recently, the use of managerial incentive schemes outside the US has been rare. For example, Japanese companies began to offer stock options to executives only in 1997 (because the use of such options was illegal until then), and by spring 1998 only 56 companies offered stock options to their executives. Even among these few firms "the average value of stock

options issued … is a far cry from the millions of dollars in stock options the US executives are often granted" (*The Wall Street Journal*, April 9, 1998). Similar figures are presented in *The New York Times* (January 19, 1999) where the structure of CEO pay in ten developed economies is compared. Long-term incentives, such as stock options, account for a much bigger share of a US executive's salary than they do for CEOs in Japan, Germany, France, the UK, or Canada.[4]

We also examine if, in addition to shareholders, banks monitor client firms in a similar fashion. This question cannot be easily answered empirically because of the difficulty in disentangling the effect of leverage per se and the effect of bank debt on activities with scope for managerial moral hazard. We find that spending on such activities is negatively correlated with leverage in general, which is in line with Jensen's (1986) "free cash flow" view. We perform several tests in an attempt to isolate the marginal monitoring effect of bank debt, but do not find strong evidence in support of such monitoring. The evidence is laid out for the reader to judge. Our own conclusion is that large shareholders are probably more important than banks for the type of monitoring we investigate.[5] Because virtually all firms in our sample exhibit positive profits, this type of monitoring seems to take place even when firm performance is normal.

Finally, we discuss the prevalence of the monitoring scheme we document in two other industries, metal products and electronics. The results for metal products are roughly similar to what we observe in the chemical industry although significance levels are somewhat lower, maybe due to the small sample. By contrast, in electronics we find no evidence of large shareholders restricting spending on activities with scope for managerial private benefits. One explanation is that the intense competition in the electronics industry disciplines management reducing managerial private benefits.

In the next section we present the basic logic of our approach. The main data set for the chemical industry and the empirical specification are presented in Section 3, and the results are reported in Section 4. Section 5 extends the analysis to two additional samples, and Section 6 concludes.

The basic idea and its empirical implications

The logic of our central empirical test is centered on the idea that management can undertake "productive" activities that improve firm performance, and "wasteful" activities that generate only private benefits to management. Shareholders observe the total amount of "productive" and "wasteful" activities undertaken, but not each separately. For example, the "productive" activity can be thought of as entertaining clients in restaurants to create business networks, and the "wasteful" activity as expenditures on fancy restaurants that do not contribute to firm performance. Similarly, these activities can represent well-targeted expenditure on

advertising versus expenditure on a highly visible but ineffective campaign of advertising and public relations which benefits only management's "ego." Shareholders cannot distinguish between "productive" and "wasteful" expenses on entertainment and advertising (otherwise the monitoring problem would be trivial). This reflects a difficulty of judging, or at least of arguing in a verifiable manner, whether the third glass of beer with a client, or an expensive television commercial, are essential for business.

Both activities consume resources and, for a given wage, shareholders would like management to allocate as little as possible time to "wasteful" activities. Assuming that shareholders observe a noisy signal of the amount of "productive" activities, they can offer management a pecuniary incentive scheme, e.g. Holmstrom and Milgrom (1987, 1991) which will induce management to engage in more of these activities and less of the "wasteful" activities.

But, as shown in Holmstrom and Milgrom (1991), this type of incentive scheme is ineffective if the signal is noisy. Therefore, shareholders are likely to use additional monitoring devices that are not sensitive to the amount of noise in performance signals. For example, they can restrict the *total* amount of spending on the "productive" and the "wasteful" activities (e.g. the total amount of entertainment expenses).[6]

How would such a constraint on spending be imposed in practice? Presumably, when management is monitored, owners can occasionally intervene and "advise" management on the amount of advertisement or entertainment outlays. This form of intervention probably involves (fixed) costs, for example, due to the need to become familiar with the firm's operations, and the time and effort devoted to meetings with management. The literature on managerial moral hazard typically regards monitoring as a public good whose benefits accrue to all the shareholders. Under the widely held assumption that monitoring costs cannot be easily shared, the free rider problem associated with monitoring is mitigated when ownership is more concentrated, so that we would expect concentrated ownership to be associated with less spending on activities with scope for private benefits. This, of course, does not imply that concentrated ownership is always optimal: it is well known since Demsetz and Lehn's (1985) study, that the benefits of improved monitoring that accompany concentrated ownership should be weighed against various costs such as increased risk, reduced liquidity, etc.

Reducing the amount of spending on activities with potential for managerial private benefits need not be achieved via *explicit* expenditure caps. If managers anticipate disciplinary measures in response to large entertainment or advertising expenses, they will refrain from excessive spending on these activities and will engage in "substitute" activities at their own initiative. Thus, the monitoring mechanism we study may be effective even if explicit expenditure caps are not imposed. Nevertheless, explicit caps

are sometimes imposed and made public. One such case was recently reported in the press when Nissan decided to "break drastically with (Japanese) tradition and ban almost all corporate entertainment," a decision that "startled and dismayed the business community" (*The Financial Times*, April 24, 1998). In addition, there have been news reports about American companies attempting to impose limits on managerial travel expenditures (e.g. *The Financial Times*, July 26, 1998).[7]

To summarize, the central empirical implication of this logic is that concentrated ownership should be associated with less spending on activities with potential for managerial private benefits. A second implication is that the effect should be more pronounced for firms with volatile performance, since in such firms pecuniary incentive schemes are less effective in disciplining managers.[8]

The sample, variables and test specification

Our main sample includes approximately 180 listed Japanese manufacturing firms in the chemical industry in 1990. We check the robustness of our findings using 1982 data for the same firms. We focus on a single (two-digit) industry in order to avoid as much as possible major inter-industry effects. Of course, there are still potentially important differences within the two-digit classification of the chemical industry, which we address later. Two additional samples of firms, one in the metal products and electronics industries are discussed on pages 240–242.

Using data from the Japan Development Bank (similar to *COMPUSTAT* for US firms), we construct five measures of activities with scope for managerial moral hazard, denoted *MH1* through *MH5*:

1 *MH1*: Cash and marketable securities deflated by sales.[9]
2 *MH2*: R&D expenditures deflated by sales. Research and development projects may involve managerial private benefits (due to discretion or prestige, for example) and, at the same time, the value of R&D outlays tends to be hard to monitor by non-specialist outsiders (see Prowse 1990 and Flath 1993).
3 *MH3*: Advertising and promotion expenditures deflated by sales. Like R&D, advertising is likely to involve private benefits to managers (e.g. visibility, "ego," or "empire building," see Flath 1993).
4 *MH4*: Entertainment expenses deflated by sales. This is, perhaps, the most obvious example of an activity that can be productive, but can very easily be turned into private benefits. Moreover, it is virtually impossible for anyone but the "entertaining manager" himself to know if a particular dinner party contributes to firm performance or not.[10]
5 *MH5*: General sales and administrative expenses deflated by sales. This measure includes some hard to monitor items such as travel expenses, managerial retirement funds, and administrative expenses.

For brevity, we will refer to activities *MH1* through *MH5* as "*MH* activities." Naturally, these variables may proxy for firm characteristics other than managerial private benefits, an issue we examine empirically later.

As our main measure of ownership concentration we construct the variable *TOPTEN*, which is defined as the cumulative percent of all shares held by the ten largest shareholders (drawn also from the Japan Development Bank). To verify the robustness of our results, we also experiment with two alternative measures of ownership concentration. The first is the cumulative shareholding of the top five shareholders and the second is the Herfindahl index of ownership concentration.[11]

Our main focus is the relation between the *MH* activities and ownership concentration, but we will also examine the effect of debt holding on these activities. In addition to leverage, we construct several measures of the size of bank debt and its concentration (drawn from *Toyo Keizai*'s *Kigyo Keiretsu Soran*). These measures are the value and share of total debt held by the largest creditor bank, a Herfindahl index of bank debt concentration, and the ratio of overall bank debt to assets.

We test the hypothesis that firms with high ownership concentration spend less on *MH* activities by estimating the regressions (one regression for each of the variables *MH1* through *MH5*),

$$MH_i = \alpha_i + \beta_i GOV_i + \gamma_{i1} Z_1 + \ldots + \gamma_{in} Z_n + \varepsilon_i, \qquad i = 1, \ldots, 5$$

where GOV_i is ownership concentration, and $Z_1, \ldots, Z_n$ are firm characteristics: the natural logarithm of firm assets (to control for scale economies), leverage (the ratio of debt to debt plus equity, to control for capital structure and liquidity constraints), and company age (to control for "learning," reputation, or life-cycle effects).[12] Since all five *MH* activities are non-negative, we estimate the equations using a Tobit procedure, assuming that the error terms are independent across the equations.[13]

We conduct a simple joint significance test of the coefficients on GOV_i in the five equations. The test statistic is calculated as follows: under the null hypothesis, ownership concentration does not affect any of the five *MH* activities, that is, $\beta_i = 0$ for $i = 1, \ldots, 5$. Moreover, under the null, the estimated coefficients of the β_i parameters are independent. This is because if high ownership concentration happens to be correlated (in the sample) with one *MH* activity it is unlikely that it will be correlated with other *MH* activities (unless the null hypothesis is false). Thus, under the null hypothesis, the sum across the five equations of the estimated β_i coefficients divided by the square root of the sum of their variances is (approximately) standard normal, and the probability that the null hypothesis is correct can be calculated.

Sample statistics are displayed in Table 9.1. Spending on certain *MH* activities is substantial: spending on R&D and advertising outlays (*MH2* and *MH3*) amounts, on average, to about half of total operating profits,

Table 9.1 Sample statistics (N = 185)

	Mean	*Standard deviation*
Total assets (billion yen)	155,713	224,568
Operating profits/sales (%)	6.9	5.1
Leverage (debt to total assets)	0.60	0.20
Holdings by *TOPTEN* shareholders (%)	47.6	13.0
Holdings by *TOPFIVE* shareholders (%)	35.7	14.7
Herfindahl index of ownership concentration	0.06	0.08
Debt to largest creditor (billion yen)	5,245	13,929
Fraction of bank debt held by the largest creditor	0.23	0.18
Herfindahl index of bank debt concentration	0.15	0.16
Liquid assets/sales – *MH1* (%)	26.4	14.7
R&D/sales – *MH2* (%)	3.6	4.1
Advertising/sales – *MH3* (%)	3.1	6.7
Entertainment expenses/sales – *MH4* (%)	0.06	0.17
General sales and administrative expenses/sales – *MH5* (%)	24.3	14.7

Note
All financial data are from the Japan Development Bank, and refer to firms in the chemical industry in 1990.

while spending on general sales and administrative expenses (*MH5*) amounts to nearly four times total operating profits.[14]

Empirical results for the chemical industry

Monitoring and shareholder concentration: the benchmark specification

Panel A of Table 9.2 displays Tobit regressions of *MH* activities on cumulative shareholding by the largest ten shareholders, *TOPTEN*, for the entire 1990 sample of firms in the chemical industry, controlling for firm size, leverage, and age.[15] Firms with a more concentrated ownership structure spend less on activities with scope for managerial moral hazard. This is particularly evident in spending on R&D, advertising, and general sales and administrative expenses (*MH2*, *MH3*, and *MH5*). The effect is of large magnitude: for example, a ten percent point increase in ownership by the top ten shareholders is associated with a reduction of about one sixth of total R&D outlays (when evaluated at the sample mean). The effect on advertising expenditures is much bigger. Moreover, all five coefficients are negative and even though only three are statistically significant individually, they are jointly highly significant. Another variable that is clearly of both statistical and economic significance is leverage. For example, a one standard deviation increase in leverage would reduce R&D outlays by about half, and eliminate advertising expenditures completely. We discuss possible interpretations of this result later and, in particular, whether it is due to the effect of bank debt or to debt in general.

Table 9.2 The effect of large shareholders (*TOPTEN*) on activities with scope for managerial moral hazard in the chemical industry

Panel A: Tobit estimates, full sample (N = 185)

	MH1	*MH2*	*MH3*	*MH4*	*MH5*
Constant	Yes	Yes	Yes	Yes	Yes
Log (ASSETS)	0.2	0.8*	0.6	−0.25*	0.6
	(0.8)	(0.3)	(0.7)	(0.08)	(0.8)
TOPTEN	−0.09	−0.05#	−0.20*	−0.005	−0.23*
	(0.08)	(0.03)	(0.06)	(0.006)	(0.08)
Age	−0.05	−0.01	0.02	−0.006	0.04
	(0.07)	(0.02)	(0.06)	(0.006)	(0.07)
Leverage	−26.2*	−8.3*	−21.2*	−0.04	−31.7*
	(4.8)	(1.7)	(3.8)	(0.37)	(4.6)

Notes
p-value of the probability that the coefficients on *TOPTEN* are jointly zero: 0.00.
Tobit regressions of *MH1* through *MH5* on (a constant and) cumulative equity holdings of the largest ten shareholders, TOPTEN, controlling for firm size, age, and leverage (debt to debt plus equity). All *MH* variables are deflated by firm sales: *MH1*-cash and marketable securities, *MH2*-R&D expenses, *MH3*-advertising expenses, *MH4*-entertainment expenses, *MH5*-general sales and administrative expenses. Standard errors are in parentheses.

Panel B: Tobit estimates, sub-sample of firms with high profit volatility (N = 57)

	MH1	*MH2*	*MH3*	*MH4*	*MH5*
Constant	Yes	Yes	Yes	Yes	Yes
Log (ASSETS)	2.2	0.9	−0.6	0.1	−0.6
	(1.7)	(0.6)	(1.1)	(0.1)	(1.5)
TOPTEN	−0.01	−0.13*	−0.35*	−0.00	−0.46*
	(0.16)	(0.05)	(0.12)	(0.00)	(0.14)
Age	−0.03	−0.01	0.06	−0.01	0.04
	(0.17)	(0.05)	(0.10)	(0.01)	(0.14)
Leverage	−13.8	−12.2*	−25.4*	−0.1	−44.3*
	(9.7)	(3.2)	(6.3)	(0.5)	(8.4)

Notes
The sub-sample of firms with high profit volatility consists of 57 firms whose variance of operating profitability between 1977 and 1986 is above the median (out of a total of 114 firms in the chemical industry included in the sample of Weinstein and Yafeh 1998, for which data are available). *p-value* of the probability that the coefficients on *TOPTEN* are jointly zero: 0.00. The *MH4* regression in this table is not statistically different from a "constant only" regression. * and # denote coefficients that are significant at the 5 and 10 percent levels respectively.

Monitoring and the variability of firm performance

As noted above, restricting activities with scope for private benefits is a type of monitoring that does not rely on any observable signals of performance. It is, therefore, likely that companies with highly volatile profits (i.e. with noisy performance signals) should use it more extensively. To examine this prediction, we use information on the variance of operating profitability between 1977 and 1986 (based on calculations in Weinstein and Yafeh 1998) for a sub-sample of 114 firms included in both our study and theirs. To guarantee that the omission of the other firms creates no selection bias, we repeat the regressions of Panel A for this sub-sample, finding a negative and statistically significant correlation between *TOPTEN* and the *MH* activities. Moreover, the coefficients are very similar to those reported for the full sample: −0.01, −0.05, −0.30, −0.002, −0.25 for *MH1*−*MH5* and, as in Panel A, the coefficients on *MH3* and *MH5* are individually statistically significant. We then divide the sample in two according to whether the variance of profitability is above or below the sample median. Panel B presents regressions similar to those in Panel A for the sub-sample of firms with highly volatile profits. It is clear from the table that for these firms the effect of *TOPTEN* on the *MH* activities is larger and more significant than in the full sample.

Do banks monitor by restricting activities with scope for managerial private benefits?

Because so much has been written about the role of Japanese banks in corporate governance, we investigate whether bank ties affect spending on activities with scope for managerial private benefits. As mentioned, the main difficulty is to disentangle empirically the effect of leverage per se, and the incremental effect of bank debt on such activities. To this end, we construct two measures of bank debt concentration that proxy for the incentive and ability of banks to monitor management. The first measure is the share of the largest creditor in total debt, and the second is the Hefindahl index of bank debt concentration. The logic is that when bank debt is concentrated, the largest creditors have an incentive to devote resources to the formation of bank-firm ties and to collecting information on the firm's operations and quality of management. (If bank debt were not concentrated, a free rider problem would arise.) These creditors, being large, can exert restraining influence on spending more effectively.

We re-estimate our basic regression with each of these measures of bank monitoring as an additional regressor. Since we control for leverage, the coefficient on these regressors captures the incremental effect of bank monitoring above and beyond that of bank debt per se. Panels A and B of Table 9.3 indicate that the coefficients on *TOPTEN* and leverage remain unchanged, but the coefficients on the measures of bank debt concentra-

Table 9.3 The effect of bank debt on activities with scope for managerial moral hazard

Panel A: Tobit estimates: regressions including share of bank debt held by largest creditor (N = 184)

	MH1	*MH2*	*MH3*	*MH4*	*MH5*
Constant	Yes	Yes	Yes	Yes	Yes
Log (ASSETS)	0.3	0.9*	0.4	−0.25*	0.4
	(0.8)	(0.3)	(0.7)	(0.08)	(0.8)
TOPTEN	−0.10	−0.05#	−0.20*	−0.005	−0.23*
	(0.08)	(0.03)	(0.06)	(0.006)	(0.08)
Largest creditor's	2.0	1.8	−5.6	−0.1	−4.3
share of total debt	(5.7)	(1.9)	(4.3)	(0.4)	(5.3)
Age	−0.05	−0.01	0.02	−0.006	0.04
	(0.07)	(0.02)	(0.06)	(0.006)	(0.07)
Leverage	−26.2*	−8.4*	−20.0*	−0.03	−30.8*
	(4.9)	(1.7)	(3.9)	(0.4)	(4.6)

Notes
p-value of the probability that the coefficients on *TOPTEN* are jointly zero: 0.00; the probability that the coefficients on the share of the largest creditor are jointly zero: 0.47.
Tobit regressions of *MH1* through *MH5* on (a constant and) measures of bank debt concentration controlling for cumulative equity holdings of the largest ten shareholders, *TOPTEN*, firm size, age, and leverage (debt to debt plus equity). In addition, we include measures of bank debt: the fraction of bank debt held by the largest creditor (Panel A), a Herfindahl index of bank debt concentration (Panel B), the absolute amount owed to the largest lender (Panel C), and the ratio of bank debt to assets (Panel D). All moral hazard variables are deflated by firm sales: *MH1*-cash and marketable securities, *MH2*-R&D expenses, *MH3*-advertising expenses, *MH4*-entertainment expenses, *MH5*-general sales and administrative expenses. Standard errors are in parentheses.

Panel B: Tobit estimates: regressions including a Herfindahl index of bank debt (N = 184)

	MH1	*MH2*	*MH3*	*MH4*	*MH5*
Constant	Yes	Yes	Yes	Yes	Yes
Log (ASSETS)	0.3	0.9*	0.5	−0.25*	0.5
	(0.9)	(0.3)	(0.7)	(0.08)	(0.8)
TOPTEN	−0.10	−0.05#	−0.20*	−0.005	−0.24*
	(0.08)	(0.03)	(0.06)	(0.006)	(0.08)
Herfindahl index of	0.8	2.5	−3.4	−0.1	−4.5
bank debt	(6.5)	(2.1)	(4.9)	(0.4)	(6.0)
Age	−0.05	−0.01	0.02	−0.006	0.04
	(0.07)	(0.02)	(0.06)	(0.006)	(0.07)
Leverage	−26.0*	−8.4*	−20.7*	−0.04	−31.1*
	(4.9)	(1.7)	(3.9)	(0.4)	(4.5)

Note
p-value of the probability that the coefficients on *TOPTEN* are jointly zero: 0.00; the probability that the coefficients on the Herfindahl index of bank debt concentration are jointly zero: 0.65. * and # denote coefficients that are significant at the 5 and 10 percent levels respectively.

tion are not statistically significant. These results do not support the view that bank-firm relations (measured by the concentration of bank debt) are important for the monitoring mechanism we investigate.

Next, we re-estimate our basic regression including as an additional regressor a measure of the magnitude of debt to the largest creditor. Since we control for firm size, the absolute amount of debt to the largest creditor captures the extent to which a firm is dependent on this creditor. The larger this dependence the greater the ability of the creditor (bank) to monitor the firm's management. The results are displayed in Table 9.3, Panel C. The coefficients on *TOPTEN* and leverage remain unchanged, and the coefficient on the magnitude of debt to the largest creditor is negative in all the regressions and statistically significant in one. This result provides some support for the view that bank-firm relations (measured by the dependence of firms on credit from one bank) are important for the monitoring mechanism we investigate.

Finally, we split leverage for each firm in our sample to the ratio of bank debt to assets and the ratio of non-bank debt to assets. We re-estimate our basic regression including both variables as regressors in place of leverage. The results are displayed in Table 9.3, Panel D. The coefficient on *TOPTEN* remains unchanged, and the coefficients on both measures of bank and non-bank debt are negative and typically significant. The magnitude and significance levels are similar, although in two regressions (*MH1* and *MH3*) the coefficient on bank debt is larger (more negative) and more significant.

Our interpretation of the fact that both bank and non-bank debt affect negatively activities with potential for managerial moral hazard (Panel D)

Table 9.3 Continued

Panel C: Tobit estimates: regressions including the amount of bank debt held by the largest creditor (N = 184)

	MH1	*MH2*	*MH3*	*MH4*	*MH5*
Constant	Yes	Yes	Yes	Yes	Yes
Log (ASSETS)	0.2	1.2*	1.1	−0.25*	1.2
	(0.9)	(0.3)	(0.7)	(0.09)	(0.8)
TOPTEN	−0.09	−0.04	−0.19*	−0.004	−0.23*
	(0.08)	(0.03)	(0.06)	(0.006)	(0.08)
Debt held by the	−9.4	−8.5*	−12.2	−2.81	−12.0
largest creditor	(8.6)	(4.1)	(10.1)	(3.21)	(8.7)
Age	−0.06	−0.02	0.01	−0.007	0.02
	(0.07)	(0.02)	(0.06)	(0.006)	(0.07)
Leverage	−24.2*	−6.8*	−18.9*	0.1	−28.9*
	(5.2)	(1.8)	(4.1)	(0.4)	(4.9)

Note

p-value of the probability that the coefficients on *TOPTEN* are jointly zero: 0.00; the probability that the coefficients on the amount of debt held by the largest creditor are jointly zero: 0.00. The coefficients on debt held by the largest creditor are multiplied by 10,000. * and # denote coefficients that are significant at the 5 and 10 percent levels respectively.

(*Continued*)

Table 9.3 Continued

Panel D: Tobit estimates: regressions with bank debt and non-bank debt included separately (N = 184)

	MH1	*MH2*	*MH3*	*MH4*	*MH5*
Constant	Yes	Yes	Yes	Yes	Yes
Log (ASSETS)	−0.01	0.8*	0.5	−0.25*	0.7
	(0.8)	(0.3)	(0.7)	(0.08)	(0.8)
TOPTEN	−0.03	−0.05#	−0.18*	−0.003	−0.24*
	(0.08)	(0.03)	(0.07)	(0.006)	(0.08)
Age	−0.06	−0.01	0.01	−0.007	0.03
	(0.07)	(0.02)	(0.06)	(0.006)	(0.07)
Bank debt to assets	−37.2*	−8.4*	−26.3*	−0.5	−31.2*
	(5.9)	(2.1)	(5.3)	(0.5)	(5.7)
Non-bank debt to assets	−11.7#	−8.1*	−15.7*	0.4	−31.4*
	(6.5)	(2.3)	(5.1)	(0.5)	(6.2)

Note
p-value of the probability that the coefficients on *TOPTEN* are jointly zero: 0.00; the probability that the coefficients on bank debt to assets are jointly zero: 0.00; the probability that the coefficients on non-bank debt to assets are jointly zero: 0.00. * and # denote coefficients that are significant at the 5 and 10 percent levels respectively.

is that "debt is debt is debt." Combined with the results reported in panels A and B, we believe that, in our sample, banks do not have a special monitoring role (besides being large creditors). We further interpret these results as indication that, when firm performance is normal, debt holders and banks discipline management mainly through a Jensen-type restriction on their "free cash flow." For example, highly levered firms may be liquidity constrained and unable to raise funds to finance their R&D or advertising outlays. (During periods of distress, bank intervention and monitoring are crucial as documented in many studies; see footnote 5.)[16]

We acknowledge, however, that the evidence on this point is not sharp. The fact that bank and non-bank debt both negatively affect activities with potential for managerial moral hazard (Panel D) need not be that "debt is debt is debt." Rather, it may reflect the separate monitoring roles of leverage through a Jensen-type restriction on "free cash flow" on the one hand, and the monitoring role of banks through relationship formation with firms on the other hand. As mentioned, the results in Panel C provide support for this view.

Robustness tests and alternative interpretations

Instrumental variables and TSLS estimation

The regression specifications so far have been based on the assumption that spending on activities such as advertising or entertainment can be adjusted easily, while ownership structure is stable in the short run and, to

a large extent, historically determined. This assumption is corroborated by historical studies showing that many equity relations in Japan were formed during and immediately after World War II (e.g. Hoshi 1994; Yafeh 1995). Nevertheless, in order to address the Demsetz and Lehn (1985) concern that ownership structure may be endogenous, we examine two additional empirical specifications. In the first, 1982 ownership concentration is used as an instrument for its 1990 counterpart, yielding a negative correlation between ownership concentration and spending on *MH* activities and coefficients which are very similar to those reported in Panel B of Table 9.2. In particular, the coefficients on *TOPTEN* in the five regressions are −0.03, −0.05, −0.18, −0.004 and −0.24, with the coefficients on *MH2*, *MH3* and *MH5* individually statistically significant. In the second specification, we follow Demsetz and Lehn (1985) and Leech and Leahy (1991) and adopt a two-stage estimation strategy. In the first stage, ownership concentration is regressed on firm characteristics that determine the desirability of concentrated ownership (firm size, age and variance of operating profitability). In the second stage, we use the fitted values of ownership concentration from this regression. Panel A of Table 9.4 shows that the negative correlation between ownership concentration and spending on *MH* activities is present in this specification as well, with four

Table 9.4 Extensions and robustness tests

Panel A: TSLS Tobit estimates (N = 114)

First stage regression (Standard errors are in parentheses)

TOPTEN = 90.39 − 3.37 * Log (ASSETS) −42.43 * Variance of profitability −0.09 * Age
(10.5) (0.83) (38.14) (0.08)

Second stage regressions

	MH1	*MH2*	*MH3*	*MH4*	*MH5*
Constant	Yes	Yes	Yes	Yes	Yes
Log (ASSETS)	−6.9#	−6.7*	−5.1#	0.3	−18.1*
	(4.1)	(0.9)	(2.8)	(0.5)	(3.0)
Fitted value of	−2.2*	−2.2*	−1.9*	0.13	−5.7*
TOPTEN	(1.1)	(0.3)	(0.8)	(0.13)	(0.8)
Age	−0.19	−0.18*	−0.10	0.01	−0.3*
	(0.14)	(0.03)	(0.10)	(0.01)	(0.1)
Leverage	−12.6#	−7.8*	−25.6*	0.1	−34.4*
	(7.1)	(1.7)	(5.5)	(0.6)	(5.2)

Note
p-value of the probability that the coefficients on *TOPTEN* are jointly zero: 0.00. The *MH4* regression in this table is not statistically different from a "constant only" regression.

(*Continued*)

Table 9.4 Continued

Panel B: Tobit estimates, controlling for Tobin's *Q* (1982, N = 119)

	MH1	*MH2*	*MH3*	*MH4*	*MH5*
Constant	Yes	Yes	Yes	Yes	Yes
Log (ASSETS)	−1.5*	0.36*	−0.35	−0.11*	−0.9
	(0.6)	(0.21)	(0.42)	(0.02)	(0.8)
TOPTEN	−0.04	−0.02	−0.08*	−0.006*	−0.18*
	(0.05)	(0.02)	(0.04)	(0.002)	(0.07)
Tobin's *Q*	0.62#	0.50*	−0.00	−0.01	10.7*
	(0.34)	(0.12)	(0.24)	(0.01)	(4.7)
Age	−0.03	0.007	−0.027	0.002	0.09
	(0.05)	(0.019)	(0.038)	(0.002)	(0.07)
Leverage	9.7*	−5.2*	−13.3*	−0.35*	−32.4*
	(3.7)	(1.4)	(2.7)	(0.13)	(5.1)

Notes
p-value of the probability that the coefficients on *TOPTEN* are jointly zero: 0.00.

Panel C: Principal components analysis (N = 185)

	Aggregate MH
Constant	Yes
Log (ASSETS)	0.06
	(0.04)
TOPTEN	−0.015*
	(0.005)
Age	0.002
	(0.004)
Leverage	−2.11*
	(0.30)
Adjusted R-Squared	0.26

Note
OLS regression with robust standard errors (in parentheses). The dependent variable is an aggregate measure of *MH* expenditures.

Panel A presents TSLS estimates where ownership concentration is endogenously determined. Panel B presents results from regressions that include Tobin's Q, calculated by Hayashi and Inoue (1991), as an additional control variable. This sub-sample consists of 119 firms out of the 1982 sample for which data on *Q* are available from Hayashi and Inoue (1991). Panel C presents regressions based on an aggregate measure of *MH*, which is constructed using principal components analysis. Estimates in Panels A and B are derived from Tobit regressions of *MH1* through *MH5* on (a constant and) cumulative equity holdings of the largest ten shareholders, *TOPTEN*, controlling for firm size, age and leverage (debt to debt plus equity). Estimates in Panel C are from an OLS regression with robust standard errors. Moral hazard variables are deflated by firm sales: *MH1*-cash and marketable securities, *MH2*-R&D expenses, *MH3*-advertising expenses, *MH4*-entertainment expenses, *MH5*-general sales and administrative expenses. * and # denote coefficients that are significant at the 5 and 10 percent levels respectively.

of the *TOPTEN* coefficients individually statistically significant and of larger magnitude than those reported in Table 9.2, Panel A.

Are the results a peculiar feature of 1990?

We re-estimate our system of equations for 1982, and find that the negative and significant correlation between ownership concentration and spending on *MH* activities is clearly present here as well (results not shown).

Alternative measures of ownership concentration

To examine if our results depend on the variable used to measure ownership concentration, we reproduce the basic results of Table 9.2, Panel A using the cumulative shareholding of the top five shareholders and the Herfindahl index of ownership concentration as alternative measures of ownership concentration. The results hold up (not shown). Similarly, the results in Panel B of Table 9.2 with respect to the sub-sample of firms with high volatility of profits are also unchanged when the cumulative shareholding of the top five shareholders or the Herfindahl index of ownership concentration are used as measures of ownership concentration.

Monitoring and relationships with customers and suppliers

The negative relation between ownership concentration and spending on certain *MH* activities (e.g. advertising expenses) may be due to the fact that in Japan shareholders are often customers and suppliers. Hence, firms with concentrated ownership can afford to spend less on product promotion. Although we do not have data on the composition (identity) of the top ten shareholders, we do have information on the total percent of equity held by other non-financial corporations (presumably mostly suppliers and customers). When we divide the sample in two according to this criterion, we find that the negative correlation between *TOPTEN* and the *MH* activities is clearly present in the sub-sample of 103 firms with below-average shareholding by non-financial corporations. Again, the coefficients on *TOPTEN* for this sub-sample are very similar to those reported in Table 9.2, Panel A. This suggests that our results are not just picking up economies of scale in activities such as R&D and advertising among firms with cross-ownership ties.

Ownership concentration and growth prospects

The negative relation between ownership concentration and R&D or advertising intensity may be related to investment opportunities, for example, if firms with concentrated ownership have poor growth

prospects. We address this issue by adding Tobin's *Q* to the 1982 sample regressions. The data are drawn from Hayashi and Inoue's (1991) seminal paper on *Q* in a model of multiple capital goods and state-of-the-art measurement of capital stocks. We focus on 1982 because of data availability (Hayashi and Inoue's sample does not cover 1990), and also because of the dramatic decline in the equity prices in the Tokyo Stock Exchange in 1990 which might affect the measurement and interpretation of Tobin's *Q*. The results, presented in Panel B of Table 9.4 (for the 119 firms included in both our sample and in Hayashi and Inoue's), indicate that the negative relation between *TOPTEN* and the *MH* activities holds when investment opportunities are controlled for.

Controlling for differences between sectors within the chemical industry

We also investigate the possibility that differences between firms operating in different sectors of the (2-digit) chemical industry are important by including three-digit sector dummies in the regressions. The results (not shown) remain unchanged.

"Compensating balances," bank influence and cash holdings

Cash and liquid assets may reflect "compensating balances" demanded by Japanese banks as a way to extract rents from their clients. We do not believe this could be a major issue in 1990 after Japanese banks lost most of their monopoly power (Weinstein and Yafeh 1998). Moreover, in 1990, after Japanese capital markets were liberalized, there was little need to circumvent interest rate regulations through "compensating balances."

Entertainment expenses, business networks and company age

Entertainment expenditures may proxy for the size of a firm's business network. We do not believe this to be the case both in view of the reports on Nissan's recent decision to curb these expenditures, and because age has only little effect on *MH4* in the regressions.

Principal components analysis

In Panel C of Table 9.4 we use principal components analysis to aggregate the five measures of private benefits, *MH1–MH5,* into a single measure (see Greene 1990). This aggregate measure is then regressed on ownership concentration and the other control variables. It is found to be strongly and negatively related to ownership concentration, in line with our earlier results.

Empirical results for other industries

To investigate how widespread is the monitoring mechanism we describe we examine two additional samples of listed Japanese firms in 1990. The first, consisting of 61 listed firms in the metal products industry, is described in the left-hand column of Table 9.5, Panel A. Firms in this sample are smaller than in the chemical industry. This sample exhibits a negative correlation between ownership concentration and spending on most *MH* activities (Panel B of Table 9.5), but the statistical significance of the coefficients is not as high as in the chemical industry, perhaps due to the smaller size of the sample. Notice that advertising expenditures in the metal products industry are particularly low with a low variance across firms (Panel A), which may explain why the relation between *TOPTEN* and *MH3* is statistically insignificant.

Next, we examine a sample of 174 firms in the electronics industry, finding no clear relation between ownership concentration and *MH* activities (Panels A and C of Table 9.5). We conjecture that in rapidly changing consumer-oriented industries where advertising and R&D constitute a vital part of firm activity it may not be in the shareholders' interest to impose a cap on such outlays. One reason could be that in the electronics

Table 9.5 The effect of large shareholders (*TOPTEN*) on activities with scope for managerial moral hazard in the metal products and electronics industries

Panel A: Sample statistics

	Metal products (N = 61)		*Electronics (N = 174)*	
	Mean	*Standard deviation*	*Mean*	*Standard deviation*
Total Assets (billion yen)	55,796	86,237	211,232	576,570
Holdings by *TOPTEN* shareholders (%)	48.2	11.9	49.9	14.1
Liquid assets/sales – *MH1* (%)	40.3	27.0	32.8	35.9
R&D/sales – *MH2* (%)	3.0	5.1	1.7	2.4
Advertising/sales – *MH3* (%)	0.5	0.9	1.1	2.1
Entertainment expenses/sales – *MH4* (%)	0.2	0.2	0.05	0.2
General sales and administrative expenses/sales – *MH5* (%)	14.4	6.2	16.9	7.2

(*Continued*)

Table 9.5 Continued

Panel B: Monitoring by large shareholders, metal products (N = 61)

	MH1	*MH2*	*MH3*	*MH4*	*MH5*
Constant	Yes	Yes	Yes	Yes	Yes
Log (ASSETS)	3.2	2.2	0.5*	−0.12	0.008
	(6.9)	(1.4)	(0.2)	(0.11)	(0.8)
TOPTEN	−0.6*	−0.22	−0.00	−0.01	−0.12#
	(0.3)	(0.14)	(0.00)	(0.01)	(0.07)
Age	−0.3	0.01	−0.01	0.02	−0.17*
	(0.2)	(0.10)	(0.01)	(0.008)	(0.06)
Leverage	−15.4	4.3	−0.03	−0.4	0.8*
	(16.6)	(8.0)	(1.1)	(0.6)	(0.4)

Note
p-value of the probability that the coefficients on *TOPTEN* are jointly zero: 0.01. The *MH4* regression is different from a "constant only" regression at the 10 percent level only.

Panel C: Monitoring by large shareholders, electronics (N = 174)

	MH1	*MH2*	*MH3*	*MH4*	*MH5*
Constant	Yes	Yes	Yes	Yes	Yes
Log (ASSET)	8.3#	1.2*	1.7*	−0.48*	2.2*
	(4.4)	(0.5)	(0.4)	(0.17)	(1.0)
TOPTEN	−0.25	−0.01	0.032#	−0.010#	0.04
	(0.18)	(0.02)	(0.017)	(0.006)	(0.04)
Age	−0.47*	−0.008	0.001	−0.010#	0.016
	(0.19)	(0.020)	(0.018)	(0.006)	(0.044)
Leverage	22.8	−0.7	−2.3	−0.84	−0.4
	(15.0)	(1.5)	(1.4)	(0.51)	(3.4)

Notes
p-value of the probability that the coefficients on *TOPTEN* are jointly zero: 0.29.
Sample statistics (Panel A) and Tobit regressions (Panels B and C) of *MH1* through *MH5* on (a constant and) cumulative equity holdings of the largest ten shareholders, *TOPTEN*, for 1990 in the two-digit metal products and electronics industries, controlling for firm size, age and leverage (debt to debt plus equity). Moral hazard variables are deflated by firm sales: *MH1*-cash and marketable securities, *MH2*-R&D expenses, *MH3*-advertising expenses, *MH4*-entertainment expenses, *MH5*-general sales and administrative expenses. Standard errors are in parentheses. * and # denote coefficients that are significant at the 5 and 10 percent levels respectively.

industry, R&D and advertising are much more effective than their substitute activities. This may well be the case even though the ratio of advertising to sales in the electronics industry is not higher than in the chemical industry. Another reason why the *MH* activities are not related to ownership concentration in the electronics industry may be fierce competition. If competition itself serves as a disciplinary mechanism for managers,

shareholders need not resort to active monitoring of the type we describe.[17] Finally it is possible that performance signals in the consumer electronics industry provide more precise indication of the effectiveness of R&D and advertising relative to other industries.[18]

Concluding remarks

Our analysis suggests that, at least in the Japanese chemical industry and probably in other "traditional" sectors, large shareholders play a role in monitoring managers by imposing a reduction of firm expenditures on activities with scope for managerial private benefits. Unlike managerial incentive schemes, this monitoring mechanism is not affected by the degree of noise in observable measures of firm performance, and indeed our results suggest that it is more heavily used in firms with high performance volatility. We also find evidence for the disciplinary role of debt, which appears to limit management's free cash flow and reduce spending on these activities. We do not find as much support for the conjecture that banks are particularly important in this respect. Finally, monitoring by reducing activities with scope for managerial private benefits is not present in the consumer electronics industry, either because of the different technological nature of this sector or because the intense product market competition in this industry leads to lower managerial moral hazard.

Notes

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1 Freixas and Rochet (1997) and Shleifer and Vishny (1997) provide extensive surveys. Empirical studies establishing the general importance of large shareholders in corporate governance include Demsetz and Lehn (1985), Shleifer and Vishny (1986), Morck, Shleifer and Vishny (1989) and, more recently, Bertrand and Mullainathan (2001). Studies focusing on the positive relation between ownership concentration and board turnover or restructuring of poorly performing firms include Kaplan and Minton (1994), Denis, Denis and Sarin (1997), Franks, Mayer and Renneboog (2001), and Kang and Shivdasani (1995, 1996, 1997).

2 Bertrand and Mullainathan (2001) propose a related idea. They contrast two theories of managerial compensation. The first, which they call the "contracting view," corresponds to standard managerial compensation theory (as in Holmstrom and Milgrom 1987, 1991). The second, called the "skimming view,"

promotes the idea that managers may influence the determination of their wages and set their own pay "constrained by the availability of cash or by fear of drawing shareholders' attention." Their empirical evidence suggests that both views have merit, but that in poorly governed firms the "skimming view" fits better (e.g. there is more "pay for luck").

3 This follows from the analysis in Holmstrom and Milgrom (1987, 1991) who show that an optimal managerial incentive scheme exhibits a negative relation between the sensitivity of compensation to performance and the extent to which measures of firm performance are noisy. Findings in Aggarwal and Samwick (1999), who use a sample of US firms, provide empirical support for this claim.

4 The fact that managerial incentive schemes have been, in general, extremely rare outside the US, and particularly so in Japan, fits the logic of our conjecture since European, and especially Japanese executives, are likely to be more risk averse than their American counterparts (Horioka 1990). This is in line with the analysis in Holmstrom and Milgrom (1987, 1991) who show that the sensitivity of compensation to performance should be smaller the more risk averse is the manager (agent). Moreover, social norms which restrict the wage differential between executives and other employees, therefore limiting the applicability of managerial incentive schemes (see Jensen and Murphy 1990), are probably more prevalent in Japan and Europe than they are in the US. Nevertheless, there is evidence of a rapid increase in the use of managerial compensation schemes outside the US in recent years. For example, see Conyon and Leech (1994), Conyon, Gregg and Machin (1995), and Main, Bruce and Buck (1996) for the UK, and Dore (2000) for Japan.

5 For a survey of empirical studies of bank monitoring, see Shelifer and Vishny (1997). Empirical studies of bank monitoring in Japan, especially in periods of financial distress, include Sheard (1989), Kaplan and Minton (1994), Kang and Shivdasani (1995, 1997), and Morck and Nakamura (1999). Prowse (1990) and Flath (1993) examine patterns of bank shareholding in Japan as a proxy for bank monitoring. Cable (1985) and Edwards and Fischer (1994) study bank monitoring in Germany.

6 In that case, management may engage in "substitute" activities: rather than entertain clients in restaurants and clubs, they can be invited to tour the plant or try the new product; rather than spend on advertising campaigns, direct mailing can be used.

7 This type of expenditure caps on specific activities should be familiar to academics. Many organizations that extend research grants limit the amount of money that can be spent on international travel – an activity that obviously can be very "productive" but may involve hard-to-detect "private benefits." The US National Science Foundation and the US–Israel Bi-National Foundation set strict limits on international travel while the Israeli National Science Foundation forbids any international travel.

8 Our approach has further implications regarding managerial compensation that we are unable to pursue empirically. Shareholders will typically not completely ban expenditure on activities with scope for managerial private benefits because the more restricted is management's choice, the higher is the wage that must be paid to compensate for the forgone "perks." This implies that in firms with more stringent restrictions on such activities, managerial compensation should be higher. Unfortunately, this prediction is not very helpful empirically since in firms that use managerial incentive schemes we should also expect to see high wages (to compensate managers for the additional risk they undertake). (The latter scheme implies both a high level of wages as well as high sensitivity of wages to (ex-post) performance, whereas the former makes

predictions only regarding the level of wages.) Another implication which we do not consider empirically is that restrictions on the amount of spending on activities with potential for managerial private benefits should be positively related to firm value (otherwise shareholders would not want to restrict these activities in the first place). This empirical implication is hard to test because it requires a counterfactual estimate of what firm value would have been without restrictions on management's activities; see Habib and Ljungqvist (2000) who measure the effect of managerial incentives on Tobin's Q relative to an efficient frontier.

9 Notice that *MH1* is actually a stock, not an activity. Jensen (1986) argues that cash and other liquid assets enable managers to pursue their own objectives without close supervision by shareholders or creditors. Prowse (1990) also uses cash and liquid assets as a proxy for the need to monitor management.

10 See Morck and Nakamura (1999) for further discussion of entertainment expenses as a measure of managerial private benefits.

11 Both are drawn from *Toyo Keizai*'s *Dai Kabunushi Soran*.

12 A measure of bank monitoring will be added to the regressions later.

13 Estimating the equations using OLS, as a system of Seemingly Unrelated Regressions (SUR), yields similar results. (Since the regressors are the same in all the equations, there is no efficiency gain from estimating them as a system.)

14 Not all five *MH* activities are highly correlated. The correlations between *MH5* and *MH2* and between *MH5* and *MH3* are high, about 0.7, but the correlation between *MH2* and *MH3* is about 0.3. *MH4* is not highly correlated with the other *MH* activities. In addition, because firms often report "zero" for some *MH* activities, particularly entertainment and advertising expenses (*MH3* and *MH4*), and to a lesser extent R&D (*MH2*), the distribution of these variables is skew: the median values for *MH2, MH3*, and *MH4* are 0.025, 0.0006 and 0, respectively. One explanation is provided by Suzuki (1993) who argues that R&D expenditures are often under-reported because research expenses at the plant level are not always included in the firm's aggregate R&D outlays, but rather in other parts of the financial statements. Even though under-reporting is apparent in our data, we find no reason for these reporting practices to be correlated with the firm's ownership structure, and therefore do not believe that they are likely to bias our results.

15 There is no conventional measure of goodness of fit for Tobit regressions. With very few exceptions noted in the tables, the reported regressions pass (at the 1 percent significance level) the likelihood ratio ($?^2$) test where each regression is compared with a "constant only" regression.

16 To address the possibility that ownership concentration picks up some of the monitoring role of banks (since the banks themselves are often shareholders), we re-estimated the regressions in this sub-section omitting the variable *TOPTEN*. The results are unchanged in the main.

17 The Bank of Japan's *Juyo Kigyo Keiei Bunseki* (Analysis of Management of Major Corporations, 1990 and 1991) documents, for 1991, average operating profit rates of 3 percent in the electronics industry compared to 6 percent in the chemical industry. In 1990, the corresponding figures are 5 percent in electronics and 7 percent in chemicals.

18 The results for the metals and electronics industries do not change when alternative measures of ownership concentration (shares held by the top five shareholders, or a Herfindahl index) are used. There is still a negative (and slightly more significant) relation between ownership concentration and spending on *MH* activities in the metals industry, but not in electronics.

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10 Did families lose or gain control after the East Asian financial crisis?

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Introduction

Previous studies document that changes in ownership and board structures of firms in the US occur in response to changes in the business or industry conditions of the firms due to changes in regulations, input costs, technology and the financial system (Mitchell and Mulherin 1996; Holderness *et al.* 1999; Kole and Lehn 1999). In addition, ownership and board changes might be attributable to past stock-price returns, top executives changes, and corporate control threats (Denis and Sarin 1999). However, little evidence on ownership structure changes following a macroeconomic shock or crisis has been compiled.

Although recently studies focusing on how firms respond to an economy-wide shock have been increasing, to our knowledge there is no study that directly investigates an impact of a macroeconomic shock on ownership and board structures. For example, Baek *et al.* (2002) focus only on the effects of the East Asian financial crisis on restructuring activities using data on Korean firms. They assume that ownership structure is predetermined, and document the negative relation between ownership by owner-managers and the likelihood that firms undertake downsizing activities. Unlike Baek *et al.* (2002), we investigate changes in ownership and board structures as a part of the restructuring process in response to the macroeconomic shock. The country of focus is Thailand, which was affected tremendously by the 1997 East Asian crisis. Hence it provides a spectacular opportunity to explore this issue. Similar to most research on the ownership structure literature, our analysis is best viewed as an exploratory data study.

Our study focuses on Thai non-financial publicly traded firms in 2000 compared to those of 1996, which is one year before the crisis. This comparison allows us to address three principal issues. First, how corporate ownership structure changes as the economy, the financial system and the regulation on foreign ownership have changed. Second, whether there are any variations in mechanisms used by the owners to control the firms before and after the crisis. Finally, to what extent the degree of controlling

shareholders' participation in management changes, subsequent to the economic shock. Surprisingly, we find that the ownership and control appear to be more concentrated in the hands of controlling shareholders subsequent to the crisis. Interestingly, even though families are still the most prevalent owners of Thai firms, their role is reduced. Similar to the pre-crisis period, the controlling shareholders are typically involved in management in the majority of firms. Especially in family-owned firms, the participation of controlling families' members in the board is even greater after the crisis. In addition, our results show that direct shareholdings are the most common means of control used in more than two-thirds of the firms in both periods. Rather than direct ownership, pyramidal structures and cross-shareholdings are employed. These control-enhancing mechanisms, nevertheless, are used less often, reflected in the lower degree of separation between ownership and control following the macroeconomic shock.

This study is organized as followed. In Section 2, we describe data sources, data collection, and data definition. In Section 3, we examine who controlled Thai firms in the period after the crisis. Section 4 provides analyses of the deviation between ownership and control of the firms' ultimate owners and the means they use to enhance their voting rights from associated cash-flow rights. We also investigate the separation between ownership and management in this Section. In Section 5, we explore the concentration of ownership and control in firms that have no controlling shareholder. Finally, our conclusion is drawn in Section 6.

Data construction

Data sources

Our sample includes all non-financial companies listed in the Stock Exchange of Thailand. The data of 1996 and 2000 are used to represent the pre- and post-crisis periods, respectively. The choices of these two years are arbitrary, however. We do not investigate banks and other financial companies because unlike non-financial companies, there are ownership restrictions imposed on banks and financial institutions by the Bank of Thailand.[1]

Our study is based on comprehensive data sources of ownership. Previous research on ownership structure of firms in East Asian countries (for example, Claessens *et al.* 2000; Lemmon and Lins forthcoming; Lins forthcoming; Mitton 2002) typically employs data sources that include shareholders with shareholdings of at least 5 percent, while our database includes more detailed information. More precisely, our database provides the information on shareholders who hold at least 0.5 percent of a firm's shares. This ownership data as well as the board data are obtained from the I-SIMS database produced by the Stock Exchange of Thailand.

Additional information on the ownership and board data, such as lists of a company's affiliates and shareholdings by these companies as well as family relationships among board members, is manually collected from company files (FM 56-1) available at the library and the website of the Stock Exchange of Thailand. Besides Johnstone *et al.* (2001), we also researched various books written in Thai to trace family relationships beyond their surnames (Pornkulwat 1996; Sappaiboon 2000a, 2000b, and 2001). We use the BOL database provided by BusinessOnLine Ltd. to trace the ownership of private companies that appear as corporate shareholders of our sample firms. The BOL has a license from the Ministry of Commerce to reproduce the company information from the Ministry's database. Basically, this database includes major information of all registered companies in Thailand that is reported annually to the Ministry.

With all the above data sources, we are able to trace the ultimate owners of all privately owned companies that are the (domestic corporate) shareholders of firms in our focus. As will be shown later, we often underestimate equity stakes held by the firm's shareholders without searching for the owners of these private companies.

Definition of controlling shareholder

A controlling shareholder or an ultimate owner can be defined as a shareholder who *directly* or *indirectly* owns more than 25 percent of a company's votes (Stock Exchange of Thailand, 1998). We are aware that cut-off levels of 10 percent and 20 percent are more commonly used in the literature (La Porta *et al.* 1999; Claessens *et al.* 2000; Faccio and Lang 2002). However, due to differences in law and legislation across countries, a 25 percent cut-off is more appropriate as far as Thailand is concerned.[2] The shareholder with more than 25 percent stakes can control a firm because no other single shareholder would own enough voting rights to have the absolute power over the firm to challenge him. Under the Public Limited Companies Act B.E. 2535, to have absolute power over a firm, a shareholder needs to own at least 75 percent of a firm's votes.

Ironically, a shareholder with 25 percent of votes has sufficient legal rights to perform the following actions under the Thai corporate law. First, he has the right to ask the court to withdraw a resolution that fails to comply with or that is in contravention of the articles of the company's association or the provisions of the Public Limited Companies Act. Second, he has the right to demand an inspection of the company's business operation and financial condition. Third, he has the right to call an extraordinary general meeting at any time. Fourth, he has the right to request the court to dissolve the company if he expects that further business operation will bring in only losses and that the company has no chance of recovery (Sersansie and Nimmansomboon 1996).

Definition of ownership and control

Unlike many countries in Europe, multiple voting shares do not exist in Thailand. Thai law prohibits the issuance of such shares. Therefore, we will focus only on the three control mechanisms, namely, direct, pyramidal, and cross-shareholdings, here. "Direct ownership" means that a shareholder owns shares under his own name or via a private company owned by him. "Indirect ownership" is when a company is owned via other public firms or a chain of public firms. This chain of controls is in the form of pyramidal structures and/or cross-shareholdings, which can include many layers of firms. In this case, we will outline the controlling shareholder(s) of these firms. Following the literature, we also calculate both cash-flow and voting rights by following the standard approach used in Claessens *et al.* (2000) and Faccio and Lang (2002). Regarding the definitions of pyramidal structures and cross-shareholdings, we use the conventional method of La Porta *et al.* (1999). Previous studies suggest that while direct shareholdings do not create discrepancies between voting and cash-flow rights, pyramids and cross-shareholdings do (Grossman and Hart 1988; Harris and Raviv 1988; Wolfenzon 1998; Bebchuk *et al.* 1999).

We classify "an ultimate owner" or "a controlling shareholder" into eight types as follows:

1 "A group of related families," which is defined as an individual, a family, and members of a group of families that are relatives, including in-law families. Regarding family relationship, we treat members of a family as a single shareholder assuming that they vote as a group. Members of a family include those who have the same family name, those who are close relatives, and those who are relatives of in-laws of a family.
2 "The state," which is the Thai government.
3 "Domestic financial institution," which is defined as a financial (and securities) company as well as a mutual fund that is owned by domestic investors.
4 "Foreign investor," which is defined as a foreign individual, family, or corporation. Note here that, similar to previous studies, in case foreign corporations hold shares in our sample firms we do not search for an ultimate owner of the parent companies of foreign corporate shareholders. So it might be the case that firms in which foreign corporations are controlling shareholders, and hence defined here as foreign-controlled firms, are actually widely held if the parent companies of these foreign corporations in their home-based countries are dispersedly owned.
5 "Foreign institutional investor," which is defined as a financial (and securities), insurance company as well as a mutual fund that is owned by foreign investors.

6 "A group of unrelated families," which is defined as members of a group of families that are not related but jointly own a private company, which in turn ultimately controls the sample firms.
7 "Multiple controlling shareholders," which is defined as a firm in which the number of controlling shareholders is more than one.
8 "No controlling shareholder," which is defined as a firm that does not have an ultimate controlling shareholder.

Comparability with Claessens et al. *(2000)*

There are a number of issues that might affect the comparability of our results and those of Claessens *et al.* (2000) who investigate the ownership of East Asian firms using 1996 data. First, the sample firms are different. Their sample includes financial companies and banks, while ours does not. Furthermore, while our sample covers all non-financial listed firms, their sample covers only 36.78 percent of all listed companies. Second, their definition of controlling shareholder differs from ours. Specifically, they use the 20 percent cut-off in defining the controlling shareholder, while we employ the 25 percent cut-off. Third, their ownership data might not be as comprehensive as ours in that their database provides only shareholders with stakes of at least 5 percent, while our database includes more detailed information of shareholders who hold at least 0.5 percent. Also, they only trace the ownership within publicly traded firms. Consequently, their ownership calculation could give some biased results. For example, firms that were classified as widely held in their sample might not truly represent firms with no controlling shareholder. Perhaps these firms are classified into such a category simply because their ownership could not be traced.

Results: who controlled Thai firms after the East Asian financial crisis

We begin our exploration by investigating who ultimately own and control Thai listed companies based on 2000 data, and then compare the results with the pre-crisis structure. Table 10.1 shows that the existence of controlling shareholders has been typical for Thai firms during the pre- and post-crisis periods. More than three-quarters of our sample firms have at least one controlling shareholder. Specifically, in 2000, about 79.19 percent of the firms have controlling shareholders. Among these firms, 67.05 percent (209 firms) have a single controlling block, while 14.29 percent (46 firms) are ultimately owned by a group of controlling shareholders. When compared to the pre-crisis data, the ownership appears to be slightly more concentrated. In 1996, controlling shareholders exist in 78.69 percent of the sample firms. The proportion of firms in which the controlling shareholder exists is not statistically different between both periods.

Table 10.1 Identification of controlling shareholders

Panel A The 25 percent ownership cut-off

Type of controlling shareholder	*2000*		*1996*	
	No. of firms	*%*	*No. of firms*	*%*
1 Firms with controlling shareholders	255	79.19	277	78.69
1.1 With one controlling shareholder	209	64.91	236	67.05
1.1.1 A group of related families	147	45.65	180	51.14
1.1.2 State	9	2.80	8	2.27
1.1.3 Domestic financial institution	4	1.24	2	0.57
1.1.4 Foreign investor	47	14.60	46	13.07
1.1.5 Foreign institutional investor	2	0.62	0	0.00
1.2 With a group of controlling shareholders	46	14.29	41	11.65
1.2.1 A group of unrelated families	18	5.59	21	5.97
1.2.2 Multiple controlling shareholders	28	8.70	20	5.68
2 Firms with no controlling shareholder	67	20.81	75	21.31
Total	322	100.00	352	100.00

Panel B The 20 percent ownership cut-off

Type of controlling shareholder	*2000*		*1996*	
	No. of firms	*%*	*No. of firms*	*%*
1 Firms with controlling shareholders	289	89.75	311	88.35
1.1 With one controlling shareholder	212	65.84	242	68.75
1.1.1 A group of related families	151	46.89	192	54.55
1.1.2 State	9	2.80	6	1.70
1.1.3 Domestic financial institution	5	1.55	1	0.28
1.1.4 Foreign investor	45	13.98	43	12.22
1.1.5 Foreign institutional investor	2	0.62	0	0.00
1.2 With a group of controlling shareholders	77	23.91	69	19.60
1.2.1 A group of unrelated families	22	6.83	22	6.25
1.2.2 Multiple controlling shareholders	55	17.08	47	13.35
2 Firms with no controlling shareholder	33	10.25	41	11.65
Total	322	100.00	352	100.00

Note
This table presents the identification of controlling shareholders. Our sample includes non-financial companies listed in the Stock Exchange of Thailand in 1996 and 2000. Firms are classified into each category according to their controlling shareholders. Panels A and B present the results when the ownership cut-off levels are 25 percent and 20 percent, respectively. Companies without a controlling shareholder are classified as companies with no controlling shareholder. The "*difference*" column in Panel A reports the difference in the percentage of firms in each category between the two periods.

We compare our results with those of Claessens *et al.* (2000) while keeping the facts stated above in mind. To be comparable, we extend the calculation of the ownership and control by using the 20 percent cut-off. Our findings show that around 10.25 and 11.65 percent of our sample firms have no controlling shareholder in 2000 and 1996, respectively. Claessens *et al.* (2000), however, document that in 1996 only 6.6 percent of Thai firms in their sample are widely held.[3] The comparison, using either 25 percent or 20 percent cut-off level, gives the consistent results that the ownership happens to be marginally more concentrated in the post-crisis period.

Changes in the ownership structure should be seen more clearly when investigating the percentage of firms associated with a particular type of controlling shareholders. After the crisis, firms that are controlled by a group of related families still appear to be the most prevalent in Thai stock market. However, the percentage of such firms has declined. That is, a group of related families controls about 45.65 percent of the firms in the sample in 2000, whilst such a group controls about 51.4 percent of the firms in 1996. The fraction of related family-controlled firms in the post-crisis period is, nevertheless, not significantly different at the conventional levels from that in the pre-crisis period. Controlling ownership by families seems to be substituted by other types of shareholders. Particularly, we find that foreign ownership increases from 13.07 percent in 1996 to 15.22 percent in 2000. Moreover, the fraction of firms owned by domestic financial institutions rises from 0.57 percent to 1.24 percent. In addition, the fraction of firms owned by a group of controlling shareholders increases from 11.65 percent to 14.29 percent. The Thai government remains as the controlling shareholder of nine firms after the crisis, while it controls eight firms before the crisis. These firms account for 2.48 percent of the 2000 sample. Among firms with a group of controlling shareholders, the proportion of firms that are controlled by a group of unrelated families slightly declines from 5.97 percent in 1996 to 5.59 percent in 2000, whilst the proportion of firms with multiple controlling shareholders increases from 5.68 percent to 8.70 percent.

Although none of the changes in the fraction of firms with each type of controlling shareholders between both periods is statistically significant, the decline in the fraction of related family-controlled firms and the rise in the fraction of firms with multiple controlling shareholders have the highest *t*-statistics of 1.43 and 1.57, respectively.

Ownership and control of controlling shareholders

Control mechanisms

We investigate how the controlling shareholder owns and controls the firms in this section. Table 10.2 shows that direct ownership is used most

Table 10.2 Control mechanisms

Type of controlling shareholder	*Direct 1*				*Pyramid 2*				*1 and 2*				*1, 2 and cross-shareholding*			
	2000		*1996*		*2000*		*1996*		*2000*		*1996*		*2000*		*1996*	
	No. of firms	*%*	*No. of firms*	*%*	*No. of firms*	*%*	*No. of firms*	*%*	*No. of firms*	*%*	*No. of firms*	*%*	*No. of firms*	*%*	*No. of firms*	*%*
One controlling shareholder																
A group of related families	112	78.32	136	76.84	2	1.40	6	3.39	21	14.69	22	12.43	12	8.39	16	9.04
State	8	88.89	8	100.00	0	0.00	0	0.00	1	11.11	0	0.00	0	0.00	0	0.00
Domestic financial institution	2	50.00	1	50.00	0	0.00	0	0.00	0	0.00	1	50.00	2	50.00	0	0.00
Foreign investor	41	89.13	39	90.70	0	0.00	1	2.33	6	13.04	5	11.63	0	0.00	1	2.33
Foreign institutional investor	2	100.00	–	–	0	0.00	–	–	0	0.00	–	–	0	0.00	–	–
Group of controlling shareholders																
A group of unrelated families	13	72.22	16	80.00	0	0.00	1	5.00	3	16.67	1	5.00	2	11.11	3	15.00
Multiple controlling shareholders	21	72.41	12	57.14	0	0.00	0	0.00	7	24.14	8	38.10	0	0.00	0	0.00
Total	199	78.04	212	76.53	2	0.78	8	2.89	38	14.90	37	13.36	16	6.27	20	7.22

Note

This table presents how firms are owned or how controlling shareholders exercise their control over the firms. Firms are classified into each category according to their controlling shareholders. A controlling shareholder is a shareholder who directly or indirectly owns more than 25 percent of the firm's voting rights. *Direct ownership* is when a controlling shareholder controls a firm directly under his name, or via his privately owned companies. *Pyramid* is when a firm is controlled via other public firms. *Cross-shareholding* is when there is an incidence of cross-shares between firms that are ultimately controlled by the same controlling shareholders. The percentage column is calculated as the proportion of firms that fall into each category divided by the total number of firms in such category of controlling shareholders.

often in Thai public firms during the pre- and post-crisis years. In 2000, in approximately 78.04 percent of the firms, their controlling shareholders use simply direct shareholdings, compared to 76.53 percent in 1996. In other words, controlling shareholders in more than two-thirds of the firms own the shares using their own names and/or through their private companies. Based on our comprehensive database, we find that, on average, 35.8 and 35.5 percent of the direct shareholdings are done via companies that are privately owned in 1996 and 2000, respectively. Hence, without tracing the ownership of these private companies, often we underestimate the actual cash-flow and control rights held by the controlling shareholders.

Interestingly, in almost all the firms, controlling shareholders do not use either pyramids or cross-shareholdings alone to control the firms. In 2000, there are only two instances of using simply pyramids, while there is no single case where the controlling shareholders employ cross-shareholdings alone. The combinations of pyramids with direct shareholdings and pyramids with direct and cross-shareholdings are more common. Specifically, in about 14.9 percent of the firms, direct shareholdings are used with pyramids, and in about 6.27 percent of the firms, direct shareholdings are used with pyramids and cross-shareholdings.

The combination of direct shareholdings with pyramids and cross-shareholdings is used most often in firms controlled by a group of related families. Statistically, out of 38 firms that use direct shareholdings-cum-pyramids, 21 firms belong to a group of related families, seven firms are multiple controlling shareholders-owned, six firms are foreign-owned, three firms belong to a group of unrelated families, and the remaining one firm is state-owned. A similar picture emerges regarding the use of direct shareholdings-cum-pyramids-cum-cross-shareholdings.

Interestingly, compared to the pre-crisis period, the exercise of pyramidal structures slightly decreases. Overall, our results show that pyramids are used in 21.96 and 23.47 percent of the firms with controlling shareholders in 2000 and 1996, respectively.

Compared to other countries in East Asia (Claessens *et al.* 2000) and more developed economies (La Porta *et al.* 1999; Faccio and Lang 2002),[4] pyramids are less commonly used in Thailand. Pyramids are employed in about 38.17 percent of companies in East Asia (Claessens *et al.* 2000) and 26 percent of firms in the 27 wealthiest countries (La Porta *et al.* 1999). Thai firms appear to use pyramids slightly more frequently when compared to firms in Western European countries, however. Faccio and Lang (2002) reveal that pyramids are found in approximately 19.13 percent of the European firms in their sample.

Consistent with findings from other countries, cross-shareholdings happen to be used much less often by the controlling shareholders of Thai firms. In 2000, only about 6.27 percent of the firms with controlling shareholders (16 firms) employ cross-shareholdings, being most prevalent in firms controlled by a group of related families. Specifically, out of these

16 firms, 12 companies[5] are owned by a group of related families, accounting for 8.39 percent of all related family-controlled firms. Cross-shareholdings also appear in firms that are controlled by domestic financial institutions (two firms) and a group of unrelated families (two firms).

The proportion of firms using cross-shareholding structures marginally decreases from that of the pre-crisis period. In 1996, there existed 20 firms, accounting for 7.22 percent of all firms with controlling shareholders, in which cross-shareholdings are employed. Again, cross-shareholdings appear most in the firms controlled by a group of related families (16 firms).

When compared with more developed countries, the proportion of Thai firms exercising cross-shareholdings is relatively more prevalent. Cross-shareholdings are used in about 3.15 percent of the sample firms in La Porta *et al.* (1999) and 6.25 percent of the Western European firms in Faccio and Lang (2002).

When compared with those in other East Asian economies, controlling shareholders in Thailand, however, employ cross-shareholdings to a lesser degree. In particular, Claessens *et al.* (2000) document that in 1996, approximately 10.1 percent of firms in nine East Asian countries use cross-shareholdings. Regarding Thailand, they find that only 0.8 percent of Thai firms in their sample use cross-shareholdings, which are the least prevalent among all East Asian firms. We suspect, however, that their results might be underestimated since their sample coverage is small. More precisely, 232 firms are excluded probably because these firms are controlled by private companies in which ultimate owners are difficult to identify (see Claessens *et al.* 2000, p. 88). In fact, we find that pyramids and cross-shareholdings are often used in this type of firm.

Ownership concentration

In this section, we investigate ownership concentration in the hands of controlling shareholders, measured by cash-flow and voting rights. The results are shown in Panel A and B of Table 10.3. In 2000, a controlling shareholder owns, on average, 45.27 percent of the firm's cash-flow rights, and 48.18 percent of the firm's voting rights, with the median values of 44.41 percent and 46.99 percent, respectively. The cash-flow rights held by controlling shareholders range from 12.38 percent to 92.85 percent, while their voting rights range from 25.03 percent to 92.85 percent.

Among all types of firms with controlling shareholders, the Thai government holds the highest mean value of cash-flow rights (52.71 percent), followed by the controlling shareholders in firms that are owned by related families (47.11 percent), unrelated families (46.47 percent), foreign investors (46.02 percent), and foreign institutional investors (43.03 percent). In firms controlled by domestic financial institutions and firms with multiple controlling shareholders,[6] the controlling shareholders hold

Table 10.3 Ownership and control held by controlling shareholders

Panel A: Cash-flow rights held by controlling shareholders (%)

Firms with:	*2000*			*1996*			*Difference*	
	No. of firms	*Mean*	*Median*	*No. of firms*	*Mean*	*Median*	t-*stat.*	z-*stat.*
One controlling shareholder								
A group of related families	147	47.11	47.63	180	46.00	47.07	−0.589	−0.540
State	9	52.71	49.00	8	54.68	46.12	0.183	0.000
Domestic financial institution	4	34.20	29.11	2	27.36	27.36	−0.512	0.000
Foreign investor	47	44.77	44.41	46	42.85	42.11	−0.636	−0.603
Foreign institutional investor	2	43.03	43.03	0	–	–	–	–
Group of controlling shareholders								
A group of unrelated families	18	47.16	47.98	21	43.75	42.52	−0.794	−0.866
Multiple controlling shareholders	28	36.63	38.73	20	35.41	35.58	−0.429	−0.439
Total	255	45.27	44.41	277	44.66	44.10	−0.574	−0.488

(*Continued*)

Table 10.3 Continued

Panel B: Control rights held by controlling shareholders (%)

Firms with:	*2000*			*1996*			*Difference*	
	No. of firms	*Mean*	*Median*	*No. of firms*	*Mean*	*Median*	t-*stat.*	z-*stat.*
One controlling shareholder								
A group of related families	147	50.41	49.54	180	49.47	49.65	−0.704	−0.576
State	9	52.83	49.00	8	54.68	46.12	0.172	0.000
Domestic financial institution	4	40.30	38.87	2	30.92	30.92	−0.781	−0.463
Foreign investor	47	46.05	44.70	46	44.76	44.85	−0.468	−0.292
Foreign institutional investor	2	43.03	43.03	0	–	–	–	–
Group of controlling shareholders								
A group of unrelated families	18	48.05	49.16	21	46.46	46.41	−0.346	−0.338
Multiple controlling shareholders	28	40.13	40.34	20	40.41	39.80	0.143	0.052
Total	255	48.18	46.99	277	47.75	47.75	−0.350	−0.120

(*Continued*)

Table 10.3 Continued

Panel C: Ratio of cash-flow rights to control rights held by controlling shareholders

Firms with:	*2000*			*1996*			*Difference*	
	No. of firms	*Mean*	*Median*	*No. of firms*	*Mean*	*Median*	t-*stat.*	z-*stat.*
One controlling shareholder								
A group of related families	147	0.926	1.000	180	0.927	1.000	0.103	0.424
State	9	0.998	1.000	8	1.000	1.000	0.934	0.943
Domestic financial institution	4	0.843	0.843	2	0.873	0.873	0.189	0.492
Foreign investor	47	0.967	1.000	46	0.955	1.000	−0.484	−0.363
Foreign institutional investor	2	1.000	1.000	0	–	–	–	–
Group of controlling shareholders								
A group of unrelated families	18	0.970	1.000	21	0.938	1.000	−1.394	−0.925
Multiple controlling shareholders	28	0.919	1.000	20	0.871	1.000	−0.865	−1.363
Total	255	0.939	1.000	277	0.931	1.000	−0.641	−0.507

Notes
This table presents cash-flow and control rights held by the controlling shareholders, and the separation between these two rights. A controlling shareholder is a shareholder who directly or indirectly owns more than 25 percent of the firm's voting rights. Cash-flow rights represent the ownership stake held by the firm's controlling shareholders. Control rights represent the percentage of voting rights held by the firm's controlling shareholders. The cash-flow and control rights of firms with multiple controlling shareholders are the rights held by the largest controlling shareholder. The "*difference*" columns report two-tailed *t*-tests of equal means and Wilcoxon *z*-tests of equal medians for each variable between the two periods.

the lowest average cash-flow rights of 34.2 percent and 36.09 percent, respectively.

Regarding the control, the most concentrated voting rights appear in firms owned by the Thai government of 52.83 percent. The mean values of voting rights held by controlling shareholders in firms owned by related families (50.41 percent), unrelated families (48.05 percent), foreign investors (47.31 percent), and foreign institutional investors (43.03 percent) are also relatively high. The lowest mean values of controlling shareholders' voting rights are shown in firms owned by domestic financial institutions (40.3 percent) and firms with multiple controlling shareholders (40.13 percent).

Compared to the results of the pre-crisis period, the concentration of ownership and control in the hands of controlling shareholders slightly increases. Specifically, the average cash-flow rights (voting rights) held by controlling shareholders rise from 44.66 percent (47.75 percent) in 1996, to 45.27 percent (48.18 percent) in 2000. The median value of cash-flow rights increases from 44.1 percent to 44.41 percent, while the median value of voting rights declines from 47.75 percent to 46.99 percent.

Except for the Thai government, cash-flow and voting rights of all groups of controlling shareholders increase after the crisis. Specifically, in firms owned by a group of related families, the controlling families hold, on average, 46 percent of the firms' cash-flow rights in 1996, compared to 47.11 percent in 2000. The mean value of cash-flow rights owned by the controlling shareholders in firms owned by domestic financial institutions rises from 27.26 percent in 1996 to 34.2 percent in 2000. The average cash-flow rights held by controlling foreign investors also increase from 42.85 percent to 44.77 percent.

Ownership concentration in firms controlled by a group of controlling shareholders is also higher. More precisely, a group of unrelated controlling families holds, on average, 43.75 percent of the firm's cash-flow rights in 1996, relative to 47.16 percent in 2000. Likewise, in firms owned by multiple controlling blocks, the mean value of cash-flow rights held by the controlling shareholders rises from 35.41 percent to 36.63 percent. In contrast, the Thai government holds less cash-flow rights in 2000 than in 1996. Specifically, the average cash-flow rights held by the Thai government decline from 54.68 percent to 52.71 percent.

Regarding voting rights, we find that the controlling shareholders of firms that are owned by families (both related and unrelated), domestic financial institutions, and foreign investors have greater control after the crisis. The Thai government and multiple controlling blocks, however, hold fewer voting rights in 2000, relative to those in 1996.

Even if there are changes in the controlling shareholder's cash-flow and voting rights following the crisis, our results show that the mean and median values of these two rights in the hands of all types of controlling shareholders are not significantly different between the two periods.

In Panel C, the results support our earlier findings. As direct shareholdings are the most commonly used means of control, the deviation of control from ownership is small. Overall, the average ratio of cash-flow to voting rights is 0.939, meaning that a controlling shareholder holds 100 ultimate votes for each 93.9 direct shares owned. The median value of the ratio is one, however. This is relatively high when compared to the average ratio of firms in nine East Asian countries (0.746) documented in Claessens *et al.* (2000) and that of firms in 13 Western European countries (0.868) documented in Faccio and Lang (2002).

The largest separation between ownership and control occurs in firms that are controlled by domestic financial institutions (0.843). In contrast, firms controlled by the State and foreign institutional investors show almost no separation. In the middle of these two extreme cases are firms that are controlled by multiple controlling blocks (0.919), a group of related families (0.926), foreign investors (0.967), and a group of unrelated families (0.97).

The degree of the separation between ownership and control appears to be slightly lower after the crisis. Specifically, the mean ratio of cash-flow to voting rights held by controlling shareholders is 0.931 in 1996 and 0.939 in 2000. The median values of the ratio for both periods is one, however. Among all types of firms with controlling shareholders, firms owned by a group of controlling shareholders have the greatest change in the mean ratio of cash-flow to voting rights. To be specific, the mean ratio increases from 0.938 in 1996 to 0.97 in 2000 in firms controlled by a group of unrelated families, and from 0.871 to 0.919 in firms with multiple controlling shareholders. To a lesser extent, in foreign-owned firms, the mean ratio increases from 0.955 to 0.967. There are, however, no changes in the ratio of cash-flow to voting rights in related family-owned and state-owned firms during the two periods.

Following Claessens *et al.* (2002), we also calculate the difference between voting and cash-flow rights, by deducting the controlling shareholders' cash-flow rights from the voting rights they hold. The outcome reported in Panel D is consistent with the results in Panel C.

However, similar to changes in the controlling shareholder's cash-flow and voting rights, we do not find any significant changes in the ratio of cash-flow to voting rights as well as the difference between these two rights in all types of controlling shareholders, during the pre- and post-crisis periods.

Controlling shareholder's involvement in management

We investigate how often the controlling shareholders and their family members are involved in management in this section. We categorize management into two groups: Executive and non-executive directors. An executive director is a person who holds one of the following positions:

Honorary chairman, chairman, executive chairman, vice chairman, president, vice president, chief executive officer, managing director, deputy managing director, and assistant managing director. A non-executive director is a board member who does not hold an executive position.

Consistent with the previous literature, our results in Panel A of Table 10.4 show that controlling shareholders in about two-thirds of the firms are involved in management. Specifically, in about 67.84 percent and 60.78 percent of the firms with controlling shareholders in 2000, there is at least one member of the controlling family sitting on the board at top executive and non-executive levels, respectively.

As expected, the controlling shareholders' participation in the board is most prevalent in firms controlled by families, including related and unrelated families. Statistically, the incidence of controlling families holding top executive positions occurs in 85.71 percent and 88.89 percent of the firms that are controlled by related families and unrelated families respectively. A similar picture emerges regarding the controlling shareholders' participation in non-executive positions. Specifically, this incidence appears in 76.19 percent and 94.44 percent of the firms controlled by related families and unrelated families, respectively. Controlling shareholders in the firms with multiple controlling blocks are also highly involved in management. In 75 percent and 67.86 percent of such firms, their controlling shareholders sit on the executive and non-executive boards, respectively.

To a lesser degree, controlling shareholders in foreign-owned firms serve as executive and non-executive directors. This incidence is found in about 21.28 percent and 14.89 percent of these firms. Board representation by the controlling shareholders does not occur in the firms that are owned by foreign institutional investors, however.

Compared to the pre-crisis results, the controlling shareholders' involvement in management as executives slightly decreases from 68.95 percent in 1996 to 67.84 percent in 2000. The decline in board representation by controlling shareholders is more pronounced at the non-executive level. The proportion of firms where controlling shareholders and their family members serve as non-executive directors declines from 65.7 percent in 1996 to 60.78 percent in 2000. Overall, however the incidences in which controlling shareholders participate as both executive and non-executive directors do not differ significantly between these two periods.

Regarding each type of controlling shareholders, we find the interesting results that the proportion of firms where controlling shareholders serve as executives increases after the crisis in firms that are owned by families, namely a group of related and unrelated families. In related family-controlled firms, this proportion increases from 84.44 percent in 1996 to 85.71 percent in 2000, while in unrelated family-controlled firms

Table 10.4 Controlling shareholders as managers

Panel A: Controlling shareholders as executive and non-executive directors

Type of controlling shareholder	*As executive directors*				*As non-executive directors*			
	2000		*1996*		*2000*		*1996*	
	No. of firms	*%*	*No. of firms*	*%*	*No. of firms*	*%*	*No. of firms*	*%*
One controlling shareholder								
A group of related families	126	85.71	152	84.44	112	76.19	138	76.67
State	0	0.00	0	0.00	0	0.00	0	0.00
Domestic financial institution	0	0.00	0	0.00	0	0.00	0	0.00
Foreign investor	10	21.28	11	23.91	7	14.89	9	19.57
Foreign institutional investor	0	0.00	–	–	0	0.00	–	–
Group of controlling shareholders								
A group of unrelated families	16	88.89	14	66.67	17	94.44	20	95.24
Multiple controlling shareholders	21	75.00	14	70.00	19	67.86	15	75.00
All firms with controlling shareholders	173	67.84	191	68.95	155	60.78	182	65.70

(*Continued*)

Table 10.4 Continued

Panel B: Ratio of board positions held by controlling shareholders to total number of board positions

Type of controlling shareholder	*2000*				*1996*				*Difference*	
	No. of firms	*%*	*Mean*	*Median*	*No. of firms*	*%*	*Mean*	*Median*	t-*stat.*	z-*stat.*
A group of related families	136	92.52	0.43	0.40	168	93.33	0.40	0.36	0.101	−0.044
State	0	0.00	–	–	0	0.00	–	–	–	–
Domestic financial institution	0	0.00	–	–	0	0.00	–	–	–	–
Foreign investor	13	27.66	0.09	0.00	15	32.61	0.09	0.00	0.226	0.543
Foreign institutional investor	0	0.00	–	–	–	–	–	–	–	–
A group of unrelated families	18	100.00	0.50	0.48	21	100.00	0.37	0.29	−1.651	−1.630
Multiple controlling shareholders	25	89.29	0.27	0.22	19	95.00	0.32	0.31	0.997	0.764
All firms with controlling shareholders	192	75.29	0.33	0.30	223	80.51	0.33	0.29	0.943	0.932

Note
This table shows the degree of involvement in the management by the controlling shareholders. A controlling shareholder is a shareholder who directly or indirectly owns more than 25 percent of the firm's voting rights. Panel A shows the number of firms where the controlling shareholders are executive and non-executive directors. An executive director is a person who holds one of the following positions: honorary chairman, chairman, chairman of the management committee, executive chairman, vice chairman, deputy chairman, chairman of executive director, president, vice president, chief executive officer, managing director, deputy managing director, assistant managing director. A non-executive director is a person who is not an executive director or an independent director, but is a member of the board of directors. Figures in the percentage columns are calculated as the proportion of firms that fall into each category divided by the total number of firms in such category of controlling shareholders. The "*difference*" columns in Panels B and C report two-tailed *t*-tests of equal means and Wilcoxon *z*-tests of equal medians for each variable between the two periods.

the proportion increases from 66.67 percent to 88.89 percent. The percentage of firms with the controlling shareholders' involvement as top managers is also greater in firms owned by multiple controlling blocks, from 70 percent in 1996 to 75 percent in 2000. The fraction, however, is lower, from 23.91 percent to 21.28 percent, in foreign-owned firms. Regarding the controlling shareholders' involvement in the board as non-executive directors, it turns out that controlling shareholders in all types of firms hold fewer board positions after the crisis.

We further investigate the controlling shareholders' involvement in management by controlling the board size effect. Panel B shows the ratio of board positions held by controlling shareholders divided by board size. The results reveal that controlling shareholders occupy about one-third of the firms' boards. The average ratios are 0.33 in both periods, while the median ratio is 0.29 in 1996 and 0.3 in 2000.

Consistent with the previous findings, the board representation by controlling shareholders is remarkably high in firms that are owned by families, and low in firms that are owned by foreign investors. To be specific, in related family-owned firms, the average ratio of board positions held by the controlling family to board size is 0.43, with the median value of 0.4. Similarly, in firms owned by a group of unrelated families, members of the families hold the mean ratio of 0.5, with the median value of 0.48. On the contrary, in foreign-owned firms, the average ratio of board positions served by controlling shareholders to the total number of board positions is only 0.09, with the median value of zero.

When compared to the pre-crisis results, in firms owned by families, both related and unrelated, the controlling families' members hold a higher fraction of board positions. In contrast, in firms owned by multiple controlling blocks, the controlling shareholders have fewer positions on the board. The ratio of board positions held by any type of controlling shareholders to board size does not differ significantly in the periods before and after the crisis, although the differences in the mean and median values of this ratio are most pronounced in firms owned by unrelated families with the *t*-statistics of -1.65 and *z*-statistics of -1.63, respectively.

Managerial ownership: the case of non-controlling shareholders

In this section, we analyze the ownership by executive and non-executive directors who are not the firm's controlling shareholders and the members of the controlling families. Table 10.5 shows that overall management that is not from the controlling shareholders or their families holds almost no shares. The median shareholdings of both groups of these directors are zero percent in both pre- and post-crisis periods. The average shareholdings of the executives, however, are 2.26 percent in 1996 and 2.54 percent in 2000. As for non-executives, their shareholdings

Table 10.5 Ownership by board members: non-controlling shareholders

Panel A: Ownership by executive directors who are not controlling shareholders (%)

Type of controlling shareholder	*2000*				*1996*				*Difference*	
	No. of firms	*%*	*Mean*	*Median*	*No. of firms*	*%*	*Mean*	*Median*	t-*stat.*	z-*stat.*
A group of related families	100	68.03	2.40	0.00	128	71.11	2.22	0.00	−0.368	0.332
State	9	100.00	0.00	0.00	8	100.00	0.00	0.00	–	–
Domestic financial institution	4	100.00	4.60	3.72	2	100.00	0.00	0.00	−1.115	−1.095
Foreign investor	42	89.36	3.43	0.00	39	84.78	3.30	0.00	−0.123	0.050
Foreign institutional investor	2	100.00	0.00	0.00	0	0.00	–	–	–	–
A group of unrelated families	13	72.22	4.08	1.99	19	90.48	2.51	0.00	−0.956	−1.542
Multiple controlling shareholders	22	78.57	1.11	0.00	17	85.00	1.60	0.00	0.454	0.211
All firms with controlling shareholders	192	75.29	2.54	0.00	213	76.90	2.26	0.00	−0.484	0.210

(*Continued*)

Panel B: Ownership by non-executive directors who are not controlling shareholders (%)

Type of controlling shareholder	*2000*				*1996*				*Difference*	
	No. of firms	*%*	*Mean*	*Median*	*No. of firms*	*%*	*Mean*	*Median*	t-*stat.*	z-*stat.*
A group of related families	135	91.84	3.52	0.00	167	92.78	3.45	0.00	−0.265	0.524
State	9	100.00	1.44	0.00	8	100.00	2.88	0.00	0.612	0.579
Domestic financial institution	4	100.00	8.39	8.31	2	100.00	11.29	11.29	0.330	0.235
Foreign investor	45	95.74	5.42	0.00	44	95.65	3.80	0.00	−0.852	−0.378
Foreign institutional investor	2	100.00	17.43	17.43	0	0.00	–	–	–	–
A group of unrelated families	16	88.89	4.17	1.40	20	95.24	1.77	0.00	−1.520	−1.542
Multiple controlling shareholders	27	96.43	0.98	0.00	19	95.00	0.46	0.00	−0.730	0.113
All firms with controlling shareholders	238	93.33	3.85	0.00	260	93.86	3.18	0.00	−1.115	0.022

Notes
This table provides the ownership held by the directors who are not from the firm's controlling shareholders. Ownership here is measured by an aggregate percentage of cash-flow rights held by the board members. A controlling shareholder is a shareholder who directly or indirectly owns more than 25 percent of the firm's voting rights. Firms are classified into each category according to their controlling shareholders. Figures in the percentage columns are calculated as the proportion of firms that fall into each category divided by the total number of firms in such category of controlling shareholders. The "*difference*" columns report two-tailed *t*-tests of equal means and Wilcoxon *z*-tests of equal medians for each variable between the two periods.

are, on average, 3.18 percent in 1996 and 3.85 percent in 2000. There are no significant differences in the shareholdings of these directors between both periods, however.

In the post-crisis period, the top executives in firms owned by a group of unrelated families have the highest average shareholdings of 4.08 percent with the median value of 1.99 percent, while the non-executive directors in firms owned by foreign institutional investors hold the greatest mean and median values of the shareholdings of 17.43 percent. In the pre-crisis year, however, the executives in foreign-controlled firms own more shares than those in other types of firms. Their average shareholdings are 3.3 percent, with the median value of zero percent. The non-executives in firms owned by domestic institutions hold the highest mean and median values of equity stakes of 11.29 percent. As one might expect, directors in firms that are controlled by multiple controlling blocks and by a group of related families hold the lowest shares in both periods.

Ownership structure in firms with no controlling shareholder

In this Section, we investigate the ownership of the firms that are defined as firms with no controlling shareholder. These firms account for 20.81 percent and 21.31 percent in our 1996 and 2000 samples, respectively. We examine whether such firms are really dispersedly owned, as described in the model of the UK and the US.

Panel A of Table 10.6 presents the cash-flow and voting rights held by the largest shareholder of these firms. The results show that the ownership of these firms is quite concentrated in both periods. In 2000, the largest shareholder holds, on average, 16.74 percent of the firm's cash-flow rights with the median value of 16.49 percent. The average voting rights held by this largest shareholder is 18.16 percent with the median value of 19.51 percent. The maximum level of both rights is 25 percent, and the minimum is 5.57 percent. When compared with the pre-crisis results, the mean value of cash-flow rights held by the largest shareholder slightly increases from 16.38 percent in 1996 to 16.74 percent in 2000, while the mean values of voting rights are the same in these two periods.

Panel B provides further information on the distribution of the ownership and control. In 2000, in 37.31 percent (25 firms) of all firms with no controlling shareholder, the largest shareholder has between 20 percent and 25 percent of cash-flow rights. Regarding the voting rights, in 29 firms (43.28 percent), the largest shareholder owns the range of 20 percent to 25 percent. So, if we relax the definition of controlling shareholdings from those with the voting rights of 25 percent to 20 percent, which is the threshold commonly used in the literature, then these 29 firms would be classified as firms with a controlling shareholder. This issue is also addressed in Section 3.

Table 10.6 Ownership by largest shareholder: firms with no controlling shareholder

Panel A: Summary statistics of cash-flow and control rights held by largest shareholder (%)

	2000		*1996*		*Difference*	
	Mean	*Median*	*Mean*	*Median*	t-*stat.*	z-*stat.*
Cash-flow rights	16.74	16.49	16.38	16.67	−0.052	−0.087
Control rights	18.16	19.51	18.16	19.89	0.339	0.479
Ratio of cash-flow to control rights	0.93	1.00	0.91	1.00	−0.425	−0.597

Panel B: The distribution of cash-flow and control rights held by largest shareholder

Ownership level	*Cash-flow rights*				*Control rights*			
	2000		*1996*		*2000*		*1996*	
	No. of firms	%	*No. of firms*	%	*No. of firms*	%	*No. of firms*	%
0–5%	0	0.00	1	1.33	0	0.00	0	0.00
5–10%	10	14.93	9	12.00	6	8.96	7	9.33
10–15%	13	19.40	20	26.67	8	11.94	13	17.33
15–20%	19	28.36	21	28.00	24	35.82	21	28.00
20–25%	25	37.31	24	32.00	29	43.28	34	45.33
Total	67	100.00	75	100.00	67	100.00	75	100.00

Note
This table shows the cash-flow and control rights by the largest shareholder of firms that have no controlling shareholder. The numbers of such firms are 75 in 1996, and 67 in 2000. A controlling shareholder is a shareholder who directly or indirectly owns more than 25 percent of the firm's voting rights. The "*difference*" columns in Panel A report two-tailed *t*-tests of equal means and Wilcoxon *z*-tests of equal medians for each variable between the two periods. Figures in the percentage columns in Panel B are calculated as the proportion of firms that fall into each category divided by the total number of firms that have no controlling shareholders.

Interestingly, if we use the cut-off level of 10 percent,[7] another commonly used threshold to define controlling shareholding, only seven firms in 1996 and six firms in 2000 can be classified as having no controlling shareholder or widely held. These firms account for only about 2 percent of the overall samples. These findings are consistent with those documented in Claessens *et al.* (2000) for the pre-crisis period. They find that 2.2 percent of Thai firms in their sample are widely held at the 10 percent cut-off. If we lower the cut-off level further to 5 percent, then there would be no firm that can be classified as widely held in both periods.

Viewed collectively, our results show that, only a small fraction of firms in our sample can be considered as dispersedly held by atomistic shareholders in the same way as described in the US and UK model. In other words, the ownership of Thai publicly traded companies is very concentrated.

We also investigate the degree of discrepancy between ownership and control in these firms. The mean value of the ratio of cash-flow to voting rights is 0.93, with the median value of 1, suggesting that the control-enhancing means such as pyramiding and cross-shareholding are not commonly used. This is similar to the case of firms with controlling shareholders documented in Section 4. In fact, our evidence reveals that the largest shareholder in 11 firms employs pyramidal structures, and in one firm uses cross-shareholdings. After the crisis, the degree of separation between ownership and control held by the largest shareholder is reduced, as measured by an increase in the ratio of cash-flow to voting rights from 0.91 in 1996 to 0.93 in 2000. The degree of separation is, however, not significantly different between the pre- and post-crisis periods.

Conclusion

This study documents the corporate ownership and board structures after the East Asian financial crisis. We compare the structure with those before the crisis to address the effects of an economic downturn on the ownership and board structures. The results reveal that the post-crisis ownership structure indicates a decline of the role of families in controlling publicly traded firms. The controlling families are replaced mainly by foreign investors and domestic financial institutions. We also find the greater fraction of firms controlled by multiple controlling shareholders after the crisis.

Controlling shareholders appear to use less complicated shareholdings, in the forms of pyramidal structures and cross-shareholdings, to enhance their control after the crisis. This is reflected in the lower deviation of control from ownership, as computed by the ratio of cash-flow to voting rights held by controlling shareholders, and by the simple difference between the two rights. Interestingly, we find that overall, the ownership and control in the hands of controlling shareholders become more concentrated subsequent to the crisis.

The degree of separation between ownership and management, measured by the incidence that controlling shareholders participate in the board, is not significantly different during the pre- and post-crisis periods. Nevertheless, families appear to participate more, while foreign investors seem to be involved less often in management.

Viewed collectively, although we do not find any statistically significant differences in the ownership and board structure of Thai publicly traded

corporations between the pre- and post-crisis periods, it might still be hard to deny that the macroeconomic shock has no effect on the firms. The related issue on what factors determine the ownership and board changes after the crisis, however, is left for future research.

Notes

1 No shareholder is allowed to own more than 5 and 10 percent of the shares of commercial banks and finance companies, respectively.
2 See also Wiwattanakantang (2000 and 2001) for the argument of this issue.
3 A plausible reason why Claessens *et al.* (2000) find smaller number of widely held firms than our calculation might be that their samples exclude firms that are difficult to trace the ultimate owners.
4 La Porta *et al.* (1999) use the data of 20 largest firms in the 27 wealthiest countries in 1995. Faccio and Lang (2002) use the data of 5,232 publicly traded companies in 13 Western European countries for the period between 1996 and 1999. Both studies include shareholder with at least 5 percent of the firms' shares and employ the 20 percent cut-off to define the controlling shareholders.
5 Among these 12 companies, nine companies belong to a single family, Chokwatana, one of the biggest business groups.
6 Note that cash-flow and voting rights in firms owned by multiple controlling shareholders are the rights held by the largest controlling shareholder.
7 In fact, at this level of ownership, a shareholder is defined as a major shareholder. According to the Thai corporate law, he has the right to ask the court for the company's dissolution and to demand the company to claim compensation from any misbehaved managers.

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11 The determinants of executive compensation in Japan and the UK

Agency hypothesis or joint determination hypothesis?

Katsuyuki Kubo

Introduction

It is a widely held belief that the behavior of large Japanese companies is different from those of British counterparts, particularly in terms of their corporate governance style (Abegglen and Stalk 1985; Aoki 1988; Dore 1987). Although there are many studies on executive compensation, both in the UK and Japan (Cosh and Hugh 1997; Conyon 1995, 1997; Conyon, Gregg and Machin 1995; Conyon and Leech 1994; Conyon and Nicolitsas 1998; Gregg, Machin and Szymanski 1993; McKnight 1996; Kato 1997; Kaplan 1994; Xu 1997), much of the literature tends to focus on the relationship between directors' pay and stock market performance. Many of these studies often take for granted the "Anglo-American style of corporate governance." This chapter seeks to contrast the effect of corporate governance on the determinants of executive pay, by comparing the UK and Japan.

There is a considerable difference between Japan and the UK in terms of corporate governance. For example, shareholders and the financial market have considerable power over directors in large UK companies. There are more hostile take-overs in the UK than in Japan (Odagiri 1994; Prowse 1994). In large British companies, the proportion of non-executive directors on the board of directors is about 40 percent on average (Conyon, Gregg and Machin 1995), while in Japan, many companies do not have non-executive directors. In Japan other stakeholders, such as banks, group companies and employees have strong incentives to monitor top managers (Itami 1994; Sheard 1989).

The purpose of this research is to analyze directors' incentives in large companies in Japan and the UK, with particular emphasis on the relationship between corporate governance and executive compensation. For example, shareholders in large UK companies have relatively strong powers to control top managers and their compensation through remuneration committees and other devices. Principal-agent theory predicts

that a director's salary depends on a firm's performance, particularly its stock market performance, in order to motivate top managers to work toward increasing shareholders' interest. Then, we hypothesize that there is a positive relationship between directors' salary and stock market performance in the UK.

In contrast, shareholders have very limited power over top managers in large Japanese companies while employees have strong incentives to monitor top managers. In Japan, a director's salary has many similarities with an employee's wage: Both directors and employees are paid a monthly wage and bonuses in a similar way. Both a director's salary and an employee's wage are affected by the firm's performance, such as its sales and profit. In addition, an employee's wage is, in practice, one of the most important determinants of a director's salary. Thus, we can hypothesize that directors' salary is determined jointly with employees' average wages. In other words, there is a positive relationship between a director's salary and an employee's wage in Japan.

In the next section, we review some previous studies on executive pay in the UK and Japan. Then, following this, we examine agency hypothesis and joint determination hypothesis, both of which explain the determinants of directors' salary. In addition, an account is provided of the corporate governance systems in both countries, showing that there are significant differences between the two. It is also shown how our hypotheses are drawn from these differences. After this, we describe how directors' compensation is set and disclosed in both countries. We then explain the model and variables used to analyze the determinants of executive compensation, followed by a section which describes data. Then, the next section shows the results of these estimations for both countries. Finally, the contribution of this research to the literature on corporate governance and executive compensation is explained.

Previous research on executive pay in the UK and Japan

Much attention has been paid to the relationship between directors' pay and firm performance in the UK. Some studies have suggested that there is a positive relationship between company performance and directors' remuneration (McKnight 1996; Conyon 1997; Ingham and Thompson 1995). For example, McKnight (1996) finds a positive correlation between change in top pay and firms' earnings per share. By analyzing 213 large UK companies between 1988–1993, Conyon (1997) finds that directors' compensation in large UK companies is positively related to current shareholders' return but much less so to previous year's shareholders' return. Ingham and Thompson's (1995) results similarly show that top pay is positively correlated with current profit. However, some studies have suggested that the relationship is weak (Gregg *et al.* 1993; Conyon 1995). According to Gregg, Machin and Szymanski (1993), the link between dir-

ectors' remuneration and company performance is disappearing. Conyon and Leech (1994) found a positive relationship albeit a weak one.

There has been relatively little work analyzing the determinants of executive compensation in Japan. Recently, however, studies have been published in response to the increasing attention to this topic in the US and the UK (Kato 1997; Kato and Rockel 1992a; Kaplan 1994; Xu 1997). Some studies have suggested that there is a positive relationship between firm performance and directors' pay (Kaplan 1994; Xu 1997). Kaplan finds a positive and significant relationship with firm performance, suggesting that directors in large Japanese firms have an incentive to work toward better company performance. In addition, Kato (1997) shows a positive relationship between profit and directors' pay. In contrast, Kato and Rockel (1992a) find no relationship between shareholders' return and presidents' pay.

Hypotheses

In this section, we describe agency theory and joint determination hypothesis in order to draw our hypotheses. We also look at the corporate governance system in the UK and Japan, with particular emphasis on the effectiveness of monitoring top directors. Table 11.1 summarizes our discussion.

Table 11.1 Corporate governance in Japan and the UK

	Japan	*UK*
Non executive directors (NED)	Very few Some directors come from group companies, particularly from banks and government	About 40% of board of directors are NED. Recommended by Cadbury/Greenbury committees
Remuneration/ nomination committee	No	Recommended by Cadbury/Greenbury committees Many large companies already introduced
Hostile take-overs and M&A	Rare	Common
Do employees have implicit investment in the company?	Yes thorough deferred compensation	Less so than in Japan
Does employees' salary reflect firm performance?	Employees' annual bonus usually consists of about 20–30% of their total salary, and reflects firm performance	Less so than in Japan

Agency hypothesis

Most previous studies on directors' compensation referred to the principal-agent theory. As a principal, shareholders try to motivate the top manager to work toward higher shareholders' return. However, managers may have their own goals and may want to pursue their own interest in managing the company. Although shareholders want to monitor the top directors, shareholders may not have enough information or knowledge for this. Therefore, shareholders may link executive compensation with shareholders' returns. As top pay depends on the stock market performance, directors may be motivated to work hard to improve the stock market value of the company. If this is the case, there is a positive relationship between shareholders' returns and executive compensation.

Shareholders and the financial market in the UK

In large British firms, there are various corporate governance mechanisms through which shareholders and financial market can exercise their power over top managers. These mechanisms include non-executive directors, remuneration committees and hostile take-overs. For example, the proportion of non-executive directors on the board of directors is about 40 percent on average in large UK companies (Conyon, Gregg and Machin 1995). These non-executive directors may have incentives to monitor top managers on behalf of shareholders, as they are relatively independent from current top management teams of the company.

In response to recommendations by the Cadbury and Greenbury committees, many large UK companies have tried to change their executive pay policy. For example, many large UK companies have remuneration committees (Conyon, Gregg and Machin 1995; Main and Johnston 1993), which are often composed mainly of non-executive directors. In 1988, 54 percent of large companies in the UK had remuneration committees, compared with 94 percent in 1992 (Conyon, Gregg and Machin 1995).

In addition, many large UK companies have annual incentive schemes for their top directors. The Monks partnership (1994) reports that 71 percent of FT-SE 350 companies have such schemes. Many companies introduce annual incentive schemes in order to motivate the directors. As many annual incentive schemes set a performance target, managers should have a clear idea of their goals (Williams 1994). Therefore, it is suggested that many large companies in the UK are trying to motivate managers to work harder toward achieving shareholders' goals by strengthening the link between directors' pay and firm performance.

Moreover, hostile take-overs may be an important mechanism for disciplining managers in the UK. Mergers and acquisitions are often observed, and significant numbers of these are hostile take-overs. According to Prowse (1994), 37.1 percent of attempted mergers and acquisitions in the

UK were hostile take-overs, in the period 1985–1989. It is suggested that executives in the UK are under more pressure from the financial market. These discussions suggest that shareholders in large UK firms have more power over top managers than their Japanese counterparts. This argument leads to our research hypothesis.

> Hypothesis 1: In the UK, there is a positive relationship between directors' compensation and company performance, particularly stock market performance.

Shareholders and financial market in Japan

It is often argued that shareholders have very limited power over top managers in large Japanese companies (Fukao 1995). Monitoring mechanisms, such as a board of directors, annual general meeting of shareholders and financial market fail to monitor directors. For example, as remuneration committees are not usually used in most Japanese companies, shareholders cannot influence the financial incentive of directors. Virtually no companies had nomination committees until recently. Boards of directors also fail to monitor senior management in Japan (Fukao 1995) because directors regard the president as their boss. Similarly, the annual general meeting of shareholders also fails to control top managers, as the annual general meeting of shareholders is usually controlled by the current management team (Matsumoto 1991). In addition, because of cross-shareholding among companies, few hostile take-overs are observed in Japan in comparison to the US and the UK (Odagiri 1994). The majority of shares in large companies are owned by other companies and financial institutions, rather than individual investors (Prowse 1994; Fukao 1995). Banks will not intervene in the management of a company unless it is in financial crisis.[1]

The above description of corporate governance in Japan suggests that both the financial market and shareholders have limited power over the executives of large firms. In other words, shareholders have little power to influence the financial incentive of directors, which leads to another hypothesis.

> Hypothesis 2: In Japan, there is little relationship between directors' compensation and stock market performance.

Joint determination hypothesis

"Implicit investment" by employees

Who is monitoring top managers in large Japanese companies? Itami (1994) suggests that employees may have an incentive to monitor top

managers, as employees are implicitly investing in their company through long-term employment relationship and deferred compensation.[2] It is often the case that an employee's salary is less than his contribution to the company when he is young. His salary increases as he becomes older because of the seniority based pay system, as pay in large Japanese companies depends more on age and tenure than in other countries (Shimada 1981; Mincer and Higuchi 1988). When he becomes older, his salary may be more than his contribution to the company. In other words, he receives a return to his capital that is implicitly invested in the company. If the company does well, employees may eventually receive a good return, or alternatively lose their money if the company fails. Because of this implicit investment, employees are considered to be implicit equity holders of the company. Thus, employees in these companies may have incentives for monitoring the management, to ensure that their implicit investment is protected.

As employees are implicitly investing in the companies, they receive a return on their investment in terms of bonus and wage increase. In other words, a significant proportion of company profit is distributed to employees in large Japanese companies.

Some empirical studies show that wages in Japan are more flexible than in other countries because of bonuses and the wage bargaining system, suggesting that a certain proportion of profit is distributed to their employees. A bonus usually makes up 20–30 percent of an employee's total annual salary (Hart and Kawasaki 1999).[3] The amount of bonus changes every year, reflecting the company's performance: Freeman and Weitzman (1987) find a positive relationship between bonus and company profit. In addition, the amount of the monthly wage is affected by company performance through "annual wage increase." Hart and Kawasaki (1999) show a positive relationship between profit and annual wage increase. Both sales and profit are considered to be important performance figures, as sales determine the company's ability to pay.

Thus, it is suggested that employees are receiving a certain proportion of company profit along with other investors, in large companies in Japan. If the company performs well, they will receive a larger return; but if the company performs less well, their bonus will be smaller. Thus, employees do have a strong incentive to monitor the company, so that they can receive larger bonuses.

Directors' compensations in Japan

Directors' salary usually consists of monthly pay and an annual bonus in large Japanese companies. The proportion of bonus is usually around 10–30 percent of the total annual salary.[4] Directors receive an annual bonus at the end of the fiscal year. In practice, directors' bonus is paid as a part of the distribution of profit. Xu (1997) suggests that directors do not

receive their bonuses when a company performs badly. In practice, the amount of bonus for individual directors is determined by presidents on the basis of their rank.

Similarly, in practice, directors' monthly pay is also determined by presidents, according to a pay table which is based on the rank and performance of the firm, such as its sales and profit. As a director's bonus is calculated as a proportion of their monthly pay, it also reflects the change in monthly pay.

It is often the case that a director's monthly pay increases after wage bargaining between management and employees. As a director's monthly pay is often determined as a proportion of the highest paid employees' monthly wage, it will increase when an employee's wage increases. In addition to employees' wages, company performance, and the rate of inflation are also important factors that determine the amount of a director's monthly wage.

Joint determination hypothesis

The above description shows that the salaries of both directors and employees are determined in similar ways in large Japanese companies. The following question then arises: Why are both directors and employees paid in a similar way? One of the most important reasons may be that from the viewpoint of corporate governance, both directors and employees are in similar positions in the firm: both of them are implicitly investing in the company.

As discussed earlier, employees in large Japanese firms are investing in a company by acquiring firm specific skills and by implicit investment through deferred compensation (Itami 1994), implying that they have an incentive to monitor top management. Directors are also implicit investors in the company, as in large companies most of them are "promoted" employees. As both employees and directors are implicit investors in the company, both a director's salary and an employee's wage can be seen as the return for their investment in terms of bonus and wage increase. As these are returns on their implicit investment, their salaries and wages reflect a firm's performance.

Hypothesis

The above discussion shows that both a director's compensation and an employee's wage are paid in similar ways: Both employees and directors receive monthly pay and bonuses. Both a director's salary and an employee's wage are determined in similar ways, and reflect the firm's performance. As they are paid in similar ways, and as an employee's wage is one of the important factors determining a director's pay, we can draw the following hypothesis.

> Hypothesis 3: In Japan, there is a positive relationship between directors' pay and employees' wage.

In contrast, there are few such mechanisms in the UK by which directors' salary is influenced by employees' wage. As described above, in most large UK companies, directors' pay is determined by a remuneration committee, which is often composed of non-executive directors. Remuneration committees try to set directors' salary according to firm performance, such as Earnings Per Share (EPS), profit, or stock market return. In other words, we can predict that there will be little relationship between directors' salary and employees' wage in the UK.

> Hypothesis 4: In the UK, there is little relationship between directors' pay and employees' wage.

How directors' pay is set and disclosed in Japan and the UK

Japan

According to Japan's company law, directors' compensation must be approved by shareholders at the annual general meeting (AGM). All types of compensation, such as pay, bonuses and retirement bonuses are required to be approved at the AGM. Shareholders usually endorse plans on executive pay, which is proposed by current management.

In practice, at the AGM, current management teams propose "the maximum pay bill for directors" which the company can pay and then it is approved by the AGM. This pay bill is usually larger than the amount actually paid so that current management teams do not have to propose pay bills for AGM every year. The shareholders do not know how much money will actually be paid for directors on approval. Although the actual payments for directors are disclosed in annual reports, amounts of compensation for each of the directors are not disclosed.

It should be noted that the "maximum pay bill" that the company is able to pay may not be the same as the pay bill that the company pays in reality. Table 11.2 summarizes the approval and disclosure of the pay bill in Japan. Usually, the "maximum pay bill" is larger than the "actual pay bill" paid by the company.

It is not required that this "maximum pay bill" has to be approved every year. For example, this pay bill should be renewed when the number of directors increases. In Nippon Steel, the "pay bill which the company can pay for all of the directors" was on the agenda of the AGM only 6 times from 1975 until 1997. In 1996, amongst 2,286 listed companies in Japan, only 140 companies changed their pay bill for directors.

Companies are required to explain the reason why the pay bill should be increased by company law. The reasons actually explained in the AGMs include:

1 an increase in the number of directors,
2 inflation,
3 an increase in employees' wages.

Usually company performance, such as stock price, is not used to justify the increase in the pay bill for directors. Thus, company performance, such as the profit before tax or stock price, may not be considered, either by the directors or shareholders, to be an important factor for the determination of executive compensation.

After the "maximum amount" is set in the AGM, the board of directors decides how much should be paid to each director within this maximum. In practice, the president is asked by the board to decide the pay package for each director. Then, the president decides the pay package for everyone, including himself.

It is noted that it was virtually impossible for companies to give stock options to its directors until 1997 by company law. As this research uses 1995 and 1996 data for Japan's estimation,[5] directors usually do not receive stock option in our sample period.

UK

There are three main types of cash compensation for directors in the UK; fixed salary, annual incentive (AI) and long-term incentive (LTI). In addition to cash compensation, other form of compensation, such as stock option, may be paid to directors. Though not all the companies have all these types of compensation, most large companies in the UK have some kind of annual incentive.

Table 11.2 Approval and disclosure of directors' salaries

	Approval by AGM of shareholders	*Disclosure*
Maximum pay bill for directors that company can pay	Yes Not every year	Yes Disclosed in AGM when it is proposed
Pay bill for directors actually paid by the company	No	Yes Disclosed in annual report every year
Compensation for each of the directors	No	Not disclosed

Note
AGM: Annual general meeting of shareholders.

In many UK companies, directors' compensation is discussed in remuneration committees (Conyon, Gregg and Machin 1995), in which a certain number of non-executive directors participate. In addition, many of these companies disclose the detail of individual directors' compensation in their annual reports, along with some recommendations.

It is often the case in large companies in the UK that the amount of annual incentive is determined according to firm performance. Typical annual incentive schemes in large UK companies can be described as follows (Williams 1994). First, the performance measure for company performance, for example, profit before tax, is chosen. Then the performance target is set in terms of this performance measure. The amount of annual incentive may be linked to the firm performance, though this link may not necessarily be able to be described by a formula. Usually, some minimum performance target is set and if managers fail to achieve this target, then they will not receive any bonus. It is often the case that the link between bonus and performance is larger as performance improves.

The maximum amount of annual bonus is usually set and is shown as a percentage of the director's fixed salary. Usually, the maximum amount is within the range of 20 to 50 percent of the fixed salary. This maximum amount of bonus is set to prevent companies from paying enormous amounts of bonus to directors.

Income Data Services (1996) report that profits and growth in earnings per share are the most important measures for company performance, accompanied by individual achievement in relation to agreed targets. Williams (1994) reports that the most widely used performance measures among companies are profit both in the Hay consulting survey and in the Monks partnership survey. Hay reports that 67 percent of companies use profit as the measure for company performance, while the Monks partnership shows that 77 percent of companies measure their performance by profit. In both surveys, EPS comes next to profit, 49 percent in the Hay report and 52 percent in the Monks report. They show that these two measures are much more widely used compared to other measures, such as cash flow or stock price.

Model and variables

To test above hypotheses, we estimate the following equation:

$$\ln(Comp_t) = f(stockmarket_t, profit_t, \ln(sales)_t, wage_t)$$

Comp is a director's compensation and *stockmarket* is a measure of stock market performance of the company. The details of these variables are discussed below for each country.

Variables (Japan)

Executive compensation: Three types of directors' compensation are used as dependent variables. These are directors' normal pay, annual bonus, and total pay.[6] Directors' normal pay is paid monthly while annual bonus is paid at the end of fiscal year. Directors' normal pay is calculated by dividing the pay bill for directors by the number of directors. Similarly, the director's bonus is calculated by dividing total amount of bonus for directors by the number of directors. We also use directors' total pay, which is a sum of directors' normal pay and their bonus. These pay variables are dependent variables in this research and log-transformed. The data are taken from the NIKKEI NEEDS database. The data source is each company's annual report.

It is noted that we use directors' *average* salary, instead of CEO's salary. As listed companies in Japan are not required to disclose the pay packages of individual directors, we cannot observe president's pay directly. Some previous studies use "presidents' income"[7] as a dependent variable (Kato and Rockel 1992). However, this research uses "directors' average salary," instead of "president's income," as "president's income" includes income from outside the company he or she manages. In addition, we can obtain "president's income" for only those presidents whose income exceeds a certain threshold, which may cause sample selection bias.

Shareholder's return: We use shareholders' return as a measure of stock market performance in Japan. The shareholders' total return (ROR) is reported on *Kabushiki Toshi Shuekiritsu* (Rate of Return on Stocks in Japan). This ROR shows the percentage gain for shareholders, including the dividend, capital gain from stock price evaluation and other gains.

Profit: Profit before tax is used as independent variable.

Wage: The employees' average wage is used as independent variable. This is calculated by dividing the total labor cost by the number of employees. Thus, this variable includes all the labor costs to the company, including both cash compensation and other benefits. Cash compensation includes both monthly salary and bonus. Joint determination hypothesis predicts that the coefficient of an employee's average wage is positive and significant.

Sales: In this research, SALES is used as size variable. Following previous studies, Sales is log-transformed. These size variables are included to control the size effect on top executive compensation.

Variables (UK)

Top directors' pay: Three types of directors' pay are used as dependent variables; these are fixed salary, annual incentive and total salary of highest paid director.[8] The amount of total salary is not necessarily the sum of the fixed salary and annual incentive, as some companies have

long-term incentive schemes. The stock option is not included. One of the possible limitations of this research is that stock option is not included in our data. Considering its importance, it would be desirable that stock options would be included in our analysis. However, difficulties in evaluating stock option, along with the volatility of stock price make it difficult to analyze it. In addition, one of the main focuses of this research is the relationship between directors' pay and employees' average wage. For this purpose, directors' cash salary would be more important than stock option, as the value of stock option will not correlate with employees wage.

Profit: Profit before tax is used as independent variable.

Stock market capitalization: In addition to profit, this research will use stock market capitalization as a measure of stock market performance in the UK. Stock market capitalization shows the "value of the company" in the stock market and therefore reflects shareholders' wealth in the stock market. Thus, if the coefficient is positive and significant, top directors may have incentives to work toward the "value of the company." Agency hypothesis suggests that the coefficient of stock market capitalization will be positive and significant in the UK.

Employee's wage: Employees' average wage is calculated by dividing wage bill by the number of employees. Agency theory suggests that there is little relationship between directors' salary and employees' wage in the UK. This variable is included to contrast the effect of employees' wage on directors' salary in the UK and Japan.

Size: Following previous studies, log of sales is used as independent variable in the UK. This size variable is included to control the size effect on director's pay.

Data

Japan

In this research, 210 of Japan's large listed companies are used as the sample. The stock price of these companies are used to calculate the NIKKEI INDEX, Japan's most widely used stock market index.[9] The time period covered is 1995 and 1996. Most variables, including directors' pay and their bonus, are taken from the NIKKEI NEEDS database. Other variables are taken from *Toyo Keizai Yakuin Shikihou (Directory of Directors)* and *Kabushiki Toshi Shuekiritsu* (Rate of Return on Stocks in Japan). The NIKKEI NEEDS database and *Toyo Keizai Yakuin Shikihou* is based on each company's annual report. The shareholder's return, which is taken from *Kabushiki Toshi Shuekiritsu* (Rate of Return on Stocks in Japan), is calculated by *Nihon Shyoken Keizai Kenkyusho (Japan Institute of Securities and Economics)*, and is based on stock price and dividend.

UK

As for the UK data, 210 listed companies data are used as the sample. As our main aim is to compare the results between the UK and Japan, we chose samples which will match the Japanese sample. We chose 210 companies from UK's listed companies. We have chosen these companies so that the size distribution of the companies will be similar in both samples.[10] Sales are used as the criteria to construct a sample as sales are one of the most important factors that affect the amount of executive compensation. 1994 and 1995 data are collected for each company. The data analyzed here is taken from Monks partnership's "United Kingdom Board Earnings, October 1995," and "United Kingdom Board Earnings, October 1994." These data sets contain comprehensive data on executive compensation and company performance, including the detailed composition of highest paid director's salary taken from annual reports of listed companies.

One of the advantages of this Monks Partnership's data set is that it reveals the details of directors' remuneration, showing the fixed salary and annual bonus of the highest paid director. This enables us to know if the company has an annual incentive or other long-term incentive. The other advantage of Monks Partnerships' data is that it is based on each company's annual report, which is a relatively reliable data source. In addition, we obtained the company's wage bill and the number of employees from the Fame database to calculate employees' average wage in each company.

Results

Descriptive statistics in Table 11.3 illustrates that the proportion of bonus/incentives to total salary for directors is smaller in Japan than in the UK. More than 80 percent of total pay is normal pay in Japan while in the UK, fixed pay consists of almost 70 percent of total compensation. It is also noted that the amount of bonus decreases in Japan in this period. This may reflect the general economic condition that most Japanese companies face financial setback in this period. In contrast, the increase of annual incentive is very large in the UK. This may be because large companies have achieved good performance in this period, or because they are introducing new annual incentive schemes (Monks partnership 1994; Williams 1994).

The econometric results for the determination of directors' compensation are contained in Tables 11.4 and 11.5. Table 11.4 shows regression results for Japan's data, and Table 11.5 shows the results for UK's data. There are a number of striking features about these results. We will examine these features by looking at coefficients for each independent variable. It should be noted that we use directors' average compensation

Table 11.3 Summary statistics: Japan and the UK

Japan		*UK*	
	Mean (in ,000 GBP)		*Mean (in ,000 GBP)*
Total pay	103.4	Total pay	416.8
Normal pay	85.72	Fixed pay	289.8
Bonus	16.57	Annual incentive	76.28
Change of total	1.087	Change in total pay	13.33
Change of normal pay	0.3617	Change in fixed pay	4.341
Change of bonus	−0.6278	Change in annual incentive	37.32

Notes
1 JPY = 190 GBP.
It is not appropriate to compare the figures in this table directory, as this table illustrates the directors' *average* salary in Japan and the salary of *highest paid director* in the UK.
The amount of total pay in the UK is larger than the sum of fixed pay and annual incentive, because the amount of total pay include other styles of cash compensation, such as long-term incentive. Stock option is not included in total pay, however.

as the dependent variable for Japan's estimation and the highest paid directors' salary for the UK's estimation.

One of our main concerns is the relationship between employees' wage and directors' salary. One of the most important results in Table 11.5 is that we found a positive correlation between directors' salary and employees' wage in large Japanese companies. These results are in line with our joint determination hypothesis that both employees and directors in these companies are paid in similar ways. All the coefficients of employees' wage are positive and significant at the 1 percent level. It should be noted that both directors' normal pay and their bonus has strong associations with employees' wage.

In contrast, Table 11.5 illustrates that there is no such relationship in the UK. There is no relationship between top directors' pay and employees' wage in large British firms. These results are in line with our hypotheses that in Japan, directors' salary is determined jointly with employees' wage, while in the UK there is no such mechanism.

The other main issue addressed in this paper is the relationship between stock market performance and directors' salary in both countries. According to Table 11.4, shareholders' return shows little effect on directors' salary in large Japanese firms. Some coefficients of shareholders' return are negative, showing that directors' salary in large Japanese firms is not affected by shareholders' return. In other words, directors in Japan may have little financial incentive to work toward shareholders' return.

Table 11.4 Regression results: Japan

	Eq. 1	*Eq. 2*	*Eq. 3*	*Eq. 4*	*Eq. 5*	*Eq. 6*
Dependent variable	Total pay	Normal pay	Bonus	Total pay	Normal pay	Bonus
Profit (*1,000,000)	0.502	−0.422	3.58	0.554	−0.0857	4.03
	(1.13)	(0.874)	(1.05)***	(1.17)	(0.916)	(1.13)***
Shareholders' return (*1,000)	−1.24	0.0126	0.0255	−1.55	−0.223	−0.257
	(0.945)	(0.0851)	(0.671)	(0.976)	(0.892)	(0.72)
Employees' wage	0.0529	0.0691	0.0843			
	(0.0129)***	(0.0112)***	(0.128)***			
ln (sales)	0.11	0.0953	0.151	0.148	0.14	0.233
	(0.0264)***	(0.021)***	(0.0349)***	(0.0254)***	(0.0206)***	(0.0349)***
Constant	1.049	0.946	−1.722	1.0066	0.934	−2.094
	(0.306)***	(0.247)***	(0.414)***	(0.315)***	(0.259)***	(0.44)***
R-sq.	0.264	0.206	0.227	0.25	0.165	0.257
N	236	368	282	236	368	282

Notess
Estimation using random effect model.
Standard errors are in parentheses.
***Significant at the 1% level. **Significant at the 5% level. *Significant at the 10% level.
Total pay: ln(total pay). Normal pay: ln(normal pay). Bonus: ln(annual bonus).
Employees' wage: Employees' average wage.
The data period covered is 1995 and 1996.

Table 11.5 Regression results: UK

	Eq. 1	*Eq. 2*	*Eq. 3*	*Eq. 4*	*Eq. 5*	*Eq. 6*
Dependent variable	Total pay	Fixed pay	Annual incentive	Total pay	Fixed pay	Annual incentive
Profit (*1,000)	0.0578	−0.139	0.0219	0.0533	−0.130000	−8.51E-03
	(0.105)	(0.100)	(0.364)	(0.104)	(0.100)	(0.363)
Stock market capitalization	0.028	0.0424	0.0347	0.0284	0.0416	0.0361
	(0.0127)**	(0.0116)***	(0.043)	(0.0127)**	(0.0116)***	(0.043)
Employees' wage (*100)	0.238	−0.271	0.901			
	(0.231)	(0.01)***	(0.617)			
ln (sales)	0.270	0.241	0.258	0.2736	0.235	0.276
	(0.0353)***	(0.0335)***	(0.097)***	(0.0351)***	(0.0334)***	(0.0970)***
Constant	3.789	3.894	2.048	3.807	3.88	2.103
	(0.245)***	(0.235)***	(0.678)***	(0.244)***	(0.234)***	(0.679)***
R-sq.	0.382	0.376	0.162	0.376	0.366	0.144
N	395	347	249	397	349	250

Note
Estimation using random effect model.
Standard errors are in parentheses.
***Significant at the 1% level. **Significant at the 5% level. *Significant at the 10% level.
Total pay: ln(total pay). Fixed pay: ln (fixed pay). Annual incentive: ln(annual incentive).
The data period covered is 1994 and 1995.
Employees' wage. Employees' average wage.

In contrast, Table 11.5 illustrates positive and significant relationship between stock market capitalization and director's salary in the UK, suggesting that top directors in large UK firms have financial incentives to work harder to achieve better stock market performance.

Turning to profit, in Japan, we find a positive relationship between directors' bonus and profit while we cannot find positive relationship between directors' normal pay and profit. This may be because in large Japanese firms, directors' bonus is paid as a part of distribution of profit. As for UK, the effect of profit on directors' compensation is not conclusive. Some coefficients of profit are positive though some are not. We find a strong relationship between directors' compensation and sales both in Japan and the UK. These results are in line with Rosen's (1990) argument that this positive relationship can be found in most studies on executive pay.

Concluding remarks

One of the most striking features of our research is the focus on the relationship between directors' pay and employees' wage. Although much attention has been paid to the relationship between top pay and company performance, little attention has been paid to the directors' pay – employees' wage relationship. In this research, we try to analyze directors' pay from the viewpoint of joint determination hypothesis. It may be important to incorporate employees' wage in analyzing directors' pay, as many reports, such as the Greenbury report, suggest the importance of taking care of various stakeholders, such as employees of the firm (Greenbury committee 1995).

It is often argued that directors in Japan's larger companies pay little attention to shareholders' interest. Instead, it is said that directors and employees have the same incentive structure, i.e. many directors consider themselves as a "promoted" employee, rather than as agents of shareholders. Our results are in line with these arguments.

This research has provided the first systematic evidence that there is a positive relationship between employee's wage and director's salary in large Japanese companies. Employees' wages have explanatory power for both directors' pay and their bonus. According to Freeman and Weitzman (1987), employee's bonus reflects the firm's performance, particularly its profit. Our results show that directors' average bonus is also affected by profit. Therefore, the positive relationship between directors' salary and employee's wage may show that both director's salary and employee's wage are affected by the same factor, suggesting both directors and employees have a similar incentive system. These results indicate that both director's salary and employee's wage can be analyzed from the same viewpoint in Japan.

In contrast, this research does not find any relationship between shareholders' return and directors' compensation in Japan. Thus, directors are

considered to have little financial incentive to pursue shareholders' interest, because they will receive little reward for doing so. These results may provide empirical support for why large companies in Japan seem to ignore the shareholder's interest.

Some previous studies on directors' salary in large Japanese firms argue that there is a positive relationship between directors' pay and stock market performance (Kaplan 1994; Xu 1997). However, this research shows that there is no relationship between director's salary and shareholder's interest using the new data set. So why is our result different from those of previous research? One reason may be that our data set is taken in the recession period. It is often the case that director's salary increases over time whether or not their performance improves. On the other hand, it may be the case that stock prices of most large companies increase in a boom period. If this is the case, then one may observe a positive relationship between stock price and director's salary, which may not necessarily reflect the company's pay policy toward directors as the conditions in the stock market greatly affect this.

As our data set is taken from the recession period, many companies' stock prices may not improve. However, the principal-agent theory suggests a positive relationship even in a recession period. As described above, this research does not observe any positive relationship between shareholder's return and director's salary, contrary to previous studies. Thus, it is suggested that previous research may observe a positive relationship that is not based on the company's pay policy, as both shareholder's return and director's salary may increase in a boom period, i.e. the result has been distorted by the condition of the stock market at the time.

In addition, this is the first research that compares the determinants of directors' compensation in Japan and the UK. This research shows that there is a significant difference in the determinants of top directors' compensation in these countries. In Japan, there is a positive correlation between directors' compensation and employees' wage whilst shareholders' return cannot explain executive compensation. In contrast, in the UK, there is a positive relationship between top directors' pay and stock market value of the company whilst employees' wage does not affect top pay. This result is in line with the study by Kato and Rockel (1992), who report that there is a difference in the determinants of executive compensation between Japan and the US, showing that shareholders' return has little explanatory power for top director's pay in Japan.

There is a difference in corporate governance style between the UK and Japan. Shareholders and financial markets have considerable power over top directors in the UK, while in Japan employees have an incentive to monitor top managers. Our analysis on the comparison of the determinants of executive compensation in both countries suggests that the difference in corporate governance does affect the director's salary and their incentives.

Notes

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1 In the case of financial crisis, banks try to push their own personnel into the company as directors to monitor the management properly (Kaplan and Minton 1993).
2 Some previous researches suggest that bank monitoring is the key monitoring devices toward directors in large Japanese companies (Kaplan and Minton 1993; Sheard 1989). Monitoring by employees through implicit investment can be another key monitoring devices toward directors, in addition to bank monitoring.
3 According to Hart and Kawasaki (1999) bonuses consist of 19 percent of the total labor cost in Japan while in the UK it is 1.09 percent.
4 In our sample from 1994–1995, the ratio of directors' bonuses to their total annual income is 16 percent, while Xu (1997) reports it is 26 percent in 1983–1991.
5 We will examine our data in detail in Section 6.
6 Stock options and benefits are not included. Stock option was virtually not allowed by company law in our sample period in Japan, though it became possible after 1997. Benefits, such as company car, are not included in our analysis. According to Abowd and Bognanno (1995) the proportion of these benefits to total salary is quite similar between Japan and the UK, i.e. around 30 percent of total compensation, excluding stock option.

   In the following section, we report the results of regressions on the *level* of directors' compensation in Japan and the UK. We obtained similar results using the *change* of top pay as dependent variable, though not reported in this paper. If we assume the proportion of benefit to total compensation is relatively unchanged in both countries, as suggested by Abowd and Bognanno (1995) the results of the regression on the change of directors' *cash* compensation will be similar as that of the regression on the change of directors' *total reward*, including their non-cash benefit. Therefore, we may be able to guess that our results would not be very different if we include non-cash benefit, such as company car.
7 The amount of "president's income" can be calculated from the data disclosed by tax office.
8 Highest paid director is not necessarily a CEO of the company.
9 NIKKEI INDEX is calculated by using the share price of 225 companies. Among them, 15 financial companies are excluded from our sample.
10 Specifically, we have sorted the listed companies in London Stock Exchange by the amount of sales. In Japan's sample, there are 139 companies whose sales are larger than 1 million GBP in 1993, and 71 companies whose sales are less. In listed companies in the UK, there were 116 companies whose sales are larger than 1 million GBP and we include all these 116 companies in our UK sample. In addition, we randomly chose another 94 companies among listed companies, whose sales are less than 1 million GBP.

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Part III

Toward a new design of financial system

12 Toward an incentive compatible financial system

Accounting and managing the non-performing loans

Akio Kuroda and Koichi Hamada

Introduction

The purpose of this paper is to summarize some features of the ongoing NPL problem in Japan, and to point out incentive compatible ways of coping with a problem and investigate the role of accounting system to assess those problems. Rather than going into the institutional details of the issues, we would like to emphasize some theoretic features that are hidden in the layer of difficult issues.

Although many people agree that resolving the non-performing loans problem is of highest priority and urgency for Japan. There still remain, however, misunderstandings and arbitrary hypotheses that may lead to inadequate estimation of the qualitative situation and to wrong appraisal of methods of disposal. Here we plan to give a precise definition of the non-performing loans and define the crucial issues such as the system of disposal, the accounting methods for the disposal of non-performing loans. We also plan to explain the development process of accounting methods for the disposal of non-performing loans by taking into account the role of the international accounting standards for financial instruments that aims at the implementation of market value measurement. Finally, we explore the point of tangency between the ongoing NPL problems and the wisdom obtained by the economics of information and contract. Two significant methods of resolving the NPL problem exist. One is assuming the liabilities of delinquent firms and selling them in the market to find the best buyers or managers as taken by the Resolution Trust Corporation (RTC) for the Savings and Loan problem in the United States. The other is injecting capital into firms, or more typically banks, to insure them against bankruptcy as done by the Reconstruction Finance Corporation (RFC) in the United States during the Great Depression, and, in a sense, recently attempted in Japan. We compare the economic implications of these two typical methods by exploring the incentive mechanisms embedded in them.

The non-performing loan problem: Its magnitude and the methods for its disposal

Three definitions of the non-performing loans (NPLs) and their controversial points

There are two major definitions for the non-performing loans (NPLs): the risk management loans, and the loans specified and disclosed by banks conforming to the Financial Reconstruction Law. First, the risk management loans were counted as NPLs in accordance with article 21 of the Banking Act. Since March 1998, extending on the previous definition of "publicly disclosed bad loans," the concept of risk management loans includes loans to bankrupt companies, loans with interest payments in arrears, loans with interest payments more than three months in arrears, and loans with waived or reduced interest payments. As of the end of March 2001, the risk management loans at All Banks (137 banks) amounted to 32.5 trillion yen. Of this total, loans to bankrupt companies, loans with interest payments in arrears, and others were 32.5 trillion yen, 17.8 trillion yen, and 11.4 trillion yen respectively.

According to the data on the risk management loans by industry, real estates industry, services industry, wholesale and retail industry, and construction industry accounted for 76 percent of the total amount of risk management loans. Furthermore, it is necessary to mention that the loans for which special loans-loss reserves (Kobetsu Kasidaore Hikiatekin) are set aside are included (not netted out) in the concept of risk management loans and, moreover, the possibility of loan collection through the sales of the collateral is not taken into account.

Table 12.1 Distribution of bank credit to industries (%) (¥1,000 billion)

	In the end of March 1998	*In the end of March 1999*	*In the end of March 2000*	*In the end of March 2001*
The loans under risk management	29.8 (22.0)	29.6 (20.3)	30.4 (19.8)	32.5 (19.3)
The loans specified and disclosed conforming to the Financial Rehabilitation Law	– (–)	33.9 (21.9)	31.8 (20.4)	33.6 (20.0)
Self-assessment of loans that is compulsory for every financial institution	71.7 (50.1)	64.3 (41.6)	63.4 (40.9)	65.7 (42.2)

Source: Bank of Japan.

Note
The number in a parenthesis indicates the total amounts of NPLs' stock of city banks, long-term credit banks and trust banks.

Second, the loans specified and disclosed under the Financial Reconstruction Law, legislated in October 1998, include the following: "unrecoverable or valueless" loans to borrowers who have gone into bankruptcy or the virtual state of insolvency; "risk" loans to borrowers classified as "at risk of failure," and loans needing careful monitoring (Yokanri Saiken) which are equivalent to loans with interest payments more than three months in arrears and loans with waived or reduced interest payments. They are rather close to the risk management loans, especially from the viewpoint of loss loan reserves and collateral treatment. However to be precise, the risk management loans include only loan assets, while the loans specified and disclosed under the Financial Reconstruction Law are evaluated on the total credits basis (i.e. loan assets plus loaned securities and other assets). As of the end of March 2001, the loans specified and disclosed under the Financial Reconstruction Law amounted to 33.6 trillion yen. In detail, "unrecoverable or valueless" loans, "risk" loans, and loans needing careful monitoring were 7.7 trillion yen, 15.0 trillion yen, and 10.9 trillion yen respectively.

Besides these two definitions of the non-performing loans, there is also another classification used in the self-assessment of loans that is compulsory for every financial institution according to the Prompt Corrective Action (i.e. stricter government monitoring of banking operations) introduced in April 1998. The Financial Examination Manual prepared by Financial Services Agency classifies of the borrowers into five categories:

1 the already-bankrupt companies (Hatansaki),
2 companies in virtual state of insolvency (Jissitsu Hatansaki),
3 companies at the risk of failure (Hatan Kenensaki),
4 companies still operating but in need of monitoring (Yochuisaki),
5 healthy companies (Seijosaki).

Also depending on the existence of the collateral, it also classifies loans into four categories: Category IV loans (loans considered unrecoverable), Category III loans (loans for which recovery is extremely doubtful), Category II loans (loans not yet non-performing but with questionable prospects for recovery), and Category I loans (performing loans). As a rule, the loans to already-bankrupt companies and companies in virtual state of insolvency are considered as Category IV loans, the loans to companies that are likely to go bankrupt are included in Category III loans. Nevertheless, the bad loans covered by special loan-loss reserves or guarantee are included in the non-classified category (Category I), even in the case of loans to already bankrupt companies. The loans to companies which are still operating but in need of monitoring (Yochuisaki) correspond to Category II loans, except for those covered by respectable collateral, which are considered as the non-classified category. As of the end of March 2001, the aggregated amount of banks' loans classified within the self-assessment framework was published by Financial Services Agency

(FSA). According to FSA, the total amount of the classified loans was 65.7 trillion yen; Category II loans were 63.1 trillion yen and Category III and IV loans were 2.6 trillion yen. Furthermore, the total amount of loans to already bankrupt companies, companies in virtual state of insolvency, companies that are likely to go bankrupt, and companies still operating but in need of monitoring, including loans covered by special loan-loss reserves or guarantee, amounted to 110 trillion yen. It was 20.7 percent of the total loans outstanding (including performing loans) of 536 trillion yen.

If we compare the above-discussed definitions of the non-performing loans with each other, we find that the risk management loans and the NPLs specified under the Financial Reconstruction Law seem to be problematic. In those definitions the loans to companies only formally fulfilling contractual terms of agreement with the help of additional support from financial institutions are not included. Recent examples are the loans to general contractors, real estate companies, and large retail companies. Since those loans are extremely close to the concept of the loans needing careful monitoring (Yokanri Saiken), exclusion of loans to those companies tends to underestimate the true magnitude of the non-performing loans problem. Meanwhile, we have to notice again the fact that a part of the bad loans for which the loan-loss reserves were set aside is included in the concept of the risk management loans and the NPLs specified and disclosed by banks under the Financial Reconstruction Law, and that the possibility of loan collection through the sale of the collateral is not taken into account.

On the other hand, with respect to the classification of the loans by banks' self-assessment, it would overstate the NPLs problem for us to consider all of the Category II loans as non-performing because this category of loans includes not only the loans to companies with the potential for default and thus needing monitoring but also the loans to companies with simply unfavorable business conditions, for example, companies operating in deficit that are common in Japan. However, the treatment of loans insured by a respectable collateral even in already-bankrupt companies or with high risk of default as non-classified category involves the danger of overestimating the collateral and thus underestimating the total amount of Category III and Category IV loans. (Loans covered by other collaterals are classified as Category II loans and partly as Category III loans.)

Methods of disposal of non-performing loans and the actual situation of disposal

The methods of disposal of NPLs can be classified into the indirect write-off of the NPLs through the loan-loss reserves and the final disposal that includes direct write-off through a legal process and selling of the NPLs.

First of all, the indirect write-off of NPLs means the writing off of loans

by using loan-loss reserves that can be divided into the following two groups:

1 the special loan-loss reserves set aside separately in each company classified as already-bankrupt companies, companies in virtual states of insolvency and companies that are likely to go bankrupt,
2 the general loan-loss reserves set aside for performing companies and companies still operating but in need of monitoring (Yochuisaki).

As of the end of September 2000, the total amount of loans to already bankrupt companies, companies in virtual state of insolvency, and companies likely to go bankrupt by All Banks in Japan was 29.3 trillion yen. Among this amount of bad loans, those covered by respectable collateral, which were classified as Category I, were 2.8 trillion yen, and those covered by general collateral, which were classified as Category II, were 10.5 trillion yen. Against the remaining 10.6 trillion yen, 7.9 trillion worth of special loan-loss reserves were set aside and the part of loans covered by special loan-loss reserves was classified as Category I. The remaining part of 2.7 trillion yen was classified as Categories III and IV. The general loan-loss reserves held by All Banks amounted to 3.8 trillion yen in the same period.

As for the final disposal, a direct write-off means a complete removal of non-performing loans from the balance sheet of financial institutions through a legal process of liquidation based on the Corporate Rehabilitation Law (Kaisha Kosei Ho) or the Civil Rehabilitation Law (Minji Saisei Ho). There are two methods of the disposal of the collateral: discretionary sale and auction. Discretionary sale is a sale of collateral by a debtor to the third party in order to use the receipt to repay the loan. The merits of this method are its comparatively low cost and speed. But in practice the implementation of this method is sometimes difficult because all the parts involved cannot reach consensus on the matter of collateral. On the other hand, auction is a method when a creditor appeals to the court and receives the dividends on the collateral sold at auction. Compared with discretionary sales, auctions have drawbacks such as low sales prices and complicated and time-consuming sales procedures. The financial institutions can also renounce loans considered irrecoverable and remove them from their balance sheet. Aside from these methods, it is also possible to sell non-performing loans in bulk to investors, particularly foreign investors. The bulk sale of the NPLs has some drawbacks such as low prices, but since 1997 final disposal of NPLs seem to have increased significantly due to an expansion in bulk sales of loans to foreign investors, mainly by city banks, as one of the effective methods of bad loans disposal. It should be also mentioned that the Law on Special-Purpose Companies (SPC) (September 1998) and the Law permitting outside companies to accept payments, collect on defaults, and administer

loans on behalf of lenders (February 1999) were prepared in order to accelerate liquidation of the NPLs.

According to the report in the August 2000 issue of the Bank of Japan Monthly Bulletin, the total disposal of NPLs by All Banks in Japan between fiscal year 1992 and fiscal year 1999 reached 61 trillion yen. (Net transfers of 1.5 trillion yen from the general loan-loss reserves were excluded.) These massive cumulative losses far exceeded banks net profit from core business operations of 41.9 trillion yen during this period. The shortfall was generally financed by net bond sales, net stock-related sales, gains from sales of premises and movable property, and a decrease in capital accounts of 17.7 trillion yen. According to a tentative estimation of the Bank of Japan, 19 trillion yen of the total amount of write-offs, had not yet been removed from balance sheets and remained in the form of special loan-loss reserves or other loan-loss reserves. Therefore, the loan write-offs in the form of the final disposal (which includes losses on sales of such loans and losses arising from financial support to troubled affiliates or business partners) are estimated to be 42 trillion yen. The total principal of non-performing loans corresponding to the above 42 trillion yen disposal is estimated to be approximately 52 trillion yen. Thus, loans recovery is about 10 trillion yen. Despite huge write-offs, Japanese banks are still burdened with large amount of loans to already-bankrupt companies, to companies in virtual state of insolvency and companies which are likely to go bankrupt. This steady increase is primarily due to dismal business performance of the borrowers.

Accounting methods for disposal of non-performing loans based on the International Accounting Standards (IAS)

New International Accounting Standards Committee and Japanese Financial Accounting Standards Foundation

The International Accounting Standards Committee (IASC) is an independent privately funded accounting standard setter established by certified accountants from nine countries such as the United States, England, Canada and others in 1973. The main mission of the Committee is the development of international accounting and disclosure standards. Originally countries were free to adopt International Accounting Standards (IAS) developed by IASC. Nevertheless, gradually they became to be accepted as global accounting standards especially after 1995 when the International Organization of Securities Commission consisting of financial supervisory agencies recommended using IAS in financial statements of the companies involved in cross-border financial procurement.

The new IASC is committed to developing, in the public interest, a single set of high quality, understandable and enforceable global accounting standards that require transparent and comparable information in

general purpose financial statements. In addition, the new IASC cooperates with national accounting standard setters to achieve convergence in accounting standards around the world.

In Japan the economic and financial crisis showed the need for reliable and transparent accounting developed by a private accounting setter remaining independent from the government which has until now had a decisive influence on the formulation of accounting standards. Based on these considerations in August 2001 the Business Accounting Deliberation Council, an advisory council of the minister of finance (after the establishment of the Financial Services Agency, an advisory council of the minister in charge of financial services), was replaced by the Financial Accounting Standards Foundation, a private sector organization including Accounting Standards Board.

International Accounting Standards and Japanese Accounting Standards (JAS)

Great Britain and Canada have been actively endorsing IAS from the very beginning of the IASC establishment. Furthermore, important developments are taking place in the European Union and the USA and it would not be an exaggeration to say that in the future IAS will become global accounting standards for all the companies procuring funds on the international financial markets.

As a part of Japan's Big Bang, financial markets liberalization kicked off in November 1996. In accordance with it, the government has been putting forward the re-examination of accounting standards. However, the transparency of the Japanese accounting standards is still a concern among other countries. Advances in financial risk management and information technology, globalization of capital markets and accelerated use of sophisticated derivatives and other complex financial instruments are now combined to be a motivation to change fundamentally the business and investment environment. It has become apparent that traditional accounting methods need to be overhauled. Harmonization of the national and international accounting standards is indispensable to boost the competitiveness of not only Japan's companies that are involved in cross-border fund procurement but also of Japan's capital markets on the whole. Use of both standards, i.e. requirement to prepare financial statements in accordance with IAS in case of international fund procurement and in accordance with national standards in case of domestic procurement, must be inefficient because of additional expenses involved that may entail a hollowing-out of Japan's capital markets.

In 1998 IASC start working on the project on accounting methods for financial instruments. IASC published exposure drafts of proposed standards E 40 and E 48 in 1991 and 1994 respectively. These drafts proposed far-reaching changes to accounting for financial instruments and similar items. IAS 32, Financial Instruments, Disclosure and Presentation, based

on the draft E48 was approved in May 1995. IAS 39, Financial Instruments, Recognition and Measurement, was finally approved after long discussions in October 2000.

In March 1997, IASC published a discussion paper on accounting for financial assets and liabilities. This paper represented the next stage of development of accounting for financial instruments. In December 2000, the Financial Instruments Joint Working Group of standard setters (JWG) accepted the discussion paper. It concluded that market value is the most relevant measurement attributed for all the financial instruments. Also it proposed that changes in market value of financial assets and liabilities reflecting the effects of changes in certain economic conditions are to be recognized in the income statement in the reporting periods. It appears that IAS for financial instruments will be completely developed on the basis of the market value measurement principle.

In the Japanese practice, it has been allowed to evaluate assets at the cost basis and occasionally either by the lower value of the cost or the market value. In contrast to the market value accounting, under historical cost accounting conducted in Japan, bonds, stock shares and other financial instrument were calculated at the cost basis (or partly either the lower value of the cost or the market value) and changes in values, i.e. unrealized holding gains and losses, were not recognized until they were realized. Since March 1998, however, banks, securities companies and others began to evaluate their contracts, which involve trading accounts securities, certificates of deposit, and derivatives, based on the market value principle. Thus they attempt to recognize all the gains and losses in the profit and loss statement in the reporting periods. Furthermore, in January 1999, the Business Accounting Deliberation Council published new accounting standards for financial instruments. It required the evaluation of the securities on the basis of market value beginning from March 2001. With regard to securities the above mentioned council divide them into the following four categories and accordingly determine their accounting treatment:

1 investment securities held for trading,
2 bonds held to maturity,
3 equity interests in subsidiaries or affiliated firms,
4 other investment securities (cross-shareholdings).

The market value accounting has been accepted for 1. On the other hand, 2 and 3 are to be conducted as before based on the historical cost accounting. As for 4, beginning from March 2002 (and possibly ahead of the schedule) unrealized profits and losses should be calculated at market price at the end of every reporting period and be recorded in the capital account (as a rule, they are not contained in the income statement) taking into consideration the tax-effect accounting. Moreover, in the case

of historical cost accounting of cross-shareholdings and other securities, the charge-off into the loss statement is compulsory if losses exceed 50 percent of the book value and the charge-off is recommended if losses exceed 30 percent.

Accounting methods for the disposal of non-performing loans

In the current international accounting standards, finance receivables (loan assets) are defined as the financial assets held with the intention of long-term investment or held to maturity. They are usually evaluated at the amortized cost, that is, determined by using the effective interest rate that exactly discounts a stream of future cash payments through maturity. When, based on current information and events, it is probable that a creditor will be unable to collect all amounts due according to the contractual terms of loan agreement, a creditor may write down the loan measured as amount of expected future cash flows discounted at the loan's effective interest rate. According to the Statement of Financial Accounting Standards (FAS) 114 "Accounting by creditors for impairment of a loan" issued by Federal Accounting Standards Board (USA) a creditor should measure impairment based on the present value of expected future cash flows discounted at the loans effective interest rate. Conceptually it is the same as IAS.

On the contrary, in the Japanese accounting practice, finance receivables (loan assets) are evaluated as the principal by taking into account the normal appraisal of default risk. And non-performing loans are usually disposed through loan-loss provisioning such as special loan-loss reserves and not through the depletion. In January 1999, the Financial Reconstruction Commission published "The Viewpoint on the Write-offs and Allowances in Association with the Capital Injection." It required the Japanese banks to make the rigorous assessment of asset quality along with the provision of reserves for NPLs at the following ratios:

1 About 70 percent was recommended on loans (uncovered by collateral or guarantee) to companies at the risk of failure,
2 About 15 percent was recommended on Yokanri Saiken (uncovered by collateral or guarantee) to companies classified in need of careful monitoring,
3 Appropriate provision ratios based on the historical loss records are recommended on other loans to companies in need of careful monitoring (Yochauiski).

This standard has been in force since March 2001. Furthermore, the provision ratio on the loans (uncovered by collateral or guarantee) to already-bankrupt companies and companies in virtual state of insolvency has been 100 percent.

The acceptance of market value accounting standards for all financial instruments by new IASC would require finance receivables to be measured at the market value or, in a sense, the fair value, i.e. future cash flows discounted by market interest rate plus risk premium. Under the market value accounting, the measurement of loan assets on balance sheets of banks will most likely be susceptible to fluctuations in interest rates and default risk of the borrower in question. Besides, the loan rollover and reduction or waiving of the interest payments will immediately affect the fair value of loan assets through the changes in future cash flows.

Nevertheless, the classification of the loans including NPLs continues to require close attention of both financial institutions and Financial Services Agency, because under the ongoing system the amount of NPLs and thus the size of loan-loss reserves entirely depend on the criteria chosen for loan assessment. It allows the bank managers to be loose in calculating the size of their NPLs. By the intentional underestimation banks are trying to conceal the burden of net transfers to make up for possible loan losses. The introduction of market value accounting is expected to force banks to make their management styles more responsive to the market because reduction in the interest payments, rollover of the loan, dismal business performance of the borrower increasing risk of default will immediately reduce the market value of the loans. However, in order to create international and domestic confidence in the market value accounting and to facilitate disposal of NPLs, it is crucial to enhance infrastructure of the secondary markets with depth by the use of such methods as securitization and establishment of credit rating system.

Incentive issues for accounting and managing non-performing loans (NPLs)

The principle of "let bygones be bygones"

In this section, we will discuss the incentive problems lying behind the figures we explained. Let us start with the accounting problem. In the finale of the first act of *Die Fledermaus*, by Johann Strauss, a charming tune sings, "Happy are those who can forget what they will be no longer able to change." This corresponds to the phrase, "Let bygones be bygones," and it is as well one of the basic principles to characterize the efficient process for handling non-performing debt. In order for the business to carry along, it should not be backward-looking about the failure made in the past but be always forward-looking.

Therefore, stock or bonds that used to be highly valued do not have any meaning to the current business if they have lost their value. Namely, the market indicates its forecast about a company's future earnings by the low values of its stock. As Kyoji Fukao once said, it is no use counting gambling tickets for the horse race you lost. This principle is, for one thing,

the basis for the market value accounting so far discussed. Incidentally, during the time when production process was more important for the company, and the process was more or less regular, the evaluation in terms of stocks or bonds at purchase cost might have been meaningful because that sort of procedure highlights activities in flow dimensions. Now that we are living in highly securitized society where the stock value of assets is important, it is essential to evaluate the value of the company by a forward-looking process. Therefore the reason for adopting the IAS (International Accounting Standards) is not just for conforming to the international practice but for following the rationality principle of "Let bygones be bygones."

The current problem in the Japanese economy is, in our opinion, substantially rooted in the aggregate demand policy that sustained the stock and land price boom and contracted, so suddenly that it over-killed the boom. Those policy environments induced many mistakes by business and financial agents. However, we can no longer change the consequence of the past failures and the task left to us is to do the best with the present situation given the past failures. The economic rationale for modern treatment of accounting such as the decomposition of earning-loss statements among sectors and projects is obvious if we demand the transparency in accounting information.

Incidentally, the traditional accounting system in Japan seemed to be not so much organized for the purpose of providing transparent information on the economic status of a firm as used for the means of imposing taxes. Accounting mattered for the tax purpose rather than for the assessment of profitability of a business. Many accounting and book-keeping instructors came from *Zeimu Daigakko* (the Tax University) of the National Tax Bureau.

The incentive structure of redeeming non-performing loans

There are two objectives to be satisfied by a desirable scheme of clearing non-performing loans. The first objective is, given the accumulation of non-performing loans that are the result of the past, to make the most of the present situation. The second is to give economic agents the incentives to minimize the *ex-ante* cost concerning the non-performing loans.

Oliver Hart (1995) lists "Goals of a bankruptcy procedure" as follows.

> A good bankruptcy procedure should achieve an ex post efficient outcome (that is, an outcome that maximizes the total value of the proceeds – measured in money terms – received by the existing claimants).
>
> A good bankruptcy procedure should preserve the (*ex ante*) bonding role of debt by penalizing managers adequately in bankruptcy states. However, bankruptcy should not be so harsh that

managers try to avoid it at any cost, e.g. by "gambling" with the company's assets.

A good bankruptcy procedure should preserve the absolute priority of claims; that is, the most senior creditors should be paid off before anything is given to the next most senior creditors, and so on down the ladder (with ordinary shareholders at the bottom).

The first two goals correspond to our criteria.

In order to fulfill the first objective in the process of clearing and managing NPLs, the principle of "Let bygones be bygones" is most relevant. We should try to make the best from the present into the future. Here again we have to ask two questions. The first question is whether the firm should continue operating. To answer this, we go back to a first lesson of microeconomics. Any business activity that covers short-term variable average cost is worth operating even if it cannot cover the long run average cost. Thus, the first principle of the debt management is to continue the activities that have more revenue than the short-run variable average cost. The loss from the past is a sunk cost and should not be considered in deciding whether or not to continue the current activity. Even if you lost a lump-sum amount of money because of mistakes or misfortune in the past, the operation will be worth continuing as long as the short-run average cost is covered. If revenues from operating the activity would be smaller than the short run average cost, then the project should be scrapped. If a bank continues to lend to the activities that cannot cover the short-term average cost, then the operation is exactly what is called *oigashi*, the rollover of the lending. (Sakuragawa *et al.*) *Oigashi* is similar to the Ponzi scheme in the sense the activity attracts lending despite its lack of productivity, but unlike the case of the Ponzi game the *oigashi* process continues because the lender as well as the borrower is motivated to continue it.

As the principle of "Let bygones be bygones" indicates, new lending decisions should be made independently of the failure in the past. Therefore, the market value principle helps the process very much. By the same token, writing-off the past NPLs would make business calculation transparent without the trace of past failures. Firms can make decisions more easily for the future because the fall-out from past failures does not obscure the profitability of new projects, and the whole process becomes much more transparent to stock holders, lender and other interested parties. *Oigashi* becomes more difficult.

Of course, in order to fulfill the *ex-ante* efficiency, the past failure cannot be neglected altogether. We have to build a sanction system against those who made wrong business decisions in the past. We can no longer correct the past behavior again, but we have to give sanctions to those who made mistakes. In order not to be repeated, the past failure should be corrected.

The firm should follow the formal bankruptcy process, when reorganization cannot make the firm cover the short-run variable cost. It should rehabilitate by some process, e.g. *minji saisei* (civil rehabilitation process), when a restructuring process makes the project cover the cost.

Then the next question is, when the activity is to be continued, who should be in charge? Hart, Aghion and Moore (1992) and Hart (1995), for example, developed a pure theory of bankruptcy from the basic principle of microeconomics. According to them, the market should be called for determining who should be in charge. The desirable principle is that those who can make the best profit out of a business should be given the right to manage it.

This principle is to choose the operation of the firm from the perspectives on earnings into the future. How can we find who regards herself or himself as she or he who can obtain the maximum profit out of the operation of the problematic firm? A bidding process will find such agents. If somebody bid the highest price for non-performing loans or stocks of the firm in troubles, then she or he should be in charge. Thus the highest bidder will be given the right to operate the firm. This principle corresponds directly to the actual institutional scheme to the RTC (Resolution Trust Corporation) and indirectly to that of the RFC (Reconstruction Finance Corporation).

Incidentally, there is another institutional device, called "*Seirikaishu Kiko*" (Resolution and Collection Corporation, RCC) in Japan. The Housing Loans Administration Corporation and The Resolution and Collection Bank merged into the RCC in April 1999. In purpose, the RCC aims to emulate the RTC. At present, however, collection is regarded as the strongest point of its activities. It will hopefully become like the RTC in the future.

The RTC in the United States was created in 1989 to manage the NPL generated by the Savings and Loans crisis that had continued then for the two decades. In the crisis about 3,000 Savings and Loan Associations bankrupted. Their loans were handled by the RTC that was built by the FDIC (Federal Deposit Insurance Corporation). The RTC bought the delinquent loans amounting to $900 billion. Using such a variety of techniques, such as bridge bank, open banking acquisition (OBA), and assumption of debt, it transformed those bad debts into liquid, marketable ones. Taxpayers paid about $125 billion as the financial burden for these bad debts but they resold all those debts by the time when the RTC was closed in 1995. The RTC synthesized, assembled, sliced, decomposed and sold the liabilities of savings and loans that were acquired and collected. The RTC engaged even in the real estate business related to the savings and loans they handled. The liabilities they transformed went, as Aghion *et al.* argued, into the hands of the supposedly, or approximately, highest-earning entrepreneurs.

Incidentally, this principle of choosing the economic agent who manages the firm, or the principle of assigning the ownership of the firm

by the RTC, is closely related to the principle of the "cheapest cost avoider" in law and economics. For example, if a person was injured by a car, who should be responsible for the damage? Or if a person is infected by the HIV virus through the use of non-sterilized blood products as happened in Japan, who among the related parties is to blame, namely, who among importers of the blood products, pharmaceutical companies that sold the product, doctors, nurses or the patient himself is to bear the cost? There are all kinds of possibilities. According to the principle of the "cheapest cost avoider," a driver should be responsible for the injury when he or she is most likely the one who can avoid the accident. This assignment is changed in case a pedestrian has committed a serious neglect of care (contributory negligence). In the HIV case, it seems that pharmaceutical companies could have avoided the accident most easily. Thus the principle of the "cheapest cost avoider" is the principle to assign the liability on whoever could have avoided the cost most cheaply or with the least sacrifice. It is hard to be responsible for something you cannot influence. If somebody can easily avoid the cost by his or her action then it is most economical for the society to impose liability on him or her. This principle can be applied to the handling of non-performing debt. Whoever can effectively change the course of business should bear the risk as well as the benefit.

In Japan, one can make use of this principle to handle the NPL problem most effectively. As Yuri Okina (1998) wrote, the essence of debt clearance is not to just write off the accumulated debt but to improve the cash flow by regaining efficiency of the firm through better monitoring of the activities and finding the best manager through securitization. Because the basic source of the bad debt problem is malfunctioning of business, just clearing the NPLs in the accounting sense does not solve the problem.

The RTC method can be seen as a straightforward application of the Aghion *et al.* type of recommendation. The present practice of the RCC is still emphasizing collection, but it is hoped that it will assume the role of the RTC soon.

There are hurdles to be cleared before the RTC should work. First, the economy must have a fairly developed security and bond markets. Second, human resources and legal institutional arrangements should be ready in order to handle the process for transforming NPLs into junk bonds and securities. Third, in Japan the market for NPLs is still just emerging. Therefore, the evaluation of fair values for those loans and securities for sale may need some adjustment period. Finally, there is a difficulty that one cannot directly use this RTC method for a large bank that occupies a significant mass in the financial market. In theory, of course, we can construct an institution that buys the non-performing loans of the bank and then reorganizes them into bundles and pieces for the resale to the public, playing the role of the RTC. However, a failure of a substantially large bank may create systemic disasters to risk the survival of the financial

system. Therefore, we should pour into the system some additional funds to avoid the bankruptcy of a major bank. This call for the injection of capital to precarious banks, the method taken by the Reconstruction Finance Corporation (RFC) in the US in the 1930's. The problem here is that injection of capital is not only expensive but also subject to various moral hazard possibilities.

A typical device to avoid the moral hazard is to require the bank under the plan to issue preferred stocks, or subordinated bonds, to the state that pours capital into the ailing bank. By this device, a substantial restraint is imposed on the incumbent manager that they may lose the control if they cannot improve the management. This is a positive feedback but still a weak one. In order to strengthen the discipline, capital is to be injected after reduction of capital as a means of redemption of non-performing debts, and one needs to change the managers who were responsible for the increase in delinquent loans.

Major re-capitalization of banks in Japan by Kinyu-Kiki-Kanri-Shinsa (Sazanami Commission) was inefficient because of its incredibly incentive-incompatible way in designating the banks to which the injection applied. The second major re-capitalization by Kinyu-Saisei-Iinkai (Financial Reconstruction Commission) led by H. Yanagisawa had a substantial impact. However, it was not without incentive problems because neither reduction of capital nor changes in management were made.

Let us start from the ex-post benefit and cost of this scheme. As already discussed, this method of injection can be most effectively used when the RTC method is inapplicable because bankruptcies of the banks under consideration would mean a loss of critical public goods. Since the injection of capital can solve this public good problem, the benefit side of this scheme is obvious. Usually, the injection of capital can prevent the crisis with some probability. Then the expected benefit of the injection of money for re-capitalization will be the expected value of the benefit of avoiding the crisis.

Let us turn to the cost side. If the institution pours capital into banks that are solvent, then the money is useless but not wasted. As long as the secure bank does not want to be nationalized by the injector of capital, they will return the money to buy back the preferred stocks. In this case, except for some room for the moral hazard that the money is used inefficiently because of the soft budget, the injection of capital does not leave room for substantial waste. If the bank under re-capitalization goes bankrupt, on the other hand, the money injected to the bank is lost and wasted. This amount of money becomes a transfer to the bank and its clients. It does not help improving the public goods of sound banking atmosphere. (An exception is when the "pay-offs" to the deposits are made by this transfer. In that case, the transfer creates some public goods effect.)

Most of banks lie in between. The RFC equivalent or even banks themselves do not know exactly whether or not they fail with capitalization or

without capitalization. Moreover, asymmetry in information exists between the RFC equivalent and banks, which probably know somewhat more about their own business conditions. The banks that are near the boundary between solvency and insolvency will have the tendency to understate the seriousness of their situation because the injection will give some room to manage cash. The government that lies behind the RFC equivalent has to guard itself against excessive injections of funds, while it is hedging against increasing the probability of failures.

What happened in Japan was more curious. Banks did not apply for sufficient capital injection, even if they were offered, because they feared that they might lose reputation for sound banking if they were seen to accept the injection. In the first episode of injection, the government, rather than receivers, begged major banks to accept capital injection (cf. Corbett and Mitchell).

We have to take account, in addition, of the *ex-ante* incentive problem. If agents know that the government will help by injection of money, banks may be too aggressive in extending loans, and depositors may be too optimistic about the safety of the banks. Here, as always, the conflict between the *ex-ante* decision and the ex-post decision appears. To make the financial behavior more efficient with disciplines, the government should refrain from using a scheme like the RFC. On the other hand, to avoid a possible financial crisis, it should rely on some scheme like the RFC.

Incidentally, another factor worth noting is the difference in the pay-off schedule for contingent claims between creditors, bondholders, lenders and stockholders. Equity holders have the return schedule contingent on firm's profit as in Figure 12.1a. On the other hand, bond holders or loan holders will get constant interest payments as long as the firm earns enough profit to pay all the interest liabilities. Neither the stockholders nor the bondholders are responsible for something more than they invested (Figure 12.1b). The profiles of return, however, are quite different. The holder of assets is motivated to manage the firm well when she or he faces an upward-sloping return schedule. Equity holders are thus motivated for managing a firm under the normal range of profit conditions. Bondholders are keenly interested in returns of the firm when the return comes into a lower range and when the possibility of bankruptcy comes into sight. Then under normal situations, equity holders are considered to manage the firm well, while bondholders have more concern with the lower range of returns. If they feel concerned about the security of the interest and principal payments, they would like to intervene in the business operation. Then they become more or less like equity holders. Dewatripont and Tirole (1994) discuss this type of problem.

There is another school of thought about monitoring the effect of debt rather than equities. If owners of the firm, stock holders, are different from managers of the firm, then the managers may find it tempting to shirk doing the job. Shareholders' meeting may not be effective to oblige

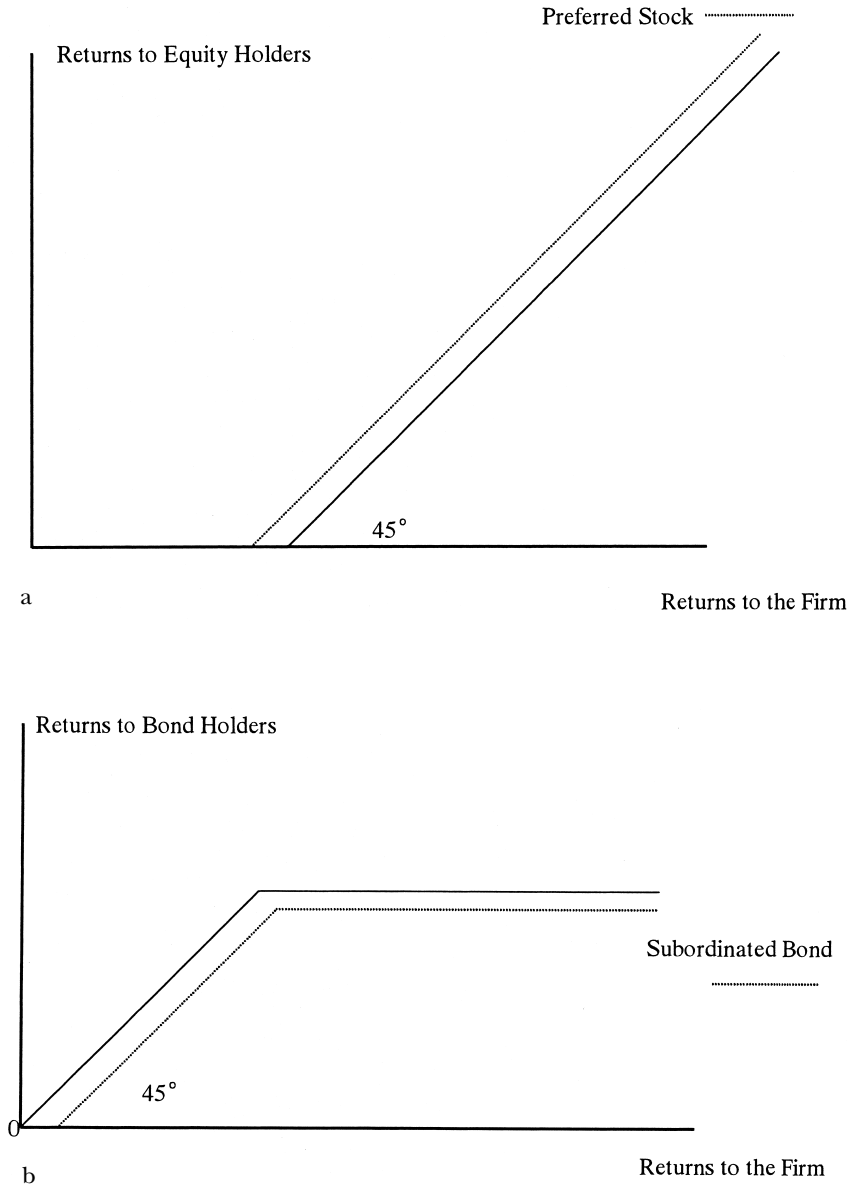

Figure 12.1 Return schedule for equity holders and bondholders.

executives to work for maximizing the profit instead of pursuing their own perks. Debtors should be repaid if managers have to be in charge.

According to the principle of equitable subordination in the Anglo-Saxon law, creditors who intervene in business activities lose priority in collecting the debt and interest payment. Accordingly, their claims are subordinated and they become subordinated debt holders. The profile of equity holders and debtors in the charts show their typical cases. Between the schedules of debtors and pure equity holders, there are schedules for the subordinated debtors and for the preferred stock holders (see Ramseyer, Chapter 7 in Aoki and Patrick (eds) 1994). There remains the question why the main bank is motivated to play the role of controlling the firm, as well as the role of incurring loss for the firm. The main bank system is an interesting way of co-insurance among banks. It was effective when the Japanese economy was growing. Banks could save monitoring cost by delegating it to the main bank. Banks took turns for becoming a main bank. Now under this turmoil, however, the incentive for defecting from this repeated game situation increased. In other words, the threat of sanction against breaking the norm for the main bank became less serious than before because the present situation is hard for the bank.

Incidentally, even though the principle of equitable subordination does not apply in the Japanese Law, the main bank intervenes and often bears the burden for reconstruction of the firm. This may indicate that the *de facto*, if not *de jure*, subordination is partly practiced in the main bank system.

The difficult problem is to tell who can manage the firm most effectively, when the firm faces adversities. In the RTC scheme, the market principle predicts that the best bidder will be the most capable one. By this principle, the firm is generally managed in accordance with the principle of the best management of the firm. This is the best scheme from the incentive standpoint. The only issue is if the RCC in Japan has sufficient accumulation of know-how to do this.

If the RTC method cannot be adopted because of the fear of a systemic crisis, then some measures like the RFC methods have to be introduced. As we have seen, then the scheme has a variety of moral hazard possibility. Here also, under the RFC scheme, the government must provide know-hows and entrepreneurship for the reconstruction of the nationalized bank. The Financial Services Agency (FSA) hardly seems to possess ample human resources for rehabilitating ailing banks. The government is now subject to a difficult choice of the trade-off between the systemic stability of the financial system and the effective working of the incentive mechanism.

Concluding remarks

We first presented the magnitude of the non-performing debt in Japan and the changing accounting principles that accompany it. Then, we dis-

cussed the economic logic behind the accounting changes and the incentive structures to be brought about by the RTC or the RFC type of the scheme. As long as the danger of systemic risks in the financial system is not altogether neglected, the choice for an incentive compatible method for redeeming non-performing debts will be a difficult one.

It remains to be seen whether this difficult task is done by the utilizing market-oriented, western style management, or by collaborative methodology developed in Japan or some parts of Asia. Still, even though some Asian legacy remains in this part of the world, the incentive compatibility must be the essential ingredient for the system. In other words, participants in the system are to be motivated properly for the efficient working of the system.

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13 Further reforms of the JGB market for the promotion of regional bond markets

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Introduction

At the end of 2000, Japanese government bonds (JGBs) issued by the central government reached US$3.18 trillion, while the outstanding balance of US Treasury securities was $2.97 trillion. In fiscal year 2001, Japan's Ministry of Finance (MOF) will raise a gross amount of ¥98.5 trillion through the issuance of JGBs, whilst the US Treasury has been playing down its debt. As a result, Japan will remain the largest issuer of government debt in the world in the foreseeable future. As summarized in Table 13.1, the International Monetary Fund (IMF) predicts that government debt is expected to reach 139.5 percent of GDP in year 2001, whereas the United States and United Kingdom are expected to achieve debt levels of 53.8 percent and 38.3 percent relative to their respective GDPs.

This is bad news for Japan's economy and future credit rating of JGBs. Moody's Investors Service downgraded the JGB rating to Aa2, two notches

Table 13.1 Government debt and fiscal deficit

	Japan	*United States*	*United Kingdom*
A Government debt/GDP (%)			
1997	96.8	70.3	49.9
1998	110.2	66.7	47.0
1999	120.4	63.4	44.4
2000	130.7	57.3	41.3
2001	139.5	53.8	38.3
2002	145.2	50.6	36.0
B Fiscal deficit/GDP (%)			
1997	−3.2	−1.3	−1.5
1998	−4.5	–	0.3
1999	−7.0	0.7	1.5
2000	−8.2	1.9	4.0
2001	−6.8	1.6	1.3
2002	−5.9	0.8	0.3

Source: IMF, World Economic Outlook (October 2001).

below the top-rated Aaa level, in early September 2000 and Standard & Poor's lowered Japan's long-term government bond rating AAA to AA+ in March 2001. Now Japan and Italy are the only two members of the Group of Seven leading economies without triple-A credit rating. According to IMF's prediction, Japan's fiscal deficit will reach 6.8 percent of its GDP in year 2001, while the United States and United Kingdom will gain a surplus of 1.6 percent and 1.3 percent as presented in Panel B of Table 13.1. Rudiger Dornbusch believes that Japan's public sector debt is a more serious threat to global financial stabilization than a US economic recession.[1] He argues that exploding debt in any country means higher interest rates and a tendency for savings to look for safety offshore, which may trigger a global financial crisis as Japanese savers choose not to hold and roll over JGBs.

The fact that Japan will remain the largest issuer of government debt securities is important news for further development of the JGB market because the MOF will be forced to heed the cost minimization of government debt. Any reform measures necessary to attain this goal will be adopted more expediently and decisively than ever before.

This paper reviews key steps for further development of the JGB market in aligning its infrastructures with those of the US and UK government securities markets. The remainder of this chapter is divided into three sections. In Section II, we assess if Japan's MOF is able to minimize the cost of JGBs given the current status of the market. In Section III, we identify numerous reform measures to create a more effective and efficient JGB market. The last section touches upon an urgent policy issues on the regional level for the progression of the JGB market in spearheading regional bond market activities.

How to minimize the cost of government debt securities?

Schinasi and Smith (1998) recommend three courses of action to minimize the cost of government debt securities: first, tap the pool of global capital; second, grant greater independence to government debt management from monetary policy; and, third, reform primary and secondary market infrastructures to appeal to institutional investors. When the cost minimizing effort is assessed against the above three criteria, Japan's MOF does not earn a good mark.

Tapping the pool of global capital

Inonue (1999) reports that non-residents hold approximately 10 percent of JGBs, while non-resident holdings of US and UK government debt amount to 36.9 percent and 14.4 percent, respectively. Schinasi and Smith (1998), however, report a smaller percentage in the order of 4–5 percent for Japan, citing a Bank for International Settlements source.[2] This

suggests that further internationalization of the yen is necessary to tap the pool of global capital. Although some concerns have been expressed regarding the delay of implementing reform measures in the areas of pension system, bank re-capitalization, and deposit insurance scheme, the MOF should be credited for its Big Bang reforms in internationalizing the yen.

The implementation of Big Bang reforms in some areas has been slow. For example, as of April 1999, the withholding tax on redemption gains and interest income from JGBs were exempted for non-residents and foreign corporations. However, no drastic increases are reported in the amount of foreigners' investment in JGBs after April 1999, which contrasts with German experience that the percentage of its government bonds held by foreign investors jumped from 10 percent in 1984 to 38 percent in 1988 subsequent to the elimination of withholding taxes on interest income for non-resident investors in October 1984. Two reasons are cited: First, the exemption of withholding taxes is not done at the source, which implies that foreigners first pay withholding taxes and then apply for reimbursement with Japanese tax authorities. This reimbursement process is known as cumbersome and time-consuming. Second, foreign investors still have to register their bond holdings with a local custodian bank because tax exemptions were granted only to foreign investors using the Bank of Japan's "book-entry" system. This was unpopular with offshore institutional investors (hedge funds, mutual funds, pension funds, etc.) as many prefer to consolidate their custody operations in one place.[3] Under a new rule that became effective as of April 1, 2001, global custodians were allowed to participate in the Bank of Japan's "book-entry" system.[4] The impact of this change has yet to be assessed for its effectiveness.

Granting greater independence to government debt management program from monetary policy

As far as the management of government assets and liabilities is concerned, central banks are responsible for assets management while ministries of finance maintain operational authority over liabilities management. As Cassard and Folkerts-Landau (1997) espouse, such separation of responsibilities is necessary considering the potential conflicts of interest between monetary policy and debt management. In Japan, however, MOF violates the simple rule of separating assets and liabilities management because of the activities of its Trust Fund Bureau (TFB). The TFB is the largest fund manager in the world, managing a total asset of ¥440 trillion, which is known as the Fiscal Investment and Loan Program (FILP).[5] As presented in Table 13.2, the primary sources of the FILP fund are comprised of postal savings (57 percent) and employees' insurance and national pension deposits (32 percent). On the asset side of the balance sheet, the fund is invested in government-related organizations

Table 13.2 Fiscal investment and loan program (as of March 2001) (billion yen)

A Assets	*Amount*	*%*
Long-term government bonds	¥72,682	16.5
Treasury and financial bills	0	0.0
General account and special accounts	101,296	23.0
Government-related organizations	115,376	26.2
Local government	69,619	15.8
Special companies	71,342	16.2
Bank debentures	311	0.1
Others	1,380	0.3
Cash/deposits	7,658	1.7
Total	¥439,664	100.0
B Liabilities	*Amount*	*%*
Postal savings and postal transfer deposits	¥247,008	56.2
Postal life insurance deposits	4,133	0.9
Employee's pension deposits	131,521	29.9
National pension deposits	11,072	2.5
Other deposits	34,117	7.8
Others	11,813	2.7
Total	¥439,664	100.0

Source: Ministry of Finance, http://www.mof.go.jp/english/mr-tfb/e1c014ao.htm.

(26 percent), general and special accounts (23 percent), JGBs (17 percent), municipal governments (16 percent), special corporations (16 percent), etc.

Beginning in April 2001, the Postal Savings System (PSS) is no longer required to transfer funds to the TFB and it has become a stand-alone government bank. Thus, compulsory deposit of postal savings and pension reserves to the TFB was no longer imposed as part of the June 1998 Laws to Reform Central Government Ministries and Agencies.[6] In order to encourage the FILP-agencies to raise funds in the capital market, all 33 FILP entities that used to obtain funds from the TFB will be required to raise their own funds in the form of:

1 FILP-agency bonds without government guarantees;
2 FILP-agency bonds with a government guarantee;
3 FILP bonds issued by the MOF.[7]

However, no differences between the old and new systems are observed for two reasons: First, FILP bonds are bought by PSS, Postal Life Insurance, and the government pension fund.[8] The only thing that changed is

the accounting system for the sources of funds for the TFB. Second, the overall operations remain unchanged as evidenced by the asset structure that remained unchanged after the new system was implemented.

Although MOF considers FILP an extension of its fiscal policy, its purchase activities of JGBs are watched carefully by market participants to predict the direction of long-term interest rate movement.[9] With FILP's holdings accounting for over one-third of JGBs outstanding, the MOF is effectively the largest seller and buyer of JGBs. This dual role executed by MOF is an explicit violation of the rule of separation between government debt management and monetary policy. Co-mingled management of assets and liabilities, especially FILP's inadvertent influence over monetary policy, not only causes the cost of government-issued debt to increase but also creates serious impediments to the development of the JGB markets as discussed below.

Unfinished primary and secondary market infrastructures

Recognizing the growing importance of capital-market-based financing, the Big Bang program implemented numerous reform measures to improve the primary and secondary markets infrastructure since November 1996. These measures include:

1 deregulation of cross-border transactions and foreign exchange business;
2 adoption of a competitive auction method to issue financing bills;[10]
3 abolition of securities transaction tax;
4 deregulation of brokerage commissions;
5 preparation of legal framework for loan/asset securitization;
6 deregulation of off-exchange trading;
7 entry by banks, securities companies, and insurance companies into each other's business;
8 introduction of individual stock options;
9 replacement of merit-based licensing system with a disclosure-based registration system for securities companies.[11]

With the aim of identifying the unfinished reform areas for the JGB market, however, Japan may want to consider the US government securities market as a role model. In retrospect, four major developments signify the underlying forces that rapidly expanded the US government securities markets in the 1980s. These developments are:

1 active trading of Treasury securities on a when-issued basis which assisted in minimizing the underwriting risk by reducing price and quantity uncertainties;
2 introduction of financial futures and options written on Treasury

securities which provided necessary vehicles for hedging of interest rate risk;

3 expansion of REPO and reverse REPO transactions which supported the increase of market liquidity and short-term investment activities;

4 introduction of the Separate Trading of Registered Interest and Principal of Securities (STRIPS) which facilitated hedging of reinvestment risk through coupon stripping.

Presently, when-issued trading is illegal in Japan. STRIPS has yet to be introduced. Although localized variations of REPO markets such as the *Gensaki* market and the *Kashisai* market emerged in Japan, their developments were inhibited by tax-related impediments (*Gensaki* market) and interest rate ceiling on the cash collateral (*Kashisai* market). For example, as *Gensaki* is recognized as a form of bond trading, REPO transactions on the *Gensaki* market were subject to securities transaction tax. Therefore, the majority of *Gensaki* transactions were implemented using Treasury bills and financing bills that were exempted from securities transaction tax. However, stamp duties on bills could not be avoided. In contrast, transactions on the *Kashisai* market have not been subject to securities transaction taxes. Legal and operational modalities of the two markets, however, reflected a hybrid form of American-style classic REPOs and European-style sale-and-buyback contracts. As a result, the two markets could not fully develop. The Japanese futures market (with equity index and long-term bond as underlying assets) has earned an unfortunate reputation of an "over-regulated" market because of stringent regulatory policies including margin requirements and circuit breakers.

Post-Big Bang reform measures

In terms of GDP, Japan's economy is about one-half the size of US economy while it is about four times as large as United Kingdom's economy. As Japan's capital market development emulates past experiences of the US counterpart, the above four areas should be an interesting point of departure in assessing further reforms for the JGB market. Since the JGB market has matured in its own historical, macroeconomic, and institutional framework, it faces its own unique blend of capital market policy issues. Therefore, this section will introduce some capital market policy issues that are unique to the JGB market as well as the policy issues in light of US market experiences.

Lack of the primary dealer system

One idiosyncratic feature of the JGB market is the lack of the primary dealer system. This may be attributed in large part to the role played by TFB as a *de facto* underwriter in the primary market. With TFB serving as

an active buyer of newly issued JGBs (usually under a buy-and-hold investment strategy), purely competitive public auctions must have been difficult to implement. Naturally, underwriting by a syndicate has been the standard in the JGB primary markets, especially for the benchmark 10-year bonds, with a specific goal of absorbing the full amount of new issues. Although competitive auction features were built into the current syndicate underwriting, their utilization has been limited. Public auction systems (based on the multiple-price auctions) were introduced later for the maturities of 2-, 4-, 6-, and 20-year bonds, but syndicate underwriting and non-competitive auctions remain the major vehicle to absorb new issues of 10-year JGBs. As a result, a primary dealer system providing competitive bidding at primary market auctions did not find its position in the JGB market.

With respect to international investors' primary concerns regarding low liquidity and large spread between bid and ask prices on the JGB market, the introduction of a primary dealer system is definitely a viable alternative that deserves serious consideration. As reported in Table 13.3, bid-ask spreads are large on the JGB market with 7 basis points for 10-year bonds, compared with 3 in the US Treasury bond market.

Table 13.3 Government securities markets

	Japan	*United States*	*United Kingdom*
Turnover ratio	6.9	22.0	7.0
Bid-ask spread			
10-year on-the-run issues	7.0	3.1	4.0
10-year off-the-run issues	7.0	6.3	4.0
Maturity distribution			
<1 year	5%	21%	7%
1–5 year	8%	62%	29%
5–10 year	78%	0%	34%
>10 year	9%	17%	30%
Average issue size ($billion)	8.2	13.9	5.6
Government/central bank holding (%)	46.3	13.1	3.6
Non-resident holding (%)	10.0	36.9	14.4
Settlement	T + 3	T + 1	T + 1
DVP-basis settlement	• 67.6% of registered JGBs and 42.7% of book-entry JGBs • All JGBs through BOJ-NET	100%	100%
No. of primary dealers	None	37	16
No. of dealers	501	1,700	16

Source: Inoue (1999).

Primary dealer systems are designed to attain at least three goals in the government securities market: first, efficient price discovery through intense competition among participating dealers; second, provision of liquidity through market-making; and third, distribution of government-issued securities. In addition, primary dealers serve as the counterparts to central banks in open market operations. Most of the advanced economies adopted the primary dealer system with the exception of Japan and Germany, where both economies are historically known for their bank-based financial systems as opposed to the US and UK style capital-market-based financial system.

The major impediment to the adoption of the primary dealer system in Japan is MOF's role as a buyer of JGBs. Therefore, it is a blessing in disguise that the MOF expects a large shortfall in FILP funds amounting to approximately ¥35 trillion as fixed 10-year deposits in the national postal savings system mature in 2000 and 2001.[12] This expected shortfall forces MOF to review structural reforms in the funding method and the management of FILP agencies with the implementation target in 2001. Given the sheer magnitude and scope of FILP activities, the complexity of FILP reforms and planned privatization of the PSS are one of the mandates to be implemented by the current administration. However, the overall direction of FILP reform is not difficult to define no matter how complicated the process is. First, FILP agencies should be corporatized to gain complete autonomy, while MOF should adopt a "hands-off" policy. This "hands-off" policy will facilitate the separation between management of government assets and liabilities. Second, the MOF should not meddle with the JGB market as an active buyer. The MOF's direct involvement should be limited to issuer's function in the capacity of the manager of government debt.

Introduction of the uniform-price auction method

In an MOF publication, entitled *Guide to Japanese Government Bond 1998*, the uniform-price auction method is introduced as a "non-competitive" bidding method executed at the average price paid in the competitive auction undertaken concurrently. This is not a generic definition of the uniform-price auction but a Japan-specific interpretation. Under the conventional uniform-price auction (also known as the "Dutch" auction), all bidders whose tenders are accepted pay the same price for a given security. This is either the lowest of the accepted prices or the highest of the accepted yields. Therefore, some of the successful bidders may pay a lower price than they actually bid. In contrast, under the multiple-price auctions (also known as the "discriminatory" auction), participants submit sealed bids and pay the prices they bid. The government accepts the bids at gradually lower prices until the price at which the auction is fully subscribed.[13] As a result, successful bidders for a security may pay different prices for

that security. These multiple-price awards result in the "winner's curse," which means that the highest bidder wins the auction by paying the highest price, only to find that another bidder pays a lower price. In the presence of this curse, bidders tend to shade their bids below the maximum that they are actually willing to pay.[14] Since Salomon's "short squeeze" scandal uncovered in mid-1991, the multiple-price method has been criticized for failing to minimize financing costs to the US Treasury and for encouraging manipulative behavior in the marketplace. As an alternative, the "uniform-price, sealed-bid" auction is advocated.[15]

Australia, France, and New Zealand now utilize multiple-price (or multiple-yield) auctions to sell marketable securities, while Canada, Belgium, Italy, and the Netherlands use it for some portions of marketable securities. Uniform-price, sealed-bid auctions are employed in Denmark, Switzerland, and the United Kingdom. Beginning in 1992, the US Treasury experimented with uniform-price auctions for 2-year and 5-year notes. Malvey, Archbald and Flynn (1995) and Malvey and Archbald (1998) indicated that these auctions produced marginally greater revenue on the average for the US government. Nyborg and Sundaresan (1996) report that when-issued market volume is higher under uniform – as compared to multiple-price auctions, which indicates a higher information release. The information release, in turn, reduces the pre-auction uncertainty, the winner's curse, and the probability of short squeeze. Feldman and Mehra (1993) report that uniform-price auctions become readily accepted because of their administrative simplicity, economic efficiency, and revenue-enhancing potential. A plethora of academic research papers provide empirical evidence in support of this perception.[16]

As summarized in Table 13.4, Japan's MOF never adopted uniform-price auctions, whereas the US and UK employ these auctions for index-linked bonds and some bonds with specific maturities (2- and 5-year bonds in the United States).[17] The US Treasury has expanded use of uniform-price auctions for all Treasury issues from November 1998.

Lack of when-issued trading

Among the developed government securities markets, Japan represents the only exception that considers when-issued trading illegal. In most of the advanced markets including the United States, however, trading during the period between the time a new issue is announced and the time it is actually issued (ranging from one- to two-weeks) is allowed and the issue is said to trade "when, as, and if issued."[18] When-issued trading functions like trading in a futures market, in which long and short positions are taken prior to the settlement date which is the issue day of the security traded. Prior to auctions, when-issued securities are quoted for trading on a yield basis because a coupon is not determined until after an auction is completed. Subsequent to auctions, they are quoted on a price

Table 13.4 Auction methods for government-issued securities

	Japan	*United States*	*United Kingdom*
Uniform-price auction	None	All Treasury securities	Index-linked bonds
Multiple-price auction	All JGBs • 20-year bond: Competitive auction only • 2-, 4- and 6-year bond: Both competitive and non-competitive auction • 5- and 10-year bond: Syndicated underwriting	**None**	All securities other than index-linked bonds

Source: Asia-Pacific Financial Markets (FIMA) Research Center, University of Hawaii.

basis. The most important benefit of when-issued trading is the minimization of price and quantity uncertainties. As trading on a when-issued basis facilitates the price discovery and distribution, the risk of underwriting becomes smaller and potential revenue from the new issue increases for the government. By not allowing when-issued trading, the MOF foregoes these benefits.

REPO market

A REPO represents the sale of securities by the borrower to the lender (investor) with an agreement to repurchase the securities at a specified date and price. It is a combination of spot sale and forward purchase of the securities. The difference between the selling and repurchasing prices represents the interest on the transaction. The borrower's REPO is the lender's reverse REPO. The REPO market serves numerous purposes. It allows primary dealers to cover their short positions, institutional investors to maximize their investment income by lending their securities, and foreign investors to reduce currency risk through money market hedging.[19] It also facilitates clearing and settlement transactions and enhances market liquidity. Without an active REPO market, the primary and secondary markets cannot develop to their full potential.

The *Kashisai* market is basically a cash-backed bond lending market with the same effect as that of the *Gensaki* market. However, *Kashisai* transactions differ from *Gensaki* transactions in that they are marked-to-market on a daily basis like the US style REPOs. *Kashisai* transactions steadily increased since the shift to rolling settlement in October 1996.[20] The *Kashisai* market witnessed a major impediment eliminated when the upper limit on the interest rate charged on the cash collateral was lifted in 1996. In addition, market participants in the *Gensaki* REPO market are exempted from payment of securities transaction tax in 1999. With these positive developments, one would expect the *Kashisai* market and the *Gensaki* market to take off. No drastic changes in market activities have been reported so far. This puzzle surrounding the *Gensaki* and the *Kashisai* markets warrants a careful review.

Introduction of STRIPS

At present, Japan does not allow "coupon stripping" which splits bond income streams into coupon interest and principal repayment. The coupon stripping was devised in 1982 by Merrill Lynch and Salomon Brothers to serve bond investors who were concerned about reinvestment risk. Beginning in 1985, the Treasury introduced the Separate Trading of Registered Interest and Principal of Securities (STRIPS) program to formalize the stripping of designated Treasury securities. The main appeal of STRIPS is to provide the market with highly liquid zero-coupon Treasury

bonds and notes, thereby expanding the bond investor base. The strip market also generates arbitrage activities. Primary dealers continuously check the price of strippable bonds against the sum of the stripped parts (the "whole" versus the sum of "parts"). The existence of zero-coupon yield curve allows a better pricing of traditional coupon bonds. In developing a very active government securities market from an insignificant and illiquid market, the French authorities, for example, introduced a set of well-sequenced reform measures. As shown below, the introduction of STRIPS and the creation of legal and institutional framework for the REPO market were the last set of reform measures implemented in France:

- Bond futures market (1986)
- Primary dealer system (1987)
- Interdealer broker network (1987)
- Purely competitive auctions (1987)
- REPOs (1991)
- STRIPS (1991)

Given the US experience with STRIPS and more recent experiences in the French government securities market, the MOF should expedite the introduction of STRIPS.

Regionalized bond markets: Implications for further development of the Japanese capital market

At the climax of the Asian financial crisis, the Japanese government introduced the new Miyazawa Initiative for which Japan pledged a total of $30 billion, of which one-half of was made available for the medium- to long-term financing needs for Asian economies affected by the recent financial crisis. At least three measures under the Initiative were directly related to regional bond market activities. They were:

1 acquisition of sovereign bonds issued by Asian countries by the Japan Bank for International Cooperation;
2 support for Asian countries in raising funds from international financial markets through the use of guarantee mechanisms;
3 possible establishment of an international guarantee institution.

Unfortunately, the Tokyo market failed to capitalize on these measures to promote itself as a global and regional financial center by expanding of the role of the *Gaisai* market.[21] The amount of *Gaisai* bonds issued in last 10 years, 1991–2000, is far from the original expectation as summarized in Table 13.5. The issuance of Samurai bonds has not reached the pre-crisis highest level of ¥37.9 trillion reported in 1996, while no Shogun bonds

Table 13.5 Gaisai bond issuance (¥ trillion)

Year	*No. of issues*	*Samurai bonds*	*No. of issues*	*Shogun bonds*
1991	27	0.71	1	0.41
1992	37	1.57	0	0
1993	49	1.23	1	0.59
1994	60	1.26	0	0
1995	85	2.11	0	0
1996	154	3.79	0	0
1997	66	1.58	0	0
1998	10	0.15	0	0
1999	24	0.87	0	0
2000	63	2.38	0	0

Source: The Bond Underwriters Association of Japan, *Bond Review*, and The Japan Securities Research Institute (2000).

have been issued since 1994. Foreign borrowers are expected to take advantage of the continued deflation in the Japanese price level and extremely low interest rates, but their fund raising activities in Japan has not been so active as expected as shown in Table 13.5. The question is, what went wrong?

To serve as international as well as regional financial center, the Tokyo market must compete with other financial markets including the eurobond market. As shown in Table 13.6, the difference in all-in-cost to sovereign borrower of ¥20 billion between *samurai* bonds and euro-yen bonds amounts to 7 basis points or ¥14 million. The difference between time-lengths required for bond issuance in both markets differs substantially (6–7 weeks vs. a few days). With a recording system still in place, the clearing and settlement processes in the *samurai* bond market is far more cumbersome than the eurobond market where Euroclear and Clearstream are readily available and utilized.[22] In order for the Tokyo market to serve global and regional customers more efficiently at the least cost, concerted efforts must be made.

Numerous reform measures were undertaken to internationalize the yen and promote foreign investments in the Tokyo financial markets. A legal framework for the promotion of cross-border transactions is in place with the revision of Foreign Exchange Law in April 1998; yet, much more has to be done to facilitate actual transactions. For example, clearing and settlement have to be revamped to introduce delivery versus payment (DVP). At present, 67.6 percent of registered JGBs and 42.7 percent of book-entry JGBs are settled on the DVP basis, whereas all JGBs processed through the Bank of Japan Financial Network System (BOJ-Net) rely on the DVP settlement. In contrast, the US and UK government securities are all settled on the DVP basis. Additionally, JGBs are not eligible for clearing through international clearing houses such as Euroclear and Cedel, whereas US and UK government securities are all eligible.

Table 13.6 Cost differential between Samurai and Euro-yen bonds

Assumptions		
Issuer	Sovereign borrower	
Issue amount	¥20 billion	
Term	5 years	
	Samurai bonds	*Euro-yen bonds*
Underwriting fee	40 bp (upfront)	25 bp (upfront)
Commissioned bank fee/ recording fee	3 bp (upfront)	n.a.
Interest payment commission	20 bp (of each payment)	nil
Principal payment commission	10 bp (at maturity)	nil
Out-of-pocket expenses	¥15 million (upfront)	¥8 million (upfront)
All-in-cost to issuer	2.03% (s.a.)	1.961% (s.a.)
Time-length of launch	6 to 7 weeks	A few days
Clearing and settlement	Recording system	Euroclear and Cedel

Source: Industrial Bank of Japan Securities Co. (1998).

Notes
bp = basis point.
s.a. = semi-annual basis.

Furthermore, no regional clearing network has been created to link the Tokyo clearing system with the region's financial centers such as Hong Kong, Singapore and Sydney. Real-time-gross settlement system (RTGS) was finally introduced as of January 2001 to bring Japan's practices in line with US and UK systems. With the implementation of a RTGS, Japan is now in a position to create necessary infrastructures for a US dollar clearing system. Hong Kong is one step ahead in this area. Hong Kong just completed a three-phase approach toward its new US dollar clearing system in December 2000:

1 the US dollar RTGS for interbank payment and DvP settlement for US dollar-denominated stocks were implemented in phase 1;
2 payment versus payment (PvP) settlement for foreign exchange transactions between US dollars and Hong Kong dollars in phase 2;
3 DvP settlement of US dollar-denominated checks and debt securities and automatic intraday REPOs in the RTGS in phase 3.

Thus, the foreign exchange risk related to time zone differences is reduced.[23] No publicly accepted practice exists for failures of deliveries in Japan unlike the US and UK markets.[24]

So much work has yet to be done for the harmonization of cross-border listing, trading, clearing and settlements, securities borrowing and

lending, REPO markets, etc. A study of inter- and intra-region portfolio capital flows must precede the implementation of the above cross-border infrastructures. In his own assessment of the Japanese debt market serving the Asia-Pacific region's financing needs, Sakakibara (1999) noted that the JGB market still lagged substantially behind London and New York in terms of market infrastructure. Therefore, in addition to building domestic market infrastructures, Japan should intensify its effort to assume a leadership role in creating regional bond market infrastructures in Tokyo and other financial centers in the region. One of key projects for the regional bond market infrastructures should focus on the creation of a single regional central securities depository (CSD) to perform the safe-keeping, clearance, and settlement functions for all securities available in the Asia-Pacific region.[25]

Notes

This is a revised and updated version of an earlier paper entitled, "Further Reforms after the 'BIG BANG': The Japanese Government Bond Market," presented at the 2000 ADBI/OECD Workshop on Capital Markets Reforms in Tokyo, Japan, April 11–12, 2000. The earlier version this paper has been published in *Bond Market Development in Asia* (Paris, France: Organization for Economic Co-Operation and Development, 2001).

1 Refer to Rudiger Dornbusch, "A Rendezvous with Bankruptcy," in Personal View Column of *The Financial Times* (December 15, 2000).
2 Street estimation also suggests that a mere 5 percent of JGBs are held by foreign investors. Refer to "Japan's Debt Mountain," *The Financial Times* (October 27, 2000).
3 Refer to "Japan Expand JGB Tax Breaks," *The Financial Times* (August 31, 2000).
4 Refer to "Withholding Tax Exemption Scheme for Interest on Japanese Government Bonds held by Nonresident Investors," in http:www.mof.go.jp/english/bonds/e1b076.htm.
5 This amount is equivalent to approximately 75 percent of Japan's GDP.
6 Even the title of the monthly report from the TFB has changed from "Monthly Report of the Trust Fund Bureau" to "Monthly Report of the Fiscal Loan Fund" as of April 2001.
7 Refer to the Ministry of Finance, *Framework of the Fundamental Reform of the Fiscal Investment and Loan Program (FILP)* in http:www.mof.go.jp/english/zaito/zae055.htm.
8 Cargill and Yoshino (2001) report that of ¥43.9 trillion FILP bonds issued in FY2001, the PSS purchased 40.8 percent, Postal Life Insurance purchased 27.1 percent and the government pension fund purchased 8.2 percent.
9 For example, the TFB announced in the latter part of 1999 that it would suspend ¥200 billion ($1.91 billion) bond purchases in the open market each month. This announcement triggered the prices of JGBs to decline sharply, raising their yields to as high as 2.7 percent. After the resumption of the purchase activities by TFB, however, the yield level stabilized to the current level of around 1.8 percent (10-year JGBs).
10 Financing bills are issued on a discount basis like Treasury bills. Because the discount rate remained below prevailing short-term market interest rate, virtually all issues had to be subscribed by the Bank of Japan (BOJ). Under the Big

Bang reform programs, Treasury financing bills, food financing bills, and foreign exchange fund bills are all integrated into single financing bills and they are issued under a competitive auction system.

11 Refer to http:www.fsa.go.jp/p_mof/english/big-bang for details of the Big Bang reform programs.

12 Refer to "Japanese Turn to 'Zaito' to boost finances," *The Financial Times* (March 13, 2000).

13 In some countries, minimum cut-off prices are imposed by ministries of finance or fiscal agents conducting auctions, which may distort truly competitive bidding process because:

1 the bidders try to second-guess cut-off prices rather than assessing the demand and supply of the securities to be issued;
2 the cut-off prices may set the yields higher than market conditions warrant.

At the time of writing this report, it is not known to the author whether this practice is used in multiple-price auctions in Japan. Refer to Rhee (2000b) for related practices in primary government bond markets in the Asia-Pacific region.

14 For details, refer to the *Joint Report on the Government Securities Market* (1992) prepared by the Department of the Treasury, the Securities and Exchange Commission, and the Board of Governors of the Federal Reserve System.

15 Refer to Friedman (1991 and 1960), Chari and Weber (1992) and Umlauf (1993).

16 Refer to Umlauf (1993), Nyborg and Sundaresan (1996) and Heller and Lengwiler (1998).

17 Because the uniform-price auction is a legitimate competitive mechanism, the Japanese version of a "non-competitive" uniform-price auction is a misnomer. Non-competitive bids specify quantity only, while competitive bids specify both price (or yield) and quantity. In Japan, the price used for settlement for a non-competitive bid is the weighted average price from the competitive auction conducted concurrently. By design, this "non-competitive" method should be restricted to small transactions intended for small investors and should remain as an insignificant supplement to multiple-price auctions.

18 Refer to Appendix A "Background on the Treasury Securities Market" in the *Joint Report on the Government Securities Market* (1992), A1–A19.

19 Brossard (1998) reports that the newly developed REPO market in 1991–1993 was essential to foreign participation in the French government securities market. At present, one-third of the French government securities are held by non-residents.

20 Refer to Executives' Meeting of East Asia and Pacific Central Banks and Monetary Authorities' *Financial Markets and Payment Systems in EMEAP Economies* (1997).

21 *Gaisai* is a general term assigned to all foreign- and yen-denominated bonds issued in Japan by non-residents. Yen-denominated bonds are called "*samurai*" bonds while foreign-currency-denominated bonds are known as "*shogun*" bonds.

22 Clearstream is completing its first full year of the merged operations of Cedel and Deutsche Börse Clearing. As indicated by the reported value of securities in custody as of last year, two major clearing houses are about the equal size: 7.424 trillion euro for Cedel and 7.420 trillion euro for Clearstream.

23 Hong Kong Shanghai Banking Corporation, which was designated as the settlement agent, reported that a total turnover of US$870 million from 2,771 transactions involving 56 participating institutions during the first day of trading. Refer to HSBC News Release dated August 21, 2000.

24 Refer to Appendix "Table of Questionnaire Results" to Bank for International Settlements, 1999, Market Liquidity: Research Findings and Selected Policy Issues (May).

25 For the regional and global level clearing and settlement, refer to Rhee (2000a) and Morgan Guaranty Trust Company (1993).

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14 Reflections on the new financial system in Japan

Participation costs, wealth distribution and security market-based intermediation

Yukinobu Kitamura, Megumi Suto and Juro Teranishi

Introduction

Ever since Prime Minister Ryutaro Hashimoto introduced new plans for financial sector reform in 1996, the financial system of Japan has undergone dramatic changes. The reform plan known as the *Financial Big Bang in Japan*, covered wide areas in finance. It called for the liberalization of asset management businesses such as trust banks, insurance companies, and investment trust companies. The plan also included reforms for the promotion of capital markets, the reduction of entry barriers in various financial institutions, and new regulations for sound management of the banking system. The Big Bang was intended to promote fair and free financial system based on accepted global standards. It was motivated by the recognition that the prolonged crisis in the financial system was rooted in the inefficiency of the financial markets; more precisely, in the lack of market competition and in the opaque policies of the Ministry of Finance (Horiuchi 2000).

Despite the broad coverage of the reforms, the Big Bang did not bring forth the concrete blueprint of the Japanese financial system. The plan emphasized the importance of financial markets, while at the same time reiterated the need to equip the banking system with sound policies. It encouraged individual investor participation in the capital markets as it tried to strengthen measures in promoting institutional investment. However, the plan did not provide a clear answer to two key questions: whether the Japanese financial system should reduce its dependence on the banking system and whether the major capital market players should be individual investors.

This chapter will attempt to address these questions and to identify the future Japanese financial system architecture. We will follow the functional perspectives (Merton and Bodie 1995), rather than the institutional perspectives. In designing the architecture of the Japanese financial system, the institution nevertheless matters greatly when we take into

consideration factors such as participation costs and state of information technologies. For example, as Allen and Santamero (1998) argues, while the recent development of financial technology has reduced the trading costs of financial transaction significantly, it has increased participation costs considerably. This has meant that many sophisticated financial transactions have become beyond the capacity of ordinary individuals. In this case individuals cannot participate in the financial markets without the help of institutional investors. Moreover, the rapid development of new industrial technologies has caused diversity of opinion among asset holders in regards to various investment opportunities, as emphasized by Allen and Gale (2000). In turn, this renders the market-based financial system more efficient than the one based on intermediaries.

For the sake of simplicity, we will classify financial institutions into two groups: banks and institutional investors. The criterion used to differentiate between the two groups is whether the institutions are themselves risk-bearers such as banks, or if they simply transfer risk to others i.e. institutional investors. Bear in mind though, that this division is not immune from oversimplification. Although the traditional role played by banks has been to eliminate or to avoid risks, the banking system nowadays actively engages in risk transfer activities. As Boots and Thakor (2000) argue, banks deal with relationship loans as well as transaction loans. Mortgage loans are a good example of the latter. Banks act as originators and servicers through loan securitization. The risks are simply transferred from the banks to the purchaser of the new securities rather than being absorbed by the banks themselves.

For some institutional investors such as life insurance companies, the risks are not unilaterally accepted. Frequently, they are passed onto the consumers in the form of changing rates of return. Similarly, corporate pension funds with fixed interest payments bear risks in principle, although payments vary depending on the earning ability of the firms that hold the funds.

We will accept four phenomena as basic backdrops for new financial system:

1 the enhanced capability of financial market transaction to redistribute and transfer risks,
2 the sharp increase in participation costs for the financial markets owing to sophisticated financial instruments and technology,
3 the rise in systemic risks due to structural changes in the industrial structure and related bank lending practices,
4 the peculiar features in Japanese wealth distribution, where most of financial assets are held by retired people.

The first two are global phenomena, and they are the major driving forces in converting the world's financial systems from a bank-based or relationship-based system to a market-based or transaction-based system. New

methods to transfer risk comprise of bundling and unbundling of risks in financial contracts. Risks are redistributed and adjusted according to the type of risks preferred by the investor. These methods have become available owing to financial innovations and information technology (IT). Nonetheless, sophisticated IT-based financial technologies have significantly raised participation costs in market transactions. Without a certain amount of expertise, participation by the average individual investor is virtually impossible.

The last two are conditions peculiar to Japan and also to some extent, other Asian countries.[1] The 1980s and 1990s have ushered in changes to Japan's industrial structure from heavy and chemical industries to information and knowledge-based industries. Such a large-scale shift in industrial structure is closely related to Japan's economic history. Being behind other Western industrialized countries, the country had to play catch-up without the benefit of learning from an industrialized neighbor or to be engaging in division of labor. Consequently, Japan had to develop all the components of heavy industries and military on its own. Since firms in heavy and chemical industries were endowed with ample amount of real estates, the changes in Japan's industrial structure came with collateral-based bank credits. As Kiyotaki and Moore (1997) opines, a local shock in productivity would lead to a significant spillover in the entire economy. In other words, together with the relation-specific firm behavior, a fall in collateral prices amplified local shocks to systemic and non-diversifiable risks. The banks had no choice but to absorb the risks as they did not have any hedging instruments.

The fourth point is the pattern of wealth distribution. Unlike the case of the US and prewar Japan, postwar Japan enjoys a remarkably equal distribution of income and wealth. Moreover, it will be shown below that the sizable private financial assets are mostly held by a segment of retired people, who are more or less risk-averse and lack expertise in financial transactions. We will argue that the current state of wealth distribution or its future pattern is a crucial condition in redesigning the financial system. The effects of participation costs and risk redistribution are highly dependent on wealth distribution.

Against these four points, we will deliberate the architecture of the new financial system. Our main conclusion is concerned with the problem of who should be the main player in the risk transfer mechanism of the new financial system. In order to deal with this problem we will consider three scenarios derived from the level of participation costs and the type of wealth distribution. A choice among these scenarios depends on the empirical examination of participation costs as well as the judgment on the adequate degree of wealth distribution in the foreseeable future.

1 When participation costs are low and wealth distribution is unequal, the financial system should be based on markets with active participations by individual investors.

2 When participation costs are high and wealth distribution is equal, intermediaries should be the main players in the financial markets.
3 In either case when participation costs is low and wealth distribution is equal or vice versa, financial market transactions should be conducted by means of an adequate mixture of individual investors and intermediaries.

Through an examination of participation costs and judgment on the type of wealth distribution in the near future, we consider that the second scenario is most likely to prevail in the Japanese financial system in the era of security market-based financial system. In other words, we argue that neither bank-centered financial intermediation system, nor security market-based system relying on individual investors, is adequate. The architecture of the new financial system for the Japanese economy should be established on the principle of *security market-based intermediation.*

We consider that a proper division of labor and coordination among various types of intermediaries – banks and institutional investors – are needed in order to conduct transfers of financial risks effectively. The division of labor is indispensable partly because cyclical patterns in the changes of diversifiable and non-diversifiable risks exist and partly because global trend of synchronization of industrial activities tends to enhance the systemic risks. Furthermore, despite the development of sophisticated technology of financial risk trading, there remains room to avoid and eliminate risks by means of diversified portfolio holding and close monitoring. More solid empirical and theoretical evidences are needed nonetheless, we feel that the following actions are necessary.

First, the capability of Japanese banks to eliminate risks has been reduced. It is urgent to introduce alternative measures to cope with risks. These include elimination, redistribution, and transfers of risks. Second, with respect to intermediation by institutional investors, we need to establish institutional and legal frameworks in order to implement effective corporate governance. Despite the development of IT, information asymmetry related to the principal-agent problem remains in the financial system and difficulties related to contingent contract cannot be eliminated. Corporate governance has been carried out by relationship banking, but we feel it should be complemented by the "voice" from institutional investors as principal shareholders.

Third, the current plight of the Japanese banking system is partly due to competition from the market-based financial system that reduces the rent in relationship lending. It is also in part due to the current state of risks that has become systemic and non-diversifiable. There exists both cyclical and trend movements in the changing pattern of risks. As a trend, the nature of risk seems to be getting more systemic. Consequently, together with the trend of IT development which makes banking technology more and more obsolete, there is no denying that the role of the banking sector is being diminished.

Yet systemic risk is cyclical as well, as seen from the experience during the 1920s. Hence the importance of banking may rise again when risks become less systemic and more diversifiable. In addition, the banking sector can fulfill its important role in assisting small and medium-size firms, i.e. venture firms, in financing local economic activities.

The second section provides a theoretical basis for the proposal of the new architecture through examination of the relationship between key concepts. These concepts are participation costs, wealth distribution, and information asymmetry. We will at first offer some evidence on the rise of participation costs in the recent financial markets, then focus on participation costs and wealth distribution in which alternative scenarios will be discussed.

The third section deals with the changing role of the banking sector in Japan. At first, we examine the role of bank deposits as the key instrument in the store of value for the Japanese household. Through an examination of detailed data on the age distribution of financial wealth as well as portfolio selection of different age groups, we will argue why bank deposits have been so important for the Japanese households. We will then discuss whether the risk-taking role of banks has declined. By paying attention to the cyclical nature in the historical pattern of risk, the Japanese banking system is experiencing not only long-term financial technological changes – which tend to replace the traditional banking technologies with new market-based technologies, but also the cyclical risk fluctuation related to the historical development phases of Japan.

The fourth section is devoted to a detailed examination of the new direction of changes in the Japanese financial system. This section will examine the phenomenon of the declining role of the banking sector, the insufficiency of the development in the securitized assets market, and the difficulties involving individual investors in the security markets. Later, this section will draw attention to the new phenomenon and possibility of corporate governance through *intermediated ownership*. We make a strong claim for the necessity of restructuring the Japanese financial markets to accommodate *securities market-based intermediation*. Finally, the fifth section provides an overview of the desirable financial system in Japan.

Participation costs and wealth distribution

In an insightful review on the state of intermediation theory, Allen and Santamero (1998 and 2001) argue that the existing theory of financial intermediation focuses on functions no longer important to the new financial environments based on new information technology and globalization of the financial markets. Instead of emphasizing the roles of asymmetric information and transaction costs as the raison d'être for banking institutions, the authors point out two new functions of the financial system. First, the major role of the financial intermediaries lies not in the

elimination and avoidance of risks, but in the trade and transfer of risks. Second, owing to rapid innovations in financial technology, participation costs in financial transaction have increased significantly. Therefore, the new and critical role of financial intermediations lies in reducing these costs.

Based on these two propositions regarding the functions of financial systems, Allen and Santamero further derive two important observations on the institutional characteristics of financial systems:

1 Financial market transaction is beyond the capacity of individual investors owing to high participation costs. Intermediaries should be the major players in the market.
2 In economies with weak market competition, the banking sector should be the risk-transferring agent. The Japanese, German and French banking sectors have historically fulfilled this role by way of intertemporal risk-smoothing; transferring risks from generation to generation.

It is indispensable to pay attention to the state of wealth distribution along with discussions on the concept of participation and transaction costs. We discuss this point and derive alternative scenarios for attracting more participants in the markets. It is especially important to understand differences between the Japanese financial system and its US counterpart.

A case for utilization of intermediaries in financial market transactions seems to be applicable to Japan in recent years. Wealth, mainly held by retirees, is individually too small to investment in the financial markets directly. Before presenting detailed discussion on alternative scenarios regarding participation costs and wealth distribution, the next section provides some evidence on the magnitude of participation costs.

How large are the participation costs?

In order to confirm whether participation costs in financial markets have actually risen, we first examine the impact of IT on information costs in the financial markets. We do not believe that IT has reduced monitoring costs or alleviated information asymmetry in the market. Rather, IT has lowered trading costs considerably. Assuming that costs in the financial system are composed of trading costs, monitoring costs and participating costs, we find that there is evidence for a recent, significant rise in participation costs.

While it is true that recent developments of financial technology have reduced transaction costs, the developments do not necessarily imply a reduction in costs of corporate governance or monitoring. This is particularly true with respect to information and communication costs in asset management. There is also a lack of evidence to suggest that the cost of writing contracts and the cost of acquiring information have fallen.

The nature of recent changes in IT and their impact on the financial system are succinctly summarized in Bank of Japan (2001) and Baba and Hisada (2002). Three main points of the IT innovation are:

1 Innovation based on the integration of information processing technology and communication technology.
2 Significant speeding-up, cost reduction and globalization of processing and transmitting information.
3 The rapid diffusion of the innovation throughout the world.

These innovations have the following impacts on the financial system.[2] First, IT strengthens the functions of capital markets. It broadens the range of financial instruments tradable on the markets, owing to its exact specification of the risk-return profile of financial assets, and to the bundling and unbundling of risk-return features. Second, through reductions in entry cost, it influences the competitiveness and industrial organization of the banking industry.[3] Third, owing to IT's economies of scale, it can accelerate changes in the industrial structure and organization of the entire financial industry by facilitating merger and acquisition activities across various institutions.

In this regard, enhanced competition in the banking industry either through the pressure from the financial markets or though new competitors in the banking industry may lower the financier-manager agency costs by investing in monitoring capacity by banks. Boot and Thakor (2000) argue that the degree of competition within the banking industry and among different financial markets affects incentives to invest in information processing capacity by the banks. Thus we see the different levels of relationship banking vis-à-vis transaction banking. Nevertheless, the innovation has little to do with improving the efficiency of such investments.

An important part of this kind of investment takes the form of human capital investment. For many companies, IT can reduce costly on-the-job training. However, the effect of IT on the efficiency of such training is quite different and perhaps negligible in comparison with its effects on the asset transaction efficiency in the capital markets.

Allen and Santamero (1998) and Mishkin and Strahan (1999) emphasize that the development of IT has made it easier to "screen out good from bad credit risks or to monitor corporations, thus reducing the adverse selection and moral hazard problem" (Mishkin and Strahan 1999, p. 5). But they fail to explain how adverse selection and moral hazard are prevented by the use of the technology. Mishkin and Strahan (1999) refer to credit-scoring models by which loans to small firms are standardized and in some cases securitized. This kind of pooling technique has very little to do with improvement of individual firm monitoring.

Likewise, issuance of asset-backed securities by banks based on the

future income on lease contracts, auto credits, consumer credits and mortgage loans does not necessarily reduce the credit risk of the banks. Although it is true that particular risks related to lease credits, mortgage and so on are transferable to outside investors, there is a risk of moral hazard in activities which risks could not be securitized. In the case of project financing, banks could be freed from risks related to particular projects. However, firms are not a simple sum of individual projects. Risks related to the remaining coordinating sections, or management parts of the firms, may not be easily transferred via project financing. There is always the possibility of agency costs between firm managers and fund providers to the firms. The monitoring of managers through personal communications is still indispensable. Basic information asymmetry between financiers and corporate managers remains a crucial problem for financial intermediaries.

IT has not eliminated the contract costs. Hart (1995) refers to three kinds of contract costs: costs to think far ahead and to plan all contingencies, costs to negotiate about those plans among contracting parties, and costs to write the plans down for each contingencies. Since IT is not capable of reducing these costs, the difficulties in writing contingent contracts will persist, and the contracts will be left incomplete, leaving the principal-agent problems intact. Information production through continuous communication is of vital importance in realizing good corporate governance.

It must be made clear that it is not our intention to deny all the positive effects of IT development on monitoring costs. We agree that recent changes in the global financial markets have had some indirect effects on the degree of information asymmetry in corporate management. For example, widely accepted rules in the area of accounting (integrated accounting system and market-price based accounting system) have enhanced transparency and reduced agency costs. Second, stockholder sovereignty in the global financial markets has intensified to a certain extent, resulting in the reduction of agency costs between financiers and manager due to disciplinary pressures exerted by stockholders.

Let us move on to the estimation of participation costs. For this purpose it is necessary to conceptualize the cost structure related to financial market activities. The financial market activity consists of the trading of various financial instruments in order to mobilize savings from surplus units to deficit units. Trading of financial instruments requires three kinds of market costs:

1 Costs to present demand schedule for each financial instrument in a way to be effectively contracted and traded.
2 Costs to present supply schedule for each financial instruments in a way to be effectively contracted and traded.
3 Costs to execute the trade and enforce contracts.

In a world with only direct securities, cost (1) is incurred by surplus units, and (2) by deficit units. In a world with both direct and indirect securities issued by financial intermediaries, part of costs (1) and (2) are born also by financial institutions. Cost (1) is composed of many things such as expenses incurred in evaluating various financial instruments, costs to get basic expertise in trading, and expenses incurred by consulting and advising services etc. Likewise, cost (2) comprises of many things such as expenses in monitoring and information processing, costs information disclosure and signaling, and expenses involved in the negotiation and preparing of contracts and so on. Cost (3) covers trade execution costs by financial intermediaries, stock exchanges, and regulatory agencies. For simplicity, we will refer to cost (1) as participation costs, (2) as monitoring costs and (3) as trading costs.

Although we do not have comprehensive evidence on significant reductions in trading cost benefitted by improvements in IT, we will conditionally accept this proposition. Evidence is in the decline of brokerage commission for stock transactions. In Japan, trading fee was deregulated on October 1, 1999. Table 14.1 confirms that after October 1987 regulated trading fee declined steadily reflecting the enhanced efficiency of security transaction and in the anticipation of financial liberalization. For each blanket of transaction volume either proportional or fixed, part of handling costs declined. This is particularly evident for large volume transactions. Table 14.2 shows average handling costs charged on customers based on the survey covering 190 security companies. Percentages declined during the years 2000 to 2001, there were small increases from 2001 to 2002. This seems to imply that trading fee on average, has already reached the equilibrium value from 1999 to 2001. It must be noted however, that the level and formula of charging trading fees have varied considerably among securities companies. Each firm has tried to offer its best price depending on its technological competitive edge and sales strategy. There is little doubt that on-line e-trading has decreased the trading fee considerably for small volume transactions, although we do not have comprehensive data to back up this claim.

As for the costs related to the monitoring of borrowers, it has often been argued that such costs have also declined. We do not agree with this view completely, although we accept the fact that there is no evidence of increases in such costs.

Let us regard GDP or value-added in the financial service industry as the total costs of financial activities. Table 14.3 show that the share of the financial service industry (financial institutions and insurance companies) in GDP terms has risen continuously until the end of the bubble economy in the late 1980s. A decade later, a similar trend has been repeated in the US. It is interesting to note that the share was higher in Japan until the late 1980s, and then exceeded by the US during the 1990s. We do not have any additional information to explain these differences, nevertheless, the message of Table 14.3 is clear. Though trading costs and monitoring

Table 14.1 Regulated handling costs of stock transaction before September 1999

Site of order	*Apr. 1, 1977– Apr. 14, 1985*	*Apr. 15, 1985– Nov. 24, 1986*	*Nov. 25, 1986– Oct. 4, 1987*	*Oct. 5, 1987– June 3, 1990*	*June 4, 1990– March 31, 1994*	*Apr. 1, 1994– March 31, 1998*	*Apr. 1, 1998– Sept. 30, 1999*
less than ¥200,000	¥2,500	¥2,500	¥2,500	¥2,500	¥2,500	¥2,500	¥2,500
less than ¥1 mil.	1.25%	1.25%	1.25%	1.20%	1.150%	1.150%	1.150%
over ¥1 mil. to ¥3 mil.	1.05% + ¥2,000	1.05% + ¥2,000	1.05% + ¥2,000	1.00% + ¥2,000	0.900% + ¥2,500	0.900% + ¥2,500	0.900% + ¥2,500
over ¥3 mil. to ¥5 mil.	0.95% + ¥5,000	0.95% + ¥5,000	0.95% + ¥5,000	0.90% + ¥5,000			0.700% + ¥12,500
over ¥5 mil. to ¥10 mil.	0.85% + ¥10,000	0.85% + ¥10,000	0.85% + ¥10,000	0.75% + ¥12,500	0.700% + ¥12,500	0.700% + ¥12,500	0.575% + ¥25,000
over ¥10 mil. to ¥30 mil.	0.75% + ¥20,000	0.75% + ¥20,000	0.70% + ¥25,000	0.60% + ¥27,500	0.575% + ¥25,000	0.575% + ¥25,000	0.375% + ¥85,000
over ¥30 mil. to ¥50 mil.	0.65% + ¥50,000	0.65% + ¥50,000	0.50% + ¥85,000	0.40% + ¥87,500	0.375% + ¥85,000	0.375% + ¥85,000	negotiation at more than ¥272,500
over ¥50 mil. to ¥100 mil	0.60% + ¥75,000	0.55% + ¥100,000	0.30% + ¥185,000	0.25% + ¥162,500	0.225% + ¥160,000	0.225% + ¥160,000	
over ¥100 mil. to ¥300 mil	0.55% + ¥125,000	0.45% + ¥200,000	0.25% + ¥235,000	0.20% + ¥212,500	0.200% + ¥185,000	0.200% + ¥185,000	
over ¥300 mil. to ¥500 mil.		0.35% + ¥500,000			0.125% + ¥410,000	0.125% + ¥410,000	
over ¥500 mil. to ¥1 billion		0.30% + ¥750,000	0.20% + ¥485,000		0.100% + ¥535,000	0.100% + ¥535,000	
over ¥1 billion		0.25% + ¥1,250,000	0.15% + ¥985,000	0.15% + ¥712,500	0.075% + ¥785,000	negotiation at more than ¥1,535,000	

Source: Internal data of Nomura Security Co. Ltd.

Table 14.2 Average handling costs after October 1999 (%)

Transaction volume	*2000*		*2001*		*2002*	
	average	*median*	*average*	*median*	*average*	*median*
1 million	1.077	1.150	1.094	1.150	1.089	1.150
3 million	0.899	0.950	0.914	0.943	0.913	0.943
5 million	0.855	0.893	0.868	0.890	0.866	0.886
10 million	0.736	0.771	0.744	0.767	0.747	0.761
30 million	0.572	0.593	0.573	0.590	0.580	0.590
50 million	0.447	0.460	0.446	0.453	0.456	0.453
0.1 billion	0.257	0.245	0.253	0.243	0.264	0.244
0.3 billion	0.124	0.091	0.117	0.085	0.130	0.088
0.5 billion	0.096	0.055	0.087	0.053	0.099	0.053
1 billion	0.072	0.027	0.064	0.027	0.076	0.027

Source: *Syoken gyouho*, No. 589 (March, 2000), 601(March, 2001), and 613 (March, 2002).

Notes
Survey data covering about 190 security companies conducted by Japan Security Association.
Average handling costs per transaction volume charged on customers for each size of transaction.

costs have not increased continuously, the increases in the total costs of financial sector activities are evidence for increases in the participation costs.

Table 14.4, 14.5 and 14.6 provide some evidence on increases in the participation costs. Table 14.4 shows that a percentage share of security analysts in the total employees of security industry has increased rapidly during the 1990s in Japan. A similar trend exists with respect to a percentage share of security analysts in the total employees of total finance and insurance industries. The number of analysts per listed firm (including over-the-counter trading) poses a similar trend. Table 14.5 confirms a similar trend in the US with respects to the share of analysts in the total finance and insurance industry employees and the number of analysts per public company.

While Tables 14.4 and 14.5 are related to consulting costs, Table 14.6 gives data on education costs, namely annual tuition of the top-three US business schools and salary comparisons of the students before entering and after graduating from the schools. Tuition costs for an MBA education can be substantial, and so can the rewards. Post-MBA salary is almost three times greater than pre-MBA salary. The high cost of tuition can be construed as an evidence for high participation costs in the financial markets. Holders of MBA degrees are considered to possess expertise in business administration and in sophisticated financial transaction. In the example of Keio University Business School, annual tuition amounts to US$18,950 (converted by the exchange rate ¥130/US dollar). According

Table 14.3 Share of financial services industry in GDP (%)

Year	*Japan*	*US*
1970	4.25	–
1971	4.67	–
1972	4.93	–
1973	4.94	–
1974	4.49	–
1975	5.22	–
1976	5.01	–
1977	4.88	–
1978	5.04	–
1979	5.15	–
1980	5.18	4.44
1981	4.77	–
1982	5.17	4.25
1983	5.45	4.83
1984	5.27	4.49
1985	5.30	4.80
1986	5.43	5.04
1987	5.79	5.45
1988	6.02	5.65
1989	6.36	5.62
1990	5.94	6.13
1991	5.56	6.59
1992	5.24	6.76
1993	4.86	7.29
1994	5.18	6.80
1995	5.04	7.13
1996	4.72	7.26
1997	4.98	7.83
1998	4.86	8.06
1999	–	8.15

Sources: US Department of Commerce. *Statistical Abstract of the United States*, each edition.
Economic and Social Research Institute, Cabinet of Government of Japan.
National Economic Accounts, each edition.

Notes
Definition of financial service industry follows standard industry code of both countries, and comprises following sectors belonging to Finance and Insurance.

Japanese financial services industry: banks including trust banks and foreign banks; credit agencies other than banks including small and medium financial agencies, agriculture and fishery agencies; financial companies; investment companies, securities and commodities brokers, services, stock exchanges; insurance companies. (Finance and Insurance Industry of Japan' standard industry code).
The US financial services industry: banking; credit agencies other than banks; securities and commodity brokers, services; insurance carriers, agents, brokers, and services; holding and other investment companies. (They belong to Finance and Insurance Industry of the US standard industry code).

Table 14.4 Participation cost related to securities analysts in Japan

	Number of certified securities analysts	*Number of public companies*	*Number of employees of securities industry*	*Number of employees of fin. and insurance industries*	*Number of analysts in securities industry*	*Average number of analysts per public company*	*Share of analysts in finance and insurance industry*	*Share of analysts in securities industry*
	A	*B*	*C*	*D*	*E*	*A/B*	*A/D*100*	*E/C*100*
							(%)	(%)
1980	0		84,402					
1981	241	1,855	88,736	1,618,000	54	0.130	0.015	0.063
1982	682	1,877	88,883		154	0.363		0.173
1983	845	1,900	91,016		191	0.455		0.210
1984	924	1,918	98,649		209	0.482		0.212
1985	1,047	1,956	105,030		237	0.535		0.225
1986	1,129	2,006	114,191	1,700,000	255	0.563	0.066	0.223
1987	1,196	2,063	126,465		270	0.580		0.214
1988	1,407	2,163	138,851		318	0.650		0.229
1989	1,711	2,282	149,275		387	0.750		0.259
1990	2,268	2,413	158,601		513	0.940		0.323
1991	3,142	2,537	156,558	1,939,000	710	1.238	0.162	0.454
1992	4,623	2,554	145,300		1,050	1.810		0.723
1993	5,815	2,632	132,646		1,297	2.209		0.978
1994	7,241	2,773	127,533		1,637	2.611		1.284
1995	8,502	2,941	118,811		1,893	2.891		1.593
1996	9,433	3,096	113,028	1,865,000	2,063	3.047	0.506	1.825
1997	10,857	3,221	108,072		2,587	3.371		2.394
1998	12,177	3,272	95,193		2,814	3.722		2.956
1999	13,528	3,340	92,065	1,637,000	3,009	4.050	0.826	3.268
2000	14,561	3,447	94,717		3,234	4.224		3.414

Sources: The Securities analyst Association of Japan.
The Japan Securities Dealers Association, *Monthly Report*, each edition.
Tokyo Stock Exchange, *Fact Book*, each edition.
Economic Planning Agency of Government of Japan, *Annual Report on National Accounts*, each edition.
Ministry of Health, Labor and Welfare, *Handbook of Labor Statistics*, each edition.

Notes
Securities analysts certification was introduced to Japan in 1981.
Public companies include listed companies on the securities exchanges and registered companies to Japan Securities Dealers Association.
Financial services industry includes as follows: banks including trust banks and foreign banks; credit agencies other than banks including small and medium financial agencies, agriculture and fishery agencies; financial companies; investment companies, securities and commodities brokers, services, stock exchanges; insurance companies (Japan' standard industry code).
A large number of security analysts work with financial institutions other than security industry. Separate numbers of analysts in security industry can be found only after 1992. The figures during the period 1981–1991 are estimated based on 1992–2000 average share of securities company analysts in the total number of analysts.

Table 14.5 Participation costs related to securities analysts in the United States

	Number of certified securities analysts	*Number of public companies*	*Number of employees of finance and insurance industries*	*Average number of analysts per public company*	*Share of analysts in employees of finance and insurance %*
	A	*B*	*C*	*A/B*	*A/C*100*
1980	6,449		4,289,000	–	0.150
1981	6,789		–	–	–
1982	7,258	5,624	–	1.291	–
1983	7,650	6,273	–	1.220	–
1984	8,306	6,432	4,732,000	1.291	0.176
1985	8,879	6,460	4,859,000	1.374	0.183
1986	9,515	6,788	–	1.402	–
1987	10,464	7,222	–	1.449	–
1988	11,306	7,028	5,373,000	1.609	0.210
1989	12,405	6,873	5,475,000	1.805	0.227
1990	13,618	6,765	5,582,200	2.013	0.244
1991	14,999	6,839	5,556,000	2.193	0.270
1992	16,602	7,016	5,580,000	2.366	0.298
1993	18,587	7,840	5,570,000	2.371	0.334
1994	20,150	8,296	5,632,000	2.429	0.358
1995	21,917	8,588	–	2.552	–
1996	23,990	9,214	5,772,000	2.604	0.416
1997	26,891	9,305	5,949,000	2.890	0.452
1998	30,488	8,952	5,770,000	3.406	0.528
1999	35,343	8,623	5,965,000	4.099	0.593
2000	41,105	8,361	–	4.916	–

Sources: The US Bureau of the Census, *Country Business Patterns*, annual editions.
http://www.aimr.com. Securities Industry Association, *SIA Report*, each edition.
New York Stock Exchange, *Fact Book*, each edition.
Nasdaq Market Data on NASD Web Site, the Nasdaq Stock Market *Fact Book*, each edition.

Notes
The number of certified security analysts is CFA chartered awards.
Public companies include NYSE listed companies, AMEX listed companies and NASDAO registered companies.
The financial services industry includes as follows; banking credit agencies other than banks; securities and commodity brokers services; insurance carriers, agents, brokers, and services; holding and other investment companies. (Finance and Insurance Industry for the US standard industry code).

Table 14.6 Cost of MBA school (US dollars)

	Annual tuition	*Pre-MBA medium pay*	*Post-MBA medium pay*
Pennsylvania (Wharton)	27,120	60,000	156,000
Northwestern (Kellogg)	28,677	55,000	142,000
Harvard	28,500	65,000	160,000

Source: Survey of *Business Week*.

Note
Top 3 best business schools of the year 2000.

to the ongoing pay scale of many Japanese companies, the reward for possessing an MBA degree is considerably less when compared with their American counterparts. Graduates of Japan MBA programs enjoy slightly higher salaries than their college graduate compatriots.

Wealth distribution and the financial system

The state of income and asset distribution has significant influence on the development of the financial system in two respects: risk aversion and participation costs. As Friedman and Savage (1963) and Arrow (1965) have opined, the level of asset accumulation is closely related to the degree of risk aversion. Other things being equal, people are less risk-averse as they become wealthier. This has important implication in considering the functions of the financial system. For an economy with relatively even wealth distribution, it is not easy to trade risks since the degree of risk aversion is homogeneous, while risk trading and risk redistribution is easier for an economy with unequal income and wealth distribution.

Wealth distribution also has important bearings on the role of participation costs in implementing various functions of the financial system. Allen and Santamero (1998, 2001) emphasize that because of the degree of sophistication and specialization required to undertake complex risk trading and risk management operations, the participation costs in recent years have risen sharply. Participation costs are shared among asset holders or surplus units, financial intermediaries, and related various service industries. However, here we are concerned with participation costs born by assets holders only. When the level of asset accumulation is low and/or when wealth is evenly distributed among individuals, average fixed participation costs would be higher, and makes it more difficult to conduct risk trading by individuals. In such a case it is necessary to promote institutional investors or asset management institutions to share the participation costs through economy of scale in transaction. Conversely, when income and wealth distribution are skewed, the rich can afford to pay the participation costs, partly taking up risk trading among themselves.

Table 14.7 Major players in the financial markets

		Participation costs	
		High	*Low*
Wealth distribution	Equal	Intermediaries (Japan)	
	Unequal	(US)	Individual investors

The following scheme shows alternative scenarios for the participants in the financial market transaction. If an economy is located at the north-west cell in Table 14.7, where participation costs are high and wealth is equally distributed, financial intermediaries should be the major players in the financial markets. This corresponds to contemporary Japan. In the south-east cell where participation costs are low and wealth is distributed unequally, rich individual investors are able to fulfill the central role in transferring financial risks. In either the north-east or the south-west cell, financial market activities are carried out by a mix of financial intermediaries and individual investors. Whether or not the US is located in the south-east cell is an interesting question to be examined empirically. Whenever participation costs are high as is indicated above, the US would actually be located in the south-west cell along with the active participation of individuals in the financial markets.

Participation costs depend on the development of financial technology, while wealth distribution could be redirected through taxation and education policies. Therefore the choice among cells depends not only on value judgments relating to the socio-economic system desired, but also political decisions over broad areas of economic and public policies. If Japan were to become a society with less equal ex-post income and wealth distribution that is partially necessary for the activation of society, we could aim at a financial system with active individual participations. If we consider that the current state of income and wealth distribution should be maintained in the foreseeable future, we might need to establish a market system intermediated by institutional investors and banks.

The relationship between participation costs and wealth distribution is important because there seems to be huge set-up or fixed costs included as part of participation costs. Since there is a scale economy in the consulting and learning activities, it is indispensable to consider the relationship between the costs and the levels of wealth. In order to illustrate the relationship of participation costs and wealth distribution, consider the following example. An individual investor with asset A (yen) faces a choice to invest his assets on his own or through the help of institutional investors. Let us assume that it is once and for all portfolio choice[4] and that an

institutional investor can arrive at an optimal portfolio choice. We need to solve for his cost if he tries to arrive at the same optimal portfolio choice as that of the institutional investor. Total costs when he delegates the job to an institutional investor is given as:

$$a + bA \tag{1}$$

where b denotes a proportional trading fee and a is a fixed (lumpsum) fee. This implies that total trading fee increases as total assets increase, although average fee declines. The institutional investor faced with a large block of asset must consider new investment opportunities in the environment of relaxed constraints. Consequently, the institutional investors must use more human and data resources to collect information and conduct monitoring.

On the other hand, in the case of an individual investor who chooses portfolio by himself, his participation costs comprise the opportunity costs of labor:

$$wT \tag{2}$$

where w denotes his wage level and T the time required to conduct the portfolio selection. This participation costs reflect costs to acquire expertise in participating complex financial transactions. We assume that T is composed of two parts, c and dA, i.e:

$$T = c + dA \tag{3}$$

where c is a fixed component and d is a proportional component. A proportional component arises because as the size of total assets become larger, an individual investor incurs more information and monitoring costs. With a small A, he may have to obtain information about listed firms and mutual funds in the newspapers. With a slightly bigger A, he may want to have information about investment opportunities abroad. With an even larger A, he might need private information about Silicon Valley entrepreneurs. Finally, with a very large A, he would need data about investment strategies of hedge funds. cw shows fixed costs to participate in the financial market transaction. Allen and Santomero (1998, 2001) argues that a rapid increase in cw vis-à-vis a is one of the basic characteristics of the modern financial system.

The investor will delegate the transaction to institutional investors if $a + bA$ is smaller than $w(c + dA)$ or $a/A \cdot b$ is smaller than $cw/A \cdot dw$, and conduct the transaction by himself if $a + bA$ is greater than $w(c + dA)$ or $a/A \cdot b$ is greater than $cw/A \cdot dw$.

In an economy with skewed wealth distribution, the wealth level of a representative investor could be large. The comparison between the two

terms would be dominated by a comparison between b and dw.[5] In this economy, those not earning wage incomes will certainly choose to implement portfolio choice by themselves. This is the typical case of classical rentier depicted in J.M. Keynes' *General Theory*. Retired rich investors also prefer to select their portfolio by themselves. However, Bill Gates, whose w is very high, would delegate the business to institutional investors or professionals as Allen (2001) mentions.

On the other hand in an economy with equal wealth distribution, the comparison will be dominated by the comparison between a and cw. c would be very large for those who lack basic knowledge of financial instruments and IT. Even if w is small, individuals will choose institutional investors when c is sufficiently large as compared with a, owing to the sophistication of financial technology and the transaction economy of scale that is provided by institutional investors. This case corresponds to the current environment in Japan as most of the financial assets are held by a segment of retirees receiving large retirement payments. It must be noted that even for the educated young, the cw is an opportunity cost, i.e. lost employment income from participants in the MBA studies (Table 14.6).

Mankiew and Zeldes (1991) has clearly pointed out the dependence on fixed participation costs or fixed information costs in regards to the level of wealth. Using the 1984 family survey data, it can be understood that higher-income families were more likely to pay the fixed costs because of their larger portfolios. The fraction of US families that held stock in 1984 increased with the level of average labor income. Noted that in Mankiew and Zeldes (1991), labor income is not treated as opportunity costs of information acquisition activities but a surrogate variable for the level of wealth.

The banking sector in Japan

In discussing the new architecture of the financial system, the restructuring of the banking sector is crucial in Japan. Throughout the postwar years, banks have played important roles in providing households with safe storage of value. They have also encouraged relation-specific investments by workers and related-firms.

This section will investigate the state of banking industry from three angles. First, we examine why the share of bank deposits in household portfolios has been so high. This phenomenon is due to wealth equality, skewed wealth distribution among different age groups, and government protection of deposits in the so-called convoy system. Second, we discuss why the non-performing asset problem has become so serious in Japan. In addition to the ramifications of the asset bubble and financial policy muddle, we will also point out significant trend and cyclical factors that explain the current plight of the banking industry.

Why is the deposit ratio so high in Japan?

At first, let us examine how households allocate their savings into different financial and real assets. We will also look at how income and wealth are distributed. Broadly speaking, both household assets and liabilities have increased since 1970, with gross financial assets rising from around 98 percent of GDP in 1970 to over 252 percent in 1998. The liabilities have increased from under 40 percent to around 77 percent. Net financial wealth, as a result, has risen strongly from 60 percent of GDP in 1970 to 115 percent in 1998.

Table 14.8 provides a comprehensive picture of household portfolio

Table 14.8 Household sector balance sheets (proportions of gross financial assets)

		1970	*1980*	*1990*	*1995*	*1997*	*1998*	*Change 1970–1998*
United Kingdom	Deposits	0.34	0.43	0.31	0.22	0.22	0.21	−0.13
	Bonds	0.07	0.07	0.01	0.02	0.01	0.01	−0.06
	Equities	0.24	0.12	0.12	0.15	0.17	0.15	−0.09
	Institutions	0.23	0.30	0.48	0.51	0.53	0.55	0.31
United States	Deposits	0.28	0.33	0.23	0.16	0.14	0.13	−0.15
	Bonds	0.13	0.10	0.11	0.10	0.07	0.06	−0.07
	Equities	0.36	0.21	0.14	0.22	0.24	0.23	−0.12
	Institutions	0.22	0.28	0.39	0.42	0.47	0.50	0.28
Germany	Deposits	0.59	0.59	0.48	0.43	0.40	0.40	−0.19
	Bonds	0.08	0.12	0.16	0.16	0.14	0.13	0.06
	Equities	0.10	0.04	0.07	0.05	0.08	0.09	−0.01
	Institutions	0.15	0.17	0.21	0.29	0.30	0.32	0.17
Japan	Deposits	0.55	0.69	0.60	0.60	0.62	0.60	0.04
	Bonds	0.06	0.09	0.09	0.05	0.03	0.02	−0.03
	Equities	0.12	0.07	0.09	0.06	0.05	0.04	−0.07
	Institutions	0.14	0.13	0.21	0.29	0.31	0.28	0.14
Canada	Deposits	0.31	0.38	0.36	0.32	0.30	0.30	−0.01
	Bonds	0.14	0.08	0.05	0.06	0.05	0.04	−0.09
	Equities	0.27	0.24	0.21	0.25	0.28	0.30	0.03
	Institutions	0.22	0.21	0.28	0.30	0.32	0.34	0.13
France	Deposits	0.49	0.59	0.38	0.35	0.32	0.29	−0.20
	Bonds	0.06	0.09	0.04	0.05	0.03	0.02	−0.03
	Equities	0.26	0.12	0.26	0.23	0.29	0.32	0.07
	Institutions	0.06	0.09	0.26	0.33	0.32	0.31	0.26
Italy	Deposits	0.45	0.58	0.35	0.28	0.23	0.23	−0.22
	Bonds	0.19	0.08	0.19	0.21	0.22	0.18	−0.02
	Equities	0.11	0.10	0.21	0.21	0.25	0.30	0.19
	Institutions	0.08	0.06	0.08	0.10	0.10	0.10	0.02
Average	**Deposits**	**0.43**	**0.52**	**0.39**	**0.34**	**0.32**	**0.31**	**−0.12**
	Bonds	**0.10**	**0.09**	**0.09**	**0.09**	**0.08**	**0.07**	**−0.04**
	Equities	**0.21**	**0.13**	**0.16**	**0.17**	**0.20**	**0.21**	**0.00**
	Institutions	**0.16**	**0.18**	**0.27**	**0.32**	**0.34**	**0.34**	**0.19**

Source: National flow-of-funds balance sheet data. Davis and Steil (2001), Table 1.9.

selection in comparative and historical perspective. As a general trend among G7 countries, we can observe the following:

1 The share of deposits has declined over time except for Japan.
2 The share of equities held by households has declined in the UK, the US, Germany and Japan while it has increased in Canada, France and Italy.
3 The share of claims on institutions has increased in all G7 countries.

Table 14.9 shows the trend of personal sector (household plus unincorporated businesses)[6] portfolio selection in more detail for Japan and confirms the characteristics mentioned earlier. It can also be understood that although the share of deposits is almost constant since 1970, the share of bank deposits declined during the 1990s, with the offsetting increase in postal savings. We will return to this point in the next section.

Overall, the share of deposits including postal savings is exceptionally high in Japan. Table 14.10 compares the level of composition of financial assets in Japan with the US, the UK, Germany and France. The percentage of cash and deposits is 54.0 percent in Japan. This is contrasted with 9.6 percent in the US. The share of claims on institutional investors is highest for the UK; 52.2 percent of insurance and pension funds plus 5.1 percent of investment funds and unit funds. For the similar claims, the share in Japan is among the lowest along with France and Germany. The share of

Table 14.9 Financial assets of personal sector (1970–1998; %)

		1970	*1980*	*1990*	*1995*	*1998*
Cash and deposits		57.3	62.8	52.3	55.1	59.6
Cash and demand deposits		15.4	11.4	8.8	10.0	12.3
Saving deposits		41.9	51.4	43.5	45.1	47.3
Banking time deposits		32.0	33.9	29.2	27.1	27.1
Postal savings deposits		9.9	17.5	14.3	18.0	20.2
Managed funds		19.3	20.8	31.6	34.7	32.9
Trust funds		5.2	6.0	6.8	6.6	5.1
Investment funds		1.6	1.5	3.9	2.7	2.3
Insurance		12.5	13.3	20.9	25.4	25.5
Securities		21.0	15.7	14.7	10.1	7.5
Bonds		5.4	8.3	4.8	3.1	2.1
Stocks/shares		15.6	7.4	9.9	7.0	5.4
Others		2.4	0.7	1.4	0.1	0.0
Total	%	100.0	100.0	100.0	100.0	100.0
	¥million	78.3	353.1	954.5	1,183.0	1,255.1

Source: Bank of Japan, *Annual Report of Economic Statistics.*

Notes
Market value.
Data aggregation base was changed in 1999.

Table 14.10 Financial assets of personal sector (as of end – 1999; %)

	Japan	*Germany*	*France*	*UK*	*US*
Cash and deposits	54.0	35.2	25.3	20.7	9.6
Insurance/pension	26.4	26.4	20.6	52.2	30.4
Investment funds unit funds	2.3	10.5	8.7	5.1	10.9
Debt securities	5.3	10.1	1.8	1.8	9.5
Stocks/shares	8.1	16.8	39.7	17.7	37.3
Others	3.9	1.1	3.9	2.7	2.2
Total	100.0 ¥1,438 tril.	100.0 DM7,034 bil.	100.0 FF21 tril.	100.0 £2,915 bil.	100.0 $35 tril.

Source: Bank of Japan, International Comparative Statistics.

equities is very high for the US (37.3 percent) and France (39.7 percent). For Japan the figure is surprisingly low at 8.1 percent.

Table 14.11 shows the portfolio composition of the households by income group based on the Family Saving Survey. Regardless of income group, time deposits are the major form of savings in Japan. This trend is constant throughout the sample period 1979–1999. Relatively speaking, the richer households own a higher share of securities – in particular equities, while more insurance is owned by the middle income group. Differences in portfolio composition among different income groups are very small. In 1999, the composition of stocks and shares was 4.72 percent for the lowest income quartile, 6.06 percent for the second, 5.35 percent for the third, 5.28 percent for the fourth and 7.86 percent for the highest fifth quartile.

The difference in the composition of stocks and shares is roughly matched by the difference in the composition of time deposits in the opposite direction. 53.48 percent for the first, 47.46 percent for the second, 47.46 percent for the third, 44.22 percent for the fourth and 44.75 percent for the fifth quartile. Until 1989, the portfolio selection of the four groups from the first to fourth quartile was very similar, and the fifth quartile had a slightly different pattern; relatively high share of stocks and shares, and relatively low share of time deposits and insurance. However, even during this period, there is little difference among income groups.

Why do households in Japan prefer bank deposits? A readily conceivable reason is the implicit protection of deposits by the government. It is true in the past fifty years the government has adopted the convoy policy of protecting inefficient banks from bankruptcy. When some banks went bankrupt in the late 1980s, the government responded with perfect protection on deposits.[7] Although the government protection explains the choice for safety of deposits, this factor is insufficient as an explanation for high deposit shares because it lacks a reason for the preference for safe assets.[8] There are two reasons.

Table 14.11 Portfolio composition of the households by yearly income quintile group (all households) (thousand yen)

1979

Item	*Average*	*Yearly income quintile group*				
		I	*II*	*III*	*IV*	*V*
Savings	5,212 (100.00%)	2,564 (100.00%)	3,290 (100.00%)	4,091 (100.00%)	5,372 (100.00%)	10,735 (100.00%)
Demand deposits	598 (11.47%)	372 (14.51%)	408 (12.40%)	474 (11.59%)	623 (11.60%)	1,116 (10.40%)
Time deposits	2,459 (47.18%)	1,277 (49.80%)	1,618 (49.18%)	1,959 (47.89%)	2,490 (46.35%)	4,946 (46.07%)
Life insurance and non-life insurance	1,024 (19.65%)	566 (22.07%)	758 (23.04%)	926 (22.64%)	1,165 (21.69%)	1,707 (15.90%)
Securities	945 (18.13%)	322 (12.56%)	395 (12.01%)	531 (12.98%)	841 (15.66%)	2,636 (24.56%)
Stocks and shares	445 (8.54%)	68 (2.65%)	130 (3.95%)	197 (4.82%)	344 (6.40%)	1,483 (13.81%)
Non-financial institutions	185 (3.55%)	27 (1.05%)	111 (3.37%)	201 (4.91%)	253 (4.71%)	330 (3.07%)

1984

Item	*Average*	*Yearly income quintile group*				
		I	*II*	*III*	*IV*	*V*
Savings	7,697 (100.00%)	4,550 (100.00%)	4,908 (100.00%)	6,360 (100.00%)	8,159 (100.00%)	14,507 (100.00%)
Demand deposits	620 (8.06%)	423 (9.30%)	446 (9.09%)	543 (8.54%)	684 (8.38%)	1,003 (6.91%)
Time deposits	3,706 (48.15%)	2,421 (53.21%)	2,539 (51.73%)	3,129 (49.20%)	3,928 (48.14%)	6,510 (44.87%)
Life insurance and non-life insurance	1,690 (21.96%)	1,030 (22.64%)	1,192 (24.29%)	1,626 (25.57%)	1,847 (22.64%)	2,757 (19.00%)
Securities	1,442 (18.73%)	635 (13.96%)	635 (12.94%)	864 (13.58%)	1,347 (16.51%)	3,728 (25.70%)
Stocks and shares	602 (7.82%)	238 (5.23%)	138 (2.81%)	280 (4.40%)	542 (6.64%)	1,810 (12.48%)
Non-financial institutions	239 (3.11%)	41 (0.90%)	96 (1.96%)	199 (3.13%)	353 (4.33%)	508 (3.50%)

(*Continued*)

Table 14.11 Continued

1989

Item	*Average*	*Yearly income quintile group*				
		I	*II*	*III*	*IV*	*V*
Savings	13,110 (100.00%)	7,487 (100.00%)	9,116 (100.00%)	10,223 (100.00%)	12,726 (100.00%)	25,996 (100.00%)
Demand deposits	895 (6.83%)	618 (8.25%)	687 (7.54%)	801 (7.84%)	884 (6.95%)	1,486 (5.72%)
Time deposits	4,999 (38.13%)	3,548 (47.39%)	3,427 (37.59%)	4,204 (41.12%)	5,119 (40.22%)	8,698 (33.46%)
Life insurance and non-life insurance	3,114 (23.75%)	1,900 (25.38%)	2,399 (26.32%)	2,678 (26.20%)	3,422 (26.89%)	5,170 (19.89%)
Securities	3,752 (28.62%)	1,370 (18.30%)	2,399 (26.32%)	2,204 (21.56%)	2,844 (22.35%)	9,942 (38.24%)
Stocks and shares	2,335 (17.81%)	681 (9.10%)	1,056 (11.58%)	1,123 (10.99%)	1,479 (11.62%)	7,336 (28.22%)
Non-financial institutions	350 (2.67%)	51 (0.68%)	205 (2.25%)	336 (3.29%)	457 (3.59%)	700 (2.69%)

1994

Item	*Average*	*Yearly income quintile group*				
		I	*II*	*III*	*IV*	*V*
Savings	15,921 (100.00%)	11,478 (100.00%)	13,009 (100.00%)	12,760 (100.00%)	15,451 (100.00%)	26,908 (100.00%)
Demand deposits	1,043 (6.55%)	774 (6.74%)	860 (6.61%)	901 (7.06%)	1,051 (6.80%)	1,630 (6.06%)
Time deposits	7,585 (47.64%)	6,041 (52.63%)	6,706 (51.55%)	5,403 (42.34%)	7,259 (46.98%)	12,517 (46.52%)
Life insurance and non-life insurance	4,420 (27.76%)	3,003 (26.16%)	3,649 (28.05%)	4,203 (32.94%)	4,477 (28.98%)	6,770 (25.16%)
Securities	2,376 (14.92%)	1,466 (12.77%)	1,528 (11.75%)	1,752 (13.73%)	2,110 (13.66%)	5,023 (18.67%)
Stocks and shares	1,145 (7.19%)	578 (5.04%)	583 (4.48%)	627 (4.91%)	952 (6.16%)	2,986 (11.10%)
Non-financial institutions	466 (2.93%)	136 (1.18%)	256 (1.97%)	465 (3.64%)	536 (3.47%)	936 (3.48%)

(*Continued*)

Table 14.11 Continued

1999

Item	*Average*	*Yearly income quintile group*				
		I	*II*	*III*	*IV*	*V*
Savings	17,377 (100.00%)	12,787 (100.00%)	13,309 (100.00%)	15,556 (100.00%)	17,281 (100.00%)	27,953 (100.00%)
Demand deposits	1,751 (10.08%)	1,403 (10.97%)	1,214 (9.12%)	1,652 (10.62%)	1,654 (9.57%)	2,832 (10.13%)
Time deposits	8,138 (46.83%)	6,839 (53.48%)	6,316 (47.46%)	7,383 (47.46%)	7,641 (44.22%)	12,510 (44.75%)
Life insurance and non-life insurance	5,026 (28.92%)	3,356 (26.25%)	3,871 (29.09%)	4,836 (31.09%)	5,622 (32.53%)	7,442 (26.62%)
Securities	2,033 (11.70%)	1,131 (8.84%)	1,764 (13.25%)	1,404 (9.03%)	1,789 (10.35%)	4,075 (14.58%)
Stocks and shares	1,071 (6.16%)	604 (4.72%)	806 (6.06%)	833 (5.35%)	912 (5.28%)	2,198 (7.86%)
Non-financial institutions	430 (2.47%)	58 (0.45%)	144 (1.08%)	280 (1.80%)	574 (3.32%)	1,095 (3.92%)

Source: Family Saving Survey (Statistics Bureau), respective years.

First, wealth distribution is highly equal in Japan, which implies that wealth held by the rich with a lower degree of risk aversion accounts for less. According to Wolff (1996), in Table 14.12, the share of wealth held by the top 5 percent of the Japanese population is 25 percent in 1984. This is less than half of the amount in the US. In 1983 the same share of wealth held by the top 5 percent in the US is 54 percent in gross assets, or 56 percent in net assets. In terms of Gini coefficient, the figure of 0.52 in Japan is significantly lower than 0.77 (gross assets) or 0.79 (net assets) in the US. Even when comparing with other developed countries including France, Germany, Canada, and Australia, Japanese asset distribution is the most equal.

Second, private financial assets in Japan are mostly held by retirees who have obtained retirement severance payments and are now aging rapidly. They prefer safe assets because of the increasing uncertainty in lifespan. The speed of population aging in Japan is highest among all developed countries. Moreover, recent theoretical examination has clarified that the share of investment in high risk assets such as stocks depends on wage earning capability, and other things being equal, the degree to afford risk is a decreasing function of age (Bodie, Merton and Samuelson 1992).[9]

For these two reasons, asset holders in Japan are significantly risk-averse compared with people in other countries. The low degree of utilization of high-tech financial instruments by the Japanese financial companies is not necessarily due to the incapability of developing financial instruments, but due to the lack of investors who are willing to take larger risks. This phenomenon explains why there is a high share of bank deposits in household assets. Incidentally, the reasons for significant equality of wealth distribution could be traced back to the three incidents immediately after the war. First, after the war, a hyper-inflation erupted which finally raised postwar price level 300 times higher compared with the prewar level. This inflation has wiped out considerable part of financial assets with nominally fixed face value. Second was the Zaibatsu dissolution and imposition of

Table 14.12 International comparisons of wealth distribution

		Gini coefficients	*Share of top 5 percent*
Japan	1981b	0.58	
	1984b	0.52	25
US	1983a	0.77	54
	1983b	0.79	56
	1988b	0.761	
France	1986a	0.71	43
West Germany	1988b	0.694	
Canada	1984b	0.69	38
Australia	1986b		41

Source: Wolf (1996).

wealth tax (zaisan-zei). Owing to these two measures most of the assets owned by wealthy families were confiscated and sold out to the public at low prices by the Security Coordination Liquidation Committee under the Occupation Army. Equity sold out during 1946–1947 comprised 57 percent of total paid-in capital of corporate firms in the country.

Third was the through-going land reform implemented during 1947–1950. All the arable land held by "non-resident" landowners were confiscated and sold out to landless farmers at a price less than one percent of the prewar price in real terms. The second and third reasons eliminated almost all of the wealthy class existed in the prewar period (Teranishi 1993). With this initial condition, wealth distribution of postwar Japan maintained extreme equality, partly owing to income sharing mechanism using internal labor markets and partly owing to high level of inheritance tax.

The fact that significant portion of the assets in Japan is held by retirees is illustrated in Table 14.13 based on the Family Saving Survey. Important observations follow. First, we look at the accumulation of assets by the age group over 65. From 1979 to 1989, the assets of this group increased from 7,438 to 24,122, by 3.2 times, while average assets increased only by 2.5 times from 5,212 to 13,110 (units in thousand yen). Second, although there was the phenomenon of life-cycle saving or hump saving in 1979 for the age group 50 to 60 (group of highest asset accumulation) and dissaving after age 65, this phenomenon disappeared after 1989 and thereafter asset level increases monotomically along with age.

In other words, Table 14.13 shows that the oldest age group has become the major asset holders in Japan since the mid-1980s. Let us have a close look at the portfolio selection behavior of this age group. By comparing 1979 and 1999, we know that the percentage share of time deposits has increased from 46.03 percent to 53.05 percent, while the average share of time deposits decreased form 47.18 to 46.83 percent.[10] Moreover, the share of stocks and shares fell from 12.95 percent to 7.01 percent.[11] These facts suggest that retirees with high preference for safe deposits led the aggregate portfolio selection in Japan.

Incidentally, it is worth noting that unlike in the US, the baby boomers in Japan could not become the main player in the financial market. Kitamura, Takayama and Arita (2001a) demonstrate that the baby boomers could not save as much as the previous generations in the prime age-income period (i.e. 50–60). This is partly due to the fact that the baby boomers consist of the largest demographic group. Firms and organizations could no longer afford to pay generous seniority wages to the boomer cohort as they did before. Another reason is timing. Unfortunately for the baby boomers, by the time they reach their 50s, they are stuck in the midst of the unprecedented 1990s economic recession.[12]

Let us now discuss the low level of equity holdings. This is especially clear when we compare Japan with the US, although Japan is the lowest

Table 14.13 Portfolio compositions of the households by age group (all households %)

1979

Item	*Average*	*Age*									
		−24	*25–29*	*30–34*	*35–39*	*40–44*	*45–49*	*50–54*	*55–59*	*60–64*	*65+*
Demand deposits	11.47	15.15	13.33	13.57	11.12	11.17	10.99	10.30	10.96	11.52	13.20
Time deposits	47.18	65.37	49.56	49.38	48.73	47.51	44.84	46.70	47.89	47.01	46.03
Life insurance and non-life insurance	19.65	13.85	22.07	21.87	21.29	24.13	20.36	18.23	18.60	16.76	14.83
Securities	18.13	2.65	8.59	9.33	13.45	13.14	20.08	21.20	20.24	23.61	24.58
Stocks and shares	8.54	0.00	3.70	3.84	5.59	5.32	12.33	10.77	8.39	7.49	12.95
Non-financial institutions	3.55	2.91	6.51	5.78	5.41	4.05	3.75	3.56	2.30	1.10	1.36
Savings	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
(thousand Yen)	5,212	1,545	1,921	2,991	3,903	4,269	5,767	7,948	7,899	8,652	7,438

1984

Item	*Average*	*Age*									
		−24	*25–29*	*30–34*	*35–39*	*40–44*	*45–49*	*50–54*	*55–59*	*60–64*	*65+*
Demand deposits	8.06	15.38	9.27	8.67	8.19	8.54	7.97	7.52	8.03	7.15	8.41
Time deposits	48.15	36.25	50.64	51.26	47.00	43.51	49.96	45.80	48.79	50.42	49.85
Life insurance and non-life insurance	21.96	31.62	23.18	25.03	26.01	27.91	24.75	23.43	18.96	17.35	14.96
Securities	18.73	10.40	8.70	9.37	13.72	15.59	14.55	19.69	21.26	24.06	26.23
Stocks and shares	7.82	0.00	1.56	3.10	5.42	7.19	7.09	10.69	6.36	7.52	11.91
Non-financial institutions	3.11	6.28	8.21	5.70	5.07	4.43	2.77	3.57	2.95	1.03	0.55
Savings	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
(thousand Yen)	7,697	1,385	2,826	4,003	5,225	6,022	8,008	9,389	10,891	12,427	11,306

(*Continued*)

Table 14.13 Continued

1989

Item	*Average*	*Age*									
		−24	*25–29*	*30–34*	*35–39*	*40–44*	*45–49*	*50–54*	*55–59*	*60–64*	*65+*
Demand deposits	6.83	14.80	10.07	8.19	7.65	7.64	6.81	7.64	7.61	5.84	5.56
Time deposits	38.13	43.60	40.11	38.50	38.49	37.57	35.93	41.53	35.78	44.98	34.78
Life insurance and non-life insurance	23.75	24.31	25.76	31.45	31.50	30.79	30.97	26.35	22.65	21.94	13.22
Securities	28.62	11.47	19.26	15.79	16.56	20.22	22.80	21.96	30.86	25.81	45.77
Stocks and shares	17.81	10.20	10.25	8.23	9.53	13.05	13.16	14.01	20.79	13.37	29.93
Non-financial institutions	2.67	5.81	4.80	6.04	5.79	3.78	3.50	2.51	3.09	1.43	0.66
Savings	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
(thousand Yen)	13,110	1,892	4,518	5,211	7,583	9,210	12,005	13,176	16,997	21,016	24,122

1994

Item	*Average*	*Age*									
		−24	*25–29*	*30–34*	*35–39*	*40–44*	*45–49*	*50–54*	*55–59*	*60–64*	*65+*
Demand deposits	6.55	13.87	13.13	9.15	7.65	7.66	7.06	6.27	6.79	5.89	5.65
Time deposits	47.64	49.92	37.24	43.36	39.56	43.63	42.57	42.63	47.63	51.75	53.76
Life insurance and non-life insurance	27.76	33.91	26.63	33.37	37.10	35.44	36.01	30.26	28.63	25.32	18.79
Securities	14.92	0.15	14.71	7.89	10.34	8.50	11.66	16.61	13.29	14.38	20.62
Stocks and shares	7.19	0.15	10.43	2.63	5.73	4.73	5.61	8.35	7.81	6.86	8.75
Non-financial institutions	2.93	2.14	7.58	6.22	5.02	4.60	2.57	4.19	3.36	2.29	1.06
Savings	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
(thousand Yen)	15,921	1,961	4,630	6,658	8,431	11,047	12,817	16,309	18,808	24,772	25,461

(*Continued*)

Table 14.13 Continued

1999

Item	*Average*	*Age*									
		−24	*25–29*	*30–34*	*35–39*	*40–44*	*45–49*	*50–54*	*55–59*	*60–64*	*65+*
Demand deposits	10.08	40.08	18.42	19.20	12.12	10.84	10.19	9.27	9.72	8.70	9.75
Time deposits	46.83	37.34	44.16	32.70	37.54	35.96	41.35	43.41	46.08	50.00	53.05
Life insurance and non-life insurance	28.92	22.27	31.49	38.08	36.28	41.09	34.69	33.17	31.12	27.92	21.09
Securities	11.70	0.00	3.36	4.71	8.29	7.22	9.80	10.54	9.74	12.17	15.39
Stocks and shares	6.16	0.00	1.54	2.27	4.59	4.84	6.05	5.66	6.14	6.77	7.01
Non-financial institutions	2.47	0.31	2.54	5.30	5.76	4.90	3.98	3.60	3.34	1.21	0.72
Savings	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
(thousand Yen)	17,377	1,280	3,897	6,620	8,698	11,375	13,247	18,256	21,227	24,621	25,271

Source: Family Saving Survey (Statistics Bureau), respective years.

among G7 countries (Table 14.14). Allen and Santamero (1998) argue that owing to the rise of participation costs, equity ownership has shifted from individual investors to institutional investors. While we agree with this assertion, we want to draw attention to the fact that even in the year 1998 household in the US held 23 percent of assets in the form of equity, and only 4 percent for Japan (Table 14.14). We consider the difference to be rooted in the difference in wealth distribution (Table 14.7). In the US, despite the rise of participation costs, a considerable number of wealthy individuals can afford to manage their stock investment by themselves, and to warrant the payment of fixed participation costs.[13] In this sense, the financial system of the US is a mixture of intermediation by institutional investors and individual investors, and corresponds to the south-west cell in Table 14.7. In Japan, high participation costs and concentration of wealth by the retirees seem to imply that *intermediated ownership* in a system of *security market-based intermediation* is the only way to accommodate and adjust to the shift in financial technology.

Failure of the banking sector in risk taking

After the bubble burst, the banking sector of Japan entered into prolonged stagnation and decline. Saddled with huge non-performing loans (NPL), bank lending has continued to shrink in spite of the exceptionally low interest rate policy of the Bank of Japan. Apart from the policy muddle which seems to have aggravated the NPL problem, there are two factors behind this phenomenon: financial technology and the changing nature of risks.

The first factor is related to financial technology development. The banking sector in Japan seriously lags behind other countries in technological progress. Owing to the rapid development of information and communication technologies, the securities markets are equipped with powerful mechanisms of risk management through the bundling, unbundling and trading of risks. Intense competition in the international bond markets, domestic security industry and among institutional investors, has led to better financial technology. For example, the deregulation of bond markets in the 1980s ushered by the expansion of Euro-yen bond market gave incentive to traditional bank customers i.e. big businesses, to shift their funding from bank borrowings to bond financing. Medium-term bond funds (chu-koku-funds) issued by security companies, have competed directly and effectively with bank deposits, owing to their liquidity and high yields.

With an increase in net financial wealth in the household sector, households increasingly want a higher share of their assets in the form of long-term, high-return and high-risk products, as their liquidity needs can be reduced to relatively small proportion of the portfolio. Traditional banking services or products while maintaining a strong position in liquidity

Table 14.14 Ownership structure of listed companies in Japan (%)

	Banking institutions	*Institutional investors*	*(Trust banks)*	*(Insurance companies)*	*(Investment funds)*	*Other financial institutions*	*Business corporations*	*Individuals*	*Foreigners*	*Total*
1966	11.8	16.0	–	12.3	3.7	7.2	18.6	44.1	1.8	100.0
1970	14.0	16.5	–	15.1	1.4	3.2	23.1	39.9	3.2	100.0
1980	17.7	18.9	–	17.4	1.5	3.9	26.0	29.2	4.0	100.0
1990	16.4	27.1	6.2	17.3	3.6	3.5	25.2	23.2	4.2	100.0
1991	16.3	26.9	6.5	17.2	3.2	3.1	24.5	23.2	5.4	100.0
1992	16.2	27.0	6.8	17.0	3.2	2.5	24.4	23.7	5.5	100.0
1993	16.0	26.6	7.1	16.5	3.0	2.5	23.9	23.5	6.7	100.0
1994	15.9	26.6	8.0	16.0	2.6	2.2	23.8	23.6	7.4	100.0
1995	15.4	24.9	8.0	14.8	2.1	2.6	23.6	23.6	9.4	100.0
1996	15.1	25.1	8.8	14.3	2.0	2.1	23.8	23.6	9.8	100.0
1997	14.6	24.6	9.7	13.5	1.4	1.8	24.1	24.6	9.8	100.0
1998	14.0	24.3	10.5	12.6	1.2	1.7	24.1	25.4	10.0	100.0
1999	12.8	22.1	9.3	11.2	1.6	2.1	23.7	26.4	12.4	100.0
2000	11.5	24.7	12.1	10.4	2.2	1.6	22.3	26.3	13.2	100.0
2001	9.4	26.0	13.9	9.4	2.7	1.6	23.2	25.9	13.7	100.0

Sources: Tokyo Stock Exchange, *Fact Book*, 2001. All Stock Exchange, *Research on Ownership Distribution in Japan*, 2002.

Notes
Number of units since 1986, number of shares before 1986.
Banking institutions include lon-term credit banks and commercial banks since 1990. They include trust accounts before 1986.
Financial institutions include trust banks, insurance companies and investment funds.
Other financial institutions include securities companies etc.

provision are inadequate for diversification and maximization of long-term investment returns. The associated rise in demand for diversified financial instruments caused an increase of institutional investors, such as trust banks, insurance companies and investment trust funds. The banks responded to these challenges in three ways.

First, focus was shifted to off-balance-sheet and fee-earning activities. Second, banks engaged in intensified cost-cutting. Third, loans were extended to high-risk borrowers in order to maintain profitability. High risk lending recipients include small and medium-sized firms as well as real estate related activities. In principle, shifts to high risk and unfamiliar markets could be made without major increases to banks' solvency risk if the associated credit risk had been priced accurately and loan reserves had been built up accordingly. Institutional competition led to aggressive risk-taking on banks during the late 1980s, as they sought to maintain the profitability of their traditional lending business. The major losses incurred in the 1990s suggest that risk pricing or quantity rationing was inaccurate. Although we do not delve into the issue why banks have failed to shift to new markets, there are two policy issues.

1 Monetary policy did not adequately function to prevent the rise of the asset bubble, partly owing to the constraints related to international policy coordination.
2 Past history of excessive bureaucratic intervention in the banking sector has deprived the sector of flexibility, and the sector continued the simple-minded strategy of scale expansion.

As to the second factor, it is claimed that the change from diversifiable risks to non-diversifiable risks has decreased the risk-function of the banks. There are trends and cyclical elements in this phenomenon. The globalization of the world economy and the consequent synchronization of the economic activity are two inevitable trends. There is an important cyclical element in the pattern of risks. Whenever there is basic innovation in industrial technology, systemic industrial risk tends to rise. Japan has experienced a similar systemic risk in the 1920s and in the 1990s.[14]

As the industrial structure shifted from light and indigenous industries (based on agriculture) to heavy and chemical industries in the 1920s, the industries tied by the input-output relationships went into difficulty simultaneously. Risks related to each industry became highly correlated. Also, the declining industries (i.e. light and indigenous industries) leveraged land as collateral and borrowed large funds from the banks. Due to fear of corporate bankruptcy, the banks did not force the indebted firms to repay. Consequently, banks were unable to fully recover their principle loans. This scenario has been repeated in the 1990s as the Japanese industrial structure once again experienced a substantial shift from heavy industries to knowledge-based industries.[15]

Kiyotaki and Moore (1997) shows that under such conditions, a single shock on an industry has significantly persistent spillover effects over other industries. A temporal and partial shock is turned into a systemic and macro shock, accompanied by a sharp fall of the value of the collateral, followed by a curtailment of bank lending. We will provide detailed explanations in the next section.[16]

When risk is cyclical in nature, the function of the banking sector could also be cyclical. When the nature of risks becomes systemic, the role of the banking sector would be diminished. Conversely, banks can fulfill their risk-eliminating role when risks in the industrial sectors are idiosyncratic and diversifiable. If we accept this as a valid assumption, today's loss of competitiveness in the banking sector might be considered to be a temporal phenomenon. This may offer another explanation as to why the Japanese households hold bank deposits in such high proportions.

Nowadays, there seems to be a trend toward weakening the functions of the banking sector. Prudential banking regulation raises the institutional cost of management in the banking sector and weakens its function. In addition, market-oriented and globalized financial markets raise the cost of cross-shareholding.

Let us argue that in both the 1920s and the 1990s, an unfavorable shock on a particular industry worked as a trigger, and spread the shock over the entire economy. The trigger was responsible for the change in industrial structure. It also caused an economy-wide decline in the value of collateral assets, i.e. land, which led to a credit crunch. As a result, the risks faced by the banking sector became systemic and non-diversifiable.

The 1920s was a period of transition. The percentage share in net domestic production valued in current prices declined from 30.2 percent in 1920 to 17.6 percent in 1930. The percentage share of food industry in total manufacture production (in current prices) declined from 34.1 percent in 1910 to 25.0 percent in 1930.[17] In contrast, the composition of heavy and chemical industries (chemical, machinery, steel and non-ferrous metals) increased from 20.9 percent in 1910 to 32.8 percent in 1930.

What happened to the agricultural and light industries sectors? First, agriculture productivity increase was stunted by the saturation of the high-yield rice production. Then, rice import policy from the colonies depressed the domestic rice price. Lastly, the Great Depression of the 1930s decimated the silk industry.

The shock on the agriculture sector had persistent and amplifying impacts on the whole indigenous and light industries. These industries depended heavily on agriculture as sources of materials, inputs and for final demand. Bank loans for these industries were highly collaterized on land – 31.3 percent in local areas, in contrast to 9.0 percent in six large city areas.[18] The percentage of lending collaterized on real estate was 16.2 percent for large banks. For small banks with capital less than one million

yen it was 38.3 percent. Their customers comprised mainly of farmers, indigenous producers and merchants.

Taking the year 1922 as 100, the land price index[19] went up from 49 in 1913 to 100 in 1922, and fell to 62 in 1932.[20] Kiyotaki and Moore (1997) note that when bank loans are tied to the collateral value, and when collateral assets are production factors, an unfavorable shock on a credit-constrained sector has persistent effects upon future periods. This also has spillover effects on other sectors through a fall in collateral prices on credit limits.

We saw the same story in the 1990s. Until the bursting of the bubble economy in 1990, the Japanese economy was highly leveraged through the use of real estate as loan collateral. Firms in the heavy and chemical industries used their large urban factory land holdings as collateral and enjoyed automatic expansion of credit as land prices went up. The banks fueled the speculative bubble through lending and raising credit limits in accordance with land price appreciation. The collapse of the bubble precipitated by the fall of land prices caused the severe credit crunch. Since 27 percent of bank lending was collateralized with land as of 1990, the credit contraction hit the heavy and chemical industries most severely. Land price index in the six largest city areas went up from 10.1 in 1970 to 33.6 in 1985, up to 100 in 1990, and dropped to 44.9 in 1997.

There is no doubt that the Kiyotaki and Moore mechanism worked, making the credit crunch persistent and economy-wide. Moreover, since the heavy and chemical industries tied up relation-specific investments, the spillover effect was exaggerated through the input output relationship. Decline in credit limits of one firm influenced other firms through the depreciating land prices. This in turn affected the input-output relationship through decreases in the demand side. Negative shocks in the 1990s became systemic, and risks faced by the banking sector became more difficult to diversify.

New direction of changes in Japanese financial intermediation

So far we have argued that the development of IT has enhanced greatly the risk transferring (trading or redistributing) capability of financial markets. At the same time, it has raised participation costs in the market to a level where average individual market participation is almost impossible. It has also failed to reduce agency costs significantly due to information asymmetry between financiers and borrowing firms.

It has helped to promote the role of institutional investors. These investors can afford high participation costs and take advantage of sophisticated market-based financial instruments. While these events have caused an outright decline of traditional banking businesses in many countries, this did not happen in Japan. Households still prefer deposit

instruments despite the banking sector being saddled with NPLs. We have construed this paradoxical phenomenon by introducing two Japanese characteristics: equal wealth distribution and the retirees as main asset holders.

Nevertheless, it has become increasingly clear that the banking sector in Japan is near its risk-bearing limit. This is evident in the recent shift of deposits from banks to postal savings account. Therefore, it is unavoidable to introduce other measures to cope with non-differentiable risks, to transfer risks more extensively. The bank-based financial intermediation system should be replaced by a more secure market-based financial system. This does not necessarily mean that the security market-based financial system will be of the US type, characterized by corporate controlled markets and dispersed corporate ownership. Instead, we argue that the new security market-based financial system will be characterized by *security market-based intermediation* i.e. intermediated shareholding, and corporate monitoring by institutional investors.

In this section, a detailed account on the limitation of risk bearing capability by banks will be given. Then, we discuss three phenomena emerging in the Japanese financial system, which work toward *security market-based intermediation.* They are characteristics of securitization, increasing share of institutional investors in corporate ownership, and emerging activism by institutional investors.

Declining functions of banking institutions

As mentioned above, Japanese households prefer safety to return and liquidity in their asset selection. Even at the end of 1999, the share of safety assets in terms of cash and deposits was still exceptionally high compared with other developed countries (Table 14.10). From a historical viewpoint, traditional financial intermediation in Japan does not seem to have changed since the 1970s, although the size of the personal assets has increased more than 16 times in the past 30 years (Table 14.9). Time deposits, (including bank deposits and postal savings) have consistently accounted for 40–50 percent of the personal assets. Regular savings deposits account for around 30 percent. In the 1980s, there was a temporary decline of both bank deposits and postal savings, but the speed of disintermediation was quite slow in comparison with other developed economies.

Focusing on the 1990s, there are some noteworthy changes in intermediation. First, assets shifted from bank accounts to postal savings accounts. This shift is due to distrust in the banks' non-disclosure of NPLs,[21] and due to a change in government regulation raising the upper limit of postal savings deposit per head.[22]

Second, in the 1990s, funds managed by institutional investors, which include trust funds, investment trust funds, and insurances, kept increasing.

Share of securities dropped sharply. In other words, direct holding of securities by households was replaced by indirect holding of risk-bearing funds. This trend is caused by the aging society, where a large part of insurance and trust funds is related to the growth of the pension funds in the Japanese pension funds scheme.[23] These facts show that the channel of funds from the personal sector to the corporate sector has partly switched from banking institutions to government and institutional investors.[24]

With regards to the risk-bearing ability of banks, there are two major reasons for its weakness. One is common to banking in general; the other is peculiar to Japan. The common reason is financial globalization and progress of IT. These two events contribute to the linkage of asset markets and the spread of information among investors, which in turn enhance correlated changes in different asset markets internally and externally.

To repeat, increased systemic risks reduce the role of the banking sector in diversifying risks. The progress of IT in globalization has weakened the risk-bearing capability through the following two mechanisms.

The first mechanism is an increase in agency costs for banking institutions, or reduced confidence of depositors in the quality of deposits as a safe asset.[25] As financial globalization and progress of IT continue, it becomes more and more difficult for financial intermediaries to diversify risks within the organization. Financial intermediaries must transfer risks, manage risks utilizing markets and serve as vehicles for risk trading (Allen and Gale 1997). However, even if banking institutions implement strategies to transfer risks, they cannot manage risks sufficiently when the financial circumstances are frequently influenced by unexpected macroeconomic shocks. The new vehicles and devices for risk management make monitoring bank management more difficult.

The next mechanism is the increase in institutional costs shouldered by Japanese banks. Difficulty in risk monitoring contributes to banking instability, especially in the field of international business. Measures to strengthen prudential regulations and steps to stabilize bank management produce new institutional costs. There are also other obligations such as the need to strengthen disclosure regulations, to fulfill equity ratio requirements, and to satisfy balance sheet rules.

The risk bearing capability of the banking sector in Japan was further reduced by additional factors in the 1990s. One is the amount of NPLs in the banking sector. The banking institutions chose to cut new lending in order to avoid additional risk rather than to promote disclosure and swift resolution of NPLs. This worsened the banking problem.

Second, the cost of shareholding by the banking sector increased. The cost of cross-shareholding within a corporate group or between banks and their corporate customers increased, owing to the stock market and real estate market slump. A certain amount of stock holdings is allowed by the BIS capital adequacy accord to be included in equity. The result was a smaller equity assets ratio due to large losses in shareholdings. The final

factor is the transition from book value criterion to market value accounting system. The transition revealed concealed losses in the book-valued accounts and reduced values of equity assets.

In summary, the weakening risk-bearing ability of Japanese banking institutions in the 1990s meant that the conditions, which have concentrated risks on the banking sector for a long time, were further eroded. It is urgently needed to complement the risk bearing by banks with new efficient methods of risk trading.

Securitization and redistribution of risk

Decline in functions of banks in terms of risk bearing and information production actually hampers management of risks in the economy through traditional intermediation. This causes two kinds of change in the financial system. First, in order to avoid increasing costs and risks of traditional intermediation, existing financial intermediaries are inclined to shift their core activities from risk-bearing to risk-transferring. By extending fee-earning businesses such as asset management and financial planning, they pass the risks to their customers.

Second, the need for risk redistribution creates demand for new financial instruments such as derivatives and securitized assets. Securitization of future cash flows, in forms of loan sales and issuance of asset-backed securities (ABS) – which include mortgage backed securities (MBS) by broad definition – provides new facilities for risk management and risk trading.

From a microeconomic view, securitization provides new risk management measures for lenders, new financing vehicles for firms and new risk assets for investors. From a macroeconomic view, securitization has two functions: the redistribution of risks and the unbundling of intermediation through markets. Both improve financial intermediation efficiency. Hence, securitization transforms the traditional financial system into a securities market-based system.

Issuance of ABS of general loans and credits started in 1994, when the government lifted the ban on the issuance of asset-backed securities in the offshore markets. The development of securitization has accelerated since 1997, when Japanese banks suffered from the Japan premium in international markets, reflecting financial distress and bankruptcies of several financial firms. The poor health of the banking institutions made the government realize the need for securitization legislation. As a consequence, the Special Purpose Company Act in 1998, followed by the Special Services Law in 1999, was passed. They enabled the Japanese financial institutions and non-financial firms to take advantage of the ABS markets. Thereafter, securitization grew rapidly. Sales of loan credit in the domestic market by city banks began in 1998. The first ABS related to housing loans was issued in 1999, and Housing Loan Corporation (government entity) issued ABS in 2001.

According to the money flow data by the Bank of Japan, the securitization of general loans and credit jumped to approximately ¥10 trillion at the end of 1997 fiscal year and to ¥12 trillion at the end of 1998 fiscal year. According to a Credit Suisse First Boston (CSFB) report, the size of ABS issuance at annual base is estimated at having been ¥2.8 trillion in 2000.[26] The size of markets for securitized assets in Japan is the second largest in the world following the US. However, the difference between the two countries is considerable, since the size of Japan is less than one-tenth that of the US. In 1996, ABS in the US amounted to 17.2 trillion yen and in Japan 0.08 trillion yen, while those in 2000 are 25.6 and 2.06 respectively (Akai 2001) based on estimation by Morgan Stanley).

In conclusion, securitization did not occur spontaneously, nor did it progress in the private sector in response to demands for the transfer/redistribution of risks. The government provided institutional and legal conditions for the securitization of loans and credits in the late 1990s, with the aim to restructure banks and other distressed financial institutions. In other words, the government initiated securitization from the supply side of assets, not from the demand side.

A large part of ABS issuance is related to lease credits and consumer loans. In 2001, lease and consumer credits respectively share 22.9 percent and 20.0 percent of total ABS issuance (Egawa 2001, based on CSFB estimation).[27] It is noteworthy that real estate related loans and housing loans grew in fiscal 2000 to account for more than one-third of the total issues. In March 2001, the Housing Loan Corporation (a government finance company) issued its first ABS and announced it would continue to do so in the future. As the Housing Loan Corporation still holds ¥70 trillion in loans, the potential for securitized assets seems very high. In addition, real estate investment trusts (REITs) based on future cash flows from new development plans were listed on the Tokyo Stock Exchange in September 2001.

On the other hand, the securitization of non-performing loans (NPLs) is still extremely limited. According to Morgan Stanley, the share of NPLs in ABS issuance was only 1 percent in 2000 and is estimated to be 3 percent in 2001.[28] NPLs in the banking sector have a close connection with the liquidation of real estate, since a large part of bank loans are collateralized by real estate. Thus, securitization related to real estate is critical for improving Japan's financial system efficiency, and for that purpose liquidation of real estate is a crucial precondition.

In general, development of securitization depends on the following conditions.

1 Proper estimation of risks of future cash flow.
2 Quality and costs of originators, servicers, and sellers.
3 Existence of investors who shoulder risks.

In the Japanese financial system, ambiguity in price formation of collateralized real estates and insufficient disclosure of NPLs are major reasons that hamper the development of securitization in reference to the first condition. Transparency in price formation of real estate markets would disentangle the close-knit relation between the NPLs and inactive real estate.[29]

With regards to the demand for securitized assets, there are no appropriate channels to link personal assets with risk investments. Households – which hold nearly 1,400 trillion yen as of 2001 in assets – seem to offer huge potential for shouldering more risky assets. Such a linkage would be desirable in the interest of efficient asset management to support the aging society.

Looking at the recent financial service industry in Japan, some active strategies explore the household retail market. Real estate investment fund that began in 2001 is one example. Regarding real estate-related financial products, the originators are real estate companies, which suffered large capital losses. Servicers and distributors are securities companies and financial institutions, both badly hurt by the sluggish markets. This poses the question whether securitization for individual investors is a desirable development.

In view of the fact that the structure of new financial products is too complex for the general public to comprehend the risks involved, the following factors are necessary for the development of securitization involving individual investors:

1 disclosure of the credit risk attaching to original loans or future cash flows,
2 sufficient accountability of suppliers for customers,
3 objective and appropriate information services which appraise the quality of the products on a continuous basis.[30]

Currently, it is highly questionable that these conditions for the retail market will be sufficiently realized. It seems too simple to believe that financial institutions will be able to mobilize households to directly invest in such unfamiliar risky assets. There are three important reasons why they may not invest: the participation costs of markets, income and wealth distributions, and the rapidly aging households, as already discussed.

First in general, the participation costs of newly developed financial markets has increased significantly, while the transaction costs of traditional banking and securities services have fallen in line with the progress of IT.

Second, income and wealth distributions significantly influence degree of risk aversion. The elderly in general prefer safe assets if other conditions are equal, as examined by Bodies, Merton and Samuelson (1992), and Bodies and Crane (1997). In addition, participation costs to directly

access securitized asset and other sophisticated new financial product markets are higher, even if they have large potential to bear risk.

Third, the speed of aging of the population has strengthened the risk-averse nature in Japan, compared with other developed countries. This is reflected in the prolonged economic slump and uncertainty for the future in the 1990s despite concern about return.[31]

There are convincing reasons to assure the proper development of securitization for professionals or institutional investors, such as banking institutions, pension funds, and others involved in asset management. Creating opportunities for individuals to enter the market indirectly through the intermediaries is important, although the financial reform plan encourages the participation of individual and institutional investors alike. Over emphasis on the direct participation of individuals in newly developed markets, such as derivatives and securitized products, may not promote efficiency in the financial system.[32]

In sum, there are two important points for development of securitization in Japan. One is to provide opportunities for households helped by professionals, to indirectly participate in the market. In other words, the key is to extend *securities market-based intermediation.*[33] Here, institutional investors are major players, as agents of individuals, and would act to mitigate information asymmetry and technology gaps.

The other point concerns consumer protection in financial markets.[34] To complete the Financial Big Bang from the consumer's view, financial services law for function-based systematic consumer protection, and fiduciary responsibility legislation for pension funds and their trustee bodies are needed. The idea of a UK-type comprehensive financial services law was partially realized in 2000 with respect to the sale of financial products. Through revision of the Pension Funds Act in 2000, pension funds have to explicitly outline their fund management policy, but the Act is far from sufficient.

Legal reform aiming to protect consumers should be given priority in the future development of securitization. Otherwise, securitization will likely neither contribute to a more efficient financial system nor a more market-oriented system that is competitive externally and efficient internally.

Corporate governance and intermediated ownership

Another noteworthy change in the late 1990s is observed with respect to the ownership structure of listed companies. Table 14.14 shows that banking institutions (including commercial banks and long-term credit banks)[35] and business corporations increased shareholdings in the late 1960s to the 1970s. Institutional investors, who are financial institutions running asset management business, kept increasing their shareholdings before the 1990s. These increases stand in close contrast with the significant

decrease in individual shareholdings from 44.1 percent to 23.2 percent in 1990.

Shares held by banks have declined sharply from 16.4 percent in 1990 to 9.4 percent in March 2001. For business corporations, their percentage of shareholdings remained the same until 1997. Cross-shareholding among corporations has unwound at a rapid pace because neither financial institutions nor corporations could shoulder the cost of long-term shareholdings against the background of declining stock prices.[36]

As far as individual shareholding is concerned, the direct shareholding by individuals recovered slightly in the late 1990s but plunged in March 2001, partly due to the rapid expansion of foreign investors' shareholdings and an increase in institutional investments. Diminished confidence in the securities market has made the general public reluctant to hold shares directly. Their preference lies in bank deposits and postal savings. Thus, direct corporate ownership by individuals has been replaced by indirect ownership via institutional investors and foreign investors.

Let us compare these changes in the corporate ownership structure with those of the US and the UK, both of which have typical securities market-based financial systems. From a long-term perspective, the retreating trend of equity investing by individuals and increase in equity holding by institutional investors is not peculiar to Japan (Table 14.15).[37] It is particularly true for the UK, where share investing by individuals decreased from 54 percent in 1963 to 15.3 percent in 1999. In terms of significant differences in the level of ownership by institutional investors, the shareholding of institutional investors in the 1990s accounted for around 50 percent in the UK and the US, but less than 30 percent in Japan. The crucial difference is not in the level of direct share ownership by individuals but in the level of *intermediated ownership*.

Institutional reforms of corporate pension funds started at the beginning of the 1990s. Similarly, the liberalization of the asset management business was almost completed in the late 1990s. As a result, corporate pension funds raised their equity asset allocation dramatically. According to the report by the Pension Funds Association (Kosei Nenkin-kikin Rengokai), corporate pension funds in 1999 invested 36.5 percent of their assets in domestic equities and 18 percent in foreign equities. This increase more than doubled the figure during the last 10 years. In 1989, the figures were only 15.1 percent and 6.8 percent respectively. Investment in equities or in risky assets as a whole surged since 1997, at the start of the financial reform.

In advance of the reform, some changes were observed following the Financial System Reform Law (effective as of April 1993). This law was designed to promote competition among financial service providers. Trustees of corporate pension funds (trust banks and insurance companies), who are legal shareholders of pension funds, faced fierce competition from newcomers (investment advisers), with regard to performance and accountability of fund management.[38]

Table 14.15 Ownership structure of the US, the UK and Japan (%)

	Financial institutions	*Individual investors*
The US		
1970	14.0	82.1
1981	34.3	58.3
1990	40.4	49.9
1998	49.5	40.0
The UK		
1963	29.0	54.0
1969	34.2	47.4
1981	57.6	28.2
1990	60.8	20.3
1999	50.9	15.3
Japan		
1966	23.2	44.1
1970	19.7	39.9
1980	22.8	29.2
1990	30.6	23.2
1999	24.2	26.4

Sources: Federal Reserve Bank. *Flow of Funds*, the US.
Central Statistical Office, *Share Ownership*, 1999, the UK.
Tokyo Stock Exchange, *Fact Book*, 2001.

Note
Financial institutions include all financial institutions except banking institutions.

Investment advisory companies have extended their market share dramatically in the 1990s. As providers of portfolio management information and of voting rights instructions on the companies they invest in, they have challenged the trust banks and insurance companies, which previously dominated the trustee business. The intensified competition among trustee bodies and careful attention paid to pension funds by the portfolio managers has affected the corporate governance mechanism.

Corporate pension funds and their trustee bodies acting as agents for private investors have become active shareholders in the companies they invest in.[39] A questionnaire regarding the changing attitude of institutional investors made by the Policy Research Institute of the Ministry of Finance[40] published in July 2001, shows that the trustees have begun to actively commit themselves to corporate governance. Among 89 trustees (including trust banks and insurance companies) that have responded to the questionnaire, 68 (77.8 percent) thought they should exercise voting rights as agents of their customers, and 42 (47.7 percent) believed legislation concerning the fiduciary responsibility of pension funds was desirable. Pension fund organizations show similar responses but they are less ambitious than the trustees. In facts, 28 (31 percent) trustees implemented some actions. 20

trustees (22.4 percent) executed the actions while voting at the general shareholders' meeting. In addition, 46 (51.7 percent) trustees surveyed questioned the monitoring ability of banking institutions. They think institutional investors will likely replace banking institutions in the monitoring or the controlling of corporate management.[41]

Institutional investors have become much more conscious of their fiduciary responsibility in parallel with the liberalization of asset management business. The background to this change has been the restructuring of the asset management regulatory framework since 1996. The restructuring followed the accelerated deregulation of asset allocation by corporate pension funds.[42] In July 1998, the Pension Funds Association published a report that explicitly laid down principles underlying the fiduciary responsibility of pension funds for beneficiaries and contributors. Institutional investors in general and pension fund trustees in particular, have been forced to monitor the market value of financial assets to fulfill their responsibilities.

Judging from this fact, corporate governance system in Japan is shifting from the insider control system toward the outsider control system. While the corporate pension funds are still dependent upon the companies, and that relationships between financial institutions and their corporate customers seem to affect the behavior of institutional investors, the trend toward the outsider control system in Japanese corporate governance is steady. Nonetheless the speed at which the change is occurring is perhaps gradual in comparison with other developed countries.[43]

However, it is important to note that such a shift in corporate governance mechanism does not imply a transformation from relationship-oriented system to stylized market-based system, where a corporate-controlled market disciplines corporate management. Unless the equality of income and wealth distribution changes significantly, the Japanese financial system will continue to shift from bank-based financial intermediation, supported by the main bank system to a *securities market-based intermediation*, supported by institutional investors who are the agents of small investors or households.[44]

In *securities market-based intermediation*, intermediaries have to account for their customers as their agents on the markets they participate. Communication with corporate managers to establish mutual confidence is crucial for institutional investors. These investors act as agents for other investors and have the power to cause stock market volatility. Private investors aim to reduce monitoring and participation costs in the asset markets. Therefore institutional investors must fulfill their role as monitors of corporate management. They must be financially sophisticated in handling risk products such as securitized assets for their clients. According to the questionnaire mentioned above, the trustees of pension funds think direct and continuous communication is most effective in enforcing corporate governance.

New architecture

Let us think about the relationships between three types of institutions (individual investors, banks and institutional investors) and the functions need to be fulfilled by each. IT has improved risk transfer capabilities of the financial markets and promoted the development of sophisticated financial technologies, IT however has also increased participation costs. Let us assume three things.

1 The Japanese society will keep the relative equality in income and wealth distribution in the future.
2 Participation costs in the financial market transaction will remain high in the foreseeable future.
3 When the industrial structural shift is completed, the risks faced by the financial system will be less systemic.

Against these facts, the following picture will emerge for the general direction in designing the new Japanese financial system. First, households will continue to hold their financial wealth mainly in the form of claims on financial intermediaries. Institutional reforms are indispensable in order to conduct an efficient monitoring of financial intermediaries i.e. banks and institutional investors. For example, corporate pension funds must be more sensitive to the fiduciary responsibility of themselves as well as their trustees. The monitoring role of depositors must be complemented by prudential regulations.

Second, the banking sector is expected to strengthen monitoring capabilities in its relationship loan business and other investments. Retail banking with respect to venture firms and small and medium size firms is the main service for the industry. IT has reduced transaction costs in lending. It has lowered the barrier for market entry into the banking business for other firms from other non-bank related businesses. As a result, market conditions in the banking sector are more competitive, contrary to the prediction by Boot and Thakor (2000). Baba and Hisada (2002) argues that, with increased competition, the Japanese banks will devote more investments in improving their monitoring capabilities in the context of the lender-customer relationship.

Third, institutional investors such as trust banks, insurance companies and investment advisory companies, must commit direct monitoring in the firms that they invest. As shareholders, they are expected to exercise their voting rights and communicate with corporate managers. *Intermediated ownership* must play an important role in the future architecture of the Japanese financial system. Owing to the strong relationships among firms, it is difficult for the corporate pension funds to be vocal on the behaviors of firms whose stocks are held by the funds. A conflict of interest may exist between sponsoring companies and the companies in which they invest. It

is more realistic and efficient to monitor companies through trustees (institutional investors) rather than direct monitoring by pension fund managers. Of course, it is the top priority for the pension fund managers to fulfill their fiduciary responsibilities. The pension fund managers should monitor their trustees to make sure fund management policies are observed.

With regards to the direction of policy reform in promoting individual investor participation in the capital markets, the Minister of Financial System, Hakuo Yanagisawa said it well. He emphasized the importance of bringing 1,400 trillion yen held by the households into the capital markets directly as "money that dares to take risk" (July 24, 2001, Nikkei Shimbun). This view comprises the backbone for the recent tax reform on equity transactions. Such an idea has been the basis for the series of capital market reforms advocated by the deliberative council on security transaction since 1998 (Royama 2001). Unless wealth distribution patterns and changes in participation costs are visible, it may be quite difficult for these arguments to obtain solid support.

Needless to say, it is not our intention to argue that the current state of equal income and wealth distribution should be maintained in the future. Rather, we consider it necessary to allow ex-post inequality to a considerate degree in the future. However, such a conversion will involve changes in tax, social security, education, and the social safety networks. Drawing a coherent plan to encompass these related areas is a prerequisite for success in reforming the financial system.

Notes

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1 Catching-up and shared growth are common characteristics in many East Asian economies.
2 The fourth possible impact is on the payment system through the development of electronic money. The Bank of Japan (2001) developed a detailed examination on the impact focusing on the general acceptability and finality of electronic money.
3 Internet banking is the case in point: two Internet banks were established; Japan Net Bank in October 2000 and Sony Bank in June 2001.
4 Allen and Santomero (1998) refer to continuous transaction on a day to day basis (op. cit., p. 1481). However, as the introduction of dynamic aspects of portfolio selection is beyond the scope of this chapter, we confine ourselves only to a once and for all selection.

5 For simplicity, consider the case where A is infinite.
6 Since Table 14.9 is based on flow of funds account, the household of Japan in the table is the personal sector.
7 When the government finally adopted the policy of pay off through deposit insurance organization in April 2002, and partly abandoned the deposit protection policy, deposits shifted from small banks to large banks and postal savings. Time deposits were converted into ordinary deposits for which pay off was postponed until April 2003.
8 Of course, the lack of alternative attractive assets is another explanation for this phenomenon in the past. Until the 1980s, security market instruments were heavily regulated by the financial authority, and were not readily available as a store of value with a reasonable rate of return (Teranishi 1982; Miller 1998).
9 Bodies and Crane (1997) examine the Bodie, Merton and Samuelson model, using data of 1996 survey of TIAA-CREF participants and have an evidence that supports the hypothesis.
10 To be more precise, the share of time deposits fell sharply at the time the bubble burst in 1989 and regained later on.
11 People in this age group increased stock holding during the bubble period 1984–1989 by 2.5 times from 11.91 percent to 29.93 percent. However, a similar behavior occurred with the other age groups. In particular, the age group 55–59 increased the share by 3.3 times from 6.36 percent to 20.79 percent.
12 Some economists argue that the bubble economy had to do with the baby boomers. Social contracts such as lifetime employment, seniority wage system, and generous pay-as-you-go public pension scheme could not be maintained for the baby boomers.
13 Other researches report that the number of stocks held by the average asset holder is not large even in the US (King and Leap 1984) and that only a small portion (27.6 percent in 1984 survey of 2,998 families) of household owns stocks (Mankiew and Zeldes 1991). However, this fact does not necessarily preclude the existence of the large number of wealthy stockholders in the country.
14 Similarities exist between the financial crisis of the 1920s that lasted until the beginning of World War II, and in the financial crisis of the 1990s. The financial crisis of the 1920s occurred when deflationary policies such as the lifting of the gold embargo were implemented. After World War I, an asset bubble occurred and collapsed in the 1920s. Then, just like now, the banks were burdened with bad loans, which led to the financial crisis in the spring of 1927. To deal with the crisis, the Financial System Research Committee (Kinyu-seido Chosakai) was established to study the Banking Law in 1926. The law was promulgated in 1927. The second asset bubble occurred in the late 1980s and collapsed in the early 1990s. The banking sector was burdened with huge amounts of non-performing loans (NPLs). As a result, many banks and financial institutions went bankrupt in the 1990s. At the same time, the Financial Deregulation Program "Big Bang" was announced in 1996 and implemented in 1999. Under the current recession, the growth rate of bank lending has declined since 1990. The rate has decreased to −4.7 percent in 1997. During the period of the financial crisis in the Showa era, the degree of credit contraction was more severe and lending by regional banks in 1934 contracted to 49 percent in 1926. These two recessions resembled each other in terms of credit crunch, although the degree of credit contraction differed. During the 1920s financial crisis, the minimum capital requirement was raised in order to raise

the net worth of banks under the Banking Law. Similarly, the government today has tried to do the same by injecting the banks with public funds. In conclusion, the two recessions share an important common point. Both recessions occurred in periods of industrial and economic transitions. The recession of the 1920s occurred during the industrial transition from indigenous and light industries (agriculture and raw silk) to heavy industries. In terms of resource allocation, the era was in transition from a liberal trading system that began during the middle of the Meiji period, to a controlled allocation system. The current recession has occurred in another industrial transition period: from heavy-industry-oriented economy to IT-based economy. Looking at resource allocation, the current economic situation is in a transitional stage from the so-called Japanese economic system to a more market-oriented economic system.

15 As mentioned earlier, during the period of the 1980s and 1990s Japan witnessed a change in industrial structure from the heavy and chemical industries (based on the revolution in energy and material transformation) to new industries (based on the new technology for processing and transmitting information).

16 Miller and Stiglitz (1999) give an interesting theoretical explanation for such a systemic risk situation in the case of an unexpected devaluation utilizing Kiyotaki and Moore (1997) model.

17 Within the light industry, the cotton textile industry was a highly competitive leading industry during the period, and it did not have any significant relationship with the domestic agriculture sector.

18 Tokyo, Osaka, Kobe, Nagoya, Kyoto and Yokohama.

19 Paddy fields.

20 The lending practice of local banks, (whose credit limits were tied to land prices) and the subsequent credit crunch throughout the 1920s and 1930s were related to the fall in the price of land (Shindo 1977).

21 Hanazaki and Horiuchi(1999) stresses that the Japanese banking crisis resulted from the delay in disclosing non-performing loans and the responses in managing them.

22 The upper limit of postal savings per head was gradually raised from ¥3 million to ¥10 million during the period of 1988–1991.

23 In Japan, institutional investors such as trust banks and insurance companies are trustee bodies of pension funds. The trustee bodies are legal shareholders of the companies they invest in. Their customer pension funds are real shareholders.

24 This is not to say that Japan's bank-based financial system characterized by financial intermediation, was shifting toward the securities market-based financial system supported by corporate control markets and dispersion of corporate ownership, all characteristics of the US financial system. Japan's financial intermediation linked broadly dispersed small funds with corporate investments through banking institutions. Bank-based financial system has not changed in Japan, from a viewpoint of households or individuals, but the channels and catalysts have diversified. Hence, in the 1990s, functions of the Japanese banking institutions in terms of risk-bearing and information production, declined. On the demand side of the funds, large firms that had strong relationships with banks, have dramatically diversified their financing since the 1980s. The gap between the risk-bearing attitude of household and the risk-funding attitude of firms has widened further in the 1990s. The function of banks as intermediaries can no longer respond to the situation sufficiently.

25 Ross (1989) classifies financial products based on transparency in asset man-

agement from a viewpoint of end users of markets. According to his classification, deposits are least transparent, mutual funds are most transparent and pension funds are in between.

26 These figures are almost the same as estimated by Morgan Stanley in Akai (2001).

27 Other assets included in ABS are CDO (13.9 percent), housing loans (15.6 percent), real estate related assets (20.8 percent) and others (6.7 percent).

28 These figures are taken from Akai (2001). ABS issues related to NPLs, all issued outside Japan, totaled ¥20.44 billion in 1999 but ¥31.57 billion in 2000.

29 In 2001, the Ministry of Land, Infrastructure, and Transport, embarked on a plan to improve real estate pricing and to create an efficient real estate market.

30 Suto (2001) discusses problems related to securitization from the viewpoint of consumers.

31 According to the results of "Questionnaire on Savings and Consumption in 2000" (*Kinyu Koho Chuo Iinkai*), when considering asset selection, 37 percent of respondents put top priority on safety, which figure rose to 54.8 percent in 2000. However, real asset allocation in the personal sector has slightly recovered since 1997.

32 In order to develop securitization of cash flows, growth of private equity market in the form of limited partnership must be useful. Private capital market is broadly used by pension funds in the US Other institutional investors contribute to help the management of start-up firms (Prowse 1998).

33 Royama (2001) refers this sort of system as market-based indirect finance.

34 Suto (2000) emphasizes the necessity of incorporating principles for the protection of consumers in Japan's asset management industry.

35 The figures should be slightly discounted because they include trusts accounts before 1986.

36 According to NLI Research Institute (1999), share of stable ownership in the total ownership by financial institutions and business companies, including cross-shareholding and one-side shareholding, decreased from 41.1 percent in 1990 to 35.7 percent in 1997, Table 14.4.

37 It should be noted that institutions in Table 14.15 include securities brokers, for it is difficult to separate securities brokers from institutions based on the data from the US and the UK.

38 The ban on the entrance of investment advisers into trustee business was lifted in 1990.

39 Regarding development of corporate governance in recent Japan, see Suto (2002).

40 One of the authors organized the project. For details see Omura, Suto and Masuko (2001).

41 The respondents are requested to choose top three or less entities among twelve stakeholders, which might contribute to controlling the corporate management. Among 191 answers of 46 trustee bodies, 150 answers are related to institutional investors.

42 Since then, the asset allocation in corporate pension funds was strictly regulated by the 5-3-3-2 regulation whereby corporate pension funds must invest more than 50 percent of assets in loans and bonds, less than 30 percent in stocks, less than 30 percent in foreign assets, and less than 20 percent in real estate.

43 This sluggishness is partly due to the serious malfunctioning of the Japanese financial system as a whole and partly due to the dependency on the old system or inertia.

44 In October 2001, the implementation of a defined contribution pension plan (called Japanese 401k type defined contribution (DC)) was scheduled. It was

expected to accelerate the *intermediated ownership* by financial institutions as agents of individuals. When the corporate sector adopts the DC plan, financial intermediation will further shift toward a market-based system. However, the Japanese 401k plan is not fair in terms of the qualification of contributors, the upper limit of contribution, and the ambiguous portability among others. It is partly because the overall of the Japanese pension system is under discussion that the DC plan is grafted onto the old framework.

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