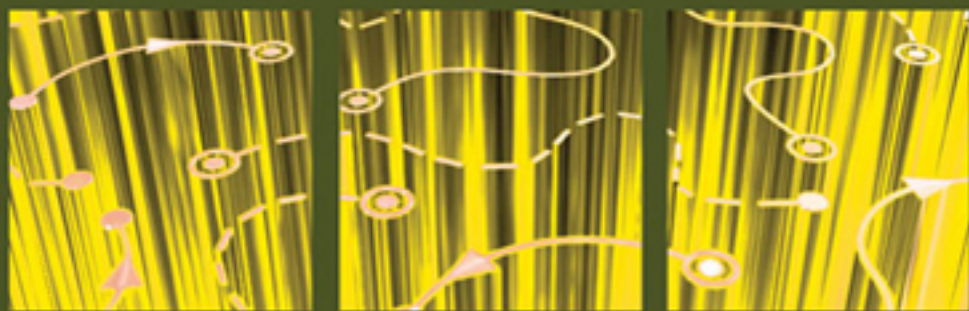


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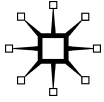
Bank Strategy, Governance and Ratings

Edited By

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Bangor University, UK*

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Introduction

Philip Molyneux

This text comprises a selection of papers that focus on dimensions of bank strategy, performance (including risk) and the role of ratings agencies. These papers were presented at the European Association of University Teachers of Banking and Finance Conference (otherwise known as the Wolpertinger Conference) held at Bangor University, Wales, in September 2010.

Chapter 1, by Barry Howcroft (Loughborough University), Rehan ul-Haq (University of Birmingham) and Chris Carr (University of Edinburgh), examines the features of cross-border banking and provide insights into how banks develop their cross-border business and what this involves. Technological developments, the deregulation of financial markets and the emergence of global level playing fields have provided both the opportunity and the means for bank management to develop appropriate international strategies. The emergence and growth of the global economy has also increased market pull pressure on banks and made it imperative for bank management to provide a comprehensive global service to corporate customers. The recent banking crisis, however, could fundamentally change the future of international banking. In terms of cross-border banking strategies, the chapter finds that individual banks adopt alternative strategies, which reflect different organizational forms, different stages of corporate development and specific managerial and cultural considerations. Moreover, the authors emphasize the diverse range of strategic approaches to internationalization in terms of geographic and segment scope, entry policy, standardization and integration of value chain activities. It was also interesting to find that only a small number of large banks were truly global and that the vast majority of banks were international, meaning that they tended to focus on a few countries or a geographic region.

The governance of banks has become a topical theme, especially since the 2008 credit crisis.

In Chapter 2 Andy Mullineux (University of Birmingham) focuses on governance issues in UK banking in the light of the Walker Report and the recent banking sector collapse. The focus of the chapter is on deposit taking, joint stock, limited liability banks that have existed in the UK since the 1866 Banking Act, and its scope does not extend to consideration of other banking structures based on mutuality, partnerships (re-enforced by the need to maintain fair reputation), non-limited liability and double liability arrangements, or state ownership. The corporate governance implications of each are different and warrant separate consideration, especially if big and complex banks are in the end to be broken up to deal with the moral hazard entailed in the 'too big to fail' problems and conflicts of interest within the complex structures. Nevertheless, some of the considerations may also apply to other shareholder-owned financial institutions that do not take deposits. The chapter highlights an array of contemporary governance issues and then makes various policy recommendations, noting that 'overtightening' of regulations will, in all likelihood, lead to slower growth, but questioning whether this is true on average over a number of cycles; that is, will it reduce 'trend' growth or might it even increase it? 'Too big to fail' issues remain a problem, and the need for better and more focused supervision and restructuring is also noted.

Chapter 3, by Pablo de Andrés-Alonso and Eleuterio Vallelado-González (from the Universidad de Valladolid), focuses on the relation between board composition and CEO/chairman compensation. The authors analyse the characteristics of the board, the experience of the CEOs and chairmen, the composition of pay in performance and non-performance compensation schemes, and the differences in compensation among countries. An interesting finding is that, where compensation only consists of salary, the bank becomes conservative and ends up taking suboptimal risks. On the other hand, if the compensation package consists of only equity-linked payment, the bank managers end up building risky loan portfolios. They also find that bank executives' compensation schemes have to account for leverage, regulation, and deposit insurance along with the traditional performance incentive framework. Overall, the chapter provides insights into how board independence and CEO compensation interact in large commercial banks in Europe and the USA.

Chapter 4, by Marcello Bianchi, Angela Ciavarella, Valerio Novembre and Rossella Signoretti (all from the Commissione Nazionale per le

Società e la Borsa, Roma), follows on a similar theme, investigating Italian CEOs' compensation. The chapter assesses the evolution and determinants of CEOs' remuneration in Italian listed companies throughout the Lehman collapse and the financial crisis. Information from 2007 to 2009 on CEOs' remuneration for companies listed on the Italian Stock Exchange is used in the analysis. The chapter finds evidence of a significant decrease in total executive compensation. As expected, this trend is particularly steep for bonuses and other variable components and is especially concentrated among big and financial firms. Other findings suggest that remuneration policies are influenced by the corporate governance framework, both before and after the advent of the financial crisis. However, as to the direction of these relationships, neither the optimal contracting theory nor the rent extraction view finds total support.

Chapter 5, by Laura Chiaramonte (University of Verona) and Barbara Casu (Cass Business School, City University), examines the link between credit default swap (CDS) spreads and indicators of bank risk. The CDS market has been under increased scrutiny since the collapse of Lehman Brothers in September 2008 and the near downfall of the insurance conglomerate American International Group (AIG). CDSs, the most widespread form of credit derivative, have been, according to some, responsible for exacerbating the effects of the recent financial crisis. The focus of the chapter is to contribute to the current debate on the use of bank CDS spreads as indicators of bank risk. The results highlight a strong link between the dynamics of CDS spreads and banks' economic and financial performance. The authors argue that regulators and markets participants should therefore pay more attention to the behaviour of bank CDS spreads, albeit with the caveat that the type of information conveyed changes across time, as economic and financial conditions vary.

Chapter 6, by Carlos Salvador Muñoz (Universitat de València, José Manuel Pastor (Universitat de València and Ivie) and Juan Francisco Fernández de Guevara (Universitat de València and Ivie), evaluates the role of credit ratings. In recent years the subprime crisis, the overvaluation of the ratings of structured products and the behaviour of banks have caused both the performance of the credit rating agencies (CRAs) and the quality of the ratings issued to be questioned. The aim of this chapter is to carry out an analysis of the behaviour of ratings agencies in the assessment of credit institutions, during the years prior to the subprime crisis and during the years thereafter. The analysis seeks to determine whether there is a change in the ratings policy between

these two periods. Using information on the Spanish banking sector over 2000–9, they find that there was a downward change in the ratings assigned to financial entities following the subprime crisis. Behind this change lay the worsening of the solvency of the banks and savings banks, and the change in the behaviour of the rating agencies in the determination of the factors that are most important when issuing their ratings, as reflected in the descriptive statistics, empirical results and theoretical models discussed in the chapter.

Chapter 7, by Rasha Alsakka and Owain ap Gwilym (both from Bangor University), focuses on sovereign ratings, with particular attention paid to Watchlist and outlook recommendations of the two main agencies, S&P and Moody's. A rating *outlook* is an opinion regarding the likely direction that a credit rating may take over the next one to two-year period. The rating outlook categories are: positive, stable, negative and developing. Credit Watch status (rating reviews) is a much stronger statement about the future direction of a credit rating within a relatively short horizon (the agencies state an ex-ante target of three months). The Watchlist categories are: Watch for upgrade, Watch for downgrade, Watch with direction uncertain. We show that the actions of different rating agencies imply different policies: S&P puts more emphasis on short-term accuracy, while Moody's actions are consistent with greater stability. We examine the lead-lag relationship, and highlight interdependence between these agencies regarding sovereign outlook and Watchlist actions. S&P leads Moody's negative outlook/Watchlist adjustments to a greater extent than vice versa, while Moody's tends to be the first mover in positive outlook/Watchlist changes.

Chapter 8, by Caterina Lucarelli (Università Politecnica delle Marche) and Gianni Brighetti (Università degli Studi di Bologna), explores the emotional side of risk-taking behaviour, comparing alternative measures of financial risk tolerance. Combining economic and psychological approaches, the authors undertake a spectrum of tests on a large population of individuals in order to gauge their attitudes to risk and financial behaviour. First, the authors measure unbiased risk tolerance (UR), which is obtained from the psychophysiological reactions of individuals taking risk in laboratory experimental settings; second, a biased risk tolerance (BR) measure is obtained through a psychometrically validated questionnaire. Finally, these indicators are compared with risks assumed in real life. The findings confirm that people tend to behave coherently with their self-representation and almost in stark contrast to what they feel. Nevertheless, experiments conducted on more than 440 individuals, with a large presence of traders and asset managers,

presents evidence of an ‘unconscious sleeping factor’ which (unusually) is absent in traders and asset managers.

Chapter 9, by Stefano Cosma and Francesco Pattarin (both from the University of Modena and Reggio Emilia), also focuses on individual behaviour and its influence on household debt decisions. Based on analyses of a data set from a survey of 2,000 Italian households, the empirical evidence presented in this paper supports the view that consumer credit users and non-users differ with respect to their psychological profile. Particularly, the attitude toward credit is more favourable among the former. Also, a stronger attitude makes using consumer credit more likely, even taking into account the simultaneous effect of other factors that may influence family financial decisions, such as per capita income and earnings expectations. In general, an interesting finding is that the influence of psychological factors on families’ credit behaviour cannot be rejected. While attitudes and personality factors, being complex features, are admittedly not easy to measure in survey-based studies, the area clearly is worthy of future study.

Chapter 10, by Nicoletta Marinelli (University of Rome La Sapienza) and Camilla Mazzoli (University Politecnica Marche), examines how banks obtain client information via questionnaires. In particular, the EU (MiFID) Markets in Financial Instruments Directive legislation has formalized the need for financial firms to acquire information about the features and preferences of their clients before selling investment products or services to them (the so-called ‘suitability’ and ‘appropriateness’ requirements). Many firms already did this prior to MiFID, but the new legislation has made it compulsory and has recommended the sections and items to be included in the suitability and appropriateness assessment. Still, this recommendation is only general, and firms are allowed to comply with this obligation by developing the assessment tool (generally a questionnaire) on their own; as a result, a multitude of questionnaires about investors is now available to the public, depending on the financial firm of which they are clients. This chapter analyses to what degree the questionnaires actually used by the major Italian intermediaries diverge from each other, and whether the differences are able to produce any impact on the profiles that investors obtain and on the consequent suitability of the products that are offered to them. Overall, the authors find that the questionnaires diverge widely as far as their structure and content are concerned; the number of questions included in each questionnaire is very different from one questionnaire to another, as are the specific items to be investigated. Furthermore, we also stress that Italian suitability questionnaires seem to be developed

mainly with the purpose of deriving objective parameters for the implementation of traditional asset allocation strategies rather than with the aim of making a more in-depth analysis of the subjective characteristics of clients. This is particularly true for the risk assessment item. In fact, Italian financial intermediaries do not seem to be particularly accurate at evaluating their clients' risk tolerance; they mainly focus on the desired risk–return combination of future investments (objective risk) rather than on individual behaviour towards risk (subjective risk).

In Chapter 11 Giusy Chesini (University of Verona) examines the changing structure of European capital markets' infrastructure, with a particular focus on the role of European clearing houses post-trading. Until recently European clearing houses operated in a quasi-monopolistic position, together with the stock exchanges for which they worked. In recent years, the situation has changed, with the attention of traders and stock exchanges focused strongly on trading and post-trading costs. In particular, some of the major stock exchanges have even threatened to review their clearing agreements if their traditional partners are unable to offer their services at competitive prices. Clearing houses perform several tasks, the most distinctive of which is central counterparty clearing. In the latter activity, they interpose themselves between the traders, becoming the seller for every buyer, and the buyer for every seller. This results in the depersonalization of the contractual relationship, which is called the 'novation' of the contract in technical terms. Traditionally, the interposition of a central counterparty was used in the derivatives markets to ensure the successful conclusion of negotiations and avoid systemic events. Over the last 20 years, however, clearing houses, also known as central counterparties (CCPs), have extended the provision of their services to the transactions concluded on the cash markets. The focus of the chapter is on this particular set of services, and this activity has seen the birth and development of aggressive competitors which try to acquire market share with the offer of pan-European services at competitive prices. The ability to provide high post-value services at competitive prices will allow some CCPs to thrive while others fall by the wayside.

Chapter 12, by René W.H. van der Linden (INHOLLAND University of Applied Sciences (IBMS) Amsterdam/Diemen), discusses the role of China's exchange rate policy and the implications for the financial system. Over five years have passed since China moved into an exchange rate regime with reference to a basket of some major currencies on 21 July 2005. Since then, controversy over the costs and benefits of China's exchange rate policy has intensified. More recently, the rapidly rising US

indebtedness and pursuit of its quantitative easing policy, the current Eurozone crisis and China's role in the global macroeconomic imbalances have reignited the debate about alternative reserve currencies. Since China has emerged as the world's second largest economy and the biggest exporter, its currency has been severely under-represented in global trade and capital markets. Therefore, in light of the current currency war with a 'rising dragon and falling eagle', many commentators are talking about Renminbi (RMB) internationalization and its potential reserve currency role as a rival to the US dollar (USD) and other major currencies. The chapter focuses on an array of contemporary policy issues, including how China's exchange rate policy obligations conflict with its internal economic priorities, the pace of currency reform and how a stronger and more flexible RMB exchange rate could affect financial sector reforms.

1

An Examination of Cross-Border Strategies in Banking

Barry Howcroft, Rehan ul-Haq and Chris Carr

1.1 Introduction

The emergence of countries such as China and India and the general trend towards economic opening has led to announcements of global strategic intent by virtually all of the major companies in recent years (Grosse, 2005). However, a primary consideration in focusing specifically on the cross-border activities of banks emanated from the sheer size of their international activities. For example, a cursory examination of foreign assets as a percentage of total assets of the 30 largest banks reveals that they increased from 35 per cent in 1980 to over 38 per cent by 2003 (De Nicolo *et al.*, 2004). Moreover, the absolute size of the foreign assets of these same banks increased 11-fold from \$650 billion in 1990 to over \$7,571 billion in 2000 (Slager, 2005). Prior to the credit crunch, the global banking sector was estimated to have had a market value in excess of \$65,700 billion in 2005 (Datamonitor, 2006).

This unparalleled growth in the international activities of banks can be traced back to a range of environmental and regulatory changes (Focarelli and Pozzolo, 2001). *Inter alia*, these include restrictive regulatory and monetary policies in the United States, which effectively forced American banks to establish offshore centres in Europe and elsewhere (ul-Haq and Howcroft, 2007). Deregulatory measures that created level playing fields also resulted in a fundamental shift in the nature of competition in financial markets (Slager, 2005). As a consequence, banks began to adopt 'market seeker' strategies and expand their cross-border activities (Roberts and Arnander, 2001; Alvarez-Gil *et al.*, 2003). Unprecedented developments in communication infrastructures, particularly those dependent on information technology and the internet,

also provided an unprecedented opportunity for banks to become international (Grosse, 2004).

More recently, the banking crisis has caused unprecedented environmental and regulatory changes that have fundamentally altered the competitive structure of financial markets. As a consequence, the crisis has forced banks to reassess their core competences and implement strategies that are conducive to sustainable competitive advantage. Such strategies, irrespective of whether they are based on retrenchment or expansion, typically focus on considerations relating to customer service, state-of-the-art technology, the composition of the service portfolio, and so forth (Gardener *et al.*, 1999). In this respect, and somewhat crucially from the perspective of this paper, the process of internationalization is yet another strategic imperative that is conducive to maintaining competitive advantage.

In terms of size, management culture, operational markets and so on, individual banks can be quite different, and this raises the possibility that the process of internationalization, that is, how firms become international, and even the meaning of the term 'international', might not be the same for all banks. Accordingly, the study addresses the following research questions: to what extent are general patterns of bank internationalization discernible, and what factors influence and determine the process of internationalization? This chapter, therefore, ascertains *how* individual banks become international and *what* this involves. In addition, it also makes an assessment of the significance of the international activities of banks and determines whether they are truly global organizations.

These are important considerations, because, despite the size and growth of international banking, there is a dearth of academic research on the range of cross-border strategies available to banks. In addressing this deficit in the extant literature, therefore, the chapter draws upon the more general literature on the internationalization of the firm. To facilitate these objectives, content analysis is used to identify predetermined themes and patterns from the annual reports of the world's 60 largest banks. These themes are then applied to the Bryan *et al.* (1999) and Atamer *et al.* (2000) typologies for classifying international strategies.

The chapter is organized as follows. The next section comprises the literature review, which commences with an examination of the relevant literature on internationalization. The research model and research methodology are then discussed, together with the bank sample. The data are then presented and the findings analysed within the context

of the research model. Finally, the conclusion summarizes the main findings, makes an assessment of the managerial implications, identifies some of the limitations of the chapter and discusses how future research in this area can be developed.

1.2 Literature review

Although by no means exhaustive, the following examples are illustrative of the broad range of considerations emphasized in the literature on international banking: cross-border bank mergers and acquisitions (Vander Venet, 1996; Buch and De Long, 2004); the relationship between globalization and bank efficiency (Berger *et al.*, 2001; Amel *et al.*, 2003); the strategic response to globalization (Karimi *et al.*, 1996; Slager, 2005); the Europeanization of banks (Goddard *et al.*, 2007; Nellis *et al.*, 2000); foreign bank entry into developing economies (Dages *et al.*, 2000; Clarke *et al.*, 2003); horizontal and vertical integration (Helpman *et al.*, 2004; Hauswald and Marquez, 2006; Goddard *et al.*, 2007; Buch and Lippuner, 2007); and trends in international banking (De Nicolò *et al.*, 2004; Focarelli and Pozzolo, 2005), among others.

The academic literature on the internationalization of firms can be dichotomized into two broad categories. The first category articulates the main explanatory reasons why firms internationalize, and the second, which derives from the strategic management literature, develops the notion of differentiation. As such, it focuses on how firms internationalize and the different types of international strategy.

Commencing with the first of these categories, the relevant literature emanates from several distinct sources or schools of thought: the behavioural school is represented by authors such as Dunning (1997), Weiss (2005), Chang (2004) and Sapienza *et al.* (2006), among others, who have emphasized the importance of regulatory push and how regulations aimed at protecting domestic firms can constrain domestic competition and cause firms to seek more profitable opportunities in less regulated foreign markets.

Regulatory push is an important consideration for banks (see, e.g., Focarelli and Pozzolo, 2001; Roberts and Arnander, 2001; Alvarez-Gil *et al.*, 2003; Slager, 2005). However, the literature also recognizes that there are substantial barriers to internationalization. *Inter alia*, these barriers include differences in national economies, culture, language, fiscal and legal systems (Berger *et al.*, 2001, 2003; Buch and Heinrich, 2002; Lewis, 2003). Moreover, these barriers are especially prevalent in commercial banking, where access to information, trust and familiarity,

factors that are crucial in the formation of banking relationships, are important considerations (Barros *et al.*, 2005; Beitel and Schiereck, 2001; Kwok and Tadesse, 2006).

Buckley and Casson (1976), Rugman and Verbeke (1998), Alvarez-Gil *et al.* (2003), Westney (2006) and Friedman (2007), among others, fit comfortably within the behavioural school, but they take a different perspective on internationalization. They explain it in terms of market pull or market seeker strategies and the need to pursue profitable opportunities in foreign markets or centres of excellence. This body of literature argues that firms are primarily motivated by self-interest and undertake strategic interactions with their external environment (see, e.g., Lawson, 1997; ul-Haq and Howcroft, 2007). They also emphasize the importance of senior management, and how managerial decisions are determined by internal considerations relating to corporate culture and internal administrative and managerial competences (Yang *et al.*, 1992; Ramachandran *et al.*, 2006). In this respect, Sapienza *et al.* (2006) have found evidence to show that banks have a tendency to locate in financial centres in order to be at the cutting edge of financial innovation. This approach also facilitates the acquisition of additional resources in the form of proprietary knowledge and skills, which can be transferred elsewhere within the organization.

Johanson and Vahlne's (1977) seminal paper focuses on the incremental nature of internationalization and similarly fits within the behavioural school of internationalization. Their so-called 'Uppsala international model' places emphasis on the gradual acquisition, integration and use of knowledge about foreign markets. The model is also predicated on the basic assumption that a lack of such information is a major barrier to the process of internationalization. Moreover, advocates of this approach (e.g., Erramilli, 1991; Luo, 1999; Denrell *et al.*, 2003) emphasize that such knowledge can best be acquired through foreign operations and that it incrementally informs future internationalization decisions.

Closely aligned to this approach is Caves (1982) Process Theory: writers such as Anderson (1993), Westney (2006) and Ramachandran *et al.* (2006) argue that internationalization is an evolutionary process, which takes place by incremental steps. Central to an understanding of this approach is the concept of 'psychic distance' and the notion that firms expand to neighbouring countries that have social, political and economic similarities to the home country. Risks associated with internationalization increase proportionately with dissimilarities between the home and host countries, and therefore, the theory argues, firms

tend to adopt either an exclusively domestic policy or a regional focus. However, unprecedented levels of innovation and deregulation, particularly in financial services, have arguably reduced these geographic and spatial barriers (see, e.g., Berger *et al.*, 2001). In contrast, however, authors such as Barros *et al.* (2005) have argued that there are still significant barriers to cross-border strategies.

The literature also discusses internationalization in terms of diversification (Bauer, 1994). Accordingly, Berger *et al.* (2003), Altman *et al.* (2005) and Bikker and Metzmakers (2005) argue that banks diversify geographically in an endeavour to spread risk and reduce procyclical characteristics. This enables them to potentially reduce the effects of domestic recession. However, in instances where there is a global recession or where an industrial sector, such as banking, is susceptible to systemic risk, international diversification may provide less protection.

The profit motive is another powerful consideration in explaining internationalization. This partially explains why there is a direct relationship between bank size, size of the home country's banking sector and global spread (see, e.g., Tschoegl, 1983; Grosse and Goldberg, 1991; Williams, 1998). To the extent that maximizing profits is an important imperative behind internationalization, selecting the right host country or region is a critical part of an international strategy. Accordingly, Focarelli and Pozzolo (2001) found that foreign banks were attracted to countries with high levels of economic growth. Similarly, Claessens *et al.* (2000) found that foreign banks were attracted to host countries with relatively low taxation regimes and high per capita income.

In contrast to the behavioural school, the second broad category of internationalization derives from the economic theory of internationalization and fits within the general or eclectic OLI (Ownership-Location-Internationalisation advantages) paradigm (see, e.g., Dunning, 2001). Somewhat crucially for the purpose of this chapter, it provides some insight into the different types of international strategy. In particular, it suggests that differentiation stems from the unique combinations of resource at the firm level. To the extent, therefore, that banks are characterized by heterogeneous supply chains and a diverse range of customer needs, *ceteris paribus* one would anticipate considerable variation in their international strategies.

Competitive behaviour and, therefore, variations in international strategies are also determined by the cognitive perceptions of senior management. To some extent, these perceptions are determined by the resources and core competences of the firm. However, management perceptions are also influenced by other considerations, such as the firm's history, its

idiosyncratic administrative abilities, the home country's business culture and the structural characteristics of the domestic markets (Lumpkin and Dess, 1996; Rugman and Verbeke, 1998; Ramachandran *et al.*, 2006).

With a few exceptions, the seminal work on analysing different strategic configurations dates back to the 1980s and relies on contingency theory (Lawrence and Lorsch, 1967), population ecology (Hannan and Freeman, 1984) and institutional theory (Di Maggio and Powell, 1983). These theories suggest that there are a limited number of viable strategies, which are largely determined by the environmental context and replicated by competitor firms.

Fayerweather (1969) and Doz (1980) identified two important dimensions of differentiation: geographic scope and standardization. Geographic scope can be either broad or narrow and was defined as the set of targeted key countries. Standardization, as opposed to the opposite dimension (fragmentation or local responsiveness), was defined as the homogeneity of the firm's competitive approaches in different countries. Subsequently, authors such as Bartlett and Ghoshal (1989) and Doz (1996) introduced a complementary dimension, which they referred to as the level of integration or coordination of activities across borders. Kogut (1985a, b) and Porter (1986) added another dimension, which they referred to as the 'geographic configuration of value chain activities'. This dimension takes into account that firm-specific competitive advantages are related to the comparative advantages of countries. Accordingly, firms will locate various aspects of their value chain, that is, research and development, marketing, manufacturing and so on, in an endeavour to exploit location-specific advantages. A fifth dimension known as 'segment scope' was introduced by Porter (1986) to take into account the fact that firms can internationalize using either a narrow or a broad product range.

What was interesting about Porter's (1986) work was that he attempted to ascertain the answer to two related questions: namely, what is the composition of an international strategy and how is it achieved? Accordingly, he used geographic and segment scope to address the first question, and international configurations and international coordination to resolve the second. The main criticism of Porter's approach, however, was that it did not explicitly relate the two dimensions by incorporating them into a single typology.

1.3 Research model

In order to examine the different international strategies of the world's major banks it was decided to use an adaptation of the typology of

Atamer *et al.* (2000) and Bryan *et al.* (1999). Atamer *et al.* (2000) identified eight international strategies, which were based on the five theoretical dimensions discussed above. The typology was constructed from a fairly extensive series of interviews with senior managers in four industrial sectors. Content analysis was then used to ascertain the main themes or dimensions and relate them to the different international strategies. Atamer *et al.* divided international strategies into two broad categories: namely, firms with a worldwide geographic scope and those with a more focused geographic scope.

Firms in the first category, referred to as 'worldwide players', have a significant involvement in the most important markets in the world and are characterized by high cross-border integration. Firms that adopt this approach, however, can differ quite considerably in terms of segment scope, foreign investment policy, standardization and integration of value chain activities. Accordingly, Atamer *et al.* (2000) categorized them into four configurations or sub-strategies: quasi-global players, transnational restructurers, worldwide technology specialists and global luxury niche players.

Quasi-global players have a worldwide geographic scope and a relatively narrow segment scope. Accordingly, they focus on one or two segments on a worldwide basis. Production is focused in a few countries, and sometimes certain aspects of production and delivery are outsourced. Their international strategy is homogeneous, which means that variations in marketing are minimal and global branding is very important; they are typified by a large spend on advertising. Costs and efficiencies through economies of scale are controlled by focusing on a small number of brands and having a narrow product range. These firms are also regarded as innovators or pioneers within their sector and try to maintain differentiation through continuous improvement.

Transnational restructurers are characterized by a strong corporate image and high levels of product and service quality. They also have a worldwide geographic presence and a broad segment scope, and are involved in most product-market segments. The primary objective of these firms is to achieve a worldwide leader position by growing the business via domestic and international mergers and acquisitions. This approach is conducive to expanding and acquiring new core competences, but it can also lead to overly complex organizational structures, with multiple locations spread throughout the world. For example, some activities in the value chain might be globally integrated, whereas other activities could be organized to preserve local responsiveness. These firms also have a tendency to suffer from duplication of resources and

overcapacity and, therefore, they frequently introduce rationalization programmes to reduce costs and simplify their operations.

Worldwide technology specialists are mainly characterized by ownership of specific technological know-how and expertise that provides them with a significant worldwide competitive advantage. Their international process is predicated on the premise that they have a unique set of technical skills which differentiate them from competitors. For the purposes of this chapter it was decided that this configuration was not appropriate for an examination of banks. This was because banks tend to differentiate on size of the business, quality and scope of the product portfolio, quality of service, and so on, rather than on the exclusive ownership of superior technological know-how.

However, it was found that the 'global shapers' of Bryan *et al.* (1999) could be usefully incorporated into the typology of Atamer *et al.* (2000). Firms represented by this strategy have worldwide geographic coverage and typically focus on a niche or a narrow segment of a mass market. They develop the business via organic growth or franchising arrangements, and place an emphasis on standardization of products and services. Their activities are globally integrated, but they are extremely adept at collating information and making reflective and timely decisions that help to shape the future structure of the market or industry. In essence, they can be regarded as innovators and calculated risk-takers who are instrumental in triggering change.

The final sub-category of worldwide players is global luxury niche players. They access world markets by differentiating themselves on the basis of top-quality products and high levels of service quality. Accordingly, they normally have a strong company or brand name that is readily associated with luxury and high net worth customers. International firms in this category generally have a very narrow focus on high-priced products and typically target a specific market segment. They also have a homogeneous core product line and production is concentrated in the home country.

The second broad category of international strategies defined by Atamer *et al.* (2000), namely, international challengers, is representative of a range of strategies that lie somewhere between the purely global and purely domestic extremes. As with worldwide players, these consist of four sub-strategies: continental leaders, opportunistic international challengers, which are associated with an offensive strategy, and geographic niche players and country-centred players, which are essentially defensive.

Continental leaders are characterized by their focus on a single continent and a relatively large segment scope. Firms normally concentrate

on the major product–market segments within their geographic zone, and they aim to achieve a high level of integration and coordination. The product and service range is typically standardized, but products are adapted to continental specificities. The primary objective of these firms is to achieve sustainable competitive advantage in a relatively large geographic area. Accordingly, they place emphasis on new product development, efficiency and service quality.

Opportunistic challengers typically consist of firms that are regarded as leaders in their home countries. In terms of international development they tend to focus on a few segments and take advantage of any market opportunities that come their way. Geographic scope can be large, extending beyond a single continent, but the associated dispersion of international assets and sales means that they seldom achieve dominant market share in a foreign country. To some extent this is a reflection of their opportunistic behaviour, which is indicative of firms that are in a transitory stage, waiting for corporate plans to be properly formulated.

Geographic niche players try to defend their strong domestic position and extend it into a larger geographic zone consisting of neighbouring countries or countries with cultural, political, social and economic similarities. Geographic scope, therefore, could be determined by a trade bloc, such as the European market, the Far East or Latin America, but it could equally be determined by market pull consideration and the need to follow customers into overseas markets. Firms typically have a consistent product range throughout their operational markets. They invest in subsidiary companies in an endeavour to provide a differentiated service, which is based on superior quality predicated on their responsiveness to local needs and preferences. They compete very effectively with worldwide or continental players and can capture a high market share in the competitive territory. In this respect, they represent very attractive acquisition targets, especially for transnational restructurers and continental players.

Country-centred players represent Atamer's final category of international challengers. They are characterized by a focus on the home country, and defend (or strengthen) their position against foreign competitors. Internationalization is regarded as a marginal activity, and international competition is regarded as multi-domestic. Firms, accordingly, focus on one or a few product–market segments in which local responsiveness is regarded as a major success factor. They can also evolve into the more ambitious geographic niche players, but (like geographic niche players) they represent attractive acquisition targets.

Table 1.1 summarizes and relates the eight strategic classifications to the five theoretical dimensions. However, because the typology of

Table 1.1 International strategy configurations

	Country-Centred Players	Geographic Niche players	Opportunistic International Challengers	Continental Leaders	Global Luxury Niche Players	Quasi-Global Players	Transnational Restructurers	Global Shapers
Geographic scope	Home country. Gain market share	Set of countries forming a homogeneous territory. Gain market share	Home country and a few key countries. Market share or market coverage	All key countries in a continent. Gain market share	All key countries	All key countries. Gain market share	All key countries. Wide coverage and market share	All key countries. Wide coverage
Segment scope	Narrow	Relatively narrow	Few segments	Relatively large	Narrow, high-priced segments	Narrow, but concerns mass market	Large, most business segments	Narrow, but concerns mass market
FDI (Foreign Direct Investment) policy/entry mode	Variable	Mainly organic growth	Variable	Mainly organic growth	Licensing and franchising	Mainly organic growth	Most entry modes, frequent m&a (Mergers and Acquisitions).	Organic or franchising
Standardization	Homogeneous	Homogeneous	Variable	Relatively homogeneous	Homogeneous	Homogeneous	Heterogeneous	Heavy standardization
International integration of value-chain activities	Depending on sector. Domestic focus	Depending on sector. Global sourcing	Variable	Global sourcing	Often manufacturer-controlled. Production in home country	Global supply chain management	Global sourcing. Vertical integration	Global supply chain management

Source: Adapted from Bryan *et al.*, 1999; Atamer *et al.*, 2000.

Atamer *et al.* (2000) was based on empirical evidence from industries other than banking, namely, footwear, cables and wires, paint, and confectionery, it was necessary to adapt the theoretical dimensions to reflect more accurately the specific characteristics of the banking industry. In essence, the banking industry, particularly in terms of its customer base and product portfolios, is a relatively complicated and multifaceted business. This consideration also raises the distinct possibility that individual banks could be simultaneously pursuing more than one international strategy at any one time. It was, therefore, necessary to categorize strategies by what was identified as the most prominent or dominant theme.

Accordingly, the following rules of thumb were adopted in specifying the dimensions of the typology. Geographic scope was based on the main countries in which each of the banks had operations and a physical presence through representative offices and subsidiaries. Segment scope was determined by the primary operational segments and breadth of the product range of each institution. Entry mode was largely determined by whether the institution had a propensity for organic growth or merger and acquisitions, and whether there was any evidence of franchising or licensing arrangements in the host countries. The standardization dimension was based on whether there was any evidence of high levels of product standardization and whether or not the product portfolio was essentially homogeneous. Finally, international integration of value-chain activities was based on whether the financial institution displayed horizontal or vertical integration characteristics: in other words, whether they sought to extend their existing domestic activities in foreign markets or to provide a range of activities that were essentially different.

1.4 Methodology

The sample consisted of the 60 largest banks in the world during the period 1999–2003. It was constructed from *The Banker's Top 100 Banks* (2004) and from the annual reports and accounts of the sample banks. The time period was chosen because it occurred well before the introduction of Basel II (Basel, 2004) and the recent emergence of the current credit crunch (Hamalainen *et al.*, 2008). As such, it corresponded with a period of relative stability in global financial markets.

In order to identify the different categories of international strategy, content analysis was used to analyse the annual reports and accounts of the sample population. Content analysis, which was popularized by

academics such as Miller (1986) and Miles and Huberman (1984, 1994), is a proceduralized approach for capturing complicated qualitative data from diverse sources. Essentially, it involves the identification and extraction of key themes from comprehensive data and is conducive to the identification of categories or main themes and sub-components (see, e.g., Atamer *et al.*, 2000, on international strategies and Perry and Bodkin, 2000, on Web page design).

As there is no consensus or commonly accepted view on the analysis of qualitative data, there has tended to be a proliferation of alternative approaches (Morse, 1994). This can be problematic inasmuch as it has resulted in a range of different strategies for dealing with data (Tesch, 1990; Dey, 1993; Miles and Huberman, 1994; Coffey and Atkinson, 1996). Some of these approaches are highly structured or formalized, whereas others rely on the subjective interpretation of researchers (Saunders *et al.*, 2007). The one thing that they all have in common, however, is that they all try to condense highly complicated and context-bound information into a format which, although simplified, is readily understood and informative (Easterby-Smith *et al.*, 2003). This chapter, accordingly, adopts a data reduction process, which involves the selection, simplification, abstraction and transformation of data to identify and fit predetermined themes and patterns (Ghauri and Gronhaug, 2005).

Institutions were categorized into the eight international strategies of Atamer *et al.* (2000) and Bryan *et al.* (1999), using the five theoretical dimensions shown in Table 1.1. In this respect, the research followed the approach used by King (2004), Yin (2003) and Strauss and Corbin (1998), among others. Specifically, a system of coding was used to identify emergent terminology from the reports. The terminology was then matched with the terms used in the extant literature to describe the theoretical dimensions of the different international strategies.

Another aspect of the research was to try to ascertain the significance or importance of the different international strategies. In this respect, studies of non-financial firms by Markusen (2002), Leknes and Carr (2004) and Rugman and Verbeke (2004), among others, have typically used sales volumes, total assets and market capitalization. However, the final accounts of banks do not follow conventional accounting principles. For example, they do not provide information on sales volumes, and regulatory considerations mean that capital is treated differently compared with other industrial sectors. Accordingly, it was decided to use tier-one capital for banks based on an average figure over the period 1999–2003.

Tier-one capital is a classification of capital under Basel I, which consists of equity and retained profits, and is used to regulate the activities of major banks throughout the world and minimize risk. The rules, which are applied by the Bank for International Settlements (BIS), are complicated, but essentially banks must observe a minimum risk asset ratio of 8 per cent tier-one capital relative to reserve assets, which are weighted according to their underlying risk and liquidity (Hall, 1993). Any increases in tier-one capital must be matched by an equal increase in tier-two capital, which, in broad terms, is represented by subordinated loan stock of different maturities. A major rationale behind these rules, therefore, is to ensure that future growth is financed by equal proportions of profit and equity, and other forms of external borrowing. This approach ostensibly imposes some degree of control on banks, because profits are internally generated from successful activities and equity investors arguably provide some form of external control or market discipline over the risk-taking actions of bank management (Hamalainen *et al.*, 2003).

The allocation of tier-one capital within an individual bank is, therefore, based on senior managers' opinions about which strategies are likely to maximize profitability and increase shareholder value within an acceptable level of risk (Yang *et al.*, 1992; Ramachandran *et al.*, 2006). As such, the amount of tier-one capital associated with a particular strategy implies a high internal (senior management) and external (investment analysts and investors) endorsement of the appropriateness of that strategy for delivering increased profitability at an acceptable level of risk. Tier-one capital is also indicative of the relative size of the sample banks and, therefore, provides some additional insight into the significance of the different international strategies.

1.5 Findings

Figure 1.1 reveals that just over half of tier-one capital, that is, \$378,987 million, was accounted for by international (international challengers) rather than global (worldwide players) strategies. Furthermore, 42 banks, or 70 per cent of the sample, had adopted international strategies (Table A1.1). Figure 1.1 also shows that the opportunistic international challenger with an emphasis on 'home country and a few key countries' was the single most dominant strategy, accounting for \$213,289 million of tier-one capital. This dominance is further underlined by Table A1.1, which reveals that 22 banks or 36.7 per cent of the sample adopted this strategy.

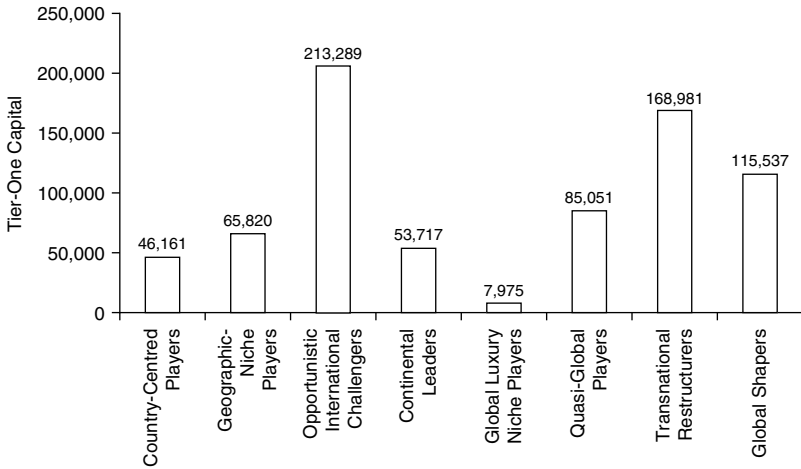


Figure 1.1 Tier-one capital (\$ million) versus strategy employed (all banking)

Note: Figures average of 1999–2003 inclusive published data.

Source: Author's own estimates.

Despite this finding, global strategies with ‘an all key countries’ focus were important too. Accordingly, Figure 1.1 shows that, in aggregate, global strategies accounted for \$377,544 million of tier-one capital. As such, this is only slightly less than that allocated to international strategies. Moreover, the transnational restructurer was the second most dominant strategy in the sample, accounting for \$168,981 million of tier-one capital. This was followed by global shapers (\$115,537m) and quasi-global shapers (\$85,051). However, Table A1.1 reveals that only 18 banks adopted global strategies. Within this broad classification, transnational restructures accounted for eight banks, and quasi-global players and global shapers accounted for eight and three banks respectively.

The evidence, therefore, indicates that the majority of banks are international rather than truly global organizations. This might be indicative of the basic fact that only very large banks can be truly global organizations. As such, the evidence supports the findings of Focarelli and Pozzolo (2001). However, Kwok and Tadesse (2006) have argued that international strategies are more conducive to risk reduction and increased profitability compared with globalization.

This latter argument is based on the premise that international challengers, especially country-centred players and geographic niche players, take a more conservative approach to cross-border expansion than worldwide players. For example, they are associated with organizations

that are looking to gain market share either within the home country or in a defined geographic region. Similarly, with the exception of continental leaders, they tend to focus on a relatively narrow market or a few market segments and attempt to benefit from economies of scale by providing a homogeneous range of products. Entry mode is variable, but for geographic niche players and continental leaders it is mainly organic, and cross-border activities are typically financed by profits rather than mergers and acquisitions.

Although international challengers might be more conservative than global players, they are not completely risk-averse. In particular, opportunistic challengers and continental leaders adopt a fairly offensive approach to internationalization. In this respect, it is interesting to observe how Santander, a geographic niche player (see Table A1.1), has apparently changed its strategy in the aftermath of the recent credit crisis and is now actively acquiring banks that were adversely affected by the crisis. Accordingly, although Santander is still operating within a 'homogeneous territory', it is adopting the more variable and aggressive entry mode more readily associated with opportunistic international challengers. This observation also serves to illustrate that bank strategy is a dynamic process, which can be very responsive to changes in the external environment.

Opportunistic international challengers, such as Lloyds TSB and Royal Bank of Scotland, have generally pursued strategies that are conducive to becoming market leaders in their domestic markets. However, from an international perspective they are not major players. For example, prior to the merger between Lloyds and TSB in 1995, Lloyds had closed down its investment banking business and had rationalized its branch network in Europe and the Far East. Similarly, TSB's strategy was to increase shareholder value by growing the domestic business via a series of well-conceived acquisitions. Accordingly, prior to the credit crunch, Lloyds TSB had a domestic rather than an international focus and only had significant international operations in two countries, namely, New Zealand and Brazil.

The opportunistic international challenger's strategy also reveals that there is no discernible pattern in terms of entry mode, standardization and integration of value-chain activities. This is undoubtedly because, although organizations that adopt this strategy are market leaders in their domestic markets, they are still evolving in terms of their cross-border strategies. Accordingly, they take an essentially opportunistic approach to international development and, as a result, there is little or no evidence of a long-term strategic plan.

It could be argued that the ability to react quickly and flexibly to emerging market opportunities is an important part of any long-term plan. Nevertheless, the almost ad hoc approach associated with opportunistic international challengers is a little disconcerting. Accordingly, although the reasons behind the Royal Bank of Scotland's problems, in the immediate aftermath of the recent credit crunch, were complex, it is perhaps not entirely surprising to find that it was classified as an opportunistic international challenger.

An examination of the global or worldwide players' strategies similarly provides some interesting insights into the cross-border strategies of banks. For example, the least common strategy was global luxury niche players, which consisted of only one organization, namely, MBNA (I). As the world's largest independent credit card issuer, specializing in affinity cards prior to its acquisition by the Bank of America in 2005, it is not surprising to find that its strategy is characterized by a focus on a narrow, relatively high-priced market segment and the provision of a homogeneous product range throughout the world. The nature of MBNA's business is also more conducive to licensing and franchise arrangements rather than mergers and acquisitions.

In contrast, the most significant global strategy, both in terms of tier-one capital and the number of banks, was transnational restructurers. The emphasis on market share and a diverse range of large business segments is a fair reflection of the activities of very large international banks. For example, the ING Group was formed by the merger of a commercial bank (Nationale-Nederlanden) and an insurance company (NMB Postbank Groep) in 1991. It is a major commercial bank, but it is also an important player in asset management and the world's largest life insurer. Since the merger it has continued to expand its international activities, predominately by mergers and acquisitions, to such an extent that the majority of its business is now located in foreign markets. However, it does not exclusively rely on mergers and acquisitions, but has also created start-up ventures in emerging markets, such as China and India.

The transnational restructurer strategy can, however, lead to complex organizational structures and a duplication of activities. Moreover, the emphasis on mergers and acquisitions can also be construed as a fairly aggressive approach to global expansion. Bearing in mind the problems encountered by the Bank of America and JP Morgan Chase in the aftermath of the recent credit crunch, it is interesting to note that over 10 years ago Boot and Thakor (1996) concluded that competitive strategies which placed an overt emphasis on growth and size could lead to complex corporate governance structures and deflect from innovative thinking.

Global shapers place an emphasis on worldwide coverage but have a relatively narrow focus within a mass market. Accordingly, they provide a fairly comprehensive service within a niche or a segment of a mass market. HSBC, Citicorp and UBS, organizations that fall within the global shapers classification, are also regarded as being fairly innovative and relatively risk-averse within the sector. To illustrate this point, HSBC Holdings plc, the second largest banking and financial services organization in the world, is represented in almost 80 countries and territories in Europe, the Far East, the Americas, the Middle East and Africa. Its global network was formed by a combination of organic growth in Asia and major acquisitions in other regions of the world. The bank also has substantial exposure in developing and emerging markets, and has taken a fairly aggressive approach to diversifying its business from commercial banking into wealth management and consumer finance.

In the aftermath of the credit crisis, HSBC has emerged relatively unscathed, but UBS and Citicorp have succumbed to very heavy financial losses. To some extent this might be attributable to their aggressive and innovative approach to business. It is perhaps pertinent to note that Lord Turner (FSA, 2009) concluded that too much innovation within a highly deregulated environment can lead to excessive risk-taking, and that this was a major explanatory reason behind the recent credit crunch.

The fourth and final global strategy was quasi-global players. In many respects this is similar to global shapers, but firms adopting this strategy tend to be relatively more focused in terms of both their geographic scope and their portfolio of activities. For example, Deutsche Bank was traditionally involved in commercial and investment banking, and insurance. However, deregulation and the commensurate increase in competition have brought about a change in its competitive profile, which is now more concentrated on investment banking and corporate commercial banking. In terms of geographic coverage, until the Hong Kong Bank moved its headquarters to London, Deutsche Bank was the largest commercial bank operating in Europe. Its acquisition of Banker Trust in 1999 also established it as a major player in the United States equities markets. However, although it has operations in the Far East and the emergent markets, its presence compared with HSBC and Citicorp is marginal.

1.6 Conclusion

This chapter makes a potentially valuable contribution to the extant literature in a number of different ways. For example, to the best of our knowledge it is the only empirical study to apply the methodologies of

Atamer *et al.* (2000) and Bryan *et al.* (1999) to the internationalization of banks. In so doing it provides some interesting insights into *how* banks develop their cross-border business and *what* this involves. These are important considerations, because technological developments, the deregulation of financial markets and the emergence of global level playing fields have provided both the opportunity and the means for bank management to develop appropriate international strategies. The emergence and growth of the global economy has also increased market pull pressure on banks and made it imperative for bank management to provide a comprehensive global service to corporate customers. The recent banking crisis, however, could fundamentally change the future of international banking. To this extent, a more coherent and comprehensive understanding of the process of internationalization could be critical in helping individual banks adopt appropriate strategies and benchmark themselves against competitors.

These are important considerations, because this chapter has revealed that, in terms of international strategies, the banking sector is not homogeneous. Individual banks adopt alternative strategies, which reflect different organizational forms, different stages of corporate development, specific managerial and cultural considerations, and so on. Moreover, although the research method oversimplifies the categorization of international strategies, the findings do provide some pertinent insights into the diverse range of strategic approaches to internationalization in terms of geographic and segment scope, entry policy, standardization and integration of value-chain activities. It was also interesting to find that only a small number of large banks were truly global and that the vast majority of banks were international, meaning that they tended to focus on a few countries or a geographic region.

This emphasis on international strategies undoubtedly reflects the high investment costs and the additional risks associated with trying to provide broad-scope services throughout the world. However, it also implies that most banks are still evolving in terms of their international strategies and adopt a fairly cautious, incremental approach to internationalization. The extant literature also suggests that banks tend to move into host countries or regions on the basis of favourable regulatory conditions, or having cultural and social affinity with the home country. This raises the rather worrying possibility that international banking might be determined more by cultural and regulatory conditions than by the market potential of host countries.

The dominance of opportunistic international challengers suggests that most banks are opportunistic in their approach to

internationalization. The dominance of this strategy also meant that it was difficult to discern any real pattern, for example, for entry mode and standardization. This may reflect the fact that banks are not symmetric organizations and can, therefore, differ fundamentally in terms of their core activities and competitive strategies. There was also no strong evidence of a horizontal strategy in which banks perform similar activities in both domestic and foreign markets. To some extent, this finding was unexpected, because this is regarded as the norm for most multinational firms. Conversely, it could be argued that a vertical strategy is more conducive to the development of new proprietary skills, the spreading of risks and the diversification of business portfolios.

The research findings are, however, essentially preliminary and have a number of limitations. For example, by focusing on the largest banks in the world the sample is to some extent biased because it does not take into account the cross-border activities of smaller institutions. The use of tier-one capital as a proxy for the relative importance of each strategy is similarly far from ideal because it does not take into account the fact that different types of bank activity incur varying degrees of risk and different levels of capital. This is potentially important because banks typically provide a comprehensive range of commercial banking, investment banking and insurance services.

It would also be interesting to ascertain the relationship between the different international strategies and some measures of efficiency or profitability. Likewise, the recent credit crisis will undoubtedly have changed the internationalization strategies of individual banks. A comparison of the existing data set with some more recent information might, therefore, throw some light on the way in which the process of internationalization has changed in the recent aftermath of the credit crisis. The next stage of the research will, therefore, increase and update the data set and address these issues.

Note

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2

Governing British Banks

Andy Mullineux

2.1 Introduction

The idea for this paper was sparked by the decision of the UK Prime Minister, Gordon Brown, in February 2009 to ask Sir David Walker to undertake a review of the corporate governance of UK banks and to report by the end of that year. The post-September 2008 banking crisis had revealed weaknesses in bank corporate governance and internal risk controls, as well as bank regulation and supervision.

The focus of the paper is on deposit taking, joint stock, limited liability banks that have existed in the UK since the 1866 Banking Act, and its scope does not extend to consideration of other banking structures based on mutuality, partnerships (reinforced by the need to maintain fair reputation), non-limited liability and double liability arrangements, or state ownership. The corporate governance implications of each are different and warrant separate consideration, especially if big and complex banks are in the end to be broken up to deal with the moral hazard entailed in the 'too big to fail' problems and conflicts of interest within the complex structures. Nevertheless, some of the considerations may also apply to other shareholder-owned financial institutions that do not take deposits. Mullineux (2006) considers the corporate governance, or Principal-Agent (or 'agency') problem, relating to limited liability shareholder-owned deposit taking banks, and reviews related literature.

2.2 The corporate governance of banks

We first need to consider why the corporate governance of shareholder-owned deposit taking banks should be any different from non-deposit taking firms operating in the field of finance or elsewhere.

With the management as ‘agents’ and the shareholders as ‘principals’, the solution to the standard ‘Principal–Agent Problem’ is to align the interests of the management with those of shareholders using an incentive-compatible remuneration package.

To the extent that it was not fully understood before, one of the lessons of the ‘subprime’ and subsequent ‘Global Financial Crisis’ (GFC) is that such alignment is easier said than done and that the remuneration packages of bank employees, especially traders, also need to be carefully designed to avoid excessive risk in taking and the ‘mis-selling’ of products.

In the case of deposit taking banks, however, the depositors are clearly also stakeholders, and the interests of depositors differ from those of shareholders, who are willing to take on more risk in pursuit of a higher return. Depositors, by contrast, accept lower interest in return for safety.

Thus, even if they could be designed, remuneration packages that incentivized management to take risks in line with shareholder preferences would lead banks to take ‘excessive risks’ from the depositors’ perspective. Furthermore, shareholders are not a homogeneous group, but instead consist of small shareholders; hedge funds; domestic, and increasingly foreign, institutional investors (pensions and insurance funds, etc.); and, indeed, management.

This leaves individual banks open to ‘runs’ by depositors, as a result of a combination of ‘asymmetric information’ and the banks’ holding of reserves that are a small fraction of deposits, unlike money market mutual funds (MMMFs), whenever there is a concern about the steadfastness of a bank.

The literature based on information asymmetry concludes that runs on individual banks can develop into systemic crises via domino effects (Diamond and Dybvig, 1983). To reduce the risk of runs and contain systemic risks, the government needs to intervene to provide deposit insurance. However, this increases moral hazard, allowing the shareholders to encourage management to take more risks unless shareholders, and bondholders, genuinely face the threat of losing their money through bank closures. A pre-funded deposit insurance scheme, with risk-related premiums, is required in order to ‘tax’ risk-taking and allow small banks to fail without adversely affecting depositors. To achieve this, bank accounts in failing banks must be quickly transferred to sound banks.

‘Co-Co’ (‘Contingent Convertible’) bonds may also be a good idea, as these bonds convert to equity, putting bondholders at risk of loss, when

a bank hits low capital trigger points (Lloyds Banking Group issued a Co-Co in late 2009). This gives them a stronger incentive to monitor the riskiness of the banks they invest in.

Banks that are 'too big' or 'too important' to be allowed to fail are implicitly insured by the 'taxpayer' above and beyond the bank's contributions to the deposit insurance scheme, to which, incidentally, they often argue they should not be required to contribute, because they will not draw on them!

Such 'big' banks should be required to pay towards their implicit insurance (by being forced to hold more capital or liquid reserves than smaller banks, and perhaps also through a special tax levy) in order to protect the taxpayer, as proposed by the G20 in Pittsburgh in 2009. New, tougher, Basel Committee capital adequacy and liquidity ratio proposals were announced in November 2009 and have been dubbed 'Basel III'.

If, however, financial stability is a 'public good', should not the taxpayers contribute to its funding, along with the banks' shareholders, bondholders, depositors and borrowers? The more 'pooled' capital and liquid government-issued assets insurance there is, through deposit insurance and 'in-house' or within the bank, the less lending there can be, and borrowing will be more costly and saving less rewarding, unless the capital markets fill the void. The asymmetric information story of modern banking suggests this is unlikely.

Can we afford to eliminate the risk of financial crisis completely, if indeed that can be done?

2.3 The global financial crisis (GFC)

The GFC did not result from a traditional bank run by retail depositors, but from the collapse of interbank wholesale money markets and ultimately the 'shadow banking system'. It started with a 'North Atlantic Liquidity Squeeze' in Autumn 2007 (Mullineux, 2008). Counterparty risks were reassessed as a result of the 'subprime crisis' and its implication for derivatives, especially collateralized debt obligations (CDOs), and the mortgage-backed securities underpinned by subprime mortgages. A wholesale deposit run by the banks themselves effectively emerged.

The collapse of Lehman Brothers in September 2008 led to the collapse of the 'shadow banking system' based around MMMFs, hedge funds, special investment vehicles (SIVs) and 'conduits', interacting

with the banks. This made 'de-leveraging' necessary and resulted in a much stronger credit crunch than normal, leading to a major global recession.

There was widespread failure of bank regulatory and supervisory systems, bank corporate governance and internal risk control systems, and also the auditing of the internal controls and the risk-pricing of non-marketable financial assets. As before the 'Latin American Debt Crisis' of the 1980s that led to the initial Basel Accord ('Basel I'), banks had become severely undercapitalized given their risk exposures and historically astronomical leverage ratios.

Basel I, implemented from 1988, had pushed risk-related capital adequacy ratios up from 4 per cent to 8 per cent, while Basel II, implemented from January 2009 in the EU, allowed large banks to drop their ratio back towards 4 per cent. Furthermore, especially in Europe, a significant proportion of banks' 'tier-one' capital consisted of hybrid assets, rather than 'core' equity capital. Meanwhile, from the mid-1990s, the big banks had become increasingly reliant on short-term wholesale funding as opposed to retail deposits, and had reduced their liquid reserve holdings of Treasury Bills and similar securities to less than 1 per cent, thereby dramatically increasing leveraging. Leveraging was further increased by the use of 'off balance sheet' SIVs and 'conduits' to hold assets with much lower capital backing than required 'on balance sheet'.

It should be noted that, while there was lots of 'slicing and dicing' of securitized assets to 'alchemically' form CDO²s (Collateralized Debt Obligation – squared) of 'triple A' through to 'toxic' ratings, there was much less 'distribution' of risks going on than the supervisors realized. Why was this? The 'originate to distribute' model was perceived as good securitization, allowing the mortgage originators to securitize the mortgages and distribute the mortgage-backed securities (MBS) to institutional investors and, beyond the banking system, to insurance companies, for example, thereby spreading the risk. Credit risks on assets were also seemingly being dispersed using credit default swaps (CDS).

It turned out, however, that the buyers did not understand the risks, or were misled by credit rating agencies (CRAs), which earned fees for helping design the CDO²s. The CRAs thus faced a double conflict of interest in that they were paid by the entities they rated, rather than the bond purchasers, and that they helped design products that needed to be 'sold' by banks to turn a profit.

The collapse of Lehman Brothers in mid-September 2008 revealed that not only were the issuing banks holding onto tranches of CDO²s,

but in addition some were buying the 'triple A' CDO²s of other banks (e.g. European wholesale banks such as IKB in Germany), and holding them in off balance sheet 'conduits'.

Unless securitization resumes, and with it increased leveraging (though the G20 want this capped), credit will continue to be much harder and more expensive to raise. The objective must be to assure that in future risks are correctly priced and appropriately distributed.

The underpricing of risks in part reflects the risk-inducing remunerative structures of management, who were increasingly paid like managers of investment banks, or hedge or private equity funds, rather than deposit taking retail bank managers, and the fee and bonus structure of the traders and the mortgage brokers. The US mortgage brokers had an incentive to sell large quantities of inappropriate mortgages to subprime borrowers to earn fees. The investment bankers were eager to earn fees from securitizing and 'derivatizing' these mortgages following their 'aggregation'.

The CRAs earned fees for advising on the design and pricing of these innovative financial products and yet had little prior experience in rating derivatives (as opposed to bonds) and ended up using inappropriate models (no 'fat tails'). The MBSs, CDOs and CDO²s were often 'enhanced', or underwritten, by 'monoline insurers', but these too had little or no experience, having formerly specialized in the 'enhancement' of bonds issued by US municipalities.

Where do we go from here? First let us reflect on the sources of banking risks.

2.4 Sources of banking risks

Extending loans automatically leads to credit risk (i.e. default and late or partial repayment). Banks are 'delegated monitors' (Diamond, 1984) because the direct finance by 'depositors' of borrowers is inhibited by information asymmetries.

Credit risks are costly to 'screen' and 'monitor', and credit scoring has become widely used for consumer loans, leading to a decline in 'relationship banking' while arguably increasing banking efficiency (cost reduction). 'Loan to income ratios' remains a choice variable for bank lenders, as does 'loan to (house) value (price) ratios'.

Lending commonly also involves mismatching by maturity (and possibly also currency, leading to foreign exchange risk). Regulators have expected foreign exchange risk to be limited and/or hedged using derivatives since the Herstatt Bank collapsed in the early 1970s, but what of the recent mortgage lending in Euros or Swiss Francs by foreign-owned

banks in Central and Eastern Europe to customers earning salaries in local currencies?

Some maturity mismatching is inevitable to the extent that a large proportion of retail deposits are repayable on demand or at short notice and used by banks to make term loans that are not callable at short notice. This gives rise to re-funding (liquidity) risk and interest rate risk, unless that is passed onto borrowers using variable rate loans. The latter increase credit risk exposures because sharp and sustained rises in interest rates can make loans unaffordable. Hence bank lending requires an appraisal of the credit standing of the borrower, or 'due diligence', and a choice of maturity exposure.

'Covered bonds' of matched maturity could, for example, be used to fund fixed-interest fixed-term mortgages, as in Germany. The incentive to borrow short to lend long is greater the steeper the yield curve (when it is positively sloped).

The degree of leveraging of capital and retail deposits through exposure to wholesale funding (liquidity) risk is also a choice variable. Higher leverage (capital) ratios and liquidity ratios could discourage this, and so could reduced loan to retail deposit ratios, as proposed by the Basel Committee.

Asset price changes impact on the asset side of the balance sheet through 'mark to market' and 'collateral value' risks, and will also affect the cost of funding. Banks can choose which assets (in addition to loans) to hold and what sort of, and how much, collateral to hold (e.g. through their choice of loan to value ratios on mortgages).

Leverage (capital) and liquidity ratios could be raised by regulators in response to asset price acceleration and reduced in response to deceleration, leaving the short-term interest rate instrument free for inflation control. 'Proprietary trading' by banks through, for example, 'in house' hedge and private equity funds had increased dramatically in the run-up to the crisis and could be damped by increased capital or 'margin' requirements. Further proprietary trading could be banned, in accordance with the 'Volcker Rule',¹ to reduce conflicts of interest in investment banking and the use of retail deposits for 'casino banking'. A 'Tobin' financial transactions tax could also be used to discourage 'excessive' trading.

The banks can hedge, for a fee, many of these risks using derivatives, but more risk, at least potentially, leads to more profit in the 'long run'. Banks also act as counterparties to high fee-generating, and probably often mispriced, 'over the counter' (OTC) derivatives (including CDS). The regulators have responded by proposing to bring the issuance

and trading of derivatives onto markets with well-capitalized central counterparties. Opposition to this from investment banks concerned about loss of fee income has been strong. Corporate users are, however, concerned about the increased costs, in terms of lost liquidity through 'margin deposits' of exchange-based trading, and are lobbying hard on both sides of the Atlantic. Further, the central banks will have to stand behind the counterparties of increasingly international exchanges!

2.5 Re-regulating the banks

Ideally, the regulators should try to build in 'automatic (countercyclical) stabilizers' based around risk-related deposit insurance and capital requirements, leverage and liquidity ratios, and forward-looking 'general' and 'specific' provisioning. These can be thought of as equivalent to fiscal automatic stabilizers, with the regulations serving as 'taxes' on financial risk-taking. Some discretionary override will be required if asset price increases accelerate, and fraud would still need to be monitored and prosecuted.

Competition issues in particular will need to be dealt with if the banking markets continue to operate at their current high concentration levels, which have increased post-GFC. Cartelistic practices need to be monitored and prosecuted, and mis-selling of retail financial products and services likewise.

There is a strand of literature that posits a trade-off between competition and systemic stability in banking, and another alleging that banks would be unable to raise sufficient equity without a strong 'franchise value', that is, 'monopoly' or 'rent seeking' power. Financial innovation can be seen as an attempt to create market imperfections to extract 'economic rent'.

There is thus a strong case for a banking product or 'utility' regulator, given that banking is infrastructural (especially the payments system), and access to finance (including credit) should be assured to allow 'consumption smoothing' over the life cycle and in the face of irregular income. The US Administration and the UK's Conservative Party have proposed such a regulator, but banks are lobbying hard against it!

There should be a macro-prudential supervisor (probably the central bank, given that it needs to protect the 'lender of the last resort' insurance it provides against abuse), with the tools it needs, in addition to setting short-term interest rates, to do the job: for example, discretion to change 'leverage' and liquid reserve ratios, and so on. The macro-prudential supervisor also needs to regulate innovation in 'wholesale'

and investment banking markets in order to prevent the underpricing of risks.

There should also be a micro-prudential supervisor; this should probably be the deposit insurance fund, prefunded with risk-related premiums, given its incentive to prevent the fund being abused. The FDIC (Federal Deposit Insurance Corporation) in the US does a good job in this respect.

The micro and macro-prudential supervisors would have to liaise with each other, and with the Finance Ministry, or 'Treasury', which represents taxpayers, when dealing with big and/or 'important' banks that cannot be simply allowed to fail and have their deposits transferred to another bank under the auspices of the deposit insurance fund manager. The retail banking products and services 'utility' regulator would have to liaise with the prudential regulators, the competition authorities and the fraud prosecutors.

The US administration is proposing that separate institutions are assigned the above three tasks: micro and macro-prudential supervision, and 'utility', or retail product and service regulation. As ever, competing bills were developed in the Senate and the House of Representatives, but agreed legislation was seemingly forthcoming at the time of writing.

The Financial Services Authority (FSA) in the UK believes it should do all three of these tasks, *and* regulate and supervise the whole of the financial system (banking, insurance and the capital markets), much of it international, *and* also promote enhanced financial capability. The Bank of England seemingly demurs with regard to macro-prudential or 'systemic' supervision, but does not want the job without additional tools, and has little interest in micro-prudential and retail product and service supervision.

The FSA did not only fail in its task of micro-prudential regulation prior to August 2007; it also failed in its consumer protection role. Since the 'Cruickshank Report' called in 2001 for a payments system regulator, the UK commercial banks have been under almost continuous examination by the Office of Fair Trading and/or the Competition Commission for anti-competitive practices. There is substantial cross-subsidization, allowing 'free banking' to be offered to some, and hence not *all* customers are simply being 'treated fairly'. In 2010, the FSA took over the monitoring of the voluntary Banking Codes, hitherto monitored by a Banking Codes Standards Board appointed by the banks. The banks also self-regulated the payments system through the Association of Payments Clearing Systems (APACS), but, as a response to an EU Directive concerning payments system supervision, the FSA took over responsibility for this as well in early 2010.

It has been suggested that the FSA was too focused on consumer protection and was consequently distracted from its micro-prudential role. Further, it has made relatively little impact in raising 'financial capability', and hived off that activity to a specialist agency in spring 2010. In sum, the FSA seems to have enough on its plate without taking on macro-prudential supervision as well. No wonder Sir Adair Turner, its Chairman, asked for more and better-trained staff on taking office in September 2008!

The issues of whether investment banking should be separated from retail banking or 'narrow banking', in which banks only take deposits but do not lend, should be adopted are not considered in detail here. 'Narrow banking' essentially creates additional money market mutual funds and requires another 'bank' to lend to small and medium-sized enterprises (SMEs) and households. Additionally, there may well be 'economies of scope' to be derived from 'universal banking' and 'ban-cassurance'. In line with the 'Volcker rule', 'proprietary trading', the true 'casino banking', should not be part of a bank that takes retail deposits.

Following reviews by competition or 'antitrust' authorities, 'big banks' should instead be split up to increase competition, subject to allowing them to operate at minimum efficient scales. Note, however, that the domestic US banking market is bigger than that in the UK, which is bigger than that in Iceland, but is 'Europe' perhaps the relevant market for the UK and other EU member countries? In the US banks are not allowed to take more than 10 per cent of aggregate retail deposits. This may have been waived somewhat as a result of the crisis-induced mergers in the US, but not that much, because the mergers tended in the main to be between deposit taking banks and non-deposit taking investment banks. A British bank that was allowed to take 10 per cent or less of the UK deposits would be much smaller than the Lloyds Banking Group, Barclays or RBS, and much smaller than Citibank and Bank of America and the major Chinese and Japanese banks. In the Baltic States and Iceland, *inter alia*, the 10 per cent rule would result in miniscule banks. Would the British or Baltic country banks achieve minimum efficient scale and be able to compete internationally? Ten per cent of EU deposits might be a more realistic ceiling, perhaps. Studies of economies of scale and scope in banking suggest that a medium-sized US bank might be able to reach a minimum efficient scale.

2.6 The corporate governance of British banks

Banks should manage their own risk exposures by establishing adequate (audited) internal risk management controls. What were the auditors

doing in the run-up to the crisis? Evidence of misreporting at Northern Rock and RBS emerged in April 2010.

Regulatory checks and balances are clearly required to protect taxpayers from abuse of the implicit insurance of ‘important banks’, and also to protect depositors and the consumers of banking products and services.

Systems also need to be put in place to ensure that bank management does not take more risk than even shareholders (but which ones?) desire. The institutional shareholders proved to be ‘absentee landlords’, according to Lord Myners, the UK’s ‘City Minister’.

The ‘Walker Review’, launched by the UK Treasury in February 2009, looked into the corporate governance of UK banks and, in its interim report, proposed the bolstering of the current UK voluntary, ‘comply or explain’, ‘Combined Code’ on corporate governance with respect to banks, and perhaps also other firms. The Federal Reporting Council (FRC), which oversees the Combined Code, undertook in parallel a wider-ranging review of the code and also of the role of auditors, especially those of banks.

Walker’s main interim proposals included: better-trained chairmen and senior executives; better-trained non-executive directors who devote more time to the task; and more active involvement of institutional shareholders in remuneration committees, and more generally.

2.7 The Walker Report (2009)

The Walker Report was published on 26 November 2009, and a number of other developments relating to the corporate governance of banks soon followed.

Despite strong criticism from bankers of the alleged bureaucratic and ‘populist’ nature of the interim proposals, those proposals were largely maintained intact and were immediately endorsed by the UK government and the FRC, and more widely welcomed by institutional shareholders, *inter alia*. There are plans to give some of the recommendations statutory backing, and most of them, with some enhancements, were adopted by the parallel review of the UK’s Combined Code of Corporate Governance, which applies to all corporate entities, not just banks, undertaken by the Chairman of the Federal Reporting Council (Sir Christopher Hogg). The Combined Code, it should be noted, is voluntary and operates under a ‘comply or explain’ basis. It sets down principles of best practice, rather than well-defined rules.

The Walker Report concluded that the crisis was not only a failure of bank regulation and supervision, but also a failure of bank corporate

governance and internal controls. It demonstrated that the feedback received following the interim report had been considered, for example, by being more flexible on the time non-executive directors ('NEDS'), especially those serving as chief executives elsewhere, should devote to their roles. The banks' boards of directors ('Boards') would, however, bear the prime responsibility for bank risk management with the support of specialist risk committees.

Sir David Walker urged institutional shareholders to be tougher on the bank Boards, and this was strongly supported by Lord Myners, the Financial Services Secretary, or 'City Minister'. The Walker Report also recommended increased disclosure of top bankers' salaries and bonuses, without naming individuals. Lord Myners seemed keen to move further towards 'naming and shaming' individuals. The impact of the 50 per cent 'windfall tax' on bankers' bonuses, also announced in late 2009, might influence the ultimate decision. Most banks tended to pay the bonuses (and thus the tax), rather than curbing them, as hoped by the government. This was at the expense of the shareholders, it should be noted. The politically charged issue of bankers' pay and bonuses looks set to run and run, but perhaps UK shareholders will be stirred into action and try to influence decisions on remuneration, and thus dividend disbursement!

In response to promptings from Walker, Myners and Hogg, the UK's Investor Shareholders Committee, which represents the main institutional investors' groups (the Association of British Insurers, the National Association of Pension Funds and the Association of Investment Companies), has beefed up its code covering the responsibility of institutional investors and has renamed it the 'Stewardship Code'. It remains a voluntary 'comply or explain' code, but adherence to it is to be overseen by the Financial Reporting Council (FRC), which issued a consultation document on the code in January 2010 (FRC, 2010). Further, the FSA will require 'institutions' to disclose their commitment to the Stewardship Code.

The aim of this new code is to discourage 'free riding' by inactive institutional shareholders on the back of costly engagement by others. But some institutions feel they have insufficient information for effective 'engagement', and smaller institutions have less incentive to engage on a 'cost-benefit' basis. Lord Myners has made it clear that he thinks that statutory requirements to enforce engagement, as a responsibility to savers with life insurance and pension funds, may still be required, and that the Stewardship Code does not go far enough because self-regulation is inappropriate. The fact that an increasing majority of

shares are held by non-UK institutional investors further complicates matters.

Lord Myners is also concerned that the rapid growth in high-frequency trading on the stock exchange and stock lending to hedge funds, enabling 'shorting', will lead to increased 'short-termism', 'absentee shareholders' and 'ownerless corporations'! He has made a number of suggestions about how to combat such developments, including a financial transaction, or 'Tobin', tax, special privilege shares for long-term 'strategic' shareholders and a more prescriptive, statutorily backed, institutional shareholder code.

The FRC may yet tighten the Combined Code further than the Walker Report recommended with respect to the annual re-election of all Directors, not just bank chairmen. Sir David Walker himself now supports this. The combined code revisions aimed to change the 'tone' of the combined code in order to encourage board members to undertake critical assessments of their performance and to engage more openly with shareholders.

Sir Christopher Hogg's review of the Combined Code, like the Walker Report, emphasizes that directors should have appropriate skills, devote sufficient time to their jobs and subject themselves to external evaluation every three years. It is not yet clear by whom! The alignment of remuneration with long-term interests is also emphasized. The Walker Report was more prescriptive in this respect, recommending that banks defer half of all discretionary pay for three to five years. The proposed revision to the Combined Code was under consultation until March 2010. Overall there remains a lack of clarity about the relative roles of NEDs, institutional and other shareholders, and auditors in the UK corporate governance system. This is particularly the case for banks, where fiduciary duties to depositors and taxpayers need to be recognized and auditors risk sparking 'bank runs' when 'qualifying' the accounts of banks.

There have also been related and widespread calls to improve corporate ethics, especially in banks, not just their corporate governance and internal risk controls. Whether this can be inculcated in future bankers by business schools is debatable, but better regulation and supervision designed to replace the current distortionary regulations are clearly required. These need to be incentive-compatible and work with the market using automatic financial stabilizers. Bailouts should ideally be eliminated to curb moral hazard and protect taxpayers, as well as depositors. This may ultimately require breaking up big banks so that they can be allowed to fail, since the threat of bankruptcy is an essential part of any capitalist corporate governance system. To curb the moral

hazard, there needs to be credible threat of failure in which bondholders, as well as shareholders, stand to lose money. Ultimately, it may be necessary to eliminate all potential conflicts of interest, rather than rely on 'Chinese Walls' or improved moral and ethical behaviour!

The UK government has hitherto eschewed breaking up 'too big to fail' banks, and instead Lord Myners proposed 'recovery and resolution plans', or 'living wills', in mid-December 2009. These are to be 'trialled' on a dozen or so large UK banks with the aim of preventing the uncertainty that followed Lehman's collapse. The various US bank rescue schemes (such as TARP [Troubled Asset Relief Program] and TALF [Term Asset-Backed Securities Loan Facility]) have, however, potentially increased moral hazard by encouraging big banks to expect future bail-outs if they can be afforded by the taxpayer!

The 'Basel III' framework, proposed in November 2009, was tougher than expected with respect to capital, liquidity requirements and leverage ratios. The proposals included phasing out 'hybrid' capital. Consultation and impact assessment took place before they were finalized in a weaker form in September 2010, and the requirements are to be phased in from the end of 2010 over a two-year period, or perhaps longer if bank lobbying is successful! This all seems rather slow, given the increased concentration in banking and heightened moral hazard. Banks that get too close to the regulatory minimum capital ratios may not be allowed to pay dividends or discretionary bonuses, and banks will be expected to build up buffer stocks of capital during booms in a counter-cyclical manner.

With regard to the review of auditors by the FRC, auditing firms will be subject to their own corporate governance code, requiring them to appoint independent NEDs to their boards in 2010. The UK is taking a lead in this respect, but there are comparable recommendations in the US and the EU.

Finally, David Miles, a former member of the UK's Monetary Policy Committee (MPC), has warned that increased capital and liquidity requirements and leverage ratios would lead to more restricted bank lending. He also called for an end to tax relief for banks, and other businesses, on interest payments in order to reduce the bias towards debt, as opposed to equity, finance. This would further increase the relative cost of bank funding and reduce the supply of credit. Equity finance might expand as a result, however, and this might improve the corporate governance of banks, and indeed other businesses.

Does more need to be done to ensure that the interests of the depositors and taxpayers, and perhaps Co-Co bondholders, are properly represented on bank boards? Would a bank utility regulator be sufficient

to safeguard the interests of consumers of retail financial, especially banking and insurance, products and services, or should depositors and other consumers also be represented on bank boards?

2.8 Concluding remarks

Is much tougher regulation of banks the answer? We have been here many times before, and each post-crisis regulatory tightening is eroded by increased 'forbearance' and 'regulatory capture' in the euphoric belief that the next boom, the one being experienced at the time, is fundamentally different and 'IT', a major financial crisis followed by a major economic recession or depression (Minsky, 1982), will never happen again.

'Over-tightening' of regulations will, in all likelihood, lead to slower growth, but is this true on average over a number of cycles? That is, will it reduce 'trend' growth or might it even increase it?

'Too big to fail' remains a problem and we may have allowed 'financial capitalism' to develop into a 'financial oligarchy' that thinks it can do what it wants until Armageddon, when the taxpayers cannot afford to bail out the banks.

Better and more focused supervision is clearly required. Micro-prudential and macro-prudential regulation should be separated from utility, retail products and services, and regulation.

Remuneration packages for supervisors need to be improved to increase the quality and status of the 'gamekeepers', but who should pay for the supervisors?

Better corporate governance of banks is desirable. But do the institutional investors have the incentives to enforce it, and are they not increasingly divided in terms of their interests? Can we rely on independent NEDs instead? Prior to the GFC, institutional investors, seeking high returns on equity, actually encouraged increased leveraging and risk-taking to improve returns, it should be remembered!

Would a 'turnover' or financial transactions tax help to foster better 'stewardship' and 'long-termism', and less socially useless short-termists' financial activity?

The ideal would be better-managed banks! Internal risk management controls might be improved by raising the status and remuneration of the risk managers. Auditors should be required to monitor internal risk controls vigorously.

The ethical and moral standards of bank management and employees should be raised,² but bringing about a fundamental change in 'culture'

takes a long time. However, increased reliance on general principles, rather than rules and 'box ticking', seems like a good idea.

It may be better to restructure the banking and wider financial system to remove the temptations created by conflicts of interest, rather than trying to manage them using 'Chinese Walls'. This would require a much more far-reaching restructuring of the financial sector in London and elsewhere. It would essentially lead to a return to the pre-1986 'Big Bang' days of 'gentlemanly capitalism' (Augar, 2000), where, in the City of London, underwriting, broking, market making, trading, and asset and wealth management businesses are not combined into US-style investment banking institutions. Conflicts of interest in retail banking, linked to incentivizing sales of products and services, regardless of whether they are appropriate to customers, such as 'subprime' mortgages and payment protection insurance, would also have to be tackled, and this would be the job of retail banking (and insurance) utility regulators.

The 'Dutch dyke problem' remains in the sense that it is too costly to reduce the probability of flooding in the Netherlands to zero, and likewise in the case of eliminating the risk of financial crises. Bubbles are arguably already inflating again. Further, the 'global imbalances' that helped generate the crisis by providing the US, and the UK, with an inflow of cheap capital have not been resolved.

Finally, the financial oligarchy remains largely unbowed and is clearly ready for 'business as usual', and indeed even better profits and salaries than before the GFC! So 'IT' could well happen again, and perhaps in the not too distant future, especially now that the recent 'Greek' and 'Euro' crises have demonstrated that the short-term 'Keynesian' remedy for economic depression also has its limits and there are no riskless medium and long term assets for banks to invest in!

Notes

1. Which was proposed in the Group of Thirty (G30) Special Report (2009).
2. In a speech in 1933, J.P. Morgan distinguished between errors of judgement (about risks) and errors of principle.

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3

Changes in Board Composition and Compensation in Banking from 1999 to 2008

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3.1 Introduction – board composition and compensation literature review

A board of directors is one of the most important corporate governance instruments available to banks. Another is the design of compensation packages for managers and directors to align their goals with those of other bank stakeholders: owners, creditors, depositors, taxpayers and regulators. Stakeholders can complement monitoring with incentive pay schemes by making the manager a residual claimant to the additional value obtained by his/her actions. However, compensation models for banks do not only have to align managerial and shareholder incentives, but must also avoid excessive risk-taking that may result in systemic risk (Bolton *et al.*, 2010; Gordon, 2010).

In fact, Bebchuk *et al.* (2002) state that CEOs (Chief Executive Officers) exert too much power over the boards of directors, which distorts optimal compensation contracts. To balance such pressures on the directors, one solution is to include high-powered incentives in executive compensation as a partial remedy for the agency problem. One expression of this power is the appointment of the CEO as chairman of the board. Incentives to executives and independent boards of directors are complementary instruments of corporate governance. Ozerturk (2005) shows that board monitoring intensity and performance sensitivity to CEOs' pay increase with boards' independence.

Cremers and Palia (2010) summarize two theories about compensation and corporate governance. The first theory states that an optimal contract for compensating a CEO is a trade-off between explicit and implicit

incentives, such that the explicit compensation increases as the CEO's career concerns decrease. The second theory to explain CEO compensation postulates that the rewards for exerting managerial effort are spread across all future periods to achieve inter-temporal risk-sharing.

In the banking industry, boards are also a key mechanism to advise managers on strategy identification and implementation (Andrés and Valledado, 2008), and their role becomes even more critical when referring to a more complex business such as the financial business. Directors need to obtain information from CEOs and managers to carry out their task. This need explains the advantage of having an adequate mix between executives and non-executives on the board (Andrés and Arranz, 2010). Thus, Kumar and Sivaramakrishnan (2008) predict an ambiguous relation between boards' dependence and managers' equity-based compensation which emphasizes the existence of trade-offs in the board composition and compensation decisions. Equity-based compensation should induce CEOs to place lower weight on short-term stock prices and greater weight on long-term stock prices (Bebchuk *et al.*, 2010).

Although banking entities, due to their unique status, are subject to intense regulation, basic corporate governance problems remain with two additional issues: depositors, instead of shareholders, as the main risk-bearers (Caprio *et al.*, 2007); and banking opacity, which is related to higher information asymmetries and more difficult monitoring (Prowse, 1997a, b; Caprio and Levine, 2002; Macey and O'Hara, 2003; Salas, 2003; Levine, 2004). To solve the governance problem between investors and managers, there are some alternative mechanisms to reduce agency conflicts (Li, 1994; Bathala and Rao, 1995; Mak and Li, 2001), such as the legal protection of investors' rights, the ownership concentration, and the board of directors' composition and compensation.

Laws vary greatly between countries, partially because of significant differences in legal origin. While civil law countries give investors weaker legal rights, common law countries provide their shareholders and investors with stronger protection (La Porta *et al.*, 1998). A particular example of these countries' legal differences is found in the banking business when referring to the supervisory power of authorities to prevent and correct problems in the financial sector (Barth *et al.*, 2006). It is expected that those banks located in countries with poor supervisory power will cope with a potential problem of investors' expropriation by using substitute mechanisms of corporate governance such as the board compensation and composition. We can conjecture that banks with their parent companies located in countries whose authorities have poor supervisory power may benefit from monitoring boards, which

will result in bigger and more independent boards with optimum compensation policies.

Ownership concentration is also understood as a governance mechanism that can substitute for the board in its monitoring role, and it also defines the composition and compensation of the board. On the one hand, when there is a blockholder, the board is composed of fewer directors, which diminishes decision-making costs (Kieschnick and Moussawi, 2004). On the other hand, blockholders often encourage the advisory role of the board, supporting the inclusion of outsiders on the boards (Bathala and Rao, 1995; Kieschnick and Moussawi, 2004). However, the meagre literature on banking boards shows that blockholders substitute for the board monitoring role by reducing not only the number of directors, but also the percentage of independents (Belkhir, 2009).

Our focus in this chapter is on the relation between board composition and CEO/Chairman compensation. We study the characteristics of the board, the experience of the CEOs and chairmen, the composition of pay in performance and non-performance compensation schemes and the differences in compensation among countries. We find that, where compensation only consists of salary, the bank becomes too conservative and ends up taking a suboptimal level of risk; on the other hand, if the compensation package consists solely of equity-linked payment, the bank managers end up building risky loan portfolios. We also find that bank executives' compensation schemes have to account for leverage, regulation and deposit insurance along with the traditional performance incentive framework. Our final goal is to provide insights into how board independence and CEO compensation interact in large commercial banks in Europe and the USA.

3.2 The data

We study the relations between board composition and compensation policies of commercial banks from six OECD countries during the period 1999–2008. Information to build the panel data was mainly obtained from Boardex Database and Spencer Stuart Board Index. We obtained complementary information on boards for the most recent periods from the banks' websites. We used Bankscope and Thomson One Banker to obtain full data about ownership structure.

The database includes banks from two common-law countries (the UK and the USA) and four civil-law countries (France, Italy, the Netherlands and Spain). All of them are developed countries with well-functioning legal and institutional environments. Our sample is comprised of banks

that represent only 32.2 per cent of the total number of banks in the six countries, but about 80 per cent of banking assets and equity. Thus, our sample contains the larger commercial banks of France, Italy, the Netherlands, Spain, the UK and the USA.

3.3 Descriptive analysis

We start in 1999 with a sample of 67 of the largest banks in France, Italy, the Netherlands, Spain, the UK and the USA. In 2008, our sample includes the 93 largest banks of these countries. The lack of information for some banks in 1999 explains the changes in the number of banks from the beginning to the end of the period. None of the banks in the sample is under government or public institution majority control. In 1999 the CEOs of banks had one of their best years in compensation; it was just before the dot-com financial markets crisis of the 2000s and after several years of reporting increasing profits. At the other end of the period of study, 2008, we saw the collapse of the financial system, with the failure of Lehman Brothers as the key event in a tough year for financial institutions around the world.

The use of large commercial banks to study compensation should take into account two important factors: first, compensation packages for large banks must align managers' and shareholders' incentives; and, second, such compensation schemes must curb excessive risk-taking in those banks more prone to systemic risk because of the moral hazard concerns associated with the 'too big to fail' condition.

The banks in our sample are quite homogeneous in their Q ratio, their return on assets and their board size. The average Q ratio for the banks in our sample is higher than one, the return on assets is 1 per cent and the annual shareholder market return is around 22 per cent. The mean and median values are quite close for each of the measures of performance, with a certain homogeneity in the Q value and return on assets (ROA) of banks among countries.

Table 3.1 shows that French banks have the largest boards. French and British banks are, on average, the largest institutions when measured by total bank assets in millions of USD (SIZE). USA banks show the highest return on assets and Tobin's Q proxy, although French and Italian banks have the highest shareholder market returns.

In Table 3.2 we observe that, as an average, the percentage of non-executive directors has increased by more than 8 per cent during the period of analysis in the boards of the large European and American banks. In particular, the percentage of non-executives (SD ratio or

Table 3.1 Average values per country for the banks in the sample, 1999–2008

	BOASIZE	Ln (SIZE)	Q	ROA (%)	SMR (%)
FRANCE	17.264	12.0600	1.021	0.3495	31.15
ITALY	15.426	4.3735	1.192	0.8235	31.05
NETHERLANDS	14.000	6.1142	N.A	0.5600	N.A
SPAIN	14.731	8.0233	1.092	0.7926	20.97
UK	15.524	9.8068	1.082	0.7645	15.31
USA	15.203	8.4005	1.213	1.437	19.37

BOASIZE is the number of total directors per bank, Ln (SIZE) is the Napierian logarithm of bank total assets in millions of USD, Q is the ratio of market value over book value, ROA is the return on assets and SMR the shareholder market return.

Table 3.2 Independence of the board, and age of the CEO and chairman of the banks in the sample

	SD Ratio			AGE			CEO=Chairman	
	2008	Diff 2008– 1999	Diff 2008–4	2008	Diff 2008– 1999	Diff 2008–4	% banks 2008	% Diff 2008– 1999
All in the sample	69.63%	8.53%	0.27%	59.92	–0.97	0.83	57.29%	–3.69%
CEO ≠ Chairman	63.48%	–0.87%	–1.28%	53.73	–2.17	0.47		
Chairman = CEO	75.33%	20.92%	–0.54%	60.82	0.17	0.14		

SD ratio is the percentage of non-executives in the bank board; Age is the age of the CEO or chairman on 31 December, % of banks; CEO=Chair is the percentage of banks where the same person is CEO and chairman of the board.

quotient between non-executive directors and total number of directors) has increased in boards where the CEO has simultaneously taken on the role of chairman of the board of directors. In contrast, in those banks where the roles of CEO and chairman are kept separate, there is no variation in the independence of the board. We also observe that the number of banks in which the same person is chairman and CEO has increased by almost 4 per cent. Finally, the age of those who assume the main management jobs has barely changed in the first decade of the new century. Only in the role of CEO do we observe that the executives are now a couple of years younger than they were in 1999. CEOs tend to be younger than those who become chairmen of the board.

Table 3.3 Experience of CEOs and chairmen of the banks in the sample

	Boards to Date Quoted	Boards to Date Private	Boards to Date Others	Current Boards Quoted	Current Boards Private	Current Boards Others	Time in Role	Time in Org	Time on Board
Panel A: Situation in 2008									
All in the sample	3.87	6.53	1.14	2.01	3.40	1.11	4.89	12.28	9.30
CEO≠Chairman	3.05	6.05	1.00	1.81	3.21	1.00	3.39	9.32	5.42
Chairman	4.17	6.71	1.16	2.08	3.46	1.13	5.44	13.37	10.72
Chairman=CEO	2.73	5.13	1.14	1.70	2.80	1.20	6.81	15.78	12.66
2008-1999									
Mean differences	Boards to Date Quoted	Boards to Date Private	Boards to Date Others	Current Boards Quoted	Current Boards Private	Current Boards Others	Years in Role	Years in Org	Years on Board
Panel B. Mean Differences between 2008 and 1999									
All	0.28	0.52	0.14	-0.63	-0.03	0.11	0.90	1.27	1.26
CEO≠Chairman	0.34	-0.11	0.00	-0.19	-0.43	0.00	0.08	1.29	1.05
Chairman=CEO	-0.75	-0.54	0.14	-0.70	-0.20	n.a.	3.13	5.73	5.97
2008-4									
Mean differences	Boards to Date Quoted	Boards to Date Private	Boards to Date others	Current Boards Quoted	Current Boards Private	Current Boards Others	Years in Role	Years in Org	Years on Board
Panel C. Mean Differences between 2008 and 2004									
All in the sample	0.41	0.46	0.11	-0.20	0.43	0.11	0.47	-0.15	-0.10
CEO≠Chairman	0.19	-0.14	0.00	-0.19	-0.14	0.00	0.15	-1.07	-0.98
Chairman=CEO	-0.55	-0.14	0.14	-0.39	0.30	0.20	0.63	0.13	1.11

Boards to date is the number of additional boards in which CEOs or chairmen have participated in the past, distinguishing between boards of quoted firms, boards of private firms and any other boards of which they were members. *Current boards* indicates the number of boards on which they are serving simultaneously with their role as CEO or chairman. *Years in* is the time the CEO or the chairman has been either in the *role*, in the *organization* or a *board member* from the start until 31 December of the indicated year.

Table 3.3 shows that chairmen of banks are more experienced than CEOs. Whether in the role of chairman or holding both roles, they have been on more quoted boards than the CEOs prior to their current position. They have also spent more time than the CEOs both in their current role and also in the bank and in the board.

We observe that compensation for bank chairmen has decreased on average in 2008 when compared with the situation in 1999 (Table 3.4). Such reduction is mainly in bonus and equity-linked compensation for those who are both chairman and CEO. On the other hand, the compensation for CEOs has increased, particularly in salary, pension and equity-linked options.

In terms of total compensation and accumulated wealth, it is worth observing the different patterns that emerge when we compare CEOs with those who are both CEO and chairman. Like the reduction in the number of banks where the same person has both roles, we also observe a reduction in the total compensation and in the accumulated wealth for those who hold the dual role of chairman and CEO. Conversely, we observe an increase in the compensation of the CEOs with no chairman responsibilities.

Table 3.3 shows that most of the difference in experience and independence of the board is due to changes in the first years of this century. Since 2004 there have been few changes in the independence of the boards, the age of the CEO and chairman, the boards in which they participate or the time they have been in the job. In 2004 most of the codes of good governance were in place, resulting in much greater standardization than in prior years. The differences in compensation in the last four years show an increase in equity-linked compensation and a reduction in direct compensation for CEOs and a reduction of direct compensation and equity-linked compensation for those who are both chairman and CEO. Much of such reduction is due to figures related to compensation by performance (Table 3.4). Starting in 2008, the banks were hit by the financial problems that precipitated the crisis. Therefore such difference in compensation could be explained by the economic crisis that has hit the banks' bottom lines.

When we analyse the experience and compensation of CEOs and chairmen by country, we find some interesting facts. Using the data available for the 2008 fiscal year, we observe that French banks have the lowest independence in their boards, with an average of 35 per cent of non-executives. The next country is Spain, where the bank boards are evenly divided between non-executive directors and executive directors. At the other extreme, we find that banks in the USA and

Table 3.4 Compensation of CEOs and chairmen

(Thousands of USD)	Direct Compensation		Direct Compensation Mean difference		Equity-Linked Compensation		Equity-Linked Mean difference	
	2008	2008-1999	2008-4	2008-1999	2008	2008-1999	2008-4	2008-1999
Panel A: Direct and Equity-linked Compensation								
All in the sample	985.57	-137.79	-788.02	-788.02	6,904.30	-9,666.23	2,426.09	2,426.09
CEO≠Chairman	1,149.97	253.76	-979.52	-979.52	6,610.28	3,771.71	3,532.67	3,532.67
Chairman=CEO	909.00	-778.68	-1,117.09	-1,117.09	6,846.32	-25,161.45	-488.58	-488.58
Panel B: Mean Differences in the Components of Direct Compensation								
	Salary		Bonus		Compensation Pension		Other	
Mean differences	2008-1999	2008-4	2008-1999	2008-4	2008-1999	2008-4	2008-1999	2008-4
All	187.46	-62.81	-812.08	-765.00	531.09	562.74	64.48	33.68
CEO≠Chairman	271.48	-162.58	-216.77	-1,086.93	44.72	173.78	63.54	0.12
Chairman=CEO	-39.97	-174.32	-2,103.83	-546.46	49.65	59.77	44.95	97.36

(Thousands of USD)	2008 Total Annual	Total Annual Mean difference 2008–1999	Total Annual Mean difference 2008–4	2008 Accumulated Wealth to date	Accumulated Wealth Mean difference 2008–1999	Accumulated Wealth Mean difference 2008–4
Panel C: Annual and Accumulated Compensation of CEO and Chairman						
All in the sample	5,259.63	-3,384.53	618.56	30,622.06	-122,072.13	-35,549.88
CEO≠Chairman	5,116.13	2,480.42	550.84	19,831.12	3,830.95	-13,891.14
Chairman=CEO	6,078.71	-17,511.50	-758.11	36,275.69	-330,531.45	-47,667.62

Direct compensation is the amount in thousands of USD on average made by a CEO or chairman. *Direct compensation* includes: salary, bonus, pension benefits and others. *Equity-linked compensation* includes the thousands of USD on average made by a CEO or a chairman due to compensation by shares or by call options on bank shares. Total Amount is the total amount that a CEO or chairman makes annually, including all types of remuneration. Accumulated Wealth is the average accumulated wealth of CEOs and chairmen during all the time they are in that role in the bank.

the Netherlands have a higher percentage, on average, of non-executive directors on their boards: more than 84 per cent for USA banks, and 74.5 per cent for Dutch banks. A percentage above 50 per cent of external directors is the most common situation in the banks in our sample. If we look at the ages of CEOs and chairmen at the end of 2008, we find that CEOs tend to be younger than chairmen. The youngest bank CEOs are in Spain, well below 50 years old, while French bank CEOs are above 60 years old. In the USA we find the youngest chairmen, with ages under 60 years old, whereas chairmen in the rest of the countries, on average, are over 60 years old, with French banks having the oldest chairmen (Table 3.5).

There are substantial differences in the number of banks where the same person holds the roles of CEO and chairman. In France, the Netherlands and the UK banks avoid having the same person in both positions, whereas in Spain and the USA 78 per cent of the banks have CEOs who are also chairmen (Table 3.5, panel A).

If we measure the experience of chairmen by the length of time they have held the position, the Spanish banks' chairmen are the most experienced, having been on the job for an average of almost 11 years, followed by the Italian banks' chairmen with eight years in the role. Spanish banks' chairmen have devoted an average of 16 years to the bank when they finally become chairman and they have 13 years of service on the board. Thus, Spanish banks' chairmen know their organization and the board they chair quite well. The country with the next most experienced chairmen is Italy, where those executives have been in the job for an average of eight years and have more than 21 years within the bank. At the opposite extreme are the UK banks' chairmen, with as little as two years in the job, and the French chairmen, with more than four years in the job. These two countries have adopted the recommendation of having two different persons in the roles of CEO and chairman to improve bank governance (Table 3.5, panel A).

There are fewer differences among the countries in the sample regarding the years CEOs have been in the role. Italian banks' CEOs have the longest time in the position, more than five years in 2008, followed by the French and Spanish CEOs with a little under five years on the job. However, CEOs in the Netherlands, the UK and the USA have about two years of experience in their jobs. Most of the current CEOs have been with their banks for at least eight years; the Spanish CEOs have worked in their banks the longest, for an average of 18 years with their current bank. French CEOs have the longest tenure on their boards prior to becoming CEO (five years); in most cases the CEO joins the board when

Table 3.5 CEO and chairman experience by country

2008	SD Ratio	Age	% banks CEO=Chair	Boards		Boards to Date Private	Current		Years in Role	Years in Org	Years on Board	
				to Date Quoted	Boards Quoted		Boards Private	Boards Quoted				
Panel A: Situation in 2008												
France all	35.63%	62.30	0%	6.90	15.90	3.60	7.11	4.80	9.03	8.78		
France CEO	41.00%	61.20	0%	7.60	18.00	3.60	7.00	4.76	9.68	9.18		
France Chairman	41.00%	63.60	0%	8.00	12.60	4.00	8.50	4.54	9.72	9.32		
Italy all	57.26%	61.96	35%	4.86	9.69	2.50	5.48	5.18	12.19	7.96		
Italy CEO≠Chair	59.00%	50.75	35%	4.00	6.14	2.25	2.60	5.24	8.31	5.24		
Italy Chair=CEO	48.71%	67.14	35%	4.86	11.14	2.86	7.67	8.04	21.81	12.96		
Netherlands all	74.50%	59.00	0%	6.25	7.25	2.25	1.75	1.15	5.13	3.33		
Netherlands CEO	74.50%	54.00	0%	2.00	3.00	1.50	2.00	1.80	5.60	2.00		
Spain all	51.73%	57.00	78%	3.45	4.64	1.91	2.13	8.59	16.13	10.51		
Spain CEO≠Chair	43.00%	47.50	78%	1.00	1.00	1.00	1.00	4.55	18.40	4.55		
Sp Chair=CEO	56.71%	61.00	78%	3.86	5.29	1.86	2.20	10.99	16.44	13.00		
UK all	58.91%	57.32	10%	4.21	5.80	1.53	3.94	2.19	7.83	4.42		
UK CEO≠Chair	60.80%	51.88	10%	2.38	4.00	1.38	3.57	2.11	8.61	4.20		
UK Chairman	57.33%	61.27	10%	5.55	7.27	1.64	4.20	2.25	7.15	4.61		
USA all	84.33%	60.02	78%	2.78	4.30	1.69	2.06	5.03	13.83	11.47		
USA CEO≠Chair	82.70%	54.92	78%	2.25	3.42	1.42	2.13	2.24	9.95	5.85		
USA Chair=CEO	84.64%	59.58	78%	1.98	4.03	1.45	2.00	6.00	14.76	12.64		

Continued

Table 3.5 Continued

2008-1999	SD Ratio	Age	% banks CEO=Chair	Boards to Date Quoted	Boards to Date Private	Current Boards Quoted	Current Boards Private	Time in Role	Time in Org	Time on Board
Panel B: Mean Differences in Experience between 2008 and 1999 by Country										
France all	-14.04%	9.97	-50.00%	0.57	11.57	-0.07	5.11	2.33	-0.57	4.18
France CEO≠Chair	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a
France Chairman	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a
Italy all	1.56%	-2.59	-25.00%	1.62	2.40	0.02	0.17	0.69	1.33	0.53
Italy CEO≠Chair	-29.50%	-5.42	-25.00%	1.17	-4.26	0.25	-3.40	0.83	3.33	0.43
Italy Chairman	9.15%	-1.81	-25.00%	1.80	5.00	-0.07	1.38	0.64	0.40	0.48
Italy Chairman=CEO	14.88%	-0.86	-25.00%	1.75	5.27	0.41	3.00	3.71	10.56	4.81
Netherlands all	-11.50%	0.50	0.00%	1.75	-5.25	-1.25	-3.50	-3.93	-5.78	-7.58
Netherlands CEO≠Chair	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a
Spain all	-2.73%	-4.36	57.78%	0.45	-0.46	-0.24	-0.08	3.72	2.50	-0.28
Spain CEO≠Chair	-9.40%	-6.83	57.78%	-0.20	-1.00	-0.20	-1.00	0.73	7.02	0.55
Spain Chairman	-2.08%	-4.63	57.78%	-0.13	-0.98	-0.64	-0.05	3.96	0.60	-3.19
Spain Chair=CEO	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a
UK all	-1.89%	-2.35	-2.50%	0.34	0.93	-1.14	0.85	-1.11	-0.14	-1.63
UK CEO≠Chair	0.00%	-3.41	-2.50%	-0.05	-1.43	-0.34	0.40	-0.44	-0.20	-0.90
UK Chairman	-3.47%	-3.30	-2.50%	-0.03	2.70	-2.22	0.70	-2.24	-0.66	-2.79
USA all	5.33%	1.25	-1.57%	-0.76	-0.55	-1.00	0.26	1.96	4.24	6.04
USA CEO≠Chair	-11.30%	-2.58	-1.57%	-2.25	-1.08	-1.58	0.13	1.69	8.80	4.70
USA Chairman	8.17%	2.19	-1.57%	-0.46	-0.41	-0.89	0.27	2.10	3.53	6.45
USA Chairman=CEO	11.64%	1.24	-1.57%	-0.80	-0.09	-0.66	0.43	1.81	3.39	7.27

2008-4	SD Ratio	Age	% banks CEO=Chair	Boards to Date Quoted	Boards to Date Private	Current Boards Quoted	Current Boards Private	Time in Role	Time in Org	Time on Board
Panel C: Mean Differences in Experience between 2008 and 2004 by Country										
France	-5.38%	5.30	0.00%	0.03	5.15	-0.53	1.40	1.51	-0.10	2.69
France CEO≠Chair	0.00%	4.95	0.00%	2.10	5.00	-0.15	1.75	1.56	-0.79	4.28
France Chairman	0.00%	5.85	0.00%	-0.25	4.10	-0.50	2.17	1.17	1.95	2.05
Italy	4.39%	-0.29	-26.90%	-0.14	0.81	-0.50	1.40	0.81	2.88	1.44
Italy CEO≠Chair	-2.25%	-0.25	-26.90%	-0.90	-3.36	-0.85	-1.00	1.14	-0.60	0.49
Italy Chairman	6.56%	-0.42	-26.90%	0.16	2.39	-0.36	2.02	0.67	4.14	1.68
Italy Chairman=CEO	4.21%	-1.09	-26.90%	-0.45	1.30	-0.07	2.33	2.75	9.89	4.92
Netherlands	0.00%	-2.00	0.00%	2.58	-3.35	0.08	-2.45	-2.43	-4.66	-6.46
Netherlands CEO≠Chair	0.00%	-3.00	0.00%	0.67	-5.00	0.50	-1.50	-1.10	-0.73	-4.33
Spain	2.03%	-0.33	27.78%	0.25	0.54	0.11	0.13	4.30	0.87	1.49
Spain CEO≠Chair	1.33%	-7.50	27.78%	-0.33	-1.00	0.00	-0.67	2.68	7.53	1.78
Spain Chairman	0.52%	1.38	27.78%	0.00	0.44	-0.03	0.04	4.16	-1.52	0.13
Spain Chair=CEO	-12.62%	-0.67	27.78%	-0.48	-1.05	0.52	-0.80	5.72	3.54	4.43
UK	0.00%	2.22	10.00%	0.73	-0.40	-0.47	0.25	-0.39	-0.10	-1.88
UK CEO≠Chair	0.00%	2.18	10.00%	-0.13	0.11	-0.33	-2.76	-0.30	-0.66	-1.96
UK Chairman	-3.47%	1.67	10.00%	0.95	-0.63	-0.76	1.31	-0.56	-0.11	-2.32
USA	0.48%	0.86	3.43%	0.44	0.22	-0.06	0.17	-0.16	-1.63	-0.64
USA CEO≠Chair	1.70%	-0.58	3.43%	0.68	-0.43	0.06	-0.04	-1.30	-2.96	-3.10
USA Chairman	0.09%	1.12	3.43%	0.37	0.37	-0.09	0.24	0.00	-1.48	-0.28
USA Chairman=CEO	-1.17%	1.22	3.43%	-0.45	0.26	-0.41	0.30	-0.63	-2.76	-0.55

SD ratio is the percentage of non-executives on the bank board. *Age* is the age of the CEO or chairman on 31 December. *% of banks CEO=Chair* is the percentage of banks where the same person is CEO and chairman of the board. *Boards to date* is the number of additional boards in which the CEO or chairman has participated in the past, distinguishing between boards of quoted firms and boards of private firms. *Current boards* indicates the number of boards on which he or she is serving simultaneously with his/her role as CEO or chairman. *Time in* is the length of time the CEO or chairman has been either in the role, in the organization or a board member from the start until 31 December of the indicated year.

she/he takes office, or he/she joins the board one or two years prior to being appointed for the CEO job (Table 3.5).

Another variable that we use to measure experience is the number of other companies' boards where chairmen and CEOs are serving or have been seated. In this case, French chairmen and CEOs are those with the most experience, having served on more than eight boards from quoted companies before taking on their current job; they concurrently serve as directors on three other boards while serving as chairman or CEO at their own bank. In all the countries chairmen tend to have more experience than CEOs as members of other companies' boards. Once in the position, CEOs devote their time to their own bank and do not sit on other boards. The only exception is the French CEOs, who, on average, sit on three other quoted companies' boards. This could be related to the bank having controlling shareholdings in other quoted companies. Chairmen, however, tend to share their role as chairmen of the bank with a seat on the boards of other quoted companies (Table 3.5).

Compensation of CEOs also differs from that of chairmen who are simultaneously CEOs. Holding both positions means larger pay cheques, especially in Spanish banks. The best-paid CEOs are those who run banks in the USA, whose payments are heavily related to equity-linked compensation schemes. In addition, the CEOs of banks in the USA are those who have accumulated the most wealth during their tenure. If we look at the differences in CEO compensation among the countries in the sample, we observe that French, British and Italian CEOs are those who received the largest sums from direct compensation, more than one million USD in 2008. The highest percentage of direct compensation for Italian and British CEOs comes from salary, and only a minor portion comes from bonus or other types of direct compensation, whereas French CEOs' direct compensation is split at 50/50 between salary and bonus (Table 3.7, panel A). In contrast, the CEOs of banks in the USA, the Netherlands and Spain received direct compensation under one million USD in 2008 (Table 3.6, panel A). In this case, the breakdown of their direct compensation shows that salary is the least relevant component of their direct compensation, with bonus, pension and other direct payments acting as the main sources of compensation (Table 3.7). Our findings here are consistent with those of Fahlenbrach and Stulz (2009), who report that base salaries for USA bank CEOs constitute about 10 per cent of their total compensation.

Other sources of compensation for CEOs are pay-for-performance schemes, of which equity-linked payments are the most prevalent. The CEOs of banks in the USA and the UK are rewarded with higher values

of equity-linked payments, well above those of CEOs from other countries; the Anglo-Saxon countries have developed a culture of payment based on equity-linked securities that are the principal component of their remuneration. Here direct compensation payments play a minor role. The relation between direct compensation and equity-linked payments for CEOs of the other countries in our sample is more balanced between direct and equity-linked compensation, introducing the idea that Anglo-Saxon countries are more performance-oriented when deciding the payment of their bank CEOs than banks in Continental Europe.

In a scenario of continuous increases in executive and director compensation throughout our period of analysis, the CEOs of USA banks have increased their equity-linked compensation in 2008 in comparison to 1999; however, they have seen a reduction in their direct compensation. In contrast, chairmen have witnessed a decrease in both their direct and equity-linked compensation. In addition, we observe that in the last 11 years the payments to CEOs who are not chairmen have increased more than the payments to CEOs who are chairmen in Italian and British banks.

In general terms, the CEOs of USA banks are the best paid by far, both annually and in terms of all the amounts they have received during their tenure in the bank, what we call the accumulated wealth to date. After the USA, British CEOs are next on the list of the best paid, with CEOs in Spain and the Netherlands paid the least. However, the results for Spain and the Netherlands might be biased by the lack of information about equity-linked payments for the CEOs of these two countries (Table 3.6).

In Spain and the USA there are more banks in which the same person is simultaneously chairman and CEO. For this reason, chairmen in these countries are the best paid in our sample of banks (Table 3.6, panel A). French chairmen are among the lowest paid in our sample of banks. In French, Italian and US banks the best-paid official is the CEO, whereas in Spain and the UK the best paid are the chairmen (Table 3.6). These numbers indicate differences in culture and payment among banks, depending on the country where they have their headquarters, which are not directly related to performance or risk.

Finally, we compare the characteristics of CEOs and chairmen between 2008 and 2004 and between 2008 and 1999 to give the reader an idea of how the experience levels and compensation of banking managers in Europe and the USA have evolved. Overall, the degree of independence of the boards shows different patterns depending on the country. On

Table 3.6 CEO and chairman compensation by country

2008	Direct Compensation	Equity-Linked	Total Annual	Total Accumulated Wealth
Panel A: Situation in 2008				
France	1,326.90	1,936.00	1,714.10	5,506.83
France CEO≠Chair	1,854.20	2,933.00	2,440.80	8,192.67
France Chairman	799.60	939.00	987.40	5,674.50
Italy	1,179.16	2,505.67	1,681.59	28,902.59
Italy CEO≠Chair	1,203.00	3,351.50	2,160.43	22,401.20
Italy Chair=CEO	882.83	814.00	1,018.50	1,273.00
Netherlands	376.75	25.50	519.67	208.00
Netherlands CEO≠Chair	727.50	25.50	753.50	208.00
Spain	1,915.20	570.00	1,972.10	14,723.00
Spain CEO≠Chair	924.00		924.00	3,642.50
Spain Chair=CEO	2,246.67	570.00	2,341.50	22,546.50
UK	1,283.36	3,913.71	3,774.00	10,882.55
UK CEO≠Chair	1,464.60	3,964.00	4,636.00	11,082.00
UK Chairman	1,132.33	3,846.67	3,055.67	10,716.33
USA	631.92	8,213.65	8,884.31	41,873.56
USA CEO≠Chair	686.78	10,382.44	11,069.11	34,479.78
USA Chair=CEO	710.49	7,198.00	7,908.57	42,602.97

2008–1999

(Thousands of USD)	Direct Compensation	Equity-Linked	Total Annual	Total Accumulated Wealth
Panel B: Mean Differences in CEO and Chairman Compensation between 2008 and 1999 by Country				
France	1,326.90	n.a	n.a	n.a
France CEO≠Chair	n.a	n.a	n.a	n.a
France Chairman	n.a	n.a	n.a	n.a
Italy	945.42	n.a	1,339.98	27,572.59
Italy CEO≠Chair	790.80	n.a	1,645.18	19,831.87
Italy Chairman	999.89	n.a	1,193.69	31,520.83
Italy Chairman=CEO	783.50	n.a	795.00	1,141.50
Netherlands	376.75	-413.50	80.67	-925.00
Spain	1,824.30	n.a	1,669.10	-13,782.00
Spain CEO≠Chair	858.50	n.a	662.00	1,346.50
Spain Chairman	2,055.17	n.a	1,910.63	-18,824.83
Spain Chairman=CEO	n.a	n.a	n.a	n.a
UK	226.36	2,836.71	2,286.13	5,367.80
UK CEO≠Chair	282.74	2,718.80	2,564.71	6,620.33
UK Chairman	97.19	3,610.67	1,986.67	2,841.13
USA	-3,440.15	-17,447.93	-18,875.69	-366,409.60
USA CEO≠Chair	-2,529.22	3,560.44	1,030.11	-43,134.22
USA Chairman	-3,607.29	-21,703.83	-22,589.28	-424,983.73
USA Chairman=CEO	-3,840.85	-24,809.78	-28,650.65	-515,544.92

Continued

Table 3.6 Continued

2008-4	Direct Compensation	Equity-Linked	Total Annual	Total Accumulated Wealth
Panel C: Mean Differences in CEO and Chairman Compensation between 2008 and 2004 by Country				
France	-351.48	1,221.17	-500.53	-4,742.77
France CEO≠Chair	256.45	2,293.00	362.80	-1,735.83
France Chairman	-959.40	149.33	-1,363.85	-4,789.17
Italy	114.40	8.33	-23.57	-67,950.63
Italy CEO≠Chair	-631.80	854.17	-1,069.57	11,682.49
Italy Chairman	439.93	n.a	470.55	-120,054.59
Italy Chairman=CEO	59.91	n.a	-170.17	-101,067.83
Netherlands	-234.25	-1,232.50	-510.67	-8,018.00
Netherlands CEO≠Chair	-303.17	-1,232.50	-1,115.83	-6,065.00
Spain	748.80	-641.00	362.73	10,045.00
Spain CEO≠Chair	671.67	n.a	545.50	2,818.83
Spain Chairman	604.86	-641.00	214.46	11,811.33
Spain Chairman=CEO	-674.33	-641.00	-983.17	9,516.50
UK	-1,014.85	1,121.21	-581.68	-1,132.61
UK CEO≠Chair	-1,366.51	716.89	-1,442.00	-449.67
UK Chairman	-834.78	1,872.47	-8.11	805.11
USA	-1,580.92	2,546.40	1,918.24	-49,990.99
USA CEO≠Chair	-2,083.31	6,289.63	4,547.28	-50,326.31
USA Chairman	-1,458.66	1,636.02	1,320.05	-50,028.01
USA Chairman=CEO	-1,639.54	-512.23	-731.43	-45,045.27

Data in thousands of USD. *Direct compensation* is the average amount of USD in thousands made by a CEO or chairman. *Direct compensation* includes: salary, bonus, pension benefits and others. *Equity-linked compensation* includes the thousands of USD that on average are made by a CEO or a chairman due to compensation by shares or by call options on bank shares. *Total Annual* is the total amount that a CEO or chairman makes annually including all types of remuneration. *Total Accumulated Wealth* is the average accumulated wealth of CEOs and chairmen during all the years they are in the role in the bank.

Table 3.7 The components of direct compensation by country

2008	Salary	Bonus	Direct Compensation	
			Pension	Other
Panel A: Situation in 2008				
France	818.80	1,015.80		81.50
France CEO≠Chair	1,052.80	1,001.50		108.67
France Chairman	584.80	1,073.00		54.33
Italy	1,124.55	789.17		820.19
Italy CEO≠Chair	980.43	388.75		1,043.17
Italy Chairman=CEO	878.17	28.00		1,629.00
Netherlands	502.33		107.00	1.00
Netherlands CEO ≠Chair	727.50		107.00	1.00
Netherlands Chairman				
Spain	847.70	2,135.00	4,561.57	348.71
Spain CEO≠Chair	460.50	927.00	2,940.00	536.50
Spain Chairman=CEO	987.17	2,519.00	465.00	157.00
UK	1,204.82	123.43	81.00	144.10
UK CEO≠Chair	1,291.80	172.80	81.00	240.60
UK Chairman	1,132.33			47.60
USA	620.92	191.33	16.78	87.35
USA CEO≠Chair	686.78		10.89	38.44
USA Chairman=CEO	694.14	191.33	19.07	108.82

2008–1999	Salary	Bonus	Direct Compensation	
			Pension	Other
Panel B: Mean Differences in the Components of Direct Compensation between 2008 and 1999 by Country				
Italy	801.47	729.17	n.a	673.50
Italy CEO≠Chair	519.68	316.08	n.a	760.42
Italy Chairman	929.91	1,568.00	n.a	600.18
Italy Chairman=CEO	654.67	n.a	n.a	1,612.50
Spain	544.70	n.a	n.a	n.a
Spain CEO≠Chair	198.50	n.a	n.a	n.a
Spain Chairman	621.00	n.a	n.a	n.a
UK	539.55	-328.49	-134.00	7.25
UK CEO≠Chair	601.94	-319.06	-212.00	9.74
UK Chairman	444.62	-486.40	n.a	20.43
USA	-356.00	-3,466.58	-20.89	-181.73
USA CEO≠Chair	-279.22	n.a	-32.11	-477.06
USA Chairman	-371.77	-3,382.37	-16.52	-121.16
USA Chairman=CEO	-386.41	-3,279.44	-15.93	-151.80

Continued

Table 3.7 Continued

2008–4	Salary	Bonus	Direct Compensation Pension	Other
Panel C: Mean Differences in the Components of Direct Compensation between 2008 and 2004 by Country				
France	15.68	15.66	n.a	66.50
France CEO≠Chair	262.80	194.00	n.a	89.67
France Chairman	-231.45	-184.00	n.a	47.33
Italy	-0.45	-613.43	n.a	424.30
Italy CEO≠Chair	-457.32	-1,323.00	n.a	211.33
Italy Chairman	213.98	1,424.00	n.a	508.48
Italy Chairman=CEO	-310.50	n.a	n.a	1,597.67
Netherlands	97.33	n.a	-199.00	-89.00
Netherlands CEO≠Chair	108.83	n.a	-199.00	-89.00
Spain	-6.30	-281.00	4,529.57	267.05
Spain CEO≠Chair	82.00	n.a	n.a	435.50
Spain Chairman	-68.00	21.00	4,799.83	201.60
Spain Chairman=CEO	-323.17	103.00	433.00	150.00
UK	44.92	-1,421.36	-896.00	76.66
UK CEO≠Chair	-56.53	-1,309.87	37.00	162.16
UK Chairman	85.56	-2,070.75	n.a	2.10
USA	-137.51	-1,542.80	-6.73	-130.26
USA CEO≠Chair	-242.31	n.a	-6.78	-404.31
USA Chairman	-110.34	-1,429.67	-5.78	-54.64
USA Chairman=CEO	-125.52	-1,339.06	-5.19	-38.58

Direct compensation is the amount of USD in thousands made on average by a CEO or chairman. Direct compensation includes: salary, bonus, pension benefits and others.

average, Italian and US bank boards are now more independent than in 1999, due to an increase in the percentage of non-executive directors in the last 11 years. This increase is explained by the efforts of banks to balance the power concentrated in their chairman/CEO through the appointment of non-executive directors; this action has resulted in improvements in the governance of the institutions. On the other hand, the banks of France and the Netherlands show the greatest loss of independence in the last decade, as the percentage of non-executive directors has decreased by more than 10 per cent. The situation regarding board independence in Spain and the UK has remained almost unchanged since 1999.

The average age of managers has changed in most countries in our sample. Spanish CEOs and chairmen have been replaced by younger managers. In all the countries, except France, the average age of CEOs and

chairmen has decreased, pointing to changes in the governance of most of the banks in our sample. It seems that in France the old guard is still in power more than in any of the other countries in the sample (Table 3.5).

We observe increases in the direct compensation of CEOs and chairmen since 1999 in all countries except the USA. These decreases in the USA were most likely a consequence of the higher percentage of compensation related to performance. In 2008, the US banks witnessed the impact of the financial crisis on their balance sheets; as a result the biggest decrease in the compensation of CEOs and chairmen has been in bonus and equity-linked payments (Table 3.7). However, when we compare the payments in 2008 with those of 2004, we observe that direct compensation payments have decreased in all countries but Italy and Spain. The decrease in direct payments since 2004 has been particularly relevant in US and British banks. Total annual compensation and accumulated wealth have only decreased in the last decade for US banks (Table 3.6).

3.4 Conclusions

Our first observation is that compensation for bank chairmen has decreased on average in 2008 when compared with the situation in 1999, in particular for those who are simultaneously chairman and CEO. This is in line with Faulkender *et al.* (2010), who argue that in the last decade executive compensation has been higher than that required to retain and motivate effective top managers, and that compensation packages with stock option grants may have created incentives for managers to manipulate company financial statements to drive up stock prices.

Our second observation is that there are substantial differences among countries in the percentage of banks where the same person holds the positions of CEO and chairman, but this difference does not explain bank performance in the 2008 crisis. Whereas in France, the Netherlands and the UK banks avoid having the same person in both positions, in Spain and the USA 78 per cent of the banks in our sample have CEOs who hold both positions. However, there is no relation between separating the roles of chairman and CEO and the performance of the bank in the 2008 turmoil. While the US government has spent a huge amount of taxpayers' funds to rescue US banks, the Spanish government has not been asked for help from the large Spanish commercial banks.

Our third observation is that the compensation of CEOs differs from that of chairmen who are at the same time CEOs. There has been a

trend in recent years to increase the relevance of payments linked to performance in both situations, and to increase the direct payments to CEOs but to reduce those payments for CEOs who are chairmen. Furthermore, there are differences in compensation among countries. Holding both positions means larger pay cheques, in Spanish banks in particular. During our period of analysis the payments to CEOs who are not chairmen have increased more than the payments to CEOs who are chairmen in Italy and the UK, pointing to a diminishing executive role for the chairmen in these countries.

Our fourth observation is that the CEOs of US banks are the best paid. The British CEOs are the next on the list of the best paid, with Spanish and Dutch CEOs paid the least. The banks most heavily hit by the 2008 financial crisis were those with the best-paid CEOs. It is also true that, as Fahlenbrach and Stulz (2009) report, US bank CEOs suffered enormous wealth losses during the 2008 financial crisis. The unique design of USA CEOs' compensation packages could be due to the passage of the Gramm Leach Bliley Act of 1999. As DeYoung *et al.* (2009) argue, it could be that the nature of executive pay in USA financial firms since that Act was passed has encouraged increased risk-taking.

Finally, our data show that British and US banks within our sample rely most heavily on equity-linked payments. These banks were among the worst hit in the 2008 crisis due to their involvement in high-risk lending, which is consistent with Gordon's (2010) argument that eliminating equity-linked compensation for bank CEOs could reduce risk-taking in systemically important financial firms such as large commercial banks.

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4

The Governance of Executive Remuneration during the Crisis: Evidence from Italy

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4.1 Introduction

Executive remuneration has long been considered a key variable of corporate governance in that it can allow a better alignment of the management's interests with those of the shareholders. In a context of asymmetric information, the optimal contracting theory suggests that an efficient remuneration contract, namely one with a fine-tuned mix of fixed and variable components, might effectively overcome agency problems (Jensen and Meckling, 1976; Fama and Jensen, 1983; Jensen and Murphy, 1990). However, recent scandals have indicated that when it comes to the real world these theoretical predictions are not always grounded. Actually, the competing rent extraction view has shown a strong explanatory power by hypothesizing that managers are able to influence the pay process for their own benefit (La Porta *et al.*, 1999; Bebchuk *et al.*, 2002; Bebchuk and Fried, 2006).

However, these paradigms need to be framed within the particular economic context in which they are analysed. In the case of Italy, listed companies are usually under the control of one large shareholder, while institutional investors do not often play a key role (Bianchi *et al.*, 2001; Bianco, 2001; Bianchi and Enriques, 2005). Consequently, the market for corporate control is still underdeveloped and, similarly, the market for executives is also at a standstill. It follows that most of the remuneration packages are mainly fixed, while variable components are less common than in the Anglo-Saxon countries. Variable components have nonetheless been the focus of empirical investigation, and two recent contributions (Melis *et al.*, 2008; Zattoni and Minichilli, 2009) highlight

the empirical validity of the extraction theory in relation to the degree of diffusion and distribution of stock options in Italy. The more general issue regarding the impact of ownership structure on both fixed and variable remuneration components has also been recently investigated (Barontini and Bozzi, 2010; Croci *et al.*, 2010). We provide a more up-to-date analysis to take into account possible effects of the crisis.

The aim of this paper is thus double: we first analyse the trend of CEOs' remuneration throughout the crisis and then 'open the black box' of remuneration governance by trying to assess which are the governance determinants of CEOs' remuneration. In order to do so, we consider all the companies listed on the Italian MTA (Mercato Telematico Azionario) at the end of 2007, 2008 and 2009. We have chosen these reference years in order to work on the pre- and post-crisis economic context. We focus on both fixed and variable (non-equity) compensation.

We find that executive remuneration has fallen in parallel with the development of the crisis. However, this general trend is differentiated according to firms' size, industry and controlling model. In particular, the reduction of total executive remuneration is more clearly observed in large firms which are subject to financial regulation and whose ownership structure is less concentrated. As expected, the reaction of variable compensation to the economic crisis has been notably steeper for big and financial firms.

Regarding the aetiology of executive remuneration, preliminary results are mixed. First, in line with the optimal contracting theory, firms in which agency problems are more severe and monitoring by owners is less intense pay executives more. Indeed, remuneration is higher in firms controlled by a coalition and with a higher free float. Moreover, we find that firms adopting control-enhancing mechanisms pay CEOs more. The explanation for this result is twofold. On the one hand, according to the optimal contracting theory, in these firms remuneration should be higher due to the larger agency costs. On the other hand, following the rent extraction view, powerful insiders may influence the pay process for their own benefit. Finally, in a case when the board suffers from coordination and free riding problems (and therefore is less likely to scrutinize managerial compensation decisions), CEOs are generally paid more. Again, this latter result is consistent with the optimal contracting theory, together with the finding that a larger board size also increases the probability of firms paying bonuses to their CEOs.

Overall, our preliminary results regarding the effect of corporate governance on remuneration suggest that corporate governance mechanisms matter for the determination of the remuneration packages. Also, in contrast to the mainstream literature, they do not deny the

soundness of the optimal contracting theory in explaining remuneration policies in the Italian context. However, our results might be biased by the absence of the equity component of variable remuneration.

In the following, we will first describe our data and explain how the level of executives' remuneration has changed throughout the financial crisis. Second, we will formulate some hypotheses regarding the link between remuneration and corporate governance characteristics. The empirical analysis described in Paragraph 4 will then test these hypotheses.

4.2 Data and descriptive analysis: executive remuneration throughout the crisis

In order to investigate the determinants of CEOs'¹ remuneration, we have collected a data set which consists of the firms listed on the Italian stock exchange at the end of 2007, 2008 and 2009. Our final sample consists of an unbalanced panel of 294 firms with 788 firm/year observations.²

For every company in the sample we have hand-collected information on remuneration disclosed for the years 2007, 2008 and 2009 as under article 78 of Consob Issuer Regulation. Consob regulation requires firms to report in the notes of the annual accounts details of individual compensation for each director and manager. Companies have to present such information in tabular form and indicate for each member of the board of directors:³

1. fees, including those fixed by the shareholders' general meeting (GM), contingent profit sharing, attendance money, flat expenses refunds;
2. non-monetary benefits, including also fringe benefits and insurance policies;
3. bonuses and other rewards (stock options are not included);
4. other fees, including those received from subsidiaries, salaries and retirement bonuses.

Based on this information, we have considered as dependent variables two measures of CEOs' compensation: first, CEOs' total compensation, as sum of 'fees', 'non-monetary benefits', 'bonuses and other rewards' and 'other fees'. The second variable, which only includes the amounts received by CEOs as bonuses and other rewards, aims at measuring the level of the variable part of the remuneration. In the following we will

call the first variable total compensation and the second one variable compensation.

We draw some descriptive statistics regarding our sample and the amount of total and variable compensation granted to executives in 2007–9. While the former evidence concerns our whole sample (788 observations), the latter focuses only on the companies which paid to their CEOs the ‘bonuses and others rewards’ component (270 observations). When we compare 2007 figures with those related to 2009, it emerges that the number of firms paying the variable compensation has decreased by 30 per cent (from 105 to 74).

Table 4.1 shows the main statistics concerning executive total compensation by market indices, namely the MIB index for large caps and the MID CAP index. Data show that, as expected, the firm’s size significantly affects the level of CEOs’ total compensation, which is higher in large caps, followed by medium-sized, in any of the years considered. A comparison between the CEOs’ pay in 2009 and that granted in 2007 shows that on average total compensation has decreased by 23 per cent. Large companies are mostly affected by this trend.

Similar results are shown in Table 4.2 as regards the amount and the trend of variable compensation in the same time horizon. In large caps variable compensation is more frequently present than in either medium or small caps.⁴ Consistently with the evidence on total compensation, the amount of ‘bonus and other rewards’ is positively affected by firms’ size. Both the presence and the amount of variable components decrease after 2008 in all the market segments.

With reference to the industry, we classify companies according to the type of regulation to which they are subject. About 25 per cent of our sample is composed of either banks and other intermediaries subject to financial regulation (15 per cent of the sample) or firms which are regulated by a sector authority (9 per cent of the sample).⁵

Table 4.3 shows that industry characteristics seem to affect the level of executive remuneration. In particular, financial companies pay a higher compensation to their CEOs than other companies. As for its evolution, CEOs’ pay has increased in the last three years (+13.8 per cent) in companies subject to price regulation, while in financial and in non-regulated firms it has declined (–26 per cent), in line with the general trend.

Variable compensation is more frequently adopted by regulated firms (Table 4.4). However, its amount has been quite stable in companies subject to price regulation (–6.3 per cent), while in the financial industry bonuses have sharply decreased in the time period considered (–65.1 per cent).

Table 4.1 Main statistics of executive total compensation by market index (amounts in thousand euros)

EXECUTIVE TOTAL COMPENSATION BY MARKET INDEX							
2007							
MARKET INDEX	#	%	mean	min	max	median	
MIB	38	14	3,093.59	249.00	17,372.00	2,296.75	
MID CAP	36	13	1,476.67	242.00	5,487.00	1,161.17	
OTHER	193	72	636.71	3.00	7,421.00	339.00	
TOTAL	267	100	1,099.63	3.00	17,372.00	533.00	
2008							
MARKET INDEX	#	%	mean	min	max	median	
MIB	38	14	2,676.33	111.00	8,113.00	2,722.50	
MID CAP	35	13	1,474.32	320.00	5,869.00	1,150.00	
OTHER	190	72	530.86	13.00	4,846.00	324.67	
TOTAL	263	100	966.40	13.00	8,113.00	473.83	
2009							
MARKET INDEX	#	%	mean	min	max	median	Δ
MIB	38	15	2,066.49	103.00	4,782.00	1,911.50	-33.2%
MID CAP	57	22	1,115.02	25.00	3,935.00	924.00	-24.5%
OTHER	163	63	459.87	6.00	3,643.00	320.00	-27.8%
TOTAL	258	100	841.25	6.00	4,782.00	447.00	-23.5%

We also classify our sample according to the nature of the controlling agent. As shown in Table 4.5, the large majority of the Italian market (almost two cases out of three) is characterized by the presence of a single dominant shareholder. A significant number of the listed companies are controlled by a coalition of shareholders, either in a formalized shareholder agreement or informally (17 per cent and 7 per cent of the sample respectively). Very few companies in which the stake held by the first shareholder is lower than 20 per cent of the share capital and the free float is higher than 70 per cent are classified as widely held (2.4 per cent of the sample); the remaining companies are cooperatives (3 per cent of the sample).

Table 4.2 Main statistics of executive variable compensation by market index (amounts in thousand euros)

EXECUTIVE VARIABLE COMPENSATION BY MARKET INDEX							
2007							
MARKET INDEX	#	%	mean	min	max	median	
MIB	27	0.26	1,435.93	6.00	5,950.00	880.00	
MID CAP	15	0.14	694.59	40.00	2,274.00	472.00	
OTHER	63	0.6	457.69	0.50	5,155.00	208.00	
TOTAL	105	1	743.08	0.50	5,950.00	336.33	
2008							
MARKET INDEX	#	%	mean	min	max	median	
MIB	25	27	1,291.80	17.00	5,000.00	750.00	
MID CAP	12	13	797.08	40.00	4,082.00	293.50	
OTHER	54	59	312.84	3.00	4,082.00	130.00	
TOTAL	91	100	645.64	3.00	5,000.00	251.00	
2009							
MARKET INDEX	#	%	mean	min	max	median	Δ
MIB	20	27	846.47	3.00	2,824.00	630.00	-41.1%
MID CAP	14	19	639.21	7.00	3,167.00	499.00	-8.0%
OTHER	40	54	289.43	14.00	3,060.00	128.00	-36.8%
TOTAL	74	100	506.15	3.00	3,167.00	230.00	-31.9%

Data show that CEOs' pay is higher in companies with more dispersed ownership, such as widely held companies and cooperatives. Moreover, coalition-controlled companies appear to be more reactive and severe in reducing CEOs' pay as a consequence of the financial crisis.

When we compare the figures shown in Tables 4.5 and 4.6, the proportion of firms using the variable component in their remuneration policy seems quite homogeneous in both concentrated and dispersed ownership structures (nearly one firm out of three); thus, the control model does not appear to be relevant in explaining the adoption of cash

Table 4.3 Main statistics of executive total compensation by industry (amounts in thousand euros)

EXECUTIVE TOTAL COMPENSATION BY INDUSTRY							
2007							
INDUSTRY	#	%	mean	min	max	median	
NOT REGULATED	203	76	1,021.60	3.00	17,372.00	472.33	
PRICE REGULATION	24	9	860.28	63.00	3,465.00	340.00	
FINANCIAL REGULATION	40	15	1,639.25	26.25	9,440.00	787.00	
TOTAL	267	100	1,099.63	3.00	17,372.00	533.00	
2008							
INDUSTRY	#	%	mean	min	max	median	
NOT REGULATED	201	76	883.37	13.00	8,113.00	394.00	
PRICE REGULATION	23	9	994.29	67.00	5,773.00	340.00	
FINANCIAL REGULATION	39	15	1,377.88	45.00	5,354.00	858.00	
TOTAL	263	100	966.40	13.00	8,113.00	473.83	
2009							
INDUSTRY	#	%	mean	Min	max	median	Δ
NOT REGULATED	198	77	757.28	6.00	4,782.00	428.67	-25.9%
PRICE REGULATION	24	9	978.85	86.67	4,272.00	367.50	13.8%
FINANCIAL REGULATION	36	14	1,211.38	60.00	4,275.00	847.50	-26.1%
TOTAL	258	100	841.25	6.00	4,782.00	447.00	-23.5%

variable compensation. As for the trend, similarly to the above, firms with dispersed ownership have made greater reductions in their CEOs' remuneration.

Finally, Table 4.7 summarizes the main statistics about the magnitude and the evolution of total and variable compensation and a few performance indicators, drawn from *Worldscope*. The effects of the crisis are clearly visible in the profitability indices, while they are less marked in other income measures.

Table 4.4 Main statistics of executive variable compensation by industry (amounts in thousand euros)

EXECUTIVE VARIABLE COMPENSATION BY INDUSTRY							
2007							
INDUSTRY	#	%	mean	min	max	median	
NOT REGULATED	71	68	605.35	0.50	5,155.00	290.00	
PRICE REGULATION	12	11	654.50	25.00	2,432.00	328.50	
FINANCIAL REGULATION	22	21	1,235.86	100.00	5,950.00	675.00	
TOTAL	105	100	743.07	0.50	5,959.00	336.33	
2008							
INDUSTRY	#	%	mean	min	max	median	
NOT REGULATED	63	69	536.05	3.00	4,082.00	197.00	
PRICE REGULATION	11	12	831.91	40.00	4,745.00	250.00	
FINANCIAL REGULATION	17	19	931.23	17.00	5,000.00	604.00	
TOTAL	91	100	654.64	3.00	5,000.00	251.00	
2009							
INDUSTRY	#	%	mean	min	max	median	Δ
NOT REGULATED	50	68	498.29	3.00	3,167.00	202.00	-17.7%
PRICE REGULATION	12	16	613.41	28.00	2,824.00	428.50	-6.3%
FINANCIAL REGULATION	12	16	431.62	30.00	1,500.00	350.00	-65.1%
TOTAL	74	100	506.15	3.00	3,167.00	230.00	-31.9%

4.3 Executive remuneration and corporate governance

In the assessment of the drivers of executive remuneration in Italy, we focus on some key governance characteristics, while also considering the effects of firm size, industry and performance indicators on the amount of total and variable compensation (see Table 4.8 for the list

Table 4.5 Main statistics of executive total compensation by control model (amounts in thousand euros)

EXECUTIVE TOTAL COMPENSATION BY CONTROL MODEL							
2007							
CONTROL MODEL	#	%	mean	min	max	median	
SINGLE	192	72	953.81	3.00	7,187.00	498.25	
COALITION	61	23	1,480.67	26.25	17,372.00	601.00	
WIDELY HELD	7	3	2,034.04	211.00	9,440.00	390.00	
COOPERATIVE	7	3	844.57	96.00	1,484.00	707.00	
TOTAL	267	100	1,099.63	3.00	17,372.00	533.00	
2008							
CONTROL MODEL	#	%	mean	min	max	median	
SINGLE	192	73	964.78	13.00	5,869.00	499.50	
COALITION	59	22	849.57	45.00	8,113.00	340.00	
WIDELY HELD	4	2	1,781.63	100.00	3,480.00	1,773.25	
COOPERATIVE	8	3	1,459.38	415.00	4,084.00	1,227.50	
TOTAL	263	100	966.40	13.00	8,113.00	473.83	
2009							
CONTROL MODEL	#	%	mean	min	max	median	Δ
SINGLE	168	65	800.26	6.00	4,782.00	406.00	-16.1%
COALITION	74	29	807.13	25.00	4,093.00	457.00	-45.5%
WIDELY HELD	8	3	1,535.13	75.00	4,275.00	901.50	-24.5%
COOPERATIVE	8	3	1,323.63	423.00	2,300.00	1,387.50	56.7%
TOTAL	258	100	841.25	6.00	4,782.00	447.00	-23.5%

of all regressors) as control variables. We consider three firm-specific groups of regressors in order to capture the firm's corporate governance environment. The main statistics of these regressors are summarized in Table 4.9.

The first group of variables refers to the companies' ownership and control structure.

According to the taxonomy described above, we use dummy variables to keep track of the nature of the controlling agent. The latter can be

Table 4.6 Main statistics of executive variable compensation by control model (amounts in thousand euros)

EXECUTIVE VARIABLE COMPENSATION BY CONTROL MODEL							
2007							
CONTROL MODEL	#	%	mean	min	max	median	
SINGLE	70	67	681.51	0.50	5,155.00	332.00	
COALITION	31	30	745.55	15.00	3,770.00	448.00	
WIDELY HELD	3	3	2,235.00	70.00	5,950.00	685.00	
COOPERATIVE	1	1	500.00	500.00	500.00	500.00	
TOTAL	105	100	743.07	0.50	5,959.00	336.33	
2008							
CONTROL MODEL	#	%	mean	min	max	median	
SINGLE	66	73	742.26	3.00	5,000.00	262.00	
COALITION	22	24	396.97	4.00	2,000.00	109.00	
WIDELY HELD	1	1	664.00	664.00	664.00	664.00	
COOPERATIVE	2	2	183.50	17.00	350.00	183.50	
TOTAL	91	100	654.64	3.00	5,000.00	251.00	
2009							
CONTROL MODEL	#	%	mean	min	max	median	Δ
SINGLE	49	66	514.50	3.00	3,167.00	250.00	-24.5%
COALITION	21	28	533.78	14.00	1,535.00	262.50	-28.4%
WIDELY HELD	3	4	293.50	79.50	651.00	150.00	-86.9%
COOPERATIVE	1	1	155.00	155.00	155.00	155.00	-69.0%
TOTAL	74	100	506.15	3.00	3,167.00	230.00	-31.9%

a single shareholder or a shareholders' coalition (*single* and *coalition*, respectively). We also consider the case of cooperatives and widely held companies. As mentioned before, the large majority of firms in our sample are closely held by a single shareholder; a significant number of firms are controlled by a coalition, while very few companies are widely held or cooperatives.

We also consider the degree of ownership concentration by looking at the stake held by the major shareholders⁶ and, in particular, the one

Table 4.7 Main statistics of executive compensation and firms' performance (amounts in thousand euros)

COMPENSATION AND FIRMS' PERFORMANCE						
2007						
	#	mean	min	max	median	
TOTAL COMPENSATION	267	1,099.63	3.00	17,372.00	533.00	
VARIABLE COMPENSATION	105	743.07	0.50	5,950.00	336.30	
ROE	261	7.07	-318.74	69.39	9.08	
ROA	263	3.98	-42.27	40.11	3.61	
ROI	257	5.08	-196.73	56.13	5.73	
SALES	267	2,665,476.52	1,579.00	87,103,010.00	293,211.00	
TOTAL ASSETS	267	13,648,776.69	10,505.00	1,014,319,000.00	519,810.00	
EBIT	266	481,463.21	-345,586.00	24,711,010.00	32,930.50	
EBITDA	266	605,298.71	-54,783.00	31,742,000.00	45,040.50	
2008						
	#	mean	min	max	median	
TOTAL COMPENSATION	263	966.40	13.00	8,113.00	473.83	
VARIABLE COMPENSATION	91	645.64	3.00	5,000.00	251.00	
ROE	251	-5.61	-263.95	75.75	4.95	
ROA	259	1.56	-47.27	43.58	2.30	
ROI	255	5.40	-214.50	893.29	3.75	
SALES	260	2,869,235.25	778.00	107,843,000.00	275,216.00	
TOTAL ASSETS	260	14,583,412.70	11,497.00	1,035,148,000.00	511,226.50	
EBIT	259	420,648.21	-296,827.00	27,448,000.00	19,149.00	
EBITDA	259	560,545.20	-254,828.00	35,878,000.00	30,557.00	
2009						
	#	mean	min	max	median	Δ
TOTAL COMPENSATION	258	841.25	6.00	4,782.00	447.00	-23.5%
VARIABLE COMPENSATION	74	506.15	3.00	3,167.00	230.00	-31.9%
ROE	234	-7.26	-304.07	37.82	2.26	-202.7%
ROA	239	-0.34	-61.57	18.06	1.08	-108.5%
ROI	238	-1.57	-283.53	31.64	1.79	-131.0%
SALES	239	2,837,124.82	2.00	87,153,700.00	255,594.00	6.4%
TOTAL ASSETS	239	15,407,991.66	12,113.00	918,598,400.00	514,474.00	12.9%
EBIT	239	361,196.46	-779,400.00	18,570,000.00	10,387.00	-25.0%
EBITDA	238	520,858.51	-341,549.00	27,338,000.00	22,890.00	-14.0%

with the highest stake ($c1$). In our sample the average highest holding is 45 per cent, while the median stake is 51 per cent. We then consider the *free float* by looking at the overall stake not held by any major shareholder (except institutional investors). The average and median free float are 41 per cent and 38 per cent respectively.

Finally, we look at the adoption of control-enhancing mechanisms which can amplify the separation between ownership and control by creating a difference between cash flow and voting rights. We distinguish between mechanisms envisaged and regulated by the law (*norm cem*), such as dual class shares and voting caps, and pyramids, in which the intensity of the separation between ownership and control is measured through the leverage, namely, the number of voting rights controlled by the dominant shareholder per cash flow unit invested (*leverage* and *leverage > 1*). Normative control-enhancing mechanisms (*norm cem*) are adopted in 17 per cent of our sample, while the deviation from the one-share-one-vote principle is obtained through pyramids in nearly 11 per cent of the firms (leverage higher than 1).

According to the optimal contracting theory, the hypothesis on the relation between ownership and control structure and CEOs' remuneration is that in firms where agency costs are high and the incentive to monitor CEOs is low due to the dispersed shareholding (Berle and Means, 1932; Hart, 1995; Schleifer and Vishny, 1997) compensation is higher, because compensation is used as an instrument to align executives' incentives with shareholders' interests. Therefore the level of executive compensation, and particularly its variable components, should be affected positively by free float and negatively by robustness of control as measured by ownership concentration and the presence of a single controlling agent. Should the rent extraction approach be followed, these relations would have an opposite sign, because controlling agents also performing executive roles could use their power in order to overpay themselves. With reference to control-enhancing mechanisms, we expect a positive relation with the level of remuneration according to both theories. Indeed, following the optimal contracting theory, in firms adopting such mechanisms remuneration should be higher due to the larger agency costs. According to the rent extraction view, powerful insiders may influence the pay process for their own benefit.

The second group of variables looks at the monitoring role exerted by large outside institutional shareholders, which are supposed to influence firms' behaviour either by selling their shares or by investing in

monitoring and voicing their disappointment through an active role in the decision-making process.

Institutional investors' monitoring is measured through dummy variables which assume value equal to one if at least one institutional investor – either Italian or foreign – is a major shareholder (*mh_ii*, *mh_iiit* and *mh_iiie* respectively). Institutional investors are major shareholders in more than half of our sample. Major institutional shareholders are more frequently foreign (46 per cent of the firms) than Italian (15 per cent).

Following optimal contracting theory, the presence of institutional investors should positively affect the level of executives' remuneration, in order to overcome agency problems. On the other hand, active institutional investors could use their monitoring function in order to reduce rent extraction phenomena through executive overpayments.

The third group of regressors considers some internal governance characteristics and aims to assess the board quality, namely, the ability of other directors to oversee executives' behaviour.

To this end, we look at board size, which is supposed to be negatively related to the ability to monitor executives. In our sample the average and median number of directors are, respectively, 10 and nine. We also look at board composition and, in particular, at the weight of independent directors (*ind dir*), which we expect to be positively related to the quality of monitoring. On average 36 per cent of board members are independent; the median value is 33 per cent. We finally consider the CEO and Chairman duality (*ceo/chair*), which reduces board independence and weakens the Chairman's monitoring activity (Belcredi and Rigamonti, 2008). The CEO is also the firm's chairman in nearly 30 per cent of cases (248 firm/year observations out of 788).

We hypothesize that, in firms where board monitoring is less efficient, agency costs (and thus executive compensation) are higher.

4.4 Methodology and results

We use pooled OLS (Ordinary Least Squares) with industry and year fixed-effects for total compensation, and we employ a Tobit regression with industry and year fixed-effects for the variable part of CEOs' compensation, which is censored at zero. We use the logarithm of both the dependent variables, in order to mitigate their skewness.⁷ As for the regressors, we use lagged values of institutional investors' major

Table 4.8 Description of the variables used as regressors

Name	Description
<i>c</i>	constant
<i>year</i>	control variable which considers the year of the observation
<i>industry</i>	control variable which considers the company's industry
<i>relcap</i>	ratio between firm market value and total market value at the end of the year
<i>roe</i>	return on equity
<i>roe t-1</i>	return on equity in the previous financial year
<i>sales</i>	total sales or revenues
<i>sales t-1</i>	total sales or revenues in the previous financial year
<i>c1</i>	stake held by the major shareholder with the highest stake
<i>free float</i>	percentage of company's shares which is not held by a major shareholder or is held by an institutional investor
<i>single</i>	dummy variable assuming value equal to one if the company is controlled by a single shareholder
<i>coalition</i>	dummy variable assuming value equal to one if the company is controlled by a coalition (both formal and informal) of shareholders
<i>widely held</i>	dummy variable assuming value equal to one if the company is widely held
<i>cooperative</i>	dummy variable assuming value equal to one if the company is a mutual company
<i>mh_ii</i>	dummy variable assuming value equal to one if at least one institutional investor is a major shareholder
<i>mh_iiee</i>	dummy variable assuming value equal to one if at least one foreign institutional investor is a major shareholder
<i>mh_iiit</i>	dummy variable assuming value equal to one if at least one Italian institutional investor is a major shareholder
<i>leverage</i>	number of voting rights controlled by the dominant shareholder per cash flow unit invested
<i>leverage>1</i>	dummy variable assuming value equal to one if the company's leverage is higher than 1
<i>norm cem</i>	dummy variable assuming value equal to one if the company has adopted control-enhancing mechanisms provided by the law (dual class shares and voting caps)
<i>board size</i>	number of directors on the board
<i>ceo/chair</i>	dummy variable assuming value equal to one if the CEO is also the chairman of the company
<i>ind dir</i>	percentage of independent directors on the board

holdings in order to overcome potential endogeneity problems, and we use both lagged and contemporaneous values for our performance indicators (ROE [Return On Equity] and total sales). We use robust standard errors adjusted for clustering at firm level.

Table 4.9 Descriptive statistics for regressors

	N. Obs	mean	min	max	median
ownership and control structure					
<i>free float</i>	788	0.410	0.003	1	0.38
<i>c1</i>	788	0.451	0	0.967	0.51
<i>leverage</i>	788	1.156	1	4.921	1
<i>leverage > 1</i> (<i>pyramids</i>)	788	0.110	0	1	0
<i>norm cem</i>	788	0.171	0	1	0
institutional investors major holding					
<i>mh ii</i>	787	0.536	0	1	1
<i>mh ii it</i>	787	0.158	0	1	0
<i>mh ii ee</i>	787	0.465	0	1	0
internal governance characteristics					
<i>board size</i>	778	10.096	3	30	9
<i>ceo/chair</i>	788	0.315	0	1	0
<i>ind dir</i>	774	0.361	0	1	0.333

4.4.1 Total compensation

Tables 4.10 and 4.11 show the results of the pooled ordinary least square regressions performed in order to assess the link between total compensation and corporate governance.

In Table 4.10, Column 1, we consider as regressors the firms' relative capitalization and some performance indicators, controlling for year and sector. The coefficient for *relcap* is positive but not significant, while the coefficients for *roe*, *roe t-1*, *sales* and *sales t-1* are positive and significant, suggesting that total remuneration is positively affected by firms' performance.

In Columns 2–4 we also include variables related to the 'ownership and control structure area'; in particular, we enrich the third regression in order to test whether the level of ownership concentration and the identity of the controlling shareholder affect total remuneration. The nature of the controlling agent seems not to affect remuneration (the coefficients for *single* and *coalition* are not significant) even if the sign is in the expected direction. Also, the coefficient for *c1* is as expected (negative), but again it is not statistically significant, while, in line with our hypothesis, the coefficient for *free float* is always significant and positive.

Table 4.10 Pooled ordinary least squares regressions

	1	2	3	4
C	6.5615*** (0.1705)	6.2083*** (0.2158)	6.2493*** (0.2410)	6.1899*** (0.2206)
Relcap	4.3990 (8.2942)	3.7345 (7.9744)	3.7081 (7.9977)	3.5987 (7.9914)
Roe	0.0026** (0.0010)	0.0026** (0.0010)	0.0026** (0.0010)	0.0026** (0.0010)
roe t-1	0.0035** (0.0015)	0.0035** (0.0015)	0.0035** (0.0015)	0.0035** (0.0015)
Sales	2.07e ^{-08**} (8.88e ⁻⁰⁹)	1.93e ^{-08**} (8.72e ⁻⁰⁹)	1.93e ^{-08**} (8.74e ⁻⁰⁹)	1.90e ^{-08**} (8.70e ⁻⁰⁹)
sales t-1	1.07e ⁻⁰⁸ (7.97e ⁻⁰⁹)	1.03e ⁻⁰⁸ (7.82e ⁻⁰⁹)	1.05e ⁻⁰⁸ (7.96e ⁻⁰⁹)	1.10e ⁻⁰⁸ (7.92e ⁻⁰⁹)
c1	-0.1277 (0.2823)			
free float		0.0062* (0.0032)	0.0059* (0.0033)	0.0061* (0.0032)
Single			-0.0449 (0.1282)	
Coalition				0.0884 (0.1282)
Year	YES	YES	YES	YES
Industry	YES	YES	YES	YES
R ²	0.1726	0.1798	0.1801	0.1808
Obs.	709	709	709	709

The dependent variable is the natural logarithm of CEOs' total compensation. All regressions include year and industry fixed-effects. Regressors: size, performance, ownership structure. Robust standard errors, which are adjusted for correlation within a cluster (company), are reported in parentheses. *, ** and *** indicate statistical significance at the 10 per cent, 5 per cent and 1 per cent level, respectively.

In Table 4.11, Column 1, we add variables aimed at assessing the effect of control-enhancing mechanisms on remuneration. The regressions reported show that firms belonging to pyramidal groups (*leverage*>1) and firms adopting normative CEM pay higher compensation to their CEOs.

Overall, the results related to the 'ownership and control structure' area provide signals in line with the optimal contracting theory, although their robustness is weak.

In Column 2 we assess whether shareholding by foreign institutional investors⁸ affects the level of CEOs' remuneration. Results show that foreign institutional investors' major holdings increase total pay.

Table 4.11 Pooled ordinary least squares regressions

	1	2	3	4	5
C	6.0746*** (0.2079)	6.1173*** (0.2063)	6.1398*** (0.2065)	5.0530*** (0.2699)	5.0441*** (0.2852)
Relcap	6.2165 (6.2905)	5.8205 (6.2267)	5.5515 (6.1659)	7.9785 (5.1804)	7.9459 (5.1914)
Roe	0.0026** (0.0010)	0.0022** (0.0010)	0.0020* (0.0010)	0.0013 (0.0009)	0.0013 (0.0009)
roe t-1	0.0036** (0.0014)	0.0034** (0.0014)	0.0035** (0.0014)	0.0031** (0.0014)	0.0031** (0.0014)
Sales	1.41e ⁻⁰⁸ ** (6.61e ⁻⁰⁹)	1.64e ⁻⁰⁸ ** (6.91e ⁻⁰⁹)	1.66e ⁻⁰⁸ ** (6.79e ⁻⁰⁹)	8.68e ⁻⁰⁹ (1.08e ⁻⁰⁸)	8.19e ⁻⁰⁹ (1.09e ⁻⁰⁸)
sales t-1	3.63e ⁻⁰⁹ (6.96e ⁻⁰⁹)	2.70e ⁻⁰⁹ (7.04e ⁻⁰⁹)	2.54e ⁻⁰⁹ (7.01e ⁻⁰⁹)	5.44e ⁻⁰⁹ (1.32e ⁻⁰⁸)	5.51e ⁻⁰⁹ (1.35e ⁻⁰⁸)
free float	0.0063** (0.0031)	0.0049 (0.0030)	0.0049 (0.0030)	0.0015 (0.0031)	0.0022 (0.0031)
leverage>1	0.4352** (0.1813)	0.4093** (0.1875)	0.3870** (0.1897)	0.2823 (0.1770)	0.2800 (0.1768)
Normcem	0.6602*** (0.1470)	0.6443*** (0.1481)	0.6465*** (0.1473)	0.3821** (0.1472)	0.3718** (0.1476)
mh_iee		0.2561** (0.1034)	0.2528** (0.1032)	0.2100** (0.0975)	0.2007** (0.0972)
ceo/chair			-0.1352 (0.1191)		
board size				0.0948*** (0.0161)	0.0963*** (0.0162)
ind dir					-0.0160 (0.2861)
year industry	YES YES	YES YES	YES YES	YES YES	YES YES
R ²	0.2383	0.2501	0.2526	0.3179	0.3215
Obs.	709	691	691	681	679

The dependent variable is the natural logarithm of CEOs' total compensation. All regressions include year and industry fixed-effects. Regressors: size, performance, free float, control-enhancing mechanisms, institutional investors' major holding, internal governance characteristics. Robust standard errors, which are adjusted for correlation within a cluster (company), are reported in parentheses. *, ** and *** indicate statistical significance at the 10 per cent, 5 per cent and 1 per cent level, respectively.

The hypothesis that institutional investors' activism fosters the use of compensation as an incentive instrument for the management is thus confirmed.

As a last step, in Columns 3–4 we enrich our analysis by including as regressors some variables aimed at measuring the level of board quality: a dummy for CEO and Chairman duality, the size of the board and

the percentage of independent directors on the board. Findings are generally not unequivocal, showing that only the board size is a significant regressor by positively affecting executives' remuneration.

4.4.2 Variable compensation

Tables 4.12 and 4.13 show the results of the regressions aimed at assessing the relation between corporate governance and variable compensation (as measured through bonus and other rewards). Some differences emerge with respect to previous results. First of all, the coefficient for *relcap* is always positive and significant, suggesting that CEOs of large firms are paid higher bonuses than those in small companies. This is probably due to the fact that large firms are more complex and difficult

Table 4.12 Tobit regressions

	1	2	3	4	5
<i>c</i>	-0.1291 (0.4819)	0.0192 (0.5905)	0.1604 (0.6334)	-0.0706 (0.5190)	-1.0056*** (0.2438)
<i>relcap</i>	21.6522 (13.5584)	32.7595*** (8.1855)	35.9772*** (8.9844)	33.7118*** (7.8595)	34.0513*** (5.0580)
<i>roe</i>	0.0130** (0.0064)	0.0138** (0.0060)	0.0138** (0.0060)	0.0140** (0.0059)	0.0147*** (0.0053)
<i>roe t-1</i>	0.0027 (0.0048)				
<i>sales</i>	2.83e ⁻⁰⁹ (1.91e ⁻⁰⁸)				
<i>sales t-1</i>	2.30e ⁻⁰⁸ (1.85e ⁻⁰⁸)				
<i>c1</i>		-0.4572 (0.8231)			
<i>free float</i>			-0.0066 (0.0098)		
<i>single</i>				-0.1611 (0.3475)	
<i>coalition</i>					0.5521** (0.2608)
<i>year</i>	YES	YES	YES	YES	YES
<i>industry</i>	YES	YES	YES	YES	YES
PseudoR ²	0.0382	0.0367	0.0369	0.0366	0.0386
Obs.	709	746	746	746	746

The dependent variable is the natural logarithm of CEOs' variable compensation (bonuses and other rewards). All regressions include industry and year fixed-effects. Regressors: size, performance, ownership structure. Robust standard errors, which are adjusted for correlation within a cluster (company), are reported in parentheses. *, ** and *** indicate statistical significance at the 10 per cent, 5 per cent and 1 per cent level, respectively.

Table 4.13 Tobit regressions

	1	2	3	4	5
<i>c</i>	-1.7747*** (0.3165)	-1.5451*** (0.3401)	-1.2990*** (0.3244)	-2.0041*** (0.4318)	-1.9333*** (0.4645)
<i>relcap</i>	29.333*** (4.6816)	29.7366*** (4.8132)	27.4679*** (4.4004)	25.6529*** (3.9313)	26.2474*** (3.9824)
<i>roe</i>	0.0149*** (0.0055)	0.0157*** (0.0057)	0.0139** (0.0054)	0.0130** (0.0053)	0.0124** (0.0052)
<i>coalition</i>	0.6461** (0.2614)	0.6653** (0.2677)	0.6341** (0.2605)	0.5186** (0.2605)	0.5077* (0.2621)
<i>leverage</i>	0.5632*** (0.1543)	0.5562*** (0.1592)	0.5229*** (0.1433)	0.4521*** (0.1441)	0.4574*** (0.1438)
<i>normcem</i>	0.7806*** (0.2977)	0.8069*** (0.3030)	0.7646*** (0.2870)	0.4860 (0.3025)	0.4808 (0.3028)
<i>mh_itee</i>		-0.3933 (0.2409)			
<i>ceo/chair</i>			-1.0927*** (0.2707)	-1.0076*** (0.2706)	-1.0341*** (0.2710)
<i>board size</i>				0.0905*** (0.0332)	0.1001*** (0.0336)
<i>ind dir</i>					-0.4070 (0.6259)
<i>year</i>	YES	YES	YES	YES	YES
<i>industry</i>	YES	YES	YES	YES	YES
PseudoR ²	0.0485	0.0514	0.0577	0.0618	0.0637
Obs.	746	723	746	736	732

The dependent variable is the natural logarithm of CEOs' variable compensation (bonuses and other rewards). All regressions include industry and year fixed-effects. Regressors: size, performance, ownership structure, control-enhancing mechanisms, institutional investors' major holdings, internal governance characteristics. Robust standard errors, which are adjusted for correlation within a cluster (company), are reported in parentheses. *, ** and *** indicate statistical significance at the 10 per cent, 5 per cent and 1 per cent level, respectively.

to manage than small companies, and therefore have to recruit for talents in a more competitive market, where incentive instruments are key to attracting the best managers. As for the performance indicators, only return on equity (at time t) seems to be relevant in explaining the dependent variable, and its sign is positive as expected.

In contrast to previous results, coalitions are significant in explaining a higher level of variable remuneration, while the positive effect of *leverage* and *normcem* is confirmed. Thus, where the separation between ownership and control is more rigid, variable compensation can serve as a tool to align the interest of executives with that of the company.

Again in contrast to previous results, the presence of institutional investors does not seem to affect variable remuneration.⁹

Finally, with reference to board quality, the positive effect of board size is confirmed. Moreover, CEO–Chairman duality still has a negative effect, and is now also significant.

4.5 Conclusion

This paper attempts to understand how CEOs' remuneration has changed throughout the crisis in the Italian market. As expected, we observe a significant decrease of total compensation and a particularly steep reaction for variable compensation both in companies with dispersed ownership and in big and financial firms.

This paper also aims to understand the governance determinants of CEOs' remuneration. It provides four main indications, which, in contrast to previous research, do not deny the soundness of the optimal contracting theory in explaining remuneration policies in the Italian context: i) compensation is higher in firms where agency costs are greater and monitoring by owners is less intense; ii) firms adopting control-enhancing mechanisms pay their CEOs more; iii) remuneration is higher in cases where the board suffers from coordination and free riding problems and its monitoring role is less effective.

Notes

1. In those companies where there is no CEO we have looked at the leading executive director, mainly the Managing Director or the Chairman/Vice Chairman. When more than one CEO is present, we have considered the average remuneration. However, our results hold even if we consider their cumulative remuneration.
2. We excluded firms for which the information was not available. This is mainly due to the fact that these firms were no longer listed at the time we collected the data and thus their financial statements were no longer available to the public. Fifty-six companies (corresponding to 72 observations) have been excluded for lack of data.
3. The information is due also for the members of the board of internal auditors, for each general manager and – in aggregate form – for executives with strategic responsibility.
4. On average, two out of three firms belonging to the FTSE MIB (the benchmark stock market index for the Borsa Italiana, the Italian national stock exchange) (formerly, S&P MIB) use variable compensation. This percentage is lower in mid and small caps at 33 per cent and 26 per cent respectively.
5. We refer to all those companies which operate in industries where the price structure is fixed, even partially, by a public authority.

6. Major shareholders are those who hold a stake higher than 2 per cent of the listed company and are therefore subject to transparency duties according to article 120 of the Consolidated Law on Finance (Legislative Decree no.58/1998).
7. In order to use the logarithm also for the variable compensation, we assume that it is equal to 1 euro in all the cases in which it is zero (see also Croci *et al.*, 2010).
8. We have also used as regressors the presence of Italian institutional investors and of foreign and Italian institutional investors together. However, the related coefficients are never significant.
9. The same result applies to Italian institutional investors and to Italian and foreign institutional investors together.

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5

On the Relationship between Bank CDS Spreads and Balance Sheet Indicators of Bank Risk

Laura Chiaramonte and Barbara Casu

5.1 Introduction

Banks have played a crucial role in the making and spread of the recent financial crisis. Indeed, the default of the investment bank Lehman Brothers in September 2008 sparked the most acute phase of the crisis and had a number of repercussions for the whole system.¹ The demise of the American investment bank, and, shortly afterwards, the near downfall of the insurance conglomerate American International Group (AIG), polarized attention towards the CDS activities of the major international banks. CDSs, the most widespread form of credit derivative, have been, according to some, responsible for exacerbating the effects of the recent financial crisis.²

CDSs were originally created in the 1990s by J.P. Morgan, and consist of an agreement between two parties, the so-called protection buyer and protection seller. The protection seller undertakes, in exchange for a premium paid by the protection buyer, to pay out if a specific credit event³ occurs, typically the default of a third debtor, the so-called reference entity. CDSs are thus contracts that make it possible to isolate and transfer credit risk. Due to these constituent features, CDS spreads have become increasingly popular as a simple, direct indicator of a firm's credit risk, especially during the financial crisis.⁴ Post-crisis, the financial sector faces several challenges. Improving the resilience of the sector, as well as improving risk management practices, is a key priority.

This chapter aims to contribute to the current debate on the use of bank CDS spreads as indicators of bank risk. Our results highlight a strong link between the dynamics of CDS spreads and banks' economic

and financial performance. Regulators and market participants should, therefore, pay more attention to the behaviour of bank CDS spreads, albeit with the caveat that the type of information conveyed changes across time, as economic and financial conditions vary.

5.2 Literature review

The CDS literature can be divided in two groups, one focusing on the pricing characteristics of CDS spreads and the other investigating the determinants of CDS spreads and their variation.

To the first group belong the empirical analyses that demonstrate the price leadership of CDS spreads over corporate bond spreads in measuring firm-specific credit risk. Hull *et al.* (2004), Zhu (2004), Das and Hanouna (2006), and Ericsson *et al.* (2009) point out that CDS contracts are quoted directly in term of spreads, while bond spreads require a number of complicating assumptions and calculations, for example, the specification of a benchmark risk free yield curve before credit spreads can be calculated. Blanco *et al.* (2005) show that the CDS market leads the corporate bond market in terms of price discovery. Norden and Weber (2010) find that CDS markets convey information on banks' default risk that is suited to playing an important role in enhancing market discipline.

The second group comprises the empirical analyses that investigate the determinants of CDS spreads. The credit risk literature identifies two different approaches: the structural approach and the reduced form approach. The structural models, derived from the option pricing model originally developed by Black and Scholes (1973), are based on firms' structural variables and consider default a function of endogenous elements. The first author to apply the option pricing model to insolvency was Merton (1974), who based his formulation on the assumption that insolvency arises solely and exclusively if, at bond maturity date, a firm's assets are worth less than its liabilities. Subsequently, a number of generalizations on Merton's model were proposed, the first by Black and Cox (1976) (cf. also Longstaff and Schwartz, 1995; Anderson and Sundaresan, 1996; Anderson *et al.*, 1996; Mella-Barral, 1997; and Zhou, 2001). These considered the possibility of default prior to bond maturity if the value of the firm's assets fell below a certain level, the threshold or default boundary.

The reduced form models emerged in the second half of the 1990s, thanks to contributions from a number of scholars (the most significant were Jarrow and Turnbull, 1995; Madan and Unal, 1995; Jarrow *et al.*, 1997; Lando, 1998; Duffie and Singleton, 1999; and Hull and

White, 2001). Reduced form models are a recent approach to credit risk, and treat default as a sudden surprise, a totally exogenous event that is unrelated to the firm's balance sheet. The reason for default is not specified.

The structural models have been widely preferred to the reduced form models by practitioners in the field of credit risk (Alexopoulou *et al.*, 2009). There is a substantial literature that builds on the structural models to analyse movements in CDS spreads. Among the studies focusing on the structural models' theoretical determinants of CDS spreads are Aunon-Nerin *et al.* (2002), Benkert (2004), Zhang *et al.* (2005), Abid and Naifar (2006) and Ericsson *et al.* (2009). Recent empirical studies on the determinants of CDS spreads include, among others, Annaert *et al.* (2009) and Eichengreen *et al.* (2009).

More recently, alongside the two groups of studies on CDS spreads mentioned above, a new current of research has emerged that examines the relationship between CDS spreads and rating announcements (Hull *et al.*, 2004; Norden and Weber, 2004; Blanco *et al.*, 2005; Daniels and Shin Jensen, 2005; Lehnert and Neske, 2006). Previously, research had analysed the impact of credit rating announcements on stock prices, bond prices or both.

5.3 Bank CDS spreads and bank risk

We analyse a sample of 57 mid-tier and top-tier international banking groups (by total assets) with five-year senior CDS: 43 European, seven US, four Australian and three Japanese banks.⁵ We consider five-year senior CDS, in so far as this is the benchmark maturity in the CDS market. The overall time horizon considered comprises the period from 1 January 2005, the year in which international accounting standards (IAS/IFRS) became mandatory for the preparation of the consolidated financial statements of European banks, to 31 March 2010, the last data available at the time of this study. This time period is then divided into: (1) the pre-crisis period: the period prior to the onset of the sub-prime crisis (from 1 January 2005 to 30 June 2007). This period was typified by very moderate CDS spreads; (2) the crisis period (from 1 July 2007 to 31 March 2009). During this time, CDS spread values grew considerably and displayed record peaks. Finally (3), we include a 'post-crisis period' to cover the most immediate aftermath of the crisis (1 April 2009 – 31 March 2010). This period thus also examines the least critical phase of the crisis, when bank CDS spreads gradually began to decrease. The division of the time period into these specific

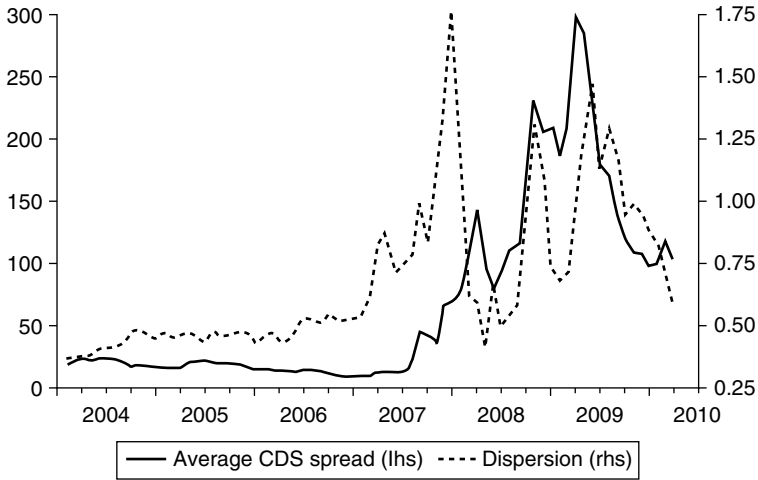


Figure 5.1 Bank CDS market

Note: The CDS market is based on the CDS spreads of 34 large banks and 14 large insurance companies in Europe and North America. Average CDS spread (lhs) is in basis points. Dispersion (rhs) is the standard deviation of the cross-section of CDS spreads, divided by the contemporaneous average.

Source: Bank for International Settlements (2010) *Annual Report*, Basel, June.

sub-periods is based on the behaviour of bank CDS spreads as highlighted by the Bank for International Settlement in the 2010 Annual Report (see Figure 5.1).

Table 5.1 presents the descriptive statistics of five-year senior CDS spreads for our sample of 57 banks by geographic area and by sub-periods. Prior to the recent financial crisis, the CDS spreads of the sample banks, regardless of geographical area, were moderate and fairly homogeneous. Conversely, clear differences between geographical areas emerge during the crisis period. The Anglo-Saxon countries were worst hit by the financial crisis: first and foremost the US, followed by Ireland and the UK, and this is reflected in higher CDS spreads. Finally, in the 'post'-crisis period (1 April 2009 – 31 March 2010), just under half of sample banks recorded lower average CDS spread values than during the crisis period. Nevertheless, almost all peak values were lower.

To relate CDS spreads to bank risk profile, we identify eight balance sheet ratios conveying information on asset quality (Loan Loss Reserve / Gross Loans and Unreserved Impaired Loans/Equity), capital (Tier-One Ratio and Equity / Total Assets), operations (ROA [Return On Assets] and

Table 5.1 Summary statistics on CDS spreads for sample banks by geographic area

Country Average	Pre-crisis period		During the crisis period		'Post'-crisis period	
	Mean (Std. Dev.)	Min.–Max.	Mean (Std. Dev.)	Min.–Max.	Mean (Std. Dev.)	Min.–Max.
Austria (2)	28.56 (25)	1–150.02	145.87 (99.84)	42.29–511.06	199.57 (72.49)	122.72–426.42
Belgium (3)	11.84 (2.88)	7.13–20.44	122.57 (88.05)	10.66–520	165.55 (54.88)	102.65–314.80
Denmark (1)	7.08 (3.11)	3.50–21	68.67 (61.87)	4.10–225	101.16 (36.45)	60.56–217.10
France (5)	20.38 (12.66)	4.70–64.88	71.89 (37.58)	9.81–175.61	91.02 (27.41)	57.22–159.58
Germany (2)	17.05 (3.08)	7.60–27.60	68.82 (31.09)	16.40–145.75	72.74 (13.64)	52.83–116.23
Ireland (3)	12.54 (3.35)	4.56–24.33	199.75 (165.15)	11.50–755.66	336.76 (97.33)	207.40–669.35
Italy (5)	15.58 (3.90)	7.88–25.59	62.84 (36.51)	11–173.76	84.07 (19.84)	57.13–166.67
Netherlands (1)	6.21 (2.01)	2.50–10	69.21 (50.96)	5–204.30	82.71 (29.56)	52.18–189.07
Norway (1)	–	–	100.27 (45.30)	37.50–188.11	86.53 (32.07)	49.53–185.60
Portugal (1)	13.33 (3.10)	8.20–22.70	91.32 (44.56)	12.50–230	134.62 (30.91)	92.18–263.97
Spain (6)	15.57 (2.34)	11.76–24.69	184.93 (136.92)	18.16–496.45	252.31 (57.19)	175.17–431.21
Sweden (4)	16.02 (5.87)	7–26.35	70.55 (62.59)	13.16–242.97	119.81 (40.43)	73.19–218.75
Switzerland (1)	14.90 (3.73)	9.20–25.50	98.42 (55.14)	17.50–262.88	88.37 (30.27)	52.80–190.33
UK (8)	11.95 (5.25)	4.07–33.08	119.91 (85.61)	13.49–448.46	150.46 (30.28)	108.44–230.67
US (7)	19.56 (5.67)	10.33–34.19	486.84 (569.96)	19.58–1,930	1,072 (22.30)	1,026–1,160
Japan (3)	18.79 (6.05)	7.63–29.70	58.97 (29.62)	9.10–120.76	60.37 (10.93)	40.86–91
Australia (4)	8.38 (2.12)	4.50–15.20	83.67 (49.92)	5.22–223.32	85.83 (20.89)	58.51–161.23

Notes: This table reports summary statistics on five-year senior CDS spreads for the 57 sample banks by geographic area for the pre-crisis period (1 January 2005 – 30 June 2007), for the crisis period (1 July 2007 – 31 March 2009) and for the 'post'-crisis period (1 April 2009 – 31 March 2010). Mean, Standard Deviation (Std. Dev.), Median, Minimum (Min.) and Maximum (Max.) are expressed in basis points (bp). With reference to the Country Average, the number of observations is indicated in brackets.

Source: Datastream Database, authors' calculations.

Table 5.2 Financial ratios and predicted relationship with CDS spreads

Variable	Description	Predicted sign
Asset Quality		
qa1	Loan Loss Reserve/Gross Loans (%)	POSITIVE
qa2	Unreserved Impaired Loans/Equity (%)	POSITIVE
Capital		
pat1	Tier-One Ratio (%)	NEGATIVE
pat2	Leverage: Equity/Total Assets (%)	NEGATIVE
Operations		
op1	ROA (%) = Net Income /Average Total Assets	NEGATIVE/POSITIVE
op2	ROE (%) = Net Income /Average Equity	NEGATIVE
Liquidity		
liq1	Net Loans/Deposits and Short-Term Funding (%)	POSITIVE/NEGATIVE
liq2	Liquid Assets/Deposits and Short-Term Funding (%)	NEGATIVE

ROE [Return On Equity]), and liquidity (Net Loans/Deposits and Short-Term Funding, and Liquid Assets/Deposits and Short-Term Funding) for each bank. Table 5.2 illustrates the eight balance sheet ratios by management area and their possible relationship (irrespective of the time horizon considered) with CDS spreads.

Table 5.3 reports descriptive statistics relating to the eight balance sheet variables for the sample banks. Unlike CDS spreads, the values of balance sheet variables did not change significantly from the pre-crisis period to the crisis period. The only exception is the average value of Unreserved Impaired Loans to Equity. Furthermore, most sample banks recorded homogeneous values for almost all variables in both periods, with the exception of the banks that ran up vast losses during the crisis and/or were bailed out by government intervention (principally the UK, Irish and US banks). Finally, the last panel of Table 5.3 highlights how in the 'post'-crisis period the average value of all eight balance sheet variables remained substantially unchanged with respect to the crisis period. The sole exception was ROE, the variable with the greatest variation.

Finally, time-series graphs were plotted to show the relationship between average bank CDS spreads and each bank balance sheet variable. Furthermore, correlation coefficients were calculated between

Table 5.3 Summary statistics on eight balance sheet indicators for sample banks

Variable	Pre-crisis period*		During the crisis period*		'Post'-crisis period*	
	Mean (Std. Dev.)	Min.–Max.	Mean (Std. Dev.)	Min.–Max.	Mean (Std. Dev.)	Min. – Max.
Asset Quality						
Loan Loss Reserve/ Gross Loans	0.014 (0.009)	0.000–0.041	0.015 (0.009)	0.001–0.042	0.023 (0.013)	0.000–0.067
Unreserved Impaired Loans/Equity	1.370 (9.505)	0.000–107.945	0.295 (1.900)	0.000–36.044	0.325 (0.214)	0.018–1.284
Capital						
Tier-One Ratio	0.078 (0.013)	0.047–0.139	0.080 (0.015)	0.051–0.145	0.100 (0.019)	0.060–0.164
Leverage	0.053 (0.021)	0.019–0.104	0.051 (0.022)	0.008–0.117	0.058 (0.021)	0.020–0.114
Operations						
ROA	0.008 (0.004)	–0.001–0.025	0.005 (0.006)	–0.044–0.022	0.002 (0.005)	–0.018–0.009
ROE	0.182 (0.060)	–0.071–0.562	0.098 (0.138)	–0.649–0.328	0.032 (0.137)	–0.642–0.224
Liquidity						
Net Loans/ Deposits and Short-Term Funding	0.820 (0.351)	0.139–2.031	0.870 (0.381)	0.125–1.993	0.886 (0.373)	0.215–1.876
Liquid Assets/ Deposits and Short-Term Funding	0.484 (0.276)	0.128–1.530	0.473 (0.289)	0.114–1.750	0.504 (0.308)	0.127–1.851

Notes: This table reports summary statistics on eight explanatory balance sheet variables for the sample banks for the pre-crisis period (1 January 2005 – 30 June 2007), the crisis period (1 July 2007 – 31 March 2009) and the 'post'-crisis period (1 April 2009 – 31 March 2010).

* The number of banks in the period preceding the crisis was 53, in the crisis period 55, and in the 'post'-crisis period 47.

Source: Datastream Database and authors' calculations.

balance sheet variables and CDS spreads. In particular, the analysis of time-series graphs on the one hand, and the results of correlations on the other, made it possible to verify whether the relationships hypothesized in Table 5.2 were correct.

Figure 5.2 shows the time-series graphs of average CDS spreads versus the eight balance sheet variables for the sample period.⁶

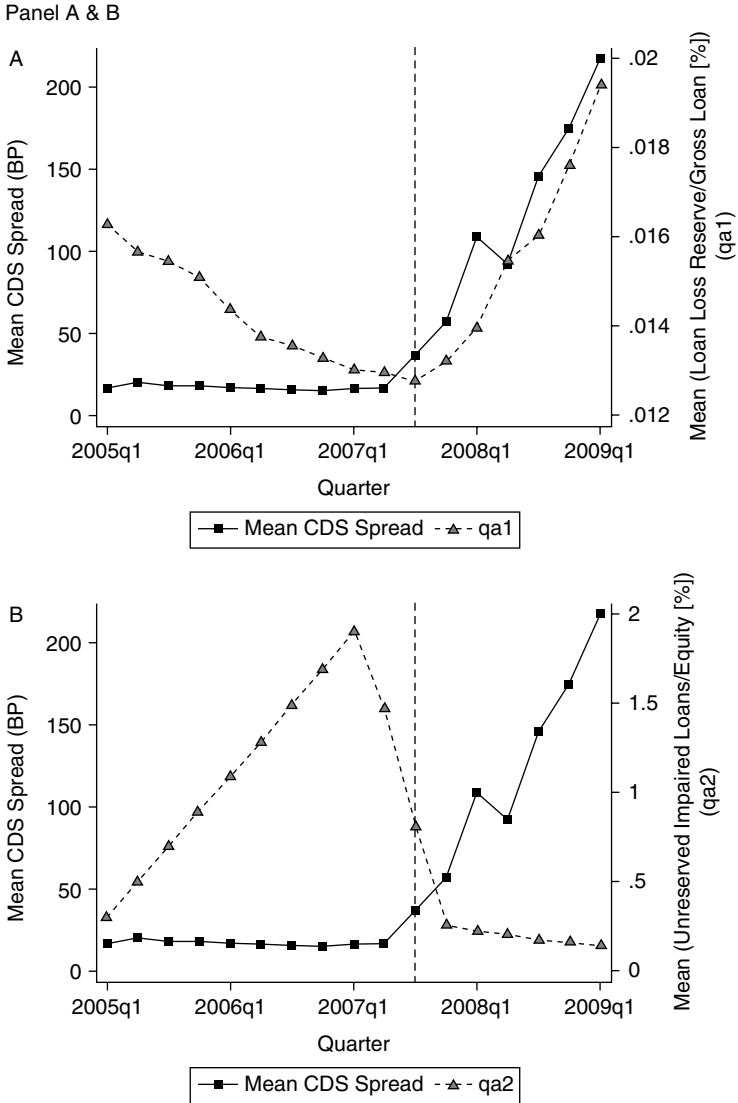


Figure 5.2 Time-series graphs

Notes: These figures show the relationship between mean CDS spreads of sample banks (in basis points, bp) and the mean of the balance sheet variable considered. See Table 5.2 for variable definitions. The sample period is from 1 January 2005 to 31 March 2009. The dashed vertical line coinciding with the start of the third quarter 2007 (July 2007) indicates the outbreak of the crisis.

Source: Datastream Database and authors' calculations.

Panel C & D

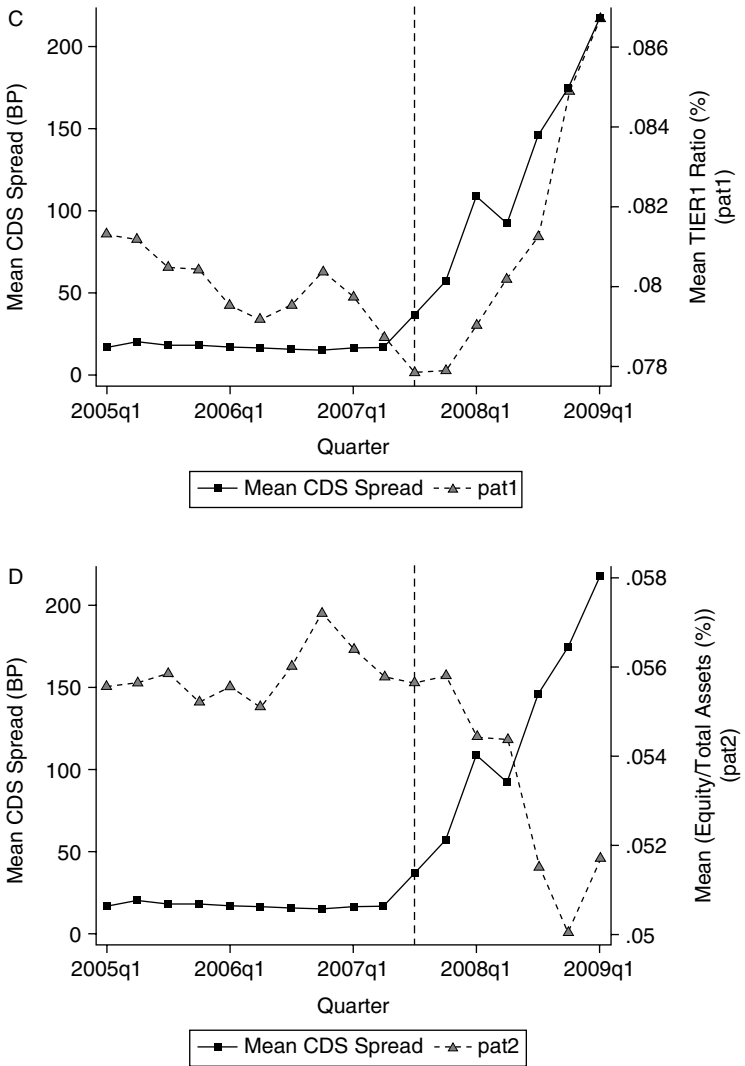


Figure 5.2 Continued

Panel E & F

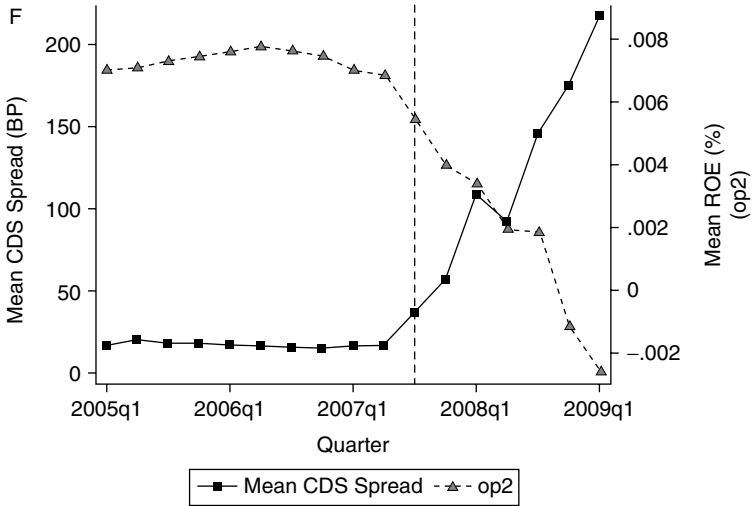
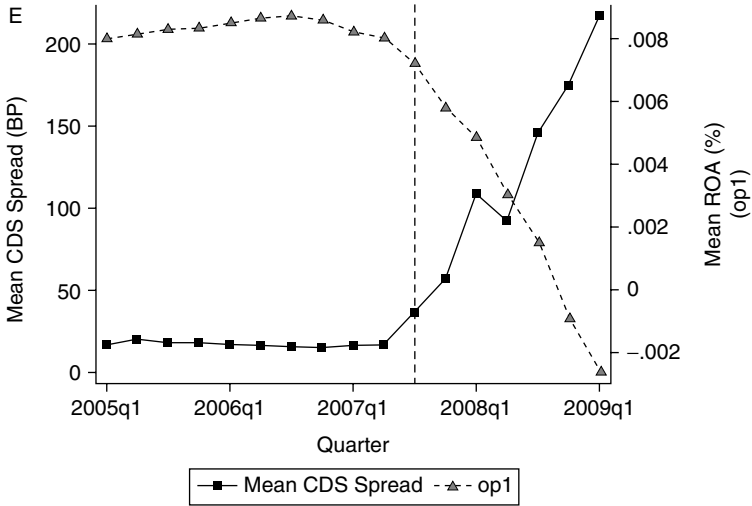


Figure 5.2 Continued

Panel G & H

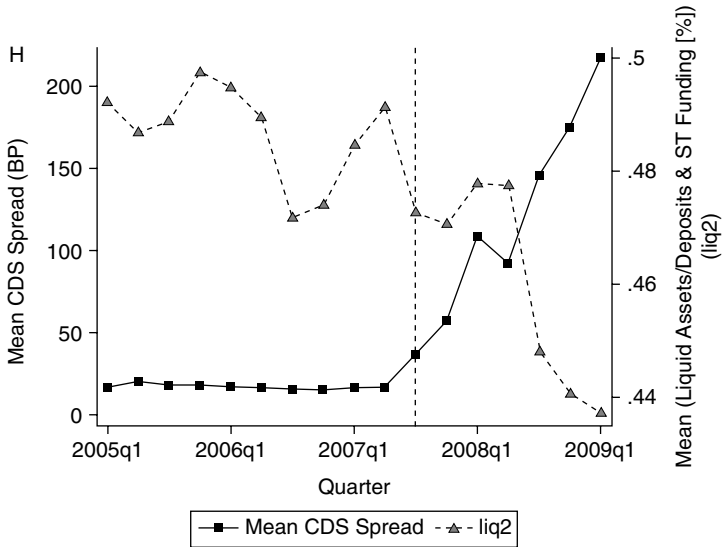
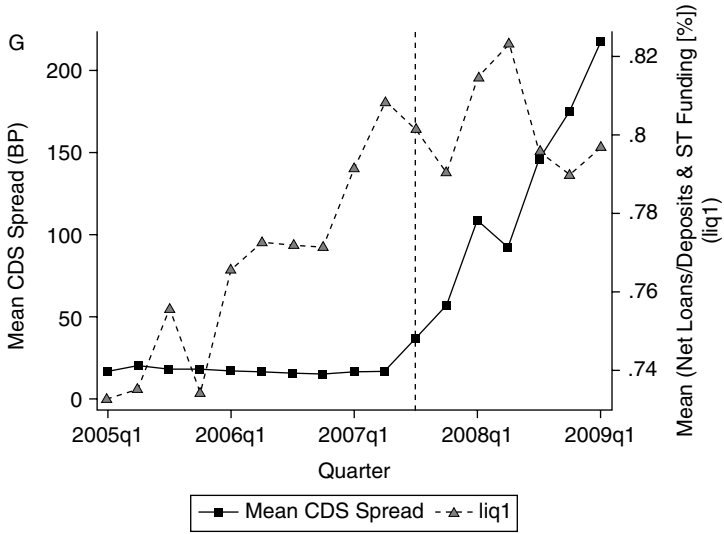


Figure 5.2 Continued

The panels in Figure 5.2 show a clear reversal in the CDS trend and in that of the majority of balance sheet variables at the start of the third quarter of 2007, the time of the outbreak of the financial crisis. Furthermore, the relationships displayed in Figure 5.2 are readily interpreted during the crisis period, when the signs predicted in Table 5.2 were largely confirmed, with the exception of the tier-one ratio.

Finally, Table 5.4 shows the correlations between each balance sheet ratio and CDS spreads, both for the pre-crisis period and for the crisis period.⁷ The results show a reversal in the trend of CDS spreads and the majority of balance sheet variables (six variables out of eight) at the start of the third quarter 2007, with the outbreak of the financial crisis. Furthermore, Table 5.4 also highlights how the signs expected in Table 5.2 are realized during the crisis. The sole exception, once more, is the sign of the tier-one ratio. This positive relationship implies that the growth in tier-one capital was accompanied, in both the pre-crisis and the crisis period, by an increase rather than a decrease in the perceived probability of bank default. As Panel C of Figure 5.2 indicates, the positive relationship between tier-one and CDS spreads is particularly evident in the crisis period. This may mean that the market, above all in the crisis period, lacked faith in this capital index or that it perceived banks' attempts at recapitalization as an indicator of risk.

Table 5.4 Correlations in the pre-crisis period and during the crisis

Variable	CDS spreads	
	Pre-crisis period	During the crisis period
qa1	0.0107	0.1174*
qa2	-0.0298	0.0133
pat1	0.0031	0.1592*
pat2	0.1372*	-0.0441
op1	0.2041*	-0.3021*
op2	0.1319*	-0.3214*
liq1	-0.0146	0.1196*
liq2	0.1339*	-0.1779*

Notes: The independent variables (qa1, qa2, pat1, pat2, op1, op2, liq1, and liq2) are defined in Table 5.2.

The pre-crisis period spans from 1 January 2005 to 30 June 2007, while the crisis period extends from 1 July 2007 to 31 March 2009.

The variables with no * are independent.

5.4 Conclusions

This study investigates whether there is a relationship between CDS spreads and balance sheet indicators of bank risk profile. Our analysis confirms the presence of a strong link between the dynamics of CDS spreads in the banking sector and the bank's economic and financial performance, and therefore highlights the need to pay more attention to the behaviour of bank CDS spreads. This would enable regulators and authorities to use CDS spreads as an Early Warning Signal (EWS) of potential problems in the banking system to identify in advance signs of crisis in the banking sector and to avoid the consequences of further financial turmoil undermining the overall stability of the banking system.

Notes

1. See International Monetary Fund (IMF, 2008); Bank for International Settlements (BIS, 2008, 2009); and Brunnermeier (2009).
2. See Dickinson (2008); Stulz (2009); and Kress (2010).
3. The International Swap and Derivatives Association (ISDA) released sets of Credit Derivatives Definitions in 1999 (which were amended in 2001) and 2003. They are: Bankruptcy, Obligation Acceleration, Obligation Default, Failure to Pay, Repudiation/Moratorium and Restructuring.
4. See European Central Bank (2009), pp. 64–70.
5. The banks of the sample are: Erste Group Bank AG, Raiffeisen International Bank Holding, Dexia SA, Fortis, KBC Groep NV, Danske Bank A/S, Banco Bilbao Vizcaya Argentaria, Banco de Sabadell SA, Banco Popular Espanol, Banco Santander SA, Caja de Ahorros de Valencia Castellon Y Alicante Bancaja, Caja de Madrid, Banque Federale des Banques, BNP Paribas, Crédit Agricole SA, Natixis, Société Générale, Deutsche Bank AG Registered, Deutsche Postbank AG, Allied Irish Banks PLC, Anglo Irish Bank Corporation Ltd, Bank of Ireland, Banca Monte dei Paschi di Siena, Banco Popolare SCARL, Intesa SanPaolo, UBI Banca SCPA, Unicredit SPA, Rabobank, DNB NOR ASA, Banco Espirito Santo, Nordea Bank AB, Skandinaviska Enskilda Banken, Svenska Handelsbanken, Swedbank AB, Credit Suisse Group AG, Alliance & Leicester plc, Barclays plc, Bradford & Bingley plc, HBOS plc, HSBC Holdings plc, Lloyds Banking Group plc, Royal Bank of Scotland Group, Standard Chartered plc, Bank of America Corporation, JP Morgan Chase & Co., National City Corporation, US Bancorp, Wachovia Corporation, Washington Mutual INC, Wells Fargo & Co., Mitsubishi UFJ Financial Group, Mizuho Financial Group Inc., Sumitomo Mitsui Financial Group, Aust and NZ Banking Group, Commonwealth Bank of Australia, National Australia Bank Ltd, Westpac Banking Corporation.
6. Since the results from the crisis period and the 'post'-crisis period do not differ significantly, the graphs for the 'post'-crisis period are not reported.
7. Since the results from the crisis period and the 'post'-crisis period do not differ significantly, the graphs for the 'post'-crisis period are not reported.

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6

Are the Ratings Good Indicators of the Creditworthiness of the Entities that Qualify?

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6.1 Introduction

A rating is an indicator, normally drawn up by a specialized agency, which measures the solvency of an entity or issue of assets by means of a categorical scale. The ultimate purpose of ratings is to inform other market agents (investors and regulators) regarding the solvency of the entities evaluated and/or of the assets issued. The rating reduces one of the main problems of markets: the asymmetry of information between issuers and other agents, since the latter do not have access to all the information relating to the solvency of the entity that is being rated (Losada, 2009).

What elements are taken into account in awarding ratings depends on the type of issuer or issue that is to be rated. In general terms, the most important factors, according to the rating agency Fitch, are the integrity of the balance sheet, profitability and risk management, although other factors are also considered, such as the quality and strategy of the management team, the future outlook for the business and the environment in which the issuer operates (sovereign risk, sector risk and support in the event of difficulties) (Verona, 2002).

The use of ratings as indicators of entities' credit quality, or as indicators of the quality of the assets issued, has experienced significant growth in recent years due fundamentally to the changes in the channels of financing. Thus, financing needs are increasingly channelled through the financial markets, which thus come to substitute for traditional bank loans. Furthermore, the emergence of new financial products in these markets, and the complexity of these products, have helped to increase demand for this type of indicator. Another factor explaining

their increasing use has been the role conceded by much of the financial regulation in the United States and Europe (Losada, 2009).

Despite the great popularity of this indicator and the intensity of its use, since the subprime crisis the excessive ratings assigned to structured products and the behaviour of banks have caused a change in the performance of the credit rating agencies (CRAs), and the quality of the ratings issued are being questioned. For this reason, the objective of this study is to carry out an analysis of the behaviour of ratings and of the rating agencies in the assessment of the credit quality of credit entities, during the years prior to the crisis and during the years thereafter. Among the different types of rating we will focus on those that attempt to value the credit quality of the issuer (issuer rating). In this way we aim to answer the following questions: Does a change occur in the ratings between the periods before $P(t-1)$ and after $P(t)$ the subprime crisis? Do the changes in the ratings occur because of the change in the behaviour of the CRAs or because of the change in the solvency of the banks and savings banks? And, if due to a change in the behaviour of the rating agencies, is this a general change towards more prudent attitudes or a change in the consideration of the most important variables?

To answer these questions we will take as our laboratory the Spanish Banking System (SBS) during the period between 2000 and 2009. We thus study a banking market that presents certain discrepancies from those traditionally analysed by the literature (the USA, the UK and emerging countries): a market in which there are practically no bank failures, and in which the entities were considered in general terms to be very solid until the subprime crisis, as reflected in terms of efficiency, profitability, solvency, bad loans and level of provisions (Maudos and Fernández de Guevara, 2008). With the subprime crisis a series of questions arose, as in the majority of banking systems, in relation to the concentration of risks, increase in bad loans, deterioration of assets, reduction in banking margins and excess of installed capacity (Maudos and Carbó, 2010).

We will use a multiple response logit model with ordered data, within a context of pool data and panel data. The specification of this econometric model will include variables that the literature has used traditionally in the determination of ratings, but will also consider other variables as environmental variables. As mentioned before, ratings are drawn up on the basis of many factors, not only of information extracted from balance sheets.

The rest of the paper is structured as follows. The second section briefly reviews the literature relating to the determinants of ratings and

of their stability. The third section specifies the sample used and the descriptive statistics of the data. The fourth section defines the empirical models that will be used in the specification of the relationship between the probability of obtaining a higher rating and the factors that are taken into account when drawing up this indicator. The fifth section sets out the specification and result of the estimation of the theoretical models. Finally, the conclusions are set out.

6.2 Literature review

The literature on the analysis of the behaviour of ratings and specialized agencies (CRAs) is extensive, though it has to be emphasized that the majority of studies focus more on the issues, that is, on corporate bonds, than on the issuers themselves. The hypotheses that have traditionally been put forward in relation to the behaviour of ratings and of CRAs make reference to: a) the philosophy followed by these agencies when drawing up this indicator, b) the reasons why multiple ratings

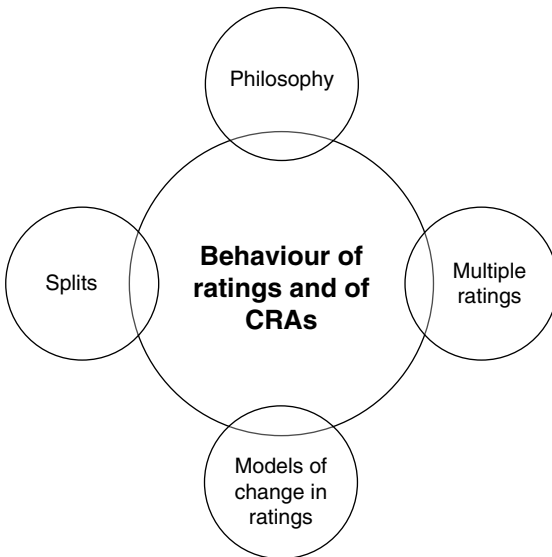


Figure 6.1 Hypotheses put forward in the literature on the behaviour of ratings

Note: Each node represents the principal hypotheses put forward in the literature on the behaviour of ratings.

Source: Authors' own work.

exist for a single issue or issuer, c) the explanations for discrepancies among the agencies (Splits) and d) how to construct models of changes in rating.

a) The philosophy of the CRAs.

The rating agencies, when drawing up ratings, must consider the time horizon on which they wish to focus; that is, they face the choice of whether the ratings should reflect the solvency of institutions in the short term or whether they should concentrate on assessing the solvency of institutions from a medium and long-term perspective (Point in Time versus Through the Cycle). In this sense, the work of Altman and Rijken (2004 and 2006) stands out. These authors find that the rating agencies focus on the long term (Through the Cycle), thus achieving a certain stability. Other studies (Cantor, 2001; Fons, 2002; Cantor and Mann, 2003), also reach the conclusion that CRAs focus on the long term (Through the Cycle) and consequently only modify the ratings when changes in solvency of a permanent nature occur.

b) The reasons why multiple ratings exist for a single issue or issuer.

In this hypothesis, we have to highlight the recent study by Bongaerts *et al.* (2009), who study the existence of multiple ratings on the basis of three possible justifications: production of information, purchase of rating and the role played by these indicators as certifiers in financial regulation. According to these authors, the most significant reason is the role as certifier in financial regulation.

c) Why do discrepancies exist among the ratings by CRAs?

There are different explanations for the existence of discrepancies (Splits) among CRAs. These are: the different methodologies used by the rating agencies (Al-Sakka and ap Gwilym, 2009), the opaqueness of firms' assets (Livingston *et al.*, 2007, 2008), the existence of random errors (Ederington, 1986), the reputation of the CRAs (Beattie and Searle, 1992; Shin and Moore, 2003) and the awarding of upwardly biased ratings to entities in the same country as the rating agencies (Duff and Einig, 2009).

d) Modelling of changes in rating.

The literature relating to the modelling of changes in rating has focused mainly on the modelling of such changes based on alternatives to the homogeneous Markov chain specification, though it has also focused on the study of rating momentum, that is, on the phenomenon that when in the previous period a fall (rise) has occurred

it is more probable that the next period will again experience a fall (rise).

The authors¹ who oppose the specification of changes in rating on the basis of the homogeneous Markov chain do so on the grounds of the influence of the heterogeneity existing in the industry, of the time variation associated with the economic cycle and of the influence of rating momentum.

Due to these criticisms, recent studies have proposed alternatives in the modelling of the deviations from the assumptions of the specification on which the homogeneous Markov chain rests.²

6.2 Sample

The corporate ratings of banks and savings banks (Issuer Ratings) are obtained from the databases CreditViews (Reuters) and BankScope (Bureau van Dijk), whereas the financial data of banks are obtained from the Asociación Española de Banca (AEB) and from the Confederación Española de Cajas de Ahorros (CECA).

The sample consists of 2,621 observations of quarterly ratings, and includes 1,756 quarterly accounting observations from 55 banks and savings banks, from the first quarter of 2000 to the fourth quarter of 2009. The choice of this period of time permits us to analyse the behaviour of the ratings before the subprime crisis, $P(t-1)$, and after it, $P(t)$.³ The three CRAs that will be studied are Fitch, Standard & Poor's (S&P's) and Moody's.

As set out in Table 6.1, the rating agency with the highest market share in the assessment of Spanish banks and savings banks is Fitch, with 64.5 per cent of the ratings issued. One possible explanation may be that it was the first CRA established in Spain. On the other hand, S&P and Moody's present very low market shares, specifically 20.6 per cent and 14.9 per cent respectively.

In order to analyse the ratings we will transform the categorical scale of the ratings into a numerical scale, containing six categories, as specified in Table A6.1 in the Appendix. On this numerical scale the score obtained increases as the credit quality improves. Furthermore, the categories that contain no observations, or a very small number, are grouped together.

The problem with this transformation is that it considers all ratings between categories CCC+/Caa1 and BBB+/Baa1, and the distances between the different scores, to be equal. This ignores the fact

Table 6.1 Market share of the different CRAs in Spain

2000–2009		Fitch	S&P	Moody's	Total
Issues	#	1691	539	391	2621
	Market Share	64.52%	20.56%	14.92%	100%
Rated firms	#	48	18	12	55

Note: Shown for the period 2000–09, by rating agencies, number of issues, market share, and number of firms rated.

Source: Creditviews, Bankscope and own elaboration

Table 6.2 Table of frequencies of ratings

Numerical Scale	Rating	2000–2009			
		Fitch	S&P	Moody's	Total
	<i>Investment</i>				
5	AAA–AA+/Aaa–Aa1	0.00%	0.00%	6.65%	0.99%
5	AA/Aa2	5.26%	11.32%	13.30%	7.71%
4	AA–/Aa3	10.00%	23.19%	6.14%	12.21%
3	A+/A1	10.88%	25.60%	41.18%	18.43%
2	A/A2	44.65%	28.76%	26.85%	38.73%
1	A–/A3	24.48%	3.71%	5.12%	17.32%
0	BBB+/Baa1	3.43%	0.37%	0.77%	2.40%
0	BBB/Baa2	0.53%	3.34%	0.00%	1.03%
0	BBB–/Baa3	0.00%	0.00%	0.00%	0.00%
	<i>Speculative</i>				
0	BB+/Ba1	0.41%	0.00%	0.00%	0.27%
0	BB/Ba2	0.00%	0.00%	0.00%	0.00%
0	BB–/Ba3	0.24%	0.00%	0.00%	0.15%
0	B+/B1	0.00%	3.71%	0.00%	0.76%
0	B/B2	0.00%	0.00%	0.00%	0.00%
0	B–/B3	0.00%	0.00%	0.00%	0.00%
0	CCC+D/Caa1 D	0.00%	0.00%	0.00%	0.00%
	Mean Rating	2.13	2.87	3.07	2.42
	Sd	44.87	10.55	9.95	24.73
	#	1691	539	391	2621
	Market Share	64.52%	20.56%	14.92%	100%

Note: Distribution of ratings by categories, for each of the rating agencies and for the aggregate of them during the period 2000–09. The first column contains the numerical scale used in this paper. The main descriptive statistics associated with each of the rating agencies are also attached.

Source: Creditviews, Bankscope and own elaboration

that ratings in reality are not distributed as a continuum and that the changes among the different categories are not identical.

In our sample this effect is reduced because most of the ratings are concentrated, as can be observed in Table 6.2, in categories A+/A1, A/A2, and A-/A3. Moreover, the specification of the econometric model will be done on the basis of a multiple response logit model with ordered data. As practically all the ratings are found within the degree of investment (98.8 per cent), no differentiation will be made among ratings by degree of investment or speculation.

In Table 6.2 the mean score is 2.42, indicating that on average the rating assigned is within the categorical scale A/A2. The ratings thus reflect the fact that the Spanish banks and savings banks have on average a good credit quality throughout the period analysed. Table 6.2 further shows that no significant differences exist among the rating agencies in the ratings issued. The agency which on average assigns highest ratings is Moody's, with a mean score of 3.07 (Aa3), and the one that seems most conservative is Fitch, with a mean score of 2.13 (A).

Having reached this point, we will try to answer the first question motivating this study: does a change occur in the ratings between the periods before $P(t-1)$ and after $P(t)$ the subprime crisis? For this purpose, we will focus on Tables 3 and 4, which reflect the distribution and the behaviour of ratings between these two periods.

Table 6.3 reflects the distribution of the ratings issued by the three CRAs, differentiating between before $P(t)$ and after $P(t-1)$ the subprime crisis. From the last column we can see that on average there is a reduction of 11.93 per cent in the mean rating between the two periods, reflecting a process of revision and downward readjustment in this type of indicator.

Table 6.4 captures the quarterly distribution of changes in ratings, for each of the three ratings agencies before $P(t-1)$ and after $P(t)$ the subprime crisis.

If we focus on the unconditional probabilities of Table 6.4, we find that the ratings in all three agencies are more stable before the crisis, $P(t-1)$, than after it, $P(t)$, since the probability that no change will occur is higher for each of the three agencies.

In the case of the probabilities conditioned to the change experienced in the previous quarter (t and $t-1$), which also appear in Table 6.4, we deduce that, of the two periods, ratings remain more stable in $P(t-1)$. Differentiating by rating agencies, we observe that Fitch and Moody's

Table 6.3 Distribution of ratings by categories before and after the subprime crisis

Rating	2000–2007 P(t-1)				2008–2009 P(t)				P(t)-P(t-1)	
	Fitch	S&P	Moody's	Total	Fitch	S&P	Moody's	Total	Total	Total
AAA-/Aaa-Aa1	0.00%	0.00%	3.05%	0.43%	0.00%	0.00%	17.71%	3.08%	2.64%	
AA/Aa2	4.84%	5.56%	15.25%	6.48%	6.88%	34.58%	7.29%	12.32%	5.84%	
AA-/Aa3	10.73%	24.31%	8.14%	13.19%	7.74%	18.69%	0.00%	8.51%	-4.68%	
A+/A1	11.10%	28.01%	47.46%	19.82%	10.03%	15.89%	21.88%	13.22%	-6.59%	
A/A2	47.32%	29.17%	26.10%	40.50%	34.38%	27.10%	29.17%	32.07%	-8.44%	
A-/A3	25.04%	4.17%	0.00%	17.11%	22.35%	1.87%	20.83%	18.12%	1.01%	
BBB+/Baa1	0.67%	0.00%	0.00%	0.43%	14.04%	1.87%	3.13%	9.78%	9.35%	
BBB/Baa2	0.00%	4.17%	0.00%	0.87%	2.58%	0.00%	0.00%	1.63%	0.76%	
BBB-/Baa3	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
BB+/Ba1	0.00%	0.00%	0.00%	0.00%	2.01%	0.00%	0.00%	1.27%	1.27%	
BB/Ba2	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
BB-/Ba3	0.30%	0.00%	0.00%	0.19%	0.00%	0.00%	0.00%	0.00%	-0.19%	
B+/B1	0.00%	4.63%	0.00%	0.97%	0.00%	0.00%	0.00%	0.00%	-0.97%	
B/B2	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
B-/B3	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
CCC+ D / Caa1 D	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
Mean Rating	2.20	2.72	3.19	2.45	1.87	3.51	2.70	2.33	-11.93%	
Sd	41.84	9.68	9.42	22.81	16.76	4.58	3.92	9.87	-12.94	
Ratings issued	1342	432	295	2069	349	107	96	552		
Rated firms	48	18	12	55	45	16	12	50		
Market Shares	64.86%	20.88%	14.26%	100%	63.22%	19.38%	17.39%	100%		

Note: Distribution of ratings by categories, after being grouped according to the numerical scale defined in annex 1. This distribution is shown for each of the rating agencies and for the aggregate of them between the first quarter of 2000 and the fourth quarter of 2007, P(t-1) and for the period between the first quarter of 2008 and fourth quarter of 2009, P(t). The last column shows the change in rating between the two periods, P(t)-P(t-1) for the aggregate of the rating agencies. The main descriptive statistics associated with each of the rating agencies are also attached.

Source: Creditviews, Bankscope and own elaboration.

Table 6.4 Distribution of changes in rating

2000–2007		#	-3	-2	-1	0	1	2	3	RR	D/U	Mean
Rating Change%												
Fitch												
All	1294	0.08%	0.23%	1.08%	96.99%	1.39%	0.23%	0.00%	0.00%	0.00%	0.86	0.00
Fall in the previous quarter	18	0.00%	0.00%	0.00%	94.44%	5.56%	0.00%	0.00%	0.00%	0.00%	U	0.06
No change in the previous quarter	1159	0.09%	0.26%	1.12%	97.24%	1.21%	0.09%	0.00%	0.00%	0.00%	1.13	-0.01
Rise in the previous quarter	121	0.00%	0.00%	0.00%	90.48%	9.52%	0.00%	0.00%	0.00%	0.00%	U	0.10
2000–2007												
#	-3	-2	-1	0	1	2	3	RR	D/U	Mean		
Rating Change%												
SP												
All	414	0.24%	0.24%	0.72%	95.41%	3.14%	0.00%	0.24%	0.00%	0.36	0.02	0.02
Fall in the previous quarter	5	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	0.00%	0.00%	C	0.00	0.00
No change in the previous quarter	359	0.28%	0.28%	0.84%	94.71%	3.62%	0.00%	0.28%	0.00%	0.36	0.02	0.02
Rise in the previous quarter	14	0.00%	0.00%	0.00%	100%	0.00%	0.00%	0.00%	0.00%	C	0.00	0.00
2000–2007												
#	-3	-2	-1	0	1	2	3	RR	D/U	Mean		
Rating Change%												
Moody's												
All	283	0.00%	0.00%	0.71%	96.82%	2.12%	0.35%	0.00%	0.00%	0.29	0.02	0.02
Fall in the previous quarter	1	0.00%	0.00%	0.00%	100%	0.00%	0.00%	0.00%	0.00%	C	0.00	0.00

Continued

Table 6.4 Continued

2000–2007	#	-3	-2	-1	0	1	2	3	RR	D/U	Mean
Rating Change%											
No change in the previous quarter	251	0.00%	0.00%	0.80%	96.41%	2.39%	0.40%	0.00%	0.00%	0.29	0.02
Rise in the previous quarter	7	0.00%	0.00%	0.00%	100%	0.00%	0.00%	0.00%	0.00%	C	0.00
2008–2009	#	-3	-2	-1	0	1	2	3	RR	D/U	Mean
Rating Change%											
Fitch											
All	217	0.65%	1.30%	7.49%	89.25%	0.00%	0.33%	0.00%	0.98%	29.00	-0.11
Fall in the previous quarter	25	4.00%	0.00%	12.00%	80.00%	0.00%	0.00%	0.00%	4.00%	D	-0.24
No change in the previous quarter	191	0.52%	1.57%	8.38%	87.96%	0.00%	0.52%	0.00%	1.05%	20.00	-0.12
Rise in the previous quarter	1	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	0.00%	0.00%	C	0.00
2008–2009	#	-3	-2	-1	0	1	2	3	RR	D/U	Mean
Cambio de rating%											
SP											
All	95	0.00%	2.11%	9.47%	83.16%	0.00%	1.05%	0.00%	4.21%	11.00	-0.12
Fall in the previous quarter	7	0.00%	0.00%	14.29%	57.14%	0.00%	0.00%	0.00%	28.57%	D	-0.14
No change in the previous quarter	55	0.00%	1.82%	10.91%	81.82%	0.00%	1.82%	0.00%	3.64%	7.00	-0.11
Rise in the previous quarter	1	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	0.00%	0.00%	C	0.00

2008–2009	#	-3	-2	-1	0	1	2	3	RR	D/U	Mean
Rating Change%											
Moody's											
All	84	0.00%	0.00%	19.05%	80.95%	0.00%	0.00%	0.00%	0.00%	D	-0.19
Fall in the previous quarter	14	0.00%	0.00%	7.14%	92.86%	0.00%	0.00%	0.00%	0.00%	D	-0.07
No change in the previous quarter	46	0.00%	0.00%	23.91%	76.09%	0.00%	0.00%	0.00%	0.00%	D	-0.24
Rise in the previous quarter	0	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	D	0.00

Note: Distribution of changes in ratings for Fitch, Standard and Poor's and Moody's by quarters. This table is divided into (1) unconditional probabilities and (2) probability conditioned to the change experienced in the previous quarter (t versus t-1). All this for two periods, (1) from the first quarter of the year 2000 to the fourth of 2007 P(t-1), and (2) from the first quarter of 2008 to the fourth quarter of 2009 P(t). A movement of negative (positive) sign according to the definition of the numerical scale used in the study is understood as a fall (increase) in the rating. In the last two columns, the symmetry properties of the rating changes are determined (i) on the basis of the quotient between the number in average terms of the falls and the rises (D/U) and (ii) on the basis of the changes in average terms. A coefficient higher (lower) than unity in the ratio (D/U) indicates a downward (upward) asymmetry in the changes in rating. When the mean change takes a negative (positive) value it also indicates a downward (upward) asymmetry in the migration of the ratings.

Source: Creditviews, Bankscope and own elaboration

maintain the same behaviour before and after the subprime crisis. In both periods, Fitch presents a higher probability of change in those ratings that experienced a fall in the previous quarter and Moody's a higher probability of change in those ratings that remained constant in the previous quarter. In the case of Standard & Poor's the higher probability of change in rating varies depending on the period analysed. Before the crisis it is concentrated in those cases where the rating had previously remained constant (5.29 per cent), but after the crisis the highest probability of change is concentrated in those cases which had previously experienced a fall (42.86 per cent).

One very important aspect of the study of changes in rating is the analysis of their symmetrical properties, that is, what are these changes like? Do downward or upward changes predominate? To answer these two questions, we will make use of the ratio between downward and upward changes in rating (D/U) and of the mean of the changes experienced.

In Table 6.4, in both conditioned and unconditioned probabilities, we can appreciate a clear change in the behaviour of ratings between the period before the subprime crisis, $P(t-1)$, and after it, $P(t)$. Before the crisis, $P(t-1)$, when a change in ratings occurs it is upwardly biased in all three CRAs, as indicated by the quotient below unity of the ratio D/U and the positive sign of the mean change in rating. On the other hand, after the crisis, $P(t)$, the changes are downwardly biased, as indicated by the quotient greater than unity of the ratio D/U and the negative sign of the mean changes. The only case in which this pattern of behaviour is broken is in Fitch before the crisis.

Altogether, from the study of the unconditioned and conditioned probabilities of the ratings, the same result is reached as in the table of frequencies (Table 6.6.3): a change occurs between the distribution and the behaviour of ratings in the periods before the subprime crisis, $P(t)$, and after it, $P(t-1)$. Furthermore, we observe that ratings are more stable in the period before the crisis. Another aspect that must be highlighted is that the changes before the crisis are upwardly biased while afterwards they are downwardly biased. We can therefore affirm that in the subprime crisis a process of downward readjustment occurs in a high percentage of the ratings in each of the three rating agencies. This result leads to the study of the next two questions that define the motivation of this paper: do the changes in the ratings occur because of the change in the behaviour of the CRAs or because of the change in the solvency of the banks and savings banks? And, if due to a change in the behaviour

of the rating agencies, is this a general change towards more prudent attitudes or a change in the consideration of the most important variables?

6.4 Methodology and variables

In order to respond to the two questions posed above, various multiple response logit models with ordered data are specified. These models estimate the probability of obtaining a higher rating as a function of a series of explanatory variables that refer to the credit quality of banks and savings banks. The models specified will receive the name of Rating Change Models (RCMs).

These three models are:

Ordered logit model within a pool data context:

$$y_{it}^* = \beta_1 ROA_{it} + \beta_2 SOL_{it} + \beta_3 IO_{it} + \beta_4 LI_{it} + \beta_5 CRED_{it} + \beta_6 PV_{it} + \beta_7 SZ_{it} + \beta_8 U_{it} + \beta_9 HHI_{it} + \epsilon_{it} \quad (1.1)$$

Panel data model with fixed effects and temporal effects, considering the effect of the subprime crisis:

$$y_{it}^* = \beta_1 ROA_{it} + \beta_2 SOL_{it} + \beta_3 IO_{it} + \beta_4 LI_{it} + \beta_5 CRED_{it} + \beta_6 PV_{it} + \beta_7 SZ_{it} + \beta_8 U_{it} + \beta_9 HHI_{it} + \beta_{10} SB_{it} + \sum_{i=1}^9 \beta_{11} year_{it} + \sum_{i=1}^4 \beta_{12} quarter_{it} + \epsilon_{it} \quad (1.2)$$

Panel data model with fixed effects and temporal effects, taking into account the effect of the subprime crisis and the possible structural change induced by that crisis.

$$y_{it}^* = \beta_1 ROA_{it} + \beta_2 SOL_{it} + \beta_3 EO_{it} + \beta_4 LI_{it} + \beta_5 CRED_{it} + \beta_6 PV_{it} + \beta_7 SZ_{it} + \beta_8 U_{it} + \beta_9 HHI_{it} + \beta_{10} SB_{it} + \beta_{11} SB_{it} \cdot ROA_{it} + \beta_{12} SB_{it} \cdot SOL_{it} + \beta_{13} SB_{it} \cdot EO_{it} + \beta_{14} SB_{it} \cdot LI_{it} + \beta_{15} SB_{it} \cdot CRED_{it} + \beta_{16} SB_{it} \cdot PV_{it} + \beta_{17} SB_{it} \cdot SZ_{it} + \beta_{18} SB_{it} \cdot U_{it} + \sum_{i=1}^9 \beta_{19} year_{it} + \sum_{i=1}^4 \beta_{20} quarter_{it} + \epsilon_{it} \quad (1.3)$$

Where i refers to the bank or savings bank evaluated and t the corresponding quarter of the period 2000–9.

The variable y_{it}^* is an unobserved latent variable linked to the observed ordinal response categories y_{it} , where y_{it} reflects the rating assigned by a CRA, in accordance with the transformation of the categorical scale into a numerical scale as defined in Appendix A.1.

As mentioned in the Introduction, ratings are drawn up on the basis of many factors and not only from accounting information extracted from balance sheets, as has been done in most previous studies. For this reason, in the specification of the econometric models we have considered, as well as the ratios commonly used in the literature, environmental variables (business cycle and structural variables), with the aim of capturing factors relating to the concentration of risk, quality of management (efficiency), and the economic environment in which the entities carry out their activity. Consequently, the vector of explanatory variables is integrated by variables that measure profitability, liquidity, solvency, operational efficiency, size of entities, the degree of concentration of risk and the economic environment.

Profitability is a key element in rating an entity's credit quality (Altman and Rijken, 2004). To capture current profitability, we will use mean profitability per asset (ROA), based on the quotient between earnings before taxes and total assets (Altman and Rijken, 2004).

The consideration of liquidity in the models is fundamental because it reflects an entity's capacity to face its commitments in the short term. This variable will be defined as cash and deposits in central banks plus deposits in other credit entities, divided by the total assets of that entity (LI).

The solvency of an entity is captured by its level of capitalization, defined as the quotient between equity and total assets (SOL). This definition of solvency is a proxy for the measure used by Maudos and Fernández de Guevara (2008).

To measure the quality of management we use the cost to income ratio (OE) as equivalent of the operational efficiency used by Maudos and Fernández de Guevara (2008). This is defined as the quotient between operating costs and the gross margin.

The size of the entities is computed on the basis of the total assets (in logs). This variable permits testing of the 'too-big-to-fail' hypothesis, which establishes a negative relationship between the size of financial entities and the probability of failure.

The risk taken by an entity is measured on the basis of three variables. The first of these is the quotient between the credits granted to customers and total assets (CRED). The second is the level of loan loss provisions divided by the total assets (PV), because this variable can be considered a proxy for the losses from bad loans (Pastor, 1999). The third variable is the degree of concentration of the activity in a certain region. This last variable will be measured by means of the Herfindahl Index (HHI) of the provincial distribution of branches of each entity. It

is expected that the higher the concentration of a firm in a geographical area, the higher will be the risk, as the firm is more exposed to economic shocks in the area.

The environment variable, which attempts to capture the economic cycle, is the unemployment rate (U) (Lawrence *et al.*, 1992). This is calculated at regional (province) level and is weighted according to the provincial distribution of branches of each firm.

To capture the possible effect of the subprime crisis, we consider a dummy variable (SB), which takes a value of unity in quarters after the outbreak of the crisis and zero otherwise. We also define a dummy variable for each year (YEAR) and each quarter (QUARTER), in order to capture possible temporal effects. Finally, in the specification of the panel data models with fixed effects we include a dummy variable for each entity, taking the value unity if the entity is rated by the agency and zero otherwise.

Having defined the vector of explanatory variables that make up the RCMs, we proceed to analyse the descriptive statistics of these variables. Tables 6.5 to 6.7 show the mean values of each explanatory variable for each of the rating categories of the CRAs analysed, as well as the principal descriptive statistics without differentiation by classes of rating, for the periods before the subprime crisis, $P(t-1)$, and after it, $P(t)$.

In Tables 6.5 to 6.7, without differentiating by categories of ratings, we can observe that, on average, the variables of the RCMs undergo change between $P(t-1)$ and $P(t)$. In general terms, after the subprime crisis, a reduction occurs in the credit quality of the banks and savings banks evaluated by the CRAs, as reflected in the reduction of the ROA, solvency and liquidity ratios. Such worsening is also reflected in the increases in percentage of credits among assets, provisions and level of unemployment. In response, the entities have taken measures to reduce cost to income ratio and the concentration of the activity in certain regions.

Therefore, from Tables 6.3 to 6.7 we observe that after the subprime crisis there is a downwardly biased change in the distribution and in the behaviour of the ratings, and worsening of the credit quality of the banks and savings banks.

6.5 Results

In this section we show the estimations of the RCMs for Fitch, Standard & Poor's and Moody's. The aim is to attempt to answer the last question

Table 6.5 Descriptive statistics of the variables according to the rating assigned by Fitch in periods P(t-1) and P(t)

RATING	N	ROA	SOL	OE	LI	SZ	CRED	PV	U	HHI
Fitch (2000–2007)										
AA	58	0.62	5.38	54.18	38.89	16.77	37.51	0.11	9.16	0.28
AA-	116	0.70	6.44	52.74	17.48	18.07	55.99	0.18	10.15	0.15
A+	142	0.75	6.68	54.49	15.43	16.90	63.79	0.18	11.10	0.21
A	587	0.62	6.05	56.13	14.69	16.39	66.61	0.21	9.74	0.40
A-	336	0.59	6.45	61.67	8.49	15.56	71.40	0.21	10.76	0.53
BBB+	9	0.51	4.58	59.16	15.13	15.00	64.89	0.16	9.87	0.67
Mean	1248	0.632	6.22	57.05	14.54	16.39	65.23	0.20	10.18	0.39
Median	1248	0.559	5.57	57.53	9.87	16.11	69.27	0.17	9.35	0.34
Sd	1248	0.393	2.24	9.49	16.22	1.20	18.03	0.15	3.75	0.26
Kur	1248	3.028	-0.02	0.39	8.61	0.05	3.49	1.76	3.31	-0.79
Asy	1248	1.309	0.77	-0.25	2.99	0.76	-1.76	0.97	1.62	0.50
Fitch (2008–2009)										
AA	16	0.58	7.04	45.16	16.83	19.24	52.35	0.22	14.17	0.06
AA-	27	0.61	5.82	41.11	24.33	17.79	57.85	0.38	14.15	0.19
A+	35	0.55	5.59	44.57	6.54	17.68	73.63	0.43	16.47	0.20
A	108	0.45	5.86	47.71	11.21	16.91	69.75	0.48	11.59	0.38
A-	78	0.39	5.50	51.39	4.70	16.49	75.78	0.52	14.83	0.35
BBB+	49	0.25	5.02	50.02	3.89	16.62	75.10	0.72	16.13	0.39
BBB	9	0.24	4.64	49.18	2.54	16.13	73.25	0.53	16.03	0.56
BB+	7	-0.94	1.66	64.99	3.00	16.92	73.11	1.41	21.68	0.18
WR	2	0.22	4.30	58.37	44.08	16.30	45.54	0.37	15.92	0.39
Mean	331	0.40	5.54	48.39	9.23	17.01	70.58	0.52	14.24	0.33
Median	331	0.37	5.01	47.53	5.15	16.85	74.25	0.36	14.22	0.27
Sd	331	0.43	2.01	10.26	14.03	1.19	15.75	0.61	4.77	0.23
Kur	331	29.73	0.20	-0.20	17.92	-0.07	9.93	18.43	-0.40	0.08
Asy	331	-3.81	0.62	0.33	4.10	0.67	-3.06	3.69	0.41	0.79

Note: Shows the mean value of each variable defined in the Rating Change Models (RCMs) for Fitch. Also shows the principal descriptive statistics of each variable; Mean, Median, Standard Deviation (Sd), Kurtosis (Kurt) and Asymmetry (Asy). All this for the periods before the subprime crisis, P(t-1) and after it, P(t).

Source: AEB, CECA, Creditwiews, Bankscope and own elaboration.

posed in this study, as to whether changes in ratings are motivated by a change in the behaviour of the CRAs or, on the other hand, by the change experienced in the solvency of the entities. The latter possibility arises from the results obtained in the descriptive analysis of the previous section.

Before proceeding to the estimations, we must note the omission of the estimations of the RCMs in a panel data context with fixed effects for the Moody's rating agency. This decision is based on the fact that

Table 6.6 Descriptive statistics of the variables according to the rating assigned by Standard and Poor's in periods P(t-1) and P(t)

RATING	N	ROA	SOL	OE	LI	SZ	CRED	PV	U	HHI
Standard and Poor's (2000–2007)										
AA	20	1.12	6.23	43.62	22.93	17.84	59.26	0.19	9.59	0.07
AA-	67	0.65	5.74	52.84	14.22	18.93	55.47	0.19	9.48	0.12
A+	117	0.58	6.99	56.40	13.72	17.57	63.68	0.19	8.80	0.20
A	126	0.67	5.59	53.19	14.37	17.29	68.62	0.23	9.55	0.12
A-	18	0.54	6.22	66.58	16.30	16.52	60.39	0.16	11.91	0.12
Mean	348	0.66	6.16	54.34	14.72	17.69	63.46	0.20	9.41	0.14
Median	348	0.59	5.36	54.60	13.73	17.71	63.49	0.18	9.40	0.09
Sd	348	0.40	2.74	9.98	6.72	1.04	11.84	0.14	1.76	0.12
Kur	348	2.4	1.56	0.22	-0.63	-1.07	-0.83	1.30	0.33	4.27
Asy	348	1.30	1.48	0.09	0.54	0.11	-0.13	0.93	0.56	2.02
Standard and Poor's (2008–2009)										
AA	24	0.62	6.40	43.04	14.55	19.41	54.68	0.27	14.11	0.06
AA-	12	0.42	4.93	49.83	9.60	19.14	72.75	0.33	12.76	0.13
A+	17	0.39	6.57	45.99	6.66	17.83	76.86	0.43	11.89	0.15
A	29	0.50	4.77	42.87	8.80	18.04	72.53	0.45	13.92	0.11
A-	2	0.62	4.53	43.78	5.46	17.66	78.89	0.73	11.79	0.12
BBB+	2	0.29	3.90	42.59	3.43	18.17	79.47	1.03	14.62	0.15
WR	3	0.22	4.30	39.44	4.38	17.82	76.30	0.20	17.49	0.13
Mean	89	0.49	5.54	44.35	9.71	18.51	69.00	0.39	13.52	0.11
Median	89	0.45	4.97	43.91	8.19	18.44	72.19	0.30	13.53	0.09
Sd	89	0.26	2.20	9.09	5.16	0.88	10.95	0.31	3.26	0.07
Kur	89	-0.24	1.60	0.13	-0.56	-0.85	0.75	0.72	-1.52	0.98
Asy	89	0.68	1.64	0.47	0.72	-0.05	-1.16	1.10	0.02	1.38

Note: Shows the mean value of each variable defined in the Rating Change Models (RCMs) for Standard and Poor's. Also shows the principal descriptive statistics of each variable; Mean, Median, Standard Deviation (Sd), Kurtosis (Kurt) and Asymmetry (Asy). All this for the periods before the subprime crisis, P(t-1) and after it, P(t).

Source: AEB, CECA, Creditwiews, Bankscope and own elaboration.

the results were not consistent, due to the small number of observations in the case of this agency. As an alternative we estimate a RCM within a pool data context, but with consideration of the effect of the subprime crisis and the temporal effects (4).

As we can observe, in the Rating Change Models in a pool data context (1), estimated in Table 6.8, there exists a close relationship between most of the explanatory variables that try to evaluate the entities' credit quality and the ratings issued by Fitch. Furthermore, in all three CRAs,

Table 6.7 Descriptive statistics of the variables according to the rating assigned by Moody's in periods P(t-1) and P(t)

RATING	N	ROA	SOL	OE	LI	SZ	CRED	PV	U	HHI
Moody's (2000–2007)										
Aa1	9	1.14	6.45	38.93	15.29	19.51	58.23	0.18	7.77	0.07
Aa2	45	0.44	4.52	60.77	11.91	19.02	59.19	0.20	9.56	0.08
Aa3	24	0.47	9.14	62.39	15.87	18.93	48.53	0.15	9.55	0.08
A1	140	0.62	6.15	53.96	9.73	17.10	67.76	0.23	8.88	0.25
A2	77	0.59	5.88	57.00	14.48	16.29	62.67	0.24	9.67	0.34
Mean	295	0.59	6.08	56.02	11.97	17.40	63.27	0.22	9.21	0.23
Median	295	0.55	5.21	55.86	11.32	17.08	64.55	0.20	9.49	0.13
Sd	295	0.34	2.54	10.00	5.31	1.17	12.25	0.14	1.76	0.21
Kur	295	1.67	0.66	0.18	0.02	-0.93	-1.01	1.11	-0.27	1.82
Asy	295	1.04	1.22	0.04	0.61	0.45	-0.15	0.91	0.10	1.62
Moody's (2008–2009)										
Aa1	17	0.52	6.64	47.07	12.82	19.65	57.83	0.23	12.54	0.07
Aa2	7	0.66	6.60	48.61	9.01	19.62	60.66	0.49	17.54	0.07
A1	21	0.51	6.56	42.49	6.69	17.52	76.11	0.32	10.47	0.22
A2	28	0.42	5.01	44.83	4.68	17.42	76.31	0.53	12.22	0.17
A3	20	0.31	4.76	40.97	4.86	17.54	73.76	0.97	16.54	0.18
Baal	3	0.36	7.62	41.73	5.14	16.34	67.15	0.59	13.38	0.52
Mean	96	0.45	5.78	44.09	6.93	17.99	71.04	0.52	13.22	0.17
Median	96	0.38	4.88	45.32	5.67	17.81	73.93	0.42	13.33	0.11
Sd	96	0.26	2.16	9.26	4.03	1.10	10.73	0.45	3.68	0.14
Kur	96	-0.45	0.01	0.27	0.90	-0.88	1.92	3.81	-0.99	1.25
Asy	96	0.78	1.14	0.17	1.25	0.44	-1.54	1.66	0.25	1.51

Note: Shows the mean value of each variable defined in the Rating Change Models (RCMs) for Moody's. Also shows the principal descriptive statistics of each variable; Mean, Median, Standard Deviation (Sd), Kurtosis (Kurt) and Asymmetry (Asy). All this for the periods before the subprime crisis, P(t-1) and after it, P(t).

Source: AEB, CECA, Creditwiews, Bankscope and own elaboration.

the effect of each variable on the probability of obtaining a higher rating agrees with the empirical evidence. Greater accumulated profitability, solvency, cost to income ratio, liquidity and size imply an increase in the probability of obtaining a higher rating. On the other hand, a higher level of the provisions, unemployment or concentration of banking activity, reduces the probability of obtaining a higher level of rating. In the other two CRAs the relation is weaker and in some cases contrary to empirical evidence.

Table 6.8 Estimation of coefficients of Rating Change Models (RCMs) for each CRA

	Fitch				Standard and Poor's				Moody's					
	CRM POOL		CRMEF SC		CRM POOL		CRMEF SC		CRM POOL		CRMEF SC		CRM POOL	
	(1)	(2)	(3)	wdep	(1)	(2)	(3)	wdep	(1)	(2)	(3)	wdep	(1)	(2)
ROA	1.232***	0.473	0.223	0.716**	1.223**	0.649	3.882***	5.959***						
SOL	0.291***	0.114	0.089	0.079*	-0.189	-0.381**	-0.093	-0.095						
OE	-0.024***	-0.007	0.007	-0.013	0.003	0.006	0.079***	0.061***						
LI	0.099***	0.074***	0.091***	0.017	0.171***	0.199***	-0.155***	-0.205***						
SZ	1.326***	-0.119	0.980	1.601***	-1.699	-2.804**	3.033***	4.001***						
CRED	0.015***	0.077***	0.111***	-0.000	0.281***	0.292***	-0.017	0.014						
PV	-2.053***	-1.068***	-0.366	-1.674***	-0.024	3.107*	-5.146***	-3.363***						
U	-0.029**	0.031	-0.009	-0.020	-0.303*	-0.665***	-0.294***	-0.216**						
HHI	-1.831***	-1.302	0.502	3.917***	2.048	-11.094**	0.058	-0.236						
SB	-2.424***		-12.799***		1.971	-22.786		-4.445***						
SBROA			1.565***			3.506								
SBSOL			0.527***			0.245								
SBOE			-0.019			-0.024								
SBLI			-0.030			-0.271*								
SBSZ			0.490**			1.673**								
SBCRED			-0.061**			-0.118								
SBPV			-0.441			-5.468***								
SBU			0.083			0.527								
SBHHI			2.663**			-28.308***								

Continued

Table 6.8 Continued

	Fitch				Standard and Poor's				Moddy's							
	CRM POOL		CRM EF SC		CRM EF CC		CRM POOL		CRM EF SC		CRM EF CC		CRM POOL		CRM POOL SC	
	(1)	(2)	wdep	(3)	wdep	(2)	wdep	(1)	wdep	(3)	wdep	(1)	wdep	(4)	wdep	
cut1	19.403	-9.695	8.797	22.426	-22.104	-53.314	40.199	56.070								
cut2	22.354	-5.062	13.907	25.085	-18.318	-49.302	45.377	61.332								
cut3	25.745	1.521	20.722	28.388	-12.200	-42.729	49.626	66.211								
cut4	27.057	4.654	23.887	30.421	-9.181	-39.258	54.674	72.009								
cut5	28.899	7.528	26.838	32.169	-6.691	-36.169	55.945	73.417								
N	1579	1579	1579	434	434	434	391	391								
Pse R ²	0.2742	0.5488	0.5709	0.1877	0.4076	0.4864	0.5047	0.568								
Log Lik	-1678.369	-1043.419	-992.280	-507.418	-370.031	-320.830	-271.243	-236.584								

Note: Estimation of coefficients of Rating Change Models for each CRA, between the first quarter of 2000 and the fourth quarter of 2009. (1) Rating Change Model in a pool data context, RCM Pool. (2) Rating Change Model in a panel data context with fixed effects, temporal effects but without cross effects of the crisis, RCM DPEF SC. (3) Rating Change Model in a panel data context with fixed effects, temporal effects and with cross effects of the crisis, RCM DPEF CC. (4) Rating Change Model in a pool data context with effect of the subprime crisis and the temporal effects, RCM Pool. Coefficients, Ancillary parameters, p-values (***) significant at level 1 per cent, (**) significant at level 5 per cent, (*) significant at level 10 per cent), number of observations, the pseudo R² of the estimation and the logarithm of the likelihood function are shown. Standard errors in the estimation are omitted for reasons of space.

Source: AEB, CECA, Creditviews, Bankscope and own elaboration.

In this same table, the estimations of the RCMs in a panel data context with fixed effects (2) and in data pool (4), both without taking into account cross effects of the crisis, reflect the effect of the subprime crisis on the close relationship between the explanatory variables and the ratings assigned by different agencies.

In Table 6.8, the estimations of the RCMs in a panel data context (3), with fixed effects, temporal effects and cross effects of the crisis, reconfirm the effect of the subprime crisis on the relationship between ratings and the different factors affecting entities' credit quality. Furthermore, in this model (3) we can deduce that the rating agencies do not take into account the same factors when issuing their ratings between periods $P(t-1)$ and $P(t)$. In addition, we find that the rating agencies disagree in the determination of the factors that are relevant to their ratings.

Finally, to confirm the influence of the subprime crisis, and consequently the change in the behaviour of the CRAs, we propose the following test:

The likelihood ratio test presented in Table 6.9 rejects the null hypothesis of joint non-significance of the variables representing the cross effect between the dummy variable relating to the crisis and the explanatory variables representing the factors that affect entities' credit quality. It is therefore confirmed that the effect of the subprime crisis on the rating agencies is significant.

In conclusion, the results obtained in this study show that a downwardly biased change occurs in the distribution and the behaviour of ratings between the periods before and after the subprime crisis. This is explained both by the worsening of the credit quality of the banks and savings banks and by the change in the behaviour of the rating agencies.

6.6 Conclusions

Ratings as indicators of credit quality or as indicators of the quality of assets issued have experienced significant growth in demand in recent years. Despite this growth, the subprime crisis and the excessive ratings assigned to structured products have caused both the performance of the CRAs and the quality of the ratings issued to be questioned, which may have implied a process of readjustment in this indicator of credit risk.

For this reason, this study has posed the following questions.

Does a change occur in the ratings between the periods before, $P(t-1)$, and after, $P(t)$, the subprime crisis? Do the changes in the ratings occur because of the change in the behaviour of the CRAs or because of the

Table 6.9 Likelihood ratio test RCM DP EF SC (2) VS RCM DP EF CC (3)

		Fitch	S&P
CRM DP EF SC (2)	Log Likelihood	-1043.419	-370.031
CRM DP EF CC (3)	Log Likelihood	-992.28	-320.83
	RV	102.278	98.402
	P-val	5.44191E-18	3.31051E-17

Note: Likelihood ratio test. RCM DP EF SC (2) = Rating Change Model with fixed effects and without cross effects of the crisis (restricted model). RCM DP EF CC (3) = Rating Change Model with fixed effects and with cross effects of crisis (unrestricted model). RV, likelihood ratio test. χ^2 , χ^2 distribution of χ^2 with two degrees of freedom.

Source: AEB, CECA, Creditwiews, Bankscope and own elaboration

change in the solvency of the banks and savings banks? And, if due to a change in the behaviour of the rating agencies, is this a general change towards more prudent attitudes or a change in the consideration of the most important variables?

The empirical results obtained in the SBS during the period 2000–9 reflect a downward change in the ratings assigned to financial entities following the subprime crisis. Behind this change lies the worsening of the solvency of the banks and savings banks, and the change in the behaviour of the rating agencies in the determination of the factors that are most important when issuing their ratings, as reflected in the descriptive statistics and in the empirical results of the theoretical models defined in this study (RCMs).

Appendix

Table A6.1 Equivalencies between the rating agencies and the numerical scale defined

Moody's	Fitch&SP	Numerical scale
<i>Investment</i>		
Aaa	AAA	5
Aa1	AA+	5
Aa2	AA	5
Aa3	AA-	4
A1	A+	3
A2	A	2
A3	A-	1
Baa1	BBB+	0
Baa2	BBB	0
Baa3	BBB-	0

Continued

Table A6.1 Continued

Moody's	Fitch&SP	Numerical scale
<i>Speculative</i>		
Ba1	BB+	0
Ba2	BB	0
Ba3	BB-	0
B1	B+	0
B2	B	0
B3	B-	0
Caa1	CCC+	0
Caa2	CCC	0
Caa3	CCC-	0
Ca	CC	0
C	C	0
D	D	0
WR	WR	WR

Note: Equivalencies between the rating assigned by Moody's, Fitch and S&P and the numerical scale defined in this study. As the score decreases, so does the credit quality, and consequently the probability of default increases. The top and bottom categories are grouped, due to the small number of observations they present.

Source: Creditwiews, Bankscope and own elaboration.

Notes

1. The authors who find evidence against the modelling of ratings on the basis of a homogeneous Markov Chain are Altman and Kao (1992), Carty and Fons (1993), Altman (1998), Nickell *et al.* (2000), Bangia *et al.* (2002), Lando and Skodeberg (2002) and Hamilton and Cantor (2004).
2. Carty and Fons (1993), Lando and Skodeberg (2002), Christensen *et al.* (2004), Frydman and Schuermann (2008) and Al-Sakka and Gwilym (2009).
3. The period before the subprime crisis, $P(t-1)$, is established from the first quarter of the year 2000 to the fourth quarter of 2007. The period after the subprime crisis, $P(t)$, is established from the first quarter of 2008 to the fourth quarter of 2009. The definition of $P(t)$ is made in accordance with the fall in profitability of the credit institutions of the SBS, because of the subprime crisis, as reflected in chapter four of the *Boletín Estadístico* of the Banco de España.

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7

The Information Content of Sovereign Watchlist and Outlook: S&P versus Moody's

Rasha Alsakka and Owain ap Gwilym

7.1 Introduction

Credit rating agencies play an essential role in global financial markets through the production of credit information and its distribution to market participants. Moody's Investors Service and Standard & Poor's (S&P) dominate the global credit rating industry, accounting for 80 per cent of the market (Alsakka and ap Gwilym, 2010a). Rating changes have long been the key means available to signal improving and deteriorating fundamental credit quality. However, rating changes are not the only signals provided by the agencies. Rating outlooks and reviews (the Watchlist) are supplemental tools to communicate potential changes in issuer credit quality. Rating outlooks/Watchlists were developed to provide indicators of the likely direction and timing of future rating changes (Hamilton and Cantor, 2004). Therefore, a complete credit opinion from a given rating agency consists of a credit rating and a rating outlook/Watchlist status. One of the criticisms of agencies is their apparently slow reactions in changing ratings. However, because of agencies' 'through the cycle' methodology and the sound reasons for stability in ratings (see Part III), signals from Watchlist and outlook are very likely to be the source whereby the agencies provide most information to financial markets. Despite this, there is little empirical evidence on rating outlook and Watchlist (see Li *et al.*, 2008).

The main goal of this chapter is to investigate the behaviour of sovereign outlook and Watchlist status assigned by Moody's and S&P. Specifically, we seek to answer three main questions: (i) Do the agencies' policies differ in relation to sovereign outlook/Watchlist? (ii) Do

sovereign outlook/Watchlist changes by one rating agency appear to be affected by prior actions by the other agency?; (iii) Does either agency demonstrate a lead in providing signals to the market through outlook/Watchlist actions for sovereigns?

One main motivation for our focus on sovereign issuers is the recent financial crisis (see, e.g., IMF, 2010), which highlights the importance of sovereign ratings and defaults (see Part II). With the inevitable globalization of markets, investors are increasingly focused on international diversification, and hence understanding of sovereign risk is very important. Sovereign ratings represent a measure of credit risk of a given country, and a ceiling for the ratings assigned to provincial governments, corporates and financial institutions.¹ Sovereign ratings have a strong influence on borrowing cost, and they are the most important stimulus for enhancing the capability of countries' governments and private sectors to access global capital markets, attracting international capital and investment (Kim and Wu, 2008). In addition, Duggar *et al.* (2009) find that sovereign risk is a key factor in corporate defaults both during and outside sovereign crises. Duggar *et al.* (2009) also show how sovereign defaults can spill over into the corporate sector, driven by institutional and political factors.²

Sovereign outlook/Watchlist adjustments impact both own-country and international stock and bond markets, but there is evidence of unequal reactions to different agencies' actions (see Part III). Each agency has a clear interest in maintaining a strong reputation in financial markets by providing high-quality credit signals (Güttler and Wahrenburg, 2007). Many market participants believe that there is added value in multiple ratings (e.g., Baker and Mansi, 2002).³ The lead-lag analysis in this chapter aims to identify whether either agency demonstrates an informational lead in supplying credit signals to the market.

Rating agencies have varying experience in different countries, differ in the methodologies used in judging the creditworthiness of a sovereign borrower, and release only limited information about their methodologies. Differences across rating agencies could affect both the time frame and the manner in which they react to any new available information by adjusting the rating and/or the outlook/Watchlist status. Credit rating agencies would rationally treat a rating change or an outlook/Watchlist adjustment by another agency as a trigger leading them to review their own ratings. It could be viewed as cost-effective to follow up a competitor's signal. Issuers seek for credit quality improvements to be reflected in their ratings and/or outlook/Watchlist status as quickly as possible in order to enable them to reduce borrowing costs and/or enhance capital inflows. Similarly, investors appreciate timely

information about any change in credit risk affecting their invested funds. The earlier a change is signalled through a rating or an outlook/Watchlist adjustment, the better it is for the agency's credibility in the market. Rating leadership can be considered a sign of the predictive ability of a given rating agency (Güttler and Wahrenburg, 2007).

Prior literature on lead-lag analysis across rating agencies is very limited. Additionally, all previous studies have focused on lead-lag behaviour for actual rating changes only, and mainly for corporate ratings. However, significant discrepancies between sovereign and corporate ratings performance have been demonstrated. Rating agencies apply different approaches and consider different inputs to evaluate the creditworthiness of sovereign and corporate issuers (see Cantor and Packer, 1996; Alsakka and ap Gwilym, 2009).

Johnson (2004) shows that S&P follows Egan-Jones (a small rating agency active since 1995) in downgrading corporate issuers. Güttler and Wahrenburg (2007) analyse the lead-lag relationship for credit ratings of near-to-default corporate issuers with multiple ratings by Moody's and S&P during the period 1997–2004. They find that, given a rating change by Moody's (S&P), the subsequent rating adjustment by S&P (Moody's) is of significantly greater magnitude in the short term (1–180 days). Further, Güttler (2009) analyses the lead-lag relationship between Moody's and S&P in the case of corporates during the period 1994–2005, and reveals that previous upgrades (downgrades) by one of these agencies are associated with higher rating intensities for most one-notch upgrades (downgrades) by the other agency. Güttler's (2009) evidence suggests that positive Watchlist additions by one agency increase the upgrade intensities of the other agency even more sharply than negative Watchlist additions increase the downgrade intensities.

Alsakka and ap Gwilym (2010a) is the only study to investigate the lead-lag relationships in sovereign ratings. They use five agencies: Moody's, S&P, Fitch, Japan Credit Rating Agency and Japan Rating & Investment Information, and find that S&P tends to demonstrate the least dependence on other agencies, and Moody's tends to be the first mover in upgrades. They point out that rating actions by Japanese agencies tend to lag those of the larger agencies, although there is some evidence that they lead Moody's actions. Alsakka and ap Gwilym (2010a) only consider actual rating changes, whereas this chapter is the first to focus on 'credit signal leadership' by focusing on Watchlist and outlook announcements.

This chapter makes a significant contribution, as it analyses the behaviour of sovereign outlook and Watchlist assignments across the two largest rating agencies. The main results are as follows. We

highlight that these agencies employ different policies, whereby S&P tends to aim for greater short-term accuracy, while Moody's policy puts more weight on stability. Strong interdependence regarding outlook and Watchlist adjustments for sovereigns is clear. Moody's is often the first mover in positive outlook and Watchlist changes. S&P leads Moody's negative outlook/Watchlist adjustments to a greater extent than vice versa.

The chapter is organized as follows. Part II discusses the effect of the current crisis on credit rating agencies and sovereign ratings, while Part III explains the importance of outlook and Watchlist signals. Part IV describes the data, while Part V presents the ordered probit models. Part VI analyses the empirical results and Part VII concludes the chapter.

7.2 The effect of the 2007–9 financial crisis on credit rating agencies and sovereign ratings

The global financial crisis of 2007–9, preceded by the subprime mortgage crisis in the United States, placed credit ratings agencies under the spotlight. The high-level group chaired for the European Commission by Jacques de Larosiere argued that, when rating agencies evaluated the credit risk associated with collateralized debt obligations (CDOs), there were 'flaws in their rating methodology'. Rating agencies have also been criticized recently on the basis of inherent conflicts of interest within their business model, lack of transparency and poor communication. In response to the perceived role of rating agencies in the financial crisis, the International Organization of Securities Commissions (IOSCO) revised the Code of Conduct Fundamentals for Credit Rating Agencies in 2008 to address issues of independence, conflict of interest, transparency and competition. Also, a formal regulation on credit rating agencies was approved in April 2009 by the European Parliament. This requires credit rating agencies operating in Europe to register with, and to be supervised by, the Committee of European Securities Regulators (CESR). Agencies will be subject to new, legally binding rules that are based on the IOSCO Code.

In 2009, the US Securities and Exchange Commission (SEC) amended its regulations for rating agencies to require enhanced disclosure of performance statistics, rating methodologies and annual reporting, and additional restrictions on activities that could produce conflicts of interest. The Basel Committee of the Bank for International Settlements reviewed the role of external ratings in the capital adequacy framework, mainly to incorporate the IOSCO Code into the committee's eligibility

criteria, and to require banks to perform their own internal assessments of externally rated securitization exposure.

The recent financial crisis also highlights the importance of sovereign ratings and defaults. In April 2010, the IMF (International Monetary Fund) Global Financial Stability Report stated that sovereign default was the most pressing risk facing the global economy. A prominent example is the case of Greece. On Tuesday 27 April 2010, S&P downgraded Greece's sovereign rating by 3 notches to BB+ (speculative-grade) from BBB+, with negative outlook. Markets in Europe, the UK and the US tumbled in reaction to Greece's rating downgrade, which also signalled that the Greek debt crisis was spreading to other indebted states in the Eurozone. Wood (2010) argues that 'with markets anticipating a Greek debt restructuring, bank traders and risk managers are preparing for a wider crisis that could drag in northern European countries, tip the euro into a tailspin or even threaten the eurozone's integrity'. This downgrade had also threatened the eligibility of using Greek government bonds as collateral to obtain funding from the European Central Bank (ECB). On Monday 14 June 2010, Moody's downgraded Greece's sovereign rating by four notches from A3 to Ba1. In response to Moody's action, Barclays Capital and Citigroup removed the country's sovereign bonds from their indices, as it no longer met the minimum criteria to be included, threatening a sell-off of Greek government debt. The US market reacted with falling stock prices and the euro weakened slightly against the US dollar.

In response to heightened concerns about sovereign risk, the cost of insuring against sovereign risk, as implied by credit default swap (CDS) premia, substantially increased for most European countries between January 2008 and June 2010. For example, the senior five-year CDS premia on debt issued by the UK, US, France, Germany, Greece and Spain increased from 9, 8, 10, 7, 22 and 18 basis points in January 2008 to 93, 43, 95, 50, 762 and 269 basis points in June 2010, respectively.

Sovereign debt concerns raised doubts about the strength of some European banks, including in France, Germany and the UK (e.g., Bank of England Financial Stability Report, June 2010). Banks face a tough refinancing challenge over the coming years. It is estimated that banks worldwide will have at least US\$5 trillion of medium to long-term funding maturing between 2010 and 2013. The Bank of England also indicated that a default by Greece and/or other sovereign issuers could lead to the collapse of many European banks. The European sovereign debt crisis could scare markets, making them less willing to lend to anyone they believe risky, including to UK and European banks. Equity markets re-evaluated prospects for the European and UK banking system, with

equity prices falling considerably during 2010. In addition, credit lines from overseas lenders to some smaller European banks (e.g., in Spain) were reportedly withdrawn, thus elevating counterparty credit risk.

7.3 The importance of outlook and Watchlist Signals

A rating *outlook* is an opinion regarding the likely direction that a credit rating may take over the next one- to two-year period. The rating outlook categories are: positive, stable, negative and developing. Credit Watch status (rating reviews) is a much stronger statement about the future direction of a credit rating within a relatively short horizon (the agencies state an ex-ante target of 3 months). The Watchlist categories are: Watch for upgrade, Watch for downgrade, Watch with direction uncertain. Watchlist assignments are formal rating reviews that are likely to result in some rating action (including confirmation of the existing rating). The agencies' perspective is that an issuer which is on Watchlist has a higher probability of experiencing a rating change than one with a rating outlook assigned. Rating outlooks and Watchlist are designed to signal when risks are imbalanced but a rating change is not certain. Many rating changes are preceded by a non-stable outlook or a credit Watch placement, but a positive or negative rating outlook/ Watchlist does not imply that a rating change is inevitable. Bannier and Hirsch (2010) identify that Watchlist can perform a monitoring function, particularly for speculative-grade issuers. Additionally, ratings with stable outlooks or which are not on Watchlist are frequently changed before the outlook/Watchlist status is revised (see Hamilton and Cantor, 2004; Vazza *et al.*, 2005).⁴

Rating outlooks and Watchlist help mitigate the tension between stability and accuracy, the two targets of a credit rating system (Hamilton and Cantor, 2004). Rating agencies are reluctant to implement a rating change if there is a high probability that the change might be reversed within a short time period. Agencies apply a 'through-the-cycle' rating philosophy; hence they only adjust ratings when they believe that a given issuer has experienced a stable and permanent change in basic creditworthiness. They take a rating action only when it is unlikely to be reversed shortly afterwards, leading to substantial transaction costs (Löffler, 2005; Altman and Rijken, 2006). Many market participants, such as bond issuers, investment management firms (particularly pension and mutual funds) and financial regulators, prefer this approach, since they often take actions based on rating adjustments and, thus, they may incur unrecoverable costs if these actions need to be reversed due

to subsequent reversal of the rating change (Cantor and Mann, 2007; Cantor *et al.*, 2007). Rating outlooks provide an indication that a change in creditworthiness of an issuer has been observed, but its permanence has not been established. When the rating agency believes that a permanent change in an issuer's creditworthiness has indeed occurred, the issuer may be placed on Watchlist for a rating change. When any remaining uncertainty is resolved, the rating is either changed or confirmed (Hamilton and Cantor, 2004; Vazza *et al.*, 2005).

Outlook and Watchlist status are good predictors of future corporate and sovereign rating migrations (see, e.g., Hamilton and Cantor, 2004; Vazza *et al.*, 2005; Alsakka and ap Gwilym, 2009, 2010b). Rating migration probabilities for issuers placed on a Watchlist are different from those of issuers not on the list. Although downgrade (but not upgrade) momentum in corporate and sovereign ratings is supported by prior studies (e.g., Lando and Skødeberg, 2002; Fuertes and Kalotychou, 2007), others have demonstrated that rating momentum can be dominated by outlook/Watchlist status (Hamilton and Cantor, 2004; Alsakka and ap Gwilym, 2009). Credit outlook/Watchlist also helps to identify issuers that are more likely to default or have their rating withdrawn (Metz and Donmez, 2008). Watchlist and rating outlook are essential to market participants who incorporate migrations in their portfolio analysis. Incorporating outlook/Watchlist status into a portfolio's analytical methodologies is likely to result in more accurate assessment of portfolio risk, leading to more efficient allocation of capital (Vazza *et al.*, 2005).

Prior studies on corporate ratings provide evidence on the relative informational value of outlook/Watchlist actions versus rating changes. Using a market price expectations model, Hand *et al.* (1992) show that negative and positive Watchlist announcements by Moody's and S&P (pooled together) are associated with stronger abnormal bond and stock price effects than in the case of actual rating changes.⁵ Steiner and Heinke (2001) observe significant bond price reactions for announcements of downgrades and negative Watchlist events by Moody's and S&P (pooled together), while upgrades and positive Watchlist announcements have insignificant impact. Hull *et al.* (2004) provide evidence suggesting that negative Watchlist signals by Moody's contain significant information for the CDS market, but actual downgrades and negative outlook signals do not. The average increase in the CDS spread at the time of a review for downgrade is almost 10 basis points.

Norden and Weber (2004) show that negative Watchlist actions by Moody's and S&P are associated with significant negative abnormal

stock returns, whereas actual downgrades are not associated with abnormal performance. Similar results are found for the CDS market, except that Moody's downgrades are also associated with significant spread changes. No abnormal performance with regard to rating actions by Fitch is detected in either of the markets. These results also highlight the fact that markets may react differently to rating signals made by different rating agencies. Cantor and Packer (1996) and Brooks *et al.* (2004) also emphasize the unequal reaction to sovereign rating changes across agencies. Moody's sovereign rating changes have a larger effect on bond spreads than S&P actions (Cantor and Packer, 1996). Moody's sovereign upgrade actions are associated with a positive abnormal return, but S&P and Fitch upgrades are not (Brooks *et al.*, 2004). Therefore, pooling ratings data from different agencies together (as done by, e.g., Hand *et al.*, 1992; Steiner and Heinke, 2001) may produce misleading results.

Other studies also provide evidence emphasizing that sovereign outlook/Watchlist changes have important information content in addition to that of sovereign rating changes. Kaminsky and Schmukler (2002) show that sovereign rating and outlook/Watchlist news released by Moody's, S&P and Fitch (pooled together) significantly impacts both bond and stock markets in emerging countries. Importantly, the results reveal that the effects of outlook/Watchlist actions are stronger than the effects of actual rating adjustments, highlighting that the rating changes are then somewhat expected. Further, the effects of rating and outlook/Watchlist changes spill over to other emerging countries' equity and bond markets, particularly during crises and to neighbouring countries. Using data for 42 sovereigns rated by the larger three agencies during 1995–2003, Hooper *et al.* (2008) find that sovereign outlook/Watchlist changes produce a 1.2 per cent change in the USD stock returns index in the direction of the outlook adjustment, which is twice as strong as the impact of rating changes. This confirms Kaminsky and Schmukler's (2002) results and implies that actual rating actions are, to some extent, anticipated, since investors are aware of the prior rating outlook/Watchlist status. The market responses are more pronounced in the cases of downgrades and emerging market debt, and during crisis periods.

Using monthly data for a sample of 13 emerging countries which experienced currency crises in the 1990–2002 period, Sy (2004) finds that S&P and Moody's sovereign ratings changes, including negative Watchlist and outlook changes, help predict the likelihood of distressed debt events (where sovereign bond spreads exceed 1,000 basis points) within the next year. Pukthuanthong-Le *et al.* (2007) study the impact

of changes in S&P sovereign ratings and outlooks/Watchlists on international capital markets using data on 34 countries for 1990–2000. They find that positive outlook/Watchlist actions have a positive and significant effect on the bond market only, while actual rating upgrades have an insignificant impact (on both bond and equity markets). In addition, a negative and significant market reaction in both bond and equity markets is associated with rating downgrades as well as negative outlook/Watchlist actions. Negative outlook/Watchlist adjustments produce a greater change in the bond market index than rating downgrades during two days before and five days after the announcement. Evidence of a significant international spillover effect of negative sovereign rating and outlook/Watchlist adjustments (pooled together) on the sovereign credit spreads and stock market returns of other countries is also provided by Gande and Parsley (2005), Ferreira and Gama (2007) and Li *et al.* (2008).

7.4 Data sample

The data set consists of daily observations of long-term foreign-currency (LT FC) ratings, outlooks and Watchlists of all sovereigns rated by two international credit rating agencies (Moody's and S&P) during the period from 10 August 1994 to 31 December 2009. The core data are obtained from the InteractiveData Credit Ratings International database, and the dates of all rating changes and outlook/Watchlist actions are verified using relevant publications from both agencies. The sample period captures the latest sovereign crises and defaults, including the 1997–8 Asian crisis, Russia 1998, Brazil 1999, Ukraine 2000, Argentina 2001–2, Moldova 2001–2, Uruguay 2002–3, Paraguay 2003, Dominican Republic, Grenada and Venezuela in 2005, Belize 2006, and finally Ecuador and Seychelles in 2008. The sample period also covers the 2007–9 financial crisis, when sovereign ratings came under growing downgrade pressure (e.g., Greece, Hungary, Iceland, Ireland, Portugal and Spain) as a result of increased public spending and other factors during this crisis.

We aim to analyse whether there is interdependence between Moody's and S&P credit outlook and Watchlist actions for sovereign issuers that are jointly rated by the two agencies during the sample period. Table 7.1 presents summary statistics on the rating outlooks and Watchlist data. The data set comprises 158 Watchlist and 166 outlook actions by Moody's, and 67 Watchlist and 459 outlook actions by S&P, for 97 sovereigns jointly rated by both agencies (see Rows 1, 8 and 15).

For S&P, there is no Watch for possible upgrade and, thus, no action of confirming a rating after being placed on Watch for upgrade (Rows 2 and 6). As a matter of rating policy, S&P has never placed a sovereign on a Watchlist for possible upgrade (Alsakka and ap Gwilym, 2009). The number of positive Watchlist and outlook changes (102 and 92) exceeds the number of negative actions (56 and 74) in the case of Moody's, and vice versa in the case of S&P (see Rows 4, 7, 11 and 14). In Rows 8 and 15, the total number of Watchlist actions by Moody's is similar to the total number of outlook adjustments (158 vs. 166). In contrast, the number of outlook actions by S&P is approximately seven times greater than Watchlist adjustments (459 vs. 67). This can be partly explained by S&P's tendency to reverse its outlook actions far more frequently than Moody's. S&P implements a far higher percentage of reversals in outlook actions: 22.4 per cent of the total outlook adjustments, compared with 14.5 per cent for Moody's (see Row 25). This is also in line with the findings of Alsakka and ap Gwilym (2010a) that S&P sovereign ratings show the highest rating volatility, while Moody's show the greatest sovereign rating stability. This suggests that S&P's policy tends to aim for greater short-term accuracy, while Moody's policy puts more weight on stability.⁶ This highlights different practices applied by rating agencies in adjusting the outlook and Watchlist status of sovereign issuers, which is ultimately one of the contributions of this chapter.

The percentages of speculative-grade issuers which experienced Watchlist or outlook changes generally exceed those of investment-grade issuers, with the exception of Moody's positive Watchlist changes (see Rows 17 to 24 in Table 7.1). This is not unexpected, as sovereigns rated at the lower (higher) range of the rating scale are more (less) likely to experience rating changes and thus outlook and Watchlist adjustments (Alsakka and ap Gwilym, 2009).

Figure 7.1 illustrates the net actions (i.e. positive minus negative) of outlooks/Watchlist announced by each rating agency during the sample period. Moody's tends to offer more positive signals than S&P, which is also in line with Alsakka and ap Gwilym's (2010a) finding that Moody's shows a slight tendency to assign the higher rating.⁷ This is also supported by higher positive outlook/Watchlist actions than negative ones by Moody's, but not by S&P, as discussed earlier (see Rows 4, 7, 11 and 14 of Table 7.1). The net outlook and net Watchlist are negative or around zero in 1998 and 2001, reflecting the Asian and Russian crises, and the crises in Latin America, respectively. The net outlook and net Watchlist actions are rising in 2000 and 2004–6 to mirror economic growth, especially in emerging countries. In contrast, there is a strong negative

Table 7.1 Descriptive statistics of the data sample

	Moody's	S&P	Row Number
No. of countries	97	97	1
Watch for possible Upgrade	87	0	2
Confirm rating after being placed on Watch for Downgrade	15	14	3
PW (Positive Watchlist signal)	102	14	4
Watch for possible Downgrade	52	53	5
Confirm rating after being placed on Watch for Upgrade	4	0	6
NW (Negative Watchlist signal)	56	53	7
Total Watchlist signal (PW + PN)	158	67	8
To positive outlook from stable/negative outlook	74	162	9
To stable outlook from negative outlook	18	61	10
PO (Positive Outlook signal)	92	223	11
To negative outlook from stable/positive outlook	58	190	12
To stable outlook from positive outlook	16	46	13
NO (Negative Outlook signal)	74	236	14
Total Outlook signal (PO + NO)	166	459	15
Total Outlook/Watchlist Signals (rows 8 + 15)	324	526	16
Investment grade PW % of Total	17.3%	0.6%	17
Speculative grade PW % of Total	14.2%	2.1%	18
Investment grade NW % of Total	8.0%	2.3%	19
Speculative grade NW % of Total	9.3%	7.8%	20
Investment grade PO % of Total	13.8%	20.2%	21
Speculative grade PO % of Total	14.5%	22.2%	22
Investment grade NO % of Total	11.1%	19.2%	23
Speculative grade NO % of Total	11.7%	25.7%	24
Outlook reversals % of total outlook actions	14.5%	22.4%	25

This table presents summary statistics for the data set. The sample consists of daily long-term foreign currency outlook and Watchlist signals for sovereigns jointly rated by Moody's and S&P during the period from 10 August 1994 to 31 December 2009.

trend through the 2007–9 period (with negative net values in 2008 and 2009) reflecting the financial crisis.

Table 7.2, Panel I, reports actual rating changes by Moody's and S&P. We identify rating changes according to mapped numerical ratings by notches (1, and more than 1) on the basis of daily intervals. We use a mapped numerical rating scale of 20 points (Aaa/AAA =1, Aa1/AA+

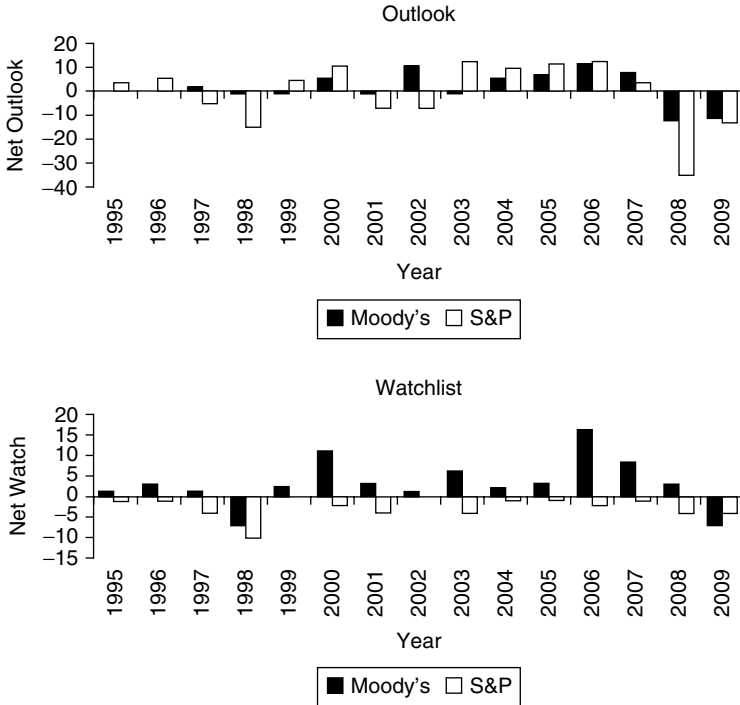


Figure 7.1 Annual net outlook and watchlist actions for sovereigns during 1995–2009

Source: Authors own estimates.

'Net outlook/Watchlist' is positive minus negative signals.

=2... Caa3/CCC– =19, Ca/CC, C/SD-D = 20). This approach is common in the relevant literature; for example, Alsakka and ap Gwilym (2009, 2010a). The number of upgrades exceeds downgrades (170 vs. 91 by Moody's, 210 vs. 157 by S&P). The upgrade trend for sovereign ratings during the sample period derives from a variety of causes fuelling economic growth, especially in emerging countries.⁸ The number of total rating changes by S&P (367) exceeds those by Moody's (261). In addition, more instances of rating reversals are observed in the case of S&P, while they are almost absent in the case of Moody's. This confirms our prior suggestion that S&P aims for greater short-term accuracy, while Moody's aims for higher stability. However, Moody's tends to upgrade its sovereign issuers by more than one rating notch far more often than S&P (43 vs. 19).

Table 7.2, Panel II, shows that 48.8 per cent of upgrades by Moody's are preceded by positive Watchlist, whereas S&P has never placed a

Table 7.2 Distribution of the daily rating changes

	1 notch upgrade	≥2 notch upgrade	Total upgrades	1 notch downgrade	≥2 notch downgrade	Total downgrades	All changes
Panel I: Number of Actual Rating Changes							
Moody's	127	43	170	64	27	91	261
S&P	191	19	210	128	29	157	367
Panel II: Percentage of rating changes preceded by Watchlist/outlook signals							
	Positive Watch	Positive Outlook	Total upgrades	Negative Watch	Negative Outlook	Total downgrades	Watchlist Outlook All changes
Moody's	48.5%	11.2%	170	40.7%	16.5%	91	59.0%
S&P	0.0%	53.8%	210	24.8%	59.2%	157	66.8%

This table provides an overview of the rating changes. The sample consists of daily sovereign long-term foreign currency ratings of countries jointly rated by Moody's and S&P during the period from 10 August 1994 to 31 December 2009. Rating changes are observed by notches based on a 20-point rating scale and daily intervals.

sovereign on a Watchlist for possible upgrade. Also, 40.7 per cent of downgrades by Moody's are preceded by negative Watchlist, while 24.8 per cent of downgrades by S&P are preceded by negative Watchlist. In the case of S&P, 53.8 (59.2) per cent of upgrades (downgrades) are preceded by outlook signals, but only 11.2 (16.5) per cent in the case of Moody's. In general, 59.0 (66.8) per cent of actual changes by Moody's (S&P) are preceded by outlook or watch signals in the same direction.

7.5 Methodology

We apply the ordered probit modelling approach, which considers the discrete, ordinal nature of credit ratings and outlook, Watchlist and rating changes. The ordered probit model has been widely employed in a variety of contexts in credit rating research (e.g., Manzoni, 2004; Güttler and Wahrenburg, 2007; Livingston *et al.*, 2008). Potential lead-lag relationships regarding outlook/Watchlist actions are assessed using a Granger-like method with ordered probit regression (Güttler and Wahrenburg, 2007). We accomplish a relative comparison of the probability of an outlook/Watchlist change by Moody's (S&P) conditional on a previous outlook/Watchlist action and/or an actual rating change by S&P (Moody's). The restriction to a relative comparison arises from the fact that rating signal adjustments are not random events (see Güttler, 2009). We estimate the following models with Moody's (M) as potential follower and S&P (SP) as potential leader in Eq. 1, and vice versa in Eq. 2:

$$y_{it}^M = \sum_{h=1}^3 \beta_h^1 op_{i,h}^{SP} + \sum_{h=1}^3 \beta_h^2 on_{i,h}^{SP} + \sum_{s=1}^2 \beta_s^3 wp_{i,s}^{SP} + \sum_{s=1}^2 \beta_s^4 wn_{i,s}^{SP} + \sum_{k=1}^2 \beta_k^5 up_{i,k}^{SP} + \sum_{k=1}^2 \beta_k^6 dn_{i,k}^{SP} + \epsilon_i \quad (1)$$

$$y_{it}^{SP} = \sum_{h=1}^3 \gamma_h^1 op_{i,h}^M + \sum_{h=1}^3 \gamma_h^2 on_{i,h}^M + \sum_{s=1}^2 \gamma_s^3 wp_{i,s}^M + \sum_{s=1}^2 \gamma_s^4 wn_{i,s}^M + \sum_{k=1}^2 \gamma_k^5 up_{i,k}^M + \sum_{k=1}^2 \gamma_k^6 dn_{i,k}^M + v_i \quad (2)$$

y_{it}^* is an unobserved latent variable linked to the observed ordinal response categories y_{it} (y_{it}^M or y_{it}^{SP}) by the measurement model:

$$y_{it} = \begin{cases} -2 & \text{if } y_{it}^* \leq \mu_1 \\ -1 & \text{if } \mu_1 < y_{it}^* \leq \mu_2 \\ 1 & \text{if } \mu_2 < y_{it}^* \leq \mu_3 \\ 2 & \text{if } \mu_3 < y_{it}^* \end{cases} \quad (3)$$

The μ represent thresholds to be estimated (along with the β coefficients) using maximum likelihood estimation, subject to the constraint that $\mu_1 < \mu_2 < \mu_3$.

y_{it} represents outlook/Watchlist status change by the potential follower agency, Moody's in Eq. (1) or S&P in Eq. (2), for sovereign i on day t . It is an ordinal variable taking the value of -2 , -1 , 1 , and 2 , as follows:

' -2 ': if sovereign i experiences a *negative Watchlist* change at time t . This includes: placing sovereign i on Watchlist for possible downgrade, and the action of confirming the rating of sovereign i after being on Watchlist for possible upgrade.

' -1 ': if sovereign i experiences a *negative outlook* change at time t . This contains: changes to negative outlook from stable/positive outlook; assigning negative outlook simultaneously with a rating change, and changes to stable outlook from positive outlook.

' 1 ': if sovereign i experiences a *positive outlook* change at time t . This contains: changes to positive outlook from stable/negative outlook, assigning positive outlook simultaneously with a rating change, and changes to stable outlook from negative outlook.

' 2 ': if sovereign i experiences a *positive Watchlist* change at time t . This includes: placing sovereign i on Watchlist for possible upgrade, and the action of confirming the rating of sovereign i after being on Watchlist for possible downgrade.

$op_{i,h}$ ($on_{i,h}$) is a dummy variable taking the value of 1 if there is a *positive (negative) outlook* change by the potential leader agency, in three predefined windows of time h , with $h=1$ for 1–15 days, $h=2$ for 16–180 days, and $h=3$ for 181–540 days, prior to the outlook/Watchlist action for sovereign i at time (day) t by the potential follower agency, zero otherwise.

$wp_{i,s}$ ($wn_{i,s}$) is a dummy variable taking the value of 1 if there is a *positive (negative) Watchlist* change by the potential leader agency, in two predefined windows of time s , with $s=1$ for 1–15 days and $s=2$ for 16–180 days, prior to the outlook/Watchlist action for sovereign i at time (day) t by the potential follower agency, zero otherwise.

$up_{i,k}$ ($dn_{i,k}$) is a dummy variable taking the value of 1 if sovereign i is upgraded (downgraded) by the potential leader agency, in two predefined windows of time k , with $k=1$ for 1–15 days and $k=2$ for 16–180 days, prior to the outlook/Watchlist action for sovereign i at time (day) t by the potential follower agency, zero otherwise.

To estimate the economic significance of each variable, we follow Livingston *et al.* (2008) in calculating the marginal effects. The marginal effects report the impacts on the probability of outlook/Watchlist status changes (dependent variable) when the independent dummy variables take the value of 1.

7.6 Empirical results

Table 7.3 present results for the outlook/Watchlist lead–lag relations between Moody’s and S&P, that is, the results of estimating Eq. (1) and Eq. (2). Panel I shows that a sovereign that experienced a negative outlook change by S&P has a significantly increased probability of being placed on negative Watchlist by Moody’s in the subsequent 1–15 (16–180) days by 26.8 per cent (38.8 per cent), and of experiencing a negative outlook action by Moody’s by 9.1 per cent (8.8 per cent). Similarly, a sovereign observed on a negative Watchlist by S&P has a significantly increased probability of being placed on negative Watchlist by Moody’s in the subsequent 1–15 (16–180) days by 36.0 per cent (17.2 per cent), and of experiencing a negative outlook adjustment by Moody’s by 6.1 per cent (8.3 per cent). In contrast, positive outlook actions by S&P have an insignificant impact on future outlook/Watchlist actions by Moody’s.

The results also show that issuers downgraded by S&P have a significantly elevated (decreased) probability of negative (positive) outlook/Watchlist adjustments by Moody’s within 180 days. Additionally, issuers upgraded by S&P have a significantly elevated probability of being placed on Watchlist for possible upgrade by Moody’s by 16.8 per cent within 16–180 days. This implies that Moody’s may follow (by issuing positive Watchlist, which is considered as a strong signal) positive news released by S&P, but only news of actual upgrades (not positive outlook adjustments).

Panel II illustrates that a sovereign that experienced a positive (negative) outlook or Watchlist action by Moody’s has a significantly increased probability of experiencing positive (negative) outlook/Watchlist changes by S&P, while it has a significantly decreased probability of experiencing negative (positive) outlook/Watchlist changes by S&P, in the subsequent 180 days. Similarly, issuers upgraded (downgraded) by Moody’s have a significantly elevated probability of experiencing positive (negative) outlook/Watchlist changes, and a decreased probability of experiencing negative (positive) adjustments, by S&P for all time windows.

Table 7.3 Lead and lags between Moody's and S&P

	Coef	t-value	Avr Chg	ME %			
				-2	-1	1	2
<i>Panel I: Moody's as Outlook/Watchlist Follower to S&P Actions, Eq. (3)</i>							
op by S&P 1–15 days before	0.87	1.68	16.3	-9.7	-17.0	-6.0	32.6
op by S&P 16–180 days before	0.33	1.80	6.1	-5.4	-6.8	0.5	11.6
op by S&P 181–540 days before	0.51	1.82	9.1	-7.3	-10.3	-0.7	18.3
on by S&P 1–15 days before	-0.94**	-4.17	18.0	26.8	9.1	-14.5	-21.1
on by S&P 16–180 days before	-1.30**	-6.30	23.8	38.8	8.8	-20.2	-27.4
on by S&P 181–540 days before	-0.28	-0.80	5.5	6.2	4.8	-2.8	-8.2
wp by S&P 1–15 days before	-	-	-	-	-	-	-
wp by S&P 16–180 days before	-	-	-	-	-	-	-
wn by S&P 1–15 days before	-1.15**	-3.71	21.1	36.0	6.11	-19.6	-22.6
wn by S&P 16–180 days before	-0.65*	-2.37	12.7	17.2	8.3	-9.2	-16.3
up by S&P 1–15 days before	0.26	0.74	4.7	-4.2	-5.2	0.5	9.0
up by S&P 16–180 days before	0.47**	2.88	8.4	-7.2	-9.6	-0.04	16.8
dn by S&P 1–15 days before	-0.68**	-2.76	13.4	18.0	8.7	-9.5	-17.2
dn by S&P 16–180 days before	-0.64*	-2.39	12.6	16.4	8.8	-8.5	-16.7
Pseudo R ²	13.3%		No. of Observations			324	
<i>Panel II: S&P as Outlook/Watchlist Follower to Moody's Actions, Eq. (4)</i>							
op by Moody's 1–15 days before	1.08**	12.54	19.1	-7.6	-30.6	24.3	13.8
op by Moody's 16–180 days before	0.46*	2.07	9.1	-5.1	-13.0	14.8	3.3

Continued

Table 7.3 Continued

	Coef	t-value	ME %				
			Avr Chg	-2	-1	1	2
<i>op</i> by Moody's 181–540 days before	0.32	1.25	6.3	-3.9	-8.7	10.6	2.0
<i>on</i> by Moody's 1–15 days before	-0.53*	-2.47	9.7	11.3	8.2	-18.0	-1.4
<i>on</i> by Moody's 16–180 days before	-0.63*	-2.38	11.2	13.8	8.6	-20.8	-1.6
<i>on</i> by Moody's 181–540 days before	0.33	0.85	6.5	-4.0	-9.1	11.0	2.10
<i>wp</i> by Moody's 1–15 days before	1.57*	2.45	24.1	-8.2	-40.0	19.8	28.4
<i>wp</i> by Moody's 16–180 days before	0.78**	4.05	14.9	-7.1	-22.7	22.2	7.5
<i>wn</i> by Moody's 1–15 days before	-0.76**	-2.77	13.1	18.1	8.2	-24.6	-1.7
<i>wn</i> by Moody's 16–180 days before	-0.30	-1.30	5.7	5.3	6.0	-10.3	-1.0
<i>up</i> by Moody's 1–15 days before	0.39*	2.11	7.7	-4.5	-10.9	12.7	2.6
<i>up</i> by Moody's 16–180 days before	0.54**	3.07	10.6	-5.7	-15.4	17.0	4.1
<i>dn</i> by Moody's 1–15 days before	-0.92**	-3.49	15.3	23.2	7.3	-28.7	-1.9
<i>dn</i> by Moody's 16–180 days before	0.78**	-4.27	13.6	18.1	9.1	-25.3	-1.8
Pseudo R ²	6.4%		No. of Observations		526		

This table reports the results of ordered probit estimations of Eq. (1) and Eq. (2) using data from Moody's and S&P from 10 August 1994 to 31 December 2009. The dependent variables are: y_{it}^M in Panel I (Eq. 1), referring to an outlook/Watchlist status change by *Moody's* (follower agency) for sovereign i in day t , and y_{it}^S in Panel II (Eq. 2), referring to an outlook/Watchlist status change by *S&P* (follower agency) for sovereign i in day t . Four different classes of outlook/Watchlist status changes are employed: -2, -1, 1, and 2, corresponding to negative Watchlist, negative outlook, positive outlook and positive Watchlist signals. The independent variables are: $op_{i,h}$ ($on_{i,h}$), a dummy variable taking the value of 1 if there is positive (negative) outlook change by the potential leader agency, in three predefined windows of time h , with $h = 1$ for 1–15 days, $h = 2$ for 16–180 days and $h = 3$ for 181–540 days prior to the outlook/Watchlist action for sovereign i at time (day) t by the potential follower agency, zero otherwise; $wp_{i,s}$ ($wn_{i,s}$), a dummy variable taking the value of 1 if there is positive (negative) Watchlist change by the potential leader agency, in two predefined windows of time s , with $s = 1$ for 1–15 days and $s = 2$ for 16–180 days, prior to the outlook/Watchlist action for sovereign i at time (day) t by the potential follower agency, zero otherwise; and $up_{i,k}$ ($dn_{i,k}$), a dummy variable taking the value of 1 if a sovereign i is upgraded (downgraded) by the potential leader agency, in two predefined windows of time k , with $k = 1$ for 1–15 days and $k = 2$ for 16–180 days, prior to the outlook/Watchlist action for sovereign i at time (day) t by the potential follower agency, zero otherwise. We apply Huber–White robust standard errors. We also estimate and report the impact of each variable on the probability of an outlook/Watchlist status change (marginal effect (ME)). **Significant at 1 per cent level; *significant at 5 per cent level. The estimates of the three threshold parameters are significant at the 1 per cent level in all estimations, and are not shown here. 'na': no data available/observed.

It is clear that Moody's is more likely than S&P to lead in positive actions. In contrast, S&P has a greater tendency to lead in negative actions. Moody's negative outlook/Watchlist adjustments tend to follow S&P actions to a greater extent than vice versa, as suggested by the marginal effects analysis, particularly during the 1–15-day window (which has an implication for market reactions). S&P negative outlook actions increase the probability of Moody's negative Watchlist (outlook) adjustments within 1–15 days to a greater extent than vice versa (26.8 per cent (9.1 per cent) versus 11.3 per cent (8.2 per cent)). Additionally, S&P negative Watchlist actions increase the probability of Moody's negative Watchlist adjustments within 1–15 days to a greater extent than vice versa (36.0 per cent versus 18.1 per cent). Overall, S&P seems less dependent, because the Pseudo R^2 value is 13.3 per cent when Moody's is a follower compared with 6.4 per cent when S&P is a follower.

7.7 Conclusion

Using a rich data set comprising the two leading global rating agencies (Moody's and S&P), this chapter analyses the behaviour of outlook and Watchlist signals for sovereign issuers. The descriptive analysis highlights the fact that rating agencies employ different policies. S&P puts more emphasis on short-term accuracy than Moody's, while Moody's policy places more weight on stability. S&P reverses its outlook actions and its actual rating changes much more frequently than Moody's. As matter of rating policy, S&P has never placed a sovereign on a Watchlist for possible upgrade. The number of positive Watchlist and outlook changes exceeds the number of negative actions in the case of Moody's, and vice versa in the case of S&P. However, the number of upgrades exceeds the number of downgrades by both agencies. Moody's tends to upgrade its sovereign issuers by more than one rating notch far more often than S&P. Approximately two-thirds of actual changes by both agencies are preceded by watch or outlook signals in the same direction.

We use the ordered probit modelling approach to examine the lead-lag relations between Moody's and S&P regarding outlook and Watchlist announcements. There is evidence of strong interdependence between Moody's and S&P regarding outlook and Watchlist actions for sovereign issuers. However, the results suggest that Moody's is a leader in positive outlook and Watchlist actions. It is the more common 'first mover', with S&P likely to follow Moody's positive outlook and Watchlist actions within 1–180 days. This is in line with the findings of Alsakka and

ap Gwilym (2010a) on lead–lag relationships for actual sovereign rating changes, and is also consistent with Brooks *et al.*'s (2004, p.247) result that only Moody's upgrades are associated with a positive abnormal stock return. Moody's may follow (by placing a sovereign on positive Watchlist, which is a strong signal) positive news released by S&P, but only in the case of actual upgrades (not positive outlook or Watchlist adjustments). To some extent, S&P shows the strongest lead in negative actions. S&P has the tendency to lead Moody's negative outlook/Watchlist adjustments to a greater extent than it follows them. This is supported by greater values of marginal effects when S&P is a leader than when it is a follower, particularly during the 1–15-day window (which has an implication for market reactions).

Outlook and Watchlist are increasingly important elements of a complete credit opinion. They help to mitigate the tensions between the two targets of a credit rating system, namely, stability and accuracy. Agencies are criticized for their apparently slow reactions in changing ratings. Because of agencies' 'through the cycle' methodology and the sound reasons for stability in ratings, signals from Watchlist and outlook are very likely to be the source whereby agencies provide most information to market participants. Sovereign outlook and Watchlist have been demonstrated to affect equity, bond and CDS markets. Sovereign outlook/Watchlist changes also contain vital information regarding the potential future direction of rating migrations. Therefore, our evidence on sovereign outlook and Watchlist behaviour and lead–lag relationships will interest many market participants, such as regulators, financial institutions, issuers (corporates and sovereigns), credit risk managers and investment managers. In particular, the recent financial crisis emphasizes the increased importance of sovereign debt. Rating agencies will also be interested from a reputational perspective, especially with the expectation of increased competition in the rating industry following the recent revision of the IOSCO Code of Conduct for Credit Rating Agencies and the European Union's 2009 regulations.

Notes

1. Moody's, S&P and Fitch have recently eliminated their sovereign ceiling rule. Though the ceiling effect is no longer absolute, there remains a 'sovereign ceiling lite' (Alsakka and ap Gwilym, 2010a).
2. The main focus of related studies on sovereigns has been the identification of the determinants of sovereign ratings and rating migrations (e.g. Cantor and Packer, 1996; Bennell *et al.*, 2006; Alsakka and ap Gwilym, 2009, 2010a,b).

3. Also, Cantor *et al.* (2007) show that most fund managers (92 per cent) and plan sponsors (67 per cent) use multiple agencies for investment decisions. Research also exists on sovereign split ratings (e.g. Alsakka and ap Gwilym, 2010c, 2011).
4. Outlook developing and Watch with direction uncertain are a very small minority of the cases of outlook/Watchlist status. As they do not signal a future rating direction, we exclude these cases in the empirical analysis.
5. Hand *et al.* (1992) report that a significant negative average excess bond return of -1.39 per cent is associated with negative Watchlist announcements, compared with the average excess bond return of -1.27 per cent on the announcement of actual rating downgrades. A significant positive average excess bond return of 2.25 per cent is associated with positive Watchlist actions, while the evidence on the effect of actual upgrades is much weaker (0.35 per cent). A significant average excess stock return is observed at the time of negative Watchlist actions (1.78 per cent), but not at the time of positive Watchlist events.
6. Many market participants seem to support Moody's policy of avoiding rating reversals (Fons *et al.*, 2002). However, Moody's has not specified its policy in more detail (Löffler, 2005).
7. This is particularly clear in Watchlist for 2006 and 2007. However, bear in mind that S&P does not assign positive watch to sovereigns.
8. As the 2007–9 financial crisis spread to emerging markets and global economic growth slowed, there was a reversal in sovereign credit trends as downgrades exceeded upgrades in 2008 and 2009.

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8

Errors in Individual Risk Tolerance

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8.1 Introduction

This paper focuses on risk tolerance, which works as a relevant feature affecting financial decision-making. Specifically, *financial risk tolerance* may be defined as 'the maximum amount of uncertainty someone is willing to accept when making a financial decision' (Grable, 2008). Theoretically, financial risk tolerance depends upon different dimensions of risk. Weber *et al.* (2002) refer to *risk attitude* as 'a person's standing on the continuum from risk aversion to risk seeking' (p. 222), and they contend that the degree of risk-taking is highly domain-specific. Risk-averse individuals in one domain (e.g., financial choices) may not behave consistently across other domains (sports, social skills...). In a word, risk taking behaviour is multidimensional. From the perspective of financial planners (Cordell, 2002; Boone and Lubitz, 2003), financial risk tolerance can be defined as a combination of both 'risk attitude' (*how much risk I choose to take*) and 'risk capacity' (*how much risk I can afford to take*). Nevertheless, these two components of risk tolerance are intrinsically different: risk attitude is a psychological attribute (Weber *et al.*, 2002, also refer to it as a personality trait), whereas risk capacity is principally a financial attribute.

Many scholars from different disciplines have analysed how *risk*, *risk perception* and *risk tolerance* influence individuals when making choices under uncertainty. The notion of *risk* in the decision process is an essential element within the classical economic theoretical background (the so-called *normative approach*), from the Expected Utility theory of Von Neumann and Morgenstern (1944) to the Modern Portfolio Theory of Markowitz (1952). However, in stark contrast, the early works of behavioural economics in the 1970s, from the prospect theory of Kahneman

and Tversky (1979) to the more recent Behavioural Portfolio Theory (Shefrin and Statman, 2000; Hoffmann *et al.*, 2010), have introduced the evidence of cognitive biases that alter rational decision-making (a *descriptive approach*).

The limitations of both classical economic theory and behavioural studies are outlined by a third stream of studies. Among others, Loewenstein *et al.* (2001) observe that these frameworks are strongly cognitive and consequentialist. These authors propose a further theoretical perspective, namely a '*risk-as-feelings hypothesis*', resulting from a range of clinical and physiological research. They provide evidence that emotional reactions to risky situations often diverge from their cognitive assessments. This new stream of studies relies on a concept which has now become common knowledge: emotions often overcome rationality when making decisions under uncertainty (Grossberg and Gutowski, 1987; Damasio, 1994; Lo, 1999; Loewenstein, 2000; Peters and Slovic, 2000; Olsen, 2001).

An extreme conceptualization of this statement is the Somatic Marker Hypothesis (SMH), in which Antonio Damasio postulated that somato-visceral signals from the body (affective reactions) ordinarily guide individuals' decisions-making and risk engagement processes (Damasio *et al.*, 1991; Damasio, 1994; Bechara *et al.*, 2003). Given that emotional responses, rather than rational forces, have now started to be considered as major factors in financial decision-making processes, it is plausible to export Damasio's hypothesis into the field of economics. Some scholars have also empirically proven a relationship between psychological processes and how investors behave in financial markets (Lo and Repin, 2002; Lo *et al.*, 2005). Thus, economics, psychology and neuroscience have started to converge into a single field under the label of neuroeconomics, which aims to employ recent neuroscientific methods in order to analyse economically relevant brain processes. This innovative field has repeatedly revealed deviations from the classical theory of economists, highlighting that subjects show dysfunctional behaviours that are not explicable using traditional economics concepts.

So, on one hand, *risk perception* is influenced by the dimensions of risk, and, on the other, it is influenced by the subjective/affective states of the perceiver (see, e.g., Johnson and Tversky, 1983; Wright and Bower, 1992). In order to maintain their state, subjects in a positive mood become more risk-seeking, but only when the stakes are low, following '*affect regulation goals*' (Leith and Baumeister, 1996). Thus, we are at a turning point in respect to the *normative approach* of standing

economic theories, which, according to Damasio (1994), states that 'to obtain the best results, emotions must be kept out' (p. 171). This more recent psychological and neurobiological thinking on individuals' risk-taking behaviour asserts that emotions do not necessarily damage thoughtful decision-making. On the contrary, some empirical studies have demonstrated that individuals who have difficulty in connecting their emotions with decisions make very poor decisions in some contexts, and take risks even when they result in catastrophic losses (Bechara *et al.*, 1997; Damasio, 1994; Shiv *et al.*, 2005). Be that as it may, there is also opposing evidence with regard to the biasing effect of non-relevant emotions on decision-making the aforementioned studies also demonstrated that there are specific circumstances under which individuals who have lost the capacity to process emotional information might actually make better decisions than normal individuals (Damasio, 1994; Shiv *et al.*, 2005).

The debate is certainly not over, and the aim of the research described in this chapter is to shed light on the emotional side of a risk-taking behaviour, comparing alternative measures of financial risk tolerance resulting from the *consilience* of various disciplines (Wilson, 1998; Rustichini, 2005; Glimcher and Rustichini, 2004).

The first assumption of this chapter is that any individual who is asked to self-assess his/her risk tolerance will evidently fail to evaluate it properly. We hypothesize that self-assessed risk tolerance is biased by a set of distortions: the difficulties in any self-evaluation; self-esteem, which influences the objectivity of the evaluation; the self-representation which he/she is willing to give to others (bankers, financial advisers); the implicit expectations linked with the risk tolerance declaration (the latter strongly correlates with expectations of returns). We hypothesize further that, in any questionnaire which is completed by a person who is asked to self-evaluate himself or herself, directly or indirectly, the resulting risk tolerance returned will be biased. We accordingly name this evaluation *biased risk tolerance (BR)*. Existing studies based on large databases have already demonstrated a tendency for individuals to underestimate their risk tolerance score (Hallahan *et al.*, 2004; Gilliam *et al.*, (2010).¹ Nonetheless, these authors compare two different biased risk tolerance measures: the score directly provided by the individual before filling in the questionnaire, and the score indirectly obtained by the psychometrically derived measure of risk tolerance (in the case of these studies, the ProQuest questionnaire). In our chapter we demonstrate that the latter measure *also* does not correspond entirely to the *true* risk tolerance. The issue appears particularly relevant for the

widespread use of these systems of risk profiling at the regulatory level also (e.g., MiFID [Markets in Financial Instruments Directive]).

The second assumption of the chapter is in line with the ‘risk-as-a feeling’ approach, which maintains that people often make judgements based on ‘gut feelings’ (Damasio, 1994; Loewenstein *et al.*, 2001). Accordingly, we build up a further risk tolerance measurement. We call it an *unbiased risk tolerance* – UR – because it is not prejudiced by the distortions of BR, given that it is obtained through a psychophysiological experiment. This test is able to replicate a risk-taking decision process, for quite a long period (100 choices), in which pre-existing financial knowledge or skills are not influencing factors (at least theoretically), and in which people are unable to manipulate the results, even unconsciously. We assume that the measurement of UR obtained through these experiments returns a more objective evaluation of risk tolerance, because it relies on the observation of individuals taking risky choices influenced by spontaneous somatic responses, emanating from their ‘gut feelings’.

We consider also the actual financial decisions taken by individuals (the real-life risk, RLR). Many studies have tried to correlate the portfolio choices taken by investors with risk tolerance (see Section II). By comparing BR, UR and RLR, our study allows us to understand what drives our real-life decisions: either who we are or who we are supposed to be. Moreover, we try to draw a parallel between these levels of risk tolerance and their cross-differences with some socio-economic variables in accordance with previous studies conducted in the literature. Even if it has been demonstrated (Dhar and Zhu, 2006) that investors can be classified into different subgroups, a main dilemma for this study still exists: how to manage the problem of *latent heterogeneity* (Pennings and Garcia, 2004, 2009). According to Hoffmann *et al.* (2010), socio-economic variables are used as a proxy for the underlying psychological process driving investment choices. Linking behaviours to socio-demographic clusters implicitly induces us to ‘assume that investors in the same age bracket, having the same gender [...] are homogenous in their underlying psychological processes and the impact these have on their decision-making’ (Hoffmann *et al.*, 2010, p. 2). Relying on commonalities of gender, age or education as proxies of plausible financial behaviours may be a strong temptation, especially for financial advisers and planners, who are not always comfortable with the mental knowledge of their customer. However, these commonalities may be misleading if the behavioural heterogeneity among investors is neglected. This chapter adds to the existing literature because it

overcomes the dilemma of obtaining socio-economic regularities by directly observing the psychophysiological reactions of individuals when facing financial risk.²

The empirical approach relies upon cross-disciplinary competences (from economics, to psychology and then to affective neuroscience). The analysis involved an assorted sample of individuals, with different levels of financial education/competences. It is the widest sample ever studied at the international level, employing psychophysiological devices. The tools used during the empirical analysis are, first, a psychophysiological test, the Iowa Gambling Task (IGT), which is conducted in parallel with obtaining Skin Conductance Responses (SCR) in order to evaluate physiological responses while risky choices are being made. Then, we utilize a more traditional questionnaire, divided into three sections. The first section includes the Grable and Lytton (1999) questionnaire, which is used to measure self-assessed risk tolerance (BR); the second section contains an impulsivity test, based on the Barratt Impulsivity Scale (BIS) from Patton *et al.* (1995); the third includes the collection of demographic–socio-economic information, together with personal financial choices, as far as both past investments and debts are concerned.

8.2 Review of existing literature

The existing literature is wide and varied, attracting the attention of several disciplines (neurophysiologists, psychologists, social scientists and economic scholars). To date, four main issues have been considered: first, how to explain human decision-making and individuals' behaviour towards risk; second, how to measure risk tolerance; third, which drivers may explain individuals' level of risk tolerance; fourth, how to explain/predict human behaviour when making portfolio choices and obtaining performances.

The first stream of studies is wide and still developing; this is especially true with regard to the input from neuroscience/psychology, given the relevant innovations in neuroimaging techniques, such as functional magnetic resonance imaging or positron emission tomography. Although this field of research is deeply fascinating, we omit these studies because our chapter aims to observe the very final effect of brain processes in relation to financial choices. Moreover, this chapter provides evidence of a new model of mental functioning that places rationality and emotion side-by-side with a third factor: *counterfactual thinking* and the *wandering mind* (Mason *et al.*, 2007; Raichle and Snyder,

2007). This interpretation in essence originates from the pioneering work of Kahneman, who, in the essay that he wrote in collaboration with Tversky (1982), posed the key question for cognitive scientists, namely: ‘how do people mentally “undo” reality?’

The second field of research refers to risk tolerance measurements. Grable (2008) proposes a list of five different methods³ of measuring risk tolerance, underlining clear limitations for some of them. First is *personal/professional judgement*; this may be strongly biased by the subjectivity of the judge, and it can often be not particularly accurate. Second, risk tolerance may be assessed in terms of *heuristics*,⁴ but this process can potentially lead to miscalculation and incorrect clustering of individuals. The third method relies on the *observation* of the actual investments, but its limitations are clear because the riskiness of portfolio choices may also be due to external recommendations (from advisers or friends) or market transitory trends. The fourth method is based on *single item questions*, such as the Survey of Consumer Finances (SCF) risk tolerance item. Answering the questions returns a score very close to the investment choice attitude, but it is often affected by some distortions. The authors’ preference is for the fifth method, which refers to *psychometrically designed scales* (Roszkowski *et al.*, 2005). Most of these scales are protected by copyright (e.g., the Survey of Financial Risk Tolerance©; the ProQuest–FinaMetrica Personal Financial Profiling system®). The only publicly available psychometrically designed scale, which has already been tested and proven to offer acceptable levels of validity and reliability, is a 13-item risk scale developed by Grable and Lytton (1999). This is the scale which we employ in our analysis to deduce the (self)-assessment of personal financial risk tolerance (which we call biased risk tolerance, BR).

Leaving aside the issue of the *quality* of the questionnaire in the psychometric meaning of Roszkowski *et al.* (2005), several researchers have tried to verify whether the ‘questionnaire’ *device* is an appropriate tool for evaluating financial risk tolerance. For example, Corter and Chen (2005) test the existence of any difference between the levels of risk revealed through traditional questionnaires used by banks and the real willingness to take a risk. They compared the results of three traditional questionnaires (their own Risk Tolerance Questionnaire, Scudder Kemper’s and Vanguard Group’s) with the ‘sensation seeking scale’ introduced by Zuckerman (1994). Results show that the three questionnaires are consistent, but not correlated, with the sensation-seeking measure. This raises doubt that evidence from a questionnaire can provide good measures of risk tolerance. On the other hand, Faff *et al.* (2008)

compare, theoretically and empirically, two approaches for the analysis of decision-making under uncertainty: a psychometrically validated survey and a lottery experiment. The analysis of a final sample of 162 participants allows them to show that the two approaches are aligned, especially for females. Finally, Pan and Statman (2010) underline how traditional risk questionnaires aimed at helping advisers guide investors are deficient in five ways: first, they fail to consider risk as a multidimensional concept; second, the recommended portfolio allocations are not transparently linked with the questionnaire answers; third, investors' risk tolerance is sensitive to the market trends; fourth, risk tolerance varies when assessed in foresight or hindsight (in the latter case, regret tends to be strong); fifth, many biases arise from questionnaires (propensities beyond risk tolerance and regret). They examine deficiencies and remedies, based on a survey of more than 2,500 individuals.

The third stream of studies comprises those who have tried to uncover some of the socio-demographic regularities in risk-taking behaviour. As already noted, these regularities are assumed as proxy of groups of psychological clusters (Hoffmann *et al.*, 2010) and they mainly overcome the organizational difficulties of carrying out a deep psychological analysis on a large scale. Table 8.1 offers a summary of the state of the art for the most relevant socio-demographic variables studied in the existing literature (age; gender; marital status: single/married; education; financial knowledge/expertise; income).⁵ We distinguish between when the research offers controversial evidences and when, on the contrary, there is a wide consensus both in the significance and in the sign of the relationship. The latter can be positive, or negative, with risk tolerance (RT), or it may be proven to be insignificant.

All the studies quoted in Table 8.1 refer to a measure of risk tolerance deduced by questionnaire (it would be our BR) and, in any case, they do not refer to psychophysiological empirical analysis. The widespread consensus is for gender and income. In particular, several studies support the idea that, within the finance domain, males are overconfident and undertake riskier behaviours than females, and that higher income induces people to be risk-seekers. Among others, we quote the research of Frijns *et al.* (2008), who distributed a web questionnaire among university students and employees interested in financial topics; the valid answers obtained numbered 94. They show that demographic drivers (age and gender) and external drivers (level of risk-free rate and market sentiment), together with the individual's risk aversion, affect portfolio choices. In particular, the older investors become, the more they invest in risky assets. The same riskier attitude is seen in males compared with

Table 8.1 Socio-demographic drivers and risk tolerance

	State of the art	Positive with RT	Negative with RT	No relation
Gender	Consensus: Riley and Chow (1992); Grable (2000); Barber and Odean (2001); Hallahan <i>et al.</i> , 2003; Frijns <i>et al.</i> (2008)	Males: within the finance domain, males are overconfident and undertake riskier behaviour than females.	Females	
Age	Controversial	Palsson (1996); Wang and Hanna (1997); Grable (2000); Frijns <i>et al.</i> (2008)	Wallach and Kogan (1961); McInish (1982); Morin and Suarez (1983); Riley and Chow (1992); Hallahan <i>et al.</i> (2003, 2004)	
Marital status – single	Controversial	Hallahan <i>et al.</i> (2004)	Grable (2000)	Riley and Chow (1992); Hallahan <i>et al.</i> (2003)
Marital status – married	Controversial	Grable (2000)	Hallahan <i>et al.</i> (2004)	
Education	Controversial	Riley and Chow (1992); Grable (2000); Hallahan <i>et al.</i> (2004)		Hallahan <i>et al.</i> (2003)
Financial knowledge/expertise	Controversial	Grable (2000); Frijns <i>et al.</i> (2008)		Hallahan <i>et al.</i> (2004)
Income	Consensus: Morin and Suarez (1983); Riley and Chow (1992); Grable (2000); Hallahan <i>et al.</i> (2003, 2004)	Higher income induces people to be risk-seekers.		

females. Investors prefer risky assets under a bull market sentiment; the opposite is true with an overall bear sentiment scenario.

Hallahan *et al.* (2003 and 2004) use a FinaMetrica® data set of 20,415 respondents and, in their first study (2003), they find that age and income seem to be the two main demographic determinants of risk tolerance, while education, marital status and dependants are not found significant in explaining an individual's risk attitude. They find that risk tolerance decreases with age, following a non-linear relationship, as already shown by Riley and Chow (1992). They confirm this evidence with a further specific study (Hallahan *et al.*, 2009). They also find that individuals tend to underestimate their risk tolerance. With some slight differences in comparison to their previous findings, in the paper published in 2004, Hallahan *et al.* find that gender, age, number of dependants, marital status, income and wealth are significantly related to risk tolerance. Gilliam *et al.* (2010) use data from 26,759 respondents (US residents) obtained via the FinaMetrica® Risk Profiling System. They examine the differences in financial risk tolerance among leading baby boomers (born between 1946 and 1950) and trailing baby boomers (born between 1960 and 1964). The latter are more risk tolerant than the former. Risk tolerance is proved to be positively related to higher educational attainment, income, net worth, and gender, with men having a higher risk tolerance than women. Given that the FinaMetrica® profiling system distinguishes between perceived risk tolerance and measured risk tolerance, they show that leading boomers (older people), those with less educational attainment, lower income earners and those with a greater number of financial dependants tend to underestimate their risk tolerance. The authors believe that this is due to lack of investment experience. Conversely, younger and more educated people, with higher income, and who are men and also married, are less likely to underestimate their risk tolerance.

The fourth and last stream of studies deals with how to explain/predict human behaviour when making portfolio choices and obtaining performances. In some cases, authors have either suggested new techniques/measurements for risk tolerance or tried to confirm the validity of existing methods. In this latter case, we include Grable and Lytton (2003), who tested the accuracy of their risk assessment instrument (the questionnaire of Grable and Lytton, 1999) when explaining actual investment behaviour, and found positive evidence. They used an internet-based survey to collect 378 valid responses (and 303 valid cases). Their results confirm the technical validity of their 1999 questionnaire. Moreover, their findings raise some doubts over the ability of

some demographic and socio-economic variables to explain financial risk tolerance. This induces them to advise other researchers also to use psychosocial constructs in their chosen methodology. Further research involving the same authors (Grable *et al.*, 2009) shows how accurately individuals judge their own level of financial risk tolerance and whether self-assessed financial risk tolerance is associated with investment risk-taking behaviours. Analysing a sample of 1,740 internet risk-assessment survey respondents, they provide evidence that self-classification is positively associated with actual risk-taking investing behaviours.

Strong innovation in the measurement of risk-taking behaviour is introduced by Lo and Repin (2002). They record psychophysiological measures of emotional responses (skin conductance, blood volume pulse, heart rate, electromyographical signals, respiration and body temperature) in a pilot sample of 10 traders during live trading sessions. Results showed that all the traders, even the most experienced ones, exhibited significant emotional responses during risky market events. Moreover, experience seems to differentiate the strength of the emotional reaction: less experienced traders show significantly higher mean autonomic responses. The authors suggest that trading skills may be related to certain physiological characteristics and that 'emotion is a significant determinant of the evolutionary fitness of financial traders' (p. 333). In a following study, they try to enlarge the sample under analysis and are forced to leave behind the previously utilized physiological experiments. Lo *et al.* (2005) employ online questionnaires for assessing the emotional state and psychological profile of the participants of a five-week online training programme for day-traders; 33 valid cases were used in the analysis. They find a link between emotional reactivity and trading performance. In particular, they uncover a negative correlation between successful trading behaviour and emotional reactivity, because those who emotionally reacted more to monetary gains and losses experienced significantly inferior trading performance. Another innovation in the metric of risk tolerance is proposed by Kimball *et al.* (2007). On the basis of the responses to hypothetical income gambles in the Health and Retirement Study (11,616 respondents), they propose a cardinal proxy for risk tolerance. Consequently they can control cross-sectionally for individual risk preferences when studying households' asset allocations. Their risk tolerance proxy explains differences in asset allocation choices, while controlling for correlations among the variables gender and education reduces their explicative role. More recently, Hoffmann *et al.* (2010) use a combination of transaction and survey data involving one of the largest online brokers in the

Netherlands and provide support for the behavioural approach to portfolio theory. They consider the latent heterogeneity among investors in terms of their preferences and beliefs that form the underlying drivers of their behaviour. They compare portfolio choices between speculators and investors; they find evidence of differences in aspirations, turnover, overconfidence and performances between those who rely on technical analysis, on the one hand, and those who rely on fundamental analysis, on the other. The latter have higher aspirations, are deemed to be risk-lovers, are more overconfident and, generally, perform better than the first group.

8.3 Sample and methodology

The fallacy of traditional measures for responsible investing (Pan and Statman, 2010) suggests the choice of *consilience*, that is, the cooperation of varied disciplines in order to understand the complexity of human (financial) risk-taking behaviour. The empirical analysis involved an assorted sample of individuals: customers of banks, traders, bankers, financial advisers and asset managers. More than 600 individuals were asked to take part in the experiments and 445 of them did so, with neither obligation nor reward. The width of the sample is relevant, considering the use of psychophysiological tests. For example, for similar experiments, Lo and Repin (2002) examined 10 subjects; Lo *et al.* (2005) studied 33 individuals; Bechara and Damasio (2002) compared 46 substance-dependent individuals, 10 subjects with lesions of the ventromedial prefrontal cortex and 49 normal controls.

The tools used during the empirical analysis were, on the one hand, a psychophysiological test, the IGT, which was used in parallel with obtaining SCR in order to evaluate physiological responses while making risky choices. On the other hand, we employed a more traditional questionnaire, divided into three sections. The first section replicates the Grable and Lytton (1999, 2003) questionnaire, used to measure self-assessed/biased risk tolerance (BR); the second section consists of an impulsivity test; the third includes the collection of demographic-socio-economic information, together with personal financial choices, as far as both past investments and debts are concerned.

Although originally intended to explain decision-making deficits in people with specific frontal lobe damage, the IGT (Bechara and Damasio, 2002; Bechara *et al.*, 2005) has been successively proven to be effective in exploring the implications of the Somatic Marker Hypothesis (Damasio, 1994) in a variety of psychiatric populations and

healthy subjects. The IGT simulates real-life decisions in conditions of reward, punishment and uncertainty. In this task, participants sequentially select a card from four decks and receive a monetary outcome after each selection. The pay-off from the alternatives and the risk/return combination of each deck appears to be a good simplification of alternative investments. In fact, some decks (the advantageous ones) are set to give low returns, but at lower risks (losses are not frequent and severe); other decks (the disadvantageous ones) offer higher returns but are associated with higher risk (losses are more frequent and severe). Somatic reactions (i.e. SCR) to these rewards (gains) and punishments (losses) are generated after each card selection so that individuals begin to trigger anticipatory reactions that will guide their forthcoming choices. For the majority of healthy subjects, the IGT consists of two phases: an early phase where subjects learn to make choices, but without having any explicit knowledge about the contingencies that guide their decision (decision under ambiguity); and a latter phase where the risks associated with each deck become more explicit (decision under risk). Even if gains and losses are only simulated, a similar performance pattern emerges when the nature of the incentive used is varied, for example, when giving real money instead of facsimile reinforcers (Bowman and Turnbull, 2003).

8.4 Risk tolerance indicators

In our study we need to compare alternative measures of financial risk tolerance. On the one hand, the IGT plus SCR experiment allows us to compute unbiased risk tolerance (UR). On the other hand, Grable and Lytton (1999, 2003) offer a scale developed framework which has been psychometrically designed as a valid and reliable risk assessment instrument for subjective risk tolerance (BR).

The need to put UR and BR side by side requires them to be metrically comparable. Two alternative options exist: the first is to impose two extreme behaviours (the maximum and the minimum risk aversion), being symmetric in relation to a midpoint corresponding to indifference towards risk; the second choice is to figure out the two extreme behaviours without a theoretical assumption of indifference towards risk. The first alternative was excluded for lack of a relevant definition of the theoretical (and empirical) meaning of indifference towards risk (see Lucarelli and Brighetti, 2011). Hence the preferred option is the choice of a range between 0 and 1. People revealing a risk indicator

Table 8.2 Summary statistics for risk tolerance drivers (441 observations)

Variable	Mean	Std. Dev.	Min	Max
UR	0.580	0.458	-0.036	1.015
BR	0.475	0.179	0.000	1.000

(either BR or UR) equal to 0 are considered risk-avoiders, whereas those exhibiting a score equal to 1 are judged to be risk-seekers.

In order to compute a UR measure, we use the model, which explains the individual decision process during the IGT plus SCR test. This model describes what drives an individual's preference for a risky or a not-risky solution, taking the anticipated somatic response under control. The UR indicator is obtained as the median of the estimated values of the binomial choices between not-risky (UR close to 0) and risky decks (UR close to 1). Since UR is obtained from estimated values, its extremes are not precisely 0 and 1, due to the presence of the error term (see Table 8.2).

Conversely, BR is obtained from the global score obtained by each individual from the 13-item Grable and Lytton test (Grable and Lytton, 1999, 2003). In order to set BR within the 0–1 range (0 signalling the highest aversion and 1 indicating the highest propensity) we apply a normalization computation using the maximum and the minimum score obtained by individuals in our sample.

The summary statistics for our indicators of risk are shown in Table 8.2 for the overall sample of 441 individuals. The unbiased risk indicator (UR) shows a higher average value than BR, meaning that in our sample individuals reveal a higher 'emotional' attraction towards risk than they think or declare themselves to have. This is a rudimentary but informative proof of the presence of an error in individual risk tolerance.

The high average level of UR compared with BR may suggest that a relevant unconscious and unaware attraction towards risk is proven to exist. Nevertheless, as a descriptive overview, we show how specific subsamples of individuals reveal different behaviours. Table 8.3 reports the average values of UR and BR computed by distinguishing our sampled individuals into seven socio-demographic categories, following the main literature on the field (from Table 8.1). We refer to gender, age, marital status, education, financial knowledge, financial profession and, finally, self-esteem.

Before any further considerations, we have to keep in mind that our sample has been built with the aim of selecting people who take

Table 8.3 Differences in average values for UR and BR (441 observations)

Gender		Observations	UR	BR
	Male	345	0.578903	0.4937618
	Female	96	0.582116	0.4080616
		t stat	-0.0607	4.2375
		p-value	0.9516	0.0000
Age		Observations	UR	BR
	Under 60	396	0.571889	0.4913263
	Over 60	45	0.647481	0.3323671
		t stat	-1.0496	5.8683
		p-value	0.2945	0.0000
Marital status		Observations	UR	BR
	With family	405	0.569087	0.4739667
	Not with family	36	0.697897	0.4879227
		t stat	-1.6205	-0.4489
		p-value	0.1058	0.6538
Education		Observations	UR	BR
	No degree	254	0.6443917	0.4664498
	Degree	187	0.4915999	0.4868635
		t stat	3.5073	-1.1867
		p-value	0.0005	0.2360
Financial knowledge		Observations	UR	BR
	Low financial knowledge	233	0.6287196	0.4206009
	High financial knowledge	208	0.5245818	0.5361622
		t stat	2.3970	-7.1594
		p-value	0.0169	0.0000
Professions		Observations	UR	BR
	Not financial professionals	310	0.6333836	0.4502104
	Financial professionals	131	0.4523341	0.5340192
		t stat	3.8536	-4.6049
		p-value	0.0001	0.0000
Self-esteem		Observations	UR	BR
	Low self-esteem	240	0.600953	0.421558
	High self-esteem	201	0.5541092	0.5390439
		t stat	1.0702	-7.2740
		p-value	0.2851	0.0000

financial decisions. The bank, the investment company and the asset managers who took part in the empirical process were kindly asked to select randomly a list of individuals (customers or personnel of the bank, traders and asset managers) from whom we collected the 445 subjects observed during the analysis. Some features of the sample are shown in Table A8.1 in the Appendix.⁶

Involving people taking real financial decisions (either for familial or for professional duties) in the analysis influences the socio-demographic features of our sample. For example, only 11.2 per cent of the sample is under 30 years of age, because, especially in Italy, young people tend to delay acquiring economic and financial independence. At the same time, the need to analyse financial professions (traders and asset managers), typically between 30 and 60 years old, reduced the over-sixties subgroup component to 10.3 per cent. Nevertheless, our numbers are wide enough, in absolute values, to allow reliable deductions for all the age clusters (50 individuals are under 30 years old, and 46 are over 60 years old).

Overall, marital status seems to reveal subgroups of individuals who do not behave significantly differently, as far as their risk tolerance goes. Gender, age and self-esteem reveal significant differences only for BR. Females evaluate themselves as risk-averse, as stated in the literature (Barber and Odean, 2001), although, surprisingly, their average emotional risk attraction is slightly higher than that of males (the female UR is 0.582 while the male UR is 0.579), even if not significantly. Ageing people, as well as those with low self-esteem, tend to declare a significantly lower level of risk tolerance (BR) than the rest of the sample. Figure 8.1 enriches our deductions. Its title is frankly provocative because it is reminiscent of the life cycle hypothesis formulated, originally in the early 1950s, by Franco Modigliani and his student Richard Brumberg. At this time they developed a theory of spending, which would later go on to become a theory of saving, based on the idea that people tailor their consumption and saving patterns at different ages.

Figure 8.1 contributes to the existing literature on the long-life trend of the biased and unbiased risk tolerance, and adds support to existing findings indicating a non-linear relationship between age and risk tolerance (Riley and Chow, 1992; Hallahan *et al.*, 2004, 2009). It is interesting to notice that the levels of the risk self-evaluation (BR) are mainly the same for the first three clusters of ages (with a small increase visible in the 30–45 cluster). Then, for those people more than 60 years of age, BR sharply decreases. Self-confidence, which is

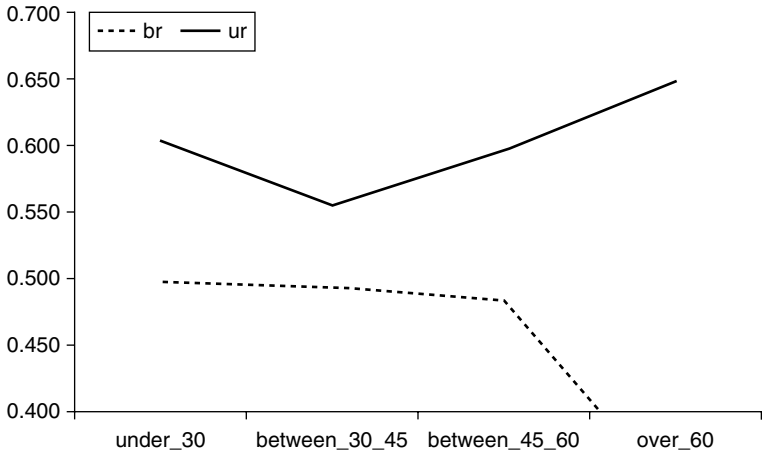


Figure 8.1 The long life cycle of risk tolerance

Source: Authors own estimates.

perhaps one of the most relevant components of biased risk, typically decreases at the end of the normal working activity life cycle, and the onset of retirement often tends to induce older individuals to assume the risk-avoider role. Conversely, getting old cannot take away the fantasy of profits, of the lucky investment, or of the dreamed hope. In psychological terms, the true sign of ageing is the reduction or loss of daydreaming.

An unexplored issue is the trend of the emotional attraction to risk in relation to age. The UR indicator reveals a trend which is completely different: it shows high levels in the under-30 cluster (it is not strange to think that young people may emotionally love risk); it reaches the lowest level when the actual financial choice indicator is highest (the 30–45 cluster); then, unpredictably, it increases regularly and sharply, arriving at the top level for people over 60 years old. It seems to be that people within the most economically active working age groups appear more secure and less emotionally attracted towards risk, while older people, especially in retirement, appear more risk-seeking in their behaviour. Indeed, their physiologically recorded love for risk appears primarily in the autonomic nervous system activation caused by the parallel process of the fantasy of winning. In real life, retired people are able to wisely recognize the benefits of prudent behaviour. So the low level of BR for the over-60s allows us to deduce that their unbiased risk attraction is strongly unconscious.

The final set of variables which could explain different levels of risk tolerance relates to the varying degree of education and financial knowledge which each subject possesses. Knowledge is obviously a significant internal feature which influences the behaviour of individuals. In particular, considering our focus on financial risk, we are interested in understanding the role of financial knowledge specifically, both in terms of knowledge of financial instruments *strictu sensu* and in terms of financial competences. The latter will be linked to the profession declared by the individuals.

Table 8.3 clearly shows the importance of education and knowledge in influencing risk tolerance. People with a degree show an emotional attraction toward risk, on average, statistically lower than the rest of the sample. Moreover, the distinction by a financial knowledge variable (high or low) and by financial profession (traders and asset managers compared with the rest of the sample) reveals a surprising phenomenon: people with high financial knowledge, or working in a financial profession, evaluate themselves as risk-lovers (high BR) even if they behave cautiously (low UR). This means that these subjects disclose an emotional attraction towards risk lower than the risk tolerance they declare themselves to possess. These findings are indirectly linked with those of Lo and Repin (2002), who observed significant differences in mean physiological responses among the traders: differences systematically related to the amount of trading experience. Specifically, less experienced traders showed a much higher number of significant mean responses in the number of SCRs. Consistently with this, Lo *et al.* (2005) show that one component of successful trading may be a reduced level of emotional reactivity.

8.5 The multivariate analysis: socio-demographic regularities for errors

The presence of statistically significant differences among individuals in terms of their risk tolerance indicators induces us to look for some regularities in a multivariate framework of socio-demographic items. The complete list of variables we considered is as follows:

- age;
- nw_family (which specifies whether the individual is single, widowed or divorced);
- female;

- metropol (which specifies whether or not the subject lives in a metropolitan area);
- edu_degree (if the highest educational level is a degree);
- edu_post_degree (if the individual has postgraduate education);
- high_fk (if the individual shows high financial knowledge);
- financial_profession (if the individual is either an asset manager or a trader);
- high_freq_news (if the individual is used to regularly reading financial news);
- quick_inv_decision (if the individual is used to making investment decisions in a few minutes);
- inv_alone (if the individual makes investment decisions by himself/herself);
- inv_ext (if the individual makes investment decisions with the help of a financial adviser);
- stable_income_expect. (if the individual declares expectation of a stable income in the future);
- growing_income_expect. (if the individual declares expectation of a growing income in the future);
- past_odds (if the individual faced some odds in the past);
- no_saving_capability;
- self_esteem;
- trust_future;
- bis (the score obtained at the Barratt Impulsivity test).

It is evident that some of these variables are correlated, revealing the same feature from a different perspective. For example, it is clear that someone in a financial profession shows high financial knowledge, regularly reads financial news and generally lives in a metropolitan area. We run some correlation tests and confirm these affirmations. In order to deal with this problem, which may have some consequences for the multivariate estimations, we run a principal component analysis (tests are shown in Table A8.2 in the Appendix). We selected the first nine components which explain 71.15 per cent of the variance of our phenomenon. The correlations among components and the original variable allow us also to identify their economic meaning. In fact, *Comp 1* stands for the financial experience (*financial_exp*); *Comp 2* stands for the expectation of income (*income_stability*); *Comp 3* stands for the educational level (*education*); *Comp 4* stands for the ageing of the individual (*ageing*); *Comp 5* stands for *odds*; *Comp 6* informs about

impulsivity; *Comp 7* synthesizes levels of *trust*; *Comp 8* indicates the impulsivity in investment decision (*quick_decision*) and *Comp 9* the gender (*female*).

The multivariate explanation of socio-demographic drivers affecting individual risk tolerance indicators (RTI_i) is formalized in the following equations:

$$RTI_i = \text{financial_exp}_i + \text{income_stability}_i + \text{education}_i + \text{ageing}_i + \text{odds}_i + \text{impulsivity}_i + \text{trust}_i + \text{quick_decision}_i + \text{female}_i + \text{constants}_{1,i} + \epsilon_{1,i} \quad (1)$$

$$RTI_i = \text{age}_i + \text{age}2_i + \text{nw_family}_i + \text{female}_i + \text{high_fk}_i + \text{edu_degree}_i + \text{quick_inv_decision}_i + \text{inv_alone}_i + \text{stable_income_expect}_i + \text{past_odds}_i + \text{no_saving_capability}_i + \text{self_esteem}_i + \text{trust_future}_i + \text{bis}_i + \text{constants}_{1,i} + \epsilon_{1,i} \quad (2)$$

In estimations of Equations 1 and 2, RTI_i s correspond to UR_i and to BR_i , respectively, as shown in Table 8.4. In Equation 1, the explanatory variables of the model correspond to the nine components resulting from the principal component analysis; results of its OLS estimation are shown in Table 8.4, Model 1. Equation 3 sets as explanatory variables the original variables, controlling for correlations by excluding redundant ones (highly correlated). Model 2 of Table 8.4 illustrates results of OLS estimation of Equation 2, including the *high-fk* or *financial-profession* variable, respectively.

The results in Table 8.4 confirm the preliminary evidences of the univariate framework. In fact, the unbiased risk tolerance error (UR) is mainly reduced by financial experience (financial profession and education) and by stability of income perspectives. Primarily people working in a financial profession (traders and asset managers) are able to reduce their emotional attraction towards risk, as well as people who hold a degree. Conversely, impulsivity tends to increase the propensity towards risk, both unbiased and biased. The gender drivers on the biased risk are confirmed also in the multivariate framework, due to the significant and negative parameter of the variable *female* of Model 2. The joint interpretation of the results of Model 1 and Model 2 for *ageing* confirms the patterns of Figure 8.1: the significance and sign of *age* and its square (*age2*) prove the non-linearity (concavity) of BR, while Model 1 proves that ageing increases the emotional attraction toward risk.

Table 8.4 Socio-demographic regularities for UR and BR in a multivariate framework

Model 1 (components)	Model 2 (original variable)			
	UR	BR	UR	BR
financial_exp	-0.0308105***	0.0375648***	-0.0011988	0.0073386*
	0.0110606	0.00398	0.0126425	0.0044415
income_ stability	-0.0602707***	-0.0012451	0.0000015	-0.0001029**
	0.0153909	0.0055381	0.0001356	0.0000476
education	0.0280878	0.0150792**	0.1074572	0.0304621
	0.0172032	0.0061903	0.0812037	0.0285281
ageing	0.0346683*	0.0112274	0.0057933	-0.0667016***
	0.0190638	0.0068598	0.0545705	0.0191714
odds	0.0061444	0.0090891	-0.0365102	0.0596592***
	0.0193762	0.0069722	0.051412	0.0180618
impulsivity	0.0428687**	0.0135996		
	0.0200495	0.0072144	-0.1442169***	0.0191778
trust	-0.0134128	0.0254126***	-0.1270006***	0.0189713
	0.0209226	0.0075286	0.0462445	-0.110193**
quick_ decision	-0.0203243	-0.008532	0.0368727	0.0456701
	0.021429	0.0077108	0.0494552	0.0459437
			0.0173743	0.0174417

female	0.0299711	0.0143567*	inv_alone	-0.0339527	0.0383232**	-0.0113272	0.0493778***
	0.0221927	0.0079857		0.0501517	0.017619	0.049415	0.0177018
constant	0.5796024***	0.475106	stable_income_expect.	-0.1020814**	0.012124	-0.1020749**	0.0151208
	0.0211445	0.0076085	past_odds	0.0447503	0.0157215	0.0443105	0.0158732
				-0.0367888	-0.0010218	-0.0296332	-0.004749
			no_saving_capability	0.059817	0.0210146	0.0593139	0.0212478
				-0.0403288	0.0054986	-0.0376052	-0.0020732
			self_esteem	0.0579227	0.0203491	0.057071	0.0204444
				-0.0334794	0.0563441***	-0.0234592	0.0630763***
			trust_future	0.0485048	0.0170404	0.0478625	0.0171456
				0.0391473	0.0576724***	0.0419374	0.0575384***
			bis	0.0598549	0.0210279	0.0593852	0.0212734
				0.0092018***	0.0025518***	0.0085987***	0.0024161**
			constant	0.0028139	0.0009886	0.0027976	0.0010022
				0.1781746	0.1044561	0.2388611	0.1044027
				0.3123886	0.1097467	0.3107454	0.1113173

Continued

Table 8.4 Continued

Model 1 (components)	UR	BR	Model 2 (original variable)	UR	BR	UR	BR
Number of observations	441	441	Number of observations	441	441	441	441
F 9, 431	4.1	13.21	F 14, 426	2.61	10.31	3.15	9.39
Prob > F	0	0	Prob > F	0.0012	0	0.0001	0
R-squared	0.0788	0.2162	R-squared	0.0791	0.253	0.0938	0.2357
Adj R-squared	0.0596	0.1998	Adj R-squared	0.0488	0.2285	0.064	0.2106
Root MSE	0.44404	0.15978	Root MSE	0.44657	0.15689	0.44299	0.15869

Note: For each variable: estimated parameter (first number with level of significance, ***1 per cent, **5 per cent, *10 per cent) and standard error (second number).

8.6 The risk tolerance indicators and real-life financial choices

The further step is to check for any relationship between the financial risk tolerance indicators and the riskiness of real-life decisions (*RLR_i*). We are aware that the two risk tolerance dimensions (UR and BR) belong strictly to a *personal inside* perspective, while the real-life choices refer to the overall family unit to which the subject belongs. This forces us to consider both the overall constraints of reality that may alter financial decisions and the degree of autonomy the individual has in making them.

We selected three indicators for the financial riskiness assumed in real life: the riskiness of the personal asset allocation (*aa_i*), the degree of insurance coverage (*ic_i*) and a spot-question whether (and how many times) the individual ever invested a considerable amount of money only for thrill (*thrill_i*). The first indicator arises from the risk-weighted asset allocation of his or her investments. One specific item of our questionnaire asked for the percentage of the personal global portfolio invested in a list of asset classes (see Table 8.5). A weight for the relative likely risk is associated with each asset class (*w_{j,i}*). This weight is assigned according to the subjective judgement of the authors, but it is grounded in both the empirical evidence of financial markets and by asset class risk scoring used for MiFID purposes. The score used to weight the associated risk ranges from 0 (the current account is considered a risk-free asset) to 1 (structured products, derivatives and hedge funds are considered the most risky asset classes).

The overall *aa_i* indicator is obtained as follows:

$$aa_i = \frac{1}{10} \sum_{j=1}^{10} p_{j,i} * w_{j,1} \quad (3)$$

where:

p_{j,i} is the percentage the subject *i* invested in the asset class *j*;
w_{j,i} is the weight for risk associated with the asset class *j* from Table 8.5.

The normalization of the weights for risk (*w_{j,i}*) allows us to have *aa_i* moving within a 0–1 range.

The second indicator for the riskiness assumed in real life is obtained by considering the insurance coverage of the subject, as revealed by specific items of our questionnaire. We asked which insurance contracts he

Table 8.5 The real-life asset allocation of individuals

Asset class j	Asset class	Weight for the asset class risk (w_j)
1	Current account	0
2	Bank deposit, Certificate of deposit, Repo contract	0.05
3	Postal deposit	0.05
4	Treasury Bills and Bonds	0.25
5	Financial management, mutual funds and ETF shares	0.5
6	Stocks	0.75
7	Foreign financial products	0.75
8	Structured products and derivatives	1
9	Hedge funds	1
10	Financial insurance policies	0.4

or she holds, apart from car accident policies, which are obligatory in Italy, among: life insurance (death, index/unit linked), disease or disability insurance, burglary and fire insurance and civil liability insurance (four different insurance alternatives, in multiple choice). We also included the pension fund alternative, as well as the possibility of not holding any insurance coverage. Even if a pension fund may not be considered an insurance contract in the strict sense, we are convinced that those willing to underwrite a pension fund in the Italian financial environment⁷ exhibit a point of view which could be considered to be akin to risk aversion. We assigned a weight to each level of real-life risk attitude acquired from the declared insurance coverage combination (from 1 to 6, shown in Table 8.6). We set a 0–1 range for these weights: 0 for the lowest and 1 for the highest risk tolerance revealed by the insurance behaviour of the subject. This weight is just the value of ic for each subject i .

The major rule followed in the assignment of this weight was first to set which insurance behaviour corresponded to the extremes. We thought it reasonable to consider the most risk-averse subject as being ($ic_i = 0$), one who holds the whole set of insurance contracts we proposed (four alternatives plus a pension fund). On the contrary, we assumed the subjects least afraid of risk to be those who do not hold any insurance coverage ($ic_i = 1$). Then, considering the lack of further details available for each insurance coverage, we assigned a progressively higher value to ic_i in relation to how many insurances the subject declared

Table 8.6 Score for drivers of insurance behaviours

	Insurance coverage combination	Weight for the insurance combination risk (<i>ic</i>)
1	All of the five alternatives (four alternatives plus pension fund)	0
2	A four-alternative combination	0.20
3	A three-alternative combination	0.40
4	A two-alternative combination	0.60
5	The subject holds only one among the five alternatives	0.80
6	The subject has no insurance coverage	1

himself/herself to hold (lower contracts, higher value). We are aware that this specific driver for risk attitude may be strongly influenced by the risk capacity of each individual: it is reasonable to assume that a preference for widening insurance coverage may be due to the increase of one's wealth. That is why we control this variable for the familial constraints.

The familial constraints of each individual correspond to the average score obtained by each subject in relation to a series of items in our questionnaire, including those which increase capacity (income, stability and diversification of the income, wealth) and those which absorb it (e.g., number of dependants). Specifically we considered: number of dependants (*familial_weight_i*); nature of the professional contract (*working_contract_i*); degree of diversification of family income (*income_diversification_i*); monthly income of the family (*income_level_i*); real estate wealth (*estate_wealth_i*); financial wealth (*financial_wealth_i*); economic stress due to debt repayment (*debt_repayment_i*). The main rule adhered to in setting the constraints was to establish each indicator within the 0–1 range, assigning a value of 0 to the situation revealing the lowest capacity and a value of 1 to the situation indicating the highest capacity. In the following, constraints *estate_wealth_i* and *financial_wealth_i* were dropped for collinearity.

Our model is described by Equation 4. We aim to find what drives the risk assumed in real life, either who we are (UR) or we believe ourselves to be (BR), with a series of control variables: first, the familial constraints described in the previous paragraph; second, the decision process, with a dummy variable *inv_alone_i*, which is 1 if the individual decides autonomously and 0 if he/she decides with the help of an external financial adviser; third, the historical period when the experiments

took place. In fact, the nature of our analysis did not allow us to carry out all the interviews over a short interval. It took us more than nine months to conduct the empirical work: from October 2008 to June 2009. We have to keep in mind that this period was particularly crucial, as the interviews started right after the Lehman Brothers crash and the first half of 2009 was influenced by strong financial instability and recessionary worries worldwide. So we built up a dummy variable named $crisis_i$, which is 1 for those interviews carried out just at the beginning of the crisis (October 2008) and 0 in the other cases. Thus, the model we estimated is:

$$RTI_i = \text{familial_weight}_i + \text{working_contract}_i + \text{income_diversification}_i + \text{income_level}_i + \text{debt_repayment}_i + \text{inv_alone}_i + \text{crisis}_i + \text{ur}_i + \text{br}_i + \text{constants}_i + \epsilon_i \quad (4)$$

where RLR_i is measured by the riskiness of the declared asset allocation (aa_i), by the degree of insurance coverage (ic_i) and by the willingness to invest for thrill ($thrill_i$), respectively. Table 8.7 shows the results of the OLS estimation of Equation 4.

First, we briefly consider results for control variables: a strong familial weight tends to decrease the riskiness of investments and to increase the insurance coverage; the uncertainty of working contract tends to reduce the riskiness of asset allocation; the higher the income, the higher are the riskiness of investments and the insurance coverage, while the willingness to invest for thrill is lower. Debt obligations are positively related to insurance coverage because the majority of debts held by individuals were mortgages, generally associated with insurance contracts. The dummy variable $crisis$ shows a significant and positive relationship with ic_i and $thrill_i$. This indicates that, when $crisis$ moves from 1 (October 2008, the beginning of the financial instability) to 0, the individuals observed in our analysis, *ceteris paribus*, tend to decrease their exposure to financial risks. This is consistent with a more prudent behaviour induced by highly volatile financial markets and the beginning of the economic recession. Finally, the variable inv_alone suggests that people making decisions without any external counselling tend to assume higher risks, even if this effect is (reasonably) significant only for aa_i and $thrill_i$.

Now we consider the influence of our indicators of risk tolerance. The overall view of the estimations persuades us to deduce that the risk assumed in real life seems to be positively related to the biased risk BR and negatively to the unbiased risk UR. This confirms that people

Table 8.7 The real-life risk and the individual risk tolerance indicators

	RLR _i =aa _i	RLR _i =ic	RLR _i =thrill
familial weight	-0.07587**	0.2406227***	-0.0244231
	0.0328225	0.0546478	0.0714115
working_contract	-0.0318948*	-0.0345947	-0.0235324
	0.0169305	0.0281883	0.0368354
income_diversification	0.0420395	-0.1118495	0.0393893
	0.0319291	0.0531602	0.0694676
income_level	0.0893195***	-0.2389542***	-0.2082936***
	0.0329614	0.054879	0.0717137
debt_repayment	0.0463651	0.3213586***	-0.1125874
	0.0442232	0.0736293	0.0962157
inv_alone	0.0434805**	0.0091804	0.0643112*
	0.0175297	0.0291861	0.0381392
crisis	0.0304764	0.103436**	0.2091115***
	0.027249	0.0453682	0.0592853
ur	-0.0015465	-0.0585004**	-0.0824211**
	0.0174768	0.0290979	0.0380239
br	0.3452152***	-0.0102803	0.3163023***
	0.0470783	0.0783828	0.1024275
constant	0.0740516	0.3633098***	0.3572175***
	0.0554617	0.0923409	0.1206673
Number of observations	441	441	441
F(9, 431)	14.05	9.32	4.97
Prob > F	0	0	0
R-squared	0.2268	0.1629	0.094
Adj R-squared	0.2106	0.1454	0.0751
Root MSE	0.16652	0.27725	0.3623

tend to behave coherently with their self-representation, and almost in contrast to what they feel. The univariate analysis conducted in previous sections already anticipated this important evidence: people who generally represent themselves as risk-averse tend to assume low risk in real life, even if they possess a relevant emotional attraction toward risk. This is particularly true for people with low education and in non-financial professions.

In particular, BR shows a significant and positive relationship with the asset allocation riskiness (aa_i) and the investments for thrill ($thrill_i$). That is to say, the higher the risk attraction one believes one has, the riskier one's investment/debt choices will be, in accordance with Grable and Lytton (2003) and Grable *et al.* (2009). Surprisingly, the unbiased risk UR is negatively correlated with the risk assumed in actual financial choices. Its contribution is not significant for

aa_i , whereas UR has a significant negative relationship with ic_i and $thrill_i$. This would mean that those showing a strong unbiased attraction towards risk declared a relevant insurance coverage and did not admit having invested money for thrill. A relevant emotional attraction toward risk, not supported by the (declared) evidences of real-life behaviours and hidden by a self-representation of risk aversion, suggests a specific behavioural condition we named *unconscious sleeping factor*.

8.7 Conclusions

In this chapter we investigated the degree of coherence among how we are (or, more technically, at which level of phase synchrony the neural populations that guide our choices oscillate); how we think ourselves to be (or, better, what representation we have of ourselves); and how we financially act, given our constraints. Specifically, we studied how, on the one hand, our unbiased emotional risk attraction (sympathetic effect, gut intuition) or, on the other hand, our biased self-representation (psychometrically derived), differently affects our actual financial choices. By comparing alternative measures of risk tolerance, we revealed relevant incoherencies. The commonly shared trait of this result is that a large number of dysfunctional behaviours take place when financial decisions are considered.

Our findings induce us to propose a model of mental functioning that places rationality and emotion side by side with a third factor: counterfactual thinking and the wandering mind. The result of these simultaneous processes (rationality, emotions and the wandering mind) is a kind of personality that is split without being pathological, most likely developed with that level of inconsistency that everyone finds within himself or herself with a minimum of honest introspection. Since the psychophysiological test used to compute UR was designed to be cognitively impenetrable, there is no rule that allows consistent winning: those who have invested with some regularity on a rational search of algorithms have always lost. The 'dreamers' guided by hope that a favourable cycle of choice would last forever also lost. Again, we should remember that our subjects were not suffering from any neurological disorder or addiction, and the results we obtained on a large scale (441 individuals) have some similarities with those reported by Bechara and Damasio (2002), who found that, in a small sample of 49 non-clinical subjects, 20 per cent had behaviours similar to those of addicted persons. Based on

their observations, the authors point out that normal subjects who perform poorly on the IGT, but generate anticipatory SCR, describe themselves to be high risk-takers, thrill-seekers or gamblers in real life. In our large sample, subjects are very reluctant to take risk in real life. Therefore, wandering and counterfactual thought are a plausible interpretation of the results.

A correct knowledge of human mental processing is essential for controlling conscious/responsible investing. Our findings reveal that a strong component of unconscious/unaware risk attraction is proven to exist in the domain of choosing risky/rewarding assets. We observed many subjects who seem to exhibit a strong risk attraction without any other sign of being gamblers, either in how they evaluate themselves or in how they practically act. In other words, we discovered many individuals who believe themselves to be, and act, as risk-avoiders, but simultaneously and unconsciously appear to be risk-seekers. When this condition occurs, the unbiased risk (UR) is much higher than the risk assumed in real life, but, at the same time, it is higher than the self-evaluation (BR). We state, in this case, the presence of an 'unconscious sleeping factor'.

The psychological explanation of incoherencies among different risk tolerance indicators is the presence of the 'wandering mind', the daydreaming, the fantasy of profits, of the lucky investment. Even if the 'wandering mind' is inherent in the human psychology, as well as in risk-taking behaviour, it tends to work in 'domains' (the 'domain of gains and losses', the 'domain of sexuality', the 'domain of driving cars'). One can have an active 'wandering mind' in one domain, and not in others. This explains why the 'sleeping factor' varies for different individual categories. We discover groups of people whose sleeping factor is completely absent, at least in the 'financial domain': this is for people who have a financial profession, like traders and asset managers. On the contrary, some other groups seem to be strongly affected by the sleeping factor. This feature is strong for old people (a long life cycle of risk tolerance is uncovered), for those who are widowed or divorced, for people who seldom acquire financial information, for those with low financial knowledge, for those who do not read news regularly, and also for those who take quick investment decisions. It is also strong for those with low self-esteem.

The multivariate analysis, which was designed to study those variables affecting actual financial choices, proved that the risk assumed in real life is positively related to the biased risk (the self-evaluated one) and negatively to the unbiased risk (the emotionally driven one).

This finding affirms that people tend to behave coherently according to their self-representation and almost in contrast to what they feel.

We foresee at least three future research developments. First, we hope to propose a reshaping of the theoretical utility function by taking into consideration our alternative risk tolerance measures and the wandering mind findings: as prospect theory innovates on the expected utility function theory by including behavioural biases, we would like to integrate existing theories with the 'risk-as-a-feeling' approach. Second, we intend to simulate the different portfolio choices which arise when using biased and unbiased risk measures, respectively. Third, we aim to employ these subjective measures of risk in the empirical validation of recent theoretical studies on spectral risk measures, especially from the portfolio optimization perspective.

Many further operational implications of our findings appear relevant. The presence of the sleeping factor in specific subgroups of people (especially older people, people with low financial education and/or less used to reading economic news) gives rise to the idea that this condition may represent a source of risk and may potentially pose a threat to financial market stability. The discrepancy between what appears outside (from our actual choices and from our self-assessment) and what is hidden inside (our gut behaviours) represents a disequilibrium which may induce unconscious or apparently irrational activities. We are afraid that the 'fear and greed' emotional sentiment of the financial marketplace could be reasonably reinforced by the wandering mind and the presence of the sleeping factor component in specific categories of individuals.

In fact, even if the sleeping factor is hidden, it exists. If people in their day-to-day life seem to act financially according to their self-assessment and to avoid risks, who knows when and how their sleeping factor may come to the surface and cause unexpected emotional behaviours? The presence of this factor in those less financially educated, or less used to reading economic news regularly, may give some hint as to what can act as a 'catalyst' for the 'explosion' of emotionally driven behaviours. Some economic and financial events, like stock market bubbles or even worldwide crises (such as the subprime crisis or the sovereign credit risk issue), may suddenly become news spread even by non-specialized media. In this case, people who are not ardent followers of technical financial information developments may become particularly impressed, which stimulates their sleeping agent to awake.

Appendix

Table A8.1 Some socio-demographic features of the sample (445 respondents)

		Frequency	Per cent
Panel A: Gender	Male	348	78.2
	Female	97	21.8
Panel B: Age	under_30	50	11.24
	between_30_45	237	53.26
	between_45_60	112	25.17
	over_60	46	10.34
Panel C: Marital Status (+)	single	139	30.9
	w_Family*	275	61.1
	nw_Family**	36	8
	* Married and Common-law wife/husband ** Divorced or Widowed		
Panel D: Education	Secondary School	23	5.17
	High School	176	39.55
	University Degree	188	42.25
	Master's or PhD	58	13.03
Panel E: Financial Knowledge	Medium_low_fin_knowledge	235	52.8
	High_fin_knowledge	210	47.2
Panel F: Profession (+)	salaried_employees	139	27.69
	pensioner	49	9.76
	manager	34	6.77
	freelancer	80	15.94
	entepreneur	41	8.17
	trader	50	9.96
	asset_manager	84	16.73
Other	25	4.98	
Panel F1: Financial specialization	not_financial_professions	311	69.89
	financial_professions	134	30.11
(+): multiple choices			

Table A8.2 Principal component analysis (PCA) for socio-economic drivers

Principal Components/Correlation				
Component	Eigenvalue	Difference	Proportion	Cumulative
Comp1	3.66289	1.77117	0.1928	0.1928
Comp2	1.89172	0.37758	0.0996	0.2923
Comp3	1.51414	0.281135	0.0797	0.372
Comp4	1.233	0.039443	0.0649	0.4369
Comp5	1.19356	0.078813	0.0628	0.4998
Comp6	1.11475	0.091096	0.0587	0.5584
Comp7	1.02365	0.047809	0.0539	0.6123
Comp8	0.975843	0.066009	0.0514	0.6637
Comp9	0.909834	0.070813	0.0479	0.7115
Comp10	0.839021	0.10834	0.0442	0.7557
Comp11	0.730681	0.023466	0.0385	0.7942
Comp12	0.707215	0.048818	0.0372	0.8314
Comp13	0.658397	0.120986	0.0347	0.866
Comp14	0.537411	0.021696	0.0283	0.8943
Comp15	0.515715	0.024665	0.0271	0.9215
Comp16	0.49105	0.055338	0.0258	0.9473
Comp17	0.435712	0.01311	0.0229	0.9702
Comp18	0.422602	0.27979	0.0222	0.9925
Comp19	0.142813	.	0.0075	1

Rotation: (unrotated = principal)

Number of observations = 441

Number of components = 19

Trace = 19

Rho = 1.0000

Kaiser-Meyer-Olkin measure of sampling adequacy: Overall = 71.73 per cent

Components Identification

Variable	Comp 1	Comp 2	Comp 3	Comp 4	Comp 5	Comp 6	Comp 7	Comp 8	Comp 9
	financial_	income_	education	ageing	odds	impulsivity	trust	quick_	female
age	exp	stability						decision	
nw_family	-0.2615	0.1504	0.3002	0.2763	-0.1875	-0.1636	0.0013	-0.1013	-0.0173
female	-0.0346	0.008	0.2391	0.5066	-0.0619	-0.3459	-0.2902	0.1643	0.4957
metropol	-0.1151	0.073	-0.34	-0.1599	0.1754	0.1933	-0.319	0.3953	0.514
edu_degree	0.329	0.1665	-0.0342	0.0343	0.2216	0.0745	-0.1682	0.0746	-0.1409
edu_post-e	0.1969	0.1647	-0.4951	-0.0152	-0.3182	-0.2327	-0.0657	0.1141	-0.0682
high_fk	0.1037	0.0184	0.4744	-0.1911	0.4756	0.2222	-0.253	-0.1011	0.071
financial_	0.3799	0.1936	0.018	-0.029	0.0087	-0.0361	-0.1007	-0.0296	0.0976
profession	0.3384	0.1192	-0.0095	0.0384	0.1094	0.0092	-0.132	0.2705	-0.1588
high_freq_news	0.3353	0.1433	0.0461	-0.0121	0.038	-0.1823	0.1167	-0.2058	0.0058
quick_inv_	-0.1568	-0.0705	0.2052	0.154	-0.1883	0.3198	-0.1342	0.5679	-0.44
decision									
inv_alone	0.3142	0.0713	0.1323	0.3647	-0.1154	0.1385	-0.0054	-0.0942	-0.0594
inv_ext	-0.284	-0.1134	0.0386	-0.1772	0.1019	-0.2509	0.0155	-0.0148	0.0484
stable_income_	-0.1617	0.6172	0.0619	-0.0682	-0.0218	0.1321	0.2354	0.0436	0.0791
expect_									
growing_income_	0.1955	-0.6214	-0.0535	-0.0052	-0.0358	-0.0577	-0.1568	-0.0652	-0.0148
expect_									
past_odds	-0.0179	-0.0473	-0.0381	0.1546	0.489	-0.4284	0.3549	0.4276	-0.1933
no_saving_	-0.1315	-0.0103	-0.2953	0.3257	0.4619	0.1075	0.1604	-0.2195	-0.0277
capability									
self_esteem	0.2849	-0.0997	0.1296	0.1024	-0.042	0.0077	0.3736	0.2025	0.2428
trust_future	0.1357	-0.1881	0.1499	-0.1796	-0.1498	0.2464	0.5272	0.1898	0.3398
bis	-0.0514	-0.0828	-0.2597	0.4854	0.0515	0.46	0.094	-0.1241	0.0837

Notes

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1. The ProQuest Personal Financial Profiling system is a proprietary, commercially provided computer-based risk tolerance measurement tool, managed by an Australian company (now FinaMetrica). The ProQuest survey contains a question in which respondents are asked to estimate their risk tolerance *ex ante*. Hallahan *et al.* (2004) conducted an analysis on a large FinaMetrica data set and showed that respondents typically underestimate their risk tolerance score by approximately five points.
2. Existing studies try to shed light on these 'unobservable variables' using further proxies, such as 'investors' preferences and beliefs' (Hoffmann *et al.*, 2010).
3. We omit the sixth method, which is a mix of the previous ones.
4. According to Grable (2008, p. 8), a 'heuristic is a simplified rule that results in a mental shortcut to solve a problem'.
5. Marginally, net worth, income variability, financial satisfaction and self-esteem are sometimes also proven to be positively correlated with risk tolerance (Grable, 2008).
6. The overall sample is made up of 445 individuals, but only 441 of them can be considered valid cases for the way in which UR is computed.
7. In Italy pension funds are not compulsory. Even when a pension plan is in place for a specific sector/industry according to an agreement between social parties, each subject is free to decide whether or not to participate in the plan (in the former case, some rules for contributions are provided). Art. 1, comma 2, Dlgs. n.252/2005.

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9

Attitudes, Personality Factors and Household Debt Decisions: A Study of Consumer Credit

Stefano Cosma and Francesco Pattarin

9.1 Introduction

From the early 1990s until the triggering of the financial crisis in 2007, household debt increased considerably in numerous countries. This phenomenon concerns not only real estate mortgages but also consumption loans. In addition to the best-known cases, like the United States and Great Britain, various economies of both continental Europe and Eurasia have doubled or tripled the ratio of household debt to GDP, especially since 2000.

In the case of the Italian market, over the last decade families have increased their propensity towards debt and, as a consequence, their financial liabilities (Banca d'Italia, 2010) with respect to their equity as well as in absolute terms.¹ Moreover, there has been a substantial modification in the structure of family balances, on both the assets and the liabilities side. Not only do Italians save less than in the 1990s, but they have also changed the composition of their wealth, towards less liquid financial instruments and real estate investments.

The economic literature has explained families' debt choices mainly by socio-economic and demographic variables. More specifically, attention has been concentrated on households' disposable income and economic characteristics. However, this approach has not led to unambiguous conclusions on the role of consumption credit in the management of family balances, due to the confounding effects of banks' and other intermediaries' credit policies. Indeed, empirical evidence is often at odds with the classical models of permanent income and life-cycle consumption behaviour, and several studies have shown the explanatory relevance

of liquidity constraints and household-specific socio-economic characteristics (Jappelli and Pagano, 1989; Guiso *et al.*, 1994; Magri, 2007). On the other hand, a fairly extensive literature from the field of empirical psychology, a review of which is provided here, has found evidence that personality factors and attitudes towards credit may influence individuals' debt financing decisions beyond economic rationality.

This chapter investigates the importance of psychological characteristics in credit-related choices by analysing the results of an original survey conducted on a wide sample of Italian households. The main goal is to test whether the psychological profile of the household's decision-maker might determine consumer credit use, focusing on attitudes and the 'locus of control' – that is, the subjective perception of one's own ability to control life events and their outcomes. The study improves on most existing research on these topics because of the larger than usual sample size and scope, and also because several studies from the psychological field are lacking in the assessment of household economic conditions and expectations.

According to the analyses that have been performed, the influence of psychological factors on consumer credit decisions cannot be rejected. Attitudes towards debt appear to play an important role and are significantly related to motivations for using credit and to the preferred form of financing. Some evidence on the effect of personality features suggests that more fatalistic individuals are less likely to use consumer credit, which contradicts many previous studies that have reached the opposite conclusion.

The relationship between the motivations and contractual forms of credit use and the psychological profile has also been investigated. An original contribution in this direction is the isolation of the influence of *credit* attitudes from that of *money* attitudes on the use of revolving credit cards, which has not yet been achieved by the existing literature (Hayhoe *et al.*, 1999).

The rest of the chapter is organized into four sections. Section 9.2 is a review of the literature on the psychological aspects and determinants of consumer credit. Section 9.3 is a description of the sample and methodology that have been used to build the data set for the research. The statistical analyses and results are presented in Section 9.4; Section 9.5 concludes.

9.2 Financial and psychological drivers of consumer credit

For an exhaustive explanation of the widespread growth of household debt both in size and scope over the last decade, a comprehensive

analysis is useful of manifold phenomena regarding both consumption credit demand and supply side. Given the confounding effects of the credit policies enacted by financial intermediaries on the analysis of households' debt decisions,² it is all the more complex to explain the increase of credit and microeconomic behaviours on the demand side through demographic, economic and financial factors only. Also contributing to the increased propensity to credit, the spread of a more favourable attitude towards debt, in particular for financing one's own consumption needs, has been typical of the last 20 years.

This attitude has spread on the individual as well as the cultural level, thus modifying some social models of economic behaviour, previously mainly oriented towards saving (Godwin, 1997).

For an explanation of families' behaviours with respect to debt, a clarification of the nature of debt itself is essential. To this point, there is a distinction in the literature between consumer *credit* and consumer *debt*. Notwithstanding the usually ambiguous definition, 'consumer credit' refers to institutional recourse to credit, presupposing that the credit request comes from a household that the banker considers solvent, and the subsequent decision to lend. The expression 'consumer debt' refers instead to those debts arising when the creditor does not fulfil the assumed obligations, and thus against his or the creditor's will.³

Some authors do not consider this distinction necessary, as they identify in the concept of consumer debt either the possible end of a credit relationship or the result of a frequently transitory difficult situation, which is consequent to a non-premeditated behaviour (Kamleitner and Kirchler, 2007). Consumer debt is frequently associated with poverty and economic or financial weakness, and is thus an enforced status, related to the household's situation and needs (Lea *et al.*, 1993) together with lack of sufficient income or adequate backup from liquid assets.

In the sphere of consumer credit, on the other hand, recourse to credit is less completely explained by income variables. From some empirical analyses a positive relation emerges between income and credit use (Crook, 2006; Fabbri and Padula, 2004; Cosma, 2006), whereas other contributions highlight a negative relation between current income and recourse to credit but a strong influence of permanent income (Jappelli and Pagano, 1989; Cox and Jappelli, 1993; Guiso *et al.*, 1994; Magri, 2007). Lastly, if we consider the average disposable income per component,⁴ recourse to credit turns out to be highly concentrated around medium-to-low values.

Psycho-behavioural factors

According to some studies, credit demand also derives from behaviours that deviate from economic rationality (Bertaut and Haliassos, 2006); often, recourse to credit is influenced by personal and psychological factors beyond utility maximization (Bertrand *et al.*, 2005). In this sense, the understanding of households' economic behaviour can benefit from an integrated analysis also accounting for psychological, individual and interpersonal factors.

Research and empirical evidence aimed at explaining the recourse to credit by households abounds within the psychological literature, delving into numerous aspects of the action as well as the decisional processes related to debt choices and credit purchases. A relevant role turns out to be performed by differences in personality, motivation, abilities and personal preferences. Also to be considered are the complex interactions between contextual and individual factors.

In the light of these considerations, a review of the literature can be organized into two main strands: one focusing on the relation between the individual and the social environment in which financial decisions are made, the other specifically dedicated to studying the personal characteristics of the credit user.

Interpersonal factors

The first strand is dedicated to studying the role and effects of family–environment interaction and of the unconscious conditionings that each individual experiences just for belonging to or acting in a given context. Such aspects are defined as 'interpersonal factors', meaning interactions between general contextual factors (such as reference group, dominant culture, behavioural patterns, ethical and aesthetic values, modes of communication) and subjective factors (such as personal needs, aspirations, motivations, cultural level) that bear on behavioural models through perceptions as well as emulation or differentiation processes.

These elements contribute to modifying families' behaviours, sharpening the comparative evaluation of their own situations; where the materialistic connotation of social classes is strong, a stronger propensity and more favourable attitudes are observed with respect to credit (Walker, 1996; Watson, 2003). In this respect, a positive relation has been pointed out between recourse to credit and the distance perceived, for instance in income terms, between a family's situation and its social group of reference (Karlsson *et al.*, 2004). In explaining their own debt situation, families tend to compare themselves with a reference group characterized by similar economic and financial situations, thus

showing consistency between their perception of belonging and their effective condition (Livingstone and Lunt, 1991). A certain consistency in social comparison has also been pointed out by Lea *et al.* (1993), as families with debt, more than those without, affirm that the majority of their own relatives, acquaintances or friends consider the fact of having got into debt to be normal.

Moreover, the act of consumption is often a crucial factor in financial decisions because of the material and social meanings that have been attributed to it. Often consumption and credit *together* assume a connotation of social identification for the family, thus satisfying their need for belonging with their peers (Livingstone and Lunt, 1991). Besides, through its consumption the family (or the individual) also defines its living standards and lifestyle, filling the gap it perceives in comparison with its real or ideal reference groups (Morgan and Christen, 2003). And yet, if on the one hand recourse to credit satisfies social identification needs, on the other hand it must not be forgotten that being in debt may also involve a psychological cost and a substantial increase of stress levels (Brown *et al.*, 2005).

Personal attitudes

The studies dedicated to credit users' characteristics generally concentrate on subjective and personal factors, on the meaning the individual attributes to credit and being in debt, on the relations amongst life events, credit behaviours and risk of over-indebtedness. Individual factors specifically concern personality, motivations, purposes of action, abilities, preferences and perceptions, in particular those concerning the general economic or environmental as well as individual condition. Moreover, an important role is covered by 'attitudes', as subjective tendencies to do something, expressed through the favourable or unfavourable evaluation of a given object (Eagly and Chaiken, 1993).

In the case of consumer credit, on the one hand, more or less favourable attitudes qualify a judgement weighing upon the cognitive and decisional process concerning recourse to credit itself; on the other hand, they identify a higher or lower tendency to use it. For our purposes, indeed, it turns out to be useful to further decompose the attitudes and to single out three significant components: the cognitive, the affective and the behavioural component.

The cognitive component is constituted by the individual's whole information set – knowledge, beliefs, opinions, perceptions, thoughts regarding consumer credit – which she has matured during her life on

the basis of her own experiences and interactions with the environment. The cognitive component is important because it contributes to determining the frame of reference in which behavioural decisions are made.

The affective (or 'emotional') component is constituted by emotions, sentiments and, especially, sensations aroused by consumer credit, that is, by the very condition or just the thought of being in debt. The affective component is relevant for seizing the effective meaning attributed to credit and the structure of preferences, which in the cognitive component could be distorted by external elements.

The behavioural component relates to all the explicit behaviours towards consumer credit and, in part, even the proactive intentions not yet transformed into explicit behaviours. In the case of credit use, these include the behaviours performed with respect to money management, family balance and recourse to consumer credit, differentiated by spending intentions.

The relation between attitudes and credit use has been the object of several studies, whose empirical evidences do not lead to homogeneous results. Such heterogeneity is mainly due to the specific orientation of much research towards revolving consumer credit (via credit card), where attitudes towards credit overlap with those towards money. These latter depend considerably upon demographic and interpersonal factors, relating to the effects of the use of credit cards as payment instruments as well, in this way functioning to affirm one's own social status or to overcome a sense of personal inadequacy (Hanley and Wilhelm, 1992). Livingstone and Lunt (1992) have found a positive and relevant relation between the individual's favourable or unfavourable attitude towards credit, his level of indebtedness and intention to repay. This relation has been identified also by Lea *et al.* (1993), who, through a comparison among families having run into debts with a water utility firm, have observed a pervasively negative attitude with respect to debt behaviours, but with significantly more intensity in families without debts. Zhu and Meeks (1994), on the contrary, cannot prove a significant relation between attitudes and credit except in the presence of a high level of instruction. Davies and Lea (1995) analyse the opinions of students who had made use of loans to fund their own education and find a positive relation between favourable attitudes and debt. Differently from what has emerged in Lea *et al.* (1993), the students do manifest attitudes of tolerance with respect to consumer debt. Actually, some attention must be paid to the relation between behaviours and attitudes, because the former may influence the latter; for instance, within *consumer debt*,

opinions tend either to justify one's own status (Lea *et al.*, 1991) or to be significantly inconsistent (Ajzen, 1996).

Not even in *consumer credit* is the role of attitudes in interpreting financial decisions unequivocal, with particular reference to the consistency between attitudes and behaviours, given that it is highly difficult to understand whether attitudes or behaviours are determined first. It has been noticed, indeed, how the existence of previous experiences of consumer credit use, even when mediated by friends or relatives, increase the probability of credit use and induce a more favourable attitude towards it (Kaynak and Harcar, 2001).

The relation between attitudes and behaviours has been even further elaborated with reference to the typology of credit instruments. Given the assumption that attitudes more often constitute a mediating factor of other characteristics, Chien and Devaney (2001) notice that a generic higher propensity to credit is more likely to lead to the use of instalment loans, whereas the existence of specific favourable attitudes is associated with a higher probability of credit card use.⁵ The role of different components within attitudes has been specifically analysed by Xiao *et al.* (1995), who have studied students' attitude towards credit. Notwithstanding the bias due to referring to the use of revolving cards in measuring attitudes, the interviewees turn out to be, on the whole, favourable towards credit. And yet, significant differences emerge amongst affective, cognitive and behavioural components: a positive relation stands out between the intensity of the first two and the use of credit cards. The same result emerges in Hayhoe *et al.* (1999), confirming the existence of a positive relation between the affective component and the use of credit cards, as well as the relevance of the cognitive component in influencing behaviours.

Personality factors: locus of control

The effects of attitudes on credit use must also be assessed in the light of the relevance of personality factors (Tokunaga, 1993; Davies and Lea, 1995) as well as of other elements such as risk propensity and subjective frame of choice options (Kahneman and Tversky, 1979). Personality factors are characteristics specific to individuals, deriving from their own personal development path as well as family, social and educational background, which determine their interpretation of both the environment and their own reference reality and, as a consequence, influence individuals' action in all the domains of their existence. Personality factors are, for example, extroversion, sociability, conscientiousness, emotional stability, shyness, insecurity and attributional style.

Attributional style ('locus of control') is related to the perception of one's own capacity to control the events of life. An *internal* locus of control identifies the perception of the capacity to control events, and the belief that situations and results of personal events depend upon decisions and capacities of the individual. Conversely, an *external* locus of control concerns the perception that one's own life's events depend upon external factors, often perceived as random and, in any case, not significantly dependent upon the individual's actions or will.

The individual with an internal locus of control trusts her capacity to control the results of her actions and her life's events. She is, therefore, more attentive to any event able to give her information to orient her own decisions; she constantly tries to evaluate her own capabilities, and is, above all, worried by her own cognitive deficit. In general, she turns out to be less subject to external conditionings (Rotter, 1966).

Some research exists on the role of locus of control in credit behaviours, but it does not always emerge as significant. Dessart and Kuylen (1986) observe an external locus of control with reference to individuals in debt with difficulty making repayments. The authors show that individuals with lower locus of control and who are in financial difficulties manifest a lower interest in, and own less knowledge of, the characteristics and conditions of their debt. Livingstone and Lunt (1992) highlight the role of locus of control in the explanation of debt. Individuals with more debt have a higher external locus of control; Tokunaga's (1993) study reaches similar conclusions. However, no relevance of locus of control emerges in the explanation of debt according to Lea *et al.* (1995) or Davies and Lea (1995), although these latter identify a relation between external locus and favourable attitude towards debt. Other studies have proved how locus of control and auto-perception influence, directly or indirectly, preferences, decisions and financial behaviours (Perry and Morris, 2005). More specifically, external locus mediates the effects of financial education on making the correct decisions, reduces the attention paid to the management of one's own balance, consistently with the results showing higher debt levels and more financial problems among individuals with external locus (Perry and Morris, 2005).

9.3 Research method

Description of the sample

The data set used in this research is the outcome of a dedicated survey involving 2,000 Italian households and carried out from April to June 2009 by a market research firm. The sample comprises families that,

when interviewed, had recently made recourse to consumption credit, as well as families that had not. Since consumption credit is not very common in Italy, credit users were oversampled in order to collect as much information as possible about the phenomenon, so to make up half of the whole sample.⁶ Otherwise, the sample design is aimed at representing the composition of the population of Italian households by size and domicile.

A questionnaire of 60 closed-form questions devised by the authors was submitted by telephone interview (through the CATI [Computer-Assisted Telephone Interview] system) to a single component of any household in the survey list declaring himself or herself as participating in family financial and economic decisions. The questionnaire consists of three main sections, concerning respectively: (1) demographic, professional and educational characteristics; (2) economic conditions and credit use; (3) psychological profile with regard to personality and attitudes towards credit.

For the purposes of this research, a 'credit user' is a family that was either using consumer credit when interviewed or had used it during the previous 24 months. 'Credit non-user' families are those that do not satisfy either of these conditions. The decision to limit the credit usage definition to the past two years is intended to assure the reliability of the answers about motivations, behaviour and the credit-related decision-making process.

In 144 cases out of 2,000, the interviewee did not answer all the questions about his psychological profile. Therefore, only 1,856 cases are effectively available for investigation: 909 cases are credit users and the remaining 947 cases are non-users. The overall frequency of non-responses is low (7.2 per cent), and it is higher for users (8.1 per cent) than for non-users (5.3 per cent); in neither of the two types have preliminary data analyses revealed any systematic difference between respondents and non-respondents by the characteristics of either the household or the interviewee.

Preliminary descriptive statistics of the effective sample have shown that almost 45 per cent of households live in Northern Italy. The share of credit users is 14 per cent higher than that of non-users in Southern Italy (including Sicily and Sardinia) and 8 per cent less in the north-west of the country. Almost 20 per cent of households have one or two members, 25 per cent have three and the rest (55 per cent) have four or more. Larger households are more frequent among credit users than non-users, among whom three-component families are most common. In over 90 per cent of cases, households have one or two income earners; the distribution by number of income-earning members is

not remarkably different for credit users and non-users. The similarity between the two types of families holds also with respect to the gender of the respondents: 40 per cent are male and 60 per cent female. Most interviewees (67 per cent) are in the 35–64-year age range; the frequency of non-users is slightly higher than for the whole sample in the age 18–34 range (15 per cent) and above age 65 (26 per cent). The level of education of respondents is mostly (80 per cent) between primary junior ('Licenza media') and secondary ('Diploma'); among credit non-users, college ('Laurea o superiore') and primary infant ('Licenza elementare o nessuno') levels are more frequent than among users. In 55 per cent of instances respondents were working when interviewed; the proportion is higher for credit users (60 per cent) than for non-users (50 per cent), who show a higher concentration of retirees (30 per cent, compared with 21 per cent for credit users).⁷

Assessing and measuring attitudes and personality

Two sections of the questionnaire are aimed at assessing the psychological characteristics of the interviewee. The first section consists of 12 questions about attitudes towards credit; six questions about the locus of control comprise the second section. All questions elicit an expression of agreement about some given statement on a five-grade Likert scale, but the interviewee may avoid answering if she has no opinion. The level of agreement is coded from 'strongly agree' to 'strongly disagree'.

The assessment of attitudes towards credit follows the approach of Lea *et al.* (1995). Five items relate to the cognitive, three to the emotional and four to the behavioural attitude (Table 9.1). A score from one to five is attributed to each answer; the higher the value, the more liking for credit is expressed. The Lea *et al.* approach was preferred over alternatives, like Xiao *et al.* (1995) or its development by Hayhoe *et al.* (1999), since it avoids any reference to credit card use, which, in the case of this study, might introduce a confounding bias because it elicits answers that are also correlated with attitudes towards money.

The self-consistency of attitude evaluations over the various items has been checked with Cronbach's Alpha. The value of this indicator ranges from 0 to 1 with improving consistency of answers; an Alpha value of at least 0.4 is commonly considered as adequate. The Alpha values for the items relating to cognitive, emotional and behavioural components are equal to, respectively, 0.539, 0.186 and 0.335. These values have been improved upon by purposefully selecting only certain items for each attitude component. A better representation of the cognitive attitude is thus achieved by keeping only items one, two and three, which deliver

Table 9.1 Questionnaire items for assessing attitudes by component**Cognitive component**

1. Taking out a loan is a good thing as it allows you to make your life better
2. It is a good idea to have something now and pay for it later
3. Having debt is never a good thing
4. Credit is an essential part of today's lifestyle
5. It is important to live within one's means

Emotional

6. I am not worried of having debt (this condition is not stressful for me)
7. I like having a credit card
8. I do not like borrowing money

Behavioural

9. I prefer to save for making an expensive buy
10. It is better to go into debt than to let children go without Christmas presents
11. Even on a low income, I save a little regularly
12. Borrowed money should be repaid as soon as possible

an Alpha level equal to 0.593; for the emotional component, items six and eight achieve $\text{Alpha} = 0.227$; finally, items nine, 11 and 12 have been selected for the behavioural component ($\text{Alpha} = 0.385$). Considering all selected items together (i.e., regardless of the dimension they belong to) the overall Alpha level equals 0.534.

The selected items have been combined into four synthetic measures of attitude towards credit (referred to as 'scale'): one for each of the three components and a further comprehensive measure of overall attitude. For each sample case and each measure a scale value is calculated by summing the scores on any relevant item and standardizing the result over the unit range, so that the closer the resulting value is to 1 the stronger is the liking for credit.

The locus of control is considerably more difficult to measure than attitudes. First attempts by Rotter (1966) required 23 questions, while Levenson (1973) used 24 in a clinical study. When samples have larger sizes than in traditional clinical studies, as is typical in survey research, scales based on a lower number of items are called for. Craig *et al.* (1984) tested a 17-item scale, while Lumpkin (1985) proposed a more parsimonious solution, based on six items only, which is suitable for large-scale studies. In Lumpkin's scale, three questions are framed towards external locus and three towards internal locus. Because of the large sample size and the fact that interviews were carried out by telephone, in this research locus of control has been measured by Lumpkin's scale (Table 9.2)

Table 9.2 Questionnaire items for assessing locus of control

Internal locus of control

1. When I make plans I am almost certain that I can make them work
2. What happens to me is my own doing
3. Doing things the right way depends upon ability; luck has nothing to do with it

External locus of control

4. Many of the unhappy things in people's lives are partly due to bad luck
 5. Getting a good job depends mainly on being in the right place at the right time
 6. Many times I feel that I have little influence over the things that happen to me
-

The evaluation method for the locus of control is similar to the method used for attitudes. According to Likert's five-grade scale, the more external (or less internal) the locus for any given item, the higher is the corresponding score. Cronbach's Alpha equals 0.376 considering all six items; when items 4 and 6 are dropped, its value rises to 0.45. Therefore, the overall locus of control scale is defined as the standardized sum of the scores on items one, two, three, and five. Values on the scale closer to 1 correspond to more external locus.

9.4 Analyses and results

This section concerns the results of the statistical analyses that have been carried out on the collected sample data. The most important hypothesis that has been tested for is the presence of a relationship between consumer credit use and psychological factors, notably the attitude towards credit and the locus of control of the interviewees. Two further aspects have been examined: whether those factors can be associated with (a) motivations for using consumer credit and (b) the families' preferred forms of credit. Finally, a logistic regression analysis has been performed to check whether the influence of attitude and locus of control on credit decision persists when other potentially relevant household characteristics are also taken into account as concurrent (possibly competing) factors.

Attitudes, personality and recourse to credit

The presence of a relationship between attitudes, locus of control and the use of credit has been tested for by comparing the average scale values totalled on each factor by credit users and non-users (Table 9.3).

Table 9.3 Attitudes, locus of control and credit use

Characteristics	Users	Non-users	t-test	p-value
Overall attitude toward credit	0.253	0.197	10.550	0.000
Cognitive	0.324	0.245	9.247	0.000
Behavioural	0.243	0.182	9.435	0.000
Emotional	0.193	0.165	3.427	0.002
Locus of control	0.219	0.229	-1.767	0.770
No. of cases	909	947		

Note: Unpaired samples t-tests; from the results of Levene's pre-tests, equal group-variances are assumed for all characteristics.

In general, the values of attitudes are higher for users than for non-users, and the differences are always strongly statistically significant. Larger differences are recorded for the cognitive (0.079) and behavioural (0.061) components, while the emotional component has more similar values for the two groups (0.193 vs. 0.165); also, the importance of this component should be judged with care, because of its low performance on the consistency test ($\text{Alpha} = 0.227$). For the single components, as well as for the overall attitude, the results are consistent with those presented in most of the existing literature and with expectations. Also, since data are quite well behaved, the results do not change remarkably if one uses more robust statistics of scale values, such as the median and Mann-Whitney test.⁸

The difference in the locus of control of users and non-users is, on the contrary, negligible and not statistically significant. While this outcome is not uncommon in the literature, it is quite surprising that the scale values are slightly higher for non-users than for users. A possible cause for this result is the effect of some confounding hidden factor; also, it might be a consequence of consumer *credit* being the object of the analyses, since most studies that find a more external locus among families with debt are about consumer *debt*.⁹ This issue is dealt with later in the chapter.

The first conclusion that can be drawn from these analyses is that one cannot reject a positive and significant relationship between attitudes and credit usage, while personality factors do not seem to have a bearing on it.

Household economic condition and attitude towards credit

Having found a positive influence of attitude towards credit on its usage, it seems sensible to check that this is not driven by a primary

Table 9.4 Attitudes towards credit by household per capita income

Per capita income class (€ monthly)	Users	Non-users
Up to 350	0.248	0.193
351–500	0.273	0.194
501–750	0.243	0.196
751–1,000	0.273	0.207
1,001–1,250	0.230	0.189
1,251–1,500	0.238	0.219
1,500 or more	0.284	0.178
Total	0.253	0.197
Regression analysis		
Slope coefficient	–0.150	0.003
p-value	0.053	0.705
R-squared	0.004	0.000

Note: Simple regression of the overall attitude score against the natural log of per capita income.

relationship between attitude and family need. It is indeed possible for interviewees to display a positive attitude towards credit in order to justify their family being in debt because of economic strain.

As shown in Table 9.4, the stronger attitude among credit users compared with non-users does not change with the household's per capita income class, which is taken to proxy the degree of family need.¹⁰ Also, no clear relationship between attitudes and needs emerges within either of the two groups. This is confirmed by the results from cross-sectional regressions of attitude scale values against the logarithm of per capita income, which are reported in the bottom panel of the table, run separately for users and non-users. The fit of both regressions is very poor, and the slope coefficient is only weakly significant for credit users, showing a negative value. This particular outcome is driven by the highest income-class families of credit users, which have the strongest attitude towards credit (0.284); if all cases belonging to this class are removed, the regression results are indistinguishable from those for non-users.

Attitudes and credit use motivations

Attitude towards credit is also related to the motivations for using credit.¹¹ The comparison of average scale values between users and non-users shows that stronger attitudes prevail among the former across all reported motivations (Table 9.5). However, the difference is larger and more significant when credit is used for unexpected, non-discretionary

Table 9.5 Attitudes towards credit by motivations

Declared motivations	Users	Non-users	t-test	p-value
Financing an unexpected expenditure	0.247	0.186	8.118	0.000
Credit is cheap	0.264	0.206	3.521	0.001
Financing an important project	0.257	0.211	3.669	0.000
Smoothing expenditure over the year	0.254	0.214	2.238	0.027
Satisfying a desire	0.256	0.222	2.071	0.039

Note: Unpaired samples t-tests; from the results of Levene's pre-tests, equal group-variances are assumed for all motivations except for 'Credit is cheap', where statistics are computed using group-specific variances.

expenditure, because it is cheap or for realizing a project important for the family. The least difference is observed when borrowed money is used for hedonistic purposes.

These results are consistent with the cognitive and behavioural attitudes dominating the emotional in explaining the propensity towards credit, as shown before, with respect to both scale values and internal consistency of their constituent items. It is also worth pointing out that, while for credit users average scale values are quite homogeneous across motivations, they are more dispersed among non-users, tending to be higher when associated with discretionary purposes.

Psychological factors and forms of consumer credit

As documented in the literature review section, the psychological traits of consumers can have an influence on the types of credit they prefer. The questionnaire included two questions specific to this topic. Credit users were asked to declare the actual form of credit they had used, while non-users were asked to state what form they would have been most likely to use had they had recourse to consumer credit.¹² This particular way of formulating the question is intended to isolate the respondent's attitude towards credit, thus reducing the bias from attitude towards money that has affected most previous studies.¹³

The data thus collected have been analysed in connection with attitude towards credit and the locus of control of the interviewee, simultaneously for both users and non-users. For this purpose, two multinomial logistic regressions have been run, in which the dependent variable is the preferred form of credit and the covariates are the household type (user or non-user) and, respectively, the attitude and the locus of control scale measures. For both regressions, the reference category of the dependent variable is credit card financing. The results are summarized

Table 9.6 Influence of attitude and locus of control on preferred form of credit

Preferred form of credit	Household type	Coefficient	Std. Err.	p-value
Attitude				
Point-of-sale lending	User	1.746	0.609	0.004
	Non-user	3.447	1.054	0.001
Personal credit	User	-1.774	0.669	0.008
	Non-user	5.683	1.013	0.000
Salary loan	User	-6.485	1.266	0.000
	Non-user	3.265	1.296	0.012
Locus of Control				
Point-of-sale lending	User	1.007	0.584	0.085
	Non-user	1.850	0.916	0.043
Personal credit	User	-2.521	0.663	0.000
	Non-user	5.245	0.859	0.000
Salary loan	User	-3.654	1.174	0.002
	Non-user	5.590	1.070	0.000

Notes: Multinomial logistic regressions of credit choice against attitude and locus of control scores; 'Revolving credit card' is the reference category; N = 1,546 excluding non-respondents.

in Table 9.6; a positive (negative) value of any given coefficient means that the psychological factor of interest increases (decreases) the probability of using the corresponding form of credit instead of credit cards.

The estimates from the first regression (top panel) show that the hypothesis of a more favourable attitude towards debt not having any effect on the preferred form of consumer credit is strongly rejected across all household types. For actual users, the higher the attitude value the more likely is financing consumption with credit cards or point-of-sale lending, as opposed to more direct forms such as personal bank credit or salary loans. In contrast, credit non-users are more likely to turn to direct forms as attitude towards credit gets stronger; point-of-sale lending is also significantly preferred to credit cards. Further analyses on the specific effect of the cognitive component return a results pattern largely similar to what has emerged from the overall attitude regression.¹⁴

With respect to the locus-of-control regression (bottom panel), while the preference for point-of-sale lending rather than credit cards turns out to be only weakly affected by a more external locus for both users and non-users, the coefficients associated with direct credit forms are sizeable and highly significant. As external locus gets stronger, users are more likely to turn to credit cards, while the opposite is true for non-users, who tend to prefer personal credit and salary loans.

Attitudes vs. other factors in recourse to credit

The collected empirical evidence supports the claim that attitudes can be an important determinant in consumer credit decisions. In order to be more confident about this, it is necessary to check whether attitudes still exert an influence when other potentially relevant factors are simultaneously taken into account.

For this purpose, a binary logistic regression has been run of credit use on attitude towards credit, locus of control and several control covariates. Beyond customary demographic variables, controls include: the logarithm of current per capita income, the interviewee's expectations of future household income and the ownership of the family home. This specification has been chosen by supervised backward selection, starting from a model that included more factors, which turned out not to be statistically significant and were then excluded. The regression results are displayed in Table 9.7.

The estimated regression has a very good fit to the sample data, as the pseudo- R^2 is quite high (10.1) and the Hosmer–Lemeshow test does not reject the null hypothesis of inconsistency between the observed and predicted values by a large margin (p-value = 0.24). The coefficient and Wald test values confirm that attitude has a major influence on consumer credit decision: as favourable attitude towards credit increases, so does the probability of taking on debt. Consistently with the permanent income hypothesis, very positive expectations about future income increase the probability of using credit, which smoothes consumption expenditure over time. On the other hand, current per capita income does not have any significant effect.

Contrary to the outcome of other analyses presented in this chapter, the (external) locus of control turns out to be significant and to have quite a *negative* influence on credit use. As already mentioned, this contradicts the findings of most existing research, wherein locus of control either is not significant or has a positive effect on taking on debt. Bearing in mind the limits imposed by the modest quality of the locus of control measure in the sample, this outcome may be explained in two ways. First, the dependent variable is the purposeful use of consumer credit and not, as in most of the literature, a situation of consumer indebtedness induced by adverse factors largely beyond the control of the individuals. Therefore, it does not seem unlikely that people with stronger internal locus may be keener to use consumer credit; the more so, considering the importance of cognitive attitudes that has emerged in this study. As a second explanation, not unrelated to the former, it

Table 9.7 Logistic regression analysis of recourse to credit

Covariate	Coefficient	Std. Err.	DoF	p-value
Domicile (by area)			3	0.000
North-east	0.233	0.150	1	0.121
Centre	0.189	0.150	1	0.209
South and Islands	0.656	0.129	1	0.000
Size of hometown (residents)			3	0.000
5,000 to 39,999	0.295	0.137	1	0.031
40,000 to 249,999	0.253	0.156	1	0.105
250,000 and above	-0.392	0.177	1	0.026
Home ownership	0.614	0.157	1	0.000
Log of per capita income	0.000	0.098	1	0.999
Income expectations			4	0.075
Increasing	-0.593	0.371	1	0.110
Stable	-0.360	0.361	1	0.318
Decreasing	-0.166	0.389	1	0.669
Strongly decreasing	0.237	0.629	1	0.706
Attitude towards credit	4.510	0.450	1	0.000
Locus of control (external)	-1.368	0.405	1	0.001
Constant	-0.892	0.759	1	0.240
No. of cases	1,856	Log-Likelihood	2,375.57	
		Ratio =		
Hosmer-Lemeshow	$\chi^2(8) = 10.36$	Pseudo R ² =		0.101
Goodness-of-fit test	p-value = 0.240			

Note: Reference categories for nominal and ordinal variables are as follows: 'North-west' for Domicile, 'Up to 4,999' for Size of hometown, 'Strongly decreasing' for Income expectations; the Pseudo R² is Cox and Snell's version.

should be considered that in Italy consumer credit is a far less common phenomenon than among North American and British households, to which most existing studies refer. Therefore, in Italy recourse to consumer credit may frequently be the outcome of conscious financial planning, which is typical of the internal locus of control personality.

9.5 Conclusions

Based on the analyses of an original data set from a survey on 2,000 Italian households, the empirical evidence presented in this chapter supports the hypothesis that consumer credit users and non-users differ with respect to their psychological profile. Particularly, the attitude towards credit is more favourable among the former. Also, a stronger

attitude makes using consumer credit more likely, even taking into account the simultaneous effect of other factors that may influence family financial decisions, such as per capita income and earnings expectations.

Motivations for using credit are also related to attitude. Larger and positive differences in attitude between users and non-users are found with respect to those motivations that are related to conscious or planned recourse to credit. On the other hand, stronger attitudes are associated with discretionary consumption for both groups.

The declared preference for different forms of credit (such as personal loans and credit cards) is also influenced by attitudes. As attitude gets stronger, credit users are more likely to finance consumption with credit cards or point-of-sale lending rather than with direct credit, while the opposite is true for non-users. The cognitive component, which determines the individual's decision-making framework, seems to be crucial in shaping this relation.

Personality characteristics are also considered in this study. Specifically, the role played by the perception of the personal ability to determine one's own life events ('locus of control') has been examined. Consistently with some previous research, the effect of locus of control on consumer credit does not clearly emerge in this study. While users and non-users do not differ significantly by locus of control scores, either in general or by motivation for using credit, this is not so with respect to the preferred form of credit. Indeed, when the locus is more external (i.e., the decision-maker is more fatalistic) users are more likely to prefer credit cards, while the opposite is true for non-users, who would tend to make recourse to direct credit.

When the effects of attitude, personality and other potential determinants of consumer credit are considered together, external locus of control emerges as an important factor that reduces the probability of taking on debt. This result is partly at odds with some existing literature that has found a higher external locus among individuals with debt, and might be explained by this study focusing on the purposeful choice of using credit rather than on the passive condition of being in debt.

The main conclusion from this study is that an influence of psychological profile on families' credit behaviour cannot be rejected. While attitudes and personality factors, being complex features, are admittedly not easy to measure in survey-based studies, the topic is worth further investigation, as they contribute to the definition of consumers' preferences and decision-making framework. Also, these elements turn

out to be complementary to expected income in shaping the outcome of credit decisions; integrating them into models based on economic rationality is, therefore, a promising line of research.

Notes

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1. At the end of 2009 the ratio of household debt to annual disposable income was equal to about 60 per cent, compared with 33 per cent in 2001. In the same period, the incidence of the debt service (comprehensive of both capital and interest payments) on the annual disposable income was equal to about 9 per cent, versus 6 per cent in 2001 (Banca d'Italia, 2010).
2. The explanation of the evolution of household debt is interestingly further completed by the analyses of the supply side in terms of number, variety of products, distributional channels, typology of intermediaries, credit processes and policies, credit availability or constraints.
3. Livingstone and Lunt (1992); Lea *et al.* (1993, 1995).
4. The average disposable income per component is equal to the current income divided by the number of household components.
5. The general attitude is measured through the analysis of the opinions on consumer credit, while the specific attitudes are measured through the analysis of the propensity to use credit in purchasing discretionary rather than basic goods.
6. The Bank of Italy estimates that the share of Italian households using consumption credit was 13 per cent at the end of 2008.
7. Descriptive statistics tables are not shown for reasons of space, but are available from the authors upon request.
8. The median comparisons and the outcomes of non-parametric tests are available from the authors upon request.
9. Please refer to Section 1 for an explanation of the specific meaning of 'debt' and 'credit' in the psychological literature.
10. Per capita income is computed using the Italian Bureau of Statistics equivalence scale, which adjusts the number of components divisor to take into account the less than proportional increase of family needs with household size (ISTAT, 2009). In 903 cases (48.7 per cent of the total sample) the interviewees did not declare their family's income. Missing income values have been estimated by a two-stage Heckit model including the following explanatory variables: the family's domicile by geographic area, the number of income recipients, and an indicator of the family's ownership of its home. Non-responses turn out to be less likely when the interviewee is the head of the household or as his age increases. Heckit estimates are available from the authors upon request.

11. For non-users, motivations refer to a hypothetical situation of recourse to credit.
12. A share equal to 32.7 per cent of non-users did not answer this question. Therefore, the analyses presented in this paragraph have been performed on a sample of 1,546 households.
13. See the review paragraph about personal attitudes in Section 1.
14. The cognitive component is indeed the most influential determinant of attitude.

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10

An Insight into Suitability Practice: Is a Standard Questionnaire the Answer?

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10.1 Introduction

For years, financial intermediaries have been focusing on data and information obtained from customers in order to develop and carry out their Customer Relationship Management (CRM) techniques; they have created and improved models that allow them to split customers into homogeneous groups according to some specific drivers (see Channon, 1985; Anderson and Kerr, 2002; Peelen, 2005). Knowing a customer's characteristics is crucial to intermediaries for two main reasons: from an ex-ante perspective, they can create products and services which can be specifically marketed and sold to particular segments of customers (*customer segmentation*); ex post, they make use of the information they obtain from clients in order to provide them with products and services that are suitable to their profile, thus reducing complaints and granting a good level of loyalty (*customer profiling*). In the literature, much effort is devoted to explaining the main drivers of customer segmentation, while the work on customer profiling is less developed. Nonetheless, the profiling process that financial firms follow to sell financial products and services is crucial, as it paves the way for a fiduciary relationship between the customer and the intermediary. Moreover, it has implications in terms of protecting both the investor and the intermediary. In fact, the information that is obtained from the customer in the profiling process is crucial in each step of the contract:

- a) *before* the financial service or product is subscribed, in order to meet the preferences and needs of the investors;

- b) *during* the contract, in order to acquire any changes in the needs and preferences of the investor;
- c) *after* the end of the contract, in order to protect the intermediary against any complaint that the client could make with reference to a loss that he or she did not expect.

With the introduction of the Market in Financial Instruments Directive (MiFID, henceforth), the practice of profiling customers has become *compulsory* for financial firms providing investment services;¹ specifically, the MiFID requires investment firms to assess the *suitability* and *appropriateness* of any product or service before it is offered to clients. In very broad terms, this profiling obligation aims to determine whether the customer has the necessary knowledge and expertise, together with the financial capacity and the right investment objectives to trade in financial instruments and to understand the risks associated with this trading activity. In practice, the abovementioned client information is collected by the use of a questionnaire, which functions to provide better knowledge of customers and also to reduce potential misunderstandings, thus protecting financial firms against possible complaints.

Actually, the MiFID does not impose a standard questionnaire on intermediaries, so each financial firm makes use of its own proprietary questionnaire, which is likely to be different from those of its competitors. Starting from this consideration, our analysis investigates whether the questionnaires that are currently used by financial intermediaries provide an accurate profile of the customer or, on the contrary, grant only partial knowledge of his or her preferences and needs. To this end, we follow both a *descriptive* and an *empirical* approach. In the *descriptive approach*, we examine the content of different questionnaires in order to highlight the main divergences and similarities among them. Specifically, we collect a sample of 14 MiFID suitability questionnaires belonging to the major Italian financial firms and addressed to retail clients. We analyse each questionnaire by comparing its level of completeness and compliancy with the MiFID requirements; moreover, we reveal the main differences among them, as well as possible explanations for such divergences. In the *empirical approach*, we investigate how reliable MiFID questionnaires are, in terms of the consistency of profiles that come out when different questionnaires are filled out by the same person. In this analysis, we employ three questionnaires used by Italian banks,² and we submit them to a sample of 100 potential investors. Each person in the sample is requested to complete all of the three

questionnaires in order to verify the consistency of the three profiles obtained. We find that, depending on the bank questionnaire that is used, at least for some subjects, the profiles obtained vary to such an extent that the same subject could be classified by one bank as risk-averse and by another bank as a risk-seeker.

Possible explanations for these results will be thoroughly discussed in the concluding remarks of this chapter. Therein, we will suggest possible improvements in the regulatory framework in order to enhance investor protection without neglecting the need for the intermediary to match client profiling with the financial instruments on offer.

In light of the current worldwide financial turbulence, we believe these issues need to be urgently addressed. The recent financial crisis has revealed not only the shortcomings of the international financial system but also the limits of the tools that are currently being used by financial intermediaries to profile investors and thus properly advise them accordingly. This seems to be the appropriate time to deal with these issues, considering that, in Europe, suitability and appropriateness obligations have been in effect for three years and, in the US, authorities are in the process of amending suitability rules by FINRA proposal to revise NASD Rule 2310 as FINRA Rule 2111.

10.2 Customer profiling in the financial literature

Customer profiling does not seem to be a topic specifically addressed in the literature. Most of the studies propose criteria that financial intermediaries and advisers should use in order to split (ex ante) their clients into homogeneous groups, thus providing a *customer segmentation* perspective rather than one of *customer profiling*. However, this approach can also be extended to an ex-post perspective; in fact, it allows the intermediaries or advisers to allocate their products (ex post) by making use of a grid that links groups of customers with groups of suitable products and services. Therefore, the drivers of the customer segmentation are quite similar to those employed in the profiling process; what sets them apart is the purpose of their employment. In segmentation, drivers are essential in order to design and create products that are addressed to the different segments of clients; in profiling, the same variables allow the matching of a group of products, designed in this way, with groups of customers.

The list below shows some of the drivers that have been suggested over the years:

- Socio-demographic and economic;
- Benefit;

- Financial knowledge;
- Financial sophistication;
- Risk tolerance.

With reference to the *socio-demographic* and *economic* variables, Channon (1985) suggests that income, profession and life-cycle stage should be considered when assessing the financial products and services that are more suitable for a particular investor. Violano and Van Collie (1990) add that socio-demographic variables (such as geographic, demographic, socio-economic and familial information) should also be considered. The main advantage of the traditional criteria is that the factors are entirely comprehensible and can be easily derived from existing customer data. Nevertheless, empirical evidence demonstrates that socio-economic factors alone are not sufficient to explain actual consumer behaviour (Moschis *et al.*, 2003). Financial consumers showing the same socio-economic features might have very different expectations from financial services and products. Moreover, Harrison (1994) maintains that traditional profiling based on socio-demographic and economic information has provided little insight into the behaviour of financial services customers. Therefore, more complex methods have been proposed. Speed and Smith (1992) divide published research into '*a priori*' and '*post-hoc*' studies. *A priori* stands for analysis in which customers are allocated into different groups according to the socio-demographic and economic information they exhibit. The *post-hoc* method does not define the number and type of groups in advance. Rather, customers are grouped according to the responses they give to particular questions aimed at understanding what they look for and expect from particular financial products and services. In other words, customers are clustered according to the *benefits* that they are seeking in a given product (Tynan and Drayton, 1987; Loker and Perdue, 1992; McDougall and Levesque, 1994; Minhas and Jacobs, 1996). Nonetheless, few studies have specifically addressed the issue of benefit variables in the financial service sector (Speed and Smith, 1992; Minhas and Jacobs, 1996). Another group of variables that have been considered in the literature refer to *financial knowledge*. Brucks (1985), Alba and Hutchinson (1987) and Mishra *et al.* (1993) measure the financial expertise of customers by testing their knowledge of various financial products and by querying them on their experience in dealing with financial affairs. In a related paper, Jansen and Hackethal (2008) propose a new method that is based on the *financial sophistication* of customers. Sophistication

provides information as to how interested a customer is in his or her financial affairs, and also reveals his or her level of financial expertise and financial knowledge. Another field of studies has concentrated on *risk tolerance* as a tool to cluster investors and provide them with suitable products and services. Risk tolerance can be defined as a combination of both risk attitude and risk capacity (Cordell, 2002). These two components of risk tolerance are intrinsically different: risk attitude is a psychological attribute and assesses how much risk an investor would like to take, whereas risk capacity is principally a financial attribute and measures how much risk an investor can afford to take. The assessment of risk capacity depends on observable variables (such as age, income, savings, wealth, job, family status and composition, and so on) and is strictly related to the concept of background risk (Guiso *et al.*, 1996, Heaton and Lucas, 2000; Shum and Faig, 2006), which represents a limit to the degree of risk that one can assume due to income (made up of labour, proprietary and housing) and borrowing constraints. Risk attitude is more difficult to assess, as it implies a psychological concept and is usually revealed through questionnaires or psychometric tools (see Brighetti and Lucarelli, 2010).

Most of the variables that have been considered in the literature in order to profile investors assume that people in the same age, gender, life-cycle stage, and so on, have homogeneous financial needs and preferences. More recent literature suggests that identifying the influence of unobservable variables such as investors' beliefs is key to achieving a better understanding of the choices and behaviour of financial market participants (Pennings and Garcia, 2010; Heckman, 2001). Unobservable, individual-level differences may help to explain the underlying mechanisms of a wide variety of behavioural anomalies (Dhar and Zhu, 2006; Lee *et al.*, 2008; Graham *et al.*, 2009). Nonetheless, to date they have not been widely used in practice to explain individual investors' decision-making or performance.

The multitude and variety of variables that have been proposed in the literature to cluster investors reflect how important and complex it is to a financial intermediary or adviser to know the needs and preferences of customers in order to provide them with suitable products and services. In the next section, we will provide evidence that both regulatory standards and widespread practice in the financial sectors usually make use of the customer information cited above as tools to assess customers' needs and preferences and the consequent suitability of the products and services that are offered.

10.3 Customer profiling in the regulatory framework: MiFID versus US suitability legislation

One of the main pillars set forth by the MiFID is the detailed conduct of business rules for investment firms, with specific regard to the new suitability and appropriateness assessments of clients. This pillar aims to enhance investor protection (especially for inexperienced retail investors) against the complexity of the market and to give practical guidance for firms about how to effectively implement the process of knowing the customers' characteristics and needs. Strictly speaking, the suitability assessment is not a regulatory novelty at all, as its original roots can be found in US legislation, in the NASD Rule 2310. The Rule directs that 'in recommending to a customer the purchase, sale or exchange of any securities, a member shall have reasonable ground for believing that the recommendation is suitable for such customer upon the basis of facts, if any, disclosed by such customer as to his other security holding and as to his financial situation and needs.' More recently, the Securities and Exchange Commission ('SEC') published a proposed rule issued by FINRA (Financial Industry Regulatory Authority) to re-codify NASD (National Association of Securities Dealers) Rule 2310 (and related NYSE (New York Stock Exchange) Rule 405 (1)) as FINRA Rule 2111.³ Henceforth, the MiFID prescriptions for suitability obligations, which are the focus of our analysis, may be better discussed by being put in relation to the recent developments in the corresponding US legislation wherein the rule has been mutualized. To make a clear comparison, we shall focus upon three main points that may be useful to summarize the suitability framework operating in each legislation, as reported in Table 10.1.

In broad terms, suitability refers to the obligation of a financial intermediary to propose to a customer only investments that match the customer's financial characteristics and needs. The specific *application field* of the suitability rule is a first point of comparison between the two legislations. In this perspective, the MiFID implicitly distinguishes between two groups of services:

- a first group of services that entails an element of recommendation on the part of the firm upon the final investment decision of the client, as the firm advises some products or receives an explicit mandate from the client to manage his or her assets ('advised services', that is, investment advice and portfolio management);
- a second group of services that does not imply a recommendation by the financial intermediary, resulting in a mere execution of transactions autonomously decided by the client ('non-advised services',

Table 10.1 Suitability obligations: MiFID versus US legislative framework

	MiFID	US legislation
Application field	Advised services (portfolio management, investment advice)	Investment recommendation
Information from customers	Three sections explicitly required: <ul style="list-style-type: none"> • investment objectives; • financial capacity; • experience and knowledge 	Three sections implicitly derived: <ul style="list-style-type: none"> • investment objectives; • financial capacity; • experience and knowledge
Exception	Less rigorous application for professional clients	No application for professional clients
Type of financial intermediary:	a) uniform application b) uniform application c) no prescription	a) only securities brokers b) bank subsidiaries and affiliates registered as securities broker-dealer c) annuity and life products
a) securities sector		
b) banking sector		
c) insurance sector		

such as reception and transmission of orders, execution of orders, dealing on own account, placing of financial instruments).

The suitability obligation refers only to the first group of services, meaning that a recommendation must be made in order for the MiFID suitability obligation to arise. The same approach is shared by US law, wherein the suitability determination is required only at the time of investment solicitation and the suitability standards apply only upon such recommendation. Where no recommendation is made, that is, when services other than financial advice or portfolio management are required (e.g., where the client simply asks that an order be executed), the MiFID requires the firm to apply an appropriateness assessment, which may be thought of as a sort of ‘lighter’ form of suitability.⁴ If suitability is a fairly familiar concept in advisory situations in the international arena, the appropriateness test for non-advised services is more of a novelty, which does not, for instance, have an equivalent in US legislation. In the latter, when a transaction is made without a recommendation, there is no explicit requirement, but only special rules applicable to certain types of products which may prevent or discourage an investor from purchasing, for example by requiring special disclosures prior to the sale and/or warning the client about the risks, or a determination that the products are not suitable for the client to purchase.

The set of *information from customers* to be gathered and used as part of a suitability analysis is a second point of comparison between the MiFID and the US legislation. In this sense, the MiFID requires that the suitability assessment be based upon three information sections. The first is addressed to the investment objectives of the client; in this section, the client has to express his or her preferences about the time horizon and the risk profile of the investment he or she is going to make, in order to identify those investment products that match his or her preferences about risk, return and length of time. The second section is focused on the financial capacity of the client; it relates to the client's financial ability to incur risk and is a function of some economic information, such as the amount and stability of his or her income, the amount of expenses relative to income, the diversification of assets, and the amount, time frame and structure of liabilities. The third section aims to investigate the experience and financial knowledge of the client, as clients who comprehend risk are more likely to make financial planning decisions consistent with the accomplishment of their goals; typically, the types of service, transaction and financial instrument with which the client is familiar or that the client has used in the past are investigated. In the US, the original NASD Rule 2310 prescribes that a member shall make reasonable efforts to obtain information about the customer's financial status, tax status and investment objectives, and, finally, shall collect any other information useful for making the recommendation. The proposed FINRA Rule 2111 expands the suitability rule specifically to require consideration of the following information, which was not explicitly included in NASD Rule 2310: the customer's investment experience, investment time horizon, liquidity needs and risk tolerance. In this sense, we may say that the two legislations seem to be increasingly converging as far as the content of the suitability obligations is concerned, thereby widening the set of information required and explicitly considering crucial elements, suggested also by the literature, such as the risk tolerance and the financial knowledge of the individual.

Furthermore, neither legislation allows firms to 'contract out' of suitability obligations. An *exception* to this may occur only where a client is deemed to be of sufficient sophistication that he/she is no longer regarded as 'retail'. In this sense, the MiFID explicitly distinguishes between a 'retail customer' and a 'professional client'.⁵ Specifically, for professional clients the suitability assessment is reduced into two sections ('investment objectives' and 'financial capability') when providing portfolio management, and reduced further into one section ('investment objectives') when providing financial advice, as the other information may be implicitly assumed by the firm.⁶ There is no

longer a need to assess the appropriateness, as the only set of information required for appropriateness ('financial experience and knowledge' of the client) is implicitly supposed to exist.⁷ Therefore, in the MiFID framework suitability requirements apply to both retail and professional clients, but differently: for retail clients the sources of information are more numerous, while for professional clients the data requirements are less rigorous. In relation to retail clients, investment firms may rely only on the exemption for execution-only services; however, this is an exemption that concerns the 'lighter' rule of appropriateness and is recognized provided only that all of the following conditions are met: (i) the service relates to non-complex products; (ii) the service is offered at the initiative of the client; (iii) the client has been clearly informed that the firm is not required to assess the appropriateness of the instrument or service offered and accordingly that the client will not have the benefits that would otherwise be provided by appropriateness determinations; (iv) the investment firm complies with its conflict of interests obligations.

FINRA Rule 2111, recalling the previous formulation of NASD Rule 2310, is even more drastic in the case of professional clients, as it provides an explicit suitability exemption with respect to institutional customers, assuming that it is reasonable to believe that the institutional customer is capable of evaluating investment risks independently, both in general and with regard to particular transactions.⁸

So far, the parallelism between MiFID and US suitability obligations does not emphasize a great gap between them; on the contrary, it seems that the two legislations are increasingly converging towards the same content and practical application of the suitability rule. However, there is still a remarkable difference between their formulations as far as the *type of intermediary* that has to follow the suitability rule is concerned. In the MiFID framework, the suitability and appropriateness obligations are explicitly provided only to investment firms providing investment services; the reference is to the securities and banking sector, so that 'pure' investment firms and credit institutions that provide investment services are subject to the same rules. In the original MiFID prescription, nothing is specified as far as insurance companies providing investment products are concerned.⁹ Conversely, in US legislation, the suitability rule is explicitly recognized across all financial services sectors (banking, securities and insurance); in the insurance sector, both carriers and 'producers' (agents) must make a determination of suitability of annuity products prior to recommending a sale; with regard to life products, the producers (but not the carriers) must determine that the product recommended is not 'unsuitable'.¹⁰ However, the substantial difference between the MiFID

and US suitability legislation does not concern its explicit extension (or not) to the insurance sector, but just the application of the rule within the securities sector itself, where the suitability rule was originally proposed. In fact, in the US suitability framework a distinction is made between two categories of financial operators: securities brokers¹¹ and investment advisers.¹² For the purpose of our analysis, 'suitability standard' as defined above applies only to brokers, while an investment adviser is required to follow a 'best interest standard'; the latter is stricter than the former as it limits, in principle, an adviser's ability to act in his or her own interest. As a consequence, a broker is required to make recommendations that are suitable for its clients; however, this standard does not imply that the recommendation is in the best interest of the customer. Conversely, an investment adviser must make only recommendations that are in the client's best interest; the problem in this case is that there are no extensive regulatory standards defining this duty and specifying what information should be considered in determining what the client's best interest is. It follows that the suitability duties applicable only to brokers are more rule-based, as they may be viewed as more explicit and fixed; the best interest duties applicable to investment advisers are more principle-based and may be viewed as potentially broader and more open-ended.¹³

In the MiFID framework, such a distinction between 'suitability' and 'best interest' standards is not recognized: the principle of acting fairly, honestly and professionally and in accordance with the best interests of the client has a tangible application in the suitability and appropriateness assessments, which generically apply to all investment firms, whether or not their core business is advisory services and whether or not they are independent advisers.¹⁴ In the light of our study, even though it is not explicitly recognized in the MiFID framework, the distinction between 'suitability' and 'best interest' standard may be of some interest, since it provides useful suggestions for a better interpretation of our results, as will be discussed in the concluding remarks of the chapter.

10.4 Descriptive analysis

10.4.1 Data and methodology for the descriptive analysis

A key part of the analysis is to understand what Italian financial firms actually do to meet their MiFID suitability obligations in order to obtain the profile of their clients. Even though it is not explicitly prescribed by law, such obligations are in practice satisfied by the use of a questionnaire. So, we analyse 14 suitability questionnaires provided by the first 14 Italian financial groups in terms of promoted assets¹⁵ in the area of

portfolio management; altogether, these groups share 90 per cent of the total market. Our analysis deals only with questionnaires in respect to *retail* customers and products with a significant *investment* component that require a suitability determination.¹⁶ It is worth pointing out that the Italian regulatory authority for financial markets (CONSOB) has recently implemented the 'Level 3' (L3, henceforth) of MiFID, in order to harmonize the practices for fairness and transparency followed by Italian intermediaries regarding retail clients with a specific concern for illiquid and complex financial products.¹⁷ In this perspective, CONSOB dictates further obligations that financial intermediaries have to follow when assessing the suitability/appropriateness of their customers. Specifically, CONSOB requires that, in order to assess the suitability/appropriateness of a product, financial firms have to implement a set of controls regarding the coherence between the complexity, the risk profile, the liquidity of the product and the characteristics of the client as derived from the suitability/appropriateness questionnaire. These obligations have led some Italian intermediaries to make adjustments to their suitability questionnaires and, most of all, to their algorithms for assessing the risk profile in order to be fully compliant with L3. For example, better specifications of illiquid and complex products inside the questionnaire have sometimes been needed, as well as some further specifications about the investment objectives and the time horizon desired. We collected suitability questionnaires from the 14 Italian financial groups after these regulatory adjustments.

At first glance, the 14 suitability questionnaires provided by the major Italian financial groups appear to be widely different. Some of them are very analytical, whereas some of the others are very short and basic. The number of questions asked of the client is a first proxy for the comparison: there are questionnaires in which the maximum number of questions equals 37 and others with a minimum of eight; in our sample, the average number of questions asked of the client is approximately 19. Indeed, in our sample the range between the maximum and the minimum number of questions is quite high, and also the dispersion around the average is not negligible, with a convergence towards the left side of the frequency distribution (see Figure 10.1).

In order to develop a more in-depth analysis of our sample of questionnaires and to derive a coherent basis for comparisons, we decided to use the information categories suggested by MiFID as an objective parameter. As stated earlier, MiFID asks firms to provide a suitability questionnaire made up of three sections, with regard to, respectively, 'financial objectives', 'financial capacity' and 'financial experience and

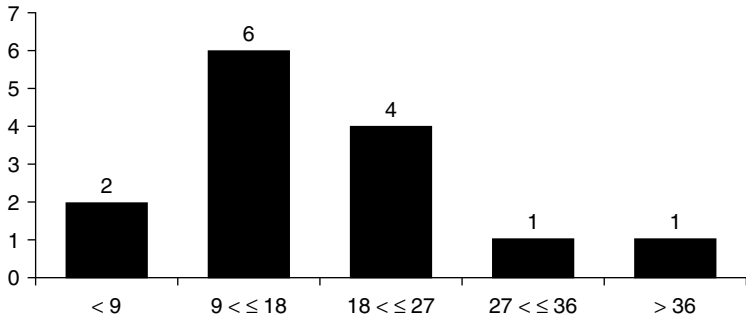


Figure 10.1 Number of questions in the suitability questionnaires*

*sample: the first 14 Italian financial groups in terms of promoted assets.

Table 10.2 Set of items suggested by MiFID for the suitability questionnaire

Section	Should include
Investment objectives	<ul style="list-style-type: none"> • Information on the length of time for which the client wishes to hold the investment • The investor's preferences regarding risk-taking • His or her risk profile • The purpose of the investment
Financial capacity	<ul style="list-style-type: none"> • Source and extent of his or her regular income • His or her assets (including liquid assets) • Investment and real property • His or her regular financial commitments
Experience and knowledge	<ul style="list-style-type: none"> • Types of service, transaction and financial instrument with which the client is familiar • The nature, volume and frequency of the client's transactions in financial instruments • The period over which the client's transactions have been carried out • The level of education of the client • Profession or relevant former profession of the client

knowledge'. These sections are compulsory and must necessarily be covered by each financial firm through the suitability assessment of its clients. At the same time, MiFID suggests a set of items that 'should' be included in each section, without directly formulating a legislative obligation for them.¹⁸ This means that, even though MiFID stipulates some advisable questions to be included in the questionnaire, each financial firm is free to define the specific questions of its own suitability questionnaire, provided that the three main sections are covered. The set of

items suggested by MiFID are summarized in Table 10.2, and we decided to use them as a 'benchmark' to compare the completeness of various questionnaires provided by our sample of Italian financial firms.

The 'benchmark' questionnaire suggested by MiFID comprises 13 items, equally divided among the three sections. All the items suggested by MiFID are clearly understandable; the only item that needs a specification is the one related to the risk assessment of the client. In this sense, MiFID makes a distinction between the preferences regarding risk-taking and the client's risk profile; since the legislation does not explicitly state the specific meaning of each of them, we associated the 'preferences regarding risk-taking' item with all the questions related to the risk and return characteristics of the investments the client is willing to undergo (objective risk), while we interpreted the 'risk profile' item as the one aimed at knowing the behaviour of the client in situations of riskiness and uncertainty (subjective risk).¹⁹ In this way we are able to make a distinction between the assessment of objective risk and the evaluation of the subjective aspect of risk.

10.2 Results of the descriptive analysis

With these premises, we try to analyse to what extent the 14 questionnaires under study converge on this 'benchmark' suggested by law, and whether or not the divergence among questionnaires is significant. A first synthesis of our findings is summarized in Figure 10.2.

If we evaluate the completeness of the suitability questionnaires in terms of how much they cover the set of items indicated by MiFID, only one questionnaire is complete; all the others omit at least one of the suggested items. The largest element of our sample (10 questionnaires) includes a number of items between eight and 10. On the basis of this evidence, it is interesting to further identify which items are generally covered in our sample and, conversely, which areas of questions are generally overlooked.

Starting from the 'investment objectives' section, the approach generally followed by our sample of Italian intermediaries is quite homogeneous (see Figure 10.2). All the 14 suitability questionnaires under analysis include questions about the time horizon of investments and preferences regarding risk-taking; moreover, the majority of questionnaires (85 per cent) ask the client to specify the purpose of the investment he or she is going to realize, in terms of capital conservation, capital growth or strong capital growth. On the other hand, a generalized behaviour in our sample is to disregard questions about the risk profile of the client,

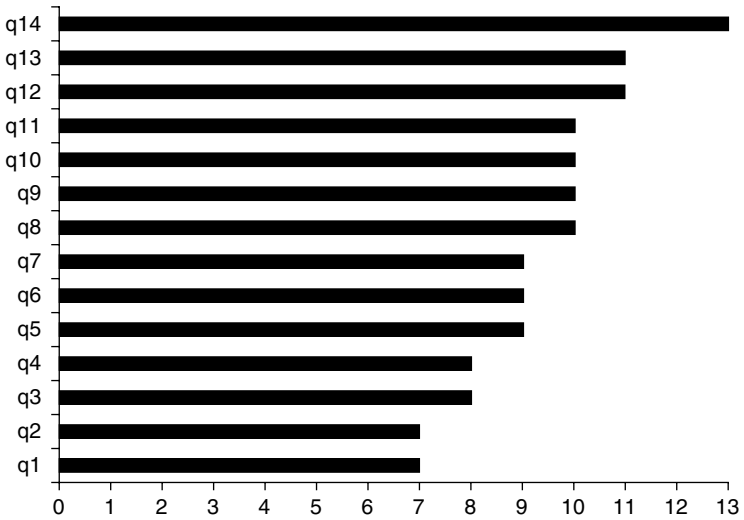


Figure 10.2 Completeness of the suitability questionnaires: number of MiFID-suggested items covered*

*sample: the first 14 Italian financial groups in terms of promoted assets

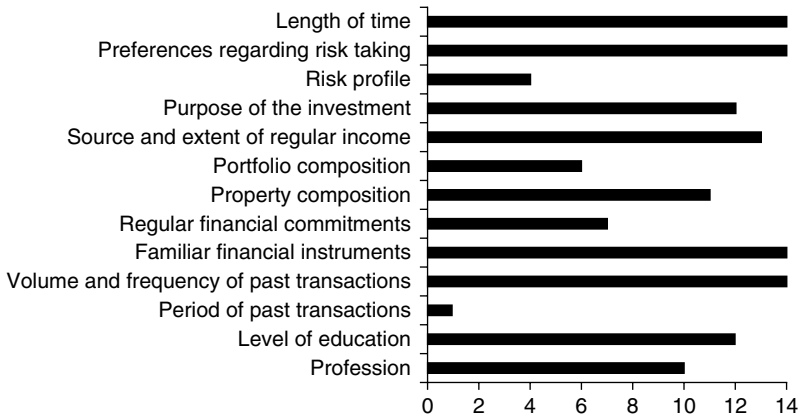


Figure 10.3 Coverage of MiFID-suggested items*

*sample: the first 14 Italian financial groups in terms of promoted assets

as only four questionnaires include this item among the ones investigated. When the risk profile of the client is assessed, the firm asks the client to place himself or herself in a situation of financial risk or of a more common daily uncertainty and to choose the alternative that

better fits his or her hypothetical behaviour in the presence of that risk or uncertainty. From the perspective of our analysis, this is a critical point: our sample of Italian financial groups seems to take great care in the assessment of the objective financial risk, while less attention is given to the evaluation of the subjective component of risk. In other words, the client is always asked about his or her preferences in respect of the financial risk–return combination of future investments; conversely, the attitude of the client towards a general situation of riskiness or uncertainty is rarely taken into consideration. This, in turn, may be due to the psychological construct of the subjective component of risk, which is difficult to measure in a valid and reliable manner.

Further investigation of the ‘financial capacity’ section of the suitability questionnaire reveals that more diversified choices are observed among Italian financial groups (see Figure 10.3). No one item among those suggested by MiFID for this section is covered by all the questionnaires. Nevertheless, the most frequent group of questions is the one related to the source and extent of regular income (13 questionnaires), followed by those questions regarding the overall property composition (11 questionnaires). The items concerning the evaluation of regular financial commitments and the financial portfolio composition are less investigated (only seven and six questionnaires respectively). From the perspective of our study, this is another point worthy of note: on the one hand, regular financial commitments are a proxy of the risk capacity of an individual, as the presence of financial dependants reduces the client’s ability to assume risk.²⁰ On the other hand, the actual financial portfolio composition is another important proxy of the client’s risk-taking behaviour in real life, as it gives information about the financial decisions assumed in the past by the client. As a consequence, neglecting these two items also means that two important pieces of information in the general assessment of risk are overlooked.²¹

Finally, in respect of the ‘financial experience and knowledge’ section, all the questionnaires in the sample collect information about the type of services/products with which the client is familiar and the nature, volume and frequency of the client’s transactions in financial instruments (see Figure 10.3). In contrast, almost none of the firms takes the period over which past investments are carried out into account (only one questionnaire); 12 and 10 questionnaires, respectively, include the level of education and the profession among the set of questions to be answered.

The 14 suitability questionnaires are very different, not only with regard to the global number of items asked and adherence to the MiFID

'benchmark', but also concerning the degree of investigation within each item. For example, even though the items of the length of time, preferences regarding risk-taking, types of service/instrument with which the client is familiar, and the nature/volume/frequency of the client's financial transactions are assessed by all 14 questionnaires,²² the number of questions included in each of them varies consistently from one questionnaire to another: some questionnaires provide just one question for investigating each item, whereas other questionnaires are much more analytical and use more than five.

In summary, a key finding of our descriptive analysis is that the implementation of the suitability assessment, even though it is recognized as a common MiFID regulatory requirement, is applied in a highly variable manner by our sample of Italian financial firms. The differences that do exist may stem from the fact that supervisors give only general rules for the development of the suitability questionnaire, without providing a unique and shared form, in adherence to a prudential regulation approach. As a consequence, each intermediary may develop its own suitability questions according to the:

- business model: the propensity to ask for some information may vary depending on the kind of business that characterizes each intermediary; the orientation toward a model of commercial banking or a prevalence of the investment business within the financial group, the penetration level in the market of investment services, the development of specific financial services, the diversification and sophistication in the offer of financial products, and the characteristics of their prevalent client are all elements that may exert an influence;
- compliance function: the specific questions included in the questionnaire may also depend upon how the compliance function of the firm interprets the regulatory recommendations and the relevance accorded to specific aspects in the application of the law;
- competence level of front offices: as front offices are the bridge between the firm and the customer in the implementation of the suitability questionnaire, a different approach to the development of the questions may also depend upon the specific competence of the front offices in terms of technical advice, ability to build a relationship, and commercial approach to the client;
- a random component, that does not depend upon a strategic or rational motivation by the firm, but just upon erratic occurrences or behavioural biases in the people assigned to the development of the questionnaire itself.

However, in spite of different constructions of the questionnaire, some common behaviours among our sample of Italian financial groups may be depicted. Specifically, the majority of our sample seem to derive the risk tolerance assessment of the client in a partial way, as also recently maintained by Pan and Statman (2010): while the desirable objective risk–return characteristics of future investments are consistently investigated, the subjective risk profile of the client, as well as his or her past financial investments (risk taken in real life) and his or her current financial constraints (risk capacity) are elements less frequently requested, even though they all exert an influence on the suitability of suggested services/products and may work as a control for the chosen risk–return combination. As outlined by Cordell (2002), risk tolerance is a multidimensional concept that may comprise ‘risk propensity’, related to the client’s real-life decision in financial situations, ‘risk attitude’, referred to the client’s willingness to incur risk, ‘risk capacity’, concerning the client’s financial ability to incur risk, and ‘risk knowledge’, directly related to the client’s understanding of risk. The risk tolerance assessment provided by the major Italian financial firms within the wider suitability test seems almost to converge on one dimension: while risk knowledge is always assessed, risk propensity and risk capacity are generally overlooked, and risk attitude is interpreted only in terms of financial risk appetite. Indeed, it seems that the suitability questionnaire provided by our sample of Italian intermediaries is drawn mainly with the aim of deriving objective parameters for the implementation of traditional asset allocation strategies (such as time horizon, purpose of investment, preferences regarding the objective risk) rather than with the purpose of making a more in-depth analysis of the subjective characteristics of the clients.

10.5 Empirical analysis

10.5.1 Data and methodology for the empirical analysis

The aim of this empirical analysis is to investigate how reliable MiFID questionnaires are, in terms of the consistency of profiles that emerge when different questionnaires are submitted to the same person. To do this, we collected a sample of MiFID questionnaires from three Italian banks.²³ All the three questionnaires are suitability questionnaires addressed to retail clients. For each of them we also collected the scoring method that is used to calculate the profile of the client completing the questions.²⁴ The three anonymous questionnaires (hereafter A, B and C) were submitted to a sample of 100 potential investors in order to

Table 10.3 Description of profiles for bank A

Profile	Description of profile
Conservative	The portfolio that is suitable for this profile addresses the realization of a financial supply, without any expectation of capital increase and whose main goal is to allow the management of small expenses. It does not require any particular expertise in investing and is generally linked to a low risk propensity. Suitable products according to this risk profile are liquid assets, government bonds, and financial insurance products with capital protection.
Balanced	The portfolio that is suitable for this profile addresses the realization of an increase in the invested capital through the acceptance and management of negative oscillations in the value of the capital. It requires a medium expertise in investing and is generally linked to a medium risk propensity. Suitable products according to this risk profile are diversified bond and stock investments and financial insurance products without capital protection.
Enterprising	The portfolio that is suitable for this profile addresses the realization of a relevant increase in the invested capital through the acceptance and management of huge negative oscillations in the value of the capital. It requires good expertise in investing and is generally linked to a high risk propensity. Suitable products according to this risk profile are sector stock investments and high-risk bonds and also derivatives.

verify the consistency of their profiles.²⁵ The sample was chosen according to a totally random criterion; we do not face any sampling problems, as each person represents a result by himself or herself through the comparison of the three different profiles.

Because each of the three banks provides a different structure of profiles, we are forced to subjectively match them according to the description of each classification that is offered. In this way, before comparing the profiles, we make them comparable. In particular, Bank A classifies clients as conservative, balanced and enterprising; Bank B as safe, income, balanced, growth and dynamic; and Bank C as cautious, moderate and dynamic. Each of the questionnaires provides a detailed explanation of the characteristics that feature in each of the profiles, as shown in Tables 10.3, 10.4 and 10.5. The way the profiles are described changes across the questionnaires; questionnaire A and B provide three and five categories respectively, and describe in words the main features

Table 10.4 Description of profiles for bank B

Profile	Description of profile
Safety	Capital conservation in the short term and slight increase in the medium term
Income	Capital conservation in the medium term and slight increase in the long term
Balanced	Increase of capital in the medium–long term
Growth	Relevant increase of the capital in the medium–long term
Dynamic	Relevant increase of the capital in the short–medium term

Table 10.5 Description of profiles for bank C

Profile	Description of profile
Cautious	35% in liquidity; 54% in bonds; 11% in stocks
Moderate	20% in liquidity; 47% in bonds; 11% in stocks
Dynamic	7% in liquidity; 33% in bonds; 68% in stocks

Table 10.6 Matching of profiles for banks A, B and C

Questionnaire A	Questionnaire B	Questionnaire C
Conservative	Safety + Income	Cautious
Balanced	Balanced	Moderate
Enterprising	Growth + Dynamic	Dynamic

that an investor must have to be included in each profile. On the contrary, questionnaire C provides three risk profiles that are described in terms of the percentage of the capital that should be allocated among liquidity, bonds and stocks for each profile. In this way, any attempt at matching the profiles requires a certain level of subjectivity. Table 5.4 illustrates how the different profiles are matched across the three banks in the following analysis.

In the experiment, each of the subjects was requested to fill out all of the three questionnaires. Once this step was completed, the three profiles for each subject were calculated and compared in order to assess their consistency.

10.5.2 Results of the empirical analysis

Table 10.7 illustrates the results; in particular, it shows the percentage of cases in which the profiles of single subjects are consistent throughout

Table 10.7 Percentage of consistency of profiles across questionnaires

Across all three questionnaires	Between questionnaires A and B	Between questionnaires A and C	Between questionnaires B and C
23%	49%	40%	47%

Table 10.8 Number of questions in the questionnaires

Questionnaire	Number of questions
q_A	8
q_B	16
q_C	9

the sample.²⁶ The first column from the left shows that in 77 per cent of cases the same subject obtains profiles that are different across the three banks. In 14 per cent of the cases in particular the profiles are totally different, ranging from the highest to the lowest profile across the three banks for the same subject. Moreover, in order to understand whether any one questionnaire causes more inconsistency in the profiles than the other two, we provide the percentage of inconsistency between profiles for each pair of questionnaires. The analysis shows that the inconsistency is 51 per cent between questionnaires A and B, 60 per cent between A and C and 53 per cent between B and C.

In this sense, we cannot maintain that any of the three questionnaires is 'bad', because each pair of questionnaires shows almost the same degree of inconsistency. More specifically, we should recognize that the questionnaires are strongly different as far as their structures and scoring methods are concerned. First of all, the number of questions asked of the client varies from eight in questionnaire A to 16 in questionnaire B and nine in questionnaire C, as shown in Table 10.8.

This evidence suggests that questionnaire B could be more precise and complex than the others. Furthermore, following the methodology that we already used in the descriptive approach, we briefly analyse the contents of the three questionnaires in order to discover any difference that could help explain the relevant inconsistency of the profiles that a single person obtains when he or she is analysed by one bank or another. We first investigate the level of compliance with the MiFID suitability provisions in terms of the number of items that are included in the three questionnaires, with respect to the 13 that are suggested in

the Directive. Figure 5.1 shows that none of the three questionnaires is perfectly compliant with the number of items suggested (with B covering 10, A covering seven and C only five out of 13 items).

As far as the similarities are concerned, the items that are present in all of the three questionnaires are those related to the purpose of the investment (within the ‘investment objectives’ section), the source and extent of regular income (‘financial capability’ section) and the types of services and products the client is familiar with (‘financial experience and knowledge’ section). In this way, at least one of the items belonging to each of the main three sections is present in each of the questionnaires. As a further similarity, the period over which the investments were carried out is absent from all the questionnaires, as Table 10.9 shows.

The main differences concern risk profile and risk preferences, together with level of education and profession. In fact, only questionnaire C investigates the investor’s preferences for risk-taking, and only A includes a question on the risk profile. Moreover, questionnaire B is the only one interested in the level of education and current profession

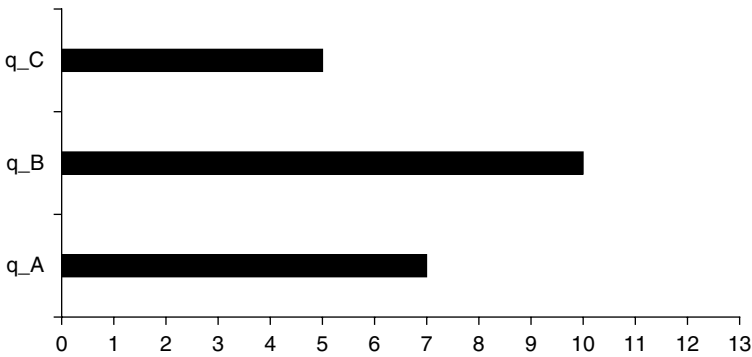


Figure 10.4 Number of MiFID-suggested items covered

Source: Authors own estimates.

Table 10.9 Similarities in the three questionnaires

Items <i>included</i> in all the three questionnaires	Items <i>absent</i> from all the three questionnaires
<ul style="list-style-type: none"> • Purpose of the investment • Source and extent of regular income • Services and products the investor is familiar with 	<ul style="list-style-type: none"> • Period over which the investment was held

Table 10.10 Differences in the three questionnaires

Items included in <i>one</i> of the three questionnaires	Items included in <i>two</i> of the three questionnaires
<ul style="list-style-type: none"> • Preference for risk-taking (q_C) • Risk profile (q_A) • Level of education (q_B) • Profession (q_B) 	<ul style="list-style-type: none"> • Length of time of the investment (q_A and q_B) • Assets (q_A and q_B) • Regular financial commitments (q_B and q_C) • Nature, volume and frequency of transactions (q_A and q_B)

of the subject. All the other items are included by two banks out of the three. Table 10.10 summarizes the main findings in terms of differences among the three questionnaires.

This analysis mainly confirms the results we already obtained in the descriptive analysis. In fact, when we examine the information provided, all of the three banks seem to be mostly interested in the *objective parameters* (purpose of the investment, source and extent of regular income, services and products the client is familiar with, length of time of the desired investment, regular financial commitments, and so on). On the contrary, very little is asked in terms of the level of education, profession or risk profile, or of the preferences of the investor concerning risk-taking, as already maintained in Linciano (2010). After the descriptive analysis our attention was already focused on the possible reasons that could explain the huge differences in the content of the questionnaires and in the scoring methods. The results of this analysis lead us to maintain that those differences, together with the lack of attention to the *subjective characteristics* of the client, seem to provide good explanations for the variety and inconsistency of profiles that an investor can obtain by applying to different banks.

10.6 Conclusions

The MiFID has formalized the need for financial firms to acquire information about the features and preferences of their clients before selling investment products or services to them (the so-called ‘suitability’ and ‘appropriateness’ requirements). Many firms were already in the habit of doing this, but the MiFID has made it compulsory and has recommended the sections and items to be included in the suitability and appropriateness assessment. Still, this recommendation is only general,

and firms are allowed to comply with this obligation by developing the assessment tool (generally a questionnaire) on their own; as a result, a multitude of questionnaires about investors is now available to the public, depending on the financial firm of which they are clients.

The aim of this chapter is to analyse to what degree the questionnaires actually used by the major Italian intermediaries diverge from each other, and whether the differences are capable of having any impact on the profiles that investors obtain and on the consequent suitability of the products that are offered to them. To do this we carry out both a descriptive and an empirical analysis on a sample of questionnaires from major Italian financial firms (14 for the descriptive analysis and three involved in the empirical approach). In the descriptive analysis, we demonstrate that questionnaires diverge widely as far as their structure and content are concerned; the number of questions included in each questionnaire, as well as the specific items to be investigated, differs greatly from one questionnaire to another. In addition, we stress that Italian suitability questionnaires seem to be developed mainly with the purpose of deriving objective parameters for the implementation of traditional asset allocation strategies rather than with the aim of making a more in-depth analysis of the subjective characteristics of clients. This is particularly true for the risk assessment item. In fact, Italian financial intermediaries do not seem to be particularly accurate at evaluating their clients' risk tolerance; they focus mainly on the desired risk–return combination of future investments (objective risk) rather than on individual behaviour towards risk (subjective risk). However, it has to be pointed out that, since individual behaviour towards risk is a psychological construct, including this item in the questionnaire without a valid and reliable assessment tool can result in misleading choices. Future research should study this critical issue further, as it is crucial to deriving complete, but also reliable, customer profiles.

The empirical analysis allows us to demonstrate that the actual differences and shortcomings in the suitability questionnaires may produce dramatic effects on investors: they could be profiled as 'cautious' by one financial firm and 'dynamic' by another. The differences that exist may stem from the fact that supervisors give only general rules for the development of the suitability assessment tool without providing a standard format. As a consequence, each intermediary may develop its own suitability questions according to the business model it holds, the conduct of the compliance function in decoding the MiFID provisions, the competence and relationship skills of the front-office employees, and so on.

This evidence paves the way for a debate about the opportunity for the European Regulator to impose a single and standardized format for the questionnaire on all of the intermediaries to whom the MiFID is addressed. Such a questionnaire could overcome the current weaknesses with regard to the incompleteness of the information required and the inconsistency of the profiles obtained.

In order to discuss this point in depth, it is useful to recall the distinction between the 'suitability' and the 'best interest' obligations, already mentioned in Section 3, with reference to legislation in the US, where these concepts were originally introduced. Strictly speaking, suitability implies matching the individual investor's characteristics with one or more of the products supplied by the intermediary; in this sense, suitability is typical of an advisory process that starts from the range of investment opportunities the intermediary actually provides and ends in their connection with the characteristics of the client (*investment advisory*). Hence, suitability implies a 'relative knowledge' of the client (relative to the range of products supplied by the intermediary). Thus far, it may be viewed as more appropriate for a 'non-independent financial advisory' process, wherein the range of products to sell is defined.

On the contrary, best interest was originally introduced as a broader concept that implies matching the individual investor's characteristics and the universe of products available in the market; in this case, the underlying advisory process starts from the characteristics of the client and, according to these, it addresses the selection of the best investment opportunities among those available in the market (*investor advisory*). Thus, the best interest standard implies an 'absolute knowledge' of the client (absolute because it is not conditioned by the range of products the intermediary is able to sell). Thus far, it seems more appropriate to an 'independent financial advisory' process, wherein knowledge of the client is at the core of any selling politics and there is no defined range of products to be offered to customers.

With this distinction in mind, we might conclude that the actual framework, based on different suitability questionnaires for different intermediaries, might be proper in a non-independent financial advisory context; here, questionnaires need to be customized to the specific features of the intermediary in terms of product supply and business model. What may be proposed in this area to enhance customer protection and reduce conflicts of interest may be the development of incentive systems for advisers more aligned to customer objectives and needs. On the contrary, an independent financial advisory framework,

wherein there is no defined range of products to sell, may offer the right context for testing a standardized format for the questionnaire; in this case, the natural focus on the knowledge of the client, the different approach to selling practices and the lack of a financial membership seem to make the shortcomings of a single questionnaire less problematic.

Notes

The chapter was jointly written by both authors. In particular, Marinelli is the author of Sections 3 and 4, while Mazzoli is the author of Sections 2 and 5. The Introduction and Conclusions were jointly written.

1. Investment services and activities are defined in art. 4 of MiFID Level 1 Directive 2004/39/EC and refer in particular to a list of activities in MiFID Annex I-A (reception and transmission of orders, execution of orders, dealing on own account, portfolio management, investment advice, underwriting of financial instruments and/or placing of financial instruments on a firm commitment basis, placing of financial instruments without a firm commitment basis, operation of Multilateral Trading Facilities) related to financial instruments listed in MiFID Annex I-C.
2. These questionnaires are different from those we employ in the descriptive analysis, and are the only ones for which we were able to collect the scoring method that is used to calculate the profiles.
3. The rule was proposed on 13 August 2009.
4. See MiFID, art. 19 (5). For a more in-depth understanding of the main differences between 'suitability' and 'appropriateness' requirements, we refer the reader to Marinelli and Mazzoli (2010), in Brighetti and Lucarelli (2010).
5. In general, the term 'retail customer' is not defined; rather, anyone who is not a 'professional' investor (for example, financial intermediaries authorized to operate in the financial markets, companies meeting specific size requirements, some public organizations and, on request, private individual investors meeting certain minimum net worth levels or experience standards) is generally treated as a retail customer. For a complete definition of 'professional client', see MiFID Level 1 Directive 2004/39/EC, Annex II.
6. The MiFID Level 2 Commission Directive 2006/73/EC, art. 35 (2) – 36.
7. Note that a subgroup of 'professional clients' are the so-called 'eligible counterparties', who typically comprise those subjects professionally operating in the financial markets. When executing orders on behalf of an eligible counterparty and/or dealing on own account and/or receiving and transmitting orders with eligible counterparties, the investment firm may provide the service without being obliged to comply with the suitability and appropriateness obligations, as outlined in art. 24, section 1 of the MiFID Level 1 Directive 2004/39/EC. For a more in-depth understanding of inclusion into the 'eligible counterparty' category, we refer the reader to art. 24 of the MiFID Level 1 Directive 2004/39/EC.
8. FINRA Rule 2111 (b).

9. For a more in-depth analysis of the MiFID suitability application in the insurance sector, we refer the reader to Marinelli and Mazzoli (2010), in Brighetti and Lucarelli (2011).
10. In a series of enforcement actions and Notice to Members, the NASD has specifically emphasized that NASD Rule 2310 on suitability applies to the sale of variable life insurance and annuities; see NASD Notices to Members 00-44 (July 2000), 99-35 (May 1999), and 98-86 (December 1996). Also, some states have developed express suitability requirements in insurance by statute or rule (see Engel and McCoy, 2002). In the meantime, one industry trade association, the Insurance Marketplace Standards Association (IMSA), has imposed a suitability requirement on its members for life insurance and annuities.
11. Brokers are defined under the Securities Exchange Act (SEA) as *any person engaged in the business of effecting transactions in securities for the account of others*. The core role of a broker is to execute transactions for customers. Brokers may provide a wide range of services for their clients related to securities transactions, such as research and advice prior to effectuating a trade, but, for the most part, their function is execution of trade (Rickert, 2006).
12. Investment advisers are defined in the Investment Advisors Act (IAA) as *any person who, for compensation, engages in the business of advising others, either directly or through publications or writings, as to the value of securities or as to the advisability of investing in, purchasing, or selling business, issues or promulgates analyses or report concerning securities*.
13. The SEC is in the process of studying the need for harmonization of the standard applicable to brokers and investment advisers in accordance with the requirement of the Dodd-Frank Wall Street Reform and Consumer Protection Act. That law requires SEC to consider whether brokers should be subject to the same standards as investment advisers and whether investment advisers should be subject to an explicit requirement to act in their customers' 'best interest'.
14. See the MiFID Level 1 Commission Directive 2004/39/EC, art. 19.
15. See Assogestioni (2009).
16. Questionnaires for institutional investors and those addressed to the provision of services that require only an appropriateness evaluation do not form part of this survey, as they may be considered as forming part of the wider suitability questionnaire.
17. We refer to CONSOB Communication n. 9019104 of 2 March 2009. This communication was followed by inter-associative guidelines for the application of L3 measures promoted by the category associations in 14 July 2009.
18. See MiFID Level 2 Commission Directive 2006/73/EC, art. 35 and 37.
19. For the purpose of clarity, we classified questions of the form: '*Which of the following investment results fits better your preferences regarding risk taking? A- A low expected return with a low risk of loss; B- A medium expected return with a limited risk of loss; C- A high expected return accepting a high risk of loss*' as belonging to the 'preferences regarding risk-taking' item, whereas questions like '*Suppose that you have made an investment in a long term stock fund. A month after your investment, the value of your fund drops by 15 per cent. What is your reaction? A- I sell my investment in order to avoid further panic if the market continues to go down; B- I try to keep a cool head and I wait until when my investment recoups its*

value over the planned time horizon; C- I buy some more in order to take advantage of low prices' are classified as belonging to the 'risk profile' item.

20. The neglect of investors' borrowing is also confirmed by the results of Cavezzali and Rigoni (2007).
21. One might think that intermediaries would be able to know a client's portfolio composition, without explicitly asking him or her, by looking at their internal source of information and databases. However, while this is true for the assets held by that intermediary, it is not possible for the part of the financial portfolio managed by other intermediaries. As a consequence, an explicit question is needed.
22. This finding is coherent with the implementation of L3, which requires a set of controls for the complexity, the risk profile and the liquidity of the products.
23. Names are not revealed for privacy reasons. The questionnaires we employ in this study are different from those we used in the descriptive analysis.
24. Obtaining the scoring method was quite difficult because of the reluctance of banks to reveal this information. This is the reason why we were able to collect only three questionnaires.
25. In this way, we submitted 300 questionnaires as a whole.
26. A full description of the results is available on request.

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11

The Business of Clearing Cash Equities in Europe: Market Dynamics and Trends

Giusy Chesini

11.1 Introduction

This chapter on European clearing houses aims to describe the current, unprecedented pace of change in this sector of the post-trading industry.

Until a few years ago, European clearing houses operated in a quasi-monopolistic position together with the stock exchanges for which they worked. In recent years, the situation has changed, with the attention of traders and stock exchanges focused strongly on trading and post-trading costs. In particular, some of the major stock exchanges have even threatened to review their clearing agreements if their traditional partners are unable to offer their services at competitive prices.

In order to understand this issue, it is worth remembering that clearing houses perform several tasks, the most distinctive of which is central counterparty clearing. In this activity, they interpose themselves between the traders, becoming the seller for every buyer, and the buyer for every seller. This results in the depersonalization of the contractual relationship, which is called the 'novation' of the contract in technical terms. Traditionally, the interposition of a central counterparty was used in the derivatives markets to ensure the successful conclusion of negotiations and avoid systemic events. In the last 20 years, however, clearing houses, also known as central counterparties (CCPs), have extended the provision of their services to the transactions concluded on the cash markets. The focus of the present research is this particular set of services.

Recently, this activity has seen the birth and development of aggressive competitors, which try to acquire market share with the offer of

pan-European services at competitive prices. It is predictable that, with an emphasis on promoting competition and user choice, the ability to provide high post-value services at competitive prices will allow some CCPs to thrive while others fall by the wayside. This is also predictable in view of the US clearing system, in which there is only a single infrastructure, the Depository Trust & Clearing Corporation (DTCC). It must be noted, however, that in the US the concentration process took more than 20 years, ending in late 1990, and that it required strong intervention by the regulatory authorities.

The aim of this chapter is to offer a clear and comprehensive view of the recent evolution of this European financial sector, with an attempt to outline future developments and their consequences for the financial markets.

11.2 The evolution of the environment due to regulatory and operational changes

In order to outline the recent evolution of the operating environment of CCPs in Europe, regulatory changes, which have had the greatest effect on the operational features of the sector, are first considered. In this regard, a number of articles contained in MiFID impact directly on the activity of central counterparty clearing, while other articles impact indirectly but to no less an extent.

Directly, MiFID, in Articles 34, 35 and 46, has extended trading competition to the post-trading sector, removing access barriers to these infrastructures. In this context, a basic principle of MiFID is the recognition of the right of access, namely the right of EU Member State investment firms (Article 34) or of EU Member State operators operating a Multilateral Trading Facility (MTF) (Article 35) to have access to a CCP located in another EU Member State, in order to use its services. As regards the stock exchanges, MiFID allows them (Article 46), in relation to their regulated markets, access to clearing services offered by central counterparties operating in the European Union. As a corollary of this liberalization, MiFID recognizes the right of choice, namely, the right of investment firms and operators to designate the system for the clearing of their transactions in financial instruments.

It should be noted, however, that MiFID has opened operational possibilities but has not firmly imposed competition in this financial sector. Consequently, CCPs initially tried to maintain their *de facto* monopolies, and in many cases remained vertically integrated with stock exchanges. Furthermore, it is worth noting that, when the CCP

and the stock exchange are part of the same group, the former usually has positive effects on the group's revenues; therefore some stock exchanges are not inclined to support a competitive environment for CCPs, because this competition presents uncertain results with regard to their future income.

As for the indirect impact of MiFID on post-trading, it is worth underlining the introduction of new trading platforms, MTFs, in the microstructure of financial markets.

Since the incumbent European CCPs were linked operationally, often legally, with incumbent trading venues, the new MTFs have had to use new entrant CCPs, such as EuroCCP and EMCF, which have thus contributed to increasing fragmentation in the European clearing infrastructure. Consequently, more fragmentation in the sector, and the need to leave free choice to the operators with which CCPs can clear their trades, have complicated the post-trading sector in Europe. In order to reduce this complexity, the market is moving towards interoperable CCPs, as will be explored in greater depth later in this chapter.

In addition to MiFID, other regulatory sources have acted on the CCP reference environment. In this regard, Table 11.1 shows that in 2006 the European Commission published two studies, designed to identify existing problems in trading and post-trading infrastructures. These studies demonstrated that, in Europe, a number of (often exclusive) arrangements between stock exchanges and clearing and settlement institutions determine the location of post-trading operations. Furthermore, two main factors stand in the way of clearing competition in Europe. Many clearing houses have strong franchises and essentially national or geographically based monopolies in their region. Those monopolies need to be broken up to create competition.

For these reasons, to compete with an existing provider, an entrant MTF, at a minimum, would have to offer competitive trading conditions (e.g., lower membership fees and trading fees) and a clearing and settlement process that should be at least as cost-effective as the one offered by the arrangements put in place or offered directly by the incumbent stock exchange. In fact, as previously mentioned, when exchanges control the services offered by post-trading institutions, this usually limits the potential for competition to develop in trading and post-trading services.

Consequently, equal access to CCPs offered to traders would certainly facilitate more competition between trading platforms, and, to avoid foreclosure of trading markets, CCPs should offer fungibility.

Since the industry did not respond quickly to the European regulators' demand to open up to competition, and also to avoid direct regulation

Table 11.1 The main features of European regulation of clearing houses

Year	Regulation	Effects
April 2004	MiFID, Directive 2004/39/EC, articles 34, 35 and 46.	Competition in the post-trading infrastructure. Traders and trading venue operators obtained freedom of access and choice.
May 2006	European Commission, Draft Working Document on Post-trading. European Commission, competition in EU securities trading and post-trading, issues paper.	Problems identified in trading and post-trading.
November 2006	EACH, ECSDA, FESE, European Code of Conduct for Clearing and Settlement.	Answers of the market participants to the identified problems.
February 2009	EMCF and SIX x-clear outlined their commitment to offer competitive clearing services under the dual CCP model.	Subject to regulatory approval, they expected to implement the interoperable link in the summer of 2009 to benefit all participants and platforms currently connected to either CCP.
September 2009	LCH.Clearnet and EMCF sign agreements to set up interoperability links, subject to regulatory approval.	There were no immediate practical effects.
October 2009	Joint statement agreed by FSA, AFM, DNB raising objections to bilateral clearing. agreements	Stop working on interoperability, citing concerns over systemic risk.
October 2009	European Commission Communication: 'Ensuring efficient, safe and sound derivatives markets: Future policy actions'.	It set out the problems identified in the OTC derivatives markets and the possible tools to address these problems.
December 2009	The European Council endorsed the contents of the Communication and supported a further legislative action by the European Commission.	Strong and authoritative request for a regulatory initiative aims to facilitate interoperability among CCPs.
February 2010	Communication of regulatory position on interoperability for cash equity clearing by AFM, DNB, FINMA, FSA and SNB.	Interoperability gives rise to inter-CCP credit exposures and CCPs need to measure, monitor and mitigate those exposures, notably by the holding of additional collateral.
June 2010	European Commission, public consultation on derivatives and market infrastructures.	It provides important guidance to the Commission service to prepare a formal proposal.

Source: authors' own work.

by the EU Commission, post-trading infrastructures decided to draw up a self-regulation code. This self-regulation was also preferred by the EU Commission, because of the known hazards of an agency mandating structural change, especially across multiple markets. A mandated design feature is not easily withdrawn if it is found to be undesirable. Furthermore, once government involvement in market design begins, the process tends to become self-perpetuating (Schwartz, 2010).

The European Code of Conduct for Clearing and Settlement, introduced in 2006 (FESE, EACH, ECSDA, 2006), is a voluntary agreement among post-trading infrastructures to encourage interoperability among CCPs and to stimulate competition through more choice and transparent pricing.

Following the formal implementation of the Code, all the CCPs soon made their price lists available on their websites. The biggest challenge to interoperability is still the lack of common standards among clearing services providers. It is not just a problem of different technologies, but also due to the fact that the terminology used to describe services and business models is different.

It should also be considered that the main task of CCPs is to protect the market from counterparty risk. The level of protection that each CCP provides its members and the overall market, however, is very different. Each CCP has different risk profiles and different risk management policies. The possibility exists that creating links among CCPs, and aligning their risk policies, may reduce the level of protection that some CCPs provide to their customers. The situation, obviously, becomes more complex every time a new CCP enters the market.

Despite the fact that the Code has been formally implemented by all European post-trading providers, in late 2009 comparison among the various price lists still seemed difficult; effective access and interoperability among market infrastructures seemed even more difficult.

It is noted, however, that not all European stock exchanges were refractory to change. For example, the London Stock Exchange (LSE) was overstretched by its customers on this front because the Swiss bank UBS and other broker-dealers, as early as the beginning of 2008, had begun to require a choice of clearer for their negotiations and to complain publicly about the protectionism of some stock exchanges, which were trying to delay interoperability. In general, the choice of clearer enables broker-dealers to consolidate their flow of trading on regulated markets and MTFs to a single 'preferred' CCP, achieving operational and commercial benefits.

Under pressure from the operational needs of traders, the LSE formally introduced competitive counterparty clearing in September 2008, giving its customers the choice between LCH.Clearnet and SIX x-clear and reaffirming its commitment to maintaining a model for horizontal trading, counterparty clearing and settlement.

Following the agreement with LSE, in early February 2009, SIX x-clear and EMCF announced a Memorandum of Understanding which stipulated the possibility for customers of both CCPs to choose a single clearing services provider. The agreement was to have become operational in summer 2009, following approval by the supervisory authorities. Also, in September 2009, a bilateral agreement between LCH.Clearnet and EMCF was announced, which was due to become operative in November 2009.

In mid-October 2009 these agreements were blocked by the British Financial Services Authority (FSA) and by both the Dutch Authority for the Financial Markets (AFM) and the Dutch Central Bank (DNB), which together raised objections to the planned links, amid concerns that these bilateral links might create excessive systemic risk. In particular, the regulators objected to the central counterparties risk model which involved unlimited liquidity risk between the CCPs. In theory, the model implies that one CCP could put the other in default if it could not cover its collateral obligations. Regulators were concerned about the systemic risk posed by complex clearing links, and they specifically stated that there could be a dangerous domino effect if one CCP went bankrupt. This was a big blow for the European Commission, because those CCPs were almost ready to launch the links for effective interoperability.

In February 2010 there followed a regulatory statement by AFM, DNB, FINMA, FSA and SNB formally stating that European clearing providers must agree to a standard approach before they could set up interoperability links. In particular, the regulators stated that they did not reject interoperability, but they wanted the European clearing houses to agree a common standard, as opposed to striking bilateral agreements.

Since then, the European CCPs have been locked in talks as they attempt to reach an agreement and to define a model that meets the new requirements that will probably be imposed by regulators.

For its part, the European Commission has initiated a process designed to review the regulations currently in force. This process should be completed in 2010 with the enactment of European regulations. It is worth noting that the regulatory response of the European Commission, announced several times in previous years, found new impetus after

the financial crisis. In fact, the bilateral trading of OTC derivatives, and specifically of credit default swaps (CDSs), highlighted risk profiles with systemic relevance and, consequently, the European Commission has begun work to better regulate these OTC instruments.

In October 2009 the European Commission sent out a Communication and in December the European Council endorsed the contents of the Communication, supporting legislative action intended to: 1) establish common rules for CCPs, 2) require the standardized use of CCPs for OTC derivatives and 3) require a reporting system to trade repositories for OTC derivative contracts. Meanwhile, the Council also mandated the European Commission to take action to facilitate access and interoperability among CCPs. In the latter respect, the European Commission launched a public consultation among stakeholders, which started on 14 June and ended on 10 July 2010. Following this, in September 2010 the European Commission published an impact assessment to the proposal for a regulation of the European Parliament and of the Council on OTC derivatives, central counterparties and trade repositories.

11.3 The issue of interoperability

As already mentioned, MiFID has opened competition among trading venues, but it has been less penetrating with specific regard to CCPs. Also, the Code of Conduct, even if formally implemented by all operators, is proceeding slowly because CCPs and stock exchanges do not eliminate commercial barriers in the sector.

Although interoperability is the solution envisaged in the Code of Conduct, it is difficult to achieve, because CCPs basically differ among themselves; they play different roles and have different competitive positions, as will be further discussed later in the chapter.

First of all, as already said, interoperability between clearing houses allows market participants to choose the CCP they prefer, increasing competition and lowering investment costs. CCP interoperability also enables cross-netting of trades for investment firms that use the same CCP for transactions executed in different trading venues: this provides significant cost savings due to lower margin requirements, fewer settlements and simpler operations. Conversely, without interoperability among CCPs, broker-dealers can negotiate by choosing a trading venue (a regulated market or a MTF), but after that they are obliged to use the CCP that has been appointed by each trading venue. This ensures the market share of the incumbent CCP, but involves more complex operations for broker-dealers. The latter, if operating with different trading

venues, need to be connected to several CCPs, with more operational costs than if they were to clear all their trades with a single CCP.

In general, to achieve interoperability, as schematically depicted in Figure 11.1, three conditions must occur:

- 1) Each trading venue should allow non-discriminatory access to CCPs that want to offer their services to the customers of the trading venue. In fact, since it is broker-dealers who pay fees for clearing services, it seems logical that they should be allowed to choose the counterparty clearer they prefer.
- 2) The incumbent CCP, which already clears the transactions that arise in a particular trading venue, should be required to interoperate with competitor CCPs that also desire to offer their services for the transactions executed in that trading venue. If this is left to individual decision, incumbent CCPs may wish to interoperate only with those competitors that are least able to challenge their dominance: in this way they try to maintain the status quo by not opening their doors to the strongest CCPs.
- 3) When the CCP has new flows of transactions to clear, coming from a regulated market or a MTF, it should establish new connections with different CSDs (Central Securities Depositories) for settlement services. This is particularly complicated when the securities are traded in different countries. The challenge of connectivity could, however, be easier to overcome than that of interoperability, through partnerships with multi-local custodians. The new CCPs – EMCF and EuroCCP – have, in fact, opted for this solution by appointing some custodians which provide connectivity for the settlement of their transactions.

In summary, at present, it is observed that MTFs have already begun to offer their clients (broker-dealers) a choice of clearing services provider. Specifically, in May 2009 Chi-X Europe, BATS Europe, Turquoise and NYSE Arca announced the introduction of competitive clearing agreements with the clearing houses operating with them in Europe. The latter, after an initial phase in which they extended the supply of their services and drastically reduced their prices, have prepared a Memorandum of Understanding designed to foster interoperability and less aggressive mutual competition. Conversely, some of the major European stock exchanges do not seem able to follow the same path because – being directly involved in intense competition – they have so far preferred to avoid unnecessary changes, taking advantage of the fact that the prices for clearing services are falling anyway for all users.

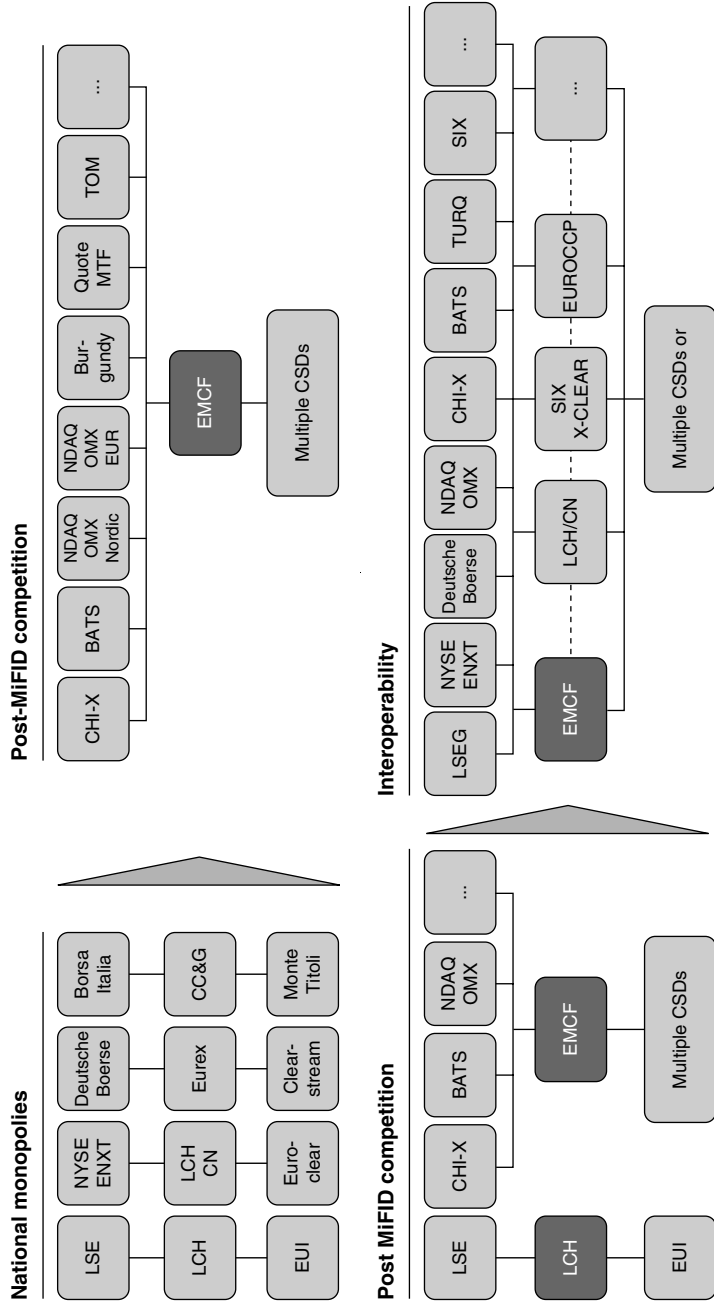


Figure 11.1 The shift to interoperability

Source: authors' own work.

Thus, to summarize, the European equity markets already have the features that make interoperability between CCPs technically feasible. In fact, interoperability already exists in the UK for the London Stock Exchange's equity markets, where LCH.Clearnet and SIX x-clear are interoperating. Consequently, a feasible model has already been tried and tested in Europe.

At this point the challenges that the industry has to address are the following:

- 1) expand interoperability beyond the MTF sphere;
- 2) engage incumbent exchanges;
- 3) create a level playing field for CCP services, because currently all CCPs are different;
- 4) ensure that interoperability is safe and scalable.

Furthermore, it is evident that interoperability and effective competition among CCPs could have a positive impact on the European equity markets (Chan, 2010).

In fact, supporters of interoperability claim that, once it becomes effective, there will be less friction in cross-border trading in Europe, trading volumes will grow and thus the liquidity of financial markets will increase. Ultimately, issuers, investors and the overall European economy will be the final beneficiaries of CCPs' interoperability.

On the other hand, critics of interoperability point out that it comes at a cost that will ultimately be charged to participants. In fact, interoperability will introduce inter-CCP risks that should be adequately mitigated. Obviously interoperability should not lead to lower risk management standards for the 'closed system'. Thus CCPs will have to mitigate the 'additional risks' that arise from interoperability with additional requests for funds to market participants.

11.4 The business and the main strategies of European Clearing Houses

As already mentioned, European clearing houses operate in an evolving regulatory environment, in which the European Commission will probably soon introduce new regulation to re-enforce competition and to further reduce costs of the main services offered. Consequently, European CCPs need to reassess their business models to better determine what they can accomplish in order to maintain or enlarge their market shares.

At present, the sector sees the presence of nine clearing houses clearing cash equities in Europe. This chapter specifically focuses on five major

incumbent CCPs and on two new CCPs with a pan-European profile:

- LCH.Clearnet SA
- LCH.Clearnet Ltd.
- Eurex Clearing AG
- Cassa di Compensazione e Garanzia (CC&G)
- SIX x-Clear
- European Multilateral Clearing Facility N.V. (EMCF)
- European Central Counterparty Limited (EuroCCP)

To be precise, Central Counterparty Austria (CCP.A) and Oslo Clearing AS are not analysed in the present work because of their small operational dimensions in comparison to the other CCPs.

Given the fragmented nature of European equity markets, it is not surprising that the five major CCPs in Europe serve the five major equity markets. This fact also shows that, due to different rules and different operational functions, consolidations in the sector have not yet really occurred (in 2004 the consolidation process of European CCPs was already a topic of great interest; see Russo *et al.*, 2004).

By analysing these five incumbent CCPs, we can immediately detect that until 2009 they remained well positioned in terms of number of cash transactions cleared. Their historical dominance in their respective markets has enabled them to manage large volumes of transactions and to achieve economies of scale. Conversely, these CCPs are struggling to reach a pan-European profile, for which they have not been technically created.

In contrast, new-entrant CCPs try to achieve the scale of operations that make it possible to achieve economies of scale. Moreover, having been designed to operate at a pan-European level, these CCPs take advantage of their IT systems and organizational processes, which have been designed to serve a large number of marketplaces.

In this regard, Table 11.3 highlights the legal and operational aspects that distinguish the CCPs in Europe.

London Clearing House (LCH) is the oldest CCP in Europe, created in 1888 to serve the financial markets of the United Kingdom. In 2003 it merged with Clearnet, giving rise to LCH.Clearnet Group and implementing a horizontal integration of relevant operational dimensions. It is a Recognized Clearing House (RCH), that is, an operator legally headquartered in the UK and regulated by the FSA.

Before the merger, LCH.Clearnet SA, originally called Clearnet, served the markets of the first pan-European stock exchange, Euronext,

and continues to serve the French, Dutch and Portuguese equity markets. Since May 2010 it has been a Recognized Overseas Clearing House (ROCH). This recognition allows LCH.Clearnet SA, like the other CCPs considered here, to provide clearing services in the UK easily even though it is not headquartered in the country.

SIX x-clear, Eurex Clearing AG and CC&G are three CCPs which are vertically integrated within their respective stock exchange groups. The first clears the transactions executed in the equity markets managed by the Swiss Exchange, SIX Group, the second works for Deutsche Boerse and Irish Stock Exchange, and the third for the Italian Stock Exchange. In 2008 CC&G, together with Borsa Italiana, entered into the London Stock Exchange Group. All three CCPs in recent years have requested and received the status of ROCH.

The two new CCPs analysed in this work are EMCF and EuroCCP; the first began operating in March 2007 and the second in August 2008. EMCF is based in Holland and is a ROCH, while EuroCCP is a subsidiary of the American DTCC. It is legally headquartered in London, and it has been granted the status of RCH. Both CCPs have taken advantage of the opportunity, already described, of becoming the CCPs for new European MTFs.

More specifically, EMCF began operating as a central counterparty for Chi-X, the MTF that is currently achieving the most success in terms of market share in Europe. EuroCCP, on the other hand, started clearing the transactions executed by another MTF, Turquoise, which was created by nine major investment banks that did not wish to continue paying high trading fees to the incumbent stock exchanges, specifically the LSE.

The pan-European nature of both these CCPs encouraged them to immediately seek other trading flows to clear in order to reach the scale of operations that makes it possible to achieve economies of scale and accounting equilibria. Consequently, as shown in Table 11.2, the two pan-European CCPs offer their services to many markets and, above all, they are very active in supporting the need to achieve interoperability, which would enable them to fit into the business of the incumbent European CCPs.

Regarding the ownership structure of the CCPs analysed here, the fact that EuroCCP is not a for-profit company, but rather a sort of utility, has brought a revolution in the sector, which has been very profitable in the past. This status allows EuroCCP to offer clearing services at competitive prices and has triggered fierce competition in the sector and a general rethinking about the more appropriate business model for the provision of clearing services in Europe.

Table 11.2 The characteristics of the main European clearing houses

CCPs	Starting date and recognition	Corporate form	Ownership structure	Trading venue served
LCH.Clearnet Ltd.	LCH.Clearnet Group is formed in 2003. It has two subsidiaries:	Commercial entity supervised by the FSA	LCH.Clearnet group: 83% users	London Stock Exchange
LCH.Clearnet SA	1) LCH.Clearnet Ltd. is a RCH established in 1888; 2) LCH.Clearnet SA has been a RCH (Recognized Overseas Clearing House) since 25 May 2010	Bank authorized by the 'Comité des Etablissements de Credit et des Entreprises d'Investissement' with their ongoing supervision	17% exchanges	NYSE Euronext
SIX-x-clear	It has been a RCH since 19 August 2004	Bank licensed under Swiss law; supervised by FINMA and by Swiss National Bank	It is wholly owned by SWX	SWX Group, NYFIX, Euromillennium
Eurex Clearing AG	Founded in 1998. RCH 16 January 2007	Bank in accordance with the German Banking Law. It is supervised by the BaFin	A wholly owned subsidiary of Eurex Frankfurt AG; Deutsche Boerse AG	Deutsche Boerse Irish Stock Exchange
CC&G	Founded in 1992. RCH 8 July 2009	Commercial entity. Since 2000 Borsa Italiana has the majority of shares	86.36% Borsa Italiana SpA 13.64% Unicredito Italiano SpA	Borsa Italiana
EMCF	In operation since 29 March 2007. Since 29 January 2009 it has been a RCH	Commercial entity. It is supervised by 'De Nederlandsche Bank' (DNB) and the 'Autoriteit Financiële Markten' (AFM)	Fortis Bank Global Clearing N.V. (77%) Fortis Bank Nederland N.V. (1%) OMX AB (22%)	Chi-X Europe, NASDAQ OMX Nordic Exchange, NASDAQ OMX Europe, BATS Europe, Burgundy, Quote MTF, TOM (The Order Machine)
EuroCCP	Since August 2008 it has been a RCH. It clears a broad range of asset classes worldwide	Not-for-profit entity	It is a wholly owned London-based subsidiary of DTCC	Turquoise, Smartpool, NYSE Arca Europe, Pipeline Financial Group, NASDAQ OMX Nordic Exchange

Source: authors' own work.

The CCPs that are parts of groups have been affected by this price pressure and have reduced their fees to avoid losing their market shares, which for now, are still linked to the trades executed inside their stock exchange groups.

With the exception of EuroCCP, all the other CCPs analysed here show the participation or control of a stock exchange in their ownership structure. Furthermore, the biggest bank in the territory of reference of that same stock exchange often participates in the ownership structure of the CCP. Thus, among the main shareholders of CC&G, in addition to the Italian Stock Exchange, there is the Unicredit Group, among the shareholders of EMCF there is a major presence of Fortis Bank, while SIX x-clear is a wholly owned subsidiary of SWX Group, which in turn belongs to the main Swiss banks.

Even though European CCPs are very heterogeneous, it is noted that, irrespective of their structure, they are currently facing at least four significant operational challenges (BNP Paribas Securities Services, 2009):

1. The substantial decrease in clearing fees.

In this regard, it is noted that a CCP's profitability is strongly influenced by the number of transactions cleared; thus, in order to reduce clearing fees and remain profitable, it is essential to generate economies of scale. Considering that the European sector is very fragmented, CCPs should seek to serve new markets to achieve greater economies of scale. In any case, once they have reduced their prices to the break-even point, there is little room for improvement, except by reviewing operational processes and outsourcing options.

2. The opportunity to serve new customer segments, namely, the buy-side traders.

The buy-side is becoming a new customer segment for CCPs because of MTFs allowing these intermediaries to send orders directly to their trading platforms, which can be both open order books and dark liquidity pools.

Even though not many buy-side traders are really able to connect directly to the CCPs and implement the instructions they generate, they must nevertheless try to strengthen their business models; in fact, this evolution leads to an increase in the number of CCP participants and an increase in transactions that must be cleared and guaranteed by a CCP.

3. The risk management of CCPs is now put to the test by the necessity to reduce clearing fees and to survive with fewer revenues in

a European equity market which is becoming broader, more global and more fragmented.

In this regard, the Code of Conduct requires CCPs to avoid competition in risk management and to adopt some basic requirements. It should, however, be noted that CCPs use different risk algorithms, and it is still unclear what the benchmark risk measure for interoperability will be. It is apparent, however, that currently CCPs should not compete based on risk coverage or measurement. Therefore, clearing houses must deploy advanced modelling techniques to fine-tune their variation margin algorithms and parameters for members with a specific profile, just as insurers use actuarial models to calculate policy premiums.

4. The loss of trading flows to be cleared following the decision of some of the major stock exchanges in Europe to manage the clearing of the trades executed on their platforms.

This is a strategic decision, made public recently by some major European stock exchanges: in this way they intend to regain market share and their profits, which are falling sharply in trading, following competition from new trading venues. This is contrary to the European Commission's guidelines on vertical silos. For example, NYSE Euronext in May 2010 announced that, subject to regulatory approval, it will begin clearing its European securities and derivatives business through two new, purpose-built, clearing houses, based in London and Paris, in late 2012. LCH.Clearnet Ltd in London and LCH.Clearnet SA in Paris have been informed that NYSE Euronext's current contractual arrangements for clearing with them will accordingly terminate at that time. Under the new strategy, NYSE Euronext will move wholly away from all of its outsourced contractual arrangements with subsidiaries of LCH.Clearnet Group Ltd in London and Paris to a situation in which NYSE Euronext has control over the clearing operations and development of its cash and derivatives businesses in Europe.

In view of the abovementioned regulatory changes and operational challenges, the European clearing houses are preparing strategies to adapt to the new competitive environment and to address the demands of their customers. The main strategies that affect all CCPs are currently the following:

- I. Since clearing for OTC derivatives is becoming mandatory, some European clearing houses, anticipating this, are becoming established in the OTC derivatives markets by strengthening their structures to meet the new potential demand. Indeed,

a large new market is opening up for all CCPs in Europe and in the US.

- II. In general, CCPs should aim, like other operators in the securities markets (stock exchanges, MTFs and CSDs), to maintain and improve their technology to allow high levels of information processing capacity. This is a strategic factor to efficiently meet the demand for greater volumes; otherwise new products and greater volumes could generate interruptions or delays in clearing services. In particular, one of the most important technological initiatives currently underway is the development of software in preparation for a shift towards a fully interoperable market.
- III. While the European CCPs currently face difficulties in expanding or at least maintaining their market shares, some of them may think strategically to implement attempts to aggregate. For example, EuroCCP currently needs to increase its operational dimensions, and could retry a merger with LCH.Clearnet Group, which is losing its position as a leader in this sector.

Despite the heterogeneity of the sector, however, it is possible to identify different strategies that each CCP can arrange based on its specific strengths and weaknesses. Following the analysis of these competitive characteristics, it is possible to further subdivide CCPs into three groups:

- CCPs that belong to stock exchange groups (vertical silos);
- CCPs that still have in their ownership structure the participation of a stock exchange, even though they are moving towards an ownership structure composed of users of their services;
- CCPs governed by the users and following a not-for-profit revenue structure.

Regarding vertically integrated CCPs, Eurex Clearing AG follows Deutsche Boerse's vertical integration strategy and operates as a clearing house for Eurex exchanges in Frankfurt and Zurich with a clearing licence for derivative, repo and equity instruments (Ripatti, 2004, pp. 31–2). The company also fulfils the same functions for selected Irish securities traded on the Irish Stock Exchange. Furthermore, Eurex Clearing acts as the central counterparty for transactions conducted by European Commodity Clearing (ECC) via European Energy Exchange (EEX) within the scope of a separate clearing link agreement. Eurex Clearing AG also participates in transactions conducted via the trading

platforms of Eurex Repo GmbH and Eurex Bonds GmbH, as well as in OTC transactions that were also entered via these platforms. Recently, with Eurex Credit Clear, Eurex Clearing AG has simultaneously created the technological and functional foundations for offering CCP services for other OTC markets and asset classes.

Ultimately, Eurex Clearing AG has always been strong on derivatives products, and it seems it will focus on this expertise to expand its business in the near future. In this field it also has the advantage of collaboration with its American partners. In fact, Eurex Clearing, the International Securities Exchange (ISE) and the Options Clearing Corporation (OCC) have initiated a joint project in order to offer a transatlantic trading and clearing link. With this link, Eurex participants will be able to access the ISE options market via their existing Eurex infrastructure.

For its part, SIX x-clear takes advantage of both its operational ties with the Swiss stock exchange group and its history of being the first CCP to become interoperable with LCH.Clearnet on the equity markets of the LSE. After the LSE introduced SIX x-clear as a second central counterparty in 2008, many other stock exchanges and MTFs followed suit: NYFIX, Equiduct, Liquidnet, CHI-X, BATS, NASDAQ OMX Europe, Turquoise and NASDAQ OMX all reached corresponding agreements with SIX x-clear during 2009. Measured by the number of linked trading platforms, SIX x-clear is well on the way to positioning itself as one of Europe's leading providers.

In summary, SIX x-clear, although it is included in a stock exchange group, aims to become a pan-European CCP; also because, as we will see later on, it has smaller operational dimensions than those of European competitors, and this could be a strong disadvantage in the context of the evolution of the sector.

The third vertically integrated CCP is CC&G, which has been working in the derivatives markets, for which it was created, for years. Over time, it has expanded its activities in the equity and bond markets. Thus it takes advantage of broad knowledge of financial markets and of relevant expertise on all traded instruments. While it predominantly clears Italian-based products, the scope of its offering is growing and serving other international markets. After becoming a ROCH in 2009, it is now able to provide services for the London-based derivatives market EDX. Furthermore, it is expanding its customer base, and now nearly half of the members are from outside Italy, accounting for 38 per cent of its equity clearing services. Now that it has received recognition as a ROCH, it can be more integrated in markets operated by LSE. In fact, the latter stock exchange can now give customers a further choice of

clearers. Furthermore, like all other CCPs, it seems prone to expand its business beyond the perimeter of the LSE Group.

Regarding CCPs which are not part of silos and feature an ownership structure formed by customers, we can consider EMCF and LCH. Clearnet Group. These are two very different clearing houses, but both aim to expand the presence of their clearing services users in their ownership structure.

LCH.Clearnet Group is the most relevant and the oldest CCP operating in Europe. In 2008 it survived the aggregation attempt by DTCC, and in 2009 it completed the successful realignment of its shareholder base through a strongly supported (€333 million) share buyback which allowed the group to respond more effectively to competitive pressures and work more closely with its clients to capitalize on opportunities for clearing new markets. In this way it was able to reduce its clearing fees to its customers, which were particularly high. It is worth emphasizing that one of the main customers of LCH.Clearnet Ltd is the LSE. Unfortunately, since 2007 the relationship between the two companies has shown some cracks, and the choice of clearer pursued by the LSE, above all other stock exchanges, can also be viewed as a sign of the weakening of this commercial relationship.

EMCF is a company born in the post-MiFID environment, starting as a clearing house for a very successful MTF; during the financial crisis it faced and overcame the difficulties of the bankruptcy of Lehman Brothers, which was one of its participants. Since 2007 it has delivered among the lowest and most transparent prices for CCP clearing services in Europe by employing a simple and transparent pricing scheme, with no hidden charges such as testing fees, membership fees, collateral or corporate action handling fees. Currently it seems that this strategy can continue in obtaining the results achieved so far. It has nothing new to add, unless by expanding the network of participants and markets served by maintaining the strong positions that it has built up to now.

Lastly, EuroCCP is governed by users and follows a not-for profit revenue structure. EuroCCP has the advantage of being a wholly owned subsidiary of the DTCC. For this reason, it is able to provide low-cost clearing and settlement, because it is a user-governed organization that operates on an 'at-cost' basis. In particular, any excess monies generated by EuroCCP over and above those needed to operate the business are returned to users on a pro-rata basis.

Unlike other European CCPs, EuroCCP takes advantage of knowledge and operational ties with US financial markets. Towards the end of 2009 it began clearing trades in the most liquid listed depository

receipts, thanks to Turquoise, which was the first MTF to offer trading in depositary receipts. In February 2010 EuroCCP launched clearing for European-listed exchange-traded currencies (Currency ETCs), and in April 2010 it began the clearing of US Securities.

To summarize, EuroCCP is working hard to expand its business through interoperability, paying specific attention to the adoption of a single standard Convention on Interoperability to be signed by all interoperating CCPs. In order to achieve the characteristics of the parent company, EuroCCP aims to achieve a critical mass and related economies of scale as soon as possible. In order to obtain this, it is trying to become the central counterparty for all instruments traded in Europe, as well as in the US, but up to now it does not seem to have developed the right strategies in Europe.

11.5 The economy of clearing houses and the reduction of clearing fees

In 2006, long before the introduction of MiFID, most European CCPs had begun to reduce clearing fees in equity markets, because it was clear that the competitive environment was changing and new competitors would be forthcoming. Among other things, as already mentioned, even the Code of Conduct of 2006 stipulated price and service competition among CCPs, and, in addition, several surveys had made it clear that clearing fees were much higher than those paid outside Europe (European Commission, 2006).

Consequently, since implementation of the Code and the transposition of MiFID, the only thing that has characterized all European CCPs is the race to reduce clearing fees to their customers.

To understand the economy of CCPs, it must be remembered that their customers are the members, also called participants, who are divided into general and individual participants. The general members are broker-dealers, also acting on behalf of those broker-dealers (called indirect members) which generally do not qualify for individual membership and work with the CCP 'intermediated' by the general members. Individual members may clear only their trades and those of their direct customers. Ultimately, all members support (directly or indirectly) the cost of clearing, and usually transfer these costs to their customers (e.g., the buy-side operators) for trades executed on their behalf.

Usually a CCP uses different forms of safeguards against the default or insolvency of a participant. First of all, a CCP applies strict access

criteria: clearing members must be licensed by national supervisory authorities and they must have minimum equity capital requirements, defined differently for direct members and for general members. The clearing members, after having been accepted, must then agree to pay some fees, which can be classified as fixed or variable. Membership fees and connectivity fees are generally considered fixed costs; members must pay these fees, which are not related to the volume of activity but to the status of participants in the clearing business. On the other hand, among variable costs it is possible to distinguish the following costs:

- 1) transaction fees (per side); these fees are required by all CCPs from participants for each transaction cleared and they are the most easily comparable fees;
- 2) various kinds of risk-based margins; these margins include initial margins and variation margins: initial margins are calculated on the basis of the net position per security and its volatility (using a historical value-at-risk model); initial margins are recalculated immediately after each purchase or sale made by the respective member; on the other hand, variation margins cover the price movements of securities between the trade and settlement dates and are usually calculated on an hourly basis;
- 3) a default fund contribution which must be provided in the form of bank guarantees and/or cash or securities collateral; this fund, in combination with the other financial resources, covers the loss that would occur under extreme but plausible market conditions, if one of the largest members were to default. Usually, compliance with this requirement is also tested on a regular basis using stress tests.

It would also be interesting to calculate the opportunity costs to users of being required to keep cash margins at a CCP, but not receiving all interest earned by the CCP on such margins: this cost is obviously difficult to compare among CCPs, and it is preferable to ignore it in this analysis.

Thus, if a CCP suffers a loss due to the default of a member, usually the margins that the defaulting member deposited, based on its trading position in the affected trading venue, are used to cover the loss. Then its contributions to the default fund are deployed. After that, the CCP uses part of its available provision, followed by additional resources from the default fund (i.e. the contributions of the other members). In a further step, the remaining members are obliged to top up the default

fund. The last resources to be used are the remaining provisions, the capital stock and the reserves of the CCP.

It is obvious, however, that CCPs can compete on price but they cannot compete in terms of the guarantee offered to their customers; therefore they cannot lower the levels of margins and the level of the default fund as well, because they cannot themselves become 'risky' companies. In general, they can apply more sophisticated methods of risk assessment, allowing less risky members, that is, less likely to default, to pay lower fees, but they cannot lower their defences against the default of members, as they have to ensure the proper functioning of financial markets.

In view of all this, the elements where competition can take place without compromising clearing activity are provided by clearing fees and membership fees.

Regarding membership fees, by analysing the price lists of CCPs it is noted that CC&G, SIX x-clear, EUREX Clearing AG and EuroCCP require fixed fees for membership according to three categories of participants: general, individual and indirect. For general participants, both CC&G and EuroCCP require 15,000 Euros per year, while SIX x-clear requires about 7,000 Euros. Eurex Clearing AG appears to be particularly expensive, requiring a one-off fee of 50,000 Euros in addition to 25,000 Euros per year for both the general and the individual participants. Conversely, LCH.Clearnet Group does not distinguish between kinds of participants. In particular, LCH.Clearnet Ltd. requires £1,500 as a one-off fee, and, strangely, LCH.Clearnet SA requires a membership fee based on the monthly volume of transactions cleared (a variable fee); for example, for monthly volumes of activity larger than 500,000 transactions, the membership fee corresponds to 15,000 Euros per year.

In summary, a good number of the analysed CCPs require a membership fee of 15,000 Euros per year from participants. A notable exception to this pattern is EMCF, which requires no membership fee and thus appears to be the least expensive CCP.

When we analyse the main variable fees, that is, clearing fees, the CCPs require these fees for each transaction side, and generally they appear to decrease as the participant's volume of activity increases.

In this regard, we can note that CC&G requires fees starting from 0.15 Euros and decreasing for participants who have an annual volume of more than 1.5 million contracts: these fees reach 0.03 Euros for participants who have an annual volume of over 6 million contracts.

LCH.Clearnet Ltd also applies different fees depending on the volume of contracts: for example, for monthly volumes in excess of 100,000 contracts, the clearing unitary fee is 0.012 Euros, but the calculation is rather elaborate, as you can see in Appendix 2.

EuroCCP also applies different fees according to the daily volumes of participants: for daily volumes exceeding 100,000 side contracts, the unitary fee is 0.010 Euros.

The principle on which the calculation of fees is based is the same for CC&G, LCH.Clearnet and EuroCCP, but the calculation varies based on the yearly, monthly and daily volumes, respectively. Obviously this complicates the comparison of the fees required by the CCPs.

On the other hand, SIX-x-Clear, being a bank, applies a linear pricing model to clearing services by using the clearing member's credit rating and the monthly transaction volume. Also, Eurex Clearing AG applies a system in which, for each transaction, the participant pays a fixed fee of 0.06 Euros and a value-based fee of 0.0010 per cent, with an upper limit of 3.80 Euros per transaction. In this system Eurex Clearing AG adds a system of rebates on fixed fees for orders executed on the Xetra system. Furthermore, Eurex Clearing AG applies a different price list for the clearing of transactions traded on the Irish Stock Exchange (simply, a fee of 0.20 Euros per transaction).

Regarding LCH.Clearnet SA, this CCP requires a single fee of 0.05 Euros, or 0.10 Euros per side transaction, according to the different markets in which the securities are traded.

EMCF differs again from other CCPs, since, on a monthly basis, clearing participants have the option of being charged per order or per execution. In an order-based fee system, every order is charged one fee, regardless of the number of executions. Alternatively, in an execution-based fee, every execution is charged. Consequently, the unitary clearing fee does not depend on the volume; it can be 0.07 or 0.05 Euros per order and 0.05 or 0.03 Euros for execution. The price list applied by EMCF is definitely very simple, and the fact that it does not depend on transaction volumes also encourages those who do not have large volumes of trades to clear with EMCF.

This comparison has highlighted a variety of significant conditions in the price lists. A more precise comparison of price lists could be made by identifying operational assumptions corresponding to specific types of traders.

Leaving aside this second type of comparison, however, this analysis indicates that, despite the fact that the Code of Conduct has surely led to greater transparency and simplification of price lists, any price list has

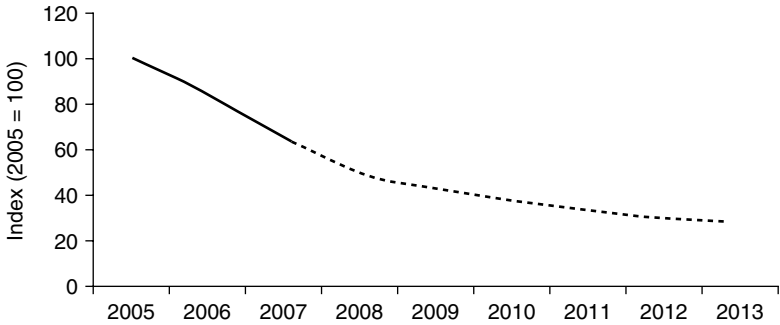


Figure 11.2 Downward trend of clearing tariffs: past evolution and Celent estimates

Source: Celent 2008.

different characteristics, which makes the comparison difficult; the only trend that unites all CCPs is the continuous reduction of clearing fees.

In this regard, the Oxera Consulting firm published a very interesting study in July 2009 (OXERA, 2009) on the costs of trading and post-trading, which shows that European clearing costs have fallen between 20 and 80 per cent per transaction, depending on the market, in the period between 2006 and 2008.

Also, Celent, an international strategy consultancy, in 2008 calculated the cost of clearing from 2005 to 2007 and estimated that clearing fees should cease to decrease once they reach what is called the 'activation fee', that is, the level where it is no longer advantageous for customers to switch from one post-trading infrastructure to another (Celent, 2008). This cost limit should be reached in 2012, as is shown in Figure 11.2.

11.6 The most likely changes in the configuration of the sector

As already mentioned, MiFID has opened competition among trading venues, but in the light of changes in the regulatory environment and of the peculiarities of individual CCPs, which lead them to adopt different strategies to expand the volume of transactions cleared, it is evident that the cutting of clearing fees is the most relevant factor prevailing in this financial sector in Europe in the last few years.

At this point it is appropriate to define the current state and the likely developments of the sector in the coming months. In this regard,

it should also be noted that, until the first half of 2008, almost all stock exchanges in Europe had appointed one CCP through which all their trades were cleared. Therefore, the number of trades for a stock exchange was equal to the number of cleared trades for its CCP, and thus it was possible to use FESE Statistics for calculating the operational dimensions of a CCP (a similar approach has been followed in EuroCCP, 2008). Currently, as we have said, the environment has changed and it is preferable to use the data presented by each CCP in its Annual Report.

By analysing the last Annual Reports of the CCPs examined up to now, we can observe some dimensions that make it possible to compare CCPs and to identify best performances. In particular, the total amount of clearing fees, the annual net profit and the equity market clearing volume are considered here for the years 2008 and 2009.

Table 11.3 shows that LCH.Clearnet Group was Europe's largest independent clearer, with 382.4 million trades in 2008. It sank to a net loss of 91 million Euros in 2009, due largely to fee cuts and reduced growth projections. In particular, in terms of cash equity the Group has responded to an increase in competition by reducing its fees, most notably in LCH.Clearnet SA. Due to the impact of these tariff reductions on future revenues, the Group has recognized an impairment charge of 393.4 million Euros. Revised volume growth assumption also contributed to the impairment, which, together with a tax bill of 121.4 million Euros, converted an operating profit of 423 million Euros into a net loss. Consequently, following a dividend of 1.50 Euros per share for 2008, there was none in 2009.

In particular, it emerges from the Annual Report that equity clearing fees in LCH.Clearnet SA were reduced by 30 per cent in July 2009 and tariffs for blue-chip stocks lowered to 0.05 Euros in January 2010. Revenues from clearing fees were consequently impacted, declining by 34.6 per cent to € 221.3 million.

For Eurex Clearing, the clearing volume in the cash market fell by 27 per cent in 2009, amounting to 94.2 million trades (single counted Xetra's floor) in comparison to 129.2 million trades in the previous year. The annual net profit increased, mainly because of Eurex's activity in the derivatives markets.

On the other hand, SIX-x-clear presents an increase in the clearing volume and an increase in the clearing fees. It is worth highlighting, however, that profit figures for 2009 include an extraordinary income figure of CHF 7.6 million for dissolution of tax provisions, which is a one-off and will not recur; without this, SIX-x-clear would have suffered a loss.

Table 11.3 The main dimensions of the clearing houses annual profit, clearing fees (thousands of euros)

Clearing houses	Clearing fees		Annual net profit		Clearing volume cash equity markets	
	2008	2009	2008	2009	2008	2009
LCH.Clearnet Ltd	198,232 €	132,195 €	171,132 €	270,532 €	188.1 million trades (2)	153.4 million trades (2)
LCH.Clearnet SA	139,982 €	89,084 €	65,429 €	33,687 €	194.3 million trades (1)	172.2 million trades (1)
LCH.Clearnet Group	338,214 €	221,279 €	219,800 €	(-91.0) €	382.4 million trades	325.6 million trades
SIX-x-clear	7,146 chf	8,145 chf	7,194 chf	4,769 chf (4)	25.4 million clearing transactions	33.4 million clearing transactions
Eurex Clearing	13,110 €	11,552 € (5)	675 €	772 €	129.2 million trades	94.2 million trades
CC&G (3)	29,617 €	29,943 €	32,668 €	27,817 €	66 million trades	67 million trades
EMCF	12,651 €	17,451 €	3,000 €	6,632 €	152 million clearing transactions	413 million transactions
EuroCCP	n.a.	n.a.	loss	loss	n.a.	94.7 million transactions sides

(1) Volumes across the NYSE Euronext cash markets

(2) Volumes across LSE cash markets

(3) Unlike the other CCPs, CC&G's accounting year ends on 31 March; we consider here the period from March 2009 to March 2010

(4) Profit figures for 2009 include an extraordinary income figure of CHF 7.6 million for dissolution of tax provisions, which is a one-off and not recurring; without this SIX-x-clear would have suffered a loss

(5) Income from CCP management for Deutsche Boerse AG. The company does not obtain any commission income from third parties, as it acts on behalf of individual sales companies DBAG and SIX within the framework of service agreements
Source: Annual reports (2009)

Among the incumbent CCPs, finally, it is evident that CC&G has maintained its positions in terms of clearing fees and clearing volume in the equity markets. It seems not to have been very impressed by the competition, because it is still closely linked to the operation of the Italian Stock Exchange.

Conversely, when we look at the new-entrant CCPs, it is observable that EuroCCP has realized a double loss in the two years analysed (more exactly, one year and four months). This is probably attributable to the fact that it has borne the costs of start-up in Europe and these costs have not been covered by adequate volumes of transactions cleared. It should be recalled, moreover, that EuroCCP is not a for-profit company, and so this poor result is better justified than in other contexts.

Ultimately, the success of EMCF seems evident in terms of business model and performances. It has passed from 152 million clearing transactions in 2008 to 413 million clearing transactions in 2009 with a doubling of annual net profit. Although it was launched in April 2007, it has surpassed LCH.Clearnet Group in the cash equity markets. It should be stressed, however, that EMCF operates only in the cash equity markets, while nearly all other CCPs have strong positions in other financial markets, such as derivative markets, which in the near future are expected to give a major boost to the performance of the central counterparty clearing sector.

In summary, an illustration of recent trends in European CCP market shares is provided in Figure 11.3.

To summarize, the current configuration of European CCPs will show significant changes in the near future, and it is easily predictable that there will be either complete interoperability or the consolidation of CCPs in a single not-for-profit entity, as happened in the US

For now, the most probable scenario is complete interoperability, which involves the dismantling of the vertical silos that the European Commission has reported as an obstacle to free competition in the sector. If the European Commission does not impose a regulatory obligation, in practice, operational conditions must occur so that stock exchanges and CCPs do not take advantage by binding themselves reciprocally in a group.

Another element to consider is that the industry is becoming less attentive to the interests of its shareholders and tends to pay attention only to its members/clients. Furthermore, in the long run it is improbable that for-profit companies will be competitive in price with not-for-profit facilities. In fact, LCH.Clearnet Group has activated itself to

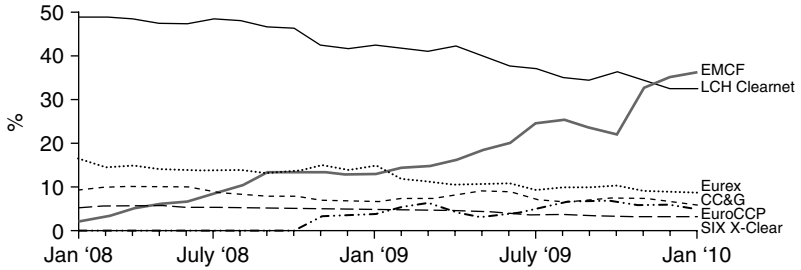


Figure 11.3 CCP market shares of European on-exchange equity trades, 2008–9 (%)

Source: EMCF, Annual Report 2009

reach a fully owned user structure, and EMCF also intends to expand its shareholder base users. This is a relevant trend, because it looks like a backward step compared with the recent revolution brought about by the demutualization of stock exchanges.

Ultimately, it is reasonable to expect that, unless significant, unpredicted events occur, in the coming years some CCPs will perish while others will consolidate in structures similar to the American DTCC, perhaps built around the most successful European CCPs.

11.7 Conclusion

Initially, many clearing houses were created as central counterparty clearing for derivatives markets, because the risks arising from the leverage effect of these traded products were particularly high; but, in more recent years, CCPs have also become prevalent in cash equity markets.

In these markets it is possible to note that the annual European trading volume has risen sharply in recent years, due to an increase in algorithmic trading, lower transaction sizes and falling trading costs. Furthermore, until recently, post-trading service providers in Europe have been very profitable due to a lack of competition in this sector.

Liberalization of financial markets due to a rapidly changing regulatory environment, combined with technological progress and customer pressure, has acted as a driver for new competitors to enter the market. As a growing number of MTFs and stock exchanges offer their users a choice of clearers, the new-entrant CCPs expect to extend their services to additional venues.

In particular, the competitive approach to pricing of new entrants in trading and clearing sectors has helped increase overall price

transparency in the market and initiated a response from incumbent players, leading to a fall in prices for trading services and for clearing services in most European markets. On the other hand, equity market traders in Europe want to be able to choose their CCPs and benefit from concentrating their clearing business. Such choice requires that the chosen CCPs have access to multiple trading venues across Europe, which necessitates interoperability among multiple competing CCPs.

Interoperability creates inter-CCP exposure because each CCP becomes a central counterparty to the other interoperating CCPs, and therefore needs additional financial resources to cover its exposure to the possible failure of any of the linked CCPs. In this regard, regulators have raised concerns about inter-CCP credit exposures and have said they will review all existing and proposed interoperability arrangements to ensure that participating CCPs have sufficient capital.

In summary, interoperability is taking longer to reach fruition than broker-dealers would have expected, because it requires greater harmonization of risk management procedures across Europe to become effective.

Another relevant factor must be considered. The formal bankruptcy of Lehman Brothers International Europe (an EMCF client, when EMCF was wholly owned by Fortis) raised risk awareness in the market in general. Consequently, the financial crisis made it clear that the default of an important contracting partner can have severe repercussions. In order to limit the impact of these consequences, the role played by CCPs is crucial, because they hedge market participants against the risk of a contracting partner defaulting.

The recent financial crisis has definitely highlighted the fact that clearing via central counterparties is a stabilizing element which, in conjunction with effective risk management, reduces systemic risks and also improves transparency and operational efficiency. Following this, the clearing of OTC derivatives is becoming mandatory both in Europe and in the US. This opens a new market for those CCPs that will be able to prepare the correct procedures and propose the best products. In particular, it is expected that the European Commission will indicate the measures to make interoperability fully operational in the same document that should soon be enacted for OTC derivatives clearing.

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12

The Nature of China's Exchange Rate Regime and the Potential Impact on Its Financial System

René W.H. van der Linden

12.1 Introduction

More than five years have passed since China moved into an exchange rate regime with reference to a basket of some major currencies on 21 July 2005. Since then, the controversies over the costs and benefits of China's exchange rate policy have intensified. More recently, the rapidly rising US indebtedness and pursuit of its quantitative easing policy, the current Eurozone crisis and China's role in the global macroeconomic imbalances have reignited the debate about alternative reserve currencies. Since China has emerged as the world's second largest economy and the biggest exporter, its currency has been severely under-represented in global trade and capital markets. Therefore, in light of the current currency war with a 'rising dragon and falling eagle', it seems natural to talk about Renminbi (RMB)¹ internationalization and its potential reserve currency role as a rival to the US dollar (USD) and other major currencies.

A rapidly growing external surplus and substantial interventions in the foreign exchange (FX) market, combined with large-scale offsetting or sterilizing of China's reserve accumulation, have raised a number of questions about the nature of its currency regime and the potential impact on its financial system. China currently maintains capital controls which are not as tight as before and a quasi-pegged exchange rate, and since 1996 the RMB has been convertible only for current account transactions. Since capital account convertibility and exchange rate flexibility could substitute for each other, the effects on currency reforms have often been confused with the effects on further capital liberalization. It is argued that the reserve currency effect of the USD,

alongside an acceleration of global imbalances in the 2000s, has led to a so-called *dollar trap*. This means that China's accelerated build-up of FX reserves (mainly denominated in USD) contributed to an unsustainable level of liquidity in the US economy, which fuelled the housing boom whose collapse in 2007 was a trigger for the ensuing global recession and the subsequent global financial crisis of 2008–9. Assuming that the RMB will become one of the world's major reserve currencies in both official and private use, the aim of this conceptual chapter is to investigate the changes to be made in the nature of China's exchange rate regime and the potential impact on its financial system. The preconditions for becoming a reserve currency and the potential costs and benefits will be described. In the circumstances of an undervalued currency and a less advanced, but gradually modernizing, changing financial system, the key challenges and threats faced by the Chinese authorities in choosing between several policy priorities will be discussed as well. The following research questions will be addressed:

- How do China's exchange rate policy obligations conflict with its internal economic priorities?
- To what extent can reducing excessive reliance on external demand sustain economic growth?
- How can the authorities maintain a gradual pace of currency reform while at the same time trying to use monetary policy as an effective instrument to fine-tune the real economy?
- What does RMB internationalization really mean for onshore and offshore markets, and to what extent does it require full convertibility to achieve status as a reserve currency?
- How will a stronger and more flexible RMB exchange rate affect the financial sector reforms?

Two basic issues are, first, whether the Chinese authorities have any interest in seeing the RMB play an important international role, and, second, whether continued heavy government control of the financial system would be consistent with this. During more than three decades, moving from an 'open door' policy towards a gradual stimulus of the 'going global' policy,² this chapter describes the evolution of China's exchange rate system from the early 1980s till the present day (Section 12.2). In addition, the following topics will be examined: the misconceptions about the ongoing debate on the pros and cons of China's exchange rate policy (12.3); rebalancing the pattern of China's growth model, reducing excessive reliance on investment and export to sustain economic growth

(12.4); China's captivity in a dollar trap (12.5); reserve currency functions and preconditions for becoming a world reserve currency (12.6); a roadmap to RMB internationalization and its potential costs and benefits (12.7); the interconnectedness between China's currency and financial system reforms (12.8); and the difficulties the authorities face in choosing between several monetary policy aims (12.9). Finally, this chapter highlights some concluding remarks and recommendations (12.10).

12.2 The evolution of China's exchange rate system

In 1994 the authorities eliminated the dual exchange rate system by raising the official central parity rate of 5.82 RMB/USD to the then prevailing market rate of 8.72. However, the authorities then continuously adjusted the official rate until it appreciated to RMB 8.28 in 1997. During the Asian financial crisis in 1997, the RMB exchange rate was kept stable in order to brake competitive devaluations of Asian currencies. Since July 2005 the RMB has abandoned its currency's peg to the dollar through a mini-appreciation to 8.11, and has been officially linked to a basket of the most important currencies. This currency reform, initially launched in 2005, was suspended during the global financial crisis of 2008–9, which caused a big dent in the trend. From July 2005 to July 2008, under pressure from the US government, Beijing allowed its currency to rise against the USD by 21 per cent. After July 2008 the authorities saw a need to protect the country from the global downturn by reintroducing a peg of around 6.83, which has remained almost unchanged since then (see Figure 12.1).

Overall, the dollar peg served China well at a time when the economy was suffering from severe inflationary internal imbalances. The evolution of China's exchange rate system over the past 60 years of CPC (Communist Party of China) reign has been a period of re-pegging, un-pegging and de-pegging (appreciation) of its currency. Now that consumer price inflation (CPI) has been brought down to single digits, exports are increasing (see Table 12.1) and further intensification of financial reforms will lead to further steps towards free capital movement, the case for the peg is less compelling. Moving into a managed floating exchange rate regime could stimulate a more independent monetary policy, although the banking system is still in a gradual process of transition to modernization and its capital account is not yet sufficiently open.

China has been keen on reforming RMB's exchange rate mechanism since the early 1990s. Yet China has had to adopt a 'special' currency policy during some particular periods, such as the Asian and the global

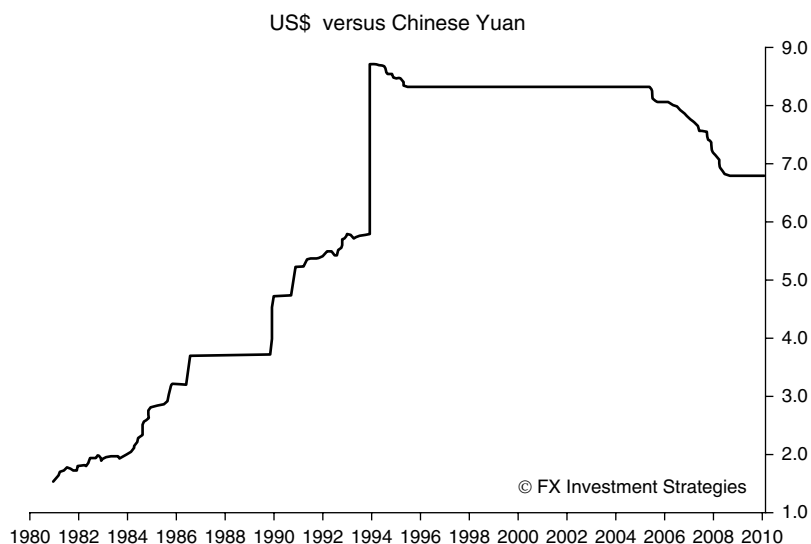


Figure 12.1 The development of the CNY/USD exchange rate between 1981 and 2010

Source: Federal Reserve Bank of St. Louis.

Table 12.1 Key macroeconomic indicators: China (2007–11)

	2007	2008	2009	2010 (forecast)	2011 (forecast)
Real GDP growth (%yoy)	14.2	9.6	9.1	10.0	8.7
CPI (%yoy) eop	6.5	1.2	1.9	2.9	2.9
Exports (%yoy)	25.8	17.6	-16.1	31.3	19.8
Imports (%yoy)	20.3	18.7	-11.1	46.3	23.9
Current account (%GDP)	11.0	9.4	5.9	3.8	3.1
Current account (USD billion)	371.8	426.1	297.1	215.0	205.0
Foreign Direct Investment (gross) (USD billion)	83.5	108.3	94.1	103.5	113.8
International reserves (excl. gold) (USD billion) eop	1,530.3	1,948.1	2,416.0	2,651.6	2,869.8

yoy: year-on-year

eop: end-of-period

Source: Deutsche Bank Research, *Country Infobase China*, last update 26 October 2010.

financial crises. The RMB has been stabilized against USD at around 6.80 since mid-2008. Such a de facto peg on USD is helpful for China in coping with short-term economic changes, and will also contribute to the recovery of the world economy. In this context, as approved by the State Council, the People's Bank of China (PBC) decided to further the reform of the exchange rate regime and enhance the flexibility of its currency on 19 June 2010. These important steps by the PBC to liberalize its monetary policy, spurring innovation in the export industries and channelling investment into its services sector where many new jobs will be found, have been widely interpreted as a decision to allow a gradual revaluation or appreciation³ of the RMB against the USD. However, so far the PBC is more willing to appreciate the RMB than the government. The PBC administers the RMB exchange rate, but the State Council is responsible for setting the rate (*The Economist*, 2010a).

12.3 Misconceptions about the ongoing debate on the pros and cons of China's exchange rate policy

For many years China's policymakers have faced economic and political pressure to adjust the RMB substantially. There have been several efforts by the US government to persuade the Chinese authorities to adopt a more flexible exchange rate. It is likely that China will stick to its policy of gradually de-pegging the 'redback' against the greenback in order to make the RMB more global, in line with its economic position in the world. The big question about the 'right value' for the RMB is whether the US trade balance will be improved by a stronger and/or more flexible RMB. The Chinese authorities recently decided that it will enhance the RMB's flexibility. However, this has not reduced the pressure from some countries, led by the USA, which are now considering demanding that China takes an even bigger step in currency flexibility. Otherwise, the US Senators will urge the Obama administration to punish China and its exporters by imposing countervailing duties, since China has been 'subsidizing its exporters unfairly by undervaluing its currency'. From a Chinese perspective, RMB appreciation cannot lead to balanced bilateral trade or help the USA solve its problems of unemployment, overconsumption and low savings rate. They argue that the main reason for the current trade imbalances is globalization of production, along with US restrictions on high-tech export to China (*China Daily*, 2010). How China will respond to these increasing foreign complaints will depend on how the authorities judge the state of the economy and

to what extent they will be able to rebalance their economic growth model.

There are many misconceptions about de-pegging and un-pegging the value of RMB against the USD. The opponents of currency de-pegging stress that RMB appreciation is not the key to global trade imbalances, and might be harmful to Chinese economic growth and external competitiveness. However, adverse effects on exports are likely to be considerably reduced by the high import content of China's exports, as well as China's strong productivity growth and low labour costs. In addition, there are some other arguments to urge China to stay on course and leave the RMB unchanged. First, it is argued that the RMB has already been quite flexible against other major currencies such as the euro, pound sterling and yen. It will be too risky to float the RMB against the USD until some necessary reforms of the financial system have been effectively executed (see Section 12.8). Second, there is no doubt that China keeps its RMB undervalued to help its manufacturers sell their toys, sweaters and electronics cheaply in foreign markets, especially in the US and EU. However, China does not compete only on the basis of an undervalued currency, but mainly in terms of low wages, superb infrastructure, hospitality to business, compliant unions, improved human capital and a hard-working labour force. China's exports would suffer a minimal loss of market share as a result of RMB appreciation. Third, trade barriers are ineffective and a RMB appreciation will not do much to reduce the US trade deficit. Most goods imported from China are those consumer goods that the US cannot or will not produce domestically anyway. Making those goods more expensive through a RMB appreciation will not make US factories more competitive. If US consumers don't buy from China, they will import it from somewhere else. The most likely outcome is that it would help other low-wage economies, like Vietnam and India, which make many of the same goods as China and keep their currencies undervalued as well. Trade with China might suffer, but the overall US trade balance will not improve significantly (Zakaria, 2010).

Proponents of RMB de-pegging argue that a meaningful RMB appreciation is necessary for China to control inflation. However, this argument overlooks the fact that China is already a price-setter in global commodity and resources markets in which it is the world's largest consumer, which means that RMB appreciation alone will not be enough to contain imported inflation. They also argue that, as long as China maintains controls on capital flows, runs surpluses on the overall balance of payment and accumulates FX reserves in large amounts, there are reasons to assume

that the RMB is significantly undervalued. China is still undervaluing the RMB to make its exports 'artificially cheap' and to keep imports expensive. The counter-argument about this issue is whether the trade surplus should be taken as hard evidence that the RMB is seriously undervalued. It's likely that the nature of China's shrinking trade surplus is different from that in most other countries. First, over 80 per cent of China's total trade surplus is created by processing trade dominated by mainland-based foreign companies. This implies that China's own domestic companies generate only a fraction of the total trade surplus. The real export growth comes more from the conscious outsourcing strategies of multinationals than from the rapid growth of native Chinese companies. While many foreign small and medium-sized enterprises (SMEs) and textile manufacturers are suffering from competition with China, large US companies such as General Motors, General Electric and Kentucky Fried Chicken are thriving on the mainland. Second, global manufacturers have been shifting their labour-intensive input stages of production into China to benefit from its massive labour pool. The value of the final assembled exported goods often exceeds the sum of the imported components and materials from China, but this value-added portion is often recorded as a trade surplus for China (Qu *et al.*, 2010).

Advocates of a more flexible RMB also stress the possibility of having a more independent monetary policy without the need to abolish capital restrictions, as is described in the 'impossible trinity' principle (see Section 12.9). Since China is moving up the value chain and wants to get into higher-quality goods and services, it will require more investments in human capital (e.g., education), and as a result China's labour edge for US companies will shrink. In this new competitive environment a more flexible RMB could help control China's currently rising (food price) inflation, avoid asset bubbles and ensure more powerful domestic consumption (Ding and Xing, 2010).

12.4 Rebalancing the pattern of China's growth model

To a large extent the structure of the Chinese economy is very much the mirror image of the USA. Unlike the USA, which is a consumer-driven spending machine, export- and investment-driven growth remain the dominant Chinese policy strategy. The private consumption ratio in China is around 35 per cent of GDP, whereas in the USA it currently stands at around 70 per cent. Since 2000 the investment and export ratio has risen while the consumption ratio has fallen. The high level of national savings (currently around 53 per cent of GDP) exceeds

investments and reflects huge current account surpluses. In order to realize high export growth, China intervenes on the FX market to keep the RMB low against the greenback, which has contributed to the high current account surpluses and FX reserves (see Table 12.1). The strategy of export-led growth makes China dependent on demand from Western countries, since half of Chinese exports go to the EU, the USA and Japan. Since 2004, enforced by the global financial crisis, the Chinese authorities have had to cope with the twin challenges of rebalancing growth towards domestic consumption and reducing excessive reliance on investment and external demand in order to make growth more sustainable, welfare-enhancing for its citizens, and employment-creating to maintain social stability (Yi, 2010).

On the one hand, authorities are directing the economy toward a new, long-term growth model, from 'made in China' towards 'created in China', realizing that future growth needs to come from an economy which is fundamentally less dependent on low-cost labour and fixed asset investment and more on innovative industries which are systematically moving up the value chain (Nettesheim and Yin, 2010). On the other hand, China is promoting consumption through fiscal, financial and exchange rate policy. Fiscal policy measures include cutting personal taxes, increasing government consumption (i.e. expenditure on health, education, welfare and pensions) and/or introducing a dividend tax for State-owned enterprises (SOEs) which would reduce corporate savings and investment. Partly due to the lack of a social safety net, Chinese households save one-third of their disposable income. Since the end of the 'iron rice bowl', in which food and employment were guaranteed by the State, it is clearly in China's interest to create a social safety net which might contribute to reducing its external surplus. For households this could be achieved by increasing social security provision, and for firms by easing credit constraints to free up lending, eliminating the need to use retained earnings for growth. There is plenty of room for increased government spending on social security and health care, which will make it less urgent for households to save for unforeseen circumstances. Another way to rebalance the growth model is by speeding up urbanization, which could promote service sector growth and hence create jobs at the low and high ends of the skills spectrum. This fits well with the profile of the Chinese urban and migrant labour force. The increased income resulting from urbanizing portions of the rural population would boost consumption.

Corporate savings lie at the heart of China's excess savings and the rise in the current account surplus. China's less advanced financial

system (see Section 1.8) forces private firms to save, mainly through retained earnings, in order to grow because they have trouble obtaining credit. But even SOEs, which have easy access to credit, save because their profits are taxed so lightly. SMEs rely more on their savings than large firms since it is more difficult for them to get access to loans from state-owned banks, due to higher financial risks, lack of collateral and limited size of the loan. Capital inflows through export earnings and large foreign direct investment (FDI) inflows have required central bank intervention to stabilize the exchange rate. As part of the 'going global' policy, capital outflow restrictions have been easing, so that China's outward direct investments have grown strongly since 2003. With China's growing appetite for natural resources, technology and brand names in the global markets, this upward trend in outward investment will likely continue. Even so, the overall balance of payments is in a large surplus. A rebalancing of the pattern of China's growth model towards more consumption will likely reduce the huge surpluses on the current account and hence diminish global disequilibria (Buitelaar, 2010).

Another way to shift the savings back to the circular flow of income is through exchange rate policy. First, a RMB appreciation will reduce the net export growth and contain inflation through cheaper import prices and by reducing domestic liquidity generation through a lower trade surplus. This should encourage diversion of investment into more domestic-oriented and service sectors, as the tradable goods sector becomes marginally less profitable. Second, a more flexible exchange rate policy would allow the central bank greater flexibility in setting domestic interest rates. This will result in making a tight monetary policy more effective in reducing investment in times of a booming economy (Goldstein and Lardy, 2008). As a first move in nearly three years, the interest rate hike of 0.25 percentage points to 5.56 per cent in October 2010 can be seen as an example of a monetary policy measure to combat rising inflation and overheating.

12.5 China's captivity in a dollar trap

In order to weaken the RMB/USD exchange rate, Chinese investors buy dollar-denominated assets which the US government uses to finance its huge budget deficits. In contrast to the world's largest debtor, the USA, China is a large net external creditor, second only to Japan.⁴ The current US quantitative monetary easing policy is interpreted by the Chinese authorities not only as a way to combat the deep recession in the US, but also as a direct attempt to export its problems to the

rest of the world via a much weaker USD and concerns about inflationary risks. In turn, this would undermine the dollar's role as a store of value for foreign investors in dollar-denominated assets, of which China is the largest. A further weakening of the USD and a possible crash in the bond market might hurt both Chinese and US investors and reduce the value of US savings when US investments are sold and converted back into the RMB (Chance, 2010). If China should sell a part of its FX reserves, this would cause a fall of the USD and hence the value of the Chinese FX reserves. China cannot dump its dollar holdings without undermining its own peg, thereby 'cutting off their nose to spite their face' (*The Economist*, 2010b). Do China's massive holdings of US dollar-denominated assets provide China with substantial leverage against the USA that China might use to advance its own economic and political interests? The export-led growth model implies that China is captured in a *dollar trap*: it cannot stop buying dollar-denominated assets, but it cannot sell them either. To a certain extent, China's huge amount of FX reserves can be considered as a weakness instead of a strength of its economic power, causing China to seek outbound direct investments in order to reduce its dependency on the value of the USD. China's authorities realize that parking the bulk of their FX reserves in the bonds of over-indebted Western governments will not generate the highest returns. There is a growing consensus in Beijing that one of the fundamental reasons the country has fallen into a dollar trap is that its own currency is not yet an international currency, which means that Chinese exporters and importers have to rely on the USD for invoicing their foreign trade. Meanwhile, government controls on outward investment by domestic corporations and households mean that most of the USD receipts can be recycled out of the country through the PBC's FX reserve accumulation. To find an ultimate solution to this dilemma, the authorities realize it is time to push forward the internationalization of the RMB. In order to relieve the upward pressure on the RMB, the Chinese government is gradually loosening controls on capital outflows, under strict conditions. China's recent decision to gradually liberalize its capital account by promoting capital outflows via FDIs and portfolio investments abroad is, therefore, welcome. SOEs are increasingly allowed and encouraged to acquire assets abroad, both to secure access to energy and other natural resources and as a way of investing their profits and pushing them to become more innovative. Table 12.1 indicates that FDI outflows have grown strongly since 2007. China offers medium- and long-term loans on preferential terms, as well as investment insurance for outward direct investment (Qu *et al.*, 2010).

An example to counter the USA's forceful request for a stronger RMB is the Greece rescue plan in October 2010. China is concerned with the recent depreciation of the euro that has been penalizing Chinese exports to the Eurozone. By offering support to Greece, China is acknowledging that the country's disastrous financial situation has had a major role in the Eurozone crisis. Supporting European recovery is a smart approach to keep the RMB from appreciating further, and, in doing so, China aims to stimulate international trade and to support its exports to Western countries. On the investment and trade front, China offered to stimulate investment in key sectors of the Greece's economy, such as shipping, construction and tourism. Supporting cross-FDI and setting up a Greek–Chinese shipping development fund will help China's trade balance and encourage Greek ship owners to buy Chinese-made vessels. These reforms will be slow, partial and largely geared towards supporting China's 'going global' policy of encouraging Chinese firms to invest overseas. Nevertheless, these measures should help China rebalance its economy and begin to redress the global economic imbalances.

12.6 Reserve currency functions and preconditions for becoming a world currency

Although China has emerged as a major economic power in the world economy, so far the RMB has served none of the purposes of an international currency. It is not used significantly in invoicing China's trade flows, nor does it circulate abroad. Assets denominated in RMB are not held by foreign governments as part of their FX reserves, nor do foreign companies borrow in Chinese capital markets and repatriate the proceeds abroad. The reason for the almost complete lack of use of the RMB internationally stems primarily from capital restrictions and the rather closed and inefficient Chinese financial markets (see Section 1.8). At present, the RMB is convertible for current account transactions, that is, for payments for goods and services. Residents of China can freely use the RMB to acquire FX, if the purpose is to make payments for imports or to remit dividends and interest to service foreign obligations. However, capital account convertibility is more limited. RMB balances acquired by foreigners (for instance, through the operation of subsidiaries located in China) or held by Chinese residents cannot be freely moved out of the country. Since these two factors are in the process of being reformed, the question arises to what extent the authorities want to encourage international acceptance for the RMB. While not convertible at present, the RMB seems to be quickly developing global status. China's financial

system is inefficient at mobilizing and allocating funds, but it is moving slowly from a government-owned bank-based to a capital market-based financial system. China's exchange rate regime at present stresses stability over efficiency, but the authorities are committed to allowing greater flexibility in determining the value for the currency. Capital controls are being removed, in part to offset the massive accumulation of FX reserves that result from the inflexibility of the exchange rate.

The main traditional functions for the international use of a reserve currency consist of a medium of exchange, a unit of account (means of evaluation) and a store of value (means of storing wealth). These functions can be further distinguished between their private and official uses. The private use of a currency as a medium of exchange would include its use both in trade in goods and in foreign exchange markets (i.e. as a third payment vehicle in triangular exchange between two other currencies to reduce the number of bilateral trades, thus saving transactions costs). The official use as a medium of exchange would involve its use as intervention currency. An international currency serves as a unit of account if it is used for quotation of prices in private transactions (e.g., for invoicing imports and exports) or officially as a pegging or anchor currency. Finally, the store of value role corresponds to its private use in international debt markets, loan and deposit business and as a financing and investment tool (means of saving), and officially it is used as a component of FX reserves (see Table 12.2).

International use of the RMB as a unit of account and store of value is currently beginning.

Although the RMB has become an official trading currency within south-east Asia, at present the RMB is not used as an international reserve currency. However, the current relaxation that allows holding

Table 12.2 International use of a reserve currency

	Private use:	Official use:
Medium of exchange	Invoicing trade and financial transaction vehicle currency for payments	Vehicle currency for FX intervention
Unit of account	Quotation and invoicing currency	Anchor for pegging local currency
Store of value	Investment and finance, debt markets, loans and deposits (means of saving)	International reserve currency

Source: Li *et al.*, 2010, p. 169.

RMB balances in Hong Kong could establish a precondition for RMB invoicing as a first step in the direction of its use as a regional invoicing currency.

Several conditions can undermine a reserve currency and its international use. The following determinants contribute to the international use of a currency:

1. low and stable inflation rate and exchange rate stability
2. country's share of world trade and its economic size and power
3. political stability and geopolitical strength
4. broad, deep and efficient financial markets

The attractiveness of a currency depends in part on its ability to keep its value stable and strong in terms of other currencies and in terms of purchasing power over goods. This is related to the central bank's ability to deliver low and stable inflation, which in turn depends on the central bank's credibility and independence. In addition, the currency must be used as a medium exchange in the sense that official or privately held balances must be easily convertible into other currencies through a variety of financial instruments with low transaction costs. In this context the country's share of world trade and the size and power of its economy also matter, since they give a country more strength to denominate its trade in its own currency. On the basis of the first two determinants, the RMB could be expected to become a major international currency. China will likely be able to maintain a low and stable inflation rate and relative exchange rate stability if it moves towards convertibility accompanied by the necessary reforms of its financial system (e.g., central bank independence, inflation targeting, open capital account and a more flexible exchange rate).

Political stability and geopolitical strength will also play a significant role in the RMB becoming one of the world's dominant reserve currencies. This third determinant will be the most difficult to measure, but it goes without saying that the countries that have closer political ties with China will therefore more likely keep a larger part of their foreign assets in RMB.

The last, but not least important, fourth determinant that contributes to an attractive international currency refers to broad, deep and efficient financial markets that are substantially free of controls. Broad financial markets contain a large assortment of financial instruments, whereas deep financial markets imply well developed secondary markets. These markets are liquid, so that assets can be bought and sold with low

transactions costs and with little adverse effect on market prices. In an efficient and transparent financial market, the market prices reflect all the new relevant available information rapidly and accurately. For these reasons, the USD and its treasuries are viewed as a safe haven in times of crisis as a result of several reinforcing factors, such as the availability of sophisticated financial instruments and a range of private financial intermediaries and dealers, transparent and effective supervisory and regulatory oversight, legal recourse and contract enforcement, and a respected central bank able to operate effectively as a lender of last resort (Tavlas, 1991). There are several reasons why China is lagging behind most in the fourth factor of acceptance of an international currency. The RMB is not fully convertible, and the authorities maintain tight capital controls, albeit the government is continuing to reform the FX market and deregulate the capital account. The domestic bond and equity market is relatively small and illiquid, and foreigners' access is highly restricted. A reserve currency also requires sophisticated open FX and derivatives markets, and its RMB assets are still difficult to compare with those in the USA and the EU. Overall the private and official use of the RMB is currently very limited. Only recently have the authorities started to allow RMB assets, such as deposits, to be held offshore (e.g., in Hong Kong) and to be used in trade settlement. A roadmap to further RMB internationalization will be closely linked to reforms of the financial system.

12.7 A roadmap to RMB internationalization and its potential costs and benefits

Taking into consideration the size of China's regional trade, reflecting China's position as an assembly platform in integrated Asian supply chains, it would be natural for RMB internationalization to begin through its use as a regional invoicing currency. It appears that so far the RMB is not much used in invoicing, but the recent relaxation that allows holding RMB balances in Hong Kong would establish the pre-conditions for RMB invoicing. If the RMB is to become an important regional invoicing currency, China must make progress in developing financial markets and improving their efficiency, and finally abolish all its capital controls. Internationalization will also be promoted through expansion in the activities of Chinese companies abroad. With an expanded overseas presence, treasurers of Chinese companies could more readily manage their financial and currency exposure with large-scale transactions spanning both their onshore and offshore operations (Ma and McCauley, 2007).

The future process of RMB internationalization can be divided into different stages, consisting of liberalization, regionalization and globalization. The geographical expansion plan extends the use of the RMB first to neighbouring and regional countries, and finally worldwide. In parallel to this geographical dimension, there is another three-stage process that sees the use of the RMB seeping first into global cross-border trade, then global investment flows, and ultimately reserve holdings. The policy to expand the RMB's role in trade settlement since 2009 was a crucial milestone in the process of RMB internationalization, and, once this is widely accepted on overseas markets, the RMB can be used in cross-border investment. Foreign enterprises ultimately need to invest the RMB they accrue in trade settlement, which necessitates the development of more sophisticated capital markets in either an offshore or an onshore RMB centre. The evolution of Hong Kong as an offshore RMB centre free of capital and exchange controls, as well as domestic capital market reforms, should offer foreign investors the RMB-denominated financial tools or hedge foreign exchange risks they need as an incentive to engage further in RMB trade settlement. This will effectively reduce China's export earnings in USDs.

China is also taking initiatives to allow foreign companies to issue RMB bonds and shares in domestic stock exchange markets, which will reduce the need for USD funds to finance their investments in China. Combined with growing outward direct investments, this will likely reinforce the slowdown of China's USD accumulation in the near future and lead to more RMB-denominated capital market products issued and traded in Hong Kong. Since April 2009, the State Council has allowed Hong Kong banks' subsidiaries on the mainland to issue offshore RMB bonds in Hong Kong.

A RMB repo market is also needed for short-term liquidity management. This will open the door for broadening existing RMB banking services, such as deposit-taking, currency exchange, debit/credit cards and trade financing. It is obvious that huge RMB trade business on the mainland, combined with the well-developed cross-border settlement systems of Hong Kong banks, will create enormous opportunities and win-win situations. RMB internationalization is a gradual process that goes hand in hand with the RMB's rise as a reserve currency. Therefore, as long as China's GDP growth stays above global growth, the RMB should increase its share in central banks' reserves (Qu *et al.*, 2010).

There are several potential benefits and drawbacks to using a country's currency as an international reserve currency (see Table 12.3). First, the reserve currency function as a store of value allows the country issuing

Table 12.3 Potential advantages and disadvantages of a reserve currency status

Advantages	Disadvantages
<i>Seigniorage</i>	Less effective monetary and exchange rate policy
Liquidity discount; more sustainable net foreign debt position	Overvalued currency
Deeper and more efficient capital markets	More international political pressure
Improved terms-of-trade	Under fixed exchange rates: dealing with 'monetary overhang' during economic decline
Lower transaction costs and lower exchange rate uncertainty	Under flexible exchange rates: risk of unstable demand for money
More competitive financial business industry	

Source: Jaeger (2010), p. 4.

it to benefit from *seigniorage* and lower borrowing costs. The reserve currency country (for instance the USA) acquires foreign goods or financial assets by printing money. By holding this currency, foreigners effectively extend an interest-free loan to the USA. At present, the very large acquisition of USD assets by foreign central banks has helped to keep the US interest rate low, helping to stimulate US investment (liquidity discount). The large circulation of USD outside the USA indirectly adds to US government revenues. However, the international use of a currency also makes the monetary policy of that country's central bank less effective in controlling economic growth and inflation. Moreover, having other countries peg to your currency makes it more difficult to use the exchange rate as a tool for adjusting the balance of payments.

The reserve currency country does not only enjoy a privilege because it can finance its own deficit by issuing its own currency or debt denominated in its own currency. As the world's banker, it can also borrow 'short' at low rates and lend 'long' at higher yields, earning the spread, while, as the world's investor, it can sell liquid, domestic-currency-denominated high-grade domestic debt to finance illiquid, high-return assets. This may help to sustain a net foreign debt position in the future. Due to the increased number of investors, the financial markets may also become deeper and more efficient than they would otherwise be, thus potentially benefiting the international competitiveness of the financial business industry. Furthermore, the reserve currency country may benefit from improved terms-of-trade, since the value in terms of

the quantity of goods that can be purchased for every unit of currency will increase. Finally, through the currency's function as medium of exchange, domestic firms may benefit from lower transaction costs and lower exchange rate uncertainty.

However, the following drawbacks of being a reserve currency country can be identified. First, the reserve currency will tend to be overvalued, hurting competitiveness and potentially economic growth, due to larger demand for its financial assets. Second, since monetary policies matter greatly to other countries, there will be more international political pressure on the reserve currency country.

Third, under fixed exchange rates, economic policy will be heavily constrained, as the country has to absorb the money holdings due to lack of ability to spend them ('monetary overhang'). The risk of a run on the currency may also become considerable. Under flexible exchange rates, however, this is likely to be somewhat less of a problem. Similarly, a reserve currency country runs the risk of greater instability of demand for money (Jaeger, 2010).

While it is unclear whether China will encourage reserve currency use as it removes restrictions on capital flows, it seems reasonable to assume that the RMB's global role should reflect China's importance to the world economy. However, a lack of marketability and transparency of financial markets in China will continue to be an obstacle to the wider use of its currency.

After a decade of euro penetration, the USD still makes up more than 60 per cent of FX reserves around the world. The euro gained some momentum, from 17.9 per cent when it was launched in 1999 to about 25 per cent in 2003, but has remained stagnant since then. The British pound actually endured the competition from the euro, and its share has risen from less than 3 per cent in 1999 to above 4 per cent recently. The share of Japanese yen, however, halved from 6.4 per cent to 3.1 per cent between 1999 and 2008. Beyond these four major currencies, there is little room (around 2 per cent) left for others. The emerging world has led the diversification thrust away from the dollar to the euro. Compared with the relatively stable holdings of reserve currency denominated in USD, emerging economies started to embrace the euro after the burst of the hi-tech bubble in the USA at the turn of this century, partly driven by the expected dollar weakness in a world of imbalanced growth. Based on the determinants which contribute to the international use of a currency, the RMB looks well positioned in terms of its share of world trade and its economic size and power, but is still at an early stage of internationalization. There are no parallel competitors

for the RMB as a candidate for international currency. The RMB will likely be regionalized before being fully internationalized. For a currency to be accepted internationally, it may require the home country to run current account deficits. China has been running current account surplus since the early 1990s, and is unlikely to turn surplus into deficits any time soon. However, China's surplus largely originated from the advanced economies (e.g., the EU and the USA). This would suggest that the RMB may be first accepted in those emerging markets that are running trade surpluses with China. However, in order to become a regional currency, the RMB needs to be traded actively in open FX markets.⁵

12.8 Interconnectedness between China's currency and financial system reforms

China's bank-based financial system can be characterized as deep in terms of a relatively high ratio of money to GDP, but not broad, since it is dominated by bank finance with few market-based instruments. Many steps have been taken to reform the banking sector, including ownership restructuring, large-scale recapitalization of state-owned banks to remove a huge overhang of non-performing loans (NPLs), listings of the biggest state-owned banks on the stock markets, and the sale of bank shares to strategic foreign partners. The reforms were completed by July 2005 and form the basis for exchange rate regime reforms. However, all banks of any size are also government-owned or controlled, and face little competition from debt markets. The management, ownership and governance weaknesses of China's state-owned banks contribute to the belief that these banks are 'too big and too important to fail'. The Big-Five banks,⁶ now listed on the Chinese stock exchanges, are more subject to external monitoring than they were before, but capital injections and continued government involvement in their governance undermine their efficiency. The pricing of bank loans remains largely undifferentiated, and the large state-owned banks usually do not take firms' profitability into account when making lending decisions. Their relatively low profitability is still very much dependent on the huge gap between lending and deposit interest rates, which might easily disappear in the future as liberalization and globalization proceed. The corporate debt market is seriously underdeveloped because of the restrictions placed on corporate issuers by several regulators. The Chinese bond market is characterized by a high degree of market segmentation, lack of benchmark rates, poor liquidity and a less developed credit market (Dobson and Masson, 2008).

It is unclear to what extent a stronger and more flexible RMB exchange rate will affect the financial system reforms. Opponents of a currency reform often argue that it would be too dangerous for the still fragile banking system. A large RMB appreciation could generate serious currency mismatches for banks and their customers which would make it harder to decline the NPLs. Because China's financial infrastructure does not yet possess hedging instruments adequate for protection against a market increase in exchange rate volatility, a deeper and broader financial system is a necessary precondition for a bolder currency reform. However, proponents of a currency reform stress that China is a net creditor in its overall FX position, and as such its banks are less vulnerable. Moreover, most of China's largest exporters are foreign-owned and do not raise the bulk of their financing in the domestic market.

The excessive FX accumulation that has accompanied the increasingly undervalued RMB has put the Chinese monetary authorities in a dilemma with increasing risk to the banking sector. If the authorities do not sterilize the large increase in FX reserves, the resulting explosion of money supply will probably generate more NPLs and inflation. The PBC administers the exchange rate policy, controls the money supply and regulates credit to the commercial banks through changes in reserve requirements and direct controls over banks' lending and deposit interest rates instead of using indirect instruments such as open market operations. The PBC, as a lender of last resort, reports to the State Council, which is responsible for making exchange rate policy, and is also constrained in its ability to carry out an independent monetary policy by the lack of RMB flexibility (Naughton, 2007).

12.9 Difficulties in choosing between several monetary policy aims

While China is facing more internal and external imbalances, it will inevitably become more exposed to different types of economic shocks, such as oil price changes and financial turmoil. It would therefore benefit from having greater exchange rate flexibility and a more effective independent monetary policy to help the economy better adjust to these shocks, irrespective of whether or not the RMB is substantially undervalued. To what extent the Chinese financial system will be subject to substantial stress as a result of more exchange rate flexibility is debatable. Chinese banks do not have a large exposure to currency risk, and exchange rate flexibility by itself is unlikely to create strong incentives to take deposits abroad. Furthermore, more currency flexibility

would create stronger incentives for developing a more advanced open FX market and currency risk management, including the use of more hedging and derivatives instruments that are currently lacking. This could broaden and deepen the financial markets and encourage RMB internationalization. More exchange rate flexibility could also facilitate capital account liberalization by better preparing the economy to deal with the impact of increased capital flows. With enough capital outflows, RMB appreciation pressures may even ease. Enforced by the 'going global' policy, a gradual capital account liberalization will also help to reduce savings if firms can operate in global markets and are allowed to access funding from better-developed overseas credit markets. In other words, firms can raise money in capital markets rather than just relying on China's banking system, with its controls on credit. This will not only reduce the motive for corporate saving, but also cut the portion of the current account surplus that is funded through the purchase of US Treasuries by allowing capital outflows in the form of FDIs instead of accumulated FX reserves (Yueh, 2010).

China is struggling with a *trilemma* between several monetary policy aims. This 'impossible trinity' principle refers to the impossibility of simultaneously achieving all three aims: stable exchange rate, free capital movement and independent monetary policy. However, it is possible to achieve any two aims at any given moment. It is a matter of give and take; if China keeps a more or less stable exchange rate and allows free capital flows, then it has to use its monetary policy to maintain this rate fixed, so it remains dependent. A stable exchange rate regime typically imposes a substantial constraint on monetary policy, since it could be subject to destabilizing capital inflows ('hot money') through a relatively large gap between domestic and foreign interest rates. However, if more RMB flexibility is allowed, the capital controls will be kept intact and more monetary independence will be possible, even though in China government interference will always be huge. Since the RMB is not fully convertible and the State Council finally determines the exchange rate movements, the Chinese and Western interpretations of the current managed floating exchange rate regime will be different (Prasad, 2005). China can run an independent monetary policy under any RMB regime, since China's capital controls are relatively effective and sterilization, mainly via the sale of central bank bills and increases in the required reserve ratio, has been successful in the past. However, the monetary control of the PBC is mainly based on credit quotas and various types of 'window guidance'⁷ on bank lending rather than the use of market-conforming interest rates. A lack of

exchange rate flexibility means that the PBC must regulate commercial banks' credit operations by setting their lending and deposit rates directly. Reliance on administrative interest rate changes runs the risk of encouraging speculative capital inflows and putting further upward pressure on the exchange rate, requiring further central bank sterilization operations. Administered interest rates have been ineffective in slowing growth and reducing commercial banks' appetite for risky credits because these banks can rely for a good part of their income on large well-known borrowers with government connections and on the generous administered spreads between deposit and lending. Thus, not only does lack of exchange rate flexibility reduce the central bank's monetary policy sovereignty, but administered interest rates are also an obstacle to the play of competitive forces desirable in a modern banking system. Liberalization of interest rates would both improve credit allocation to private firms and further reduce the savings incentive. It would also reduce financing costs for firms and thus the need to save. The combination of exchange rate and interest rate reforms could result in a better balance between China's internal and external disequilibria. The result would be a more balanced Chinese economy that would also help reduce liquidity build-up from global imbalances (Goldstein and Lardy, 2008).

12.10 Conclusions

The Chinese economy has recovered strongly from recession, shifting from disinflation and unemployment in 2009 to inflation and overheating in 2010. China's RMB 4 trillion stimulus package has been a success, resulting in better than expected GDP growth, which has fuelled increasing inflation and heralded a fiscal and monetary policy shift via capital gains taxes, loan restrictions and an interest rate hike aimed at preventing the risk of overheating and increasing price inflation. The stimulus package has also buoyed up the world economy and contributed to the global economic imbalances. The worry is that the nature of the stimulus, focused on state-directed lending for investment, will perpetuate a lopsided national economy. China's economy is still too dependent on investment and export, while it needs to shift to a new growth model, emphasizing consumers over producers, and more innovative production. In this context the Chinese economy should become more like that of the USA, whose growth is driven primarily by domestic demand. If China strengthened both internal and external demand, it would be less subject to volatility in the world economy

and more able to protect itself from external shocks. This rebalancing of the pattern of the growth model would not only help China, but would also help to stabilize the world economy by easing China's massive external surpluses, reducing global imbalances. China's growing external imbalances put pressure on several key policy aims, and it will be difficult for the authorities to choose between several policy priorities. The nature of China's exchange rate regime has been carefully managed into the direction of more flexibility. Many hope a more flexible RMB will support further reduction of large global imbalances. The policy measures that have been taken so far are clearly insufficient to defuse international tensions; as China's exports continue to grow at a rapid pace, China continues to gain market share, while imports lag behind because of massive overcapacity in heavy industries. Unless something happens to turn around the US trade deficit, political pressure from the US Congress for protectionist measures is expected to intensify, amid charges that China is manipulating its currency. How China will respond to these increasing foreign complaints will depend on how the authorities judge the current state of their economy and to what extent they will be able to rebalance their growth model. Export-led growth means that China is captured in a dollar trap: it cannot stop buying dollar-denominated assets, but it cannot sell them either. To a certain extent China's huge amount of FX reserves can be considered as a weakness rather than a strength of its economic power, causing China to seek expansion in activities of Chinese companies abroad in order to reduce its dependency on the value of the USD.

The heavily managed exchange rate and capital restrictions are significant factors influencing the conduct of monetary policy and contributing to the inefficiency of the financial system. In the long run this implies that China has to reform its bank-based financial system into a more market-oriented one. This will include further recapitalizing of state-owned banks, decreasing the extent of state ownership, and putting in place commercial best practice on new lending, developing securities markets for corporate borrowing, liberalizing capital account restrictions, improving the regulatory framework of the financial sector, broadening and deepening of financial markets, increasing the independence of the PBC and putting in place a more flexible exchange rate regime. These reforms will be slow, partial and largely geared toward supporting China's 'going global' policy of encouraging Chinese firms to invest overseas. Nevertheless, these measures should help China rebalance its economy and begin to redress the global economic imbalances. The government has initiated steps to make the RMB more active

in world trade and has taken steps to increase its role in international finance. Although the private and official use of the RMB is currently rather limited, the liberalization measures already in train will probably lead to increasing international use in invoicing and expansion of foreign holdings of RMB.

After the resumption of RMB exchange rate reforms, a more flexible RMB will encourage RMB cross-border trade settlement and fuel expectations of RMB appreciation. In the short run, RMB liberalization and regionalization and opening up of the domestic market will be a prerequisite for achieving RMB internationalization in the long run. It is crucial to develop offshore RMB products and expanded channels by which foreign investors and enterprises may park their RMB holdings. More importantly, to become an international currency, the RMB must be used widely for investments as well as for payments. Therefore, more measures are needed to facilitate offshore RMB investments and products to offer instruments to foreign investors. Substantial use of the RMB as a store of value would require a major development of deep, broad and liquid RMB-denominated financial markets.

China will stick to its policy of de-pegging the RMB to the USD in order to make the RMB more global, in line with China's economic position in the world. More RMB flexibility and further moves to relax capital controls will help encourage the international use of the currency as a medium of exchange, store of value and unit of account. However, the Chinese authorities have to balance conflicting aims of stable exchange rates, free capital movement and sovereign monetary policy. Relaxing capital controls on banks' foreign currency operations without strengthening regulation and putting state-owned banks on a fully commercial footing would be building in trouble.

Ultimately it is likely that the world economy is gradually moving from greenbacks to 'redbacks'. The authorities appear to envisage a gradual and low-volatility adjustment of China's exchange rate system. Because RMB internationalization will be a gradual process, the pace of interconnected reforms of the financial system will also be executed step by step. The RMB is likely to become another major reserve currency, in parallel with the USD, and its international acceptance will depend on how quickly the Chinese policymakers are willing to push forward the necessary reforms of their financial system. In the short run, the RMB will be unlikely to replace the USD's dominant position until China develops well-established, sizeable, deep, broad and efficient open financial markets.

Notes

1. The Renminbi (RMB), nowadays sometimes called 'redback,' is the name of the currency meaning 'the people's currency', whereas the Chinese Yuan (CNY) is the basic unit of account issued and administered by the central bank or People's Bank of China (PBC). As China's legal tender, the exchange rate of the RMB has been fixed for most of the past half century with a few major changes. The RMB is not the only currency used in China, and neither the Hong Kong Dollar (HKD) nor the Macao Pataca (MAC) peg their currencies to the RMB, but the central government encourages using the RMB also in these regions.
2. Since the 11th National Party Congress in 2007, the 'going global' policy is a key exit strategy of the Chinese government to internationalize target industry sectors and companies.
3. Hereinafter summarized as a RMB appreciation assuming a gradual RMB adjustment to a more flexible exchange rate system in the future.
4. Around 70 per cent of China's more than USD 1.8 trillion FX reserves is held in US debts like US Treasuries and bonds, and over 70 per cent of China's USD 2.6 trillion annual trade flows in 2008 are settled in USDs, with the balance being settled in the euro, yen and other currencies.
5. Based on comments from Robin Zhou Liang, associate, strategic transaction group HSBC, Hong Kong, 8 August 2010.
6. Agricultural Bank of China (ABC), Bank of China (BoC), China Construction Bank (CCB), Industrial and Commercial Bank of China (ICBC) and the Bank of Communications (BOCOM). Starting from 2007, the China Banking and Regulatory Commission (CBRC) added BOCOM to this segment as a state-owned commercial bank, while this bank was segmented as a joint-state commercial bank prior to 2007.
7. 'Window guidance' implies that the state urges or coerces commercial banks to act according to its own goals.

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