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The Financial Systems of Industrial Countries

Evidence from Financial Accounts

Springer

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To our parents

Foreword

The Great Recession of 2008/09 had two distinct characteristics: its financial origin and its global dimension. Over the last 20 years substantial changes have occurred in market openness, as well as in technology and demography. Financial integration has been very intense in the advanced economies and financial deepening has accompanied a marked increase in world economic growth.

The development of new information and communication technologies impacted all sectors of the economy. The financial system was affected to a significant degree in all its building blocks, from market exchanges to investment instruments, from payment and settlement infrastructures to the behaviour of intermediaries. The securitization of banks' assets expanded considerably, and with it the complexity of structured financial products. Contrary to most expectations, this meant that rather than being more distributed across a wider set of investors, credit risk ended up being extremely concentrated. Moreover, unlike traditional bonds these products were not generally traded in secondary markets and their valuation was often based on conjectures that were hard to verify. Over the years the values of traditional financial and real assets – such as equities and real estate – reflected the predominantly low interest rates generated by highly expansive monetary policies and large flows of investment in the financial markets of advanced countries from rapidly growing emerging economies. Eventually, this led to across-the-board reductions in risk premiums, a wide-ranging search for yields by financial institutions that made use, in very liquid markets, of the illiquid and opaque structured products assembled through financial innovations and innovation in finance, and – with lax regulation and supervision in many sectors of financial intermediation – to the booms and busts that have characterized the past decade.

The crisis has indeed shown that financial flows matter. It is precisely because of financial innovation and innovation in finance that during the years of the Great Moderation tracking quantities appeared less important and monetary transmission was basically summarized through term-structure equations in efficient capital markets. Efforts at incorporating in macro-modelling, for description as well as for interpretation, national income and product accounts, input–output interdependency tables, and flow-of-funds accounts were abandoned in the late

1970s in the wake of the so-called rational expectations revolution. With that, attempts to take explicit account of balance sheets in forecasting and policy evaluation were, with few relevant exceptions, also curtailed. I believe that it is fair to say that the possible interactions and feedbacks between the real and financial sectors of the economy did not receive sufficient attention and we were not prepared to address the non-linearities that emerge especially during crises. What has happened in the last 3–4 years has shown that interconnections have developed across institutions, markets and economies in ways that make financial systems very complex, corner solutions very costly, the consequences of excessive leverage and defaults very dramatic and the accumulation of systemic risk very dangerous. Much intelligence is currently being deployed to address these issues, and others that the depth and diffusion of the crisis have highlighted. But while theoretical advances may rapidly emerge, the risk is that on the empirical side our interpretation of the world remains essentially linear. Much of this is due to the limitations of the statistical apparatus that is available for the comprehensive and systematic study of the evolution of our economies.

While much useful information is now being assembled, and utilized in several empirical analyses that depart from the abused assumption of "representative" agents, there is a return of attention to the use of flow-of-funds data and the balance sheets of households, firms, governments and financial intermediaries to better assess financial positions and risks. Flow-of-funds are typically constructed and examined within central banks. They contain a wealth of useful information, at times not obvious to read and necessarily to be complemented by other sources of information on the real economy, asset prices and the balance of payments. For some time they may have been considered too detailed and difficult to use systematically and extensively. But now is certainly time to return to them.

This book is useful in tracking the history of flow-of-funds, pointing out interesting analytical and statistical uses, showing that financial flows matter and that they might have been used ahead of the crisis for a better understanding of the state and vulnerabilities of our economies. It is also honest in its conclusion that although financial accounts are important in helping to understand the potential effects of financial imbalances and mismatches on the real economy they would not have been sufficient to depict the actual size of the problems accumulated and masked during the years of macroeconomic stability that preceded the crisis. We learn how interconnections between the balance sheets of financial intermediaries increase in periods of booming financial conditions and how this may harm financial stability and economic growth. The presence of a common trend of financial deepening across different countries is highlighted, where and how households' indebtedness exploded in the years preceding the crisis, and how it was masked by the contemporaneous rise in net worth, made possible, however, not by the accumulation of saving but by unsustainable changes in asset prices. While this phenomenon was seen and acknowledged by several economists and policy makers as it was taking place, it is fair to say that its consequences were grossly underestimated. We also learn how households and firms have reacted to shocks in monetary policy by

increasing their borrowing or reducing their financial investments in ways and with a timing that need to be examined carefully.

Balance sheets of households, enterprises and governments are fundamental to understand the complexities of the economy. In this sense we cannot do without good financial accounts, and as important aggregate ratios are summarized in flow-of-funds data these have to be carefully managed and compiled. With them, micro data are essential to understand and allow for the build-up of leverage, risks of default, interconnectedness. The links between flows and stocks and asset prices and rates of return also need to be better understood, as the measurement and role of capital gains and losses are paramount. Finally, we need to improve our awareness and information of cross-border transactions, as financial linkages are certainly no less important than linkages in traded goods and services. A weighty agenda, then, for economists and statisticians, one that needs to be addressed and to which this book offers a timely contribution.

Ignazio Visco
Governor of the Bank of Italy

Acknowledgments

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Financial Systems: Introduction and Summary

1

Riccardo De Bonis and Alberto Franco Pozzolo

Abstract

For good or for bad, finance has a pervasive role in modern economies. Understanding the functioning and evolution of financial markets and intermediaries and their interconnections with the real world is an old theme in economics, but one that needs continuous updating to keep pace with financial innovation on one side and the development of new statistical tools for their analysis on the other. This introductory chapter gives an overview of how interest in understanding the financial aspects of the economy has fluctuated considerably in the past, before reaching centre-stage in recent years. It also argues that the clarity of the macroeconomic picture of a country's financial structure offered by its financial accounts is difficult to match, and it illustrates the thread connecting the essays included in the rest of the book. The key message is that financial accounts can be a powerful tool for understanding the structure and the weaknesses of financial systems.

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1.1 Economics and the Financial Systems: A Tale of Love and Disenchantment

Financial systems are commonly defined as the set of markets and intermediaries that manage the transfer of resources from sectors in surplus, mainly households, to sectors in deficit, mainly firms and the government. Although there is a fairly broad consensus on the definition, the importance of this activity for the working of the economic system at large has been and still is the object of lively debate. Indeed, finance is still virtually absent from most introductory courses in economics, and more often than not the only references to the subject in the majority of macroeconomics textbooks are representations of real and financial flows within the major sectors of the economy, and the role of financial variables is confined to the analysis of money demand and supply. Even in more advanced graduate courses, aggregate financial flows figure only marginally – mostly as the counterpart to real economic transactions, as in the case of financial accounts of the balance of payments, seen simply as the counterpart to the trade balance.

Interest in understanding the financial aspects of the economy has fluctuated considerably in the past, and the pattern has been similar in the consensus on whether and to what extent finance is important. In a farsighted piece, Schumpeter (1911) emphasized the role of financial intermediation in fostering technological innovation and growth (see King and Levine 1993 for a later appreciation). But with the exception of Schumpeter, until a few decades ago the role of financial markets and intermediaries in economic development was largely undervalued. Joan Robinson's (1952) widely cited and, at the time, largely subscribed view was that economic growth was driven by capital accumulation and technological progress, and that finance followed, building on the shoulders of already developed economies. Indeed, even development economists of the calibre of Clark, Hirschman, Schultz, Lewis and Myrdal did not consider financial markets a key determinant of economic growth (see Meier and Seers 1984 for a survey). This view was probably reinforced by the ready acceptance of Solow's contributions on economic growth. More recently, in a seminal paper on economic growth, Robert Lucas (1988) stated that "the importance of financial matters is very badly over-stressed in popular and even much professional discussion", although he conceded that the development of financial institutions can be a limiting factor for growth (see Aghion et al. 2005 for an empirical exercise).

Analysis of the interactions between financial structure and business cycle fluctuations provide similar results. Veblen (1904) and especially Fisher (1933) were among the first to propose a causal relationship between the real value of financial debt and current expenditure, and hence the business cycle. Economists such as Robertson and Hawtrey, and writers in the Austrian "school" of economics, such as Hayek and von Mises, shared the belief that credit variations shaped the business cycle. In his *Treatise on Money*, Keynes devoted attention to the institutional details of the banking system and credit rationing, and in his *General Theory* he suggested that investment decisions, and therefore aggregate demand, depended in part on lenders' confidence. But in the years following these publications, there was a progressive abandonment of such positions in favour of explanations of the

business cycle that centred more on monetary and real factors, leaving credit and financial systems aside.

In the decades following the Great Depression and the Second World War, few authors put financial markets at the centre of their analyses. Gurley and Shaw (1955) stressed that risk diversification through the financial markets could lead investors to take on projects with a higher idiosyncratic probability of default, but also higher expected returns. Gurley and Shaw (1956) and Tobin (1963) discussed the differences between banks and other financial intermediaries, with particular emphasis on the consequences for competition and the conduct of monetary policy. Gerschenkron (1962) viewed banks as instruments able to substitute or integrate financial markets and the State in order to overcome economic backwardness. Authors such as Cameron (1967), McKinnon (1973) and, especially, Goldsmith (1969) provided the preliminary empirical evidence to show that financial development and the structure of financial markets have a positive effect on real economic growth, and set the stage for the enormous empirical literature on finance and growth that emerged in the 1990s. But between the 1950s and the 1970s general perceptions were clearly more aligned to Robinson's opinion than to these views.

On the microeconomics front, moreover, the major contributions of the 1950s and the 1960s certainly left to one side the role of financial markets. In the general equilibrium framework of Arrow and Debreu (1954) there was no explicit room for financial markets. Even the seminal paper of Modigliani and Miller (1958) aimed to show how a firm's financial structure had no impact on its value. However, a more careful reading of these results shows that they paved the way for the major contributions of the microeconomics of finance that emerged in subsequent years. From the theoretical hypothesis of market completeness, proposed in Arrow and Debreu's general equilibrium framework, it was only a small step to analysis of financial markets as a means of taking the economic system closer to the theoretical benchmark. Also, the conditions required for Modigliani and Miller's irrelevance theorem to apply were a starting point from which to analyse the theoretical reasons for its practical failure, rather than the foundations of a research agenda claiming the insignificance of finance. Some 10 years or so later, the foundations for the theory of asymmetric information established what is still the most important reference framework for analysing financial markets and intermediaries. At that stage, the direction of the research on financial markets was irreversible, with seminal contributions such as Jensen and Meckling (1976) setting the prerequisites for the subsequent development of an entire field.

An area where finance has maintained a more visible role over the years, and which falls between macroeconomic and microeconomic analyses, is the examination of economic crises. Indeed, the same markets that often favour efficient allocation of financial resources across different alternatives can also have the opposite effect of exacerbating the negative effects of information asymmetries. The possibility of crises is itself a corollary of the existence of financial intermediaries and markets, and the most recent crisis has clearly shown that differences in the financial structure matter not only for a country's economic growth, but also for its stability.

The research agenda of the Great Depression has provided fertile ground for a debate on the role of financial intermediaries in which monetarist interpretations of the crisis are set in harsh contraposition to the credit view. According to Friedman and Schwartz (1963), banking troubles prompted people to withdraw deposits, and this in turn caused a drop in the supply of money and, via the traditional monetary channel, a reduction in output. However, building on Mishkin (1978), Bernanke (1983) and Bernanke and Blinder (1988) emphasized that it was the contraction in bank credit itself that caused the collapse of investment and output. This line of research – initially designated the credit channel – has been enriched by an array of mechanisms, such as the financial accelerator, the borrower balance sheet channel and, more recently, the liquidity channel and the capital channel of monetary policy (see Basel Committee on Banking Supervision 2011 for a survey). All these approaches have in common the idea that the financial conditions of both financial intermediaries and non-financial firms play a key role in causing episodes of macroeconomic instability.

Following Allen and Gale (2008) and the literature on bank runs, there are two broad approaches to explaining financial crises. According to the first, a crisis is essentially an irrational event, caused for example by panic, which affects agents' behaviour and eventually becomes a self-fulfilling prophecy (Kindleberger 1978; Diamond and Dybvig 1983). According to the second approach, crises are always caused by shocks to real economic fundamentals, which then are amplified by financial factors. In both cases, the role of finance is pervasive.

The consensus on the role of finance in shaping economic relationships is therefore relatively new in the empirical literature, beginning from the late 1970s (for a comprehensive survey see Levine 2005). It is only more recently that economists have begun to look at financial systems as strategic ingredients in the functioning of modern economies (see Allen and Gale 2000), triggering a parallel research agenda on how the financial system prevailing in each country affects economic growth (Tadesse 2002) and industrial specialization (Rajan and Zingales 2001). Other analyses have focused on the interaction between legal and political institutions, financial development, and economic growth (La Porta et al. 1997; Rajan and Zingales 2003; Roe and Siegel 2009; Demirguc-Kunt and Levine 2001).

Real growth is just one aspect of economic life affected by the specific features of financial intermediation. Business cycle fluctuations also are linked to the characteristics of financial systems, which themselves can be major sources of positive and negative disturbances, as well as important catalysts that help economies react to exogenous shocks. Moreover, financial systems have a crucial impact on income distribution, by providing the means required to capitalize on personal skills or by changing the pattern of wealth distribution. This list is far from exhaustive: it is difficult these days to envisage any single aspect of the economy that is not influenced by the workings of financial intermediaries and markets.

Given that finance has a pervasive role – for good or for bad – in modern economies, it is important to understand the channels of transmission from financial markets and intermediaries to the real world, and to offer a comprehensive description of their functioning and evolution. This may be an old theme, but it is one that

needs continuous updating to keep pace with the development of financial innovation and of the statistical tools available for its analysis. In this book our aim is to contribute to the understanding of the role of financial systems within the developed economies, from the point of view of financial accounts. It will become clear from the various chapters that financial accounts provide a description of the aggregate characteristics of financial intermediation that is difficult to match using other statistics.

1.2 Financial Structures through the Lens of Financial Accounts

This book collects a number of contributions that view the financial systems of the most advanced economies through the lens of financial accounts. The picture emerging from these analyses shows that financial accounts can be a valuable tool for understanding financial systems, studying their evolution, uncovering growing imbalances, and foreseeing and challenging potentially dangerous patterns: being able to see the forest is more important than being able to see the trees.

By permitting the transfer of resources from sectors in surplus to sectors in deficit, financial systems impact on the choices of the actors involved, thus affecting the performance and the specialization of the real economy. Households that can choose how to invest their funds among a wider range of diversified portfolios – or that have easier access to bank financing – are likely to accumulate a buffer of precautionary savings and will therefore have a higher propensity to consume out of income. At the same time, financial intermediation can help firms to access funding for more productive but riskier projects, since investors can diversify their idiosyncratic risk. On the contrary, financial repression may limit the development of corporate and international bond markets and thus can be used to maintain relatively low interest rates on public debt, with the negative effect of reducing the incentives for governments to cut excessive public spending.

Financial accounts can help to depict a country's financial sector in terms of the relative incidence of intermediated and arm's-length finance, the characteristics of the most popular financial instruments, the degree of international integration, and the sector's overall development. Moreover, the frequency and timeliness of the accounts – in most industrialized countries quarterly statistics are available with a delay of around 100 days – help to keep track of the evolution of the financial system, and of the size of the relative imbalances across sectors. Financial accounts statistics link examination of the role of financial intermediation in allowing funds to flow across sectors with macroeconomic analysis of the causes and the consequences of changes in saving, investment, public expenditure and trade. Since sector imbalances and an excessive accumulation of debt are frequently at the root of financial crises (Visco 2009; Reinhart and Rogoff 2009), the implications for financial stability of a careful reading of the trends emerging from financial accounts cannot be overlooked. The clarity of the macroeconomic picture of a country's financial structure that its financial accounts offer is difficult to match,

for they permit the assets and liabilities of all the major institutional sectors in an economy – firms, households, financial intermediaries, the public sector, and foreign counterparts – to be compared within a unified framework and, what is more important, they establish and highlight their interconnection.

The complexity of the statistical architecture, the lack of a complete integration with real accounts, and some entanglement among methodological issues have made the exploitation of financial accounts rather more of a rarity than it should be. The contributions in this book represent an attempt to fill some of these gaps. First, they analyse the origins and evolution of financial accounts in Europe and in the United States, discussing some of the major methodological issues still being debated. Second, they put flow-of-funds accounts to work and compare differences and the most recent trends in the financial structures of the major industrialized countries.

The original idea to register a country's flows of funds can be attributed to Morris A. Copeland (1895–1989) in his 1952 *A Study of Moneyflows in the United States*. In Chap. 2 of the present volume, De Bonis and Gigliobianco describe the "invention" of financial accounts in the US and Italy as the culmination of a complex process undertaken by economists and statisticians. The "flow of funds" construction has two intellectual origins. First, the business cycle literature underlined the importance of monetary and credit flows in influencing variations in economic activity, but in the 1950s statistics on those flows were very poor. Second, the Keynesian revolution spurred the initial building of non-financial accounts – such as production or income accounts – and the later elaboration of financial accounts. After probing Copeland's thinking, Chap. 2 offers an overview of the subsequent intervention by the Federal Reserve, which in the 1950s took responsibility for the regular publication of flow-of-funds data.

The economic and statistical innovations in the US are compared with the Italian approach to financial accounts, in which Paolo Baffi (1911–1989), Governor of the Bank of Italy from 1974 to 1978, is the main protagonist. Baffi joined the central bank in 1936 and, following Wesley Mitchell's approach, he introduced a statistical programme to draw together the financial statements from the sectors of the economy. De Bonis and Gigliobianco show that notwithstanding innovations and continuous improvements there is continuity between the statistics prepared by the Bank in the 1940s and 1950s and the proper financial accounts that appeared in the 1960s. Moreover, the Bank of Italy's communication needs, which were dependent on its changing policy goals, influenced the manner of presentation of its statistical information. Chapter 2 concludes with a discussion on how the evolution of macroeconomic theory influenced the construction and use of financial accounts statistics from the 1960s to the present day.

In the course of the twentieth century many economists came to believe that the level of private debt played a central role in determining saving and investment choices. Chapter 3, by Riccardo Massaro, argues that requests for reliable statistics on aggregate debt were one of the drivers that led to the standardization of financial accounts in many countries. Between the 1920s and 1940s, especially in relation to the Great Depression, leading economists acknowledged the role of banks and financial markets in fostering expansion and also in shaping subsequent recessions.

These economists, who included Schumpeter, Hayek, Machlup, Keynes, Ohlin, Fisher, Simons and Hicks, had different theoretical backgrounds and views. Some looked at how banks grant or restrict credit during the business cycle; others were more interested in the lack of coordination between saving and investment; yet others emphasized that excessive accumulated debt could accelerate a crisis. Notwithstanding the theoretical differences, all these scholars had a common interest in understanding the consequences of excessive lending, and they encouraged improvements in the quality of financial statistics, especially those on private debt.

Massaro goes on to underline the role played after the Second World War by the major international institutions in agreeing on a common taxonomy of financial stocks and flows. The conclusions of the Radcliffe Report published in 1959 in the UK prompted deeper analysis. During the 1960s several European countries, as well as Japan and Canada, began to present financial accounts on a regular basis. The Organisation for Economic Cooperation and Development (OECD), the Bank for International Settlements (BIS), the International Monetary Fund (IMF), the United Nations (UN), Eurostat and the European Central Bank (ECB) established common standards to make financial accounts comparable across countries.

The increasing availability of detailed and reliable statistics fostered the analysis of financial systems. Economists and financial analysts such as Jones, Minsky, Wojnilower, Kaufman and Teplin emphasized the increasing risk of financial instability in the American economy, due mostly to the excessive rise in private debt. Indeed, after the summer of 2007, surveillance of private debt became prominent on the economic policy agenda, confirming the validity of many of the topics highlighted by the economists discussed by Massaro in Chap. 3.

So, what can we learn from financial accounts about the behaviour of households, firms, governments and financial intermediaries in recent years? In Chap. 4, Laura Bartiloro, Massimo Coletta, Riccardo De Bonis and Andrea Mercatanti compare household wealth in the main OECD countries from three points of view: financial assets, indebtedness and real assets.

Before the financial turmoil that began in 2007 households' gross financial wealth increased worldwide in relation to their disposable income, confirming the strong financial deepening of the economies that had begun in the 1990s. The level and composition of financial assets differed from country to country, depending on participation rates in financial markets, agents' risk aversion, the role of banks, and the weight of public pension schemes. Therefore, household portfolios differed as to the relative weight of safer assets, such as deposits and securities other than shares, and more risky instruments, such as quoted shares and mutual funds. Household debt also increased in the second half of the 1990s, eventually raising concerns about sustainability and financial stability. The explosion of subprime lending in the US proved that these concerns were indeed justified. Household financial debt is very high in the UK, Spain and the US, but less so in the other leading countries of the euro area, especially Italy. Notwithstanding financial deepening, real assets are more important than financial wealth in most countries. Up to 2007, the value of household real assets rose in most countries, showing a close link with the evolution of residential property prices. In terms of households'

total wealth, that is, the sum of financial and real assets net of debt, the highest values are in Spain, the UK, France and Italy and the lowest in Germany, Japan and particularly the US, where household real wealth is relatively lower. The destruction of financial and real wealth in 2007–2008 as a consequence of the financial crisis affected all countries, but the effect was strongest in the UK and the US.

We do not have a complete explanation of why countries have different levels of household wealth. In the long run wealth is linked to the accumulation of savings, but statistical exercises show a weak link between savings and wealth since the mid-1990s. In the period from 1995 to 2007 wealth was influenced more by capital gains and house price trends than by saving. In some countries the causality link was probably reversed: in most of the period 1995–2007 rising share and house prices prompted people to save less because their wealth was increasing.

In the developed world, the size and the composition of households' asset portfolios are influenced by an intertemporal planning exercise, where the most important choice is the accumulation of savings for retirement. In Chap. 5, Gabriele Semeraro begins by reviewing the literature on the impact that choices related to pension planning have on household saving, government spending and public debt sustainability, and follows this with a discussion of how significantly the treatment of prospective pension liabilities in financial accounts can alter the picture that emerges from a more traditional static analysis.

In 2011, only the assets and liabilities of funded, mainly private, schemes are included in household financial assets; unfunded public pension schemes are not registered. As a result, if an unfunded system faces an intertemporal structural disequilibrium – that is, it is accumulating pension commitments not covered by corresponding contributions – but in the short run and on a year-by-year basis the contributions received are equal to or larger than the pensions paid, there is no visible effect on government sector aggregate net borrowing. Although in an intertemporal framework the imbalance would be visible, it would not enter the financial accounts until that moment in the future when the payment outflows exceeded the contribution inflows (and vice versa). Clearly, the opposite would be true for a country that faced a temporary imbalance on a cash basis, but was structurally in equilibrium on an intertemporal basis.

Although the intuition behind intertemporal accounting of pension assets and liabilities is straightforward, as ever the devil is in the detail. This motivates Semeraro's thorough discussion of the methodological, statistical and measurement problems of calculating the value of future pension liabilities. Among the major problems are those relating to the choice of interest rate to be applied in calculating the present discounted value of future liabilities, and of the potential inconsistencies of not including rights to future contributions.

Some applications of the methodologies described in the paper are available in the literature. Heidler et al. (2009) shows values for future pension liabilities ranging from less than 100% of GDP in the UK, where private pension schemes are most common because of a very parsimonious public system, to more than 350% of GDP in Austria, France and Poland. Due to the numerous statistical and methodological issues raised in this chapter, Semeraro convincingly argues against the blunt use of aggregate

measures of overall net borrowing that include future pension liabilities within fiscal rules of the type decided by the Maastricht Treaty. A naive application of an allegedly simple rule might create even greater incentives for bad government behaviour than its complete omission. A more promising method would be to create separate accounts for pensions, and to confine the use of estimates of future pension liabilities to the analysis of household saving and investment behaviour.

In Chap. 6, Laura Bartiloro and Giovanni di Iasio move away from households and focus on two other key players in the financial system: financial intermediaries and firms. Building on the vast literature that tries to classify financial systems, the authors investigate whether financial accounts add anything new to our understanding of the most important features of financial intermediation in the most developed countries. The picture that emerges from a traditional indicator such as the ratio of bank assets to GDP is reassuringly similar to that based on other data sources, such as those published in the various versions of the Database on Financial Development and Structure produced by the World Bank (Beck et al. 2000). More interesting information comes from the aggregate statistics of other financial intermediaries, confirming the common wisdom that non-bank intermediaries, from shadow banks and hedge funds to venture capital and private equity firms, are more common in the UK and the US than in continental Europe. Interestingly, although less surprising in light of the discussion in the chapters by Bartiloro et al. and Semeraro (Chaps. 4 and 5), the incidence of insurance and pensions fund assets is strictly related to the generosity of the public pension system, with the only partial exception of France.

Differences in the financial intermediation sector are obviously matched by the capital structure of non-financial firms. Arm's-length financing is associated with lower levels of firm leverage – the ratio of financial debt (loans plus securities other than shares) to the sum of financial debt and equity – while non-financial corporations typically have a higher share of debt in bank-centred countries. This pattern holds true despite the fact that arm's-length financing includes bonds issued in regulated markets, which are typically more common in countries with better developed stock markets. It is interesting that if we examine flows, a relatively common pattern emerges which is broadly consistent with Myers and Majluf's (1984) pecking order theory: investment by non-financial corporations is funded first by retained earnings, then by external funds.

A remarkable picture emerges from the analysis of changes in financial intermediation since the mid-1990s, with three facts standing out: a sustained increase in leverage, especially in Spain; strong growth in the amount of lending among financial intermediaries which has increased the degree of interconnectedness within the financial sector and the risk of systemic events; and an increase in maturity mismatches, mostly due to the surge in the share of short-term borrowing (e.g. repurchase agreements) from financial intermediaries. Overall, the size of the financial sector has increased substantially, but, as the recent crisis has shown, with no benefits to the real economy. This calls for a better understanding of the mechanisms behind the finance-growth nexus discussed earlier, an area where an important contribution could come from a more widespread production and a more careful reading of the financial accounts.

Despite cross-country differences in the size and composition of household and firm assets and the liabilities described in the previous chapters, it is questionable whether globalization, international integration and deregulation have encouraged some forms of convergence of financial systems. Chapter 7, by Valter Di Giacinto and Luciano Esposito, addresses a well-defined research question: whether the European financial structures have converged in the wake of the creation of the Economic and Monetary Union and the euro area. The authors survey the empirical literature on the convergence of financial systems and summarize the techniques developed for the analysis of economic growth and convergence of per capita GDP, applying these methods to the study of financial convergence in 13 European countries between 1995 and 2008.

Di Giacinto and Esposito adopt the following method. First, for each country they choose 14 financial indicators (including, among others, total financial assets, items of bank balance sheets, stock market capitalization, household financial assets, public debt to GDP ratio). Second, they select the main synthetic (or composite) variables capable of explaining a large share of the variability in the 14 national indicators using a multidimensional factorial analysis. The three main variables are able to explain about 70% of the dispersion of the countries' individual indicators, summarizing the overall financial deepening of the economies, the relative weight of the banking system, and the incidence of public finances. Third, they study the β- and σ-convergence of the three composite indicators, and find the presence of both types of convergence.

In a nutshell, financial deepening, the relative weight of the banking system, and the influence of public debt are currently more similar in Europe than in the mid-1990s, on both time and cross-country dimensions. The recent financial crisis has not had a major impact on the β-convergence in the three synthetic indicators. By contrast, cross-country dispersion has slightly increased in the banking and public finance indicators, reversing the trend observed between 1996 and 2006. While the different public interventions to bail out financial sectors may account for this increased dispersion in the public finance indicator, the break in σ-convergence observed for the banking factor appears to be linked to the dynamics of cross-country interest-rate differentials and the evolution of national bank aggregates.

The convergence of financial structures within the European Monetary Union is an important result in terms of its effects on the impact of monetary policy on the size and composition of the net financial assets of households and firms. Structural differences between countries with a common monetary policy could lead to asymmetric responses, and therefore to asymmetrical effects on the real economy. Financial accounts may help to analyse the impact of monetary policy on the different sectors of economic activity. In Chap. 8, Riccardo Bonci adopts an up-to-date VAR methodology to study the effects of monetary policy using quarterly sectoral financial accounts for the euro area. The analysis is grounded in the large empirical literature on the real effects of monetary policy in the euro area (see, e.g., Angeloni et al. 2003), the main conclusions of which are replicated, and in the similar exercise by Christiano et al. (1996) using the US flow of funds.

Consistent with the analysis on the US (and in contrast with the case of Italy, as shown in Bonci and Columba 2008), Bonci finds that after an unexpected monetary tightening, non-financial firms increase their net borrowing on impact, and reduce it below the baseline after 2 years. This pattern is the result of a stronger increase in debt than in gross financial assets, mostly inter-company loans and equity. The impact on household portfolios is neater than the findings in Christiano et al. (1996) for the US, with an immediate increase in net borrowing and a subsequent decline below the baseline by the end of the first year after the shock. This aggregate pattern is driven mostly by a decline in the acquisition of mutual fund shares and in currency and deposit holdings, and an increase in the acquisition of short-term securities, an outcome that is consistent also with the worsening of the public sector deficit. Finally, the net external position tends to deteriorate after an interest rate hike, with a recovery towards the baseline after slightly more than 2 years. The results confirm the broad findings of Christiano et al. (1996), but also highlight some major differences, especially in relation to the magnitude of some of the estimated effects. Most interestingly, the mixed cross-sector reactions confirm that financial accounts can be a powerful tool for understanding the effects of monetary policy shocks.

Chapter 9 by Luigi Infante, Alberto Pozzolo and Roberto Tedeschi concludes the book, providing a unified picture of the interrelations between the balance sheets of households, firms, financial intermediaries, and the rest of the world. Their focus is mostly on how the progressive emergence of sizeable imbalances has been one of the major causes of the recent financial crisis. After a discussion of the mechanisms that can lead to a financial crisis, especially the role of cross-border imbalances, maturity and currency mismatches, and asset price misalignments, the authors describe the financial conditions of the major sectors of the economy in the G7 countries and in some smaller European countries at the end of the 1990s, at a moment that can be considered relatively normal. While confirming most of the findings of the previous chapters, the analysis shows the linkages between the positions of the different sectors, and the way in which aggregate imbalances are mirrored by the positions in the rest of the world. Three facts stand out in terms of their implications for financial stability: (a) the very high incidence of financial wealth of US and UK households; (b) the large gaps between the gross positions of financial intermediaries across countries, which might hide maturity and exchange rate misalignments; (c) the huge differences in the size of the external imbalances between debtor countries such as the US and the UK and creditor countries such as Japan, Germany, and more recently China.

They go on to describe the evolution of the financial positions of the major sectors of economic activity in the first decade of the twenty-first century in order to understand whether, and eventually to what extent, the crisis of 2007 and beyond could have been foreseen. It emerges that there was (a) an extraordinary increase in the integration of domestic sector assets and liabilities with the rest of the world (see, e.g., the case of Ireland, Netherlands and the UK), confirming that financial integration was an important component of globalization; (b) a large decrease in households' net assets in some countries compared with an improvement in others;

and (c) a switch from a surplus to a deficit position of general government in the UK and the US, but with limited effects on the ratio of public debt to GDP. Some aspects of the way in which the crisis unfolded could have been anticipated from more careful scrutiny of these trends. Indeed, the figures show that it was clear that financial integration would spread globally the effects of otherwise smaller idiosyncratic shocks, and that countries which experienced a sharper reduction in the net assets of the non-financial sector – such as the UK and the US – would be more severely hit by the crisis.

An important feature that emerges from the analysis is that flows and balance-sheet changes are much more important than actual stocks for understanding the build-up to a crisis. As to the availability of additional data on maturity mismatches, while they might have pointed to some of the risks of certain innovations in financial intermediation, probably other statistical sources than financial accounts would have shown these trends better.

1.3   Conclusions

The essays included in this book make a contribution by showing the power of financial accounts for understanding the structure of financial systems. New research on comparative economics looks at financial structures as a way to detect information on different types of capitalism (Djankov et al. 2003).

The crisis has shown that developments in the financial sector have a greater impact on economic activity than economists had realized, and that macroeconomic theory should incorporate the role of financial intermediation much better (Mishkin 2011; Woodford 2010). Even if theoretical and econometric models do not offer a clear and shared vision of the interactions between the real and the financial sectors of the economy, financial accounts can provide a unified picture of the imbalances across institutional sectors and countries, which, according to many commentators, were a major cause of the recent financial crisis. As such, they will certainly prove useful for studying the emergence of new imbalances and mismatches in the future, which most likely will involve the public sector, households, and the rest of the world. In this respect, more detailed information on maturity and exchange rate mismatches could be useful. But most important is to make full use of the tools already available. We hope that the evidence collected in this volume will contribute to the understanding of how financial systems work.

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The Origins of Financial Accounts in the United States and Italy: Copeland, Baffi and the Institutions

2

Riccardo De Bonis and Alfredo Gigliobianco

Abstract

The paper analyses the birth of financial accounts in the US and in Italy. We start by looking at Morris A. Copeland, the first scholar who rationalized the account framework. We debate the intellectual environment that influenced Copeland's work, namely the building of national accounting and the discussion on business cycle measurement. We summarize the Federal Reserve's intervention that led to the regular presentation of the flow of funds in the 1950s. We then explore the multiple intellectual sources of the "Italian way" to financial accounts, underlining the role of Paolo Baffi, chief economist of the Bank of Italy in the 1950s. The Italian case epitomizes the idea that statistics are not neutral: in their conception and design they reflect the needs of the institutions which implement them. Multiple examples are given of how the rhetorical needs of the Italian central bank shaped the definition of the building blocks of the financial accounts and their presentation. We conclude by describing the later interaction between the evolution of macroeconomic theory and the rise of financial accounts in the 1960s and 1970s, a loss of interest in these statistics in the 1980s and 1990s, and its revival in recent years, mostly influenced by the financial crisis.

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2.1 Introduction

Thomas Kuhn has made us aware how difficult it is, when talking about scientific revolutions, to answer questions of the type 'When did it happen?' or 'Where did it take place?' Although the invention of financial accounts, which completely by-passed most of the world's population, can aspire at most to the qualification of 'minor revolution', the methodological precautions advised by Kuhn apply nonetheless. If we were to stretch the truth of the records and answer those questions, 'In the 'Fifties!' and 'In the United States!', we would run into another problem. Scientific revolutions are rarely the product of individual genius, whatever the romantic myth of the lone inventor implies. More often they are the fruit of the efforts of several scholars, who may come to the same conclusion by different routes. Moreover, it is unlikely that those scholars, especially in the twentieth century, would be able to achieve anything without the support of organisations equipped with the necessary means. Therefore, we must examine how the motives of scholars converge with those of organisations if we are to understand the progress of knowledge.

In this essay we show that the invention of financial accounts was the culmination of a complex process undertaken by economists and statisticians, which began almost independently in several countries. That process, although it responded to a series of common theoretical questions and practical concerns, cannot be ascribed to a single cause. It gave rise to similar, but separate, systems and conceptual frameworks. That said, there is no doubt that the greatest statistical organiser of accounts was Morris A. Copeland (1895–1989), who published in 1952 the fundamental text *A Study of Moneyflows in the United States*.

We begin by describing Copeland's work, from the origins of his ideas to the publication of his main book and the subsequent intervention of the Federal Reserve, more or less at the end of the 1950s (Sect. 2.2). We then look at parallel developments in Italy, where, as in most European countries, the influence of economic policy on statistics has been more explicit (Sect. 2.3). We close with some later research on financial accounts (Sect. 2.4). We chose to concentrate on the US and Italy because the financial accounts were published regularly in the US from 1955, while Italy was one of the first countries to present financial accounts in Europe, starting in 1963 (the following chapter by Riccardo Massaro deals with parallel developments of financial accounts in other European countries).

An underlying theme runs throughout our essay: it is the importance of the institutions for the development of statistics. Financial accounts have had their own Royal Society, Max Planck Institute, and *Accademia dei Lincei*: central banks, semi-public research organisations such as the National Bureau of Economic Research, central statistical institutes, and international bodies.

The structure of this essay is due to the subject-matter. The section on the United States, in which we have to analyse a complex theoretical construction, deals at length with the history of doctrines; the part devoted to Italy seeks to explain how economic policies – and the debates surrounding them – were able to determine the structure of financial accounts tables.

2.2 Copeland's Moneyflows and the Federal Reserve's Flow of Funds

2.2.1 Copeland's Intellectual Context

Copeland's work ties in with various lines of analysis. The first connection is with the developments in national accounts that followed Keynes's *General Theory*. Keynes invented not only a discipline, but also the words to describe it, setting the national accounts on a new basis. Their construction was not an easy one. Blanchard (2000) described macroeconomics before the Second World War as 'an age of confusion'. During the interwar years progress in national accounts can be attributed to Colin Clark and Simon Kuznets.[1] According to Patinkin (1982), the work of Clark and Kuznets was a statistical revolution that anticipated the Keynesian one.[2] Later on, in 1942, Hicks published the first edition of *The Social Framework*. A major effort of organisation produced the United Nations' *System of National Accounts* (SNA) of 1947, strongly based on Richard Stone's paper (1945) on 'Definition and Measurement of the National Income and Related Totals'.

Copeland had already studied the national accounts before the Second World War, publishing papers in the NBER series *Studies in Income and Wealth*. His essays of 1935, 'National Wealth and Income – An Interpretation', and 1937, 'Concepts of National Income', were cited by Stone in the preparatory work for the SNA. Copeland's view was that the estimation of national income could benefit from the use of a double-entry bookkeeping system, i.e. of the approach he would apply for his future moneyflows. During the Second World War, statistical work on national accounts received a tremendous impulse (see Carson 1975). After the focus on the 'inflation gap', i.e. the amount by which the real GDP exceeds potential GDP, it became natural to ask questions concerning the spending capacity (and therefore the financial situation) of the different sectors of the economy: households, firms, government, financial intermediaries, the rest of the world. In other words, when the concepts of national income and other non-financial accounts had been codified, it was a consequent, yet complex, step to move on to the notion of financial accounts.

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[1] A survey of the origins of national accounts goes beyond the scope of this paper. On the subject see Vanoli (2005).

[2] McCloskey's (1985) challenge should not be forgotten: '. . .the Keynesian revolution in economics would not have happened under the modernist legislation for science. The Keynesian insights were not formulated as statistical propositions until the early 1950s, 15 years after the bulk of younger economists had become persuaded they were true. By the early 1960s the Keynesian notions of liquidity traps and accelerator models of investment, despite repeated failures in their statistical implementations, were taught to students of economics as matters of scientific routine. Modernist methodology would have stopped all this cold in 1936: where was the evidence of an objective, controlled and statistical kind ?'

A second inspiration for moneyflows was the debate on the business cycle. Since at least the nineteenth century economists had been discussing the real or financial origins of downturns and expansions of economies. These debates took place without a complete knowledge of how money, credit and other financial variables moved during the business cycle. After the First World War, Wesley Mitchell devoted great effort to the collection of relevant statistics on fluctuations in economic activity, building annual estimates of national income while working at the NBER (see Fabricant 1984, and Rutherford 2003, on the history of the NBER and the role played by Mitchell). Mitchell and Copeland were very close. The moneyflows project was the last undertaken by Mitchell before retiring. Copeland had already worked in the field of statistics before joining the NBER (see Millar 1990). He had been executive secretary of the Central Statistical Board (1933–1939) and director of research for the Bureau of the Budget (1939–1940). In 1944 he entered the NBER where he was commissioned to create a statistical framework for the money circuit. The project was carried out in collaboration with the Federal Reserve, in particular the Board's Division of Research and Statistics.

Moneyflows are part of the American tradition of institutionalism – stretching from Veblen to Commons and from Ayres to Mitchell himself – which stresses the importance of an empirical approach to the interpretation of economic phenomena and the need to build statistics based on time series. It is not an obvious approach: Koopmans's cutting verdict, 'measurement without theory', appeared in 1947 in a review of Burns and Mitchell's book on the measurement of economic cycles.[3]

Copeland's ideas on moneyflows were first and briefly published in 1947, in an article in the *American Economic Review*. His principal book, published in 1952, analysed the moneyflows of US institutional sectors from 1936 to 1942.[4] In Chap. 1 of the volume Copeland quoted some passages from an unpublished memo that Mitchell had written in 1944 ('The Flow of Payments, A Preliminary Survey of Concepts and Data'). In this note Mitchell divided the economy into four groups of units: families, business enterprises, governments and philanthropic agencies. Each group makes payments to and receives payments from the others. In double-entry accounts, the payments made by each group are recorded on one side and the payments received on the other.

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[3] Some defence of Mitchell can be found in Kydland and Prescott (1990). See Della Torre (1993) and (2000) on the links between institutionalism, national accounts developed at the NBER, Mitchell's work, and theory of the business cycle.

[4] Kuhn's conviction – that scientific revolutions are never brought about by one scholar only – is borne out by Copeland himself, who wrote in the preface to his work: 'Mention should be made, too, of a study that to some extent parallels the present attempt to organise debt and credit information and relate it to gross national product information, Raymond Goldsmith's study of saving and capital markets in the United States. Had some of the results of Goldsmith's study become available a year or so earlier, my task would have been easier.' Copeland was referring to Goldsmith's research, which eventually became part of the monumental work, *A Study of Saving in the United States*. Goldsmith's use of the balance sheets of institutional sectors and of flow of funds falls outside the scope of our work and merits specific treatment.

Following Mitchell's memo, Copeland wanted to provide a comprehensive system of measurements of moneyflows and to appraise the significance of such a system. The book is divided in two parts. In the first Copeland presents his statistical framework. In the second he offers some tentative interpretations in the light of monetary theory. We will discuss the main messages of the book following the same line of reasoning: first the statistics (Sect. 2.2.2), then the economic analysis (Sect. 2.2.3).

2.2.2 What Are 'Moneyflows'?

Moneyflows are payments and receipts made and received by one sector to and from another. In his book Copeland provides statistics for 11 sectors: households; farms; industrial corporations; business owners and partnerships; the federal government; state and local governments; banks and monetary funds; life insurance companies; other insurance carriers; other financial intermediaries not included in the above categories; and the rest of the world.

Copeland identifies four origins of moneyflows, or motivations: households' distributive shares, households' product transactions, transfer payments, and flows through financial channels. There are 14 types of moneyflows, all of which can be traced to one of these four motivations. Four moneyflows can be attributed to households' distributive shares: wages and salaries, cash dividends, cash interest, and net owner take-outs (i.e. entrepreneurial cash withdrawals by the owners of unincorporated businesses plus net money rental income of persons). A further four moneyflows are the result of production transactions: customer's payments to firms for goods and services (the greatest moneyflow); rents; instalments to contractors; payments for real-estate sales. Five moneyflows – insurance premiums, insurance benefits, taxes collected, tax refunds, and public purpose expenditures – fall into the category of transfer payments. The fourteenth moneyflow consists in financial transactions and constitutes the fourth motivation. These changes in loan fund balances include currency and deposits, book credit accounts, securities, mortgages, etc. Table 2.1, taken from the Meldenson's (1955) review of Copeland's book, summarises the structure of the moneyflows.

Moneyflows are sources (or receipts) and dispositions (or payments) of money. One moneyflow may be a source for one sector and a payment for another (and vice versa). For instance, for households the main sources are wages and salaries, while the main payments are customer moneyflows. For industrial corporations and business proprietorships, on the other hand, customer moneyflows are mainly sources while wages and salaries are the main payments.

Moneyflows are presented as an extension of the national accounts, which Copeland had written extensively about from the end of the 1920s. Moneyflows are compared with the concept of national income, underlining analogies and differences. First, household distributive shares differ from corresponding items in the national income account because of accruals and imputations (which are not moneyflows), and the different disaggregation by sectors. Second, moneyflows are

Table 2.1

STRUCTURE OF THE MONEYFLOWS ACCOUNTS
Sources & Dispositions of Money—1939—Millions of Dollars

Transactions	I. Households		II. Farms		III. Industrial corp.		IV. Business prop. et al.		V. Federal government		VI. State and local government		VII. Banking		VIII. Life ins.		IX. Other ins.		X. Securities & real estate		XI. Rest of world		Total		Discrepancies[a]	
	S	D	S	D	S	D	S	D	S	D	S	D	S	D	S	D	S	D	S	D	S	D	S	D	S	D
Non-Financial																										
1. Gross Cash Pay	45,100	860		780		25,200		7,800	410	3,940	140	4,160	1,700	580	680	420	220	240	900	1,060	30	30	45,100	45,100		
2. Cash Interest	2,700	1,320		540	340	1,800	60	320	410	1,040		550	20	440	20	20	80	130	1,100	1,300	180	160	7,400	7,400		
3. Cash Dividends	3,800			990	990	4,300	60		30	320	30	10							1,100	700	190	320	6,200	6,200		
4. Net Owner Takeouts	9,300		2,420		2,200	680	3,300	6,160							200					700			9,300	9,300		
5. Installments to Contractors		1,040		60	520	1,860	220	700	30	320	50	30	100	40	200	30	20	10	6,900	1,100			5,500	5,500		
6. Gross Rents	140	3,000		440	440	81,500	50,400	1,500	1,160	1,900	1,360	2,800	360	220		−20	20	30	1,200	240			8,000	8,000		
7. Customers Monopflows	600	51,200	7,900	3,500	119,500	81,500	50,400	36,000							3,640		2,600	810		2,400	3,200	3,810	185,200	185,000		200
8. Net Payments for Real Estate	20	3,200	100		40	100	10	100	5,300		8,400									490		10	680	680		
9. Taxes Collected				480		6,500		1,900	5,300	80	8,400		30	160		130		110		1,300			13,700	13,700		
10. The Refunds									160		180												80	80		
11. Insurance Premiums	3,720	4,300	60	100	260	1,000	140	440	160	720	180		30	90	3,640	120		70	140	380			6,600	6,600		
12. Insurance Benefits	1,560	1,130	810		60	30	1,000	60	840	2,310	2,380	3,240				2,160		1,200		0	150	40	6,800	6,800		
13. Public Purpose Payments														0												
14. Financial																										
Net Increase (+) or Decrease (−) Currency & Deposits — Assets	200	2,500		200	1,000	1,000	400	200	580		100		5,200			100		100		100		1,200	5,200	4,000		300
Liabilities										20														1,500		100
Book Credit — A / L	200			100		1,200		300															1,500			
National Gold Account — A / L													3,100				2,600				3,000		3,000	3,100		200
Federal Obligation Acc't — A / L		200					2,200		200				1,600		500			100					2,200	3,100		200
Treasury Currency Acc't — A / L									200		300		200						600				200	200		200
Other Loans, Securities & Debts Payable — A / L	900					100						100	600		800					300		1,000	1,300	900		300
Corporate Paid-In Capital — A / L	700			200		100	700																	200		
Valuation Adjustments / Valuation Gains / Valuation Losses	500				1,000	200		200		700				100		100		40		100			500	1,840	1,340	
Total Sources[b]	69,200	69,700	8,800	8,800	124,900	126,100	56,200	56,200	10,880	10,920	13,000	12,600	7,400	0	4,800	4,800	3,000	2,840	11,200	10,700	6,600	6,500				
Discrepancies: Sources Not Accounted For / Dispositions Not Accounted For	400		1,300		1,300		200		100			400	0		0		0		0				2,000	900	1,300

[1] Less than .5 million or between ± .5.
[2] Only starred discrepancies are carried from the data in this table. The remaining discrepancies are taken from the original tables.
[3] Total sources and dispositions may differ even because of rounding even after adjusted for sources and dispositions not accounted for.
[4] Includes withdrawals of interest accrued on dividends left on deposit.
[5] Includes sinking and trust funds.

[a] Premium receipts are gross of cash dividends withdrawn by policyholders. Premium payments are shown net of such dividends. Contributions by private business companies to pension funds they maintain for their own employees have been deducted.
Source: Based on the thirteen national moneyflows accounts, the eleven statements of payments and balances, and the various loanfund balance accounts in Moneyflows. These accounts show the sources for every figure used.

mainly measured on a cash basis while the national accounts are predominantly on an accrual basis. Third, loan fund transactions are not product transactions and therefore are not included in the GNP. Fourth, the GNP account only reports transactions connected with the final, current production of goods and services, while moneyflows include product transactions and transfer payments which are intermediate transactions that disappear in the GNP accounts. For this reason moneyflows are much greater than the GNP as the latter excludes transactions involving moneyflows that are non-final-product expenditures.

Copeland states that both his approach and the national income one are based on the notion of the economy as a circuit. Moneyflows make it possible to analyse debit and credit movements that are not part of the concepts of production and income distribution. Copeland describes his work as an extension of 'social accounting to moneyflows measurement', highlighting the advantages of his approach over the equation of exchange. The disaggregate approach produces 'money inflows' and 'money outflows' for each sector. Despite the different definition given to the institutional sectors, Copeland maintains that Leontief's work is similar to his own.[5] Moneyflows go from one sector of the economy to another, with sources 'financing' uses. Leontief describes inputs in producing outputs. There is a visual similarity between the two approaches, as the phenomena are measured by constructing large double-entry matrices.

In addition to moneyflows, Copeland also considers stocks, which are measured by loan funds, i.e. financial assets and liabilities of institutional sectors. He cites Irving Fisher's *The Nature of Capital and Income* of 1906, which draws a distinction between stocks and flows. Copeland stresses the importance of using financial statements in economics, following an approach already adopted by Robertson, Mitchell, Hawtrey, Lutz, Hicks and others.[6] He recalls the difficulty of communication between accounting and statistics, principally because of the different conventions they employ.

Copeland makes a clear distinction between consolidated statements, in which positions between sectors are net of reciprocal transactions, and combined statements, which include – as in the case of moneyflows– all transactions between sectors. He examines issues on which economists and statisticians are still working, such as the differences between real accounts and financial accounts, and – in the case of business owners – the distinction between assets belonging to the business and assets of the owner's family. He points to the difficulties of 'balancing' the total

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[5] 'The Leontief set of measurement resembles the set of moneyflows measurement presented here', Copeland (1952), 2.

[6] In his seminal work of 1935, Hicks said 'we shall have to draw up a sort of generalised balance sheet, suitable for all individuals and institutions'. Furthermore, 'monetary theory needs to be based . . . upon a similar analysis, . . ., not of an income account, but of a capital account, a balance sheet.' Hicks's contribution was fundamental in guiding monetary theory towards an interpretation of money as a store of value instead of a means of exchange. On Hicks, see also Chap. 3 by Massaro.

assets and liabilities of the economy caused by three differences: in the timing of entry of transactions; in the classification of identical items; and in the evaluation criteria applied to assets and liabilities (see Copeland 1952, Chap. 8 in particular.)

2.2.3 Copeland's Monetary Theory and an Interpretation of His Work

After making a statistical reconstruction of moneyflows, in the second part of his book Copeland looks at contemporary monetary theory. He argues that the economy is based on exchanges between economic subjects through a system of prices and the operation of different institutions. Money enables an economy to work. One of its functions is to keep track of moneyflows, i.e. of the claims that economic agents have over the social product; besides being a medium of exchange, it is a storehouse of value that cushions the imperfect coincidence between the institutional sectors' revenues and payments. Money performs this last function with the aid of financial assets and liabilities, including trade credits and debts.

Copeland studies how money influences the business cycle. Regarding the link between expansions and contractions of money, on one hand, and the performance of production, on the other, he proposes 'a partial reformulation of economic theory'. He criticises the quantity theory of money, particularly the aggregate version, according to which money flows to the whole economy indistinctly. Copeland contrasts this 'hydraulic analogy' of economic activity with his version of the economy as an electric circuit, in which several sectors exchange money (Table 2.2). Although the electric circuit analogy sometimes becomes confused and over-stretched – as stated in Baumol's (1954) review of Copeland's book – its purpose is to underline that, in contrast with the hydraulic analogy, every sector has two poles, to and from which money flows, and that the transmission of funds occurs virtually instantaneously.

The sectors make discretionary decisions regarding the size and composition of moneyflows. Each sector's balance depends partly on its choices and partly on those of the other sectors. The equation of exchange does not tell us which sectors 'were advancing or returning money through financial channels and which sectors were obtaining money by financing'. In Copeland's circuit the sectors produce income, receive and make transfers, and create financial flows. Some sectors need external funds to finance their spending, while others supply these funds. According to Copeland, Keynes's view is similar, but in the *General Theory* he takes an aggregate perspective. Keynes was interested in how adjustments between saving and investment affect the level of income. The moneyflows approach links changes in output to changes in money balances and to the structure of the economy's debts and credits. The behaviour of the sectors affects changes in production; some institutional sectors may reduce their financial assets and increase their expenditure; others may build up their financial resources instead.

Copeland examines the banks' role in the business cycle, comparing Fisher's position – that banks influence fluctuations – with Hansen's – that banks cannot

Table 2.2

THE MAIN MONEY CIRCUIT
SHOWING PRODUCTION AND FINANCING CONNECTIONS
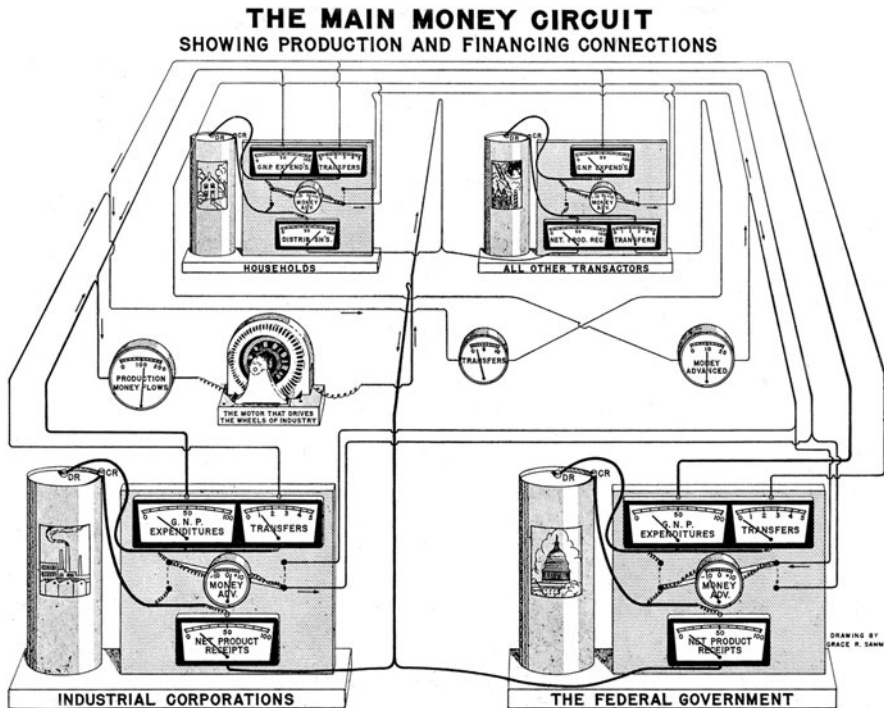
influence the cycle (the two theories are set out respectively in Fisher 1935, and Hansen 1941). The most important flows for banks are changes in the volume and composition of deposits and of credit to the economy, which is given by the sum of loans and securities held in their portfolio. Banks do not autonomously set the supply of credit; it is affected by the decisions of the Federal Reserve through the supply of liquidity, the purchase and sale of securities, and the setting of minimum reserves. The Federal Reserve's influence over the banking system allows the banks to be considered in aggregate, disregarding the differences that exist within the category.

Copeland believes that the behaviour of banks is asymmetrical during the four phases of the business cycle, i.e. depression, recovery, peak of expansion, and recession. In the midst of a depression, the banks' willingness to increase credit can have a positive effect, but they are unable to bring about an economic recovery on their own. Once the recovery gets under way, it can be assisted by a greater availability of loans. If the expansionary phase is close to peaking, higher interest rates and tighter lending policies can have negative effects on moneyflows and cause an economic slowdown. When the economy is in recession, banks can make matters worse by adopting restrictive policies, although 'easier' lending policies alone cannot halt the recession. In summary, banks do influence moneyflows and

economic fluctuations, but mainly during expansionary phases. These positions are close to the view that monetary policy cannot 'push on a string'.

Copeland concludes with a suggestion of directions for future research. He calls for the construction of statistics that separate the balance sheets of poor households from those of rich ones, an objective that is still pursued. He hopes that quarterly data on the activity of enterprises and regional analyses of moneyflows in the United States will become available. Above all, he considers the use of statistics that identify not only the issuers of financial instruments, but also their holders. This principle, known as 'from whom to whom', appears in a few instances in his book due to the lack of statistics; it was introduced in the United States and Italy between the 1950s and 1960s, but it was only used systematically in European financial accounts when the European System of Accounts was introduced in 1995. Copeland ends by recalling Keynes's emphasis on the role of demand in triggering variations in national income. He believes that his own approach – based on the discretionary nature of the sectors' decisions – also helps to highlight the importance of demand. When demand increases, so does the general price level, but relative prices move differently and their variations can be analysed by examining the money circuit.

Copeland's approach was predominantly empirical. He thinks that Keynes' theoretical approach was one of the reasons the General Theory had been assimilated in the Neoclassical Synthesis (see Millar 1991). Copeland had already attacked the abstraction of the neoclassical approach in 1931, causing Frank Knight to express several reservations (the debate is summarised in Asso and Fiorito 2001). In a nutshell, Copeland was an advocate of behaviourism, with its emphasis on distinguishing between science, based on observed behaviour, and the approach to economics based on introspection or mental states which cannot be tested experimentally. On the other hand, Knight criticised the adoption of behaviourism in economics. He defended the role of introspection in the examination of human behaviour and refused the mechanical interpretation of human nature.

It would be wrong to classify Copeland's contribution as empirical only, and to level against him the same accusation that Koopmans made against the Burns-Mitchell duo. Copeland has in mind not only the work of Keynes, but also that of Hicks, notably *Value and Capital*, which was first published in 1939, and in particular Chap. 14 on the difficulties of defining and measuring an economy's income, and Chap. 19 on the demand for money. He asserts that a similarity exists between his ideas and those put forward in *Value and Capital*, underlining that Hicks focuses only on households and firms. Copeland has a vision of an economic system with a wealth of specialised and interconnected activities that is co-ordinated by institutions of the law: property rights, regulations governing contracts and negotiable instruments, rules on compensation and bankruptcy, and freedom of association. Money and other 'pecuniary institutions' are further elements that allow an economy to function (on Copeland as an institutionalist see Rutherford 2002).

After the essays on moneyflows, he remained interested in money, particularly the origin of monetary economies and the development of bank deposits. His interest in all the institutional sectors of the economy led him to study the US

general government debt, with strong emphasis on relations between the federal government, on one side, and state and local bodies, on the other (see Copeland 1961, with a preface by Kuznets).

2.2.4 Moneyflows after Copeland: The Federal Reserve in 1955 and 1959

The history of scientific revolutions is made of adjustments, adaptations and the assimilation of new discoveries. First there was the work from moneyflows to flow of funds. Copeland's work was followed by two economists at the Federal Reserve: Winfield Riefler, who wrote the introduction to Copeland's book, and Ralph Young, manager of the Research and Statistics Division. It was Young who carried on Copeland's work within the Federal Reserve during the 1950s, joined by Dan Brill, who had been Copeland's chief assistant in the reconstruction of statistics (see Taylor 1991). In 1955 the Federal Reserve produced the first version of flow of funds, containing annual flows from 1939 divided by institutional sector and by instrument; statistics on stocks of financial assets and liabilities for banks and other financial intermediaries were also provided. The change of name, from moneyflows to flow of funds, was made for several reasons. First, the expression 'moneyflows' caused ambiguities because it could be confused with changes in the stock of money. Second, Copeland used 'moneyflows' as one word to distinguish his system from business accounting, in which 'money flows' is used to denote cash flows. The Federal Reserve wanted greater clarity to avoid any possibility of confusion with the terminology used by enterprises.

The Federal Reserve, like Copeland, makes flow of funds part of a triad that includes national accounts and input-output tables, highlighting the differences between the three systems. In national accounts the emphasis is on the production and distribution of goods and services. Input-output tables concentrate on relationships between different industries. Flow of funds has two specific features: the economy is divided into sectors and financial transactions are taken into consideration alongside the non-financial transactions typical of national accounts. Flow of funds records transactions entailing the transfer of a credit and/or of money; the production of new goods is taken into consideration, as in the GDP account, as well as transactions involving existing goods, such as the sale of houses and land. The Federal Reserve underlines the differences between flow of funds and the production and distribution of income account: the classification of transactions and sectors, offsetting criteria, consolidation methods, timing of entries, evaluation rules, and estimation methods.

The 1955 version of flow of funds focuses not only on the links between financial and non-financial transactions, but above all on the latter's composition (Table 2.3). In the case of households, non-financial transactions give rise to the following main uses of funds: purchases of goods and services, purchases of houses and durable consumer goods, and payments of insurance premiums and taxes. The non-financial sources of funds are wages and salaries, sales of houses and durable goods, tax

Table 2.3

SUMMARY OF FLOW-OF-FUNDS ACCOUNTS FOR 1953

S = Sources of Funds,   U = Uses of Funds

(Annual flows, in billions of dollars)

Sectors / Transactions	Consumer S	Consumer U	Corporate S	Corporate U	Non-corporate S	Non-corporate U	Farm S	Farm U	Federal S	Federal U	St. and loc. S	St. and loc. U	Banking S	Banking U	Insurance S	Insurance U	Other S	Other U	Rest of the world S	Rest of the world U	Total S	Total U
Nonfinancial																						
A Payroll	195.5	2.7		118.7		30.0		2.6		19.0		13.5		1.9		2.6		4.4		*	195.5	195.5
B Receipts from and payments on investment	59.4	16.3	9.7	20.0	17.5	40.0	1.1	13.0	1.0	5.5	.8	1.0	6.2	2.1	3.5	.3	1.7	1.5	.5	1.9	101.4	101.4
C Insurance and grants	23.9	22.7	1.3	12.2	1.0	3.0	.4		7.5	14.4	11.9	11.7	*	.3	29.0	16.7	5.7	1.4	2.2	.3	82.8	83.0
D Taxes and tax refunds	2.6	40.9	.2	36.0		6.8		1.1	64.8	4.2	21.4	7.8		.8		.7		2.1		*	89.4	89.6
E Capital acquisitions		63.8		26.7		6.0		5.0														819.5
F *Net change in inventories*		*39.4*		*1.6*		*5.1*		*.3*														
G *New fixed capital*		*24.4*		*24.9*		*.9*		*4.6*													*829.9*	
H Other	22.0		.2	.2	1.5	*	.4	*	*	*4.2*	.1	*7.2*			*	*	.4	*2.1*				
I Purchases and sales of other goods and services	155.4		538.3	341.8	195.8	130.2	29.8	10.8	5.0	38.8	5.8	6.4	.8	.7	.5	.2	4.9	3.0	15.8	14.3		
J Total	303.4	301.8	550.0	555.3	215.9	215.9	31.7	32.8	78.4	85.1	40.0	40.4	7.0	5.9	33.0	23.9	12.3	12.4	18.4	16.5	1,290.0	1,290.0
Financial[1]																						
K Currency and deposits		4.4		.1		.4		*	5.2	−1.6		1.0	5.0	.9			*	.2	*	.3	5.0	5.0
L Federal obligations		.3		1.1		.6				.3		1.8		2.5		.2		3.7		.6	5.2	5.1
M Mortgages			1.3	1.8	1.8	.5	.4	.5							*	2.1	*				9.8	9.8
N Corporate securities and State and local obligations	6.2	3.2	6.7	.3	1.6	−.6			.1	−.3	3.6	.3	.1	1.1	.4	6.5	.4	.3	.1	.1	10.9	10.8
O Other	4.5	4.4	−.6	.1	.6	2.3	.6	*		.2		.2	.2	1.4	4.5	.2	4.5	.9	.6	1.4	11.8	10.8
P Total	10.7	12.9	7.4	1.6	3.5	3.2	1.0	*	5.3	−1.4	3.6	3.0	5.2	5.8	.3	9.1	5.0	5.0	.6	2.3	42.6	41.5
Q Grand total	314.4	314.4	557.4	557.4	219.3	219.3	32.8	32.8	83.7	83.7	43.6	43.6	12.2	12.2	33.3	33.3	17.3	17.3	19.0	19.0	1,332.7	1,332.7
Memoranda:																						
R GNP identifiable in J		215.1		29.5		6.9		6.9	.9	57.9	.7	24.4		1.4				10.7		−1.9	6.9	350.9
S Bank credit in P	3.5		.5		1.2		.6						*	6.9					−.2		6.9	6.9

*Less than 50 million dollars.

[1] Financial sources of funds represent net changes in liabilities; financial uses of funds represent net changes in financial assets.

NOTE.—For contents of each line, see notes to summary tables, pp. 1123-24.

refunds, pensions and other public payments. Financial transactions contain information on monetary circulation and deposits, federal government securities, mortgages for house purchases, and securities issued by enterprises and local authorities.

After 1955, the Board of the Federal Reserve asked for the frequency of the statistics to be increased. In 1959 quarterly flow of funds were published in the *Federal Reserve Bulletin*, with a revision of the statistics from 1949. The system adopted for non-financial transactions was simplified (Table 2.4). Many items, such as wages and salaries, were not available on a quarterly basis and were therefore left out, as was much of the data for which Copeland had provided estimates. Compared with the 1955 version, many details regarding non-financial transactions, of households and enterprises alike, were excluded in order to focus on the relation between saving and investment (see Ritter 1963).[7] The Federal Reserve set out, for each sector and for the economy as a whole, the relation between saving, investment, and acquisition of financial assets and liabilities. The new statistics were already, even if at an embryonic stage, integrated accounts of the economy, showing saving, private capital expenditures and net financial investments of the institutional sectors.[8] The emphasis shifted onto the financial variables, which were broken down into greater detail than in 1955, with some loss of information regarding the real aggregates, for which statistics were produced by the Department of Commerce. In sum, the FED flow of funds started to include mainly those moneyflows that Copeland had classified as financial transactions (the fourth origin of moneyflows; see Sect. 2.2.2), with details on net acquisitions of financial assets and net increases in liabilities. For the first time, information was included on savings accounts and fixed-term deposits, insurance companies and pension funds, consumer credit, and shares. An explanation of the reorientation of the statistical framework away from real variables and more towards financial ones lies in the willingness to avoid potential conflict between the Federal Reserve and the Department of Commerce.

With the regular publication by the Federal Reserve, flow of funds became an established tool of analysis of the economy.

2.3   The Beginnings of Financial Accounts in Italy

Copeland was a pioneer, but not before the middle of the 1950s, when his method was suddenly propelled forward by a force stronger than the purely scientific value of his work. That force was the central bank of the leading country of the western world, the United States, which adopted his method and put it into practice with

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[7] Young (1957) provides an application of US flow of funds to the years 1953–1955. See also Taylor (1958).

[8] Sigel (1962) discusses the integration of US flow of funds with the national accounts. For the recent integration of US macroeconomic accounts see Antoniewicz et al. (2005).

Table 2.4

SUMMARY OF FLOW-OF-FUNDS ACCOUNTS FOR FIRST QUARTER, 1959

[In billions of dollars]

Transaction category	Consumer and nonprofit sector U	S	Nonfinancial business sectors — Farm U	S	Noncorporate U	S	Corporate U	S	Government sectors — Federal U	S	State and local U	S	Financial institutions sectors — Commercial banking U	S	Savings institutions U	S	Insurance U	S	Finance n.e.c. U	S	Rest-of-world sector U	S	All sectors U	S	Discrepancy U	Natl. saving and investment
A Gross saving		18.7		1.0		2.2		7.1	.5	.5		−.5		.2		.7		.4				10.6		30.1	113.6	29.5 A
B Capital consumption		10.6		.7		2.0		5.0						.2								.6		18.6		18.6 B
C Net saving (A−B)		8.2		−.7	.1			2.1	.5	.5		−.5												11.5		10.9 C
D Gross investment (E+J)	18.6		.3		2.2		5.3		.5		−1.0		.7		.7		.4		*		.4		27.9		−1.4	26.1 D
E Private capital expenditures (net of sales)	14.5		1.4		3.1		7.4																26.5			26.5 E
F Consumer durable goods	9.4																						9.4			9.4 F
G Nonfarm resident constr.	4.3						*																4.3			4.3 G
H Plant and equipment	.9		1.2		2.1		5.4						.1										9.7			9.7 H
I Change in inventories			.2		.9		2.0																3.2			3.2 I
J Net financial invest. (K−L)	4.1		−1.1		−.9		−2.1		.5		−1.0		.5		.7		.3		*		.4		1.4		−1.4	−.4 J
K *Net acquis. of finan. assets*	6.6			1.1				*	.1		.7		−5.5		2.2		2.2		1.0		.9		7.8		16	−.9 K
L *Net increase in liabilities*		2.5		.6	−.3			2.1	.1	−.4		1.7		−6.1		1.5		1.9		1.0		.5		6.4		.5 L
M Gold and Treas. currency	−1.3					.1		−2.9	−.5			−.4		−.1		−.3		−.2		.1	−.1		−5.5		−1.7	−.1 M
N Currency and dem. dep.									*	−.2				−7.2		*					−.2			−7.2		.2 N
O Fixed-value redeem. claims	2.3												.9		.7		1.7				.1		2.4			−.1 O
P Time deposits	1.1												.9		*		1.3				.1		1.1			−.1 P
Q Savings shares	1.1														1.6		1.4						1.1			Q
R U.S. savings bonds	−.2																						−.2			R
S Saving through life insur.	.8																						.8			.8 S
T Saving through pen. funds	1.6		.7		−.4		1.0			.1					1.6		1.7						1.6			T
U Credit and equity mkt. instr.	4.5	2.5			−.4		1.0	2.2	.5	−.2	1.0	−.2	−5.4	.1	2.5	−.2	2.3	.9			.2	.2	7.2	7.3	.1	* U
V Federal obligations	2.6					−.2	1.5				.6	1.3	−5.5		.7		.1	.3			.2		−.1	1.3	.2	−.2 V
W State and local obligations	.6						.6				.1	1.3			.1		1.0	.3					−.1	1.3		W
X Corp. and foreign bonds	−.1					.2	.6				.3		.1		−.1		.4	.5			.2		1.1			.1 X
Y Corporate stock	−.5					.4	.9										.4				.1		1.1			Y
Z 1-to-4-family mortgages	.8	3.0	.3										.3		1.6		.2						1.9	2.6		Z
a Other mortgages					−.4		−.9						.3		.3		.2						1.7			a
b Consumer credit	−.1					−.6							.4		−.1				*			.4	−.2			b
c Security credit		.2		.1		.2								−.4					*				−.2	.4		c
d Bank loans n.e.c.		.1		.1		−.6								−.4						.7			−.4	.2	−.1	−.1 d
e Other loans				.2		−.2	.4		.1	−.2		−.2	.1	−.2	−.1							−.1	1.0			.1 e
f Trade credit		*			2	92.3	1.6																1.7	2.4	.8	f
g Proprietors' net invest. in noncorporate business	−1.4			.2		−1.5								−.1		*							−1.4	−1.4		g
h Misc. financial trans.					*		.3		.1	−.2									.1		.8	.3	1.0		−.6	−.5 h
i Sector discrepancies (A−D)	.1				1.9							.6		−.5						−.1	.2		2.2	2.2	2.2	3.4 i

* Less than $50 million.

NOTE.—U= uses of funds; S= sources of funds. Financial uses of funds represent net acquisitions of assets; financial sources of funds, net changes in liabilities. Descriptions of sectors and of transaction categories are given in notes to tables and in "Technical Notes," on pp. 846–59 of this BULLETIN.

Details may not add to totals because of rounding.

For other notes see pp. 1047 and 1049.

For discussion of saving and investment concepts see pp. 831–43 of this BULLETIN.

tools suited to the magnitude of the task. Before the 1950s and despite the common intellectual roots we mentioned in the introduction, academics and institutions from various countries, and first and foremost the central banks, had moved haphazardly in that direction.[9] This Section describes the 'Italian route' to financial accounts, explains some of its peculiar features, and gauges its relationship with other national stories.

2.3.1   Paolo Baffi

Paolo Baffi, a young assistant professor from Milan's Università Bocconi who was hired by the Bank of Italy in 1936, is a central figure for understanding Italy's experience. Before and especially during the Second World War, Baffi, influenced by Giorgio Mortara, his teacher, and by Wesley Mitchell, whose work he had translated,[10] examined the problem of drawing up financial statements for the various categories of operators. His basic aim was to predict more accurately the impact of the central bank's monetary policies and, more generally, the reactions of the economy to cyclical or structural changes in interest rates, costs and productivity. To this effect, he needed to achieve a deeper knowledge of the terrain on which monetary policy acted, especially regarding the liquidity position of the various classes of actors in the economic process. In the end, Baffi's scientific programme, which he outlined during the war, was to highlight the link between real phenomena and financial phenomena.[11] The problem was defined clearly in a letter written in January 1941 to the head of the Bank of Italy's Research Office, when Baffi, then in his thirties, was at Pola, having just been called up:

> Dear *Commendatore*,
>   At the Research Office, where we follow and analyse statistics, principally of a monetary and financial nature, we find ourselves poorly equipped to understand the movements of non-monetary aggregates, barring those associated with foreign trade and the manufacture of some products. Yet such movements are among those at the root of financial phenomena: to give an example, the money obtained to underwrite public debt issues or deposited in bank accounts may have been previously invested in inventories, which could not or would not be renewed; or it may have represented the amortisation of plant and tangible assets, which will not be renewed in the present circumstances (ships or buildings).

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[9] An early survey on different national approaches may be found in E. Hicks (1957a).

[10] W.C. Mitchell, 'Fenomeni e fattori dei cicli economici', in Mortara (1932). The text that Baffi translated was the first chapter of Mitchell's book *Business Cycles*.

[11] It is quite probable, as Della Torre (2006) points out, that the Italian experience with the 'money circuit' during the war (an attempt to cancel out, via compulsory saving, the inflationary effects of monetary financing of the State's expenditure) may have had a role in defining Baffi's scientific programme. In fact the money circuit functioned in so far it had no leaks: a detailed knowledge of the liquidity situation of the different classes of actors was instrumental in pointing out possible leaks. One could say that the money circuit was (as an intellectual stimulus) the dictatorial counterpart of the inflationary gap discussed in the same period in the US.

We are at a similar disadvantage as regards our knowledge of the problems encountered by business enterprises: yet the data of such problems determine the situation of whole 'branches' of industry. For example, it is possible that in one industry the plant is not utilised at full capacity (whereas, on first impression, one might conclude that in wartime it should be); why is this so? Is it because low-cost enterprises win against co-existing high-cost enterprises, forcing them to become idle? Is manpower lacking, or are raw materials? (And, incidentally, why, vice versa, does some manpower not find employment?) Have profitable outlets abroad disappeared? Is the market unable to absorb goods produced at the increased costs?[12]

Baffi's programme reflected the theoretical interests of the group of 'statisticians-economists' of the 1930s and 1940s, academics who, as we saw in the previous section, believed that the measurement of economic phenomena could play a key role in understanding them. We can include in this group not only the Italian, Mortara, and the American, Mitchell, but also Kondratiev in the Soviet Union and Beveridge in England, whose lessons at the London School of Economics were attended by Baffi in 1931.[13]

Immediately after the war, Baffi found himself acting head of the Bank of Italy's Research Department, from which position he wielded great power to determine the direction of research. The post-war monetary situation offered many opportunities for reflection on the liquidity of the various sectors, particularly because for a long time the household sector had hoarded large amounts of banknotes, which remained idle until, with the change of economic climate in the summer of 1946, they fuelled the sharpest inflation in the country's history. While the Bank of Italy's Annual Reports for 1945, 1946 and 1947 make mention of the problem, it was not until the 1948 Report that a table of flows was published, called the 'national monetary balance sheet' (see Table 2.5 below, taken from the English version of the Report). It divided the economy into two sectors, 'public sector' and 'private sector'. The liabilities of these sectors (short- and long-term debts and securities, but not the Treasury's debt vis-à-vis the central bank) were offset by 'collections from the public' (current and savings accounts, and again securities, this aggregate being absolutely identical to its counter-item) owned by the economy (essentially households) and by a so-called 'residual' item, containing mainly central bank financing of the economy. Below the line, the central bank's transactions with the Treasury and with the foreign sector were entered. A further line of totals revealed the overall creation of central bank money, as well as total financial asset and liability formation during the period. The whole exercise used flows, not stocks.

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[12] Banca d'Italia, personal file.

[13] See the short biography of Baffi in Gigliobianco (2006).

Table 2.5 National Monetary Budget (billion lire)

	Lending		Collections from the public		Difference between borrowing and collections (residual effect on note circulation)
	To the public sector	To the private sector	Net of current accounts	Current accounts	
Banca d'Italia (direct transactions with the public and special institutions)					
(individuals)	1.1				
1. Advances to [special institutions, to individuals]	3.3				
2. Deferred payments, to individuals					
3. Direct discounts					
4. Rediscount of wheat bills to farm credit banks and local farm credit branches	3.4				
5. Rediscount to the Consorzio sovvenzioni su valori industriali	- 1.1				
	6.4				
6. Private deposits			29.9		
7. Money orders, checks, other sight liabilities				3.7	
			31.6		- 25.2
Credit institutions					
Compulsory investments in ordinary Treasury bills (required by reserve regulation):					
8. direct	72.7				
9. through the Banca d'Italia	61.1				
10. Other investments in ordinary Treasury bills	73.6				
11. Investments in other government securities	3.9				
12. Deposits with the Treasury	- 16.6				
	194.7				
13. Commercial loans		349.1			
14. Surplus of miscellaneous credit items over miscellaneous debit items					
		349.1			
15. Savings deposits and current accounts with customers			277.0	229.4	
16. Money orders and checks				13.8	
17. Surplus of miscellaneous debit items over miscellaneous credit items					
			27.2		
			547.4		
Coverage of the difference between lending and collection:					
18. Rediscounts					- 10.6
19. Debit advances					13.3
20. Deferred payments					0.1
21. a) - minus Deposits required by reserve regulation, not invested in ordinary Treasury bills					13.3
21. b) - minus Other bank deposits					- 6.3
					-3.6
Cassa Depositi e Prestiti					
22. Current account with the Treasury	132.8				
23. a) Investments in ordinary Treasury bills	-				
23. b) Investments in other government securities (including Elfer)es	4.5				
	137.3				
24. Other investments			23.7	{ 143.0 18.0	
				161.0	
Special institutions and capital market					
25. Issue of shares against payment	71.1				
26. Issue of industrial bonds	24.4				
(bonds	43.7				
27. Special institutions (Treasury bills and time deposits	5.4				
	144.6				
28. minus Investments of credit institutions and of the Cassa Depositi e Prestiti in non-government securities	- 21.4				
	123.2				
29. Subscription by the public of ordinary Treasury bills			123.2		
30. Subscription by the public of other government securities and Elfer es	109.5				
31. Deposits of non-banking entities with the Treasury	2.7				
	9.8				
	113.0		111.0		
(1)	445.6	502.4	713.3	262.9	-28.6
			976.2		
32. Current account of the Treasury with the Banca d'Italia	76.6				76.6
33. Advances of the Banca d'Italia to the Treasury	- 0.2				- 0.2
34. Current account of the Italian Foreign Exchange Office, gold and foreign exchange of the Banca d'Italia			162.6		162.6
35. Foreign aid	73.2	30.6	157.1		- 53.3
36. Minor items on the Banca d'Italia balance sheet	(2) 15.1	(2) 2.9			(2) 16.0
	609.7	698.5	870.4	262.9	154.9
			1,133.3		437.8
37. Government budget collections	850.7				
38. Difference between minor Treasury collections and payments	3.2				
	853.9				
39. Payments for budgetary expenditures	(3) 1,663.6				

2.3.2   An Analysis of the 'National Monetary Balance Sheet'

In this Section, we discuss the 'national monetary balance sheet', as we believe it was the embryo of the financial accounts that appeared in the Bank's Report for the year 1964. Before doing so, we must show that one derives from the other. First, we must explain that the use of the word 'monetary' should not be taken to indicate that the first statistics were only monetary statistics and that those introduced later were also financial: in practice, they all attributed the same importance to medium- and long-term financial assets, as is apparent from rows 25, 26 and 27 of the table of the monetary balance sheet. No changes of significance occurred between 1948 and 1960. The table published in the Annual Report for 1960 (Table 2.6 of this essay) adopted a very different form from its predecessor, although it was still called (in the Italian version) 'sources and uses of monetary and financial assets' (*Relazione Annuale*, 1960, page 286, not translated in the abridged English version). The link with the previous table was openly acknowledged: 'In this Report, the aforementioned tables have been replaced by others that reproduce the main lines of the monetary balance sheet and the tables mentioned earlier, but with the addition of some variations' (*Relazione Annuale*, 1960, page 276). The line of reasoning was maintained, and apart from the graphic layout the data were the same. A further innovation was introduced in the Annual Report for 1964, which at last adopted the expression 'Financial Accounts' (*Abridged English Version of the Report for the year 1964*, page 114), still in use today, and contained a large double-entry table entitled 'National Financial Assets and Liabilities' (Table 2.7 of this essay). Although the change was a very significant one, mainly because the from-whom-to-whom principle was established and stock figures were introduced, the line of thinking was the same (particularly as regards the 'statistical motivation', a concept we will explain later)[14] and most of the data were taken from an ongoing research project (on insurance companies, social security institutes and the national accounts). This continuity in research – from 1948 to 1964 – is our *first conclusion*.

We now return to the 1948 table (our Table 2.5), which will be our main focus of study. What first strikes today's reader is the fact that it combines elements of what is a classic financial accounts table with elements of a table of the sources and uses of monetary base. One explanation is that the table was not developed in an academic institution but in a hierarchical one, a central bank, which was by nature wary of any radical innovation. The origin of monetary circulation (the term 'monetary base' only entered the language 15 years later) had long been a subject of study in the Bank, a tradition that arose from the fact that notes originating from Treasury financing received a different tax treatment – normally, less favourable – from those originating from the 'economy' and 'foreign' sectors (which were not separate). In its annual reports the Bank had always distinguished between

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[14] The 'statistical motivation', in terms of the 1964 table, emerges clearly in the research paper published by two of its main authors. See Ercolani and Cotula (1969).

Table 2.6

Flows of Money Supply and Finance Funds

(annual and quarterly changes, in billion lire)

Items	1958	1959	1960	1960 First Quarter	Second Quarter	Third Quarter	Fourth Quarter
By sectors:							
1. Public sector	293.3	369.7	143.2	− 7.4	− 125.1	49.2	226.5
2. of which: short-term credits	295.3	44.1	− 16.6	− 124.8	− 132.9	54.5	186.6
3. securities (¹)	− 2.0	325.6	159.8	117.4	7.8	5.3	39.9
4. Private sector	1,223.2	1,741.5	2,824.3	428.7	685.6	705.5	1,004.5
5. of which: short-term credits	202.7	677.8	1,186.2	48.2	289.1	273.0	575.9
6. loans and mortgages	580.0	691.3	879.9	199.4	181.5	216.1	282.9
7. securities	440.5	372.4	758.2	181.1	215.0	216.4	145.7
8. Foreign sector	459.0	517.9	273.0	− 8.5	76.0	168.9	36.6
9. Total money supply and finance funds (1+4+8)	1,975.5	2,629.1	3,240.5	412.8	636.5	923.6	1,267.6
By types:							
10. Gross liquid assets	1,233.0	1,532.6	1,625.4	− 103.5	346.3	561.6	821.0
11. Other non-security assets	211.1	431.1	521.7	175.2	74.8	120.9	150.8
12. Securities	531.4	665.4	1,093.4	341.1	215.4	241.1	295.8

(1) Including railway bonds.

Table 2.7 Financial Assets and Liabilities of Italy (changes in billion lire)

Assets transferred and liabilities contracted by sectors	Households and non-financial enterprises	Bank of Italy and Ital. Exch. Office	Banks	Special credit insti-tutes	Insurance compa-nies	Govern-ment	Central Post Office Savings Fund	Social Insur-ance Funds	Foreign Sector	Unclassi-fiable and discrep-ancies	Total assets	liab.	balance
HOUSEHOLDS AND NON-FINANCIAL ENTERPRISES													
a) Notes and coin	—	432.4	—	—	—	8.5	—	—	—	1.0	440.9	—	440.9
b) Sight deposits	—	9.9	647.2	—	—	—	82.1	—	—	1.0	740.2	—	740.2
c) Other deposits	—	—	1,031.7	—	—	—	339.7	—	—	—	1,371.4	—	1,371.4
d) Short-term securities	—	—	—	—	—	117.7	—	—	—	—	—	117.7	— 117.7
e) Short-term credits	—	— 1.7	2,044.9	54.6	—	—	—	—	14.4	8.5	22.9	2,097.8	2,097.8
f) Medium- and long-term credits	—	—	255.6	956.3	17.3	14.4	351.2	32.3	173.6	—	—	1,800.7	1,800.7
g) Bonds	135.0	—	—	336.9	—	162.0	—	—	11.0	—	320.9	—	320.9
h) Shares and equity participations	135.0	5.5	70.5	5.0	4.0	—	137.4	8.9	2.9	—	369.2	—	369.2
	— 141.6	—	2.5	1.6	1.0	—	—	—	34.7	—	101.8	—	— 101.8
i) Other financial assets and liabilities	— 141.6	—	— 58.4	0.2	11.3	47.0	—	4.9	569.6	—	432.6	432.6
	—	—	—	155.5	119.1	—	6.6	173.0	913.8	116.0	1,484.0	—	1,484.0
Net financial surplus or *deficit*	=	438.5	631.2	521.7	87.5	332.6	60.2	126.9	227.8	125.5	4,160.8	4,700.3	539.5
FINANCIAL ENTERPRISES													
Bank of Italy and Italian Exchange Office													
A) Gold	—	—	—	—	—	2.7	—	—	62.3	—	62.3	—	62.3
a) Notes and coin	—	—	—	—	—	0.5	....	—	—	—	2.7	—	2.7
	432.4	—	32.3	..	—	320.3	—	7.6	464.2	—	—	464.2	464.2
b) Sight deposits	—	—	—	—	—	15.4	—	—	—	—	15.4	—	15.4
Sight deposits	9.9	—	31.6	3.1	—	320.3	—	7.6	81.7	—	—	186.4	— 186.4
c) Other deposits	—	—	322.1	—	—	8.8	—	—	10.4	—	—	323.7	323.7
Other deposits	—	—	—	—	—	—	—	—	4.2	—	4.2	—	4.2
d) Short-term securities	—	—	—	—	—	54.6	—	—	336.8	—	391.4	—	391.4
e) Short-term credits	— 1.7	—	453.1	18.4	—	459.7	—	—	12.2	—	917.3	—	917.3
f) Medium- and long-term credits	—	—	—	—	—	28.6	—	—	6.0	—	22.6	—	22.6
Medium- and long-term credits	—	—	—	—	—	—	—	—	0.8	—	—	0.8	0.8
g) Bonds	5.5	—	—	0.4	—	8.8	—	—	15.3	—	11.6	—	11.6
i) Other financial assets and liabilities	—	—	—	—	—	—	—	—	—	28.6	—	28.6	28.6
Net financial surplus or *deficit*	438.5	—	67.1	14.9	—	767.2	—	7.6	374.5	28.6	630.9	630.9	=
Banks													
a) Notes and coin	—	32.3	—	—	—	—	—	—	1.3	—	33.6	—	33.6
b) Sight deposits	—	31.6	117.4	33.3	—	0.3	2.3	—	40.8	1.0	77.3	—	77.3
Sight deposits	647.2	—	— 117.4	61.8	7.3	—	—	204.1	275.6	—	—	1,078.6	1,078.6
c) Other deposits	1,031.7	322.1	— 72.2	—	—	—	—	—	168.5	—	81.4	—	81.4
Other deposits	—	—	— 72.2	9.5	—	—	—	—	—	—	969.0	969.0
d) Short-term securities	—	—	—	—	—	13.8	—	—	—	—	13.8	—	13.8
e) Short-term credits	2,044.9	—	8.8	—	—	75.9	—	—	18.0	—	1,995.8	—	1,995.8
Short-term credits	—	453.1	8.8	—	—	—	—	—	25.5	—	—	487.4	487.4
f) Medium- and long-term credits	255.6	—	—	46.0	— 0.8	—	—	—	—	—	300.8	—	300.8
g) Bonds	70.5	—	—	307.5	—	36.3	—	—	—	—	341.7	—	341.7
h) Shares and equity participations	58.4	—	—	27.9	—	—	—	—	—	—	30.5	—	30.5
Shares and equity participations	2.5	—	—	—	—	—	—	—	—	—	—	2.5	2.5
i) Other financial assets and liabilities	—	—	—	—	—	—	—	—	— 3.4	97.6	—	94.2	94.2
Net financial surplus or *deficit*	631.2	67.1	=	276.8	8.1	126.3	2.3	204.1	406.1	98.6	2,631.7	2,631.7	=
Special Credit Institutes													
b) Sight deposits	—	3.1	61.8	—	—	..	—	—	—	—	64.9	—	64.9
Sight deposits	—	—	— 33.3	—	—	—	—	—	—	—	—	33.3	33.3
c) Other deposits	—	—	9.5	—	—	—	—	—	—	—	9.5	—	9.5
e) Short-term credits	54.6	18.4	—	—	—	11.1	—	—	—	—	43.5	18.4	25.1
f) Medium- and long-term credits	956.3	—	—	—	—	—	42.8	—	26.0	—	982.3	—	982.3
g) Bonds	5.0	—	46.0	—	—	—	0.5	15.0	38.5	8.5	150.8	150.8
Bonds	336.9	— 0.4	307.5	—	18.8	—	53.1	58.8	—	—	—	4.5	4.5
h) Shares and equity participations	0.2	—	—	1.4	—	—	—	—	—	—	774.7	774.7
Shares and equity participations	1.6	—	27.9	1.4	4.1	16.5	1.5	—	—	—	1.2	—	1.2
i) Other financial assets and liabilities	155.5	—	—	—	—	—	—	—	—	13.2	53.0	53.0
											13.2	155.5	142.3
Net financial surplus or *deficit*	521.7	14.9	276.8	=	22.9	70.9	54.6	73.8	12.5	4.7	1,119.1	1,119.1	=
Insurance companies													
b) Sight deposits	—	—	7.3	—	—	—	—	—	—	—	7.3	—	7.3
f) Medium- and long-term credits	17.3	—	0.8	—	—	—	—	—	—	—	17.3	— 0.8	18.1
g) Bonds	4.0	—	—	18.8	—	2.1	—	—	—	—	20.7	—	20.7
h) Shares and equity participations	11.3	—	—	4.1	—	—	—	—	12.9	—	28.3	—	28.3
Shares and equity participations	1.0	—	—	—	—	—	—	—	—	—	—	1.0	1.0
i) Other financial assets and liabilities	119.1	—	—	—	—	—	—	—	6.5	—	—	125.6	125.6
Net financial surplus or *deficit*	87.5	—	8.1	22.9	—	2.1	—	—	6.4	—	73.6	125.8	52.2

(continued)

'monetary circulation on behalf of the Treasury' and 'monetary circulation on behalf of trade'.

Since the table is a table of flows and does not distinguish between households and enterprises, it would not have been of much use in an analysis designed to predict or contain an episode of inflation such as the one that happened in 1947. Other factors, in addition to the intention to analyse inflation, must therefore have been at play in order to bring about the construction of a table which was not useful for calculating sectoral liquidity. In the first place one has to mention the very

Table 2.7 (continued)

Assets transferred and *liabilities* contracted by sectors	House-holds and non-financial enterprises	Bank of Italy and Ital. Exch. Office	Banks	Special credit institutes	Insurance companies	Govern-ment	Central Post Office Savings Fund	Social Insurance Funds	Foreign Sector	Unclassifiable and discrepancies	Total assets	Total liab.	Total balance
TREASURY													
Government													
a) Notes and coin	—	0.5	—	—	—	—	—	—	—	—	− 0.5	—	− 0.5
Notes and coin	*8.5*	*2.7*	—	—	—	—	—	—	—	—	—	*5.8*	*5.8*
b) Sight deposits	—	− 320.3	—	—	—	—	—	—	—	—	− 320.3	—	− 320.3
Sight deposits	—	*15.4*	− *0.3*	—	—	—	—	—	—	—	—	*15.1*	*15.1*
c) Other deposits	—	8.8	—	—	—	—	256.4	6.8	—	—	− 8.8	249.6	240.8
d) Short-term securities	− 117.7	− 54.6	− 13.8	—	—	—	—	—	—	—	− 186.1	—	186.1
e) Short-term credits	—	459.7	− 75.9	− 11.1	—	—	—	—	—	—	—	372.7	372.7
f) Medium- and long-term credits	14.4	28.6	—	42.8	—	—	—	—	—	—	57.2	28.6	28.6
g) Bonds	− 162.0	8.8	36.3	− 0.5	− 2.1	—	143.9	− 5.0	—	—	—	70.8	70.8
h) Shares and equity participations	47.0	—	—	16.5	—	—	—	—	—	—	63.5	—	63.5
i) Other financial assets and *liabilities*	—	—	—	—	—	—	—	1.3	—	—	—	1.3	1.3
Net financial surplus or *deficit*	332.6	767.2	126.3	70.9	2.1	—	112.5	3.1	—	—	− 208.9	83.0	125.9
Central Post Office Savings Fund													
b) Sight deposits	82.1	—	2.3	..	—	—	—	—	—	—	—	84.4	84.4
c) Other deposits	339.7	—	—	—	—	− 256.4	—	—	—	—	− 256.4	339.7	596.1
f) Medium- and long-term credits	351.2	—	—	—	—	—	—	—	—	—	351.2	—	351.2
g) Bonds	137.4	—	—	53.1	—	143.9	—	—	—	—	334.4	—	334.4
h) Shares and equity participations	—	—	—	1.5	—	—	—	—	—	—	1.5	—	1.5
i) Other financial assets and *liabilities*	6.6	—	—	—	—	—	—	—	—	—	—	6.6	6.6
Net financial surplus or *deficit*	60.2	—	2.3	54.6	—	112.5	—	—	—	—	430.7	430.7	=
Social Insurance Funds													
b) Sight deposits	—	7.6	204.1	—	—	—	—	—	—	—	211.7	—	211.7
c) Other deposits	—	—	—	—	—	6.8	—	—	—	—	6.8	—	6.8
f) Medium- and long-term credits	32.3	—	—	15.0	—	—	—	—	—	—	47.3	—	47.3
g) Bonds	8.9	—	—	58.8	—	− 5.0	—	—	—	—	62.7	—	62.7
h) Shares and equity participations	4.9	—	—	—	—	—	—	—	—	—	4.9	—	4.9
i) Other financial assets and *liabilities*	173.0	—	—	—	—	1.3	—	—	—	—	1.3	173.0	171.7
Net financial surplus or *deficit*	126.9	7.6	204.1	73.8	—	3.1	—	—	—	—	334.7	173.0	161.7
FOREIGN SECTOR													
A) Gold	—	62.3	—	—	—	—	—	—	—	—	—	62.3	62.3
a) Notes and coin	—	..	1.3	—	—	—	—	—	—	—	—	1.3	1.3
b) Sight deposits	—	81.7	275.6	—	—	—	—	—	—	—	357.3	—	357.3
Sight deposits	—	—	*40.8*	—	—	—	—	—	—	—	—	*40.8*	*40.8*
c) Other deposits	—	10.4	—	—	—	—	—	—	—	—	10.4	—	10.4
Other deposits	—	− *4.2*	*168.5*	—	—	—	—	—	—	—	—	*172.7*	*172.7*
d) Short-term securities	—	− 336.8	—	—	—	—	—	—	—	—	—	336.8	336.8
e) Short-term credits	—	—	25.5	—	—	—	—	—	—	—	25.5	—	25.5
Short-term credits	—	− *12.2*	*18.0*	—	—	—	—	—	—	—	—	*5.8*	*5.8*
f) Medium- and long-term credits	173.6	0.8	—	38.5	—	—	—	—	—	—	212.9	—	212.9
Medium- and long-term credits	*14.4*	− *6.0*	—	*26.0*	—	—	—	—	—	—	—	*34.4*	*34.4*
g) Bonds	2.9	—	—	—	—	—	—	—	—	—	2.9	—	2.9
Bonds	*11.0*	*15.3*	—	—	—	—	—	—	—	—	—	*26.3*	*26.3*
h) Shares and equity participations	569.6	—	—	—	—	—	—	—	—	—	569.6	—	569.6
Shares and equity participations	*34.7*	—	—	—	*12.9*	—	—	—	—	—	—	*47.6*	*47.6*
i) Other financial assets	—	—	− 3.4	—	6.5	—	—	—	—	—	3.1	—	3.1
Other financial liabilities	*913.8*	—	—	—	—	—	—	—	—	3.0	—	*916.8*	*916.8*
Net financial surplus or *deficit*	227.8	374.5	406.1	12.5	6.4	—	—	—	—	3.0	1,181.7	625.8	555.9

limited availability of data. It was impossible to distinguish, within the item 'bank deposits', those of households and those of enterprises. Another difficulty was how to separate, in the banks' books, lending to enterprises from lending to households.[15]

Alongside these two negative elements, or obstacles, we must add two positive elements that had a motivational effect. They are mentioned in the Bank's Annual Report for 1948, in which the table appeared for the first time. It is worthwhile quoting from the Report:

> The borrowing requirement associated with the total gross investment mentioned above was evidently met, albeit in a not accurately quantifiable amount, both with funds drawn from resources flowing to the market and with funds derived from depreciation allowances (and hence included in the sale price of goods) and, finally, also by true self-financing out

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[15] Both difficulties are well known and were mentioned by Baffi himself, who acknowledged that progress since 1948 had been slow (Baffi 1957, p. 316).

of undistributed profits. Unfortunately, it is not possible, with the data available, to effect a direct comparison between investment, on the one hand, and monetary saving and self-financing, on the other. It is possible, however, to give fairly clear details of the resources flowing to the market and the lending operations of the banking systems, both to the Treasury and to the economy. This table, moreover, by considering the residual effect on monetary circulation of the individual sectors' sources and uses of funds, makes it possible to capture the overall effect of the whole set of fund-raising and lending or investment operations on the monetary circulation.[16]

This passage suggests two motivations. The first is to identify the sources of investment financing; the mention of the impossibility of making a direct comparison between investment and saving with the data available indicates that the long-run objective is to match the measurement of investment to that of the sources that help to finance it. This intention, which we call 'statistical', is confirmed by a short internal memo dated October 1949, in which Baffi gives an outline of the Bank's Annual Report to be presented the following year:

For the next annual report it would be useful to examine the possibility of drawing up a national balance on investment by branch of activity using financial data, that is [bank loans, share issues, government investment expenditure, loans from abroad]. There should be a connection between this framework and the national monetary balance sheet, and a comparison can be made between the results and those obtained [. . .] for the 'real' sector.[17]

This document sets out clearly the ambitious programme, only a small part of which was actually achieved during the 1950s, to balance the real aggregates against the financial aggregates in the national accounts.

The second motivation can be broadly defined as an attempt to incorporate the monetary and financial aggregates within a clear quantitative framework. Since the accounts have to balance, this encourages efforts to refine the data. We note that the desire to balance the accounts is expressed, rather surprisingly, as an intention to compute 'the overall effect of the whole set of fund-raising and lending or investment operations on the monetary circulation' (meaning the change in monetary circulation obtained via the banks and the private sector) 'by considering the residual effect on monetary circulation of the individual sectors' sources and uses of funds' (meaning the sum of the differences between investments and deposit accounts observable in the various sectors). This method of presentation, because of the accompanying reasoning in the body of the Report, gives credit to the concept of a central bank that plays a largely passive role in money creation, almost as if constrained within the framework of a posthumous gold standard.

This second motivation calls for further investigation. It ties in with a more general problem affecting the tasks of the central bank during the period of reconstruction and catching-up, as it was perceived by the Governor, Donato Menichella, and the political leaders of the time. There was a very strong 'rhetorical' need – in order to counter repeated outcries against policies described as being

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[16] *Annual Report for the year 1948*, Banca d'Italia, pp. 189–192.

[17] Archivio Storico della Banca d'Italia (ASBI), Studi, cart. 343, fasc. 1, last page.

timid, deflationary and suchlike by politicians, trade unionists and occasionally international institutions – to prove that the banking system had 'done its duty' relative to its obligation of ensuring economic growth. More precisely, we can say that in the 'Concluding Remarks'[18] of those years two typical points regarding the financial system were central to the structure of the discourse.

The first point consisted in substantiating the contention that the system had done 'everything' it could. Let us take, as an example, the Report for 1948: 'The entire amount of these assets was used to finance both the private sector and that part of the requirements of the government for which it was obliged to resort [. . .] to the banking system in order to avoid greater recourse to the central bank. [. . .] the banking system performed its duty fully, unconditionally and fearlessly'.[19] The second point was the evidence that the resources had been channelled increasingly towards the private sector rather than towards the Treasury. According to the Annual Report for 1949, 'Nor did the existence of the compulsory bank reserve prevent a shift of the money supply toward the private sector during the last year. [. . .] In 1948, resorting to the banking system as well as to the financial system in general, the Treasury raised 445 billion [lire] and the private sector 504; whereas in 1949 the Treasury reduced this to 376 billion; and the private sector instead obtained 586 billion, an increase of 82 billion with respect to the previous year.'[20]

These points are entirely consistent with Menichella's view of the Italian economy. This view can be summarised as follows: the objective to be pursued is growth; growth depends on investment (while consumption is not recognised as having any role); investment depends positively on saving and negatively on the funds taken up by the Treasury and not allocated to investment. Given these sole determinants of investment, we should reflect that money or credit illusion will only have the effect, through inflation, of altering the distribution of income inequitably.

A crucial element in this argument is the decision to present the liquidity created by the central bank through its refinancing of banks as a 'residual' effect *on* monetary circulation of the economy's sources and uses of funds via the market and the banking system. To give an example, 'The exceptional growth in the formation of monetary assets has made it possible to reduce the rise in monetary circulation from 283 billion in 1947 to 175 billion in 1948'.[21] This bears out the concept of a 'natural' economy that progresses at a pace it would be impossible to modify with monetary devices: basically, money is a lubricant. An 'active' monetary policy was not contemplated (although monetary policy, was by no means non-existent). Alongside issues that we now recognise as being typical of monetary policy (although, it is important to note, *with almost no reference to*

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[18] The final part of the Annual Report, read by the Governor at the Annual Meeting of the Bank, was (and still is) called 'Concluding Remarks'.

[19] Menichella's 'Concluding Remarks' have been reprinted in Cotula, Gelsomino and Gigliobianco (1977), Vol. ii. The original quotation appears on page 24.

[20] Cotula, Gelsomino and Gigliobianco (1997), Vol. ii, page 38.

[21] Cotula, Gelsomino and Gigliobianco (1997), Vol. ii, p. 21.

interest rates), the Concluding Remarks dealt extensively with the distribution of credit, financial resources, and 'monetary assets'. Such distribution is regarded as the result of collective behaviour on the part of bankers, rather than of their individual decisions. The prevailing view of the financial system is still a corporative one: it transmits, or at least should transmit, public objectives, not so much by means of the regulatory instruments envisaged by the law (discount rate, compulsory reserves, etc.), but because these objectives are fully appropriated by bank executives. The central bank enters the scene because it sets down the written rules and the unwritten ones, becoming shepherd of the flock of banks. Each member of the flock is free to graze a bit further here and there at will, but mass movements must depend on the authorities.

Interestingly, it was also decided to place central bank financing of banks and the private sector (changes which were added to changes in deposits) above the first line of totals while central bank financing of the Treasury was placed below it. Baffi explains this decision in *Monetary Analysis in Italy* as 'the area covered by this row of totals is coterminous with the jurisdiction of the monetary authorities under the Bank Act and the statutes regulating the issue of securities.'[22] This explanation was clearly intended as a 'defence': the line was drawn to indicate what happens in the area for which the Bank is responsible; money created via the Treasury and the foreign sector is outside the Bank's control. This way of presenting data facilitates and justifies a reasoning which hinges on the structure and behaviour of a 'natural economy'.

The history of the 1948 table leads us to our *second conclusion*: the Bank's 'rhetorical' needs determined in several ways the manner of presentation of the data. This confirms the validity of a new school of historiography of statistics, which considers the significance of the discipline in terms of culture and communication and not just the purely technical aspect. According to the authors of this school, statistics do not merely reflect reality, they 'build' reality, i.e. they have a profound influence on the way that problems are identified and tackled.[23] Central banks, like the majority of organisations, do not have only a policy 'of things', but also a policy of communication, including statistical communication, and had one well in advance of the 1980s and 1990s debate on the link between the credibility of central banks and their communication strategies.

Our conclusion is borne out by the fact that what we described as the peculiar features of data presentation ended with the Report for the year 1960, the first issued under Governor Guido Carli: the data are virtually the same (although additional tables provide greater detail), but their presentation has been radically altered. Whereas in another part of the Report a distinction is obviously made between central bank financing of the Treasury and financing of the banks,[24] in the financial

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[22] Baffi (1957), p. 318.

[23] See Desrosières (1993) and Tooze (2001).

[24] The distinction appears in Annual Report for the year 1960, Table 109 (and in English in the *Abridged Version of the Report for the year 1960*, Table 34).

accounts table money creation is consolidated; the concept of 'residual' referring to refinancing of the banking system disappears. A table of the sources and uses of monetary base appeared 3 years later, in the Annual Report for 1963 (p. 286), only to become regrettably more muddled the following year 1964 (p. 348; p. 86 in the English version).

Our examination of the 1948 table led us to set aside momentarily the source of Baffi's inspiration, associated with the conduct of monetary policy. We find some trace of it in an essay which Baffi wrote in 1985, 'Via Nazionale e gli economisti stranieri': 'Despite these and other possible defects, the "monetary balance sheet" constituted the first attempt to give an overall view of financial flows (albeit of net amounts) and to identify the forces pushing towards expansion or contraction that stemmed from the sources of monetary base creation (Treasury, economy, and foreign sector) and was extremely useful for analysing the reciprocal links between these sources and the uses of the monetary base.'[25] This assertion confirms that there was more than one inspiration for the table. The 1957 essay 'Monetary Analysis in Italy' gives some interesting examples of how the table can be used: (1) to relate the flow of funds to the volume of investment, from which indications can be obtained regarding the evolution of self-finance in relation to the business cycle: in periods of inflation (or, rather, of overheating) profits increase and the ratio of flow of funds to investment decreases; (2) to observe - having acknowledged that banknotes are held mainly by households and that households react slowly to price increases - that: 'The public absorbs cash in a manner which exerts a dampening influence on the inflationary process, for, by decreasing to this extent the liquidity of the banks, the public in effect lowers the coefficient of expansion applying to the funds available to the banking system at the central bank. The use of average coefficients of expansion [i.e. deposit multiplier] therefore seems inappropriate in the analysis of the credit cycle, whenever currency is an important part of the money supply'[26]; (3) to encourage caution when interpreting cyclical deviations from trend in the volume of deposits.[27]

2.3.3 The Intellectual Framework of Monetary Movements

Let us now consider the broader intellectual context in which studies on monetary movements developed. We have mentioned the link between Baffi and Mitchell before the Second World War (through Mortara and the translation of Mitchell), but there is no trace of any contact with Copeland after the War, although of course it is possible that Baffi had read his 1947 article. The first documented contact with foreign academics working in the field of flow of funds dates to June 1953, by

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[25] Baffi (1985), § 11.

[26] Baffi (1957), p. 322.

[27] Baffi (1957), p. 322.

which time the Italian system was already in place: it was then that Baffi visited Holland as a guest of the Dutch central bank, which was a leader in this field.[28] Meetings then took place in 1956–1957 with the Federal Reserve and the group organised by the International Monetary Fund, led by Earl Hicks, who promoted the February 1957 issue of *Staff Papers*, mainly dedicated to the topic.[29] In an article written for the issue, Holtrop says that 'The purpose of the method of monetary analysis [. . .] is to provide the Bank with a tool to help it in unraveling the mechanism of inflationary and deflationary disturbances and thus to aid the Bank in framing its policies.'[30] Earl Hicks was of the same opinion: 'Monetary Analysis [. . .] is an inquiry into the sector origins of changes in the quantity of money made for the purpose of trying to understand the forces pushing towards expansion or contraction.'[31] Baffi's article, 'Monetary Analysis in Italy', which was also published in the 1957 issue of *Staff Papers*, takes much the same line. J.J. Polak, perhaps the group's leading economist, seems slightly more biased towards real issues: 'we want to isolate autonomous spending, that is, spending that does not constitute a mere passing on in the next round of income received in the previous round of the income stream. Fluctuations of the expenditure not associated with fluctuations in income by the same sector are precisely want financial statistics focus on.'[32] This is consistent with Copeland's own approach, as described in Sect. 2.2.2.

We can conclude that the original version of the monetary balance sheet was entirely the result of interaction between Baffi and Governor Menichella, and that it can be ascribed basically to four factors: (1) a remodelling of the central bank's traditional balance sheet (monetary circulation on behalf of trade and monetary circulation on behalf of the Treasury); (2) the willingness to fill the knowledge gaps that Baffi and his colleagues, partly due to the influence of Mitchell and Mortara, spotted during and after the War (economic cycle, monetary policy, statistical motivation); (3) the difficulties in obtaining the data; and (4) Menichella's political and rhetorical requirements. This is the *third conclusion*, which confirms the 'multiple' nature of the financial accounts (their many origins and many uses) mentioned in the introduction and in connection with the experience of the United States.

We can now trace at least one of the directions that could have been taken but was not, *irrespective* of the fact that Menichella had an evident interest in the matter. There does not appear to have been any attempt to develop financial accounts in the way they were originally developed in the United States (the 1955 flow of funds), that is, with an emphasis on the flows created by real transactions in order to capture the sources of operators' self-financing. This would have been useful to support a certain type of argument that the Bank was

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[28] Documents regarding this trip, including correspondence between Menichella and Holtrop, Governor of De Nederlandsche Bank, can be found in ASBI, Studi, cart. 383, fasc. 2, sfasc. 83.

[29] The correspondence is in ASBI, Carte Baffi, cart. 346.

[30] Holtrop (1957), p.303.

[31] Hicks (1957b) in ASBI, Carte Baffi, cart. 346/2.

[32] Polak (1959), pp. 1–8.

often called on to set forward: on several occasions Menichella answered specific categories of operators who complained of the lack of financial assistance by pointing to the sector's aggregate resources resulting from the evolution of relative prices. In 1955 he told farmers and savings banks that 'if the volume of credit flowing to agriculture has been proportionally smaller than the volume of credit flowing to all other economic activities, this is a natural condition because credit to agriculture has been provided by us, by you, by me, paying prices that were much higher than the average of other prices.'[33]

2.3.4 The Modernised Format Propounded by Guido Carli: A Short Account

Guido Carli's arrival in the Bank of Italy marked a change of policy and mentality, and a new relationship with the public. The major event on the policy front, from our point of view, was the partly successful attempt to create a money market, which had not existed beforehand: the main instrument was the new system of Treasury bill placement launched in 1962. There began to be scope for a less rudimentary monetary policy. Regarding the change of mentality, new impetus was given to research, which received a substantial endowment of resources, and old approaches and traditions were put aside. As far as public relations went, the amount of communication increased dramatically and the central bank's 'teaching' role was enhanced.[34]

The new system of accounts introduced in 1960 to replace the monetary movements reflected the changed needs, both material and 'rhetorical', of the central bank. Although considerable interest was still focused on the uses of financial resources, under Carli monetary policy could and did come into the open: this created a need for a theory based on aggregate money supply. The central bank could stop depicting itself as a passive subject: the concept of residual disappeared.

A few years later the main reform was enacted, the one culminating in the large matrix appearing in the Report for the year 1964. This was a double-entry table in which each sector (economy, banks, special credit institutes, market, and Treasury) had a row and a column. Every XY cell contained, instrument by instrument (currency, deposits, bonds . . .), the financial flows from sector X to sector Y.

This system of accounts, which was very similar to the present format (except that the presentation adopted then was later abandoned), was first introduced, as explained in the report and in the methodological notes published in the

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[33] Menichella (1955), p. 589.

[34] On the innovations brought about by Carli, see his biography in Gigliobianco (2006), in particular pp. 292–297.

Bank's *Bollettino*,[35] as part of a convergence of methodologies within the EEC[36] (and no doubt following the experience of the Federal Reserve mentioned earlier), and satisfied the new exigencies of the central banker. While the discussion of monetary policy relied on the liquidity table and the analysis of investment financing also had a new and substantial statistical apparatus, the financial accounts matrix served a debate geared to developing the financial market. A mature and deep financial market – this was Carli's argument – is necessary because without it small changes in the supply of bonds cause large changes in securities prices (and interest rates), forcing the central bank to intervene by issuing currency, which may have an inflationary effect.[37] From those years onwards, the financial accounts, although they retained and considerably refined their original 'statistical function' (some very interesting work was done to link them to the national accounts, which finally produced concrete results in 1968[38]), also became the testing ground for international comparisons of the development of markets and intermediaries.

The most serious flaw, the failure to make a distinction between households and enterprises (see Sect. 2.3.2), was rectified in the 1965 Annual Report. Since then, academics and operators have had sounder material on which to base their study of households' propensity to save and firms' indebtedness. Moreover, it finally became possible to make the attempt, until then only possible in theory, to identify the sector of origin of forces pushing towards expansion or contraction by means of sectoral financial analysis (basically, a resumption of Holtrop's and Polak's theories mentioned above).[39]

This brief incursion in the 1960s allows us to *carry forward the second conclusion* that we reached: the 'rhetorical' needs of a central banker always accompany the evolution of the format of the financial accounts. This is meant as a reminder that statistical work is, now as in the past, conditioned and stimulated not only by the theoretical tools available and the difficulties encountered in gathering data, but also by the particular 'world views' of those who commission it. In fact, once statistics have been produced and published they acquire a power that should not be underrated, the power to consolidate, and even to block, the lens through which both public and experts view reality.

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[35] Banca d'Italia (1965), pp. 107–125 (the point we are interested in is on p. 122). More information and data can be found in Cotula and Caron (1971).

[36] The reference is to the working party that finally produced the ESA70.

[37] Banca d'Italia, *Annual Report for the year 1964*, 'Considerazioni finali', p. 493.

[38] In the Annual Report for 1967 the first explicit attempt – i.e. not confined to internal memos – was made to link the financial accounts to the capital account.

[39] On this point again see Ercolani and Cotula (1969), p. 20.

2.4   Rise, Fall and Revival of Financial Accounts

In this final Section, we briefly look at some developments of financial accounts in the 1960s and 1970s, at their later less frequent use, and, finally, at their intellectual resurgence in recent years.

During the 1960s, the study of financial accounts took different directions, interacting with economic theory and policy applications. We describe only two developments, each of which would really deserve separate and lengthy discussion: Tobin's emphasis in studying the links between the financial and real sectors of the economy, and the use of financial accounts in econometric models and for economic forecasts.

According to Keynes, the demand for money depends on income instead of wealth; in the speculative motive framework the individual chooses to hold either only money or only securities. Tobin progressed from demand for money to demand for financial assets, where the latter are chosen according to their risk-return profile: this is the theory of portfolio choices.

Wealth consists of money, other financial assets and real assets. Tobin looked not so much at the link between the money demanded and income as at the way operators distribute wealth between financial and real assets. The emphasis shifted to the capital account in the balance sheet of individual operators, partly because of the importance of the wealth effect debate in those years. Wealth in its various forms influences not only the demand for new financial assets, but also aggregate demand: consumption and investment do not depend on income alone (Tobin 1952, 1961). An examination of the total financial assets exchanged in an economy prompted Tobin to ponder the differences between banks, on the one hand, and non-bank intermediaries, on the other. Together with the work of Gurley and Shaw (1960), that of Tobin (1963) is one of the first contributions on the specific or non-specific role of banks, an issue often examined by the Yale school.[40]

In 1962 Duesenberry remarked that 'the Keynes' of flow-of-funds analysis had not yet made an appearance.[41] The flow of funds was an accounting system, but there was no complete body of behavioural equations that could use the statistics. In the following years Tobin presented stock-flow models of the financial sector and its interactions with the real sector.[42] In particular, Tobin (1969) centred his analysis on the capital account of the institutional sectors. An economy's relationships are summarised in a table that is the same as the normal financial accounts table, with

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[40] Hester and Tobin (1967a), (1967b) and (1967c) collected the school's most important contributions in three volumes, published by the Cowles Foundation.

[41] 'The national income analysis had Keynes…[but] the Keynes of flow-of-funds analysis has not yet revealed himself', Duesenberry (1962).

[42] As Buiter (2003) noted, 'Tobin's mistrust of the representative agent approach and his relaxed attitude towards micro foundations are consistent with his decision to pursue the empirical implementation of complete systems of portfolio balance and flow-of-funds models using asset demand specifications that were eclectic or ad-hoc as regards the selection of arguments.'

different sectors appearing in the columns and financial instruments in the rows. Tobin stressed that the financial sector and the real sector are interdependent. Initially, the real variables and the stocks of financial assets are assumed to be exogenous and determine the financial instruments that each sector wishes to hold. According to the logic of a general economic equilibrium model, the financial inputs to the real sector must have the same values as the initial real inputs to the financial sector.

If we turn now to the use of financial accounts in econometric models and financial forecasts, we may distinguish between four approaches. The first sought to build tables of the financial sector of the economy which were sometimes incorporated in the large macro-econometric models.[43] This research field was boosted by the paper by Brainard and Tobin (1968); they presented a scheme of the financial sector in which the flows, stocks and yields of financial assets were determined, the policy variables or real aggregates were assumed to be exogenous.[44]

A second line of research, mainly undertaken by central banks, used financial accounts to predict future flows of funds, and savings and investments of the various sectors were assumed to be exogenous; the flows of financial assets and liabilities of households, enterprises, general government and the rest of the world were estimated. One aspect that differentiated between national experiences was the form of the feedback from the financial sector to the real sector. In the forecasts, there was a consistent behaviour of the various sectors.[45] The forecasts were used in the programming of financial flows which many industrialised countries, including France and Italy, attempted with varying degrees of success.

A third category of models stressed the connection between sources and corresponding uses of funds. An economic system can be summarised in input-output tables, taking a certain financial instrument as input for the production of a given output. The amount of each input required to produce one unit of output is a fixed technical coefficient of the system. Richard Stone was probably the most prolific builder of such models: based on the idea that in an economy stable relations exist between financial liabilities, on the one hand, and financial and real assets on the other, in terms of both stocks and flows (see Stone 1966). The main problem with this approach was that in advanced economies the technical coefficients were not fixed because innovation – principally in the methods of financing business and general government, and international activity – altered

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[43] The applications were heterogeneous, a feature they shared with the Keynesian macroeconomic models (see Visco 2005).

[44] One Italian application is Modigliani and Cotula (1973). Regarding the incorporation in the Bank of Italy's econometric model see Fazio et al. (1970).

[45] Regarding the United States, '. . . we see more and more clearly one of the ways in which everything depends on everything else . . . as Bob Solow once put it', Taylor (1963). As far as the United Kingdom is concerned, 'The whole is reasonable only if the parts are', Bank of England (1972).

the balance between financial assets and liabilities. This financial input-output approach was thought to be more promising in planned or developing economies, in which regulation and public intervention, not capital market developments, determined the allocation of financial flows.

The fourth group of models relates to forecasts of interest rates by private institutions in the United States and Canada. The models were based on flow-of-funds statistics and hypotheses about the future behaviour of the monetary authorities. By comparing the economic sectors' demand for finance with the supply of funds, it was possible to obtain estimates of interest rates.

The three surveys we draw on – Cohen (1972), Roe (1973) and Bain (1973) – list some 250 works on flow of funds which were published in the 20 or so years after Copeland. In the middle of the 1970s the interest in financial accounts waned, and no survey of recent developments is available. Factors such as the abandonment of Keynes's approach; the growing emphasis on the microeconomic foundations of macroeconomics; the difficulties encountered by macro-econometric models, including the assessment of the interactions between financial and real sectors; the justified disappearance of economic planning and programming of financial flows; the abandonment of administrative monetary policy controls and the growing role of prices in attaining market equilibrium, conversely to the quantities considered in the financial accounts; the unsuccessful empirical application of flow-of-funds models, partly because of collinearity of yields on financial instruments used as independent variables in the demand functions of financial assets (see Walsh 1981); the growing role of monetary and credit aggregates as tools for the conduct of monetary policy; the progressive focus of central banks on the objective of price stability, sometimes to the detriment of a general analysis of the financial system; and the difficulties of achieving international harmonisation of statistics, partly because the process of European integration stalled until the middle of the 1980s, are some of the causes of the decline in importance of financial accounts.

In recent years financial accounts have made a comeback as an important source of information for economic analysis. Eurostat has published annual financial account of the EU countries since 1995. Renewed interest was linked to the development of official statistics for the purposes of the European monetary union. The European Stability and Growth Pact introduced a specific form of budgetary surveillance, based on strict monitoring of the development of government deficit and debt and which was accompanied by plausibility and validation checks. In this context, the financial accounts of the government sector played a major role as the only analytical tool able to cross-check the simultaneous plausibility of the debt and deficit figures, often derived from different sources of data and by separate institutions. The reconciliation of deficit and debt through the financial account (or 'stock-flow reconciliation') is one part of the official statistical reporting foreseen by the European Treaty (Excessive deficit procedure notification).

The European Central Bank (ECB) has collected quarterly financial accounts from euro-area national central banks since the end of the 1990s and has published quarterly euro-area financial accounts since 2007. The ECB looks at financial

accounts as a cross-checking between the two pillars of monetary policy strategy, i. e. as a way to link economic and monetary analysis (Papademos and Stark 2010). Projections of financial assets and liabilities for the euro area are similar in scope and methodology to the central banks' exercises of the 1960s and the 1970s we discussed earlier. Since 2007 the ECB has also commented every quarter on the integrated euro-area accounts: they provide consistent information on the income, spending, financing and portfolio decisions of the sectors of the economy.

The financial crisis shed new light on the importance of monitoring financial flows and stocks not only for the conduct of monetary policy but also to try to ensure financial stability (see Palumbo and Parker 2009; Be Duc and Le Breton 2009; Gonzalez-Paramo 2009). Financial stability or soundness indicators are normally collected and commented using the financial accounts. The European Commission is devoting attention not only to public debt but also to private debt of households and firms in evaluating economies' performance.

The history of ideas is a history of the sudden vanishing of lines of research that later resurface in a new form, like underground rivers. The recent revival of interest in financial accounts is due not so much to theoretical developments as to a new acknowledgement of their usefulness. Efforts to revamp the financial accounts have been made by Eurostat, national statistical institutes, the Eurosystem, other national central banks including the Federal Reserve Board and the Bank of Japan, and the OECD. It is a confirmation of the role that institutions play in the history of science, without losing sight of the relevance of the theoretical approach. Indeed, one of our aims in these pages has been to recall the great economists on whose shoulders rests the present-day work on financial accounts.

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Private Sector Debt Matters Too: Theoretical Perspectives on Credit and the Building of Financial Accounts

3

Riccardo Massaro

If there is no change in the liquidity position, the public can save ex-ante and ex-post and ex-anything-else until they are blue in the face, without alleviating the problem. (Keynes 1937b: 668)

Abstract

Many authors in the 1930s created a theoretical framework that described financial interactions within the enterprise sector as a whole and between firms and the household sector, giving equal importance to stocks and flows. These authors include Schumpeter, Keynes and Fisher. Soon after World War II discussions started on conceptual and practical problems regarding the design of financial accounts. This phase culminated in the SNA 68, the international accounting manual which provided an integrated view of financial phenomena across sectors. The work was done mostly by statisticians, the most prominent being Copeland and Stone. As data on financial accounts became regularly available, some economists used them to fathom the long-term tendencies of the American economy. Some of them signalled that the remarkable post-war economic growth was accompanied by significant increases in private debt, which grew to such an extent as to potentially jeopardize the long-term prosperity of the American economy. Authors in this vein include Minsky, Kaufman and Teplin. The need for financial accounts to monitor the economy was initially felt in the 1930s, when the Great Depression was unfolding. Their availability today might help to design solutions for a healthy return to growth after the 2007–09 world recession.

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3.1   Introduction

The history of financial accounts is a fascinating subject as several economists have made contributions to its inception and development. Copeland can be regarded as the pioneer of the building of financial accounts: in 1947 and 1952 he proved, with key support from the NBER and the Fed, that existing primary statistics in the USA were adequate to compile a national accounting system based on moneyflows, i.e., distinct categories of flows of money that circulate across sectors of the economy. It is unnecessary to elaborate on Copeland's contribution, which has been commented in the previous chapter by De Bonis and Gigliobianco. Here we will look into the streams of economic thought that predated Copeland (1952) and those that were contemporary and followed him.

We will argue that the 1929–1933 depression gave great impetus to studies of the financial sphere of industrialized economies, and that an urge to classify and measure financial magnitudes was then shared by many economists.

The chapter is organized in five sections. After this introduction, Sect. 3.2 deals with credit and boom in economic thought from 1927 to 1947. Section 3.3 describes the building of financial accounts in the post-war era. Section 3.4 is dedicated to reflections on the post-war private sector debt in the US. Section 3.5 briefly concludes.

3.2   Credit and Boom: 1927–1947

In this section we will distinguish four lines of enquiry: (1) a Schumpeter branch, with contributions from Hayek and Machlup, which conceives booms and depressions as due largely to swings in credit extended by banks; (2) a Keynes branch, which suggests that booms and depressions are due to imbalances in savings and investment across sectors; (3) a Fisher branch, which focuses on the outstanding debt of each sector; and (4) a statistical branch, concerned with the systematic collection of integrated financial statistics to monitor the economy.

3.2.1   Excessive Credit Extension

3.2.1.1 Schumpeter

Schumpeter wrote his book *Economic Development* in 1912. Although it was not translated into English until 1934, in the late 1920s Schumpeter himself summarized his main ideas in two articles published in English. The first article appeared in *Economica* in 1927, with the title *The Explanation of the Business Cycle*. Schumpeter believed "what happens in depression to be the consequence of something which happened in the boom" (Schumpeter 1927: 295) and thus concentrated on booms. In his opinion:

> booms consist in the carrying out of innovations in the industrial and commercial organism.
> By innovations I understand changes of the combinations of the factors of production
> as cannot be effected by infinitesimal steps. (Schumpeter 1927: 295)

Innovations are characterized by two important features: (1) they take place in leaps; (2) after a step in a new direction has successfully been made, it becomes easy for other entrepreneurs to follow suit.

According to Schumpeter, banks play a large role in the occurrence of booms. In fact it is the additional purchasing power created by banks that permits the large-scale adoption of innovations:

> banks can and do, even without knowing it, exert influence on the pace of prosperity and
> depression, although . . . more on the former than on the latter; and they do more than this.
> They not only finance innovators' or entrepreneurs' demand, but also the demand of other
> people, who simply want more credit because they see prices rise. . . . Hence, they help the
> coming up of a secondary wave of the boom. (Schumpeter 1927: 307)

Schumpeter is, of course, aware of the role of savings but, as he considers them to be generated from profits,[1] accumulated savings are "a shade less important" for innovators (Schumpeter 1927: 304–305).

The role of new firms for innovation, and the financing channels of new firms, is restated in a later article as follows:

> innovation, being discontinuous and involving considerable change and being, in competi-
> tive capitalism, typically embodied in new firms, requires large expenditure previous
> to the emergence of any revenue, credit becomes an essential element of the process.
> (Schumpeter 1928: 381)

In the 1928 article Schumpeter also made the point that the emergence of very large companies, or "trustified capitalism", required a modification of his original theory to take into account the access of large companies to non-bank finance.[2] This was not so much a change in theory as the result of empirical observation. It had, however, an important theoretical implication, on which Schumpeter did not elaborate: a role for the general public in the financing of non-financial enterprises.

3.2.1.2 Hayek

After 1931 Hayek became a regular contributor to the economic debate in England. In 1933, when he was teaching in London, he published *Monetary Theory and the Trade Cycle*, a marginally revised version of a book published in 1929 in German. Its main purpose was "to refute certain theories which have led to the belief that, by stabilizing the general price level, all the disturbing monetary causes would be

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[1] Schumpeter considered savings to be generated mostly from profits: "[the] constant revolution of industrial and commercial methods is constantly yielding profits, the first, most natural and most important source of 'mobile resources' or of 'savings'" (Schumpeter 1927: 304).

[2] "Innovation is, in this case, not any more embodied typically in new firms . . . Although credit creation still plays a rôle, both the power to accumulate reserves and the direct access to the money market tend to reduce the importance of this element in the life of a trust" (Schumpeter 1928: 384).

eliminated" (Hayek 1933: 16). Our main interest is for the sections in which Hayek considered "the *monetary causes* which *start* the cyclical fluctuations" (Hayek 1933: 17).[3]

The theoretical apparatus within which Hayek developed his analysis was that of Wicksell:

> His fundamental thesis is that when the money rate of interest coincides with the natural rate (i.e., that rate which exactly balances the demand for loan capital and the supply of savings) then the money rate bears a completely *neutral* relationship to the price of goods, and neither tends to raise nor to lower it. . . . this thesis enables him to show . . . that every lag of the money rate behind the natural rate of interest must lead to a rise in the general price-level. (Hayek 1933: 112)

Wicksell's analysis had been largely restated by Mises. However, Hayek decided to take a different route to both of them and to:

> develop to the full the effects of all discrepancies between the natural and money rates of interest on the relative development of the production of capital goods and consumption goods. (Hayek 1933: 133)

Taking a broad view of the issue, Hayek suggests that the alternation of booms and crises is not necessarily due to actions taken by banks, as several events might take place outside a stationary economy:

> The situation in which the money rate of interest is below the natural rate need not, by any means, originate in a *deliberate lowering* of the rate of interest by the banks. The same effect can be obviously produced by an improvement in the expectations of profit or by a diminution in the rate of saving, which may drive the 'natural rate' (at which the demand for and the supply of savings are equal) above its previous level. (Hayek 1933: 146–47)

Furthermore, in the opinion of Hayek, the German literature often lacks clarity on "the 'credit creation' of the commercial banks" (Hayek 1933: 150).[4] Once one is aware of the possibilities available to the entire banking system of a country, one can conclude that the banks are able to satisfy an increase in demand of credit from businessmen "without being obliged immediately to raise their interest charges" (Hayek 1933: 166).

In this vision, the scrutiny of bankers is important, and it is necessary for them:

> to weigh carefully the relative advantages and disadvantages of granting credits on an increasing scale. But the utmost that can be achieved on these lines is only a mitigation, never the abolition of the Trade Cycle. . . . the only way of minimizing damage is . . . an increased insight into the nature of the Trade Cycle and a knowledge of its actual phase at any particular moment. (Hayek 1933: 191–192)

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[3] "My *Prices and Production*, originally published in England, should be considered as an essential complement to the present publication. . . . I have, in the later publication, concentrated on the *successive changes in the real structure of production*, which *constitute* those fluctuations." (Hayek 1933: 17).

[4] However, a clear perception of the issue was recent in the Anglo-American literature as well. See the contribution of Crick (1927).

The last statement by Hayek, which heralded the knowledge of the *actual phase*, led directly to the production and collection of statistics. By this route, a book which had started on theoretical issues turned out to promote "the development of empirical research and forecasting" (Hayek 1933: 229). We will comment more on this later in Sect. 3.2.4.2.

The important step that Hayek made beyond Wicksell was that he moved, basically within the same theoretical framework, from a study of inflation and deflation to a study of the business cycle. In Hayek's vision the actions taken by banks have a real impact on production.

3.2.1.3 Credit and the Stock Market in Machlup

Fritz Machlup, an Austrian economist belonging to the circle of Mises,[5] published the book *Börsenkredit, Industriekredit und Kapitalbildung* in 1931.[6] The origin of the book was an examination of stock-exchange lending in Germany and the United States in the late 1920s. Before developing his main topic, Machlup built up an analytical apparatus in which he studied the interrelations between capital formation, credit and the stock market.

Machlup produced an extensive and well-articulated list of items which contribute to capital formation:

> current savings, current replacement allowances, currently liquidated working capital, and also new bank credit and disbursements of surplus cash balances (Machlup 1940: 14–15)

Each item is discussed at some length and, very interestingly from our perspective, Machlup does not consider individual firms but "the economy as a whole".

His treatment of "current savings" does not clarify whether he is referring only to savings within the business sector or also to savings made in other sectors. However, in later sections, dealing with the stock exchange, he discusses "the process of transferring saving to the producers" (Machlup 1940: 27), which implies that savings made by other sectors are considered.

His *current replacement allowances* and *currently liquidated working capital* are funds within the business sector. He also suggests that firms can obtain other funds by liquidating non-essential financial assets. On external financing Machlup apparently mentions only bank credit, but as we suggest above, the heading "current savings" includes external financing channelled through the stock exchange.

Machlup is always careful to distinguish between gross and net funds, the latter being the only ones available for new investment. He also makes the important point that the exchange of existing securities is not relevant to new capital formation.[7]

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[5] The other economists in the circle were Mises himself, Hayek and Haberler.

[6] A second edition of the book, slightly revised, was published in English in 1940. Our quotations are from the English edition.

[7] "So far as old securities . . . are concerned, it is immaterial from the point of view of real capital formation or its utilization how many times and at what prices these existing titles to a share in the yield of real capital exchange hands." (Machlup 1940: 21)

Later in his analysis, Machlup suggests interpreting the acquisition of securities by the public as a form of credit:

> We are here bringing the two forms of security, stocks and bonds, under one formula which abstracts from the legal distinctions and concentrates on the essential economic characteristics common to both. As to their periodic share in the return of the enterprise we may call both capital shares; while if we wish to emphasize the transfer of purchasing power we may regard both as credit transactions. (Machlup 1940: 22)

Machlup clearly moves beyond Wicksell, Schumpeter and Hayek when he discusses the co-operation between bank credit and security credit, for example, when an industrial enterprise finances an extension of plant at first with bank credit and later refinances its debts by issuing securities (Machlup 1940: 25). But Machlup, echoing Hayek, notices a difference in the two forms of credit: when the demand for funds by business is met by banks they "are able to grant additional credit on unchanged or practically unchanged terms", funds derived from current new savings are instead "fairly inelastic" (Machlup 1940: 92).

In the last part of the book Machlup introduces the concept of "transfer credit", the case in which an entrepreneur lends money to another entrepreneur. The term was chosen as "the purchasing power accruing to the borrower is counterbalanced by the purchasing power foregone by somebody else" (Machlup 1940: 224). The choice of terminology reveals again that Machlup was interested in non-financial enterprises as a sector.

In some places Machlup distinguishes between the cash balances of producers and the cash balances of consumers (Machlup 1940: 224). He considers this an important new feature:

> The introduction of surplus balance credit into the analysis of the trade cycle supplements modern monetary theory. (Machlup 1940: 247)

Summing up, Machlup put forward the same basic ideas as Hayek on the causes which lead to a boom, but he constructed a framework in which the financing of firms was articulated in several categories: internal funds, loans from banks, other financing. Hence, Machlup contributed to clarifying the financing needs of the non-financial enterprises sector.

3.2.2   Savings and Investment Take Place in Different Sectors

3.2.2.1 Booms and Slumps in Keynes's Treatise on Money

Although the main argument of the *Treatise* is a theory of the price level, it also deals with fluctuations in business activity. In Volume I of the *Treatise* Keynes argues in several places that investment decision and saving decisions are taken by different people, and the occasional divergence between them is the main explanation of the trade cycle. Keynes introduced the terminology *available output* for output available for consumption, and *non-available output* for capital goods (Keynes 1930, v. I: 127). In his opinion:

> If the decisions as to the proportion of the flow of future output to be in available and in non-available form respectively at a given date were to be made by the same people who decide how much is to be 'saved' at that date, no trouble would arise. But if they are made – as in fact they are – by different people, then ... the net increment to the capital wealth of the community as a whole will differ to a certain extent (more or less) from the aggregate of the cash-savings of individuals. (Keynes 1930, v. I: 175)

Keynes repeated his fundamental idea on the origin business cycles in other parts:[8]

> It is not surprising that Saving and Investment should often fail to keep step. In the first place ... the decisions which determine Saving and Investment respectively are taken by two different sets of people influenced by different sets of motives, each not paying very much attention to the other. (Keynes 1930, v. I: 279)

A second important element of his theory of the business cycle is that whilst "saving is essentially a steady process", "investment in fixed capital ... has been accustomed to proceed irregularly and by fits and starts." (Keynes 1930, v. I: 280)

The separation between savers and investors creates the need for external financing of business. This is implicit in certain passages of Keynes. For example, when discussing the early phase of a boom, he notices that:

> the development of an investment boom certainly does not mean that the entrepreneurs who initiate it have deliberately decided that the public are going to save out of their incomes on a larger scale than before. (Keynes 1930, v. I: 279)

Some form of bridging finance is then required, and a few lines later Keynes mentions that:

> it is the facilities allowed by the banks which are the marginal factor determining the precise degree to which entrepreneurs will be in a position to carry out their enterprises. (Keynes 1930, v. I: 279)

It would thus seem that Keynes shared the basic tenets of the theories of Schumpeter and Hayek: banks play an important role in an investment boom.

A more complete exposition of his theory of the business cycle is offered by Keynes in Volume II, in which Book VI is dedicated to "the rate of investment and its fluctuations". Here Keynes suggests that a disequilibrium between savings and investment is generally due to fluctuations in the rate of investment.[9] He then goes on to study the causes of changes in the rate of investment under three headings:

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[8] One has to bear in mind that the definition of saving and investment in the *Treatise* is not the same as that in the *General Theory*. The difference is due to the definition of income in the *Treatise*: "the definition of income, which I there employed, differed from my present definition by reckoning as the income of entrepreneurs not their actually realised profits but (in some sense) their 'normal profit'" (Keynes 1936: 77).

[9] "When there is disequilibrium between savings and investment, this is much more often due to fluctuations in the rate of investment that to sudden changes in the rate of savings, which is, in normal circumstances, of a fairly steady character." (Keynes 1930, v. II: 95).

fixed capital (goods in use), working capital (goods in process) and liquid capital (goods in stock).

Regarding fixed capital, Keynes's analysis is very similar to that of Schumpeter.[10] Basically Keynes's argument is the following: (1) a small group of innovators from time to time develops new products and new forms of industrial and commercial organization; (2) once these individuals achieve success, a crowd of imitators joins in; (3) the pace at which the innovating entrepreneurs will be able to carry out their projects depends on the behaviour of the banking system.

The time required to build up working capital is seen as an element that explains the "slow upward movement of the boom" (Keynes 1930, v. II: 146). Liquid capital, i.e., goods in stock, and the attempts to get rid of its surplus play, instead, a role in explaining the slow recovery after a crisis (Keynes 1930, v. II: 130). The combination of the two elements that Keynes adds to Schumpeter's analysis of fixed capital makes the profile of the business cycle more complex, and is commented by Keynes in the following manner: "an important factor of *instability* is thus introduced into our economic life" (Keynes 1930, v. II: 146, italics added).

Summing up, in *Treatise on Money* Keynes presented of a theory of business fluctuations that hinged on fluctuations in investment, in which saving was seen as a rather passive element. Both his theory of fixed investment and the role assigned to banks were similar to the ideas presented by Schumpeter in 1927 and 1928.

3.2.2.2 Keynes and Financing after the General Theory

In the *General Theory* Keynes centred his attention on the new elements that he was introducing in economic theory. He did not devote much attention to the financing needs of the economy.[11] However, the topic was promptly raised by Ohlin. In his replies Keynes produced new insights.

In 1931 a Swedish committee had asked four economists to write monographs on economic policy in relation to unemployment. The studies were published, in Swedish, in 1933 and 1934. Ohlin, one of the four economists, was invited to give a presentation on these issues in the prestigious Marshall Lectures in Cambridge in 1936. A year later Ohlin published a two-part article in the Economic Journal, summarizing the Swedish theory of savings and investment and comparing it with Keynes's *General Theory*.

Ohlin found it useful to distinguish between variables that referred to plans and those related to a bygone period, or ex-ante and ex-post variables. In this framework

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[10] Keynes acknowledges the influence of Schumpeter on his ideas: "Professor Schumpeter's explanation of the major movements may be unreservedly accepted" (Keynes 1930, v. II: 95–96).

[11] Schumpeter in 1954 noticed a different treatment by Keynes in the *Treatise* and in the *General Theory* of the view that bank loans create deposits: "The deposit-creating bank loan and its role in the financing of investment *without any previous saving up of the sums lent* have practically disappeared in the analytic schema of the *General Theory*" (Schumpeter 1954: 1114). More in general, the need to consider the entire evolution of Keynes's analytical framework, and not just his 1936 book, has been suggested by various post-Keynesian authors, such as Vicarelli (1984).

he discussed the financing of investment. According to him, financing constraints play a major role in deciding investment levels:

> *The investment plans* are ... based on the profit expectations. But it would be wrong to assume that entrepreneurs plan to carry out all the investments which they think will yield a return, exceeding the rate of interest which they expect to pay. ... Of all the possible investments which seem profitable, only some are planned for the next period and actually begun. This may be due to the fact that the present cash and credit resources of the firm are not large enough to permit more, or that the expected cash and credit resources put a check on the investments. ... [I]t is clear that the cash and credit resources, which the firm has at its disposal at the beginning of a period and acquires during the period, provide an upper limit for its *ability to buy*. (Ohlin 1937a: 61)

Ohlin then extends his analysis to consumers. He denies that they are only concerned with income and consumption over the next period; financing opportunities are important for them as well. Ohlin concludes that "the present and expected future position with regard to cash or credit plays the same role for consumption demand as for investment demand" (Ohlin 1937a: 63).

Ohlin also suggests that it is necessary to make a detailed study of the acquisition of financial instruments, and criticizes Keynes for bypassing the issue:

> Consumers buy consumption goods, business men buy capital goods, i.e., invest in a real sense, but there is a third kind of purchases to be explained – namely, "financial investment", i.e., the purchases of bonds, shares and bank deposits and the failure to use savings either for real or financial investment, which is identical with an increase in cash. It is noteworthy that Keynes ... pays so little attention to the connection between changes in production, income and savings on the one hand and the ability to make financial investments on the other. (Ohlin 1937b: 226)

Keynes replied to Ohlin shortly after. He worked further on his position and provided additional ideas. In his first reply Keynes makes the following argument:

> Planned investment – i.e., investment ex-ante – may have to secure its "financial provision" before the investment takes place; that is to say, before the corresponding saving has taken place. ... There has, therefore to be a technique to bridge this gap between the time when the *decision* to invest is taken and the time when the correlative investment and saving actually occur. This service may be provided either by the new issue market or by the banks. (Keynes 1937a: 246)

He then states his new position in very neat terms:

> 'finance' has nothing to do with saving. At the 'financial' stage of the proceedings no net saving has taken place on anyone's part, just there has been no net investment. (Keynes 1937a: 247)

In December of the same year Keynes published another article elaborating on Ohlin's views. In it he deals with the practicalities of financing, distinguishing previous accumulation of financial assets, short-term and long-term debt:

> The entrepreneur when he decides to invest has to be satisfied on two points: firstly, that he can obtain sufficient short-term finance during the period of producing the investment; and secondly, that he can eventually fund his short-term obligations by a long-term issue on satisfactory conditions. Occasionally he may be in a position to use his own resources or to

make his long-term issue at once; but this makes no difference to the amount of "finance" which has to be found by the market as a whole. (Keynes 1937b: 664)

Keynes restates, broadly along the lines of the *Treatise*, the essential role of banks in allowing changes in the scale of economic activity to take place. More explicitly, he remarks on the impossibility of converting future savings into current investment:

The investment market can become congested through shortage of cash. It can never become congested through shortage of saving. This is the most fundamental of my conclusions within this field. (Keynes 1937b: 669)

The discussion on financing which took place between Ohlin and Keynes in 1937 thus provided strong encouragement to study cash circuits in the economy. This was an essential aspect of *Moneyflows* as conceived by Copeland, and a concept incorporated in later versions of financial accounts.

3.2.3 Excessive Accumulated Private Debt

3.2.3.1 Debt Levels in Fisher

After the stock market panic in 1929, Irving Fisher undertook an in-depth study of depressions. In 1930 he presented some preliminary notes on the book he was working on. His attention had been drawn to the excessive expansion of loans in the years preceding the stock market crash:

there was an unjustified going into debt, encouraged by the fact that investors found themselves confronted on the one hand by wonderful opportunities to make money and, on the other, a low rate for loans. They could borrow at much less than they expected to make. (Fisher 1930: 96)

Further elaboration led to his book *Booms and Depressions*, which appeared in 1932. It breaks down the causes of the depression into nine main factors. The first factor, the fundamental one, is over-indebtedness, which Fisher links to insolvency: "over-indebtedness is whatever degree of indebtedness multiplies *unduly* the chances of becoming insolvent" (Fisher 1932: 69).

Conscious that the stock of debt does not tell the whole story, he also takes into account the stock of assets:

Everyone who is not a gambler, provides himself with a margin of safety. He puts a buffer between his debts and the collector. This buffer is the difference between assets and liabilities. (Fisher 1932: 69)

However, a generic buffer is not enough to attain security, and a more detailed analysis becomes necessary:

Over-indebtedness is largely a question of dates of maturity. The entire set-up of assets and liabilities, therefore, has to be considered. (Fisher 1932: 69).

In a few steps we are thus led to examine the entire balance sheet of an enterprise, as well as to investigate each one of its items.

Fisher did not explicitly suggest assembling a balance sheet for large groups of individuals, but it was implicit in his discussions of over-indebtedness as a separate state from the normal debt situation of the community. He probably moved towards a macroeconomic framework because the general depression was due to elements affecting all enterprises simultaneously. In fact, when many firms try to liquidate their assets at the same time, the proceeds from sales are modest, while a general deflation makes debts larger in real terms, causing a further deterioration in the position of debtors.

A depression once started will continue for some time in a disorderly fashion. The crisis only ends when the level of debt in the community declines sufficiently, attaining a "normal" level:

> Ultimately, of course, the over-indebtedness, whether of one individual or of *a whole community*, will be wiped out, with or without business failures. But sometimes the liquidation … does more than restore a *normal debt situation*. (Fisher 1932: 72, italics added)

The last remark takes into account the likelihood that the liquidation phase may affect the psychology of market participants in such a way as to delay recovery. Deluded savers might become too prudent:

> Those debtors who have burned their fingers by over-indebtedness, and those creditors who have burned theirs by over-lending – especially if the two groups comprise most of the community – become over-cautious, and end in an undue reaction against borrowing. (Fisher 1932: 72)

In his 1932 book Fisher distinguishes between individual and community over-indebtedness. The second one is riskier for several reasons. Excessive debt is easier to detect in the case of an individual, by comparing him with other individuals, and the overall consequences are not too severe. On the other hand, if too many individuals have high levels of debt it becomes difficult to detect them, as people may believe that the "normal debt level" has moved upwards; the consequences of excessively high debt for the entire community can be devastating.

Fisher's book includes a brief survey of other theories of booms. When dealing with the ideas of Keynes (1930) he comments on the importance of external financing to make up for differences between investments and savings of the business sector:

> The *discrepancy* between savings and investments has by some students been emphasized as causing trouble – and very likely it does, especially by investing out of borrowed money instead of out of savings. The discrepancy is caused largely by debt. (Fisher 1932: 124)

Thus, Fisher endorsed the main idea of Keynes on the origin of business cycles, but his attention was more on the build-up of debt than on the intermittent character of investment.

3.2.3.2 Henry Simons

As we know, under Franklin D. Roosevelt the American financial system was re-regulated in the years 1933–1935 by the introduction of new laws and new

institutions. Shortly afterwards, in 1936, Henry Simons, of Chicago University, stated that in his opinion the changes made until then were too timid. To avoid new financial crises, he suggested introducing new norms and adopting at least severe limitations on short-term loans. The ideas presented by Simons were analogous to those of Fisher (1932), but they were worked out to their ultimate consequences.

Simons (1936) starts by describing the ideal financial system. It is a system in which a financial crisis will not lead to the forced liquidation of a large number of enterprises, thus avoiding a cascading effect and the possibility of falling into a deep depression.

In the ideal financial system all financing takes the form of shares or other forms of participation in capital. In this way the fortunes of the lender are directly linked to those of the controlled enterprises and, crucially, it is not possible to withdraw finance when enterprises encounter a difficult period.

Later in his list Simons suggests perpetual loans, i.e., loans for which the principal cannot be redeemed; one can only ask for the payment of interest. Such payments do not vary over time and are independent of the current economic situation. Therefore, should a financial crisis occur, it cannot be accelerated under this scheme.

Simons then considers long-term loans over periods of at least 50 years. Even in this case interest payment flows are independent of the phase of the business cycle, and the reimbursement of principal is spread gradually over time. This scheme, too, would attenuate the repercussions of a financial crisis.

Short-term loans are instead a very risky form of financing:

> The economy becomes exposed to catastrophic disturbances as soon as short-tem borrowing develops on a large scale. No real stability of production and employment is possible when short-term lenders are continuously in a position to demand conversion of their investments. … [S]hort-term obligations … precipitate hopeless efforts at liquidation during depressions. The shorter the period of money contracts, the more unstable the economy will be. (Simons 1936: 9)

Simons was well aware that his reflections on private debts required the creation of a very different financial system to that in which he lived: "To propose abolition of all borrowing, of even of all borrowing at short-term, is merely to dream." (Simons 1936, p. 16).

However, he thought that a complete re-organization of the financial system would be feasible if done gradually. The main obstacle he perceived was that of obtaining a convergence of opinions on the long-term strategy, on the shared aims of a properly designed financial reform (Simons 1936: 16).

3.2.4 Requests for Financial Statistics

As we have seen so far, in the 1920s and 1930s several economists attempted to understand the roots of the business cycle, and some studied its possible deterioration into a long depression. Beyond the conceptual understanding of the

business cycle, two lines of practical action were suggested. The first was that of Simons, already illustrated, which advocated a profound reshaping of the financial system, designed to limit borrowing and especially short-term borrowing. The second was to request the regular collection of a broad set of financial statistics for several reasons: better understanding, monitoring, forecasting and possible intervention. We will now examine this second line of action.

3.2.4.1 Keynes 1930

It is perhaps surprising that Keynes ended his *Treatise on Money* by turning his attention, in the very last pages, to the lack of adequate statistics:

> before we can either perfect our theory or apply it with safety to practical issues, there is another kind of knowledge which we need to increase – namely, exact quantitative information concerning contemporary economic transactions. (Keynes 1930, v. II: 407)

The surprise stems from the monumental character of the *Treatise*, almost the testament of an entire generation. That Keynes ended up in unexplored territory may seem odd, but he was nevertheless firmly convinced of the need for more statistics:

> In the case of monetary science there is a special reason why statistics are of fundamental importance to suggest theories, to test them and to make them convincing. (Keynes 1930, v. II: 408)

Moreover, he did not blame economists for that state of affairs. In his opinion, it was the British "practical bankers", including the Bank of England, who had done nothing to facilitate improvements in the collection of statistics. Modern readers might question Keynes himself for not providing a list of essential statistics, but they would very probably have agreed with him at the time: to raise awareness was more urgent than to draw up a detailed list.

3.2.4.2 Hayek 1933

We have already underlined in Sect. 3.1.2.2 how Hayek considered the collection of statistics a necessary step to gauge the *actual phase* of the Trade Cycle. Thus, Hayek led the way in promoting empirical research (Hayek 1933: 229). His treatment of the issue was broader than that of Keynes (1930).

Hayek called for better statistics on the money market (Hayek 1933: 231), but other areas too required additional work:

> It is in the statistics of private banking . . . that the heaviest task presents itself. In Europe we are still worse supplied with these than with those of the money market proper. In the United States, on the other hand, some pioneer work has been done in this field. (Hayek 1993: 233)

For the United States, he referred specifically to a set of four articles by A. A. Young, which had appeared between 1924 and 1927: *An Analysis of Bank Statistics for the United States*. The main merit of Young (1924, 1925a, 1925b, 1927) was that of calling attention to the usefulness of some statistics that had been collected for several years, but not used to get an overall

view of banks as a sector. The work of Young was a step towards macroeconomics as much as a step into empirical analysis.

Hayek had great expectations of banking statistics:

> The possible contributions of banking statistics to Trade Cycle research are by no means exhausted by the chance they offer of observing the immediate connection between the granting of credit and the movements of production. (Hayek 1933: 237)

And he effectively foresaw a large role for them:

> Such an investigation … if it were to clear up the relationship between interest rates, profits, and the liquidity of the banks, would further our insight into the factors determining credit expansion as well as our knowledge of their limits, and thus make it possible to forecast movements in the factors determining the total development of the economic situation. (Hayek 1933: 237–38)

It is also very interesting that Hayek reflected on the cost of new banking statistics:

> As soon as it is realized that, owing to the existence of banks, the equilibrating forces of the economic system cannot bring about that automatic adjustments of all its branches to the actual situation, which is described by classical economic theory, it is justifiable even from a liberal point of view that the banks should be subjected to degrees of publicity as to the state of their business which is not necessary in the case of other undertakings; and this would by no means imply a violation of the principle of business secrecy, since it would be quite sufficient for this purpose if the authorities were to adopt the United States' plan of publishing summary returns for all banks at frequent intervals. … [A]n alleviation of cyclical fluctuations should be expected pre-eminently from a greater publicity among business enterprises, and particularly among the banks. (Hayek 1933: 238–239)

It is clear that Hayek considered the cost of collecting banking statistics not only bearable but advantageous overall. His vision of developing an ability to provide forecasts once adequate statistics become available, and a theory to interpret them is built, is particularly intriguing.

3.2.4.3 Hicks on Balance Sheets

In his frequently cited article *A Suggestion for Simplifying the Theory of Money,* Hicks puts balance sheets at the centre stage. His starting question is how much money an individual decides to hold. He notes that an individual can reduce his holdings of money in three ways: (1) by buying something; (2) by lending money to someone else; (3) by paying off debts which he owes (Hicks 1935: 4–5). Hicks remarks that the three above mechanisms are possible in a community without banks. All that is required is the existence of substitutes for money. He calls these substitutes "safe investments", and gives a list of sectors with safe liabilities:

> The appearance of … safe investments will act as a substitute for money in one of its uses …. This particular function is performed, in a modern community, not only by banks, but also by insurance companies, investment trusts, and, to a certain (perhaps small) extent, even by large concerns of other kinds …. And, of course, to a very large extent indeed, it is performed by government stock of various kinds. (Hicks 1935: 10)

Hicks repeats his idea that banks are not essential later in the article: "my suggestion can be expressed by saying that we ought to regard every individual in the community as being, on small scale, a bank." (Hicks 1935: 12).[12] We can restate this by saying that the key element is being able to lend, which can be done by drawing down "safe assets".[13]

Hicks also suggests building monetary theory around balance sheets. But he does more than that: he suggests that it is necessary to draw up a single generalized balance sheet "suitable for all individuals and institutions" (Hicks 1935: 12). He also advocates a precise balance sheet, which has the following financial assets: money, bank deposits, short-term debts, long term debts, stocks and shares.[14] The list of financial liabilities is, somewhat mysteriously, not symmetrical and shorter: short-term debts, long-term debts (Hicks 1935: 13).

Considering that the article appeared in 1935, in a period of deep depression, the work of Hicks may appear a little too abstract and remote. We interpret it, though, as a clear request for the collection of financial statistics. It suggests new lines to follow in monetary studies after the return to normal conditions. The idea that banks are not alone in having the ability to finance is full of practical consequences: in a world in which many units and institutions have a significant financial role, it is wise to study each sector along similar lines.

Hicks also chose to emphasize stocks of financial assets and liabilities, instead of current flows. We trace this back to the influence of Fisher (1932).

3.2.4.4 NBER

Taking the statistical route was the main suggestion of the Exploratory Committee of the National Bureau of Economic Research. The Committee set out its reflections in *A Program of Financial Research,* in two volumes, published in 1937. The core idea was that financial institutions were interdependent and therefore could not be studied individually. This had become evident during the Great Depression. The Committee then proposed moving into action and studying the financial sector as a whole with the help of elaborate statistical investigations. It further suggested compiling financial statistics on the entire economic system. Both types of investigations had to be conducted on a regular basis (Exploratory Committee 1937: 23–27).

The proposals of the Exploratory Committee were very important both at the conceptual level and at the practical level. It stated that one direction to take to prevent and mitigate financial crises would be to develop statistics that allowed the financial system to be monitored over time. The NBER took a very concrete approach: it financed research on the American financial system over many years

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[12] This lending of money by individuals is very similar to the concept of "credit out of surplus cash balances" that appears in Machlup.

[13] In this vision, a bank is basically a unit characterized by safe liabilities.

[14] The full list of assets includes goods and productive equipment.

through a number of closely coordinated projects. A summary of the projects it undertook until 1947, as part of the *Financial Research Program*, is given by Saulnier (1947). The surveys spanned several topics: consumer credit; housing loans; relations between business and banks since 1900; long-term securities issued by enterprises since 1900; loans to agriculture. A large mass of basic statistics thus became available, and the habit of several institutions working on common projects was established.

3.2.4.5 Jones

Also in 1947 Homer Jones presented a study, conducted for the Committee of Economic Development, on private debt in the American economy. The article was short on methodology but had long economic comments. The main theme was that of the short-term perspective of investment, a very important topic just after the end of World War II.

Jones based his statements on private sector debt on an enquiry spanning 30 years, from 1916 to 1945. In 1945 private debt equalled disposable income, but private debt had been twice the level of disposable income in 1929, a value never reached in the years from 1916 to 1927. His data also confirmed the intuitions of Fisher (1932): the ratio of private debt to disposable income went up from 200% in 1929 to 295% in 1932, and declined gradually afterwards.

According to Jones, a high level of investment is the premise for a period of growth with high employment (Jones 1947: 15). He suggests that a link exists between the rate of economic growth and the growth of debt and that rapid growth based on internal funds is unlikely but possible instead with large external financing, which is facilitated by the low debt of American households and firms in 1945:

> So far as the non-Federal segment of our economy system is concerned, we are now possibly more nearly free of debt than we have been in many decades. (Jones 1947: 16)

> This indicated debt incurring capacity is a real positive force for maintaining an investment boom for a number of years. (Jones 1947: 19)

However, Jones foresees long-term difficulties, due to the negative implications of an increase in private debt:

> There is some evidence that this flow of saving into investment in the form of debt, and the ultimate impossibility of continuing to increase debt and debt cost at such a rate in relation to equity and income, has been a feature of past prosperities and subsequent depressions. (Jones 1947: 25)

In the footsteps of Fisher (1932), Jones suggests that severe crises are due to objective mechanisms, such as the contraction of investment owing to the impossibility of obtaining further finance by increasing debt.

According to Jones, the long-term perspective is not encouraging, partly for reasons not connected just with the increase in financial liabilities by households and corporations. In fact, he mentions problems caused by the choice of financial

assets, owing to households' preference for fixed income securities over shares (Jones 1947: 21). This tendency is largely due to saving by workers, as observed in the years 1920–1930 (Jones 1947: 23).

Jones suggests that bankruptcy of corporations, and households, has been a useful mechanism to restore a low level of debt in the past:

> Bankruptcy, business failure and foreclosures in the depressions of the past may not have been "just" but they probably did contribute to recovery. When the old owner was wiped out and the creditor became the owner, the debt was wiped out and there was a basis for new savings to flow into investment in the form of debt. (Jones 1947: 26)

However, he also believed that a new vision has emerged after the New Deal. In the new economic and social climate public intervention was likely to be used to avoid bankruptcy, thus interrupting a classic mechanism for debt contraction.

For these reasons Jones occasionally hinted at a position close to that of Simons (1936), although what he envisaged was not necessarily a financial reform, but rather a building of consensus around a sound strategy for economic development, one which did not entail excessive debt. He suggested favouring the acquisition of shares over bonds by removing the double taxation of dividends (Jones 1947: 31), and limiting the credit granted by financial institutions; "We should exercise a more rigorous control over the lending of these institutions in time of prosperity in order to keep down the volume of debt." (Jones 1947: 31).

In particular, limits to the expansion of credit should be applied to households and governments. "Consumer debt, state and local debt, and real estate mortgages might probably be held within strict limits" (Jones 1947: 32).

His further reflections on economic stability were rather short, and Jones (1947) primarily encouraged the use of statistics to monitor the financial system. He drew many conclusions from the historical evolution of a few simple ratios: debt and income of the private sector; shares over debt of non-financial of enterprises.

3.3   Financial Accounts at the International Level after World War II

Following the reflections of economists on both sides of the Atlantic, the US took the lead in the systematic collection of financial statistics from 1937 to 1947, which culminated in Copeland's *Moneyflows* in 1952 and in the Flow of Funds of the Fed a few years later. However, after the War international institutions and European economists and statisticians also became very active in the field. In this section we will look briefly at the early years of this international effort, a period in which interest in the field increased, but in which the real need for such a prolonged statistical effort was still to be verified, and the format to adopt for financial accounts was still very unclear.

3.3.1   The Role of the OEEC

The Organisation for European Economic Co-operation (OEEC) was set up in Paris in 1948 by a number of European countries.[15] A group of experts was soon created to draw up a system of national accounts to help in comparing the economies of the OEEC countries. A number of meetings took place in Cambridge as early as 1949, coordinated by Richard Stone, and a memorandum on the subject was then published in 1951 by the OEEC. Economic activity was described by distinguishing the rest of the world and three domestic sectors: enterprises, government agencies and households, which included private non-profit institutions (OEEC 1951: 17). The enterprise sector included the central bank, other banks and the Post Office Savings Bank. Each sector had a current account, with entries such as current sales, compensation of employees and taxes. A gross saving and investment account was defined, under the name of "Resting Account". There is a single Resting Account for the whole economy, as:

> In practice . . . it is frequently found that little information is available about the lending and borrowing activities of the domestic sectors with one another or, individually, with the rest of the world. (OEEC 1951: 14)

In other words, financial accounts by sector were considered premature in Europe in 1951, and so borrowing and lending between domestic sectors, although acknowledged, were not explored.[16]

In a few years much more information became available, and in 1960 the OEEC published a volume on money and credit across sectors, in which the integration between finance statistics and national accounts was achieved to some extent (OEEC 1960). The volume was entitled *Statistics of Sources and Uses of Finance, 1948–1958* and it was designed by Robert Triffin and Geer Stuvel. The accounts were presented in two separate tables for "banks" and "domestic non-bank sectors". However, an analysis of the published tables leads to the conclusion that this OEEC project was only partially successful, as the underlying national data were still very scattered.[17] Nevertheless, the publication can be regarded as a prelude to later achievements in the field of financial data collection.

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[15] The OECD, Organisation for Economic Co-operation and Development, became the successor of the OEEC in December 1960. The OECD had an enlarged mandate, and its members were western European countries as well as the US and Canada. Participation in the OECD was extended to other countries in the subsequent years.

[16] A few years later Richard Stone led another group of experts, working for United Nations (1953). In 1953 *A System of National Accounts and Supporting Tables (SNA 53)* was published. The project was more ambitious, as for each of the same three domestic sectors of the OEEC System of 1951 there was a capital account (*Capital Reconciliation Account*).

[17] For example, in Austria the domestic non-bank sector was divided, as suggested in the general definitions, into three sectors but the data were all from the income accounts. Data on banks were not provided. A similar situation applied to many other countries. Only four countries provided broad financial information: France, Germany, Italy and Norway. But, even for these few countries, the data presented were of doubtful usefulness for comparative purposes.

3.3.2 Exchanges of Ideas at the BIS

The *Annual Reports* of the Bank for International Settlements make it possible to follow the evolution and the spread of economic ideas on monetary subjects and supporting statistics. As the board of directors of the BIS was largely composed of governors of central banks, we can assume that the *Annual Report* of the BIS influenced the opinions of high-ranking officials in national central banks, and that it incorporated some reactions from national central bank staff.[18] In the following we summarize about a decade of BIS *Annual Reports* for the parts relating to our topic. As will become apparent, the BIS was very active in collecting and disseminating information on sector financing.

The *Annual Report* published in 1950 focused on macroeconomic concepts and the use of financial statistics beyond banking statistics. For the United Kingdom, information was provided on saving by three domestic sectors (households, corporations and the public sector) and aggregate domestic investment over the years 1947–1949 (BIS 1950: 66). For corporations, Germany presented both investments and some details on financing ("capital markets", "medium- and long-term credit from financial institutions" [BIS 1950: 69]). Information on trade credit was provided for eight European countries (BIS 1950: 187). For Belgium and France, the relative importance of bank credit and trade credit was commented upon. For Italy, there were two tables on money funds received by the central government and the rest of the domestic economy (years 1947–1949), the first containing credit which the banking system granted, the second adding funds obtained on capital markets (BIS 1950: 191–192).

In the *Annual Report* of 1951, credit given by British banks to the private domestic economy was presented for two sectors: "industry and commerce" and "financial institutions and households" (BIS 1951: 185). In the *Annual Report* of 1952, the Italian table on money funds supplied was rearranged to provide additional detail.

In the *Annual Report* of 1953 a section on the financing of investment appeared which explicitly referred to Keynes's *General Theory*. It suggested that the postwar economy had required a high rate of saving (BIS 1953: 37–39). For the United States, the Report contained a table in which the financing of investment by corporations was broken down into three sources: "retained earnings and depreciation", "long-term credits", and "net short-term credits", i.e., short-term credits netted of liquidity invested in treasury bills (BIS 1953: 172).

The *Annual Report* of 1954 restated the importance of high domestic savings for a robust economic expansion (BIS 1954: 50). Attention focused on personal saving and a long section dealt with saving accumulated through insurance companies. In the United Kingdom in 1952 the only positive contribution to financial saving came from contractual saving (BIS 1954: 56), which amounted to about one third

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[18] Toniolo, in his history of the BIS, claims that "Research and its dissemination was traditionally regarded at the BIS as a tool for central bank cooperation." (Toniolo 2005: 323).

of financial saving in Belgium, Switzerland and the United States. Insurance companies represented only 5% of financial saving in Germany, Italy and France.

In 1957 the structure of the *Annual Report* was revised.[19] A chapter on economic expansion and savings was added, containing new ideas: an introduction to some concepts of financial accounts and their link to accumulation accounts. It was emphasized that the study of savings and investment would benefit greatly from subdividing the domestic economy into sectors, a list of which was proposed: central government, local government, private companies, public corporations, and the personal sector.[20] A link was also made between the financial surplus of a sector in a period and the increase in its financial assets at the end of the period (BIS 1957: 34).

The most complete partitioning of national income accounts into sectors was that of the United Kingdom (BIS 1957: 35). However, whilst the table in question contained savings data for five UK sectors, investment was given only for the whole domestic economy. The BIS staff therefore took the very courageous step of presenting estimates of savings and investment by sector for the United Kingdom (BIS 1957: 40).

For Germany, a table showed savings, capital transfers and investments for three domestic sectors (government, enterprises and households), with a breakdown of the financial surplus into six categories of financial instruments (BIS 1957: 51). This represented an important step towards modern financial accounts.[21]

For the Netherlands, there was a table of savings and investment by sector with four sectors: "central government", "local government", "institutional investors and capital markets" and "enterprises and households" (BIS 1957: 60). Interestingly, there were two different estimates of the financial surplus of each sector, a cash figure and an income account figure.

In the *Annual Report* of 1958 new information was available for France. Four sectors were envisaged (households, enterprises, government and financial institutions) and the financial surplus was divided into several categories (BIS 1958: 37). A reference was also made to the *flow of funds* statistics in the United States, and some data were presented (BIS 1958: 52–53).

In the *Annual Report* of 1960 new information on Germany appeared. Financial institutions were entered as a separate sector and were further divided into three sub-sectors ("banks", "insurance companies" and "building societies") (BIS 1960: 84).

In 1961 the previous table on the United Kingdom was discontinued, and a new table on the private sector was presented. This sector included households

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[19] It is very likely that the revised structure of the Annual Report was due to Paolo Baffi and Frederich Lutz, who had been nominated external consultants for the BIS Annual Report at the end of 1956, replacing Per Jacobsson who had moved to the IMF. Baffi and Lutz held this position until 1960.

[20] We observe that the financial sector does not appear in this ideal list.

[21] Some parts of the table were still very condensed, however.

and companies (BIS 1961: 72). The *Annual Report* of the BIS of 1962 again had a section dealing with financial accounts, similar to that of the previous year. However, in the *Annual Report* of 1963 no tables on financial accounts appeared. The previous interest in financial accounts resumed only in 1970.

In conclusion, an examination of the *Annual Report* of the BIS, as an important international institution and a forum for discussion between central bankers, shows that in the 1950s many changes were made in the format of national data on private sector saving and finance, which were rapidly taken into account. In the years 1957–1961, in particular, the flow of finance across sectors was a frontier topic.

3.3.3 Contributions by the IMF

The numerous reflections on financial accounts are documented in a number of articles that appeared in the IMF Staff Papers in the mid-1950s. The first article was by Graeme Dorrance, a Canadian economist working in the Statistics Division, which appeared in 1955. He acknowledged that his ideas on the subject originated mainly from a privately circulated paper by three Dutch authors (Lips, Schouten and Bosman). The article also incorporated comments by Professor Sayers.[22]

Dorrance suggested using the term "financial account" of a sector for the sources and uses of funds arising from "borrowing and lending" and the "purchase and sale of financial obligations" (Dorrance 1955: 319). He further proposed dividing the economy into seven sectors: households, enterprises, public corporations, local governments, central government, foreigners and the monetary system. He then commented on the absence of a monetary system sector in the United Nations' *System of National Accounts* (*SNA 53*) in these terms:

> If only national income accounts are considered, the monetary system is not especially important. If, however, the development of additional forms of social accounting are considered, the monetary system immediately assumes enormous importance because of the relative size of its activities in asset transfers and because the purposes for which the monetary system holds assets are so different from those of any other sector. (Dorrance 1955: 320)

Dorrance focuses on the difference between the saving and investment of a single sector. This gives a measure of the financing it provides to other sectors (Dorrance 1955: 321). He suggests studying the lending of each sector to every other sector in the economy.

In his article Dorrance anticipates what is nowadays called *from-whom-to-whom* reporting. However, he suggests it in its crudest form, with all transactions with another sector lumped together. His proposal to isolate the monetary system can be regarded as a first step towards a financial institutions sector.

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[22] Professor Sayers became a member of the influential Radcliffe Committee in 1957. This reference by Dorrance confirms Sayers's early exposure to financial accounts theory.

The interest in financial accounts remained alive at the IMF and in 1956, as an aside to the Annual Meeting of the Board of Governors, a session was arranged on *Recent Developments in Monetary Analysis*. The papers presented were published the following year. The first paper was by Marius W. Holtrop, President of the Netherlands Bank (Holtrop 1957). It presented a study of the economy considering five sectors and focused on the most liquid financial instruments (money, bank deposits and treasury bills). The second paper was by Paolo Baffi, then economic adviser to the Bank of Italy. It presented a statement on the flow of savings and the money supply in a scheme that provided limited information on sectors, but in which all financial instruments were considered (Baffi 1957)[23]. The third article was by Ralph A. Young, director of the Division of Research and Statistics at the Fed, and described the *Federal Reserve Flow of Funds Accounts* (Young 1957). The article was short on technical detail, but gave considerable space to comments on quarterly data on the consumer sector and the business sector.

In a fourth paper, Earl Hicks, of the Research and Statistics Department of the IMF, gave an overview of various types of monetary analysis, linking each to the collection of a specific set of financial statistics (Hicks 1957). In the section *Matrices of Intersector Finance* the paper surveyed some still-unresolved problems, especially the integration of national income accounts and financial accounts. The article had a very lengthy Appendix covering 41 countries,[24] each of which had at least a table on monetary or financial statistics; the tables were very heterogeneous, however.

Both Dorrance and Earl Hicks continued working on sector finance accounts in subsequent years. Dorrance wrote on financial balance sheets. Earl Hicks participated in the Expert Group charged with writing the *1968 SNA*. Other economists at the IMF were also interested in these topics (Polak 1959).

3.3.4   International Conferences

In the first part of this section we review the contributions made by some European economists and statisticians in international conferences in the late 1950s. These conferences can be seen as a prelude to a major revision of the United Nations' manual on national accounting and as contributing to improvements in national compilation practices. An article by Dorrance is also referred to, as it gives a snapshot of the national formats of financial accounts in Europe in 1959–1960. We conclude with a short presentation of the *1968 System of National Accounts (1968 SNA)*.

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[23] The article by Baffi is examined in chapter 2 by De Bonis and Gigliobianco.

[24] The Appendix was prepared by Dorrance and Aubanel.

3.3.4.1 International Association for Research on Income and Wealth (IARIW), 1957

Petter Jacob Bjerve and Mikael Selsjord of the Central Bureau of Statistics of Norway wrote the article *Financial Accounting within a System of National Accounts* for a conference organized by the International Association for Research in Income and Wealth, held in the Netherlands in 1957. The authors discussed how to develop a comprehensive system of accounting that integrated traditional national accounts, financial variables and statistics on money and credit. According to them, the complete system should be made up of five accounts for each sector: (1) an income account; (2) a real capital account; (3) a financial capital account; (4) a revaluation account for financial capital; (5) a revaluation account for real capital (Bjerve and Selsjord 1959: 63–65).

Bjerve and Selsjord proposed a system with seven domestic sectors: (1) public administration; (2) financial institutions; (3) public productive enterprises; (4) private corporations; (5) private non-corporate enterprises; (6) wage and salary earners, pensioners, etc.; and (7) non-profit-making organizations (Bjerve and Selsjord 1959: 69–70). They also suggested distinguishing five types of financial transactions: means of payments, discountable objects, marketable objects, non-negotiable objects, other financial objects.

The last part of the article gave a summary of the work done in Norway which had led to figures for 1955. This accounting system was much simpler than that envisaged in the theoretical section, having only four sectors: public administration, financial institutions, other domestic sectors, rest of the world.

3.3.4.2 IARIW, 1959

Jean Denizet, a French economist, presented a paper in 1959 in which he discussed several technical problems to be solved before starting the compilation of financial accounts: (1) conceptual framework; (2) valuation; (3) coordination between financial accounts and national accounts. Under the first heading, Denizet discussed the principle of homogeneity of behaviour. This led him to suggest a sector on financial intermediaries (Denizet 1961: 67). Following the same principle of homogeneity of behaviour, he also discussed the desirability of two further breakdowns of non-financial corporations: (1) by legal characteristics; (2) by size. Regarding financial transactions, Denizet criticized the idea of previous authors of having only a matrix of financial dependence across sectors (Denizet 1961: 75), preferring a long list of financial transactions on the grounds that having data on each financial market is relevant in practice.

A long section of the article was devoted to the problems of data collection. Denizet was sceptical regarding the possibility of overcoming the practical difficulties of data collection as both companies and households were very hesitant about disclosing information on their financial affairs (Denizet 1961: 97).

3.3.4.3 Conference of European Statisticians, 1959

Another article that led the way to the *1968 SNA* was that of Poul Høst-Madsen, a Danish economist working at the IMF. The article had been prepared for the *Expert Group on Statistics and Changes in Financial Assets and Liabilities*, a session of the *Conference of European Statisticians* held in Geneva in February 1959.

The article discusses the integration of sector financial accounts and national income statistics. To clarify the main issues, Høst-Madsen used an indirect approach. In the first place he linked national income statistics to the balance of payments, and then connected financing statistics and balance-of-payment concepts. This allowed him to discuss the consolidation of sector accounts in national accounts, and to trace a similarity between foreign assets in the balance of payments and inter-sector claims in financial accounts.

Høst-Madsen made a lucid contribution on sectoring. According to him, the economy can be divided into two types of sector: (1) sectors whose main activity is the production of goods and services; and (2) sectors whose main activity is the creation of financial assets for other sectors and the acceptance of liabilities of other sectors. The traditional division of sectors in national income statistics at that time was functional rather than institutional, i.e. the sectors were chosen by type of activity rather than as groups of economic decision-making units. In financial statistics the sectors were instead usually defined institutionally. Høst-Madsen then pointed out that to integrate financial statistics with national income statistics, the sectoring of the two parts of the system must be coordinated beforehand (Høst-Madsen 1960: 341).

3.3.4.4 Conference on Research in Income and Wealth 1959

In a conference organized by the NBER in 1959, Dorrance surveyed financial accounts in countries other than the United States and Canada. His list of financial accounts published by official national organizations contained nine European countries: Finland, France, Germany, Italy, the Netherlands, Norway, Sweden, the United Kingdom and Yugoslavia. Dorrance suggested classifying these statistics according to various criteria. He presented the results in a neutral tone, but problematic areas did emerge. For example, businesses and individuals appeared as two sectors in some statistics (France, Germany, the Netherlands, and the United Kingdom) but as one combined sector in other cases (Finland, Italy, the Netherlands, Norway, and Sweden).[25] Similarly, in some cases there was a separate financial institutions sector (Italy, Norway, Sweden, and the Netherlands), and in other cases it was absent (Finland, Germany, the Netherlands, and the United Kingdom) (Dorrance 1962). All this made international comparisons rather troublesome.

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[25] In that period two sets of financial accounts were prepared in the Netherlands by two different institutions. The two data sets diverged in many respects.

3.3.5   The Radcliffe Report and the Surrounding Discussion

A very influential Report appeared in 1959 in the United Kingdom, the *Radcliffe Report*.[26] It had large resonance in the world of central banks, the institutions which in most countries took the lead in the collection of financial accounts. The Radcliffe Committee invited several institutions and economists to prepare memoranda, later discussing some of them with selected officials and economists. The theoretical chapters of the *Report* accepted many of the ideas contributed by Kahn and Kaldor. We will describe the main economic ideas, before moving on to the statistical part.

3.3.5.1 Kahn, Kaldor and Sayers on Financing

During the economic debate promoted by the Radcliffe Committee in the late 1950s, Richard Kahn, Nicholas Kaldor and Richard Sayers placed great emphasis on the fact that the financing of investment is related to *overall liquidity*. Overall liquidity is determined by two main factors: existing easily realisable assets and the expected availability of credit (Kaldor 1960b: 15; Sayers 1960: 712).

These authors shared the view that the study of the level of activity of an economy requires a comprehensive view of the web of financing in that economy. Bank advances retain an important position in financing investment, but this is mostly due to the fact that, except for "the really large companies" (Kahn 1960: 140), the issuance of ordinary shares is difficult. Other financial institutions can also be a source of short-term credit, such as hire-purchase finance houses (Kahn 1960: 146). The extension of trade credit between companies is also considered a crucial financing channel (Kaldor 1960a: 148; Sayers 1960: 713). Next, the authors examine the credit obtainable in capital markets. Finally, they suggest that it is necessary to integrate the analysis of credit and capital markets as sources of finance (Sayers 1960: 713–14).

Along the lines of Hicks (1935), they suggest that liquid assets, as well as those corresponding to the liabilities of non-monetary financial institutions, can be used to extend credit (Kaldor 1960b: 19; Sayers 1960: 722).

This group of authors argued that for the purposes of monetary analysis, and especially for its link to the general level of economic activity, it was necessary to have a full picture of the financing that takes place in the economy, both across

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[26] Against a background of poor productivity growth, and a struggle against inflation, the aims of British monetary policy were set out in 1956 in the White Paper on *Economic Implications of Full Employment*. This was followed in May 1957 by the appointment of the Radcliffe Committee "to inquire into the working of the monetary and credit system, and to make recommendations". Within a few months the question of monetary policy became very urgent, due to the balance-of-payments crisis of September 1957. The Radcliffe Committee was composed of nine members, two of them, Cairncross and Sayers, from the academic world.

sectors and through different financial instruments. It is not surprising, therefore, that their opinions favoured the position taken by the Radcliffe Committee on the need to improve the collection of financial statistics beyond banking returns.

3.3.5.2 The Radcliffe Committee on Statistics

The Radcliffe Committee made very few concrete recommendations, and the majority of those they did make concerned the collection of statistics.

That statistics were considered important also emerges from the fact that the *Report* devoted an entire chapter to them. At the beginning it was noted that in the previous 30 years the improvements in statistics had been uneven:

> While there has been a steady improvement in the collection and publication of statistics of national income and output, the statistical coverage of financial assets and liabilities has not received the same attention either from the monetary authorities of from outside commentators (Committee on the Working of the Monetary System 1959: 281).

To provide a background for this state of affairs, the Committee observed that two important factors limited the production of statistics by financial institutions: (1) "reluctance to disclose their private affairs more than is necessary"; and (2) "the wish to avoid undue expenditure of time and trouble on providing information" (Committee on the Working of the Monetary System 1959: 281). As the Committee intended to redress the situation, it required improved "financial and monetary statistics" along these general lines:

> we take these to be statistics of financial assets and liabilities, not merely banking statistics or statistics relating to the money supply (Committee on the Working of the Monetary System 1959: 284).

The suggested shift from banking statistics to a set of statistics on the financial sector reflected the partial role played by banks in financing (Committee on the Working of the Monetary System 1959: 285). The Committee then called for financial information on sectors other than financial institutions. And a list of these additional sectors was put forward:

> the financial sector would (...) take its place alongside the other sectors of the national economy, and it would be one of the principal objects of monetary analysis to examine the interactions of these sectors on one another through financial transactions. These sectors, in terms of which financial and monetary statistics would have to be organised, include the public sector, the overseas sector, and such sub-divisions of the private sector as companies, unincorporated businesses and private individuals (Committee on the Working of the Monetary System 1959: 286).

The requests of the Radcliffe Report concerning financial statistics were thus sufficiently specific:
1. Financial assets and liabilities.
2. Six sectors spanning the entire economy.

In its effort to render the requests operational, the Radcliffe Committee took the further step of assigning one institution, the Bank of England, a special role in

gathering and publishing financial statistics (Committee on the Working of the Monetary System 1959: 303).[27]

3.3.6 The Main Features of 1968 SNA

We have shown above that in the late 1950s and early 1960s the statistics on sector financing were very far from being homogeneous across countries. We have also documented the rich exchange of views that was taking place at the international level, both within institutions and through conferences. These discussions culminated in the revision of the *System of National Accounts*, coordinated by the United Nations in the mid-1960s and published in 1968.

One of the new features of *1968 SNA* was the introduction of considerably expanded financial information. Moreover, the framework provided a way to integrate financial information with data on production, income and capital formation. *1968 SNA* also contained a complete view of the process by which the economy moved from its position at the beginning of the period (opening balance sheet) to its position at the close of the period (closing balance sheet).

The many discussions we have viewed earlier, regarding sectoring and the classification of financial assets, the opinions of the Expert Group created by the United Nations, and the comments on the draft of *SNA*, such as those made at a conference held in 1966, were finally condensed into two lists: a list of institutional sectors and sub-sectors and a list of transactions in financial claims. These two lists, which cross-classify the financial side of an economy, had a pivotal role in subsequent developments in the field. In fact, the meaningfulness of a financial description of an economy is directly related to the general structure of the cross-classification by sectors and financial transactions, to the level of detail of this cross-classification, and to the possibility of collecting accurate data which conform to the chosen definitions.

1968 SNA also contained a very ambitious table, which suggested a more detailed breakdown of financial transactions by adding, in some cases, further dimensions: national/foreign currency; domestic/non-resident sector; cross classification by institutional sector; quoted/unquoted shares (United Nations 1968: 199–200).

To sum up this section, we note that the new parts of *1968 SNA* on financial transactions were the outcome of more than a decade of discussions and permitted the achievement of three ambitious results:

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[27] The Bank of England responded quickly to the requests. The publication of its *Quarterly Bulletin* started at the end of 1960. Data and comments on the financial surplus of the private sector appear in the first number of this new publication. Fuller financial accounts were made available in 1963. Some years later, the Department of Applied Economics of the University of Cambridge undertook empirical work on sectors' financial balance sheets (Stone and Roe 1971).

1. A unified system that integrated income accounts and financial accounts.
2. Institutional sectors that were meaningful for different types of economic analysis.
3. A clear articulation of financial transactions.

At this point, it would have been reasonable to expect a rapid convergence of the national schemes on sector financing towards a unified scheme. This did not occur, however. National agendas were not yet ready.

In the 1970s the OECD started to collect Financial Statistics which benefited from the progress with financial accounts that had been made by individual states (OECD 1970). However, in a *Supplement*, revised occasionally, it was forced to admit that deviations from the *1968 SNA* were numerous and often significant.

In any case, as evidenced by the papers presented at a Conference held at the Bank of France in 1977, the use of financial accounts flourished in several central banks. The focus in each country was policy-making in the domestic economy, however, and so there was no drive to undertake long and costly revisions of national data for the sake of having harmonized financial accounts across countries. A drive for harmonization took place in Europe only after the signing of the Maastricht Treaty, when national priorities were modified to take the international dimension into account. Thus, a real harmonization of the format of financial accounts was achieved in Europe during the 1990s. It required strenuous efforts by Eurostat and its Financial Accounts Working Party, a group of experts from member states, as well as close cooperation from various national institutions which collected the raw data. To guarantee the success of the harmonization process, a specific EU Council Regulation was adopted in 1996 (see Bull 2004). This huge process later allowed the ECB to build up coherent financial accounts for the euro area (see ECB 2007).[28]

3.4   The Finances of the US Private Sector in the Post-World War II Period

As we have seen, in the period 1955–1960 there was a huge interest in financial accounts outside the US: it was a period of intense conceptual work at the international level, both within international institutions and through conferences of statisticians. At the theoretical level, the Radcliffe Report provided a new impetus and was very important in heralding data collection not only in the UK but also in several other industrialized economies.

In this section we focus on the United States, which, through the collaboration between the NBER, the Fed and Copeland, took the lead in the compilation of

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[28] A major task promoted by the ECB was the move from annual to quarterly financial accounts (see ECB 2007). The ECB also has the merit of commenting the data, either in its *Monthly Bulletin* or in occasional papers by its staff. An interesting example, on households' portfolio, is the article by Gadsby and Giron (2010).

financial accounts in the mid-1950s. Even today the United States is the country with the longest set of uniform historical data on financial accounts. While this allows us to explore one of the main uses of financial accounts, namely the study of private sector debt, it also provides an overview of financial conditions in the US during the decades leading up to the crisis of 2007–2009, and reveals that, according to some authors, fragilities in the American financial system had already emerged in the 1960s.

3.4.1 The 1960s

The forecast by Jones (1947) that the United States were likely going towards an investment boom, and an associated growth of national income, turned out to be true.[29] But also the second phase foreseen by Jones, that of a slowdown of the economy due to excessive accumulated debts, was approaching.

In a period of apparent calm, Hyman Minsky published in 1964 an article outlining various risk factors for the American economy. His main thesis was that financial crises do not happen by accident but are due to changes in the financial structure, a thesis that went against the beliefs of most mainstream economists of the period, but that was similar to the debt-deflation theory of Fisher (1932) and certain elements of Simons (1936) and Jones (1947). According to Minsky, financial crises are due to slow changes in the financial structure which take place during prosperity (Minsky 1964: 324). When the financial system eventually reaches a weak configuration, a financial crisis may take place even following minor events. The financial crisis will then spread to the real economy:

> The financial panic is made possible by the changes in the financial structure that take place during the long-swing expansion. As a result, the triggering event for a deep depression need not be especially severe. . . . Once a panic occurs, the decline in asset values, the forced changes in portfolios, and the revaluation of prospects combine to lower both consumption and investment demand, thus depressing income further (Minsky 1964: 325)

Minsky, using simple statistical elaborations, suggested various signs of a progressively weakening financial structure: the growth of the ratio between debt and income of households and firms; the growth of share indexes and housing prices; a reduction of liquidity of the private sector.

An increase in the size of debt relative to income implies potential trouble for any operator, as it limits its range of actions:

> Each liability carries with it a dated . . . commitment to make payments. . . . Dated payments act to constrain behaviour; units will operate so as to have sufficient cash on hand at the designated dates to fulfil the commitments. (Minsky 1964: 329–330).

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[29] From 1948 to 1957 the growth of the American economy averaged 6.1% per year; after 1957 it decelerated, but was still robust at 4.5% between 1957 and 1962.

To have cash available at the right moment can be difficult for households and firms, as their sources are income flows (Minsky 1964: 330–331). If interest payments increase relative to normal income, even a modest reduction in current income may lead several units to look for funds through unusual channels, such as sales of assets and emergency loans (Minsky 1964: 331). However, sales of assets will bring funds only if there are potential buyers, and if they have ready access to funds. If there are few buyers, prices of assets will decline abruptly, with ensuing capital losses for sellers.

An accelerated growth in the prices of shares and housing that continues for a period of time may lead to the belief that price increases will continue, so that capital gains will continue to accrue over time. This leads to further acquisitions motivated only by the search for gains, and eventually to an instable economic system:

> A purely speculative secondary run of asset prices can occur as prices begin to reflect capital gains that occurred when the capitalization rate was increasing. This speculative secondary wave is inherently unstable. (Minsky 1964: 332).

Minsky complemented his economic reasoning with statistical data, mostly taken from the American financial accounts. He considered three periods: 1922–1929, 1948–1957 and 1957–1962. The average GDP increases were, respectively, 5.2, 6.1 and 4.5%. He noticed that the value of shares had increased considerably in the first two periods (19.0 and 12.6%), that the liquidity of the private sectors, in the form of public debt, had increased very little (0.15% in the second period, 1.50% in the third period), but that the ratio of household debt to income had increased steadily in the three periods, by 7.2, 8.4 and 4.5% respectively. The debts of non-financial enterprises had recorded a modest increase. Based on these figures, Minsky suggested that the American financial structure had become less stable over the years from 1948 to 1962 (Minsky 1964: 335).

As a prudent observer, Minsky (1964) shunned the idea of discussing the likelihood of an imminent financial crisis:

> This paper contains no answer to the question as to whether or not a financial panic followed by a deep depression can now occur or whether a long-wave contraction can take place in the absence of a financial panic. . . . All we can assert is that during the period of slower growth since 1957 the destabilizing changes have continued at a slower rate. (Minsky 1964: 335)

To a general vision which considers financial crisis endogenous, Minsky added a statistical analysis based on a few indicators. The mixture of economic and statistical analysis made his contribution similar to that of Jones (1947). With respect to Jones, Minsky importantly suggested a configuration that would not lead to a crisis in the long period: the stabilization of the ratios between financial and real variables (Minsky 1964: 335).

Notwithstanding Minsky's circumstantiated approach, tensions had built up over the years in the American financial systems and a first important episode of financial turbulence took place in 1966 in the form of a credit crunch: a sharp contraction of banking credit, accompanied, moreover, by a swift rise in the prime rate from 4.5% to 6.0% (Wojnilower 1980: 287).

According to Wojnilower, the immediate cause of the credit crunch was a recent financial innovation: the introduction in 1962 of negotiable certificates of deposit (Wojnilower 1980: 284–285). The innovation had permitted large American banks to collect deposits all over the globe, which they invested in the American private sector, leading to a rapid increase in debt:

> Over the four years beginning early in 1962, bank holdings of business-type loans, consumer credit, and mortgages grew at an annual rate of over 13 percent, . . . far in excess of the 7 percent growth rate in nominal GNP. (Wojnilower 1980: 285)

According to Wojnilower the ultimate cause of the 1966 episode was, in line with Minsky's analysis, an objective element: the increase in debt ratios of the private sector. A subjective element had also played its part, however: the widespread expectation of an expanding availability of credit.

3.4.2   The 1970s

In the 1970s the American financial system experienced repeated financial turmoil, which confirmed that the 1966 credit crunch should not be interpreted as an exceptional episode. In 1970 the railway company Penn Central defaulted on its commercial paper. The Federal Reserve was forced to intervene on a large scale, and the credit market stiffened (Wojnilower 1980: 292–293). In 1974 there was the collapse of the Franklin National, the twentieth largest American bank. Major consequences for the banking system were avoided thanks to a bail-out by the Federal Reserve, but the issuance of certificates of deposit halted, leading to another credit crunch in the summer of 1974. Two further episodes of credit crunch took place in 1979 and 1980.

Wojnilower suggested that the fundamental reason for the persistence of financial turbulence was the continuous increase in private sector debt. This had been made possible by the spread of a new financial practice: variable-rate loans. This type of loan made it easier for companies to enter into long-term debt as they did not have to wait for favourable market conditions, and it was easier for banks to approve as the interest-rate risk was transferred to clients.

Variable-rate loans were, according to Wojnilower, the springboard for another financial innovation: financial futures, a contract that allows companies to hedge against the interest-rate risk encapsulated in variable-rate loans. However, Wojnilower noticed that this financial instrument, heralded as a guarantee for a single company, was not valid at the community level:

> Just as banks through floating rates have passed their interest risk to borrowers, now borrowers are learning to hedge these risks with the general public through the future markets. As sensible as all this in on a microeconomic scale, from the macroeconomic standpoint it promises trouble . . . In the end the supposed immunity to financial risk always turns out to be illusory, and the risks and costs of shattering the illusion may be considerable. (Wojnilower 1980: 308–309).

The spread of two interconnected financial innovations had thus allowed a continuous increase in private sector debt. Wojnilower did not think it was sensible for this trend to continue in the future, and suggested a general restriction of credit:

> It is presumably impossible to restore most of the financial constraints that have already been swept away. . . . Nor do I have a full agenda of substitutes to offer. The list would include marginal capital requirements on banks, outlawing floating-rate credit contracts, punitive margin requirements on futures transactions, and liberal but rigid (not discretionary) down payment and maturity limits on mortgage and instalment credit. (Wojnilower 1980: 326)

3.4.3 The 1980s

In 1986 Henry Kaufman, a financial analyst who had been working at Salomon Brothers since 1962, specializing in forecasts based on financial accounts, wrote a book of memoirs in which he highlighted the main tendencies in the American financial structure over the previous 30 years.

Kaufman observed a noticeable growth of debt in the US from 1970 to 1984, and he suggested that debt levels were too high, as much as twice GNP in 1984. Like other authors we encountered earlier, Kaufman posited that high levels of debt were risky:

> The false comfort provided by the credit creation process is part of the problem. The generation of credit is of course quite agreeable. . . . The initial credit creation process contributes to economic expansion and financial exhilaration. Once debt is created, however, it might become sufficiently onerous to the borrower to necessitate changes in the repayment schedule. There may be failures or partial refinancings. (Kaufman 1986: 35)

Kaufman drew attention to several destabilizing elements: the growth of debt (households, companies, government) at a pace more rapid than that of national income; the increase in short-term debt, especially for companies; the diffusion of floating-rate debt; the contraction of issued shares, as well as their reacquisition by companies (Kaufman 1986: 37–38).

Kaufman expressed scepticism about the widespread financial innovation that had taken place in the previous years, and discussed its long-term implications. He first considered the case of floating-rate loans. According to him, by using them banks transfer interest risk to the final sectors, and their next step is to try to obtain more profits by expanding the balance sheet. This corresponds to a growth of private sector debt. In the end, banks as a whole face an increased credit risk, as the expansion of debt makes the bankruptcy of some units more likely (Kaufman 1986: 44).

In general, market participants do not seem to perceive the amount of risk in the system as a whole:

> Financial institutions tend to assume that risk diversification – a classic portfolio principle of financial institutions – protects them sufficiently from the negative impact of credit deterioration. . . . For the system as a whole, however, this is impossible. Any single bank or investor can sell off assets to others and raise cash in an emergency, but that means others must be willing to acquire the assets. If everyone is trying to raise cash at the same time, no one will be successful, because there will be no buyers. (Kaufman 1986: 44)

Another risk element that Kaufman noticed was the securitization of financial assets:

> Increased "securitization" of credit obligations is another development that has had unfortunate consequences. Today financial institutions do not want to be bound to borrowers. After they make the initial loan, they get rid of the obligation by disposing it to . . . some . . . packager. . . . Thus what was a "private" loan becomes part of a "public" marketable security. (Kaufman 1986: 54)

The main risk of the securitization of credit lay in the potentially non-attentive initial examination of each borrower, and the securitization of mortgages was a phenomenon of increasing relevance: from 10% of new loans in 1975 to 40% in 1985.

After examining the potential weaknesses of the American financial structure, Kaufman advanced two main proposals: stricter regulation of financial intermediation and directing professional economists towards the production of better statistics and their use on a regular basis (Kaufman 1986: 50, 74, 219–220).

Kaufman's position thus echoed that of Simons (1936), who had proposed a more prudent organization of the financial system, and that of the NBER Exploratory Committee (1937), which had proposed a constant monitoring of financial flows in the economy.

3.4.4   The Evolution Until 2006

Notwithstanding the carefully stated scepticism of a few economists, American household debt kept growing over time. A description of the evolution of household debt was given by Albert Teplin in 2001, in an article which appeared in the *Federal Reserve Bulletin*. Household debt had kept growing steadily and had reached a considerable level: from less than 70% of disposable income in 1984 to 100% in 2000. Teplin suggested that this debt to income ratio was probably too high:

> Ultimately, whether the elevated level of household sector debt will lead to substantial financial distress will depend in large measure on whether employment and income conditions unfolds in line with expectations . . . . Strains could become evident if employment and income conditions deteriorate more than contemplated by borrowers and lenders when the loans were made. (Teplin 2001: 436)

Teplin also analysed the mechanisms which had made the increase in debt possible, finding that it was mostly new financial practices which had allowed a modest increase in interest expenditures:

> For some types of debt, longer maturities have made it possible to hold higher outstanding amounts without increasing the servicing burden. . . . Other loan terms that have lowered households' costs of carrying mortgage debt include variable interest rate provisions and flexible down-payment requirements. Although such "non-standard" terms change the repayment risks for lenders, they also likely broaden the pool of eligible borrowers and enable borrowers who would qualify for a loan under standard terms to carry larger outstanding balances. (Teplin 2001: 435)

Teplin thus provided some key elements for reflection: the increase over time of total household debt had most probably been accompanied by an increase in the quota of excessively financially burdened households; the reduction in down-payments had increased the risks for banks; the spread of variable interest loans would probably have led to a sudden increase in interest payments if higher market rates had followed. The continuing increase in the debt of American households from 1984 to 2000 then had the effect of creating a more unstable financial structure.

Teplin then analysed the debt of companies. This sector, too, had seen a considerable increase in its debt ratio: from 40% of the sector's income in 1984 to 60% in 2000. However, in this case the increase had not been continuous, as there had been a marked decrease between 1991 and 1994. On the positive side, he noticed that short-term debt had shown a modest increase (Teplin 2001: 440), but on the negative side, he noticed the very considerable buy-back of shares by corporations (Teplin 2001: 439).[30]

If the analysis of the American private sector is brought forward from 2000 to 2006 one notices a very rapid deterioration for households, with a ratio of debt to disposable income that jumps from 99% to 135%. The debt of firms instead remains stable at around 60%, a level which is not low by historical standards, however. Teplin's warnings about the financial fragility of the American private sector in 2000 were therefore even more pertinent in 2006.[31]

3.5   Conclusion

As we saw in Sect. 3.2, in the years 1927–1947 there was an increasing acknowledgement of the role played by banks and finance both in the generation of a boom and in the downward mechanisms that operate during a crisis.

Authors like Schumpeter and Hayek focused attention on the ease with which banks extend credit, and their ability to finance investment without a previous accumulation of savings. With Keynes and Ohlin the emphasis was placed on two facts: (1) in advanced economies, savings made outside the business sector play an important role and they are not necessarily synchronized with real investment; (2) companies need to have cash in hand to advance from investment plans to investment decisions. Fisher and Simons concentrated on the fact that, once a financial crisis starts, it is further accelerated by the hangover from previously accumulated private debt.

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[30] The buy-back of shares goes in the opposite direction to the suggestions of Simons (1936) and Jones (1947). Kaufman (1986) had also been sceptical about this.

[31] Palumbo and Parker (2009), commenting on sector net lending in the periods 1960–79, 1980–99, and 2000–07, notice that in 2000–07 "what was unprecedented was the household sector's dramatic shift from funding the investment of other sectors to borrowing from them" (Palumbo and Parker 2009: 83).

The quest for comprehensive financial snapshots of an evolving economy was then transformed into the creation of a broad statistical framework. In this phase institutions in the United States took the lead: after the proposals of the Exploratory Committee in 1937, the NBER coordinated and financed statistical projects on finance; the Committee of Economic Development financed Jones's work on estimates of private sector debt; the Fed cooperated with the NBER to promote the Copeland's *Moneyflows* project. Just after World War II the United States were uniquely positioned with regard to the availability of comprehensive data on financial interactions in the economy.

Other countries were much slower to accept the burden of compiling financial accounts. A lively debate took place around 1955–1960 in many international institutions and statistical forums. In 1959 and 1960 added momentum was provided by the publication of the Radcliffe Committee's Report. Its emphasis on the link between general liquidity and realized investment provided a modern interpretation of the cash nexus hinted at by Keynes and Ohlin in the 1930s. The outcome of this long process was that in the early 1960s several European countries, as well as Japan and Canada, set up the collection of financial accounts on a regular basis.

In the long period of prosperity that followed World War II financial accounts were typically used in discussions of short-term issues, such as comments on recent events, and near-term forecasts made according to various methodologies (Banque de France 1978; Hendershott 1977).

A few economists, however, used the information in financial accounts to question the long-term stability of the American financial structure. Minsky did so in an article published in 1964 and continued in his vein of scepticism in the following years. Over time Minsky worked out a theory of financial instability, built on elements which he found in Keynes, Fisher and Simons (Minsky 1982, 1986). We suggest that Jones (1947) should also be included in this line of thinking. Also, some analysts working in financial firms, like Wojnilower and Kaufman, produced analyses very similar to those of Minsky.

After the summer of 2007, when the spiralling effect of subprime mortgages impacted on worldwide financial markets and institutions, the notion that the debt of the American private sector was too high in relation to income is something that most economists admit. It is not necessary, therefore, to emphasize that the debt of a sector cannot be allowed to expand forever unchecked.[32] Here, we simply summarize the opinions expressed by the authors concerned with the long-term outcomes

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[32] We will not go into an examination of the current financial crisis, although we wish to stress that two Reports published in 2009 interpret the 2007–2008 financial crisis along lines similar to those of Fisher, Minsky and Kaufman. Brunnermeier et al. (2009) are close to the endogenous vision of Minsky (1964): "financial crises are predominantly caused by market dynamics, not just by external shocks, though such shock … may well have been the trigger" (Brunnermeier et al. 2009: 5). The Turner Report, along similar lines to Kaufman (1986), suggests that the crisis is due to the interaction of macroeconomic imbalances and financial innovations, with a special role for credit securitization (Turner 2009: 42–43). The Turner Report suggests monitoring various financial indicators over time, many of them on the debt of the private sector (Turner 2009: 83).

of a financial system, i.e., with its structural stability. We will do so by introducing two tables. Table 3.1 is on sectors and broad categories of financial assets or liabilities; in this table cells with the sign "−" show a destabilizing effect, while those with the sign "+" show a stabilising effect. Table 3.2 relates to more narrowly defined financial contracts; their increasing diffusion has been signalled as a possible source of financial instability. In this table, too, cells with a "−" sign indicate a destabilizing effect.

These synthesis tables do not allow the positions of the various authors to be presented in detail, and they should not be interpreted as being valid for all countries, as these might have different features (established traditions, existing institutions, behavioural choices) that limit the suggested destabilizing effects. Nevertheless, they indicate that almost identical conclusions on the American financial system were reached by economists with various theoretical backgrounds, whether neoclassical and monetarists (Fisher, Simons, Jones), Keynesians (Minsky), or financial analysts (Wojnilower, Kaufman). To put it very briefly, these authors suggested that for the private sector as a whole it is necessary to distinguish between *normal* and *excessive* levels of debt.

To define the concept of *normal debt level* of a sector in real numbers is certainly very difficult and open to controversy. However, with adequate reflection, based on historical analysis and on international comparisons, it should be possible to work

Table 3.1 Sectors and financial instruments

Author	Institutional sector	Short-term debts	Long-term debts	Unredeemable debts	Shares as liabilities of companies	Short-term financial assets
Fisher (1932)	Non-financial enterprises	−	−			+
Simons (1936)	Non-financial enterprises	−	+	+	+	
Jones (1947)	Non-financial enterprises, households	−	−		+	
Minsky (1964)	Non-financial enterprises, households	−	−			+
Kaufman (1986)	Non-financial enterprises, households	−	−		+	

− destabilizing, + stabilizing

Table 3.2 Financial contracts

Author	Variable-rate loans	Financial futures	Securitization of assets	Flexible down-payment
Wojnilower (1980)	−	−		
Kaufman (1986)	−		−	
Teplin (2001)	−			−

− destabilizing

out *warning thresholds* of debt and income ratios both for households and for non-financial enterprises.

Another useful lesson to be learnt from the authors examined in this essay is that in a period of crisis it is worthwhile devoting some resources to the design of future infrastructures and norms. In other words, it is wise to avoid concentrating only on short-term problems, however pressing they may be, and to spend time developing conceptual instruments for the long-term horizon, a horizon over which it becomes possible to redress the situation with gradual interventions and, to use an expression of Kaufman, to re-establish "the integrity of credit".

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Household Wealth in a Cross-Country Perspective

4

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Abstract

This paper provides a comparative analysis of household wealth in the United States, the United Kingdom, Japan, France, Germany, Spain, and Italy. We start by comparing national levels and composition of financial wealth, looking at the instruments in which households invest: deposits, securities other than shares, shares and other equity, mutual funds, pension funds, and insurance products. We then discuss the empirical evidence on household indebtedness and real assets across countries, providing a summary of the situation with regard to total household wealth (i.e. net financial assets plus real assets). The analysis of aggregate wealth is accompanied by an examination of micro data on household asset participation and the distribution of household net worth. Finally, we study some correlations and run an econometric exercise on the links between household wealth and selected economic indicators, with particular focus on saving.

4.1   Introduction

Household wealth is the focus of many different lines of research. An incomplete list includes studies of the wealth effect, notably the effect of wealth variations on consumption (see Poterba 2000; Paiella 2007); contributions that look at wealth

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in order to deduce information on agents' risk aversion (Guiso et al. 2002); the literature that examines the financial instruments held by households as a guide to the peculiarities of the financial systems of different countries (Goldsmith 1969; ECB 2002; Babeau and Sbano 2002); and studies of the links between portfolio choice, retirement saving, and poverty (Kapteyn and Panis 2003; Group of Ten 2005; Brandolini et al. 2010).

More recently, the financial crisis and the decline in share and house prices in many countries have reinforced the debate on asset values, on the economics of housing and on the way changes in household wealth and indebtedness can affect macroeconomic and financial stability (Cecchetti 2006; White 2007). Further research deals with the complex relationship between wealth and saving. On the one hand, one would expect a structurally large saving rate to be associated with a higher wealth-to-income ratio. On the other hand, high levels of wealth may reduce the propensity of households to save from current income. Lastly, one of the recommendations of the Stiglitz, Sen, and Fitoussi Report of 2009 is to consider income and consumption jointly with wealth in order to evaluate wellbeing.

The aim of this paper is to make a comparative analysis of household wealth in the main industrial countries: the United States, the United Kingdom, Japan, Italy, France, Germany, and Spain. We distinguish between financial wealth, household indebtedness, net financial wealth, and real wealth, i.e. non-financial assets. In commenting the empirical evidence, we summarise some of the recent literature on the subject. The analysis covers the period 1995-2009.

The paper is divided into six sections. Section 4.2 presents the main features of household financial wealth. In Sect. 4.3 we make a more detailed examination of its components: deposits, securities other than shares, shares and other equity, mutual funds, pension funds, and insurance instruments. Section 4.4 looks at household debt and net financial wealth. Section 4.5 is devoted to household real or non-financial assets, and household total net worth. Section 4.6 reviews the micro data available, while in Sect. 4.7 we present some correlations between household wealth and a set of macroeconomic indicators. The last section summarises the main conclusions of the paper. The sources of the data are described in the appendix.

4.2 Financial Assets

Households allocate their disposable income between saving and consumption. Saving is then used for investing, either in real assets (mainly residential property) or in financial instruments (e.g. deposits, bonds and shares). The accumulated stock of financial assets is important for individual wellbeing, as it represents the resources available to maintain adequate levels of consumption and welfare after retirement. Household financial assets are the result of the combined action of two factors: the net acquisition of financial instruments which accumulate over existing financial assets and the impact of changes in market prices.

Table 4.1 Household financial assets: ratio to disposable income

	Italy	France	Germany	Spain	UK	US	Japan
1995	2.5	2.1	2.0	2.1	3.9	3.9	3.9
1996	2.6	2.2	2.1	2.2	3.9	4.1	4.0
1997	2.9	2.3	2.2	2.4	4.4	4.4	3.9
1998	3.2	2.4	2.4	2.6	4.5	4.6	4.0
1999	3.4	2.7	2.5	2.7	5.0	5.1	4.3
2000	3.5	2.7	2.5	2.5	4.7	4.6	4.4
2001	3.3	2.5	2.5	2.5	4.2	4.2	4.5
2002	3.3	2.4	2.4	2.3	3.8	3.8	4.4
2003	3.3	2.5	2.5	2.5	3.9	4.2	4.6
2004	3.4	2.6	2.6	2.5	4.1	4.4	4.6
2005	3.5	2.7	2.7	2.7	4.4	4.7	4.9
2006	3.5	2.9	2.8	2.9	4.6	4.9	5.0
2007	3.4	3.0	2.8	2.8	4.6	4.9	4.9
2008	3.2	2.7	2.6	2.4	4.0	3.9	4.6
2009	3.4	2.9	2.8	2.4	4.4	4.1	4.7

See the statistical appendix for the sources of the data in the tables

Looking at the evidence provided by the financial accounts for the last 15 years, for financial assets held by households, as a proportion of disposable income, we identify two groups of countries (Table 4.1). In the first group, consisting of the UK, the US and Japan, financial wealth is more than four times disposable income, while in the second group, which includes Italy, France, Germany and Spain, it is between two and a half and three and a half times. Per capita figures broadly confirm the gap between the two sets of countries, which is mainly attributable to three factors.

A first explanation lies in households' participation in financial markets, which also allows them to benefit from capital gains. Individuals who invest in shares represent 30% of the population in the UK, 29% in Japan and 26% in the US, while the figures are 15% in France, 8% in Germany and 7% in Italy (Zingales 2007). Table 4.2, in which household financial assets are presented as a ratio to disposable income, confirms that listed shares figure more prominently in the first set of countries than in the second, reaching the highest value in the US. Participation in financial markets through mutual funds, pension funds and insurance companies is also higher in the US and the UK. Table 4.2 shows a similar degree of financial development for the US, the UK and Japan, although reflecting different household choices. While American households invest most in shares and other equity, Japanese savers concentrate on deposits, and insurance technical reserves are significant in the UK.[1] In other words, even if the Japanese stock market remains

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[1] Defined as actuarial reserves against outstanding risks in respect of insurance policies.

Table 4.2 Household financial assets with respect to disposable income

Countries and years	Deposits	Securities other than shares	Shares and other equities		Insurance technical reserves	Other assets
			of which quoted shares	of which mutual funds		
Italy						
1995	0.98	0.59	0.58	*0.07*	*0.10*	0.24	0.10
2003	0.84	0.65	1.16	*0.12*	*0.37*	0.50	0.09
2006	0.92	0.65	1.23	*0.15*	*0.34*	0.59	0.10
2009	1.03	0.69	0.99	*0.07*	*0.18*	0.60	0.10
France						
1995	0.86	0.12	0.50	*0.08*	*0.28*	0.50	0.09
2003	0.86	0.05	0.66	*0.08*	*0.27*	0.85	0.12
2006	0.84	0.04	0.82	*0.13*	*0.27*	1.05	0.14
2009	0.84	0.05	0.69	*0.10*	*0.22*	1.12	0.19
Germany						
1995	0.08	0.25	0.38	*n.a.*	*0.15*	0.55	0.02
2003	0.93	0.19	0.59	*0.10*	*0.31*	0.77	0.04
2006	0.96	0.23	0.67	*0.14*	*0.32*	0.86	0.03
2009	1.07	0.22	0.55	*0.09*	*0.33*	0.94	0.02
Spain						
1995	1.05	0.07	0.62	*0.10*	*0.21*	0.21	0.10
2003	0.98	0.07	0.99	*0.19*	*0.31*	0.37	0.08
2006	1.06	0.08	1.31	*0.24*	*0.32*	0.40	0.10
2009	1.15	0.07	0.77	*0.16*	*0.19*	0.36	0.08
United Kingdom						
1995	0.93	0.10	0.78	*0.34*	*0.14*	1.98	0.13
2003	1.05	0.08	0.64	*0.26*	*0.16*	2.03	0.12
2006	1.19	0.05	0.73	*0.26*	*0.19*	2.47	0.15
2009	1.25	0.05	0.58	*0.17*	*0.09*	2.35	0.14
United States						
1995	0.53	0.43	1.68	*0.81*	*0.22*	1.24	0.06
2003	0.52	0.38	1.85	*0.81*	*0.35*	1.40	0.06
2006	0.57	0.41	2.29	*0.97*	*0.42*	1.52	0.07
2009	0.59	0.42	1.66	*0.68*	*0.38*	1.33	0.07
Japan						
1995	2.09	0.31	0.44	*0.22*	*0.11*	1.04	0.22
2003	2.47	0.10	0.42	*0.22*	*0.10*	1.20	0.26
2006	2.41	0.13	0.80	*0.34*	*0.19*	1.23	0.24
2009	2.52	0.13	0.47	*0.20*	*0.17*	1.23	0.20

large in terms of capitalization, deposits are still very important in the country. As underlined by Demirguc-Kunt and Levine (2001), both markets and banks matter for financial development.

A second reason for the difference between the two sets of countries is household preferences for investing in real assets. Traditionally, household real assets have always been substantial in Spain and Italy (see Sect. 4.5) and, by contrast, extremely low in the US. However, the link between financial and real wealth is complex because, as we will see, the two forms of assets are complementary in countries such as the UK.

A third reason for country differences is that public pension schemes are less conspicuous in the first group of countries than in the second. Consequently, household financial assets are greater in the UK, the US and Japan because of the popularity of private pension schemes. Currently, the pension obligations of general government vis-à-vis households – which are important in the euro-area countries – are not classified in the financial accounts.[2]

In addition to these structural differences between countries, there are some factors that are common to all the economies. Between 1995 and 2009, the ratio of household financial assets to disposable income grew in all countries, but progress was not steady because financial wealth is influenced largely by equity prices. Financial assets increased between 1995 and 2000 in response to the stock market boom. The slowdown of equity prices affected financial assets adversely between 2000 and 2003 in every country except Germany and Japan where deposits are prominent in household portfolios. The subsequent recovery of stock prices, lasting until the first half of 2007, caused a new increase in financial assets in relation to disposable income. When the financial crisis started, financial assets were again hit by a fall in asset prices: in 2008 their ratio to disposable income decreased in all the countries, and especially in the US. By contrast, in 2009 the ratio gained from the recovery of the national stock exchanges.

Looking at the flows of financial assets (Table 4.3) from 1995 to 2009, the largest flows are in investment in insurance technical reserves. These flows were always positive and appear independent of the business cycle momentum. In terms of size, flows of deposits were the second most important form of household financial saving, particularly in years of plummeting share prices. The flows of securities other than shares were in most cases smaller than those of the other financial instruments and sometimes even negative. The flows of shares and other equity were linked to the trend of the stock exchanges, reaching peak values during the years of the internet bubble (1995–2000). In 2008, the financial crisis led to low and negative flows of listed shares and mutual funds. Instead, in 2009 and the first half of 2010, the low interest rates set by central banks in response to the economic recession prompted households to invest in shares at historically high levels.

In the last 15 years a general financial deepening process has taken place. Two key elements are deregulation and international integration. Between 1995 and 2007, when the financial crisis started, financial deepening was driven by the deregulation in finance and in financial institutions which led to a broadening of

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[2] See in this volume Chapter 5 by Semeraro on the inclusion in financial accounts, as household assets and general government liabilities, of the items implied by pay-as-you-go systems.

Table 4.3 Household financial assets flows (percentages with respect to GDP)

Countries and years	Deposits	Securities other than shares	Shares and other equity	*of which mutual funds*	Insurance technical reserves	Other assets	Total
Italy
1995–1997	1.5	1.8	4.1	*4.0*	2.2	0.7	10.3
1998–2000	−0.1	−3.4	8.4	*8.4*	3.3	0.2	8.4
2001–2003	2.7	3.7	−0.2	*0.1*	3.6	0.0	9.8
2004–2007	3.4	2.6	−0.2	*−1.1*	2.4	0.4	8.6
2008	4.3	3.4	−2.3	*−4.1*	−0.4	0.2	5.2
2009	1.8	−2.6	3.8	*0.6*	1.9	−0.3	4.5
France
1995–1997	3.7	−0.6	−1.5	*−1.8*	5.3	0.3	7.2
1998–2000	1.6	−0.4	0.4	*0.7*	4.6	0.1	6.2
2001–2003	2.0	−0.3	1.5	*0.6*	3.9	0.6	7.6
2004–2007	2.0	0.2	0.6	*0.0*	5.3	0.7	8.9
2008	2.5	0.2	0.2	*−0.1*	3.3	0.6	6.6
2009	1.0	0.2	−0.2	*−0.7*	4.8	2.5	8.3
Germany
1995–1997	2.0	0.6	1.1	*0.7*	3.2	0.1	7.1
1998–2000	0.4	−0.2	3.1	*2.1*	3.3	0.2	6.9
2001–2003	2.6	0.6	0.1	*1.8*	2.4	0.2	5.9
2004–2007	2.4	0.2	0.2	*0.4*	3.0	−0.1	5.6
2008	4.8	0.1	−1.3	*0.4*	1.6	−0.1	5.0
2009	2.1	−0.2	1.3	*1.2*	3.2	−0.2	6.1
Spain
1995–1997	2.0	0.1	5.5	*5.3*	2.3	−0.9	9.0
1998–2000	5.3	0.0	0.2	*−0.1*	3.0	0.7	9.2
2001–2003	4.3	0.2	1.4	*1.1*	2.3	−0.1	8.1
2004–2007	6.2	0.5	0.5	*0.6*	1.6	0.7	9.5
2008	7.0	−0.6	−3.5	*−3.6*	0.2	−0.4	2.7
2009	2.5	0.2	1.0	*0.0*	0.9	−0.4	4.2
United Kingdom
1995–1997	4.3	−0.4	−0.8	*0.5*	4.9	0.3	8.3
1998–2000	3.5	0.4	−2.2	*0.9*	3.6	0.6	6.1
2001–2003	4.9	0.3	0.1	*0.5*	3.7	0.4	9.5
2004–2007	5.9	−0.9	−2.2	*−0.2*	4.3	0.4	7.6
2008	5.4	−0.3	−6.6	*−1.1*	1.9	0.6	1.0
2009	1.1	0.0	0.8	*1.3*	0.7	0.1	2.8
United States
1995–1997	1.2	0.5	0.9	*2.7*	3.1	0.4	6.0
1998–2000	1.3	−0.1	−1.9	*2.5*	3.3	0.7	3.4
2001–2003	2.8	−0.3	−0.9	*1.7*	3.5	0.3	5.5
2004–2007	3.2	2.0	−1.7	*2.5*	2.4	0.8	6.7
2008	2.4	−0.1	1.3	*1.7*	1.6	−0.8	4.5
2009	0.4	−2.8	1.4	*0.9*	0.9	−0.6	−0.7

(continued)

Table 4.3 (continued)

Countries and years	Deposits	Securities other than shares	Shares and other equity	*of which mutual funds*	Insurance technical reserves	Other assets	Total
Japan							
1995–1997	6.2	−0.8	0.1	*0.1*	3.5	0.1	9.1
1998–2000	4.1	−1.3	0.8	*0.6*	2.1	−0.1	5.5
2001–2003	2.3	−0.8	−0.4	*−0.1*	0.2	0.0	1.2
2004–2007	0.2	1.0	1.3	*1.5*	1.8	−0.8	3.5
2008	1.5	−0.4	1.0	*0.7*	−1.2	−0.6	0.3
2009	2.8	0.0	−0.4	*−0.4*	−0.5	−0.1	1.8

the range of instruments available for the allocation of saving. This is shown by the huge values of total asset flows to GDP recorded up to 2007 for almost all countries. Moreover, the greater integration of financial markets has been reflected in a growth of financial transactions with abroad. In most of the countries, the ratio of external financial assets or liabilities to GDP has risen (on this issue see Chap. 9 by Infante, Pozzolo and Tedeschi). There is a line of research on the drivers of financial integration that looks at determinants such as trade, domestic financial development, GDP per capita, size of countries, degree of capital account openness, and role of international financial centres such as the UK, Belgium, the Netherlands and Switzerland (Lane and Milesi-Ferretti 2008). The harmonization of financial regulation in Europe has also underpinned the increase in cross-border financial holdings.

Having observed some common trends, one can investigate whether there exists a convergence in the composition of household financial instruments between countries. Even though there is no theory of financial system convergence nor of an optimum financial system, globalization, economic integration and harmonization of regulations and corporate governance rules may have led to a convergence of some financial system characteristics. The results of some papers on the subject are influenced by the methodology applied, the time span considered, and the countries taken into account.[3] Signs of convergence in the composition of household wealth are emerging, but sometimes only for the products most closely linked to financial markets, such as shares and other equity and insurance and pension products. For instance, Schmidt et al. (1999) show that France is the European country which introduced, during the 1990s, the most important financial market reforms in the direction of the Anglo-Saxon model. National peculiarities seem to persist, if we look at the weight of deposits and securities other than shares. But taking into account a longer time span, in Chap. 7 of this volume Di Giacinto and Esposito find β-convergence for indicators of financial development of European countries also for banking products. Financial convergence remains a fascinating issue to pursue.

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[3] See Bianco et al. (1997), Bartiloro and De Bonis (2005), De Bonis et al. (2007), Bruno et al. (2011).

4.3   The Composition of Financial Wealth

In this section we distinguish in detail between the different forms of financial wealth: deposits, securities other than shares, shares and other equity, mutual funds, and insurance technical reserves.

4.3.1   Deposits

From 1995 to 2006, the decrease of deposits in household portfolios as a percentage of total assets continued in all the European countries due to a longer term disintermediation process (Table 4.4). The share of deposits remained relatively stable in the UK and the US, where banking disintermediation took place earlier. As already underlined, Japan is an outlier. Households invest around 50% of their financial wealth in deposits; the Post Office is important in this regard. From 2007 onwards the financial crisis partially interrupted banking disintermediation: the percentage of deposits to disposable income increased in most of the countries, reflecting the move of households towards safer instruments.

Countries differ with regard to the importance of transferable and non-transferable deposits (Table 4.5). Italy and the UK are the only countries where transferable deposits, consisting mainly of current accounts, outweigh non-transferable ones. A first explanation is that transferable deposits have always been remunerated in these two countries, while this has not always been the case in other financial systems. For example in France, where transferable deposits have a small weight in the household portfolio, remuneration of current accounts was forbidden by law until 2006; in the US, transferable deposits are negligible given the strong competition coming from money market funds since the 1960s. The ratio of money market fund shares to the total mutual fund business in the US is the highest among the seven countries analysed.

A second explanation relates to the characteristics of the banking systems: non-transferable deposits are important not only in France but also in Germany and Japan, where relationship banking and the predominance of long-term loans led banks to issue deposits with a long agreed maturity.

A third explanation involves institutional factors. In the euro-area banking systems there are differences in product characteristics and business practices, particularly as regards taxation, degree of liquidity and the return structure of deposits (ECB 2006). For example, deposits redeemable with a period of notice of more than 3 months are offered only in Germany. In some European countries, customers become eligible for a mortgage after they have invested for a certain period in a long-term bank saving product. Repos are important mostly in Italy, because of the large availability in the economy of securities other than shares issued both by banks and the general government.

4.3.2   Securities Other than Shares

Securities other than shares are very important in household portfolios in Italy (20% of total financial wealth) and, to a lesser extent, in the US (10%), while their weight

Table 4.4 Household financial assets composition (percentages with respect to total assets)

Countries and years	Deposits	Securities other than shares	Shares and other equities		of which quoted shares	of which mutual funds	Insurance technical reserves	Other assets
Italy								
1995	39.2	23.7	23.4	2.9		3.9	9.8	4.0
2003	26.0	20.0	35.8	3.8		11.3	15.4	2.9
2006	26.3	18.6	35.3	4.2		8.5	17.0	2.8
2009	30.2	20.3	29.0	3.5		5.2	17.6	2.9
France								
1995	41.6	5.9	24.1	3.6		13.4	24.0	4.4
2003	33.9	1.9	25.9	3.2		10.6	33.5	4.8
2006	29.0	1.5	28.4	4.4		9.5	36.3	4.9
2009	29.1	1.6	23.9	3.3		7.8	38.8	6.6
Germany								
1995	42.4	11.8	18.2	n.a.		7.2	26.5	1.1
2003	36.8	7.5	23.5	4.0		12.2	30.8	1.5
2006	34.9	8.4	24.5	5.1		11.8	31.1	1.1
2009	38.3	7.8	19.7	3.9		11.9	33.5	0.7
Spain								
1995	50.9	3.9	30.2	5.0		10.1	10.1	4.9
2003	39.2	3.0	39.7	7.7		12.3	15.0	3.2
2006	36.1	2.6	44.5	8.2		11.1	13.5	3.3
2009	47.4	2.8	31.6	6.5		8.0	15.0	3.2
United Kingdom								
1995	23.8	2.4	19.9	8.6		3.6	50.5	3.4
2003	26.7	1.9	16.4	6.6		4.0	51.9	3.0
2006	25.9	1.1	15.9	5.7		4.2	53.9	3.2
2009	28.6	1.1	13.2	3.8		2.0	53.8	3.3
United States								
1995	13.4	10.9	42.7	20.6		5.8	31.4	1.5
2006	12.4	9.0	43.9	19.1		8.2	33.3	1.4
2006	11.7	8.6	47.1	20.0		8.7	31.2	1.3
2009	14.5	10.4	40.7	16.8		9.3	32.6	1.8
Japan								
1995	49.4	7.9	13.5	6.7		2.4	25.2	4.0
2003	55.2	3.7	9.3	4.7		2.2	26.0	5.8
2006	49.8	4.4	16.2	6.7		3.9	24.7	4.9
2009	55.4	4.7	9.9	4.2		3.6	25.9	4.1

is smaller and even negligible elsewhere. In the US, securities other than shares consist mainly of corporate bonds; in Italy during the 1990s, at first Treasury bonds had a predominant role but later, from the end of the 1990s, bonds issued by banks became prevalent.

Table 4.5 Household deposits (percentages of household total financial assets)

Countries and years	Deposits		
	Total	Transferable	Non transferable
Italy			
1995	36.7	15.9	20.8
2003	24.1	14.3	9.8
2006	24.0	14.3	9.7
2009	27.2	15.0	12.2
France			
1995	38.7	10.2	28.5
2003	32.5	8.5	24.1
2006	27.8	7.6	20.2
2009	27.6	7.4	20.2
Germany			
1995	41.3	7.0	34.3
2003	34.2	10.5	23.7
2006	31.6	10.6	21.0
2009	34.2	14.0	20.2
Spain			
1995	43.8	5.6	38.2
2003	34.6	6.0	28.7
2006	31.4	15.5	15.9
2009	42.1	17.6	24.5
United Kingdom			
1995	22.8	20.1	2.8
2003	25.7	23.4	2.3
2006	25.0	23.0	2.0
2009	27.6	25.2	2.4
United States			
1995	13.4	2.6	10.8
2003	12.4	1.1	11.3
2006	11.7	0.4	11.3
2009	14.5	0.6	13.9
Japan			
1995	48.2	6.5	41.7
2003	42.3	18.3	34.0
2006	47.0	18.8	28.2
2009	51.8	20.2	31.6

For a more correct interpretation of the data we need to look more closely at whether households can also own bonds indirectly through their holdings of mutual funds shares and insurance products. Some economists have recently criticized the national accounts standards for the way household assets are classified. The majority of the bonds held by insurance corporations, pension funds and mutual funds should be attributed to household balance sheets (Palumbo and Parker 2009).

This inclusion would raise household investments in securities other than shares in France, the UK and the US.

4.3.3 Shares and Other Equity

Shares and other equity is a heterogeneous item that includes listed shares, unlisted shares, other equity and mutual fund units (on the latter see Sect. 4.3.4). In Europe, between 1995 and 2000, the percentage of listed and unlisted shares in total assets increased significantly because of the stock market booms. The increase was particularly large in Italy and Spain, from relatively underdeveloped financial markets. Shares suffered from the stock market downturns between 2000 and 2003 and were boosted by the subsequent resurgence of prices. The crisis in the financial markets caused household holdings of shares and other equity to decrease as a percentage of total assets in all countries in 2008. Throughout most of Europe, the value of equities reduced not just because of this price effect, but also due to sizeable sales, as the flow statistics show (Table 4.3).

Listed shares, on the one hand, and unlisted shares and other equity, on the other, may be substitutes. If private business is important for the household portfolio, investments in listed shares might consequently be low. In a country like Italy, where small family-run firms predominate, households have a lot of unlisted shares and other equity in their portfolios, possibly crowding out other forms of equity investment. Heaton and Lucas (2000) emphasize that wealthy households face entrepreneurial risk through holdings of business assets. Following this argument, countries where unlisted shares and other equity are sizeable might have low levels of listed shares.[4]

On the basis of the available evidence (Table 4.6), unlisted shares and other equity are especially important in countries where small firms prevail, such as Italy[5] and Spain, while they are less important in the UK, the US, and Japan, where larger corporations traditionally predominate. However, unlisted shares and other equity are also large in France, notwithstanding the progress of formal financial markets in that country. The possible contrast between the different types of shares and other equity appearing in household portfolios is a subject that merits further analysis.

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[4] The issue is difficult to study because there are statistical problems relating to the estimation of unlisted shares and other equity. International organizations, such as Eurostat and the OECD, have set up task forces to discuss common methodologies for estimating unlisted shares (see Durant and Massaro 2004). Only some countries are able to provide details on the amounts of listed shares, unlisted shares and other equity (on Italy, see Rodano and Signorini 2007).

[5] The limited number of companies that decide to go public contributes to both the incomplete development of the stock exchange and the reluctance of small business owners to open the equity of their firm to external investors. The limited success of a number of initiatives taken over the years by the Italian Stock Exchange for the listing of small firms suggests that, at least in Italy, the second reason is more important than the first.

Table 4.6 Household quoted shares, unquoted shares and other equity in 2009 (percentage composition)

	Italy	France	Germany	Spain	UK	US	Japan
Quoted shares	14.8	20.6	42.0	28.0	33.4	53.4	66.1
Unquoted shares	60.3	55.8	7.7	59.6	47.2		33.9
Other equity	24.9	23.6	50.3	12.5	19.5	46.6	0.0

4.3.4 Mutual Funds

In some years, mutual fund units were greater than 10% of total household assets. A mutual fund is a professionally managed collective investment scheme that pools money from many investors in order to purchase financial assets (bonds, shares, other mutual funds shares) and non-financial assets (commodities, real estate). Mutual funds have benefited from the deregulation of finance offering households new possibilities to allocate their savings and from cross-border holdings. Looking at the breakdown of funds according to their investment policy (Table 4.7), bond funds are particularly important in Spain and Italy. On the other hand, equity funds are more common in countries with larger financial markets, such as the UK, the US and Japan. In most of the countries reviewed, mutual funds have lost importance in household portfolios because of stock exchange difficulties and a disappointing performance.

A frequent distinction is drawn between open-end investment funds and closed-end funds. Open-end funds issue units that are, at the request of the holders, repurchased or redeemed directly or indirectly out of the undertaking's assets. Closed-end funds have a fixed number of issued shares and shareholders have to buy or sell existing shares to enter or leave the fund. Open-end funds are prevalent in all the countries. Close-end funds invest in real estate or securities. Funds investing in real-estate assets benefited from the recent increase in house prices. Closed-end investment funds buying securities are still marginal in most of the financial systems; they invest mainly in unlisted shares of start-up companies and in many countries they are equivalent to venture capital companies or private equity firms when they invest in more mature companies.

4.3.5 Pension Funds and Insurance Products

In the light of the crisis of public pension schemes, the ageing of the population and larger personal responsibility for the financing of individual healthcare, insurance technical reserves rose in all countries. The rise was particularly sharp in countries, like Spain and Italy, where private pension funds and insurance companies' business were small fifteen years ago. At the opposite extreme, UK households invest more than 50% of their portfolio in insurance technical reserves. As underlined by the OECD (2005), the British pension system combines one of the least generous state pension schemes of the industrialized countries with one of the most

Table 4.7 Mutual funds by investment policy (percentages of total mutual funds)

	IT		DE		ES		FR		UK		US		JP	
	2000	2009	2000	2009	2000	2009	2000	2009	2000	2009	2000	2009	2000	2009
Equity funds	37.4	16.6	27.3	14.9	20.2	6.8	34.1	28.3	n.a.	61.0	77.4	63.5	44.1	89.8
Bond funds	49.4	46.8	26.1	28.7	50.5	61.9	26.0	19.7	n.a.	19.9	15.8	28.3	55.9	5.2
Other funds[a]	13.2	36.6	46.7	56.3	29.3	31.3	39.9	52.0	n.a.	19.1	6.8	8.2	0.0	5.0

[a]Include mixed, real estate, hedge and other funds

developed systems of voluntary private pensions. This also explains why households' listed shares and mutual funds are less important than pension funds and insurance products in the UK.

The reform of public pension schemes was at the origin of increased household investment in pension funds in all countries (Table 4.8). The largest stocks of reserves are found in the UK and the US; intermediate levels are registered in Japan and Germany and low levels prevail in Spain, France and, especially, Italy. In Europe, private pension funds are facing obstacles: although households are well aware of the limited amount of resources they will receive from the public pension schemes at the time of retirement, they are still reluctant to invest in private instruments.

The institutional architecture of pension funds is different in each country. There are several possible classifications. A first example is the distinction between autonomous and non-autonomous funds. The former are managed by financial intermediaries or other managers to provide incomes for employees on retirement; the latter are funds set up by employers, for example large industrial corporations and banks, to offer pensions to their employees. Autonomous pension funds are prevalent in all countries, with the exception of Germany, where non-autonomous pension funds are a component of the German system of corporate governance.

A second distinction is between defined benefit plans, where the risk is borne by the unit responsible for portfolio management, and defined contribution plans, where the risk is mainly borne by the individual. There is a general trend towards an increase in defined contribution schemes. Nonetheless, they are still a minority in Italy, France and Spain, while they are more common in the UK, the US and Japan.

Not only is the incidence of pension funds different in each country but so is the composition of their assets. This asset mix reflects national developments in financial markets. While securities issued by general government are one of the main choices in the majority of countries, investments in deposits and real estate are important in Italy and shares dominate in the UK.

For life insurance products, a common distinction is between unit-linked and non unit-linked instruments (Table 4.9). In unit-linked life insurance reserves, the return of the capital invested is linked to the performance of an index or to a financial portfolio, and the risk is borne by the subscriber. Non-unit-linked life insurance reserves ensure a guaranteed rate and the risk is borne by the insurance company. During the stock market boom of 1995–2000, there was an increase in unit-linked contracts. They remain, according to OECD statistics, notably important in the UK.

4.4   Household Debt and Net Financial Wealth

Household propensity to borrow and its determinants vary across countries with many factors (ECB 2002; Campbell 2006). Cultural attitudes – the moral judgement on debt prevailing in society – are important. The scale of the tax deductibility of interest expenses varies across countries and influences borrowers' behaviour. The demand for mortgages is affected by the housing markets, including

Table 4.8 Household pension funds reserves (percentages of total financial assets)

Countries and years	Managed by autonomous pension funds			Managed by non-autonomous pension funds	Insured pension plans	Total
		Defined contribution	Defined benefit			
Italy						
1995	0.7	0.7	n.a.	0.4	n.a.	1.1
2000	0.6	0.6	n.a.	0.2	n.a.	0.8
2008	1.2	1.2	n.a.	0.1	n.a.	1.2
2009	1.2	1.2	n.a.	0.1	n.a.	1.3
France						
1995	0.0	0.0	0.0	–	0.0	0.0
2000	0.0	0.0	0.0	–	3.1	3.1
2008	0.1	0.1	0.0	–	4.1	4.2
2009	0.1	0.1	0.0	–	4.1	4.1
Germany						
1995	5.6	n.a.	n.a.	7.5	–	13.0
2000	6.1	n.a.	n.a.	6.7	–	12.8
2008	8.0	n.a.	n.a.	6.7	–	14.6
2009	7.9	n.a.	n.a.	6.7	–	14.6
Spain[a]						
1995	2.1	1.3	0.0	1.4	1.0	4.5
2000	3.7	2.6	0.1	1.2	0.9	5.8
2008	4.6	n.a.	n.a.	0.5	1.1	6.3
2009	4.7	n.a.	n.a.	0.5	1.1	6.4
United Kingdom						
1995	n.a.	n.a.	n.a.	n.a.	n.a.	25.8
2000	n.a.	n.a.	n.a.	n.a.	n.a.	24.5
2008	n.a.	n.a.	n.a.	n.a.	n.a.	23.5
2009	n.a.	n.a.	n.a.	n.a.	n.a.	24.4
United States						
1995	22.5	6.9	15.6	–	4.1	26.6
2000	22.9	7.8	15.1	–	4.6	27.5
2008	19.9	6.9	13.0	–	5.2	25.1
2009	n.a.	n.a.	n.a.	–	n.a.	26.8
Japan						
1999	n.a.	n.a.	n.a.	n.a.	n.a.	7.8
2000	n.a.	n.a.	n.a.	n.a.	n.a.	9.3
2008	n.a.	n.a.	n.a.	n.a.	n.a.	11.8
2009	n.a.	n.a.	n.a.	n.a.	n.a.	11.7

Data for 2009 are partially estimated

[a]Spanish households hold hybrid plans managed by autonomous pension funds representing 0.7%, 1% and 1.2% of their total financial assets in 1995, 2000 and 2007 (last year available) respectively

Table 4.9 Household life insurance reserves (percentages of total financial assets)

Countries and years	Life insurance reserves	Unit-linked	Non unit-linked	Total insurance technical reserves
Italy				
1995	3.2	n.a.	n.a.	4.0
2000	5.7	1.8	3.9	6.6
2008	9.7	3.2	6.5	10.7
2009	10.7	3.1	7.6	11.7
France				
1995	20.9	1.9	19.1	24.0
2000	24.2	5.4	18.8	26.8
2008	31.1	5.2	25.9	34.6
2009	34.6	n.a.	n.a.	37.9
Germany				
1995	12.6	0.1	12.5	14.5
2000	14.2	0.3	13.9	16.0
2008	16.9	0.8	16.1	18.7
2009	17.1	0.8	16.3	18.9
Spain				
1995	4.5	0.0	4.5	5.6
2000	6.8	1.3	5.5	8.1
2008	6.8	0.7	6.1	8.4
2009	7.0	n.a.	n.a.	8.7
United Kingdom				
1995	23.3	n.a.	n.a.	24.7
2000	26.7	n.a.	n.a.	27.9
2008	27.2	n.a.	n.a.	28.5
2009	28.3	n.a.	n.a.	29.4
United States				
1995	2.6	n.a.	n.a.	4.2
2000	2.5	n.a.	n.a.	3.6
2008	2.8	n.a.	n.a.	4.6
2009	2.8	n.a.	n.a.	4.6
Japan				
1995	17.1	n.a.	n.a.	17.1
2000	16.6	n.a.	n.a.	16.6
2008	15.0	n.a.	n.a.	15.0
2009	14.4	n.a.	n.a.	14.4

Data on 2009 are partially estimated

the efficiency of the rental market. Many features define the completeness of the markets for household debt: the types of loans available in the countries, the alternative between fixed and variable rates (see Paiella and Pozzolo 2007), the average loan duration, the restrictions and fees on early repayment, the prevalent

loan-to-value ratio, and the possibility of refinancing loans if house prices rise (mortgage equity withdrawal). Finally, the ratio of household loans to total banking credit may be affected by the efficiency of the legal system in ensuring that creditors recover their loans if debtors become insolvent.

Until the start of the financial crisis in 2007 household debt development was predominantly interpreted as an improvement in the degree of market efficiency. Complete and efficient markets – and more specifically a larger menu of options provided by intermediaries to customers – made it easier for individuals to smooth their consumption path along the life cycle. On the contrary, the problems of the sub-prime segment in the US, the bursting of the housing bubble, and the defaults of borrowers and resulting excessive household indebtedness had adverse effects on financial stability and the business cycle. An extreme view now is that debt is a pollution: it imposes costs on others that the borrowers fail to take into account (Jeanne and Korinek 2010) and a better allocation of resources would therefore be obtained by introducing a tax on debt (see Bianchi and Mendoza 2010). The intuition is that the rise in debt may lead to an increase in collateral values and subsequent risk of their collapse, according to the debt deflation idea of Fisher (1933) and to the financial accelerator hypothesis of Bernanke, Gertler, and Gilchrist (1996). There is currently a widespread opinion that policy-makers, central banks and supervision authorities should exercise closer oversight of household debt than in the past. The issue is cumbersome because households hold financial and real assets that may mitigate the burden of a high gross debt. However, a harmonized concept of indebtedness might be defined together with the introduction of common procedures for treating excessive debt of private individuals (European Commission 2008).[6]

Figure 4.1 shows the ratio of household financial liabilities (or debt) to disposable income. Financial liabilities include loans granted to households by banks and other intermediaries. In the financial accounts, household liabilities include other items, such as trade debts of producer households. We prefer to consider only financial liabilities: the measurement of trade debt and of other some minor items is not harmonized and the results would not be affected by taking into account total household liabilities.

Between 1995 and 2007, the ratio of household debt to disposable income increased in all the countries, with borrowers taking advantage of a general environment of low real interest rates. However, countries may be split into two sets. On the one hand, debt is very high in the UK, the US, Japan and Spain, with values that are greater today than those for disposable income. On the other hand, debt is smaller than disposable income in Germany, and especially in France and Italy. We now look in closer detail at the various national experiences.

In 1995, high levels of debt were found in Japan (106% of disposable income), in the UK (96%) and the US (89%). Subsequently, debt has increased slowly in Japan because of the economic recession. In the UK, debt growth has been significant

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[6] In Europe, countries like France, Germany and the UK have judicial debt settlement procedures for households which are absent in Italy.
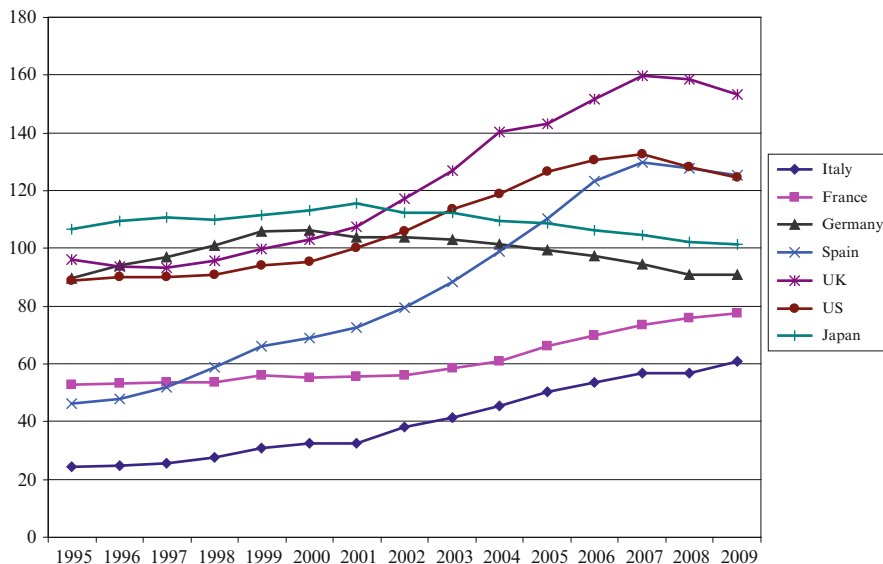
Fig. 4.1 Household: financial debt to disposable income (percentages)

since 2000, driven by intense banking competition and the diffusion of mortgage equity withdrawal (MEW).[7] The most recent data show the persistence of high household debt in the UK (153% of disposable income in 2009), the US (124%) and Japan (101%).

In the US, the growth of debt was similar to that in the UK, with an acceleration around the end of the 1990s and the use of home equity as collateral. From 2000 to 2006 American households became a net borrowing sector leading to an accumulation of debt (Eichner et al. 2010). With the recession in 2008, there was a decrease of the ratio of household debt to disposable income for the first time in 40 years. This de-leveraging has gone hand in hand with an increase in household propensity to save. Before the crisis, a large body of literature claimed that a broader availability of financial instruments underpinned macroeconomic stability. The decline in the volatility of the US business cycle was linked to a decrease in the correlation between housing investments and the other components of effective demand. The last two US recessions, in 1991 and 2001, were characterized by an increase in household leverage which contrasted with the four previous US recessions (Mojon 2007). The increase in household debt was considered to be a key component of the "great moderation" interpretation of the evolution of the American economy. Of course, the sub-prime crisis caused a reversal of the idea of a stable, positive association between economic growth and household debt. Regulators, public

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[7] MEW takes place when households increase their borrowing secured on housing assets, devoting the funds to home improvements and consumption (Bank of England 2003; Walton 2004).

agencies, and economists are now asking for the introduction of consumer protection rules against predatory mortgage lending.[8]

Notwithstanding the high debt of the UK and the US, the most spectacular change took place in Spain, where between 1995 and 2007, household debt increased from 46% to 130% of disposable income. Saving was decreasing (see Sect. 4.5) and a real-estate price bubble was taking place.

Among the countries where debt is lower than disposable income, Germany has a similar story to Japan. Household debt was high in the 1990s, but subsequently stagnated because of the low growth of the economy. Lastly, France and Italy still lag behind in the level of household debt and are the only countries where debt continued to increase in 2008 and 2009.

The dispersion of household financial liabilities among countries is larger than that of financial assets. In Italy, the ratio of household debt to disposable income is around 40% that of the UK. The fact that the variance of the ratio of debt to disposable income is greater than the variance of the financial asset/disposable income ratio indicates that national institutional factors are still important in influencing household debt, while financial deepening, as shown in Sect. 4.2, was more widespread across countries. Bertola and Hochguertel (2007) note that the household menu of debt instruments is more severely constrained than the menu of assets.

Financial innovation is likely to influence the links between debt and the macro-economy differently in countries like the US and the UK, on the one hand, and in countries where more traditional debt arrangements prevail, on the other. The diffusion of MEW is still limited in the euro area (the Netherlands are a notable exception, see DNB 2003). Another example is reverse mortgages: while they are common in the US and in the UK, they are rare in Italy, where a law on the subject was approved only in 2005.

Not only the level of debt matters but also its composition. A traditional way to distinguish between the different forms of household debt is the split between consumer credit, loans for house purchase and other loans, the latter mainly granted to producer households. In the countries surveyed, mortgages are the most important form of household debt, ranging in 2008 from 43 of total loans in Italy to 78% in the US. Consumer credit is generally the second form of household debt by size, but not in Italy, Germany and Spain where "other loans to households" are more

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[8] Some authors have investigated the correlations between subprime mortgage growth, construction of new houses and increase in home prices (Mayer and Pence 2008). Other scholars have found that delinquencies related to subprime mortgages in 2007–08 were linked to past credit growth, in terms of number and volume of originated loans (Dell'Ariccia et al. 2008). There is evidence that the rapid growth in the supply of mortgages to high-risk borrowers can explain much of the large variations in house prices and the connected dynamics of defaults (Mian and Sufi 2008). Gorton (2008) has shown that the chain of interlinked securities related to the subprime market was sensitive to house prices; that asymmetric information was created by complexity, and risk was spread in an opaque way. As far as political economy issues are concerned, Mian et al. (2010) have shown that subprime mortgage lenders and borrowers were able to influence government policy towards housing finance.

Table 4.10 Household net financial wealth: ratio to disposable income

	Italy	France	Germany	Spain	UK	US	Japan
1995	2.2	1.5	1.1	1.6	3.0	3.1	2.8
1996	2.3	1.7	1.2	1.7	3.0	3.2	2.9
1997	2.6	1.8	1.3	1.8	3.4	3.5	2.8
1998	3.0	1.9	1.4	2.0	3.5	3.7	2.9
1999	3.1	2.2	1.4	2.1	4.0	4.2	3.2
2000	3.2	2.1	1.4	1.8	3.7	3.6	3.3
2001	3.0	2.0	1.4	1.7	3.2	3.2	3.3
2002	2.9	1.9	1.4	1.5	2.6	2.7	3.3
2003	2.8	2.0	1.5	1.6	2.6	3.1	3.5
2004	2.9	2.0	1.6	1.5	2.7	3.2	3.5
2005	3.0	2.1	1.7	1.6	3.0	3.4	3.8
2006	3.0	2.2	1.8	1.7	3.1	3.5	3.9
2007	2.9	2.2	1.9	1.5	3.0	3.5	3.8
2008	2.7	1.9	1.7	1.1	2.4	2.6	3.6
2009	2.8	2.1	1.9	1.2	2.8	2.8	3.7

important, reflecting loans to small firms. The maturity of loans to households is crucial for the possible consequences for financial stability, together with the prevalence of variable interest rates in some countries.

Finally, we present some international comparisons of net financial wealth (Table 4.10) computed as the difference between total financial assets and financial debt. In Sect. 4.2 we saw that household gross financial wealth is greater in Japan, the UK and the US than in the euro-area countries, among which Spain has the lowest levels. The consideration of debt provides a different picture. With regard to net financial wealth, Japanese households maintain their first place. With low debt, Italian net financial assets are now in line with English and the American values. In the euro area, Spanish households – because of their great indebtedness – are even further from the French and Germans. During 2008, the crisis produced a larger deterioration in net financial assets in the UK and the US and a smaller collapse in the euro area markets.

4.5 Household Real Assets and Household Total Net Worth

With the exceptions of the US and Japan, real assets are more important for households than financial wealth in the main OECD countries. Real assets include dwellings, land, valuables, non-residential buildings and plant and machinery. The degree of harmonization of data is lower than the statistics on financial assets and liabilities and caution must be exercised in the analysis. We concentrate on total real assets because the single components of wealth are not always available in all the countries. However, dwellings (or real estate) are the most important component in most countries; percentages reach 80% in the UK, the US and Italy.

The recent collapse of house prices following the previous strong increase gave a new impetus to the classic study of the links between the housing sector and the rest of the economy. A first issue concerns the effect of an increase in house prices on consumption. On the one hand, a rise in housing prices might alleviate financial "frictions", such as collateral constraints, in those financial systems where equity mortgage withdrawal exists. Thus, debtors would borrow more funds against the increased values of houses and might spend more. But an increase in house prices also produces a rise in the price of housing services that owner-occupiers would have spent had they been renting (ECB 2009). As a result, economic agents might reduce their demand for housing services as a consequence of an increase in house prices. This effect is influenced by the relative proportion of owners, often older people, and tenants, often younger in age, in the economy. As synthesized by Buiter (2008), changes in house prices can influence consumption if the marginal propensity to consume out of wealth is different between those "long in housing", typically the old, and those "short in housing", typically the young.

Another issue concerns the different effects of financial and real wealth on consumption. In the past, the propensity to consume from net financial wealth was considered to be larger than the propensity to consume from real wealth. Recent studies provide mixed evidence. A last line of research looks at a weaker effect on consumption of real wealth in the euro area than in the US and the UK because the latter countries have stronger market-based mortgage markets. Financial innovation, such as MEW, influences the transmission of housing price shocks. Moreover, other studies have not been able to detect for the housing-consumption link a clear distinction between Anglo-Saxon financial systems and the more traditional bank oriented structures (see Altissimo et al. 2005, and De Bonis and Silvestrini 2012 for evidence of the different empirical results).

In recent years, the development of housing wealth has had a close link with the evolution of residential property prices. From 1995 to 2007 house prices increased in all the main OECD countries, but not in Japan and Germany. This increase was particularly strong in the UK, Spain and France. In 2008 and 2009 the real house price indices decreased in all the seven countries under examination.

For an analysis of the ratio of real assets to disposable income the countries may be divided into three groups (see Table 4.11). The first group of countries, which have high values of real wealth, includes Spain, the UK, France and Italy. Household real wealth reaches its maximum value in Spain, where it is around eight times disposable income. Real assets have traditionally been important in Spain, reaching a high level in international comparisons already in 1995. Since the end of the 1990s the growth of loans to Spanish households has been the highest in the euro area. Given low interest rates, the strong demand for mortgages has been sustained by the rise in house prices, the real index of which more than doubled between 1998 and 2007.

In the same period, the UK, where household real wealth is about five times disposable income, was the country that experienced the largest increase in house prices, with a key contribution coming from an inelastic housing supply (OECD 2005); there was also a rise in the price-rent ratio and a spatially concentrated demand, given the major role of London as a financial and business centre.

Table 4.11 Household non-financial assets: ratio to disposable income

	Italy	France	Germany	Spain	UK	US	Japan
1995	3.9	2.9	2.9	4.2	2.8	1.6	4.3
1996	3.9	2.9	2.9	4.1	2.9	1.6	4.2
1997	4.0	2.9	2.9	4.1	2.9	1.6	4.1
1998	4.1	2.9	3.0	4.2	3.1	1.7	4.0
1999	4.0	3.1	3.0	4.6	3.4	1.7	4.0
2000	4.1	3.3	3.0	4.8	3.7	1.9	3.9
2001	4.1	3.4	3.0	5.3	3.7	2.0	3.8
2002	4.3	3.6	3.0	6.1	4.3	2.0	3.6
2003	4.6	4.1	3.1	6.9	4.6	2.2	3.5
2004	4.7	4.6	3.1	7.8	5.0	2.3	3.3
2005	4.9	5.1	3.2	8.5	5.0	2.6	3.2
2006	5.2	5.5	3.3	8.9	5.2	2.5	3.3
2007	5.4	5.5	3.4	9.0	5.6	2.3	3.3
2008	5.4	5.3	3.3	8.5	4.8	1.8	3.2
2009	5.6	5.1	3.3	8.0	4.9	1.7	3.2

In general, new housing supply tends to be more rigid in the UK and continental Europe and relatively flexible in North America.

In France, the increase in house prices – similar to that in Spain – has been ascribed to the growing number of families and the strong concentration of inhabitants in Paris. According to Gervais (2007), French households also face a high opportunity cost of renting instead of buying; legislation allows rents to be indexed to construction prices.

In Italy, as in France, household real assets are around five times disposable income, but the increase in house prices has been lower than in the UK, Spain and France. The high ratio of real assets to disposable income has different explanations. Traditionally houses have been seen as safe investments against high inflation in the 1970s and 1980s. Housing was considered part of the retirement strategy of an ageing population, worried by the never-ending reforms of the public pension system. The stock market difficulties between 2000 and 2003, together with large and well publicized corporate and sovereign bond defaults, also provided incentives for rising house demand and prices. Finally, the imperfections in the market for rented property probably stimulated house purchases.

A second group of countries includes Germany and Japan, where household real wealth is about three times disposable income. Eymann and Borsch-Supan (2002) have noted that German households have low holdings of real estate. In Germany, house prices have remained stable. Traditionally, the country has a large social housing sector. The owner-occupation rate is around 44%, a smaller percentage compared with other countries. Another factor has been the low prices prevailing in former East Germany (ECB 2003). In Japan, general deflation and a particularly sharp decline in land prices caused a decrease in national wealth during the 1990s. In 1995, Japanese households had the highest ratio of non-financial assets to

disposable income; this ratio is now only larger than the ratio in the US. Analyses in Japan look further at the interaction between population ageing, portfolio choices and investment in real assets (Iwaisako 2003).

Finally, household non-financial assets are lower in the US than in the other countries, with a value around twice that of disposable income. The literature has investigated the explanations for the rise in American housing prices between 1998 and 2006. Soaring home prices were mainly a coastal phenomena, affecting metropolitan areas where the supply of new houses is restricted and where the long-run average appreciation rate attracts rich people to these "superstar" markets. But the increase in house prices left the internal states of the US largely untouched. There is a huge quantity of cheap land in the US, which may explain why "housing remains and will remain inexpensive in most areas of the country" (Glaeser 2004; see also Glaeser et al. 2005). The US also has an extremely low population density (31 inhabitants per kilometre). But there are still unresolved puzzles. The boom of house prices occurred in cities where the supply is not restricted – such as Phoenix and Las Vegas – and where the occurrence of a bubble was testified by a growing gap between house prices and fundamental production costs (Gyourko 2009). House prices began decreasing in the second half of 2007. The Case-Shiller index of house prices fell by more than 18% between March 2008 and March 2009: this fall in prices was larger than the drop in 1932, at the worst point of the Great Depression. The Case-Shiller price index has been rising since mid-2009, but at the beginning of 2010 house prices were 30% below their 2006 peak levels. In the US, there are signs of a stabilization of the housing market, but most of the sector indicators remain near record low levels.

Adding household real assets to net financial wealth it is possible to compute total household net worth. Table 4.12 shows that the highest level of the ratio of

Table 4.12 Household net worth: ratio to disposable income

	Italy	France	Germany	Spain	UK	US	Japan
1995	6.2	4.4	4.0	5.8	5.7	4.7	7.1
1996	6.2	4.6	4.1	5.8	5.8	4.8	7.1
1997	6.7	4.7	4.2	5.9	6.3	5.1	7.0
1998	7.0	4.8	4.3	6.2	6.7	5.4	6.9
1999	7.1	5.3	4.4	6.6	7.4	5.9	7.1
2000	7.3	5.4	4.4	6.6	7.4	5.5	7.1
2001	7.1	5.4	4.4	7.0	6.9	5.2	7.1
2002	7.2	5.5	4.4	7.6	6.9	4.8	6.9
2003	7.4	6.0	4.5	8.5	7.2	5.2	6.9
2004	7.6	6.6	4.7	9.4	7.6	5.6	6.9
2005	8.0	7.2	4.9	10.1	7.9	6.0	7.1
2006	8.1	7.7	5.1	10.6	8.3	6.1	7.2
2007	8.2	7.8	5.3	10.5	8.6	5.8	7.1
2008	8.1	7.2	5.1	9.6	7.3	4.4	6.8
2009	8.4	7.2	5.2	9.2	7.7	4.6	6.9

household net worth to income is found in Spain, with a value around nine times disposable income. This result is driven by the record stock of real assets. Italy has a ratio around eight times disposable income, followed by France and the UK, with values around seven: these countries have intermediate levels of both financial and real assets. In Japan, net worth is less than seven times disposable income. Levels around five are found in Germany and the US. Germany has relatively low financial assets and, especially, real wealth. In the US, housing wealth is at the lowest levels. For net worth, the collapse of 2008 and the recovery of 2009 were stronger in the UK and the US than in most of the European countries. Spain had a peculiar experience because the strong decrease in house prices implied a decline in net worth also in 2009.

4.6   Evidence from Micro Data

So far we have examined household wealth using the national financial accounts. These macro statistics do not contain information about the distribution of assets and debt among different individuals and families and about wealth concentration. For a more comprehensive analysis of household investment choices it is important to look at the micro information, mainly collected through surveys conducted by the national statistical offices and central banks. Micro data, where available, provide different insights. The case of Italy is a useful example. Excluding insurance reserves and pension funds, three quarters of Italian households either have no financial assets (11%) or just hold a deposit (63%; see Bank of Italy 2010).[9] Discussions on the riskiness of the portfolio, particularly on the ups and downs of shares and mutual funds, affect only a small fraction of the population.

Few countries run surveys on household wealth, so that international comparisons are difficult to carry out.[10] The only attempt available is the Luxembourg Wealth Study (LWS), a collaborative project to assemble existing micro data on household wealth into a coherent database (Sierminska et al. 2006).[11] Even if data refer only to 2000–2002, due to the resilience of this information it is still worth looking at the evidence of the LWS. Another important caveat refers to the partial comparability of these results: when looking at household asset participation, a threshold of 2,500 euros has to be adopted to enhance comparability, as the Germany survey records only values exceeding this amount (see Table 4.13). With respect to our set of

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[9] Caution must be exercised when trying to bridge micro data with the evidence provided by financial accounts. The two datasets cannot be matched because of different asset definitions and valuations, together with possible under-reporting in the survey (see Bonci et al. 2005).

[10] The ECB is currently working on a project aiming at collecting harmonized micro data on household finance and consumption.

[11] The LWS project was official launched in 2004, with nine participants: Canada, Cyprus, Finland, Germany, Italy, Norway, Sweden, the United Kingdom, and the United States. Austria also joined in spring 2006.

Table 4.13 Household asset participation (percentages)

	Germany[a]	Italy[b]	UK[c]	US[d]
Non-financial assets	43	72	70	70
Principal residence	39	69	69	68
Investment real estate	13	22	8	17
Financial assets	50	81	80	91
Deposit accounts	–	81	76	91
Bonds	–	14	–	19
Stocks	–	10	–	21
Mutual funds	–	13	–	18
Debt	30	22	59	75
Home secured debt	–	10	39	46
Only financial assets and non-housing debt exceeding 2,500 euros				
Non-financial assets	43	72	70	70
Financial assets	49	70	58	60
Total debt	30	17	49	65

Source: Jantti et al. (2008)
[a]Social Economic Panel Study 2002
[b]Survey on Household Income and Wealth 2002
[c]British Household Panel Survey 2000
[d]Survey of Consumer Finances 2001

countries, we have information from the LWS only for Germany, Italy, the UK and the US. These data confirm some of our previous results and, most importantly, add some further information.

Table 4.13 (lower part) confirms that the percentage of indebted households is higher for the UK and the US (49 and 65 respectively), while it is lower in Germany and especially in Italy. By contrast, 70% of Italian households hold financial assets over 2,500 euros; the percentage is lower for the UK and US (around 60%) and much lower for Germany (49%). In the light of the different development of financial markets, shares and mutual fund holdings are less widespread in Italy than in the US (the only two countries for which we have this type of evidence). In 2002 only 10% of Italian households had shares, while the percentage was double in the US; the difference is less striking for mutual funds (13% for Italy against 18% for the US). Households that own their principal residence are very few in Germany and more numerous in the other countries.

Because of the large diffusion of debt in the UK and the US, the quota of households with a negative net worth – i.e. financial liabilities larger than the sum of real and financial assets – amounts to 11 and 19% respectively (see Table 4.14).

Probably the most important new information provided by micro data concerns wealth concentration. Using the Gini index, concentration is higher in the US and Germany (the coefficient equals 84 and 78 respectively) than in the UK (66) and Italy (61). More accurate information is provided by the breakdown of wealth shares by wealth percentiles. In the US the richest 10% of the people possess 71% of total wealth, while the indicator is lower for Germany (54), UK (45) and

Table 4.14 Distribution of household net worth (percentages)

	Germany[a]	Italy[b]	UK[c]	US[d]
Positive net worth	63	89	82	77
Nil net worth	29	7	6	4
Negative net worth	9	3	11	19
Wealth Shares				
top 10%	54	42	45	71
top 5%	36	29	30	58
top 1%	14	11	10	33
Gini index	78	61	66	84

Source: Jantti et al. (2008)
[a]Social Economic Panel Study 2002
[b]Survey on Household Income and Wealth 2002
[c]British Household Panel Survey 2000
[d]Survey of Consumer Finances 2001

Italy (42). A more recent study (Davies et al. 2009) provides some evidence about the countries of our sample: in 2002, the top 10% of households in terms of wealth held 42% of total wealth in Spain; in Japan the percentage amounted to 39% in 1999. For France, the most recent data (2003) also show a low concentration (38%) with respect to the other countries examined (Insee 2006). In a nutshell, total wealth concentration seems to be higher in the US and Germany than in the other major European countries and Japan.

4.7 Some Correlations between Household Wealth and Economic Indicators

Economic theory does not offer a comprehensive view of the determinants of household wealth. We start with correlations between wealth and some indicators: household saving rate, general government gross financial liabilities, GDP per capita, international trade share (exports plus imports as a percentage of GDP), unemployment rate, tax revenue and social security contributions, current and total public expenditure (excluding interest payments), and the elderly ratio (or elderly dependency ratio). We leave to future research an analysis of the causal links. All the series have been de-trended to account for possible confounding effects of common trends. The small sample sizes have forced us to focus on business cycle frequencies.

Table 4.15 shows the correlations between total household net wealth and our indicators for the seven countries under scrutiny. Table 4.16 reports the correlations between household net financial wealth and the same indicators. For each indicator, the tables show the correlation coefficient and the corresponding p-value. Here we summarize our main results.

First, the correlation coefficients between saving and total net wealth are statistically significant in four countries; for net financial assets we got two significant

Table 4.15 Correlations between total net worth[a] and some macroeconomic indicators[b]

	France	Germany	Italy	Japan	Spain	UK	US
Net saving rate	−0.569	0.249	−0.736	0.449	0.150	−0.557	−0.545
	(0.000)	(0.411)	(0.003)	(0.143)	(0.610)	(0.038)	(0.044)
Government liabilities	0.179	0.022	0.446	0.026	−0.652	−0.340	−0.411
	(0.847)	(0.940)	(0.110)	(0.927)	(0.011)	(0.234)	(0.144)
GDP per capita[c]	−0.095	0.881	−0.142	0.525	0.626	0.239	0.392
	(0.759)	(0.000)	(0.629)	(0.054)	(0.017)	(0.411)	(0.165)
International trade	−0.339	0.522	0.071	0.126	−0.581	−0.363	−0.084
	(0.236)	(0.067)	(0.811)	(0.667)	(0.029)	(0.202)	(0.776)
Unemployment rate	0.643	0.026	0.495	0.158	0.044	0.396	0.697
	(0.013)	(0.931)	(0.072)	(0.590)	(0.881)	(0.161)	(0.006)
Tax revenue and social security contributions	0.172	0.254	0.186	–	0.596	0.292	–
	(0.557)	(0.402)	(0.525)	–	(0.024)	(0.311)	–
Current public expenditure	0.355	−0.759	−0.240	−0.334	0.044	−0.481	−0.645
	(0.213)	(0.003)	(0.409)	(0.288)	(0.884)	(0.082)	(0.013)
Total public expenditure	0.475	−0.639	−0.247	–	0.144	−0.632	
	(0.086)	(0.019)	(0.395)	–	(0.624)	(0.015)	–
Elderly population ratio	−0.017	0.517	0.245	0.053	−0.642	−0.749	−0.481
	(0.954)	(0.071)	(0.400)	(0.857)	(0.013)	(0.002)	(0.082)

[a]Ratio of total net worth to disposable income as reported in Table 4.12
[b]p-values in parenthesis
[c]Correlation with respect to total net worth per capita here

Table 4.16 Correlations between net financial wealth[a] and some macroeconomic indicators[b]

	France	Germany	Italy	Japan	Spain	UK	US
Net saving rate	−0.310	−0.106	−0.916	0.057	0.519	−0.614	−0.497
	(0.281)	(0.718)	(0.000)	(0.860)	(0.057)	(0.019)	(0.071)
Government liabilities	−0.193	0.208	0.294	0.534	0.278	−0.010	−0.312
	(0.508)	(0.476)	(0.307)	(0.049)	(0.335)	(0.968)	(0.278)
GDP per capita[c]	0.000	0.575	0.268	0.022	−0.014	−0.149	0.495
	(0.985)	(0.032)	(0.355)	(0.940)	(0.961)	(0.612)	(0.072)
International trade	0.554	0.432	−0.035	−0.301	0.562	−0.097	0.157
	(0.040)	(0.123)	(0.907)	(0.296)	(0.036)	(0.742)	(0.592)
Unemployment rate	0.028	0.152	0.563	0.151	−0.696	0.358	−0.849
	(0.926)	(0.605)	(0.036)	(0.607)	(0.006)	(0.209)	(0.000)
Tax revenue and social security contributions	0.838	0.376	−0.108	–	0.616	0.718	–
	(0.000)	(0.185)	(0.713)	–	(0.019)	(0.004)	–
Current public expenditure	−0.481	−0.398	−0.331	−0.010	−0.638	−0.716	−0.765
	(0.082)	(0.159)	(0.248)	(0.980)	(0.014)	(0.004)	(0.001)
Total public expenditure	−0.528	−0.401	−0.455	–	−0.680	−0.729	–
	(0.052)	(0.155)	(0.102)	–	(0.007)	(0.003)	–
Elderly population ratio	0.022	0.677	0.718	−0.485	0.427	0.671	−0.266
	(0.942)	(0.462)	(0.004)	(0.079)	(0.128)	(0.009)	(0.359)

[a]Ratio of net financial wealth to disposable income as reported in Table 4.10
[b]p-values in parenthesis
[c]Correlation with respect to net financial wealth per capita here
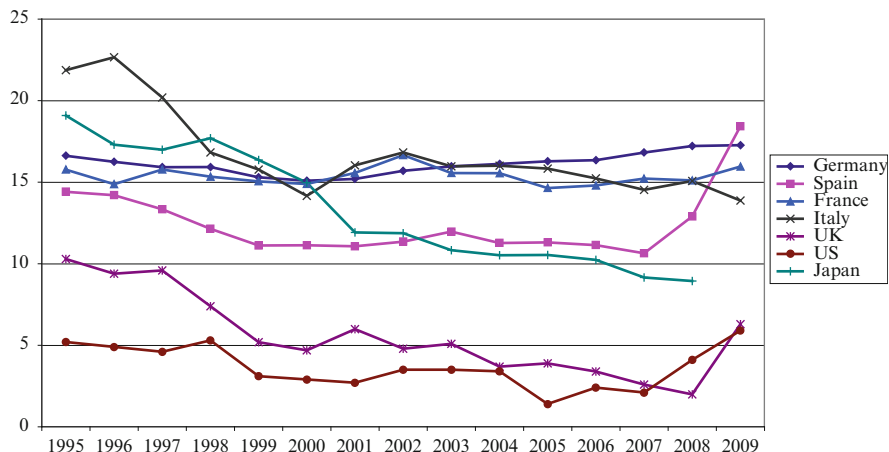
Fig. 4.2 Household saving rate (Percentages)

correlations. The correlations are always negative when significant at a confidence level of 95 per cent. This result is in line with the existence of a "wealth effect": people saved less because their wealth increased. This seems to be the case of Italy, the UK, the US and France. Recent research has investigated the idea that price bubbles increased household net worth and were at the origin of low saving rates in Anglo-Saxon countries.[12] Saving rates show a sharp difference between the UK and the US (Fig. 4.2), where household saving was about 6% of disposable income in 2009, and Europe, ranging from 18% in Spain, to 14% in Italy, with Japan at 9%. Analysis points to the combination of declining saving rates and large fiscal deficits in Japan.[13]

We also run some panel regressions to measure the overall link between wealth and saving in our countries. First, we regressed total net wealth and net financial wealth on saving, accounting for country and time dummies (see Table 4.17). We found a positive significant influence of saving only on total net wealth. However, the partial correlation coefficient is very low (0.223). This result is compatible with the idea that in recent years wealth variations have been more linked to price

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[12] "The decline in the saving rate over the past decade can be explained by the decline in interest rates and by the increase in overall household wealth", Greenspan 2005.

[13] "Japan's ability to sustain high fiscal deficits, low interest rates, and net capital exports has been possible because of its high private saving rate, which has kept national saving positive. But, with the current low rate of household saving, the cycle of rising deficits and debt will soon make national saving negative. A shift from deflation to low inflation would accelerate this process. The result in Japan would then be rising real interest rates as the low private saving rate runs head-on into large fiscal deficits. That would weaken the stock market, lower business investment, and impede economic growth. And if Japan's domestic net saving surplus vanishes, the current $175 billion of capital outflow would no longer be available to other countries, while Japan might itself become a net drain on global savings." (Feldstein 2010).

Table 4.17 Results from regressions[a] of net worth and net financial wealth on net saving

	Dependent variable			
	Net worth[b]		Net financial wealth[c]	
Coefficient:				
Intercept[d]	3.453	(0.000)	1.845	(0.000)
Net saving	0.084	(0.041)	−0.013	(0.447)
Dummy				
1996	0.261	(0.474)	0.045	(0.765)
1997	0.497	(0.175)	0.244	(0.110)
1998	0.779	(0.036)	0.399	(0.010)
1999	1.254	(0.001)	0.634	(0.000)
2000	1.255	(0.002)	0.470	(0.004)
2001	1.165	(0.003)	0.282	(0.078)
2002	1.178	(0.003)	0.070	(0.653)
2003	1.569	(0.000)	0.186	(0.243)
2004	1.960	(0.000)	0.229	(0.158)
2005	2.389	(0.000)	0.388	(0.020)
2006	2.678	(0.000)	0.464	(0.006)
2007	2.760	(0.000)	0.417	(0.015)
2008	2.234	(0.000)	−0.072	(0.676)
Germany	−1.155	(0.000)	−0.506	(0.000)
Italy	1.389	(0.000)	0.857	(0.000)
Japan	1.526	(0.000)	1.274	(0.000)
Spain	1.162	(0.015)	−0.169	(0.377)
UK	2.213	(0.000)	0.979	(0.000)
US	0.141	(0.742)	1.253	(0.000)
Partial correlation coefficient between net saving and the dependent variable				
	0.223	(0.041)	−0.015	(0.447)

[a]p-values in parenthesis
[b]Ratio of total net worth to disposable income as reported in Table 4.12
[c]Ratio of net financial wealth to disposable income as reported in Table 4.10
[d]Dummies for 1995 and France are included in the intercept

changes than to saving accumulation. The country dummies are significant, meaning that institutional characteristics of each nation and their heterogeneity may explain the weak association between wealth and saving. We also regressed the variations of total net wealth and net financial wealth on saving to consider flows on both sides of the equations. However, the results, available on request, illustrate that the effect of saving is not significant.

Coming back to the correlation analysis, there are mainly negative correlations between wealth and current and total public expenditure. A tentative interpretation may be that households accumulate assets in countries where public expenses are lower. We did not find a strong positive association between GDP per capita and wealth per capita. We obtained neither a negative link between the elderly population ratio and the accumulation of wealth. This is in contrast with previous studies

that sometimes found a positive relationship between house prices and GDP per capita and a negative linkage between asset prices and the elderly ratio (see for instance Takats 2010). For the other indicators there are no strong associations with household wealth. At this stage the future investigation of the determinants of household wealth might start from the role of saving and public expenditure to pursue the effect of other variables.

4.8   Further Discussion and Conclusions

We first summarize our main results and then provide some further comments on household wealth trends and determinants.

With regard to gross financial wealth, the seven countries can be divided into two groups. On one side there are the Anglo-Saxon economies and, to a lesser extent, Japan. On the other side there is continental Europe. The UK and the US are market-based financial systems: the huge development of the stock market leads to the predominance of market instruments in household portfolios, but also to greater risks. These characteristics, together with a well-developed private pension fund sector, yield higher values of household total financial assets. On the other hand, countries in continental Europe, traditionally bank-based, show lower levels of total assets, but greater saving rates. Japan, where banks play a predominant role in the economy, falls between the two groups in many respects. Wider financial markets enlarge investment opportunities but may involve higher price volatility. Indeed, in 2008 the crisis caused a greater decline in financial wealth in the US, the UK and Japan than in the euro-area countries. The composition of financial assets in Europe was more in favour of safe instruments, like deposits and securities, especially in Italy.

In the last 15 years, all countries have experienced a common trend of financial deepening, driven by deregulation and international integration. Some authors have suggested the existence of convergence in the composition of financial assets across countries, but this remains an open issue.

The explosion of household debt before the financial crisis was seen as a way to improve inter-temporal allocation. More cautious considerations have subsequently been expressed because of the subprime crisis and the global recession. Household debt remains very high in the UK, Japan, Spain and the US, and it is smaller in the other countries. Taking into account low indebtedness, the net financial wealth of the Italian households is very near that of UK and American households; Spanish households have the lowest value of all the countries. The surveillance of household debt is now on the policy agenda.

Spain is a special case in the euro area, with its large household debt linked to the outstanding level of real assets. Household real wealth is also important in France, Italy and the UK. Real assets are lower: in Japan, in large part because of the bursting of the housing bubble of the 1980s; in Germany, where private ownership of houses is low; and especially in the US. Monitoring of real-estate volumes and prices is important as boom and busts in the housing sector may affect the real economy and be a source of macroeconomic imbalances.

Total household net worth is very high in Spain and reaches intermediate levels in Italy, France and the UK. It is lower in Japan, and shows the lowest levels in Germany and the US. In some countries – e.g. Spain and the US – financial wealth is crowded out by real assets and vice-versa. On the contrary, in the UK financial and real assets appear to be complementary rather than substitutes.

Micro data show that wealth concentration is highest in the US and Germany. An explanation is that the two countries have the lowest values of real wealth. Moreover, financial wealth concentration is greater than that of real assets. Therefore economies with lower real wealth have, relatively, greater financial wealth and are consequently more prone to a higher concentration of total wealth.

In the long run, wealth is linked to the accumulation of saving and is influenced by capital gains and the trend in house prices. However, correlations between the saving rate and wealth were negative in most of the countries in the time range 1994–2009. This is compatible with the idea that in the years of rising share and house prices, i.e. in most of the period 1995–2007, people saved less because their wealth increased. Taking into account our sample of countries, a panel regression shows a small impact of the saving rate on the ratio of total wealth to disposable income. We also found in some countries a negative association between household wealth and current public expenditure, perhaps because households accumulate more assets where State expenses are smaller.

We do not have many analyses of why countries have different levels of household wealth. Among the possible factors to consider are institutional characteristics of the financial and banking markets, saving rates, pension systems, legal origin of finance, taxation, weight of the shadow economy, linkages between households and other institutional sectors, such as general government, and demographic trends.[14] These subjects are on our research agenda.

Statistical Appendix

The household sector includes non-profit institutions serving households. Gross disposable income is used to compute the ratios in Tables 4.1, 4.2, 4.10, 4.11 and 4.12. Financial and non-financial data are at current values; therefore they are neither corrected for inflation nor seasonally adjusted.

Tables 4.1, 4.2, 4.3, 4.4, 4.10, 4.12. For European countries, data are based on the European System of Accounts 1995 (ESA95), for Japan and the United States (US) on the United Nations' System of National Accounts 1993 (SNA93). Stock data are those at the end of the year, annual flow data result from the sum of the transactions that occurred in the year. Data are not consolidated, i.e. they include transactions between units belonging to the household sector. The data sources are the financial accounts databases available on the national central banks' websites in

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[14] On these subjects see Ando et al. (1994), La Porta et al. (1998), Guiso et al. (2003).

the June 2010 version. The only exception is the UK for which data have been taken from the Office for National Statistics (ONS). In the case of Japan and Germany the main sources have been supplemented with some details available respectively on the OECD and the European central bank's statistical data warehouse.

Tables 4.2, 4.3 and 4.4. Deposits include currency in circulation. Securities other than shares include short- and long-term securities and financial derivatives (whose amount is, however, negligible). Insurance technical reserves include life and non-life insurance claims and net equity in pension fund reserves. For Italy, retirement allowances are included. "Other assets" is a miscellaneous item: ESA95 rules (paragraph 5.120) indicate that this item includes financial claims deriving from a timing difference between the moment in which the transaction takes place and the corresponding payment. Trade credits are classified in this item. In the light of their negligible amounts, loans granted by households are included in this category in France, Italy (loans to co-operatives), Spain (only for 1995), Japan and in the US.

Table 4.3 Flows are different from changes in stocks as revaluations and other changes in volume are not included. The ratio for each period (e.g. 1995–1997) has been calculated between the average amounts of the period.

Table 4.5 In this table, unlike the previous ones, deposits do not include currency. For the European countries, deposits are broken down according to ESA95 categories: transferable deposits and other deposits. Transferable deposits are those immediately convertible into currency or transferable by payment means (e.g. cheques) without any kind of significant restriction or penalty. US transferable deposits correspond to the item "Checkable deposits and currency" in the Federal Reserve's Flow of Funds.

Table 4.6 In this table, shares and other equity include listed shares, unlisted shares, and other equity. The aggregate is not fully comparable across countries because the criteria adopted for the valuation at market prices of unlisted shares and other equity differ. For Germany, the weight of quoted shares is partially estimated using ECB data. Listed shares held by English households are taken from the ONS. For the US, listed and unlisted shares are approximated by the item "corporate directly held equities asset" and other equity by the item "Equity in non-corporate business", both published in the Flow of Funds accounts. For Japan, listed shares correspond to the sub-item "shares" published in the Bank of Japan Flow of Funds (see the Guide to the Flow of Funds, page 66, available on the Bank of Japan website).

Table 4.7 Money market funds are not included. For continental European countries data are taken from the quarterly statistics on mutual funds transmitted by the national central banks to the European Central Bank. For the UK the source is the Investment Management Association (see the Report on Asset management in the UK 2009–2010, published in July 2010). For the US data are taken from the 2010 Fact Book of the Investment Company Institute. For Japan data from the financial accounts of Securities investment trusts have been used.

Tables 4.8 and 4.9. The main source of the data on pension funds and insurance products is the table on Households' financial and non-financial assets and liabilities by country that the OECD has published since 2005. The OECD collects this additional information in the framework of the national annual financial

accounts. Even though definitions are consistent with SNA93 and ESA95, information available has yet to be fully harmonized. The national financial accounts have been used also to estimate the data on 2009 not yet available. Italian households hold other pension plans (severance pay provision) traditionally managed internally by firms and therefore not included in Table 4.8 but reckoned in total household financial assets (Table 4.1)

Table 4.10 Net financial wealth is computed as the difference between total financial assets and financial debt. The latter, differently from total financial liabilities in the financial accounts, basically include only loans and exclude trade debts and other liabilities.

Tables 4.11 and 4.12. Dwellings for Spain, total real assets for all the other countries. For Spain, the UK and the US data updated to 2009 have been taken respectively from the Banco de Espana, the ONS and the Federal Reserve. For Japan the data source is the Cabinet Office. For Italy data are taken from the Bank of Italy's Supplement to the Statistical Bulletin "Household wealth in Italy – 2009". For France and Germany data are taken from the tables on household assets available on the OECD website. The data for 2009 for France, Germany, Italy and Japan have been estimated using statistics on the price dynamics in the housing markets. Net worth in Table 4.12 is computed as the sum of net financial wealth (Table 4.10) and non-financial wealth (Table 4.11).

Figure 4.2. Household saving rate. The household gross saving rate is the ratio of gross saving to gross disposable income for European countries and Japan. For the US the indicator is the ratio of personal saving to disposable income.

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Should Household Wealth and Government Liabilities Include Future Pension Rights?

5

Gabriele Semeraro

Abstract

Pension rights, though relevant to policy-making and the macroeconomic debate, are generally ignored by the system of national accounts. The revision of national accounts standards to be implemented in the coming years only partially addresses this problem. This paper looks at how the new measures on pension entitlements can be implemented, emphasizing the role of pension liabilities in the economic literature, as well as in the national accounts and policy institutions. The robustness of the new method is examined from the point of view of statistical consistency, dependence on uncertain parameters, sensitivity to non-significant operations and opportunities for manipulation. Close attention is paid to the main points of interest for European countries in the context of the Stability and Growth Pact's Excessive Deficit Procedure. The ability of the new statistical rules to capture pension imbalances and provide appropriate incentives to foster structural reforms is also examined. A first conclusion is that the quantitative estimates produced with the new standards do not seem particularly useful in the field of government finance indicators; however, they do appear to satisfy the requirements of the economic literature on household wealth and saving rates.

5.1 Introduction

The size and dynamics of future pension rights is a subject of major concern in the economic literature, as well as in political and administrative fora. In the field of macroeconomic policy, data on the future development of public pension schemes

The paper is the responsibility of the author and the opinions expressed here do not necessarily reflect those of the Bank of Italy or of the Eurosystem.

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play a decisive role, and projections and estimates on the amount of future pensions are regularly used in the surveillance of fiscal discipline. By contrast, studies on household savings make intensive use of similar data and produce an increasing demand for cross-country harmonization. In spite of all this, entitlements to receive future pensions occupy little or no space in the national and financial accounts; as a rule, they are measured and entered in the accounts only when they are due for payment, as if they were "discovered" only at the time of retirement, and only for components paid in the period.

These properties are retained, to a large extent, in the revised standard for national accounts (*System of National Accounts 2008 – or SNA 2008*), which only partially changes the previous standard (*System of National Accounts 1993, or SNA 93*). More precisely, in the SNA 93, still in use in many countries, the most important categories of future pension liabilities are not considered in the national and financial accounts. The commitments of social security funds, in particular, as well as unfunded employer schemes are not included. The rationale underlying this treatment is related to the way the pension scheme works. Private pensions are recognized by the SNA 93 because the insured subject pays contributions, while his counterpart sets apart corresponding reserves to finance future pension payments. The commitment is similar to underwriting a private life insurance policy, with payment of a lump sum at death or retirement or the purchase of mutual fund shares: such forms of investment are recognized in the system of accounts. In each period before payments, the insured individual position can be unambiguously determined.

Similar properties were not thought to be present in the case of unfunded schemes, in which current pension payments are financed by current contributions and transfers rather than by returns on previously accumulated and invested assets. Thus, the debtor's commitments are not incorporated into corresponding reserves or segregated assets and so are not analogous to traditional financial instruments. The accounts just show a possible cash imbalance resulting from the gap between contributions received in the current period and pensions paid in the same period, regardless of any commitments relating to future periods.

Under such rules, if an unfunded system faces structural disequilibrium (i.e. is accumulating pension commitments not covered by corresponding contributions), but the contributions received in the current year equal the paid pension payments, there is no visible effect on net borrowing. Even if, in economic terms, the imbalance was apparent today, it would only enter the national accounts in the future. In general, the figures visible today on a cash basis might underestimate the real imbalance, which would result from appropriate accrual-based measurement.

The process of revising these SNA 93 rules has produced many proposals, ranging from full inclusion of all pension liabilities (social security as well as government employer schemes) to the reporting of such liabilities only as "memo items", without any impact on GDP, savings or government deficit (see United Nations 2002; Pitzer 2002). The outcome of the new SNA (2008) was a "worldwide compromise" allowing for the partial inclusion of some liabilities in core accounts and others in memo items. The precise outcome and details for the European standard will be codified in the ESA 2010 Regulation, to be implemented in 2014.

This paper aims to investigate how the ideas discussed so far can be implemented, with specific reference to the role of pension liabilities in the economic literature, as well as in the national accounts and policy institutions. The implications will be shown from the viewpoint of statistical consistency as well as from the perspective of economic incentive problems. The statistical debate is often focused on flow data, whereas the economic literature has a more direct link with stock data: both aspects will be treated in the paper.

In Sect. 5.2, we discuss the main economic, statistical and accounting reasons for changing the current recording criteria and the status of the decision process. A more detailed description of the way pensions are recorded in the current system of national and financial accounts and the methods that might be used to make the proposals effective then follows in Sect. 5.3.

In Sect. 5.4, the robustness of the new method is examined from the point of view of statistical consistency, dependence on uncertain parameters, sensitivity to non-significant operations and opportunities for manipulation. Although several arguments are of a general nature, specific attention is paid to the main points of interest for European countries in the context of the Stability and Growth Pact's Excessive Deficit Procedure. Section 5.5 discusses the ability of the new rules – assuming they are correctly implemented – to capture pension imbalances and provide appropriate incentives for fostering structural reforms. In Sect. 5.6, the latest estimates on pension liabilities are discussed. Section 5.7 summarizes the main findings.

5.2   Why Introduce Future Pensions into the System of Accounts?

5.2.1   The Role of Pension Liabilities in the Literature on Household Savings

The main reference to pension liabilities can be found in two branches of the economic literature: the work on household savings and the studies on the sustainability of public finances. In this paper, we keep this distinction, although some papers (and authors) may fall across the two fields. The theoretical framework used to investigate the relationship between pension wealth and household savings is the lifecycle model. The starting point for our purposes can be pinpointed in Feldstein's work since the late 1960s. Investigating the effects and properties of social security, Feldstein realized that the tests of consumption theory – Friedman's work on the permanent income hypothesis and Modigliani's work on lifecycle saving – completely ignored the role of social security even though it had become the major source of retirement income. Moreover, Feldstein noticed that the theory of social security's effect on saving was more complex than a simple displacement of financial wealth. To the extent that social security induces earlier retirement, it raises the desired level of financial wealth. The net effect of social security on savings, therefore, depends on the balance between two opposite effects: the positive induced retirement effect and the negative wealth displacement effect. It was then clear that the

issue could only be settled empirically and that the empirical elements needed to do so should include data on social security "wealth" (the actuarial present value of social security future benefits). Feldstein's empirical results (updated 22 years later; see Feldstein 1974 and 1996) implied that social security "wealth", the present actuarial value of future social security benefits, significantly reduced personal savings. The reduction in savings and in the present value of consumption is not the only adverse effect of a pay-as-you-go programme. A second important effect is the distortion of labour supply and of the form in which compensation is paid because of the increase in the marginal tax rate. A third distortion caused by a traditional pay-as-you-go system is the incentive to retire early when an implicit tax results from the loss of benefits caused by delayed retirement. Those elements are also relevant for investigating the welfare implication of the existence, size and financing of social security. In addition, the relationship between pension wealth and household savings is crucial for important policy issues, such as establishing the effects of changes in pension legislation on saving behaviour (Feldstein 2005).

The relationship between pension liabilities and individual consumption can be explained by a simple optimization problem. In the first *N-1* periods of their lives, individuals work and receive an exogenous income. In the last period, they retire and receive pension benefits denoted by *b*. During retirement, in addition to their pension benefits, they can use any savings accumulated during the first periods of their lives. Individuals' preferences are described by an additively separable utility function. Their optimization problem can be described as:

$$\max_{c_t} \sum_{t=1}^{N} \beta^{t-1} u(c_t)$$

$$s.t. \sum_{t=1}^{N} \frac{c_t}{(1+r)^{t-1}} \leq \sum_{t=1}^{N-1} \frac{w_t}{(1+r)^{t-1}} + \frac{b}{(1+r)^{N-1}}$$

where c_t is consumption at time t, β is the subjective factor by which the utility is discounted, w_t is the exogenous income at time t, b is the exogenous pension benefit and r is the exogenous interest rate. The right-hand side of the budget constraint is the present value of wages earned until period N-1, plus pension wealth.

The key point is that total wealth, defining the intertemporal budget constraint, includes pension wealth as a component. Solving the maximization problem provides formulas for c_t at each time. However, one can directly derive an expression for saving rates as a function of pension wealth (Attanasio and Rohwedder 2001).

Following Feldstein's previous analysis, King and Dicks-Mireaux (1982) provided evidence from micro-data analysing the relationship between the stock of pension wealth and saving rates. They interpret the coefficient of pension wealth in a regression for financial wealth as a measure of the degree of substitutability between the latter and the former. They find that an increase of one dollar in social security wealth decreases financial wealth by 25 cents, while an increase in private

pension wealth decreases financial wealth by 10 or 18 cents, depending on the methodology. A similar exercise was undertaken by Brugiavini (1987) and developed during the 1990s in response to the growing debate on the need for a major reform of the Italian social security system. In Rossi and Visco (1995) and Beltrametti and Croce (1997), aggregate time series analysis shows relatively high values of the offset between pension and non-pension wealth, with estimates of around 0.7 and 1.0 respectively for the period 1954–1993. This value does not exceed 0.2 in Brugiavini (1991) and Jappelli (1995) because of cross-section analysis based on the micro-data provided by the Bank of Italy Survey on Household Income and Wealth (see Zollino 2001 for a further comparison).

Similar exercises have been carried out in many other countries: for example, by Attanasio, Banks and Rohwedder for the United Kingdom (see Attanasio and Brugiavini 2003; Blake 2002; Blake and Orszag 1999). Overall, the results show great variability, with high sensitivity to measurement errors in social security wealth and the aggregation level in data. Although scholars agree on the qualitative results, the empirical evidence is heterogeneous because of the different data used, raising concerns about the reliability of the exercises. In this context, the availability of consolidated and harmonized data on pension liabilities would be extremely helpful.

5.2.2   The Economic Literature on Fiscal Indicators and Sustainability

Pension liabilities are strictly related to another field of analysis, that of developments in the literature on sustainability and fiscal indicators, with major contributions provided by Kotlikoff, Buiter and Blanchard. The contributions relevant to our purposes date back to the 1980s, when many studies pointed to the deficiencies of conventional cash flow deficit measures in the assessment of fiscal impact and budgetary sustainability (for example, Buiter 1985; Kotlikoff 1984). They argued that the level and changes of conventional public debt did not provide comprehensive indications about fiscal position sustainability.

Their point may be better understood by writing out the intertemporal budgetary constraint that dictates the sustainability condition. This means that the discounted value of the total future primary surpluses should be (at least) equal to the public debt at the starting point, and can be written as:

$$D_{t_0} - \sum_{t=t_0+1}^{\infty} \frac{PB_t}{(1+r)^{t-t_0}} = 0 \qquad (5.1)$$

Where D_{t_0}: current public debt; $PB_t = revenue_t - primary$ exp $enditure_t = primary$ balance at time t; where all variables are expressed in GDP terms (D, PB) in % of GDP; r is defined as $1 + r = (1 + i)/(1 + y)$, where y is the rate of growth of nominal GDP.

A common practical approach to assessing sustainability was based on the assumption of non-increasing government debt as a benchmark to distinguish sustainable fiscal policies from those that are unsustainable. However, the theoretical literature already focused on whether current fiscal policy could be continued into the distant future without threatening government solvency (i.e. the condition 1), which did not necessarily imply that debt (D in 5.1) had to be non-increasing. It should be stressed that future primary expenditure (flows) in (1) included pension payments and that the corresponding stock obtained by discounting the flows corresponded to a measure for pension liabilities.

One possible solution to the inadequacy of traditional measures has been identified in the development of generational accounting, which goes beyond conventional government budget measures by accounting for projected lifetime taxes per capita net of transfers (Kotlikoff 1987; Auerbach et al. 1991; Penner 2007). This concept – originally developed by Laurence J. Kotlikoff, Alan J. Auerbach and Jagadeesh Gokhale – attempts to quantify the value of all relevant net assets and liabilities transferred from generation to generation, as well as the fiscal adjustment needed to ensure that future generations face the same burden as current generations. The net tax rate faced by future generations is calculated by dividing the present value of the *net tax burden* (taxes minus transfer payments) *by the present value of expected future earnings from labour*. The basic assumption is that future generations will pay the debt not paid by current generations: there is no default and no free lunch. The present value of the burden passed forward consists of official government debt, net of assets, plus the present value of all future government purchases, plus the present value of all government payments to individuals (including social security benefits) promised to those alive now, minus the present value of all the taxes that will be paid by those alive now. Data on pension liabilities accumulated by current employees and pensioners are a required component of this calculation.

A second approach, adopted by Buiter and by Blanchard, aims to develop synthetic fiscal indicators that evaluate the amount of sustained fiscal adjustment required to balance the present value of the long-term budget constraint, as a strategy to overcome the inability of conventional budget figures to capture future imbalances. It should be noted that such indicators are not supported by a formal definition of sustainability. Instead, they rely on a more intuitive notion of what distinguishes sustainable from unsustainable fiscal policy. Buiter (1985) argues that sustainable fiscal policy should maintain the ratio of public sector net worth to output at its current level. He then calculates the permanent primary deficit necessary to achieve this objective. In a similar way, Blanchard (1985, 1990) proposes several indicators: for example, one based on the change in policies required to maintain the current debt ratio. Blanchard also suggests a medium-term tax gap indicator, which is the difference between the current tax ratio and that needed to stabilize the debt ratio over the next N years (assuming constant interest and growth rates). Both authors assume that a government should be able to pay back new debts through the accumulation over time of net surpluses, i.e. any anticipated future

deficit must be offset by surpluses at some point in time. The most forward-looking perspective is taken by Blanchard's tax gap indicator. This gives a measure of the adjustment in the taxes-to-GDP ratio required today and the one to be sustained until some terminal point in the future in order to allow the debt ratio to return to its initial value. Its calculation also includes elements closely linked to the calculation of pension liabilities, though not coinciding with the definitions relevant to the national accounts.

A third approach (not in chronological order) was previously proposed by the same authors and pointed out the inadequacy of traditional government accounts (Buiter 1985; Blanchard 1984). Their proposed solutions were based on an extension of coverage for the items included in the accounts. More precisely, the relevant government accounts should be extended to include assets as well as liabilities (in order to show the final "net worth"). In addition, the liability side should include implicit entitlements, even though these are related to state contingent amounts.

The concept of pension liabilities has strong relationships with each of the three approaches described above; however, the closest link is clearly with the third approach (the extension of governmental balance sheets). This latter approach continues to influence the literature as well as the "preventive arm" foreseen by European policy: from the reform of the Stability and Growth Pact in 2005 to the recent decisions linked to the financial crisis and the treatment of Greece in 2010. On the one hand, it should be stressed that *some* of the weaknesses identified by Buiter and Kotlikoff have been better addressed in the past two decades by the development of harmonized accrual-based statistics. This is notably true for the development of a full accrual basis, which is able to capture transactions in many cases when no "visible" payment has occurred. On the other hand, even today it is largely agreed that the progress achieved by national and financial accounts is still not able to capture significant components of the real burden accumulated by government, notably in the field of social security.

5.2.3 The National Accounts and Learnings from the Employer-Defined Benefit Schemes Crisis

After reviewing the demand for data on pension liabilities coming from different fields of economic literature, we will now discuss two further groups of arguments that arise from the revision of statistical standards. As we have seen, proposals to measure future pension liabilities are *not* a new phenomenon (see Franco 1995; Castellino 1985; Feldstein 1974), at least in the context of expenditure projections and the *stock* of debt (but not in the context of national accounts *flows*).[1] The

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[1] See Kotlikoff (1984) and Van den Noord and Herd (1993).

debate has mainly focused either on incorporating future pension payments into one unique current stock (to be added, possibly, to debt) or on foreseeing future flows of expenditure without discounting them at a single date (avoiding problems of choice of the interest rate). Therefore, current flows recorded by national accounts (in particular, net borrowing) were not involved. What is new in recent proposals is the attempt to record also future pensions in the system of national and financial accounts, thus developing an appropriate accounting for flows in which the implicit cost of future pensions is added to the current deficit (Lequiller 2004; Oksanen 2004; OECD 2004), in addition to the previously described requirements.

To better understand recent developments we need to highlight the example of the employer pension schemes of major corporations in Anglo-Saxon countries. In the US, almost 40% of employer pension schemes have a defined benefit, i.e. the risks relating to future pension payments are borne by the employer. This percentage is even greater in the UK (Spadafora 2004), in spite of the recent efforts to "wind up" defined contribution schemes in which the financial risk is borne entirely by employees. In the last years the prevalent negative trend in the stock market, compared with given pension commitments, has significantly worsened corporations' solvency and the risks incurred by creditor banks. In addition, refinancing pension deficit has decreased the resources available for productive investments with consequences on a macroeconomic scale. In previous years, the opposite had happened: the favourable trend in the stock market, causing a significant pension scheme surplus, had induced corporations to decrease pension allowances ("contribution holidays"). Looking at the elements that could have encouraged this underestimation, many agree on the role played by the previous accounting rules' inability to evaluate future pension commitments properly.

Since 2001, the introduction of accounting standards FRS 17 and IAS, which envisage harmonized and pessimistic methods for employer commitments, has clarified the real financial fragility of several enterprises in the US and the UK. Had they already been in force, the IAS on pension liabilities would have provided investors and employers with more realistic evaluations that were less dependent on temporary improvements in cash movements. In the same period, not only in the context of pensions, a new approach by statisticians and national accountants started to develop, which harmonized as far as possible the national accounting rules with the new standards of good business practice.

With this background, it is reasonable to ask whether the accounting methods for future pension liabilities might be extended to cases where the debtor is a government rather than a firm (H.M Treasury 2002; Blake 2003). To the extent to which pre-IAS business accounting tended to underestimate the real increase in firms' liabilities, national accounts might underestimate the deficit of the government, regarded as either the employer or guarantor of social security. Actually, the analogy provided by IAS and estimation errors for employer commitments, relating to biased signals based on simple cash-based balances, can be regarded as one of the most appealing elements of pressure in favour of changing the current treatment of pensions in national accounts.

5.2.4   Problems of Budgetary Surveillance and Extraordinary Operations

Leaving apart the question of consistency with firms' employer schemes and focusing only on public accounts, a significant role is played by increasing concern about the theme of ageing economies. In several European countries, this concern is linked to the constant decrease in the ratio between labour force and number of pensioners in systems already experiencing an imbalance on a cash basis (with some exceptions, notably the UK).[2] In the US, where the pension system is balanced on a cash basis (actually, it is in surplus), the concern is about to how to react to deficits foreseen in future decades, starting from the time of retirement for the "baby boomers" born in the 1950s (Diamond and Orszag 2004). In this context, the increasing demand for harmonized statistics that are able to capture future liabilities reflects, on the one hand, uncertainty about *the overall impact of ageing* (Disney 2001) and, on the other, the need *to evaluate the effects of pension reforms.*[3]

In European countries, concern for long-term sustainability is accompanied by constant attention on the effectiveness of budgetary surveillance, even in the short run. Concerning the statistics used for the latter purpose, flow data are based on national accounts, both capital and financial. Efforts to measure future pensions may be regarded as a more general attempt to extend the field of application of the accrual principle. The importance of this principle is linked to the need to avoid advantages for those governments simply *rescheduling* payments for existing commitments. Actually, many of the most recent (and most criticised) decisions of Eurostat are decisions to implement accrual principles (see European Commission – DG ECFIN 2005; Council of the European Union Ecofin 2005). Recording future pensions can be regarded as an extreme case of accrual accounting, which is prohibited by current rules but desirable in the process of revising the rules.

A closely related argument concerns the treatment of extraordinary transfers. The best known cases are France-Telecom in France, Daiko Henjo in Japan and Belgacom in Belgium (Lequiller 2004; Eurostat 1997; 2004). Apart from technical differences, the three transfers have in common the transfer of assets recognised in the system of accounts and of assets that are not. For example, to facilitate a privatization campaign, the government assumes pension commitments of a firm versus its employees, receiving as a counterpart a lump sum payment. In each of the three cases above, a purely financial transaction occurred, in which acquired pension liabilities were the counterpart of an actuarially equivalent lump sum payment. However, current rules recognize just one side of the transaction

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[2] For a detailed discussion of the European situation, see Castellino and Fornero (2003); Economic Policy Committee (2003).

[3] Worries about future pension expenditure are reinforced by authors who argue that there is a *trade-off* between pensions and other welfare expenditure which, under budget constraints, may entail severe limitations for weaker groups of people (Boeri and Perotti 2002).

(cash payments). That would imply a fictitious improvement in the net borrowing (deficit) for the sector that assumes the "hidden liabilities" (as a counterpart of a "visible" cash payment; see Lequiller 2005). The only way to avoid such artificial improvements in government accounts would be to recognize *all* pension liabilities in the system of accounts. The previous concerns about "re-labelling operations" are not specific to the functioning of EU budgetary discipline, and should apply to other countries as well, including the US *("the real labelling master"*; Kotlikoff 2010).

The renewed interest in the production of official statistics on pension liabilities is strictly related to the pressure on European institutions created by the financial crisis and the Greek case, where a combination of lax fiscal policy, structural weaknesses and statistical misreporting led to an unprecedented sovereign debt crisis. The functioning of the Economic and Monetary Union has been under particular stress since 2010 because of earlier failures to comply with underlying rules and principles. In official statements, the existing surveillance procedures have been judged not comprehensive enough. The measures that should be taken in the short term based on the Treaty on the Functioning of the European Union include the use of a wide scoreboard of indicators (see Watt 2010). This would include government assets as well as liabilities, and the liability side should include all entitlements, whether explicit or implicit. It should be noted how strong the influence of the early ideas of Buiter and Kotlikoff remains.

5.3   The New Method: Statistics and Accounting Aspects

5.3.1   Future Pension Liabilities in the System of Accounts

Before entering the new proposal details, it is appropriate to discuss briefly the current treatment of pensions in national accounts, according to the SNA 93. For the sake of simplicity, we will use only financial accounts, without describing the complete sequence of accounts. In fact, the impact on capital accounts (net borrowing) equals the financial accounts balancing item. The financial accounts record transactions in financial instruments on both the asset and liability sides. There are seven admissible financial instruments: monetary gold and SDRs (F.1), currency and deposits (F.2), securities other than shares (F.3), loans (F.4), shares and other equity (F.5), insurance technical reserves (F.6) and other accounts receivable/payable (F.7). Each transaction involving one or several financial instruments, held or incurred by a sector, is recorded in its financial account. Purely financial transactions (such as an exchange of bonds for a cash payment) move financial instruments only, in equal opposite amounts, and so do not impact on the balancing item of the financial accounts. Conversely, non-financial transactions (for example, the sale of goods or services in exchange for a cash payment) do impact the balancing item.

Current accounting rules state that pension commitments must be included in financial instruments (such as insurance technical reserves F.6) for funded schemes

Table 5.1 A defined contribution employer scheme

Financial instrument	Description	Financial account	
		Asset flows	Liability flows
F.2 (currency and deposits)	Contributions paid by employees	+100	
F.6 (insurance technical reserves)	Creation of pension commitments		+100
B.9	F.A. Balancing item (=net lending)		0

only. Pension commitments of social security are excluded.[4] Table 5.1 depicts, as an example, the contributions paid to a firm sponsoring a defined contribution scheme for its employees. Together with the (contribution) cash payment (F.2), the system of accounts recognizes the incurrence of a financial liability (F.6) of the firm in an equal amount. Therefore, a purely financial transaction occurs, without any impact on net lending/borrowing.

Similarly, at the time of pension payment, a new financial transaction occurs with exactly opposite entries (i.e. cash payment (−), reducing pension liabilities by the same amount). Thus, the impact on net borrowing is again zero.

In the case of social security, by contrast, only cash payments (F.2) are recognized. Therefore, contribution payments improve net borrowing, whereas pension payments worsen it. The balancing item (or net borrowing) is zero only if contributions equal paid pensions in the same year. If a law promises greater future benefits without the corresponding coverage through greater contributions, the imbalance is not immediately visible in (cash-based) net borrowing.

5.3.2 Recording Future Pension Liabilities in Financial Accounts

Based on the results of the IMF discussion group on employer schemes operated by governments, Lequiller proposed a generalized method that would also apply to the government as the sponsor of social security.[5] The main aspects are the following: (1) to abandon the different treatments based on the funded/unfunded nature of the scheme; (2) to use actuarial valuation to measure future, defined benefit commitments; and (3) to allocate the net assets of defined benefit pension schemes to the sponsor (either the employer or the social security fund).

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[4] When the government acts as an employer, the last version of the IMF *Manual on Government Finance Statistics* (see International Monetary Fund 2001) recommends that transactions in unfunded government employer retirement schemes be recognized. However, social security schemes remain excluded.

[5] "My proposal is [. . .] to accept from the start an extension of the borderline to include the liabilities of social security." (Lequiller 2004, p. 5).

Table 5.2 Impact of pension liabilities on government net borrowing

Financial instrument	Description	Financial account	
		Asset flows	Liability flows
F.2 (currency and deposits)	A) Contributions paid by employees	+1.5	
	B) Contributions paid by the employer	+11	
	C) Pensions paid	−11	
(B.9)	Memo: balancing item (net lending/borrowing) under the current rules		(+1.5)
F.6X (insurance technical reserves)	Incurrence of liabilities vs. employees (=A + B)		+12.5
	Redemption of liabilities vs. pensioners (=C)		−11
	Actuarial additions		+3
(B.9S)	Memo: net pension quasi-liabilities		(−4.5)
B.9X	Balancing item or net lending (new definition) = B.9 + B.9S		−3

Although the method is rather complex, an extremely simple and intuitive version can be provided by using the financial accounts only. Without affecting the main conclusions, some components considered in the proposals will be assumed to be zero.[6] Consider first the case of a private firm in a pay-as-you-go pension system. Let the government pay 11 in pensions, and receive 12.5 in contributions. One part (1.5) of the contributions is paid by employees, while the remaining part (i.e. 11) is paid by the firm. Assume that, in spite of the cash surplus just described, the system is unbalanced, and the contributions are less than the legally recognized increase in pension rights. The notional contributions able to keep the system in equilibrium are assumed to be 15.5 (3 more than the contributions actually paid).

Cash entries (F.2) for received contributions (A + B) and paid pensions (C) are depicted in the first part of Table 5.2. All that matters for the financial accounts, according to the current rules, is this set of cash entries. The result is a net lending of +1.5.

The lower part of the table depicts the further entries to be added according to the new treatment. As in the previous chapter, recognizing pension liabilities (or "quasi-liabilities") within financial instruments implies that contribution (A + B) and pension (C) payments correspond to purely financial transactions: counterpart entries of the cash movements are now incurred and cancel the insurance technical reserves (F.6X).[7]

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[6] In particular, the item corresponding to *property income*. Simplification aside, this choice reflects our scepticism about the need to add this further component. In our view, such a treatment would require the implicit existence of "second line reserves" (for an actuarial comment, see Appendix VI, prepared by John Walton, in De Rougemont 2003).

[7] Capital X denotes that it is a memo expansion of item F.6 (this should also clarify the term "quasi-liabilities"). Similar comments hold for B.9X, memo expansion of net borrowing B.9.

Finally, a further increase in liabilities, the "actuarial additions", denotes the incurrence of other pension liabilities not covered by corresponding cash contributions. Such an entry is defined as the difference between current contributions and actuarial contributions (i.e. able to keep the system balanced).

An alternative version for this part of the account directly denotes the equilibrium total actuarial contribution (assumed to equal 15.5) without this artificial split into three components (several kinds of contributions and, by difference, the actuarial additions). The version in Table 5.2 is more suitable to separate the components of purely financial transactions (i.e. contributions or pensions identically compensating corresponding entries in the first part of the account) from the components regarded as non-financial transactions.

Adding new quasi-liabilities (F.6X) to pre-existing financial instruments (F.2), a new version of net borrowing is obtained. In the previous example, thanks to the change in definition, the balancing item moves from a net lending of 1.5 to a deficit (or net borrowing) of 3, which seems to better illustrate the underlying imbalance.

5.3.3 Implementing the Reference Scheme

The documents prepared by the discussion group coordinated by the IMF do not provide explicit formulas or general computing methods even though they are accurate on all conceptual points. Such computations are already taken for granted in the numerical examples. In addition, the examples refer to micro-data, notably for a single firm. Similar comments apply to what follows, including the proposal by Lequiller to extend the results to social security. However, to facilitate the discussion, it is appropriate to develop a more general version of the method to allow for the possible implementation of aggregate data as well.

Consider an unfunded scheme, without specifying whether it belongs to a firm or to social security. Beneficiaries are divided into employees and pensioners.[8] For a generic employee (j), the stock of future pension rights E_{t_0}, corresponding to the counterparty's commitments, can be written as:

$$E_{t_0}^j = \sum_{h=1}^{\infty} \frac{w_{t_0+h}^j}{(1+r)^h} \cdot \gamma_{t_0+h}^j \alpha_{t_0+h}^j \tag{5.2}$$

t_0 = current year, w_t^j = pension income for individual j at time t;
γ_t^j = probability of individual j receiving a pension at time t;
α_t^j = probability of individual j being alive at time t; r = rate of discount

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[8] For the sake of simplicity, inflation is ignored. Some components of income, as well as some probabilities, may of course equal zero.

In the case of already pensioned individuals, the relationship is simpler. The stock P_t^j of future pension benefits for pensioner j is:

$$P_{t_0}^j = \sum_{h=1}^{\infty} \frac{w_{t_0+h}^j}{(1+r)^h} \cdot \alpha_{t_0+h}^j \tag{5.3}$$

Let N_E denote the total number of employees and let N_P denote the total number of pensioners participating in the scheme. Denoted by α and γ are the two arrays of actuarial coefficients from which sequences of values α_t^j and γ_t^j per each individual are obtained. For the given population of employees and pensioners, the total stock S_{t_0} of future pensions at time t_0 is:

$$S_{t_0}(r, w, \alpha, \gamma) = \sum_{j=1}^{N_E} \left(\sum_{h=1}^{\infty} \frac{w_{t_0+h}^j}{(1+r)^h} \cdot \gamma_{t_0+h}^j \, \alpha_{t_0+h}^j \right) + \sum_{j=1}^{N_P} \left(\sum_{h=1}^{\infty} \frac{w_{t_0+h}^j}{(1+r)^h} \cdot \alpha_{t_0+h}^j \right) \tag{5.4}$$

where $w_t = (w_t^1, w_t^2, \ldots \ldots w_t^{N_E}; w_t^1, w_t^2, \ldots \ldots w_t^{N_P})$ and $w = (w_1, w_2, \ldots w_t, \ldots)$.

It should be stressed that in the above formulas future pension income (as expected today) may or may not take into account probable future promotions and future increases in real wages. The first approach is referred to as the "projected benefit obligation" method (or PBO), whereas the second method (in which no projection is made for future promotions) is referred to as the "accrued benefit obligation" (or ABO). Both methods are used by actuaries and present pros and cons. The ABO initially seemed to be closer to the national accounts approach, but at a later stage European statisticians expressed the opposite view and came out in favour of the PBO.

The value obtained in (5.4) is the stock of pension wealth for households. To obtain the corresponding flow – to be recorded in the financial accounts – it is necessary to identify and isolate the components to be excluded from simple changes in stocks (the other economic flows, or OEF).[9] For example, the effect of a change in the discount rate can, according to (5.4), be approximated through the expression $\frac{\partial S_{t_0}(r, w, \alpha, \gamma)}{\partial r} \cdot \Delta r$, whereas similar expressions hold for the impact of other parameters. However, elaborating on conclusions reached by the group of discussion on pensions coordinated by the IMF (De Rougemont 2003, pp. 38–42), the flow can be directly obtained by comparing two successive values in (5.4). This occurs by imposing constancy in the actuarial parameters. For example, in the case of discount rate changes, the following formulas are easily obtained for change of stock (ΔS), flow (ΔFL), and revaluation (ΔOEF):

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[9] In national accounts, *other economic flows* (OEF) are changes in stock not explained by flows (transactions). The OEF include *revaluations* and *other changes in volume*.

$$\Delta S_{t_0+1} = S_{t_0+1}(r_{t_0+1}, \cdot) - S_{t_0}(r_{t_0}, \cdot) \tag{5.5}$$

$$FL_{t_0+1} = S_{t_0+1}(r_{t_0}, \cdot) - S_{t_0}(r_{t_0}, \cdot) \tag{5.6}$$

$$OEF_{t_0+1} = \Delta S_{t_0+1} - FL_{t_0+1} \tag{5.7}$$

The flow defined as in (5.6) measures exactly the increase in future benefits earned by employees and pensioners during the accounting period.[10] The procedure to obtain the flow is similar in the case of the simultaneous change of several parameters: as a first step, the flow is computed assuming no change in all actuarial parameters; the OEF is, therefore, obtained from the difference.

Summing up, before the statistical process, the starting data (3.1, 3.2) are similar to those used in models for forecasting government expenditure whose results are used and published in several countries. Insofar as the actuarial parameters remain unchanged, all that statisticians need is a single stock, and the corresponding flows are simply determined by their changes over time. If a decision to change certain parameters is made – by law or by actuaries – statisticians also need a second stock; this is derived from the model by computing the new year's data using old parameters. Comparing the two stocks allows us to isolate the OEF for the year.

5.4 Statistics and Measurement Problems

5.4.1 How to Overcome Difficulties Relating to the Discount Rate

Several doubts about the efficacy of the new method have concerned uncertainty about the main occupational and income data involved in formula (5.6). Nevertheless, the most widely accepted argument refers to the dependence of the results on the rate of discount. In this regard, two kinds of problems can be identified: on the one hand, arbitrariness in the choice of the initial rate; on the other hand, volatility induced by rate movements over time, even in the absence of the creation or redemption of commitments. In the case of private firms, both effects were magnified by pre-IAS accounting practices, allowing the discounting of liabilities by means of an average rate based on the expected returns on the firm's assets (with degrees of freedom in evaluating returns, weights and expectations). Once such a rate has been determined, the second problem is the ample movements in the scheme's commitments induced by changes in asset prices.

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[10] Even though no formulas are used, what is called *Actuarial addition* in Lequiller's paper does not correspond to the flow defined in formula (5.6). It must correspond to the difference $FL_{t_0+1} - \sum_{j=1}^{N_E} C_j^E(t_0 + 1) - \sum_{j=1}^{N_F} C_j^F(t_0 + 1)$, between the present value of new commitments (5.6) and contributions paid in the current year (N_E and N_F denote the number of employees and employers; C^E and C^F denote contributions paid by employees and employers).

By contrast, the new accounting standards require discounting based on the return rate of a "double A" long-term debt security with further specific restrictions. This dramatically decreases both discretional power and sensitivity to market trends. Even though not all researchers, actuaries included, have regarded such a method as superior, it is now largely agreed upon, however "exogenous" with respect to statistics: the results of discounting no longer depend on arbitrary choices by statisticians.[11]

This latter discussion does not eliminate all the doubts about the impact of the discount rate on stock data but, in our view, the criticisms seem significantly weakened for flow data thanks to the specific method proposed. When adopting the accounting scheme developed in the previous section, it is easy to check that the flow derived from (5.6) cannot be influenced by volatility in the discount rate. Robustness to rate movements should be regarded as a main characteristic of the new method. The impact of rate movements is deleted from flow data and included in the OEF. As a result, all main flows (income, savings and net lending) are unaffected by problems relating to rate volatility (De Rougemont and Lequiller 2004, pp. 3, 4).[12]

Indeed, arguments based on rates continue to provide excellent reasons to exclude future pension liabilities from (the stock of) Maastricht debt.[13] However, any attempt to adapt the same arguments to measure national account flows is, in our view, in contrast with the new method's characteristics.

5.4.2 Possible Inconsistency in the "Accrued-To-Date" Method

A similar answer holds for other reactions[14] related to hypotheses on population trends (considered, however, the less difficult data to be foreseen, see Mink and Walton 2005), as well as to difficulties in forecasting its employed components and the corresponding income.

Actually, the new method does not rely on hypotheses and forecasts of population trends. In some senses, the valuation of pension commitments at any date starts

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[11] It is not clear why a different rate should be used for social security. See, however, Mink and Walton (2005), p. 6.

[12] Of course, we refer to the accounting effect of rate changes for actuarial evaluation, not to the direct effects of rate changes on returns (for those schemes that hold assets too).

[13] For a list of arguments against inclusion of pension liabilities in debt, see Fenge and Werding (2003), Franco (1995), Bohn (1992).

[14] "While population forecasts may to some extent be reliable, it is extremely difficult to make appropriate employment and income forecasts by institutional sector over a (very) long time horizon. The compilation of future entitlements based on such assumptions may have to be revised continuously and substantially. As a consequence, fiscal variables such as government **deficit** and **debt** would be surrounded by a high degree of uncertainty and be prone to manipulation." (Mink and Walton 2005, p. 6). We disagree on the "deficit" part of the last sentence, and totally agree with the "debt" part.

from the past, by considering only rights that have been accruing up to that time for a given number of individuals registered in the social security system. The flow is obtained as the "present value of additional rights accrued (actuarially estimated) due to the work service delivered during the period" (De Rougemont and Lequiller 2004, p. 3). This corresponds exactly to the definition of "accrued-to-date liabilities" (Franco et al. 2004, p. 17). It should be stressed that this method still requires hypotheses on the retirement age and wage developments. But, again, the impact of movements on those parameters is deleted from flow data and included in the OEF, leaving income, savings and net lending unaffected.

Another two aspects exist, which are poorly developed in international discussions but deserve further analysis. They both refer to the treatment of contributions. It is clear from our re-exposition of the proposal (par. 3.3) that the new method takes into account the commitment to pay future pensions, but ignores the right to receive future contributions. If the rationale for the new method is to recognize in the system of accounts the notion of "constructive obligation" (par. 2.3), the reason for this asymmetric treatment is unclear. The two obligations (pension payments and contributions) are often envisaged by the same law and they also share the same nature. Moreover, being forced to make a choice between the two, the commitment to contributions seems more binding because of the asymmetric positions of the two parties. Unlike their counterparty, contribution payers have no means of unilaterally changing the law.

A counterargument can be found in the view expressed by economists in other contexts. For example, Disney (2001) indirectly expresses a view consistent with the new method by arguing that future contributions should not be subtracted from pensions of the same period. Such contributions are the basis for further liabilities, referring to later future periods. In this view, unfunded systems are implicitly assimilated to funded systems, in which any increase in future pensions is the exact counterpart of what happens to current contributions. The price to be paid for implementing this analogy is a major deviation from cash basis.

Although no problems arise from the point of view of internal consistency, some consequences of this approach may appear questionable or undesirable when attempting to capture and describe imbalances. Taking for granted that neither of the two methods is indisputably superior, we describe an example of such conflict to better illustrate some of its characteristics. In the example in Table 5.3, a defined benefit scheme is described, where the fund statute foresees an obligation to keep the cash balance in equilibrium and has the legal power to change the contribution level accordingly (this situation is common for so-called "privatized schemes"). Assume that (1) paid pensions and accrued rights grow at the same level and (2) contributions are constantly updated to cover current pension payments.

The old method (balancing item B.9) shows zero net borrowing in each period, which seems to reflect appropriately the economic situation. The new method, by contrast, shows a deficit in each year, not easily interpretable (not only in terms of sustainability). Such a deficit seems to relate to the failure to take into account the double equilibrium between benefits and contributions (both current and future, and in both cash and legal terms).

Table 5.3 Annual increase in pensions perfectly financed by a corresponding increase in contributions (privatized scheme) Year t

Financial instrument	Description	Financial account	
		Asset flow	Liability flow
F.2	Contributions received	+10	
	Pensions paid	−10	
(B.9)	*Memo: net lending/borrowing (old definition)*		*(0)*
F.6X	Incurrence of liabilities		+10
	Redemption of liabilities		−10
	Actuarial additions		+1
(B.9S)	*Memo: net pension quasi-liabilities*		*(−1)*
B.9X	Net lending (new definition) = B.9 + B.9S		−1
F.2	Contributions received	+11	
	Pensions paid	−11	
(B.9)	*Memo: net lending/borrowing (old definition)*		*(0)*
F.6X	Incurrence of liabilities		+11
	Redemption of liabilities		−11
	Actuarial additions		+1
(B.9S)	*Memo: net pension quasi-liabilities*		*(−1)*
B.9X	Net lending (new definition) = B.9 + B.9S		−1

The informative content of such a deficit seems questionable. The same deficit can be easily obtained for a fund imbalanced in cash terms and requiring continuous external financing, and therefore there are neither obligations nor attempts to achieve balancing. The fact that the new method may treat such different situations in the same way could raise doubts over the advantages of the new definition of deficit.

5.4.3 Other Expenditure Components

Other points deserving specific attention are the arbitrariness of the separating line between contributions and taxation and the possible inconsistencies regarding the treatment of other expenditure components.

In pay-as-you-go systems, the classification of paid amounts as contributions rather than taxes is largely discretional. When a direct link between payments received and those made by the government does not exist, and in addition when both contributions not used for pension payments and pensions not entirely financed through contributions are observed, separating contributions from taxes may be a fictio iuris, able to change at any time without a real or economic reason. For example in Italy in 1995, a reclassification of about 4.5 points between taxes and contributions occurred (bringing the latter to 23.81% of salaries). This left both the total labour cost for the employers and, of course, sustainability, unchanged. If

similar changes influenced net borrowing, governments could easily improve their accounts without any real counterpart.

The net borrowing corresponding to the old definition does not depend, of course, on such "cosmetic" changes. It seems that the new treatment could be affected (this point has been raised in international working groups). However, it is easy to verify that the new method is robust to such operations and the new definition of net borrowing, like the old one, does not allow for the impact of the reclassification of taxes and contributions.

Discussion regarding the consistency of several components of expenditure is based on a simple fact: no significant difference exists between pension obligations of a pay-as-you-go system and obligations relating to public health expenditure (this point was mentioned, but not entirely developed, in the OECD workshop "Accounting for implicit pension liabilities"; see Lequiller 2004). In both cases:

• The government assumes the obligation to provide benefits in future years.
• The "insured" individuals pay certain amounts, without a direct link to benefits.
• In principle, a "notional contribution" exists, corresponding to the amount that a private insurance would receive for the same benefits.

If, based on the principle of "constructive obligations", unfunded pensions were recognised in the system, a serious inconsistency would arise with other significant components of public expenditure. However, if health liabilities (such as pensions, which lack any link to corresponding explicit assets) were recognized, it would no longer be clear where the stopping point might be. Some criticisms consistent with this view were expressed in the discussion of the IMF panel of external fiscal experts (Aaron et al. 2003).

5.5   Incentive Problems

5.5.1   Rights Accrued Before the Change of Method

So far, we have only discussed measurement aspects to test the new method's statistical consistency regardless of incentive problems. In this Section, we will consider both methods applicable and compare them with regard to the different incentives that they might provide. As sketched in Sects. 5.1 and 5.2, this comparison refers to the following use of pension liabilities: to compute flow data to change the current notion of net borrowing, adopted in the context of a threshold-based fiscal rule (such as the 3% rule foreseen by the Stability and Growth Pact). In fact, a change in the definition of net borrowing may affect flow data only (net borrowing or deficit), whereas no change is envisaged for the Maastricht debt (a concept that does not depend on the revision of national accounts). In the following section, we refer to a standard description of the economic environment used in the literature on fixed fiscal rules, assuming a link between deficits and short-run growth. For a complete and formal description of the model, see Buti et al. (2006).

We postulate that the government aims to attain a given level of output growth and has two instruments at its disposal: its effective cash receipts and payments (the

traditional deficit B.9 in cash terms) plus a component of hidden (or non-cash) deficit that may represent the "accounting gimmicks" allowed by the inclusion of pension liabilities. The economic activity in each period is influenced by the payments actually made and received by government, whereas the numerical constraint (as in the EU) applies to the deficit as defined in national accounts (with the possible inclusion of pension liabilities).

In the short run, prices are sticky and therefore output is demand-determined. It follows that fiscal policies that increase deficits by cutting government receipts or by raising payments contribute positively to short-run growth. Fiscal authorities need to respect as far as possible constraints on deficit and debt similar to those in the EU. In this context, we will show how some "accounting gimmicks" linked to the inclusion of pension liabilities can be used to limit deviation from the deficit objective.

Let K(t) denote the new pension rights accrued during year t, P(t) and C(t) the cash pensions and contributions paid in the same year, respectively, and B.9(t) and B.9X(t) the corresponding balancing items according to the old and new definitions. The following formulas can be easily derived:

- The impact of the pension system on *B.9(t)* is *C(t)–P(t)*;
- The impact on the new *B.9X* is *C(t)–K(t);* and
- Therefore, the difference between *B.9X(t)* and *B.9(t)* equals *P(t)–K(t)*.

As an example, consider two identical countries (A and B), in which two generations exist with different pension systems: (1) a young generation at the beginning of their working lives; and (2) an old generation approaching retirement age. For the old generation, once retirement age is reached, pensions are determined by the last wage (without a direct link to the individual's complete contribution history). In the years before retirement, the new method already recognizes pension liabilities in favour of this generation based on current wages. For the young generation, a formula links the individual pensions to all previously paid contributions. This implies a pension liabilities increase in each year because of contribution payments.

In the past, before introducing the new statistical method, both countries implemented a pension reform by increasing the retirement age for both generations. In comparison to B, country A limited pensions for the old generation. A positive component of K exists depending on the successive contribution payments by young workers. Therefore, the total flow K is positive. Since contributions are assumed to be the same in both countries, this flow K is the same too.

It follows that P(t)–K(t) is greater in country B, which faces the same K(t) but pays more pensions. From the third relation above, this means that in country B the new definition ensures a lower deficit. A first, direct conclusion follows: the change in method creates an accounting advantage for the less virtuous country. Therefore, the analogy with the introduction of IAS in business accounting does not apply. In that case, introducing the new method implies an unambiguous worsening of the accounts of the firms that have been less prudent in previous years.

It should be noted that this situation implies that a deficit alone is not able to capture a part of the relevant information included in the stock data. However, if the

proposal to change the SNA 93 had been adopted, within the two indicators subject to a threshold fiscal rule, the deficit would have been the only one to change (without any impact on the Maastricht stock of debt).

5.5.2 Scheduling

Consider now the case of a single country under constant new method rules. The country has to compare the deficit impact of two alternative pension reforms. We will show that a permanent incentive may exist to postpone the reform's effectiveness.

Assume there exists one young generation with workers at the beginning of their working lives and one old generation with workers closer to retirement age. Thus, the old generation continues to acquire pension entitlements, whereas the new generation's rights are acquired together with contribution payments.

The two reforms envisage an overall similar cut in pension rights, with different distributions over time. The first reform entails a similar cut in rights for the two generations, whereas the second reform places most of the cost on the younger generation, postponing the reform's effectiveness. Assume that, in the year in which the reform is implemented, the cut in older people's rights is able to keep the deficit under the threshold of the fiscal rule for both reforms.

Table 5.4 shows an example relating to any of the years that follow the introduction, provided some old generation pensioners are still alive. The right-hand columns show the financial account, computed in each of the three hypotheses (no reform, the first reform and the second reform). In comparison to the status quo, reform 1 envisages lower pension payments,[15] as well as lower growth in future rights

Table 5.4 Postponing the reform effects

Instrum.	Description	No reform		Reform 1		Reform 2	
		A	L	A	L	A	L
F.2	C) Contributions received	+10		+10		+10	
	P) Pensions paid	−16		−12		−15	
B.9)	*Memo: net lending/borrowing (old definition)*		−6		−2		−5
F.6X	Incurrence of liabilities vs. employees = C		+10		+10		+10
	Redemption of liabilities vs. pensioners = P		−16		−12		−15
	(Memo: actuarial contribution (K))		(13)		(12)		(11)
	Actuarial additions = K–C		+3		+2		+1
B.9S)	*(Memo: net pension quasi-liabilities)*		+3		0		+4
B.9X	Net lending/borrowing (new Definition = B.9 + B.9S)		−3		−2		−1

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[15] Effects on *P* e *K* may be interpreted equivalently in terms either of lower income or greater retirement age.

(K moves from 13 to 12), whereas paid contributions remain the same. Reform 2 leaves pensions paid to the old generation almost unchanged (from 16–15) by reducing the growth in future pension rights for younger people (this results in a lower K) for given paid contributions. By comparison, reform 2 entails greater pensions today at the expense of poorer pensions tomorrow. In spite of delaying effects to the future, reform 2 does not worsen net borrowing B.9X: actually, these latter results are improved. Of course, similar inequalities would never apply under the old (cash-based) definition of B.9.

The main reason why reform 2, although entailing greater cash disbursement, does not worsen deficit B.9X is shown in the central rows of Table 5.4 (the account for pension quasi-liabilities). In that section, a greater current pension payment implies an accounting benefit, since it is interpreted as a greater cancellation of liabilities. All things being equal, paying more in current pensions improves the pension account (B.9S).[16]

In the same section, a second aspect is shown, resulting from the attempt to make extreme the application of the accrual principle. This is the possibility of exchanging current cash with future promises, leaving the pension account (B.9S) unchanged.[17] For countries in which a pension imbalance already exists and a fiscal rule on deficit holds, it seems that such properties of the new method may allow the greater freedom of action rather than prompt the immediate adoption of rigorous measures.

More accurate measurements can be obtained through a specific account for pensions, including forecasts for pension expenditure in future years (a concept outside the range of national accounts). In the absence of such a specific account, however, if we were forced to use a single imperfect indicator, stock data would be by far a better choice. In both the examples above, a stock measurement would provide more reliable information: it would remain higher in the less virtuous country (in the first example) and would contrast the misleading information on the deficit in the choice between reforms (in the second example).

The conclusion is that, in the specific context of European fiscal rules, the attempt to include pension liabilities in one of the two indicators seems to pose more problems than it provides solutions. The above examples show how the inclusion of pension liabilities in only one indicator is far from a compromise and is able to move things in the "right" direction. Actually, such a partial inclusion may be strictly worse than both the extreme cases (i.e. pension liabilities in both the

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[16] This does not imply any problem of internal consistency for the new method, but may create incentive problems. Doubts in this regard were expressed by Franco et al. (2004), in the case of extension to flow accounts of the *accrued-to-date* method: "Pensions would be considered as loan repayment (...). An increase in contribution rates would, ceteris paribus, have no effect either on current or future deficits. (p. 27)."

[17] In addition, with a counterintuitive *trade-off*: if current pension payments increase, it is necessary to increase (instead of reduce) future rights in order to the keep pension account balancing item (B.9S unchanged).

indicators or in none). The chances of manipulation that are easily excluded in any of the two extreme cases may become available in the mixed regime.

5.5.3   Consequences

In the previous paragraphs, examples were shown to discuss the general ability of the new method to properly illustrate pension imbalances through the national accounts net borrowing and to provide incentives for adopting structural reforms (see Fenge and Werding 2003).[18]

Taking into account the supporting examples in Sect. 5.3, as well as the above counter-examples, the new deficit seems more efficient at capturing pension imbalances while they are being created, without waiting for the impact to become visible in cash terms. By contrast, it may not be so effective in countries where the imbalance has already occurred in cash terms. One intuitive explanation can be found by observing that the new method, besides its complexity, boils down to a change in recording the same flows. On this point, the authors and supporters of the new method seem to agree too.

> In the long-term, and taking into account a whole cycle of pension debt creation and extinction, the cumulated deficit of the previous account and of this one are equal. The timing is however different, the last one giving a better picture in terms of structural deficit (De Rougemont and Lequiller 2004, p. 6).

A key factor to understanding the view expressed in the last sentence is provided by the pension situation in the US, where the social security system is currently facing a cash surplus that will continue for the next two decades. Nevertheless, many economists are worried about the cancellation of the social security system when cash deficits occur in successive decades (Diamond and Orszag 2004). The new method seems designed to deal with this problem. If applied, it would immediately change the current surplus to a deficit, thus providing a picture more consistent with economists' worries.

Considering the previous observations concerning the time of recording, it may be the case that no method exists that can simultaneously penalize the US and the European countries – i.e. those in the process of creating the imbalance and those in the process of recovering it – and provide better incentives to both compared with simple cash accounting.

In this regard, it should be stressed that our counter-examples do not show that the old method is better than the new one. They just show that cases exist where

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[18] In a different context, referring to stock measurements, Franco et al. (2004) noticed that the size of unfunded pension liabilities might not imply univocal consequences about sustainability or future imbalances (p. 21). A case is discussed in which a difference arises in pension liabilities to GDP, but sustainability is the same. A second example refers to a demographic shock, causing a significant change in sustainability without any corresponding change in pension liabilities to GDP.

imbalances are better depicted and penalized by the old method as well as cases where the opposite is true. Indeed, what could be deduced is the general impossibility of capturing in one current dataset (either B.9 or B.9X) all the information that would result from the time series of forecasts for pension expenditure. This series would give a better understanding of pension reforms, without deleting information on the dates of the actual implementation of real effects.

Incentive bias and measurement problems seem to arise from the attempt to summarize too many pieces of information into one indicator, such as the general deficit. If the aim is to better measure pension imbalances without creating artificial bias or errors, it is not necessary to remain within the range and limits of national accounts. What really matters is harmonizing those methodologies used in the various countries to report pension outlays and forecast future public spending, as well as defining common standards for the frequency of expenditure forecasts and the length of forecast horizons. Keeping this in mind, the development of specific harmonized pension accounts may provide better results than reshuffling the definition of deficit.

5.6   Quantitative Outcomes and Estimates

Some countries are already compiling official national and financial account data on pension entitlements partially in line with the SNA 2008, notably Canada and Australia. For European countries, the adoption of the new treatment is planned for 2014 based on an updated regulation and manual (European System of Accounts; ESA 2010), whose requirements will be stricter than those stated in the SNA 2008. The new *transactions in pension entitlements* will be mainly reported as *memo items*, i.e. not affecting the measure of net lending/borrowing (the "deficit" used for European budgetary surveillance). The Maastricht debt (i.e. the stock of debt used for European budgetary surveillance) will be unaffected, too. However, the pension entitlements will be still available for economic analysis in general.

Research centres, together with national and European institutions, have been preparing a first set of estimates, almost in line with the expected requirements.[19] Since the data of many countries are still incomplete, important gaps have been filled by the model developed at the University of Freiburg (Heidler et al. 2009; Raffelhüschen et al. 2010). The Freiburg model is a systematic device for substituting the complete set of individual data and calculations (see formula 5.4 in Sect. 5.3 above), similar to those a pension actuary would perform. The methods of approximation used by the Freiburg model allow the estimates of pension entitlements for all European countries that were published in 2010 by the European Central Bank together with Eurostat (Fig. 5.1).

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[19] Other estimates have been published in the past: in some cases the definitions and hypotheses were close, but not identical, to those of the forthcoming ESA 2010: see Van den Noord and Herd (1993), Kunè et al. (1993), and the analysis and comparisons in Franco et al. (2005).
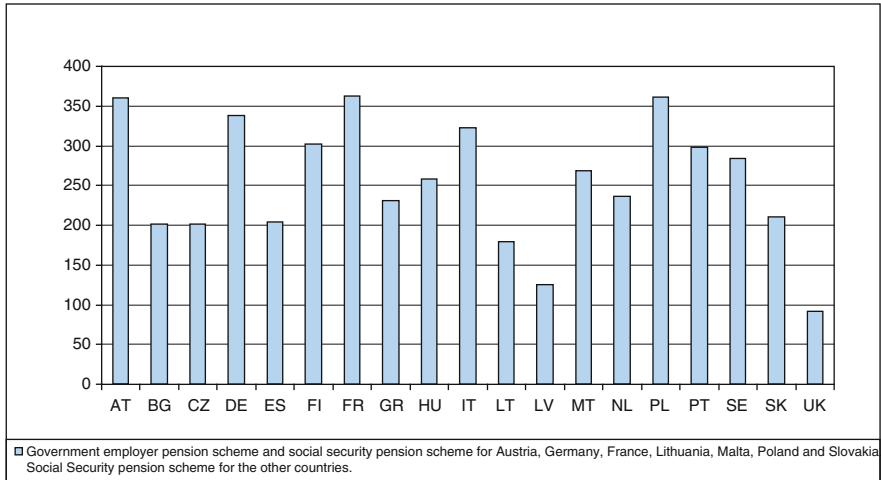
Fig. 5.1 Accrued to date liabilities in 2006 (as a percentage of GDP)

These estimates, based on the Freiburg model and elaborations by Heidler et al., show that the largest pension liabilities as a percentage of the corresponding country's GDP can be found in France (362.2), Poland (361.1) and Austria (359.9), followed by Germany (338.6) and Italy (323.1). Most of the other countries show pension liabilities in the range of 200 to approximately 300% of GDP. These are Finland (301.4), Portugal (298.3) and Sweden (284.5) followed by Malta (269.0), Hungary (257.5), the Netherlands (236.2) and Greece (230.7). Slovakia (210.5), Spain (204.2), Bulgaria (201.8) and the Czech Republic (201.4) can be regarded as having a medium level of pension liabilities. The lowest liabilities were calculated for the United Kingdom (91.2), where private pension schemes are notoriously important, followed by Latvia (124.8) and Lithuania (179.9).

Heidler et al. examine the main determinants of the different results shown above, broken down into the following categories: initial level of pension expenditures, development of old age pensions, indexation and recent pension reform. They find that the initial level of pensions apparently is the main factor for the level of pension liabilities. It should be noted that pension reforms seem to play a relatively minor role in explaining cross-country differences.

The authors' conclusion is that the calculation of pension estimates provides three orders of benefits. First, this approach helps to assess the costs of terminating unfunded public pension schemes. Second, the concept of pension entitlements represents a useful tool to examine various pension reforms – such as changes in pension indexations or minimum retirement ages – and their impacts on pension entitlements. Third, it can provide further insight when looking at the impact of "pay-as-you-go" pension schemes on national savings. "In this context, [it] quantifies the social security wealth which represents a significant determinant on saving rates – as has been pointed out first by Feldstein (1974). With the current revision of the [...]

national accounts a further impetus has been given to pay attention to the concept of [accrued-to-date pension entitlements]." (Heidler et al. 2009).

The main point of disagreement may relate to the second conclusion, i.e. the usefulness in the context of pension reforms. As we have seen, the role played by pension reforms in explaining cross-country differences is minor. This conclusion is closely linked to the fact that the entitlements only refer to the asset side of existing employees and pensioners. They do not take into account the liability side, i.e. future contributions, but only the effects of the reforms on *accrued* benefit (even though relating to future contributions). However, in the majority of cases the largest financial impact of pension reforms is drawn from future pension benefits not yet accrued: such future effects, although crucial for assessing the long-term sustainability of public finances, would be ignored in the above calculation. It should be stressed that when explicitly studying the problems of sustainability and pension reforms, the same authors involved in the "Freiburg calculations" use estimates based on different definitions, which also cover future generations (see Raffelhüschen et al. 2010).

The above estimates are both forward and backward looking simultaneously: forward since they refer to future payments; backward, since they only refer to the part already matured in the past. The reference only to existing employees and pensioners, although limiting for pension reform analysis, is appropriate in the context of national and financial accounts. All assets in financial accounts (e.g. bonds, currency, etc.) relate to current households (not future households). To calculate saving rates, portfolio composition, and so on, as well as to estimate the cost of terminating unfunded pension schemes, it is therefore crucial to stick to the above calculation. Therefore, what may be seen as a point of weakness for the second conclusion above is a point of strength for the two other conclusions.

5.7   Conclusion

After first reviewing the rationale underlying current statistical rules, we analysed the main links with the economic literature on household savings as well as on fiscal indicators. A first conclusion is that valid reasons do exist to evaluate the revision of current national and financial accounts.

After explaining the formal treatment of the new method proposed by the OECD and IMF, many objections so far put forward do not seem entirely justified. The proposed method seems to deal efficiently with problems of arbitrariness as well as the volatility of parameters and rates, and its practical implementation would not require entirely new pieces of information (compared with what is already used to model pension expenditure forecasts). In addition, the new deficit does not directly depend on long-term forecasts of population or employment thanks to using the accrued-to-date formulas.

Besides such advantages, however, the method suffers from problems of sensitivity to non-significant operations. It is less sensitive to extraordinary operations (e.g.

Belgacom), but it is also able to create entirely different effects on net borrowing starting from similar situations. Other doubts refer to asymmetry in treatment with regard to health expenditure and legally binding future contributions. In addition, the accrued-to-date formula may be well defined for employees close to retirement age, but noticeable uncertainty is faced by all others.

Together with such problems of measurement and statistical consistency, the new proposal raises economic questions related to potential incentive effects. On the one hand, if already in force at the right time, the new method would allow the discovery of imbalances while their causes are being created: for countries facing deficit-based fiscal rules, this would generate a useful counterincentive to place the cost on younger generations. On the other hand, results may dramatically change if the method, far from being in force at the right time, had to be introduced in economies already facing pension system crises. Moving to the new method may worsen the position for countries that are increasing the coverage of pensions through contributions. Second, the change in method may create an accounting advantage for countries less virtuous in the past (i.e. before the adoption of new accounting rules, unlike what happened in the IAS case). Finally, under constant (new) rules, a country that is postponing the effects of pension reforms may face a comparative advantage for a deficit.

We recalled the common opinion according to which it is "too early" to extend the new method of calculating social security. From the above analysis, the new method would seem to provide appropriate incentives during the first part of pension imbalance, e.g. in cases that are similar to the US system where the cash deficit will occur after the next 20 years. By contrast, the method seems to provide opposite results in systems were cash pension imbalances have already occurred. It may be said that, for most European countries, it is indeed "too late" rather than "too early".

Estimates of pension liabilities, although rough, would undoubtedly be useful in many contexts. Doubts exist about the opportunity to link such estimates to the calculation of net borrowing, as used in European fiscal rules. Based on the examples discussed above, the ability of the new method to provide appropriate incentives is unclear. Creating a separate account for pensions, and improving other indicators such as forecasts for pension expenditure to GDP or equilibrium contribution quotas (concepts external to the context of national accounts), would provide better elements for judgment. By contrast, an aggregated indicator such as overall net borrowing, subject to a fixed threshold fiscal rule, seems to be a shortcut attempt that would be unable to provide efficacious and well-founded results.

The quantitative estimates produced in the context of the ESA 2010 revision, on the one hand, do not seem useful for assessing fiscal sustainability; however, they seem to meet the demand coming from the economic literature on household wealth and saving rates. With reference to our classification of the reasons to change pension treatment in the national accounts, it seems that the most successful results could be expected in the field of household analysis more than in the field of government finance indicators.

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Financial Sector Dynamics and Firms' Capital Structure

6

Laura Bartiloro and Giovanni di Iasio

Abstract

Economic theory argues that developed financial systems foster economic growth by promoting efficiency in the allocation of resources to productive units. However, the evidence from the flow of funds in the last 15 years suggests that in countries with booming financial sectors innovations in intermediation activity, rather than influencing firms' capital structure, have promoted self-referential dynamics, as the overall expansion in size has been mainly due to the surge in claims and obligations between financial firms. The evidence of the increased interconnectedness within the financial system has several implications for financial stability.

6.1 Introduction

Well-functioning financial markets and properly designed intermediation systems play a vital role in the allocation of resources and, more generally, foster economic growth. Though the causal link may be elusive and hard to ascertain empirically, economists agree about the positive impact of financial development on the level of economic activity. Capital markets and financial intermediaries channel funds from the original providers/savers – normally households – to the ultimate users – mainly non-financial corporations. The instruments used are either loans or marketable securities, such as shares and bonds. Frictions in this mechanism hamper the ability of firms to find resources for their productive activity.

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The different degree of development of capital markets with respect to financial intermediaries can have an important influence on the type of resources available for firms, and thus on their uses. For instance, the ability to issue marketable instruments or to raise long-term loans gives a firm a relative advantage in financing longer-term investment projects compared with a firm that is instead forced to rely only on short-term debt.

In this chapter we analyse the way in which differences in financial systems are reflected in firms' capital structure. One main result is that, notwithstanding an increase in firms' indebtedness in recent years, non-financial corporations have taken advantage only partially of the huge increase in the size of the financial industry observed in the last 15 years. At least in some countries, a large part of this increase in the balance-sheet size of the overall financial sector can be traced back to more intensive trading activity among financial intermediaries, with little impact on the ability of non-financial firms to exploit better financing conditions. This evidence may suggest a reconsideration of the positive and monotone relationship between financial development and economic growth.

Since we are interested in examining financial systems and firms' capital structures over time and across countries, we use national financial accounts as our main statistical source. Besides providing a complete picture of the flow of funds between different sectors, financial accounts are highly comparable across countries, since all compilers adopt the same standards (System of National Accounts, SNA, or European System of Accounts, ESA). These data are available for the period from 1995 to 2009. We therefore try to single out both structural developments and dynamics before and during the 2007–2009 financial crisis. We have chosen to examine the main European countries – France, Germany, UK, Italy and Spain – as well as the US.

The paper is divided into five sections. This introduction is followed by the description of the differences between financial systems (Sect. 2). The third paragraph focuses on the analysis of the balance sheets of financial corporations, while Sect. 4 looks in detail at the capital structure of non-financial corporations. Paragraph 5 contains the main conclusions.

6.2   The Differences between Financial Systems

Since Schumpeter, economists acknowledge the vital role of a well-functioning, deep and developed financial system in promoting efficiency and economic growth. In this light, many studies have investigated differences between advanced financial systems that can explain GDP growth differentials. A large production of scientific contributions (King and Levine 1993; Rajan and Zingales 1998; Fazzari et al. 1988) has certified the positive role of finance on economic prosperity.

Financial systems are often divided into market-based (i.e., grounded on an extensive use of marketable securities like shares and other equities, bonds, etc.) and bank-based (i.e., relying mainly on bank loans). Another classification

distinguishes between financial systems marked by close relationships with customers (relationship-based) and those with a high degree of anonymity (arm's length). The latter classification does not coincide entirely with the former: a part of intermediaries' activity uses instruments that are typical of the markets (e.g., bonds); on the other hand, some assets commonly found in market-oriented systems conceal close relationships between intermediaries and firms, such as the participation of venture capitalists in a firm.

There are a number of ways of identifying bank-based financial systems and market-based ones. Bartiloro et al. (2008), for example, look at the relative importance of "intermediated" and "non-intermediated" financial instruments, while Allen and Gale (2001) highlight the differences between the riskiness of households' financial portfolios and the greater use of capital markets by the US and the UK firms.

In order to provide a clear picture of the different financial systems we present a standard indicator, the ratio of domestic bank credit (i.e., loans granted by monetary financial institutions – MFIs – to households and non-financial corporations) to market capitalization, proposed by Levine (2002).[1] A country with a high value of the indicator is considered bank-based. This indicator is downward (upward) biased
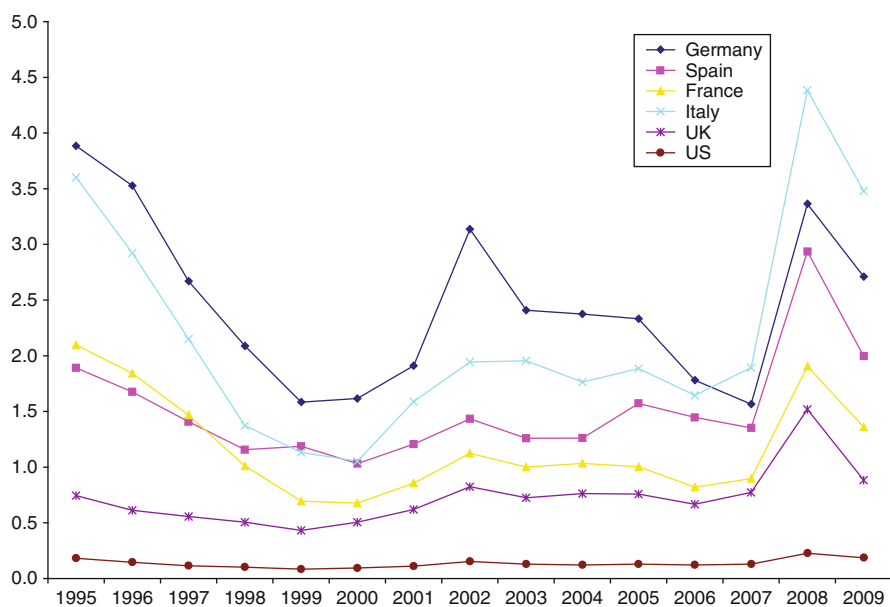

Fig. 6.1 Bank-based vs market-based financial systems (Source: World Bank, Eurostat, Bank of England, Board of Governors of the Federal Reserve System)

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[1] The indicator proposed by Levine has bank credit to the private sector as the numerator. Slightly changing the aggregate used does not, however, alter the relative position of the countries considered.

when stock prices are high (low). A clear example is the recent financial crisis
(Fig. 6.1). Confirming previous studies, we flag Germany and Italy as countries with
a bank-based financial system; the UK and the US are clearly market-based.
The indicator does not provide robust evidence regarding the most appropriate
classification for Spain and France.

During the last 15 years, the importance of markets has experienced alternate
periods of rise and fall, but the main characteristics of the financial systems have not
changed. Moreover, despite the ups and downs of the markets, the relative positions
of countries with regard to stock exchange capitalization have remained quite
stable. Although some minor changes can be observed over time, the structure
of financial systems is largely path-dependent, and abrupt changes take place
after significant institutional or regulatory interventions, or in the aftermath of
a financial/banking crisis.

Historically, Anglo-Saxon countries have larger stock exchange markets
(Fig. 6.2). Up to the first years of this decade, European stock exchanges, except
the British one, were not attractive to many local firms. This is confirmed by cross-
listing decisions. Indeed, despite the fixed costs of listing abroad, many companies
from continental Europe decided to cross-list in the US stock exchanges and, to
a smaller extent, in the UK. This was particularly important for high-tech com-
panies that found better financing opportunities and more qualified analyst expertise
in the US stock exchanges. In addition, for export-oriented firms cross-listing has also
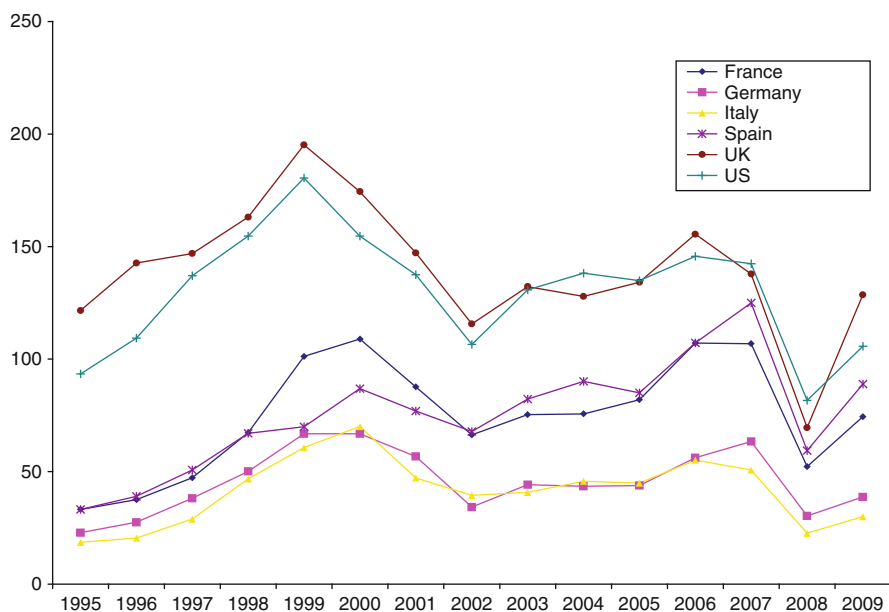been used as an advertisement tool. In their comprehensive review of the literature

Fig. 6.2 Market capitalization (GDP percentages) (Source: World Bank)

on the characteristics of European firms listing abroad, Pagano et al. (2002) interpret the willingness of many companies to be listed overseas in terms of different accounting standards and protection of shareholders' rights. Of course, the opportunities for firms to expand their equity base are related to the size of the market. In short, cross-listings, besides contributing to the size of stock markets in the Anglo-Saxon countries, provide an indirect proof of their greater efficiency.

Starting in 2002, signs of transformation have appeared in the European markets as well; the Spanish and the French stock exchanges have grown significantly, reaching in 2009 a total capitalisation of 89% of GDP in Spain and 74% in France. These are relatively large values, albeit well below the corresponding figures for the UK and the US of 128% and 106% of GDP respectively. The German and the Italian stock exchanges, instead, remain underdeveloped: in Germany the stock market capitalization is 39% of GDP and it is even lower in Italy (30% of GDP).

Table 6.1 shows asset holdings for monetary financial institutions, other financial intermediaries, insurance corporations and pension funds, and the total. In the last 15 years, the size of the financial sector has increased in all the countries considered in our sample. The picture is indeed that of a generalized and rapid expansion in the size and relevance of the financial sector as a whole, and of all its sub-components. The crisis has only partially affected the aggregate trend, as central banks have increased their holdings in support of banks and other institutions (Bernanke 2009; Trichet 2009).

Analysing the financial sector as a whole, between 1995 and 2009 the growth in the ratio of total financial assets to GDP ranges from +57% in the US to +177% in the UK. Huge differences remain in the levels. For instance, in 2009, the ratio ranges from 3.41% in Italy (the lowest) to 13.24% in the UK (the highest). The expansion of the financial sectors is remarkable, especially if compared with the much more flat dynamics of the corresponding figures for households[2] and non-financial firms. This asymmetry is a clear mark of financial sector development. However, the phenomenon is not equally significant in all the countries considered: a clear example is the very different dynamics in Italy and the UK (Fig. 6.3).

In almost all the countries, except the US, the intermediaries that have shown the largest increase in asset holdings are those in the most traditional group, that of monetary financial institutions (MFIs), an aggregate which includes banks, the central bank and money market mutual funds. The ratio of MFIs' assets to GDP is smaller in the US (around one third of the assets of the financial sector) and the UK (65%). The role of banks in these two countries is limited compared with that of other financial intermediaries, although it has increased slightly over the 15 years considered. This confirms the market-based nature of the financial system of these countries.

MFIs' assets as a share of total assets of the financial sector have been decreasing in all European countries since 1995 as a result of a common disintermediation

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[2] On households see Chap. 4 by Bartiloro et al.

Table 6.1 Financial sector assets (percentages with respect to GDP)

	MFIs	Other financial intermediaries	Insurance corporations and pension funds	Total financial institutions
Italy				
1995	1.43	0.23	0.10	1.76
2000	1.55	0.64	0.26	2.45
2007	2.13	0.56	0.36	3.05
2008	2.29	0.55	0.31	3.14
2009	2.47	0.58	0.36	3.41
France				
1995	2.45	0.25	0.40	3.10
2000	2.94	0.70	0.70	4.20
2007	3.99	0.84	0.93	5.75
2008	4.10	0.69	0.84	5.64
2009	4.04	0.73	0.96	5.74
Germany				
1995	2.30	0.15	0.41	2.86
2000	3.17	0.40	0.59	4.16
2007	3.43	0.48	0.71	4.62
2008	3.49	0.44	0.68	4.61
2009	3.42	0.53	0.73	4.68
Spain				
1995	1.88	0.13	0.17	2.18
2000	2.07	0.34	0.27	2.68
2007	3.00	0.83	0.31	4.14
2008	3.20	0.79	0.30	4.28
2009	3.37	0.87	0.33	4.57
UK				
1995	2.74	0.72	1.32	4.78
2000	3.33	1.06	1.70	6.09
2007	6.81	2.18	1.68	10.66
2008	10.86	3.20	1.50	15.56
2009	8.58	2.92	1.73	13.24
US				
1995	0.93	0.90	1.00	2.84
2000	1.07	1.40	1.14	3.61
2007	1.28	1.94	1.20	4.42
2008	1.56	1.79	0.97	4.32
2009	1.51	1.81	1.08	4.40

Sources: Eurostat, Banca d'Italia, Banque de France, Bundesbank, Banco de Espana, Bank of England, Central Statistical Office, Federal Reserve, Bureau of Economic Analysis

process. This process has been more marked in France and Spain owing to the faster growth of the stock markets in these two countries compared with Germany and Italy. The higher value of assets held by other financial intermediaries in France and
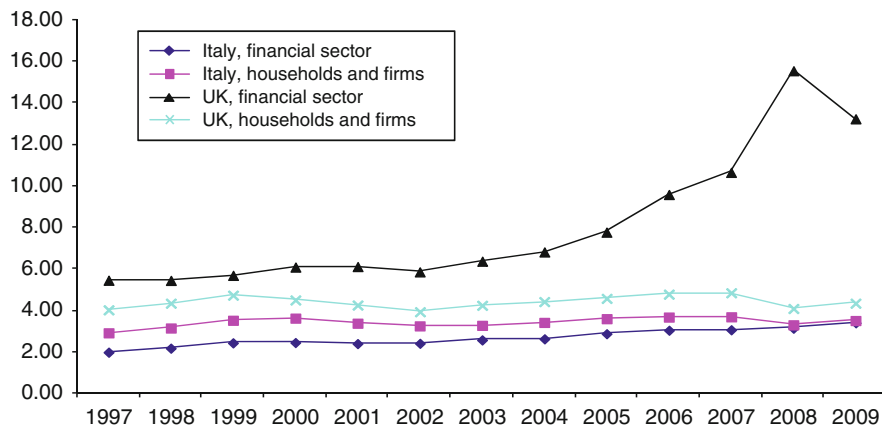
Fig. 6.3 Financial assets of financial institutions vs households and firms (stocks, GDP ratios) (Sources: Banca d'Italia, Istat, Bank of England, Central Statistical Office)

Spain (between 70% and 80% of GDP in 2009, compared with less than 60% in Germany and Italy) also confirms that these two countries have reached a position midway between pure traditional bank-based systems as in Germany and Italy and pure market-based ones, such as in the UK and the US.

The subsector of other financial intermediaries includes heterogeneous institutions such as mutual funds, special purpose vehicles that securitize assets, intermediaries engaged in lending (for instance leasing and factoring companies), and security and derivative dealers, such as the merchant and investment banks operating in the US and the UK. The increase in this sub-sector's financial assets was due, up to 2007, to the growing importance of mutual funds in several countries. The subsequent decline (which began earlier in Italy than elsewhere, due to the adverse fiscal treatment of mutual fund shares issued by Italian companies) was then accompanied by an increase in the importance of special purpose vehicles specialized in loan securitization. Moreover, the crisis has sharply underscored the growing importance of security and derivative dealers in the UK and the US. Table 6.1 confirms that other financial intermediaries' assets reach their highest values in these two countries.

Besides the size of the financial institution sector, the type of intermediaries composing the aggregate also matters. An important example in this regard is the presence (or absence) of intermediaries specialized in providing credit to innovative firms (private equity and venture capital). In Italy and Spain private equity investments in firms are rare: in 2009 they amounted to around 0.1% of GDP (Fig. 6.4). Among the other European countries, such investments are slightly larger in France and Germany (around 1.5% of GDP) and particularly huge in the UK (almost 30% of GDP in 2009).[3] The crisis has had a tremendous impact on

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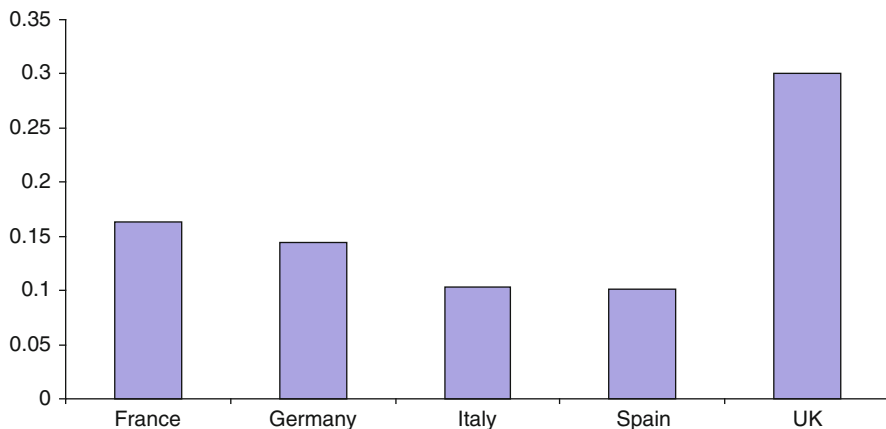[3] Data for the US are not comparable as they do not include buyouts.

Fig. 6.4 Private equity investments in 2009 (flows, GDP percentages) (Sources: EVCA, PEREP_Analytics (industry statistics))

private equity and venture capital investments: in all the countries considered investments, as a percentage of GDP, were twice as large in 2008. The underdevelopment of pension funds, and of other long-term institutional investors, which are the natural counterpart of venture capital intermediaries, together with the small size of the domestic stock exchange, have contributed to the immaturity of this subsector.[4]

Finally, a very important determinant of the differences between countries is the heterogeneity of pension systems.[5] In 2009, the ratio between financial assets of the insurance and pension fund sector and GDP was around 0.3–0.7 in Italy, Spain and Germany; it was higher in France, where the importance of this sub-sector has more than doubled in the last 15 years, reaching the level of the US. Traditionally, higher values are found in the UK, where public pension schemes are relatively unimportant, so that households are pushed to invest in private pension funds. In the other European countries (Spain and Italy above the others), public pension systems reduce the incentive for households to participate in pension funds.

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[4] Other intermediaries with a key role in the development of non-financial firms are those supporting them for the issuance of bonds and their subsequent placement on the market. For example, between 2000 and 2009, among the top 20 lead managers in bond placement there was just one Italian intermediary (Unicredit, ranking 18th) and only 3% of bonds placed on the euromarket were related to an Italian intermediary. The absence of intermediaries specialized in bond placement increases the cost of issuance for non-financial firms; this helps to explain the small amount of private bonds in Italy.

[5] On this issue see also Chap. 5 by Semeraro.

6.3 The Recent Developments of the Financial Industry

The integration of the world economies and the associated extensive internationalization of financial markets have undoubtedly played an important role in the growth of the financial sector discussed in the previous paragraph. Macroeconomic explanations point to global imbalances and mainly refer to a global savings glut: emerging countries with large trade surpluses have started to participate heavily in financial asset trading and, in some cases, have flooded advanced economies with their abundance of savings (Caballero and Krishnamurthy 2009).[6] The United States, with the most advanced financial system, have hugely benefited from this inflow, borrowing at historically low rates (Bernanke 2005). The UK is another fitting example, since it is known to be a major financial node for international exchanges, with many large financial institutions headquartered in the City of London.

Following the sequence of large financial shocks to economies with advanced and fast-growing financial systems that culminated in the 2007 crisis, academics and policymakers are challenging the social desirability of an infinitely large financial industry. While it is generally agreed that a deep financial system is crucial in promoting economic efficiency and in the allocation of productive capital, when it grows too large in relation to economic fundamentals it becomes excessively complex, interconnected, risky and unstable and the costs outweigh the benefits (Bini Smaghi 2010). These considerations cast doubts on the once popular belief that the-bigger-the-better, both in regard to the financial industry as a whole and to some systemically important players considered in isolation, which are now clearly understood to be too-big-to-fail, and are classified among the culprits of the 2007-09 financial crisis.

Besides the global imbalance perspective, a second view hinges upon the transformation of the role of the financial intermediation system and its basic operating mechanisms. A growth in size can even be generated by an increase in lending/borrowing within the financial intermediation system itself (in other words, the case when both parties of the trade are financial intermediaries), without significant variations in the other two aggregates (assets of savers/lenders and liabilities of borrowers). The evidence of Graph 6.3 points in this direction for the UK. Indeed, for any given amount of funding (both equity and debt) raised from the ultimate lenders, financial intermediaries can expand their balance sheet only by increasing borrowing (lending) from (to) each other. This phenomenon can be associated with the profit-seeking behaviour of leveraged financial intermediaries. A growing body of literature (Adrian and Shin 2009, 2010; Shin 2009b) argues that financial companies that target their desired risk-taking and leverage profiles can give a first-order boost to the financial system's size-inflation, increasing the amount of lending/borrowing within financial companies.

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[6] On this issue see also Chap. 9 by Infante et al.

The analysis of data from financial accounts documents a clear distortion of the liability structure of financial intermediaries. The first evidence is given by leverage, computed as the ratio of financial debt (loans plus securities other than shares) to the sum of financial debt and equity (Fig. 6.5). Leverage is high for Anglo-Saxon countries (above 80 in 2009). In the last 15 years, it has risen slightly in the US (it was already high in 1995) and increased sharply in the UK. It is lower for the other European countries, ranging from 50 for France to 74 for Italy. Spain stands out in this context owing to the larger increase in this indicator: starting from particularly low levels at the end of the previous decade (when leverage was below 20), debt increased until it reached the highest values in continental Europe (in 2009 leverage in Spain was around 70). Over the past 15 years, the importance of debt in financial resources (debt and equity) has increased in all the countries in our sample except Germany, where it is almost stable.

Two other noteworthy pieces of evidence are the shortening of the maturity of liabilities and the expansion in the volume of lending/borrowing between financial firms, even in relative terms. Looking at the composition of balance sheets (Fig. 6.6), it emerges that financial intermediaries have sharply modified the liability structure in the last 15 years. Comparing figures for 1995 and the 2007 peak, i.e., before the outbreak of the financial crisis, the share of the balance sheet that was funded out of deposits decreases and this reduction is particularly pronounced in Spain and Italy. This source of funding, traditionally based on retail deposits of households, has been supplemented mainly with shares and other equity (for France
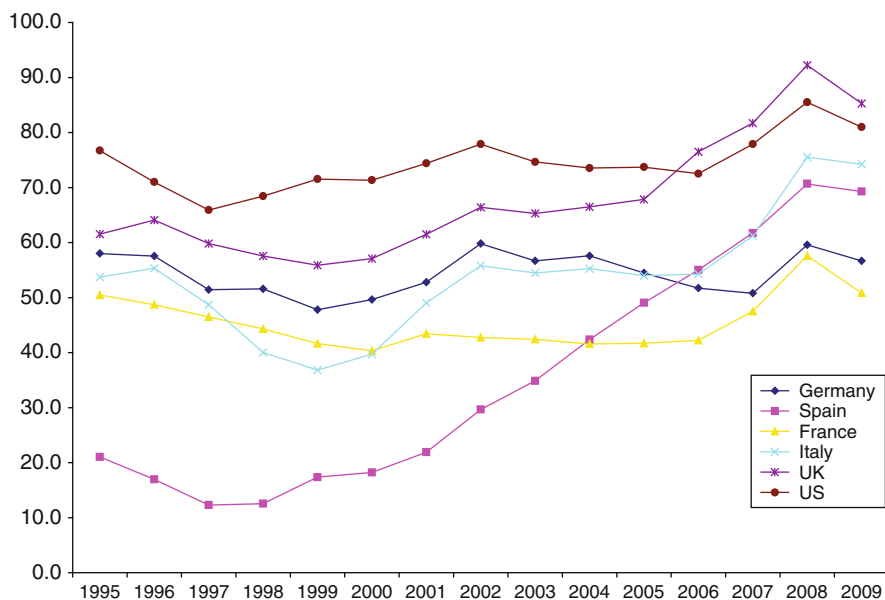
Fig. 6.5 Financial institutions: leverage (percentages) (Sources: Eurostat, Federal Reserve)
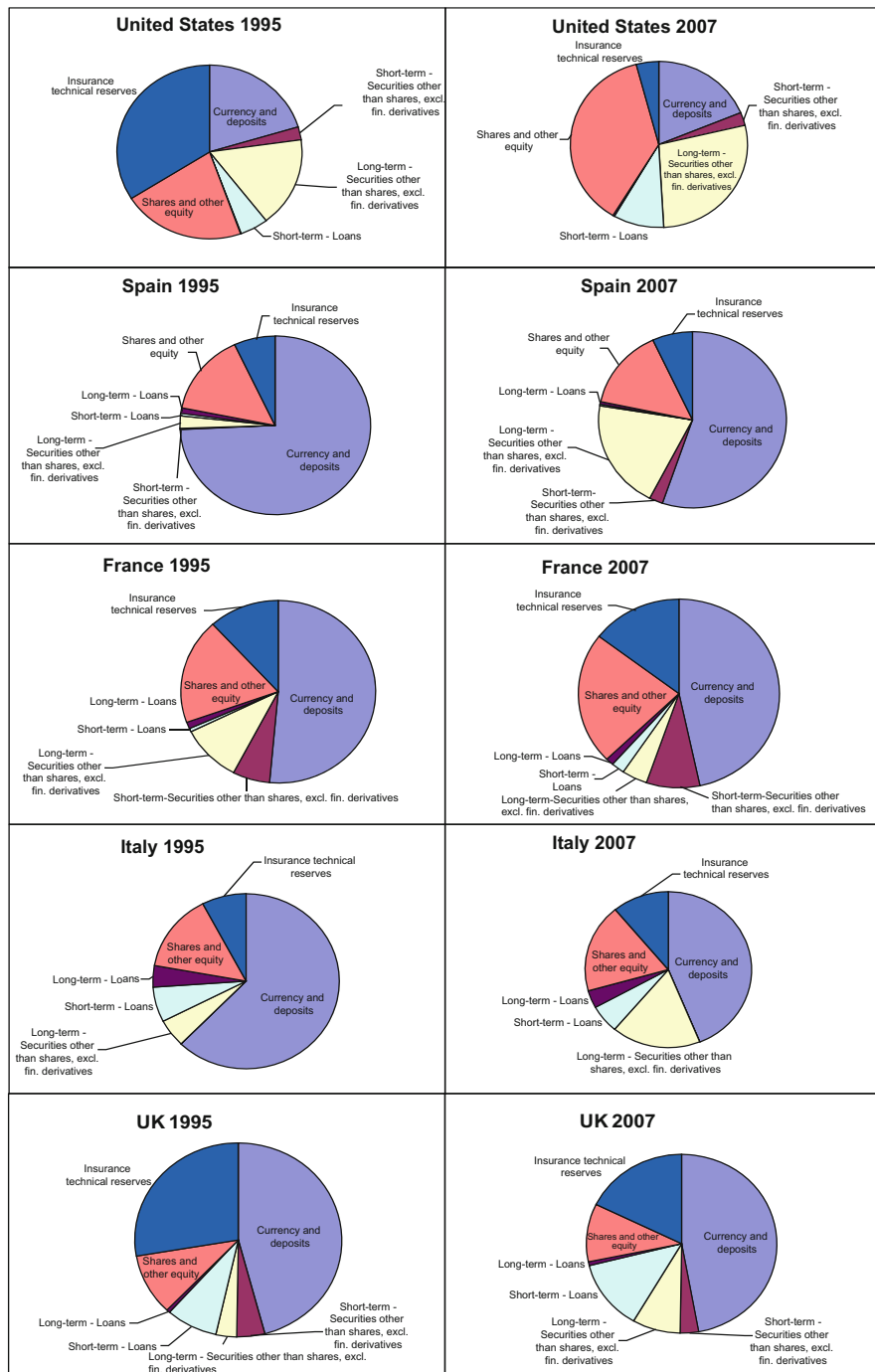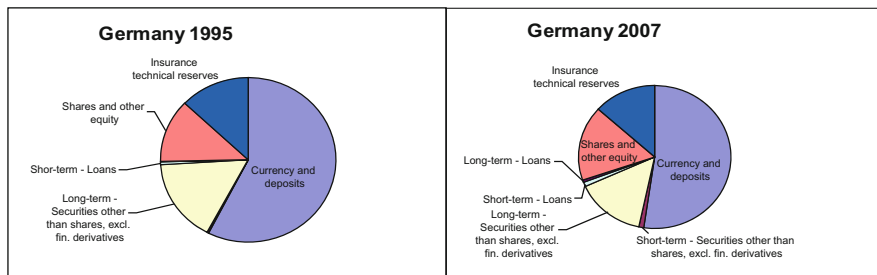
Fig. 6.6 (Continued)

Fig. 6.6 MFI Liabilities (percentages of total liabilities stock) – (Sources: Eurostat, Federal Reserve)

mainly due to mutual funds) and with long-term securities (Italy and Spain). In this respect, the US financial system is unusual, with deposits representing only 19% of total financial sector liabilities (in the other countries in the sample their share ranges from a minimum 42% in Italy to 56% in Spain). This may be due to the low saving rates of US households in the last decade (Palumbo and Parker 2009) and to the large presence of money market funds that compete aggressively with traditional bank deposits. Another significant cross-country difference is represented by short-term loans in Anglo-Saxon financial systems. In 2007, they represented 13% and 9% of total financial liabilities in the US and the UK respectively, testifying to the heavy dependence of intermediaries on other financial institutions, e.g., through inter-bank relations. Corresponding figures in the other countries are fairly negligible.

The increasing relevance of funding by means of short-term loans is a sign of the change in connections within the financial system. Figure 6.7 shows claims and obligations of financial institutions with other financial institutions. During the last 15 years, in Germany such growth has been almost absent. The overwhelming majority of trades between financial corporations are made with deposits and the aggregate increased slightly, from 50% of GDP in 1995 to 60% in 2007. It then rose again in 2008 to a still modest 74% following ECB liquidity intervention as the financial crisis unfolded. On the other hand, the Spanish financial system has become much more interconnected, with debt obligations within the sector climbing from a low of 46% (of GDP) in 2001 to nearly 147% in 2009. Long-term securities represent a major component. This instrument is significant even in France, where total liabilities between financial companies increased only with the financial crisis, rising from 102% in 2000 to 146% in 2008. In Italy, the figures are modest (less than 30% in 1995 and nearly 57% in 2009), but until 2008 short-term loans were particularly high in the European comparison.

In the UK, similar data show a very different picture. The deposits, loans, bonds and money market instruments issued by British MFIs in the portfolio of UK financial corporations soared from under 100% GDP percentage in 1995 to over 350% in 2009. Although an extremely large part of total debt obligations within the financial sector consists of loans, deposits represent the most common instrument.

Spain

Germany

France
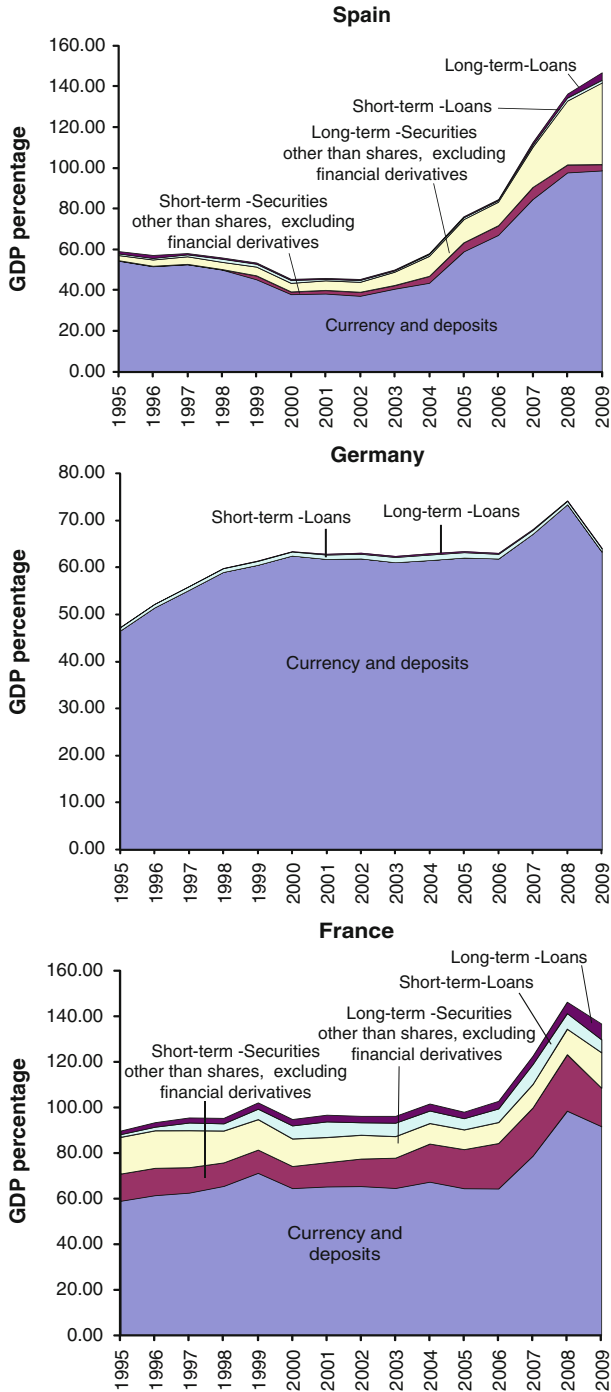
Fig. 6.7 (Continued)
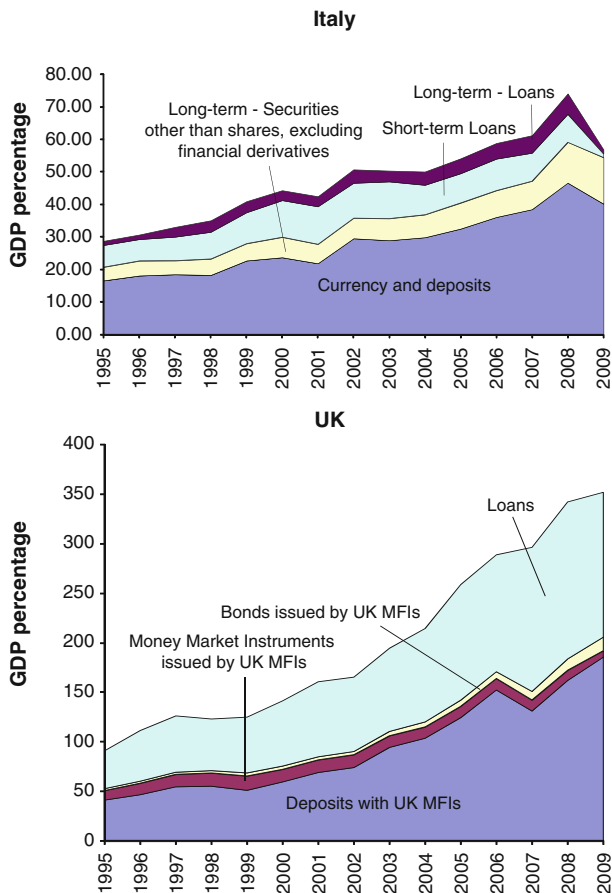
Fig. 6.7 Claims and obligations between financial institutions – part A (Source: Eurostat), part B (Source: Eurostat), part C (Source: UK Office for National Statistics)

In this respect, wholesale funding has proved to be a primary source for numerous financial institutions. Many argue that this transformation, by making the banking system more sensitive to overall capital market conditions, has increased the probability of large liquidity shocks (Brunnermeier 2009). The collapse of Northern Rock is a clear example (the retail depositors' run was just the fall-out from the banks' previous liquidity problems) as short- and medium-term creditors in the financial market stopped buying Northern Rock paper (Shin 2009a).

With the evolution of recent decades and the financial crisis of 2007, the debate on the effects of an oversized financial system has intensified. A large financial system, with strong connections between its operating units (financial companies), may also become very complex (Caballero and Simsek 2009). From an individual institution standpoint, collateralized lending/borrowing, e.g., security repurchase

agreements (repos and reverse repos) and short-term instruments (e.g., open market paper), helps to mitigate the informational and computational difficulties of assessing various types of risk in a complex environment. US data show unambiguously that financial intermediaries (especially some of them) have rapidly increased the share of the balance sheet they finance on the basis of short-term market funding, such as repurchase agreements (Hordahl and King 2008). Figure 6.8 reports, for the entire financial business sector, the short-term liabilities (the sum of short-term loans including repos and open market paper) and total liabilities. The dynamics of the two series are quite similar from 1995 to 1999 but then diverge sharply, especially from 2005 to 2008 during the boom. Conversely, short-term liabilities slump with the outbreak of the crisis, reflecting the well-documented freeze of some markets for funding.

When a substantial share of the liability side of the balance sheet of financial institutions is funded out of trading with other financial institutions (by construction, highly leveraged) by means of short-term instruments or instruments that are marked-to-market in continuous time, the financial system as a whole becomes (1) much more sensitive to overall capital market conditions (hence prone to liquidity shocks) and (2) more intertwined, i.e., less resilient to contagion. The expansion of financial intermediaries that rely more heavily on this type of funding (sometimes called the "shadow banking system" or other financial institutions), which exploits regulatory arbitrage opportunities, has led them to overtake the more traditional
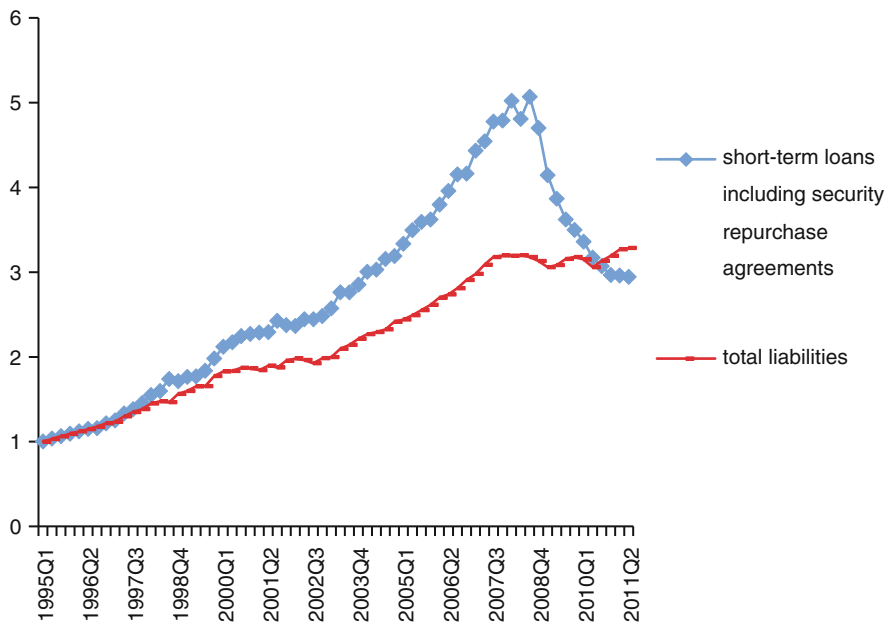

Fig. 6.8 Short-term and total liabilities of the financial sector in the US (Source: US Flow of Funds)

financial institutions with more stable sources of funds, such as secured deposits of households.

Apart from concerns regarding the impact on stability of these recent developments, other implications of this changed attitude of banks may relate to their relations with households and firms, the original and ultimate players in our framework. Focusing on firms, the bias towards short-term funding has an important effect on the type of loans that banks should be willing to offer. In fact, if banks were to preserve a minimum maturity match between assets and liabilities, long-term lending to firms would necessarily decrease when the part of the bank liability side consisting of short-term inter-bank deposits or securities increases. Moreover, the opposite scenario (banks accept a widening maturity mismatch) can trigger hard adjustments in the case of adverse shocks. The macroeconomic impact of this phenomenon is greater the larger the share of firms that rely on banks to finance their business and hence the more bank-based is the financial system. Fortunately, for the time being this change in attitude is more common in Anglo-Saxon banks, partly because it is also linked to the presence of a well-developed capital market. Nevertheless, Europe should watch out for a possible upswing of this trend in European banks as well. In the following paragraph we examine the capital structure of non-financial firms.

6.4 Non-Financial Firms' Capital Structure

The structural differences in the financial systems of the countries analysed in this chapter, together with the different patterns of evolution in the last 15 years, are clearly mirrored in the financial structure of non-financial firms.

A possible approach to the analysis of firms' capital structure starts by looking at firms' financing needs, analysing retained earnings and investment. We then examine firms' choices between the different options available for external financing, and hence between market instruments (shares and bonds) and loans. We then focus on the traditional distinction between debt and equity financing, using as a summary indicator of this choice the leverage ratio, measured as the ratio of financial debt (loans and bonds) to the sum of financial debt and shareholders' equity, as is customary in the literature. Finally, we also focus on the term structure of debt.

According to the pecking order theory (Myers 1984), firms prioritize their sources of financing (from internal financing to equity) according to the principle of least effort, or least resistance, raising equity as a financing means of last resort. Hence, internal funds are used first. When external financing is required, firms first issue debt, then possibly hybrid securities such as convertible bonds, and finally equity. This principle holds also because, in general, issue costs are very low for internal funds, low for debt and high for equity.

In line with this theory of the hierarchy of funding sources, self-financing contributes heavily to firms' resources (Table 6.2, column a), in both market-oriented and bank-oriented countries. In normal times, retained earnings are high in Anglo-Saxon countries (on average around 11–12% of GDP in the UK, 9.5% in

Table 6.2 Non-financial firms' resources and uses (flows, GDP percentages)

	Self-financing (a)	Investments and change in inventories (b)	External financing needs (c) = (b)-(a)	External funds (d)	Financial assets (d)-(c)	*Memo: self-financing/ Investments (a)/(b)*
Italy						
1995–2000	0.09	0.11	0.02	0.07	0.04	*0.84*
2001–2006	0.09	0.12	0.02	0.08	0.05	*0.80*
2007	0.08	0.12	0.04	0.12	0.08	*0.64*
2008	0.06	0.12	0.05	0.06	0.01	*0.55*
2009	0.08	0.10	0.02	0.01	−0.01	*0.76*
France						
1995–2000	0.09	0.09	0.00	0.10	0.10	*0.96*
2001–2006	0.08	0.10	0.02	0.12	0.11	*0.81*
2006	0.07	0.10	0.03	0.18	0.15	*0.71*
2007	0.08	0.11	0.03	0.19	0.16	*0.73*
2008	0.07	0.11	0.04	0.18	0.15	*0.67*
2009	0.07	0.08	0.01	0.14	0.14	*0.86*
Germany						
1995–2000	0.10	0.11	0.01	0.08	0.06	*0.90*
2001–2006	0.10	0.10	0.00	0.03	0.04	*1.03*
2007	0.12	0.10	−0.01	0.05	0.07	*1.10*
2008	0.11	0.11	0.00	0.04	0.05	*1.01*
2009	0.10	0.09	−0.01	0.00	0.02	*1.09*
Spain						
1995–2000						
2001–2006	0.10	0.15	0.05	0.14	0.08	*0.66*
2007	0.06	0.17	0.11	0.23	0.12	*0.36*
2008	0.09	0.16	0.07	0.09	0.02	*0.54*
2009	0.02	0.13	0.11	0.09	−0.02	*0.12*
UK						
1995–2000	0.11	0.11	0.00	0.16	0.16	*1.00*
2001–2006	0.12	0.10	−0.02	0.10	0.11	*1.18*
2007	0.12	0.10	−0.02	0.17	0.18	*1.25*
2008	0.12	0.09	−0.02	0.11	0.12	*1.24*
2009	0.12	0.07	−0.05	−0.07	−0.02	*1.78*
US						
1995–2000	0.09	0.11	0.01	0.09	0.08	*0.87*
2001–2006	0.09	0.10	0.00	0.06	0.06	*0.96*
2007	0.09	0.10	0.01	0.12	0.11	*0.92*
2008	0.09	0.10	0.00	0.03	0.01	*0.99*
2009	0.09	0.08	−0.01	0.00	0.01	*1.17*

Sources: Eurostat, Banca d'Italia, Banque de France, Bundesbank, Banco de Espana, Bank of England, Central Statistical Office, Federal Reserve, Bureau of Economic Analysis

the US) and in Germany (ranging between 9.7 and 11.0% of GDP): in the US self-financing has been virtually stable during the last 15 years, while increasing fairly steadily in the UK. For the other European countries considered, self-financing is slightly lower, ranging from 7.9% (France) to 10.0% (Spain) of GDP.

In some countries the recent financial crisis has caused a reduction in self-financing, particularly in Spain where in 2009 it represented only 2% of GDP. Retained earnings do not necessarily decrease during crises, because the drop in total revenues can be accompanied by an even higher contraction in dividends, taxes and, due to the interest rate dynamics, in interest paid. The net effect on self-financing is therefore not perfectly foreseeable. The recent decline was accompanied by a reduction in the use of these resources. Non-financial corporations' investments shrank in the whole sample, but more severely in Spain and the UK, respectively −4 and −3% of GDP from 2007 to 2009 (Table 6.2, column b). In the same period, investment decreased by around 2% of GDP in the other countries. In Italy, France and Spain, self-financing diminished more than investment, so that the contribution of retained earnings to investment activity declined significantly (Table 6.2, last column). By contrast, in the Anglo-Saxon countries and in Germany, the share of investments covered by internal resources increased due to the initially higher level of self-financing.

Once we have assessed the different need for external funds by the various countries examined, other discrepancies emerge regarding the way this need is fulfilled. When we turn to stocks, Table 6.3 shows that shares are the largest source of external financing in all countries, except in Spain where loans and shares are equally important. Moreover, the incidence of shares has risen in the last 15 years in all countries examined, although to a smaller extent in the Anglo-Saxon countries, where their weight in total liabilities was higher already in 1995. It is striking to observe the change that took place in France between 1995 and 2000, due to the successful efforts of French authorities to develop their capital markets: in 1995 the weight of shares was only 10 percentage points higher than that of loans; 5 years later this difference amounted to 47 points. The decline in share prices due to the crisis has reduced the percentage of shares on total liabilities, but again the differences between the countries remain unaltered: in 2009 the weight of shares in total financial liabilities was almost three times that of loans in the US, more than double in France, and slightly less in the UK. In the same year the ratio was 1.2 in Italy and Germany. This is because in Spain, Italy and Germany banks continue to play a central role in the financing of firms as we saw in paragraph 2.

Leverage (measured as the ratio of financial debt to the sum of financial debt and shareholders' equity; Fig. 6.9) has declined dramatically in the last 15 years for French firms (from around 60 in 1995 to less than 35 in 2006), because of the progress in France's financial structure mentioned earlier. It increased in Spain and the UK by approximately 10 percentage points from 1995 to 2009 and in the US by 5 points, while remaining broadly stable in Germany and Italy. For Spain this result is related to a huge increase in loans, while for the US and the UK it is due to the significant amount of bonds issued by non-financial corporations. This indicator too is clearly influenced by stock price dynamics, with a downward bias in the case of

Table 6.3 Non-financial firms' liabilities (percentages of total stock)

	Bonds	Loans	Shares and other equity	Trade debits and other liabilities
France				
1995	6.6	30.5	41.1	21.8
2000	5.0	17.9	65.3	11.9
2007	4.6	20.2	64.3	10.9
2008	6.0	27.2	53.1	13.7
2009	5.8	24.3	57.2	12.7
Germany				
1995	2.7	39.3	41.9	16.1
2000	1.4	34.1	50.6	13.8
2007	2.7	31.6	50.7	15.0
2008	3.5	37.1	41.6	17.9
2009	3.4	35.7	43.7	17.2
Italy				
1995	1.1	33.6	35.8	29.5
2000	1.0	25.6	53.6	19.8
2007	2.1	30.2	46.8	20.8
2008	2.1	34.2	42.4	21.2
2009	2.6	33.8	43.0	20.6
Spain				
1995	3.0	25.1	45.5	26.5
2000	0.9	27.3	50.8	21.0
2007	0.4	34.6	49.1	16.0
2008	0.7	40.9	40.9	17.5
2009	0.8	40.9	42.0	16.3
UK				
1995	5.9	21.9	64.4	7.8
2000	7.8	19.0	68.3	4.9
2007	9.4	29.9	56.5	4.2
2008	10.3	36.9	48.1	4.6
2009	12.4	30.3	53.0	4.3
US				
1995	9.5	14.3	56.7	19.6
2000	9.1	13.1	58.1	19.7
2007	9.0	15.8	57.3	17.9
2008	11.2	19.5	47.7	21.5
2009	11.5	17.3	50.4	20.9

Sources: Eurostat, Banca d'Italia, Banque de France, Bundesbank, Banco de Espana, Bank of England, Central Statistical Office, Federal Reserve, Bureau of Economic Analysis

bull stock markets. As a consequence, for all the countries considered, leverage decreased in the late 1990s and then completed another cycle of rise and fall until the crisis.
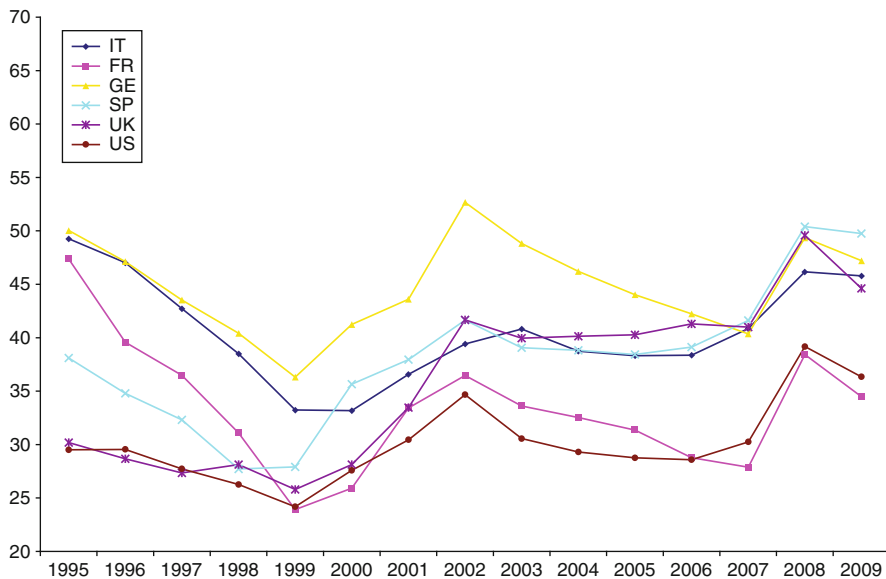
Fig. 6.9 Non-financial firms: leverage (percentages) (Sources: Eurostat, Banca d'Italia, Banque de France, Bundesbank, Banco de Espana, Bank of England, Federal Reserve)

With the crisis, leverage increased owing to the low level of share prices, and so in 2009, when the stock markets recovered, the indicator decreased again in all the economies. So far the crisis does not seem to have greatly altered countries' ranking of more recent years: leverage remains lower in the US and France (around 35) and higher in Spain, Germany and Italy (between 45 and 50), confirming previous evidence.

In the Euro-area, despite the growth of bond issues stimulated by the single currency, liabilities of this type are still of limited importance in Spain, Italy and Germany, where, in the last 15 years, they have remained consistently below 10% of financial debt.[7] They are more important in France (around 19% in 2009) and, above all, in the UK and the US (respectively 29% and 40% of total financial debt in 2009; Fig. 6.10). Following the credit crunch experienced during the crisis, larger firms have substituted loans with bonds, but in terms of stocks we do not observe any significant change in historical and international patterns.[8]

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[7] Financial debt differs from total financial liabilities in that it includes only loans and securities other than shares.

[8] A recent study focusing on Italian non-financial firms' bond issues shows that the differences with respect to the more developed Anglo-Saxon markets is due in large part to the underdevelopment of the stock exchange, which attracts a small number of non-financial corporations (De Socio et al. 2010). Indeed, when analysing bonds issued by listed companies (measured with respect to total financial debt) these differences almost disappear, confirming that bonds are usually issued
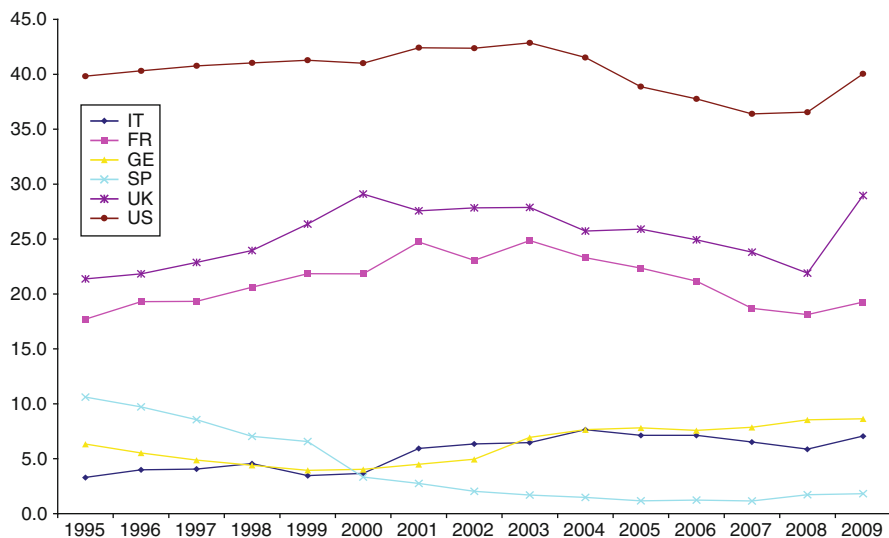
Fig. 6.10 Non-financial firms: bonds issued (as percentages of total financial debt) (Sources: Eurostat, Banca d'Italia, Banque de France, Bundesbank, Banco de Espana, Bank of England, Federal Reserve)

In the last few years corporate debt has reached historically high levels in the main industrial countries (Fig. 6.11); this is particularly true for Spain. Since 1999 firms there have experienced a sudden, and subsequently continuous, increase in loans, linked to the huge expansion of the real estate sector; together with the recent sharp reduction in revenues, interest paid on this debt explains, among other things, the very low level of self-financing. In Spain the ratio of firm loans to GDP in 2009 was equal to 1.38, a level never reached by the other countries, where the ratio, though rising during the last 15 years, has always been smaller than one. The lowest values are found for the US and Germany, respectively equal to 0.46 and 0.60, because of the low external financing needs of non-financial firms in these two countries (see Table 6.2). Even if the impact on stocks is not significant, we observe a reduction of loans to non-financial corporations during the crisis. In 2009, loans to non-financial firms decreased in all the countries considered except France, where the government had put in place a public guarantee scheme to induce banks not to

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only by listed firms because of the fixed costs of entering the financial markets. Another important determinant of small bond issues is the lack of an adequate network of institutional investors: on the supply side, the absence of specialized intermediaries for their placement may increase the cost, while on the other side, a limited range of institutional investors, which are the main buyers of this type of securities, keeps demand low.
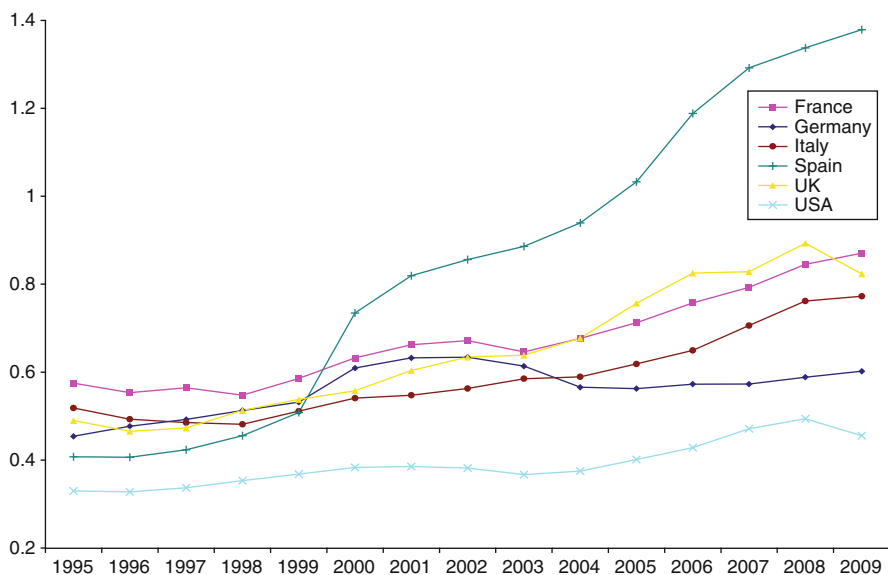
Fig. 6.11 Non-financial firms: loans (stock, GDP percentages) (Sources: Eurostat, Banca d'Italia, Banque de France, Bundesbank, Banco de Espana, Bank of England, Central Statistical Office, Federal Reserve, Bureau of Economic Analysis)

reduce lending to firms (Table 6.4). The reduction in bank loans was larger in the UK and the US and lower in traditional bank-based financial systems: in Italy, Germany and Spain loans to non-financial firms decreased in 2009 by 1.3–1.5% of the previous stock; in the UK the reduction was 10.7% of the 2008 stock, while in the US the contraction, which started in 2008 (−0.9%), amounted to 8.6% in 2009. In the last two countries the available evidence points clearly towards a credit crunch.

Together with the total amount of loans, it is important to consider the term structure of financial debt (Fig. 6.12). Including securities other than shares with loans and considering only financial debt with a maturity of less than 1 year, an interesting picture emerges. Of the huge amount of loans to Spanish firms, only a small proportion is represented by short-term debt; this information goes some way towards easing concerns about the fragility of the financial structure of Spanish firms. Some concerns instead arise about the situation of Italian firms: while the amount of debt is lower as a percentage of GDP (0.77% in 2009), 42% of debt is short term, a percentage that has been declining over time, however. By contrast, the same percentage is increasing for French firms, reaching 35% in 2009. In the UK too a high percentage of short-term debt has been observed, but, as already mentioned, this is due to the huge development of the British securities market. In Germany, the archetypal bank-oriented country, loans are mostly long-term (76%); in the US short-term loans are about 27% of the total.

Table 6.4 Non-financial firms' funding (percentage of the flow on the previous stock)

	Bonds issues	Loans transactions	Shares issues	Other liabilities
Italy				
1996–2000	−0.016	0.066	0.033	0.029
2001–2006	0.171	0.071	0.015	0.043
2007	0.068	0.131	0.012	0.044
2008	−0.022	0.095	0.005	−0.014
2009	0.202	−0.014	0.027	−0.031
France				
1996–2000	0.100	0.064	0.036	0.030
2001–2006	0.109	0.073	0.027	0.024
2007	0.090	0.130	0.025	0.060
2008	0.373	0.094	0.014	0.014
2009	0.225	0.017	0.033	0.066
Germany				
1996–2000	0.006	0.110	0.047	0.023
2001–2006	0.141	0.012	0.021	0.023
2007	0.068	0.039	0.021	0.024
2008	0.081	0.053	0.008	0.003
2009	−0.053	−0.013	0.008	0.018
Spain				
1996–2000	−0.076	0.148	0.046	0.122
2001–2006	−0.036	0.163	0.034	0.088
2007	0.123	0.155	0.027	0.055
2008	0.055	0.074	0.015	0.003
2009	−0.014	−0.015	0.009	−0.086
UK				
1996–2000	0.185	0.092	0.059	0.017
2001–2006	0.056	0.121	0.009	0.026
2007	0.068	0.128	0.031	0.019
2008	0.007	0.107	0.014	−0.026
2009	0.005	−0.107	0.025	−0.002
US				
1996–2000	0.082	0.099	−0.016	0.156
2001–2006	0.061	0.076	−0.011	0.072
2007	0.108	0.148	−0.047	0.209
2008	0.050	−0.009	−0.014	0.078
2009	0.064	−0.086	−0.016	0.079

Sources: Eurostat, Banca d'Italia, Banque de France, Bundesbank, Banco de Espana, Bank of England, Federal Reserve
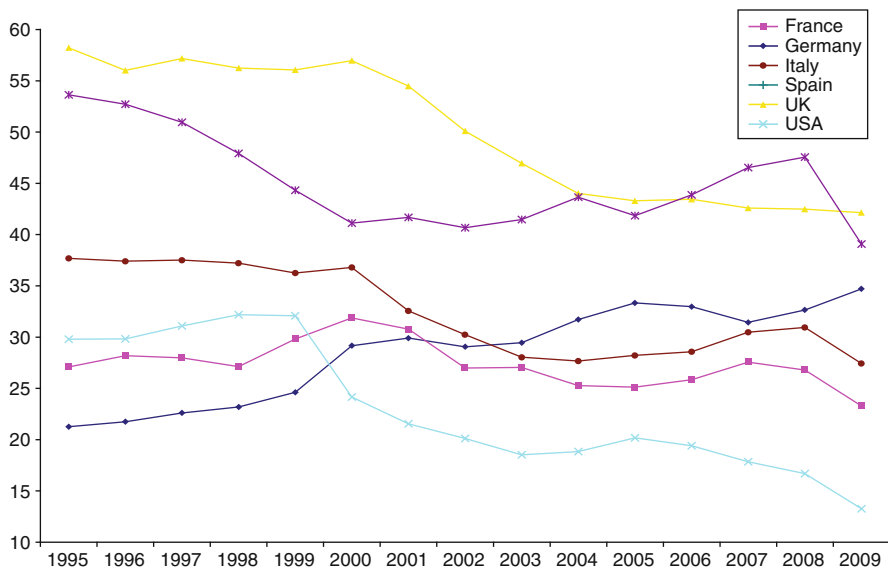
Fig. 6.12 Non-financial firms: short-term financial debt (on total financial debt, stocks) (Sources: Eurostat, Banca d'Italia, Banque de France, Bundesbank, Banco de Espana, Bank of England, Federal Reserve)

6.5   Conclusions

In recent years, the key event in the financial landscape has been the clear, generalized and sharp increase in the size of the financial sector in the most developed countries, albeit with differences as to its speed and magnitude. However, this major transformation, in particular in Anglo-Saxon countries, does not seem to be associated with a parallel change in non-financial firms' capital structure.

Firms' financing behaviour continues to be determined by structural characteristics, mainly linked to the ability to finance investments with internal funds: Germany stands, along with the Anglo-Saxon countries, among the economies with the lowest external financing needs. With regard to external financing, the main difference concerns the use of risk capital (shares), or market instruments more generally (shares and bonds), as opposed to loans. Countries show a high degree of heterogeneity that can be traced back to the development of the capital market. In the well-developed stock exchange markets of Anglo-Saxon countries and France, firms make wider use of shares and bonds compared with firms in Italy, Germany and Spain, where banks play a predominant role. As a consequence, leverage is higher in the latter countries. In Spain and Italy, firms' capital structure seems to show some fragilities: the main concerns regard the high level of debt in Spain and the large short-term component of loans in Italy. The determinants of firms' capital structure are closely linked to the nature of business

practices and to the type of financial system, two features that change very slowly over time. There is no clear-cut evidence that the financial crisis has induced structural changes in firms' financing decisions thus far; nonetheless, a reduction in credit to the economy has been observed in almost all the countries examined. Although some forecasts predict a long time-span before loans to non-financial institutions return to pre-crisis growth rates, firms, especially in Germany and Italy, will continue to rely heavily on bank debt for financing; there the capital markets need to be further developed.

The basically stable scenario that emerges from an analysis of innovations in firms' capital structure seems to be at odds with the turbulent and rapidly changing landscape of the financial sector. In recent times, one of the most interesting and, in our view, important features of financial companies' behaviour is the progressive shift, at least in some countries, from traditional funding sources (e.g., retail deposits) to wholesale funding and financial debt (loans and bonds). The trends are quite common but the magnitude of the phenomenon differs sharply among countries, with the UK, the US and Spain outpacing Germany, Italy and France. Very interestingly, in the first set of countries, the financial system has become even more intertwined as an increasing share of financial institutions' liabilities is now represented by claims of other financial intermediaries: the relative weight of debt obligations towards other financial corporations (i.e., trades between two institutional units that belong to the financial sector) has clearly soared. We use this evidence to confirm the view according to which the increasing interconnection between the balance sheets of financial institutions is necessary in a period of booming financial conditions; this is because, for any given amount of resources raised from the saving sectors, financial intermediaries can only achieve a significant expansion of their asset holdings by borrowing and lending from each other (Shin 2009c). Interconnectedness may harm financial stability and, eventually, economic growth in many ways. Financial corporations that are heavily exposed to each other are more prone to contagion and liquidity problems. In our sample, the corresponding dynamics have instead been much less pronounced in Germany, Italy and France.

The evidence provided by this chapter suggests that the traditional link between the size of the financial system and economic growth (via firms' capital structure) cannot be considered a general rule, especially after the recent boom-bust cycle. Further investigations are needed: a first step could be to use different measures of financial development. In order words, the challenging task is to gain a better understanding of which kind of financial development truly fosters economic growth and preserves financial stability.

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Convergence of Financial Structures in Europe: An Application of Factorial Matrices Analysis

7

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Abstract

In this paper we provide a quantitative assessment of whether or not the financial structures of Europe have converged in the wake of the institution of the Economic and Monetary Union and of the euro area. Starting with a broad selection of financial indicators, multidimensional data analysis techniques are used to derive a small set of composite indicators, synthesizing the evolution of national financial structures over time. Three main indicators are obtained, summarizing respectively the overall level of financial deepening, the relative weight of the banking sector and the influence of the government borrowing requirement. In all cases, empirical findings show a decline in cross-country dispersion in the period following the launch of the euro. Path dependence also appears to be ruled out by standard empirical tests, although the existence of a single steady-state level for the national financial indicators is rejected by the available data.

7.1   Introduction

Starting with the work of Goldsmith (1969), the literature has increasingly studied the evolution of national financial systems over the long run and the possibility of a progressive reduction in the differences between their

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structures.[1] In order to justify the goal of this chapter let us briefly summarize the expectations that have been voiced concerning the evolution of national financial systems within the European Union.

In the run-up to the launch of Stage Three of Economic and Monetary Union, the countries whose macroeconomic situation was out of line with the reference parameters were required to take far-reaching corrective measures to qualify for the nascent single currency area. Substantial fiscal adjustments were required for the countries with excessive deficits and public debt. At the same time, national monetary policy was expected to bring inflation rates into line with the European average.

In parallel with the macroeconomic adjustment, financial legislation was modified in order to create a uniform European framework and strengthen the single capital market within the area (market deregulation and harmonization of the rules governing intermediaries). The heightened integration of the European financial markets helped to increase competition between financial marketplaces and intermediaries, which in turn served as a factor for the transformation of local financial arrangements from the service supply side.[2]

Macroeconomic convergence, the transition to the single currency, greater integration between national financial markets and sharper competition led some authors to expect a progressive reduction of the substantial differences observed in the early 1990s between the financial structures of the countries that would belong to the euro area. Other academics, however, stressed that major differences in key elements of the legislative and institutional framework would persist, for instance in the taxation of financial income and corporate profits, shareholder protection and pension systems.[3] There remain significant national peculiarities in the structure of the non-financial sector, such as in industrial specialization and the average size of firms. The persistence of these disparities, it was argued, prevents the progressive elimination of differences between national financial structures even in the context of monetary unification.

This essay gathers empirical evidence on the recent evolution of financial systems within the European Union, taking a multivariate approach based on the joint analysis of a large number of statistical indicators. In the first stage of the study, by applying factorial matrices analysis (FAMA) we condense the data drawn from the pool of relevant variables into a limited number of composite indicators. The latter then serve to formulate quantitative judgements about whether or not a process of convergence is taking place. The data are drawn mainly from the various national financial accounts drafted according to ESA95 standards. Although the convergence of financial structures is likely to manifest itself only over long time spans, the period covered in the analysis – about 15 years starting

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[1] Allen and Gale (2001) provided a review of the studies on comparative financial systems. For an overview of the extensive literature on the finance and growth relationship, see Levine (2005).

[2] See Trichet (2008) for a recent, synthetic, account of the state of financial integration in Europe.

[3] For a discussion of the repercussions of the introduction of funded pension schemes in European financial markets, see Davis (1998).

from the mid 1990s – and its coincidence with profound structural reforms by the countries involved should allow for an initial assessment of the current tendencies.

The final years of the time span analysed are marked by the inception of the vast international financial crisis that spread among the majority of advanced countries from the summer of 2007. The impact of the crisis on financial convergence can hardly be assessed a priori and is likely to be far-reaching in time. In the context of the present analysis, we are only able to provide some evidence on the early consequences of financial disruptions for the dynamics of national financial structures in the EU, leaving to future research a fully-fledged evaluation of the effects of the crisis.

The essay is organized as follows. Section 7.2 briefly reviews the empirical international comparisons of financial structures in the advanced countries using the financial accounts, focusing in particular on their conclusions concerning convergence or path dependence. Section 7.3 sets out the various concepts of economic convergence used in the literature and the statistical and econometric methodologies adopted for empirical analysis. Section 7.4 briefly describes the multidimensional technique of factorial matrix analysis used to construct the composite indicators. Section 7.5 presents the variables used in the analysis, together with some initial descriptive evidence. Section 7.6 recounts the results of the factorial analysis, which serve as the basis for a statistical analysis of convergence set forth in Sect. 7.7. Section 7.8 summarizes and concludes.

7.2   Convergence of Financial Systems: An Overview of the Recent Empirical Literature

A growing body of literature deals with the relationship between financial systems and economic growth and the convergence of financial structures. It studies the regulatory framework, whether intermediation is direct or indirect, and the financial structure of firms, in that the degree of financial deepening depends not only on households' portfolio choices but also on firms' investment decisions.

The recent empirical literature does not offer uniform results in assessing the hypothesis of convergence among financial system structures, though there does appear to be some prevalence of the alternative thesis of path dependence. In general, the results appear to be largely influenced by the time span examined, the countries analysed, the techniques employed and the financial products studied. In the following we give a brief overview of the main empirical findings.

Bianco et al. (1997), comparing the dynamics of an ample range of indicators, offered evidence of a basic lack of convergence in the financial structures of the G7 economies, indicating that the changes in them reflected mostly past evolution (path dependence). The authors also noted that in countries where public intervention in the economy had been important historically, the state's role in the financial system remained significant.

Narrowing the geographic scope of the analysis to six European countries, De Bondt (1998) studied the evolution of financial structures from the mid-1980s to the mid-1990s taking three distinct approaches, examining respectively intermediation,

regulation and the financial structure of firms. The study found that banks outweighed markets in the financing of firms and derived some principles for explaining financial structures and the persistence or evolution of some key characteristics. Economic and regulatory convergence in Europe with the launch of the monetary union, it concluded, would foster progressive approximation of national structures.

Schmidt et al. (2001) studied the evolution of the financial structure in the main European countries before EMU, from 1980 to 1998. Their thesis is that the expected convergence with the launch of the single market did not occur. The German financial system remained bank-oriented, while the British continued to be market-oriented. The French system was harder to classify, as it had undergone more substantial change, especially in market organization and arrangements, the product of continuous interaction among the various players and components.

Hartman et al. (2003) compared the structure of the financial systems of the euro area, the United States and Japan from 1995 to 2001, confirming that the US was market-based and the other two bank-based. However, the euro-area system was less strongly bank-based than in the past, as the traditional role of banks in intermediation had diminished with respect to institutional investors, with the rise of the bancassurance business. The introduction of the euro fostered portfolio diversification, sustaining the demand for financial assets. The authors also examined convergence between the different euro-area countries, finding an increase in the dispersion of the indicators of ratios between financial assets and liabilities.

Blum et al. (2002) reviewed the literature on the link between finance and growth, studying the structure of the financial system in 32 countries. They concluded that on the whole the degree of convergence between the national financial systems of the euro area was modest.

Bartiloro and De Bonis (2005) tracked the ratio of residents' financial assets to GDP from 1995 to 2000 in 12 European countries, finding evidence of convergence (defined as mean reversion) in the face of greater dispersion of the indicator between countries, which could be attributed to the effect of transitory shocks. More recently, Bruno and De Bonis (2009) exploited a database containing time series since 1980 for nine OECD countries to run some experiments of convergence for the main components of household financial assets: deposits, securities other than shares, shares and other equity, and insurance technical reserves. The authors found evidence of convergence for total financial assets, shares and other equity, and insurance products. Mixed results, and often no convergence, were found for currency and deposits and securities other than shares. In other words, financial systems show signals of convergence in the allocation of assets linked to capital markets, but national characteristics persist when households invest in safe products like deposits and securities issued by the general government or banks.

Antzoulatos et al. (2008) used 16 financial indices from the World Bank's Financial Development and Structure database to classify the OECD countries, according to their financial system structure, into five relatively homogenous clusters for the 1996–2005 period. They showed that the financial systems of the OECD countries do differ, even after 25 years of deregulation, liberalization and globalization. These clusters, however, do not readily conform to the capital-market-based versus the bank-based norms. Financial systems change, but not

necessarily in the same direction nor at the same pace. Another important implication of their study is that the variety in financial system structures is likely to remain a feature of the economic landscape, and that convergence may not be as fast as casual observation and qualitative analyses suggest.

In a subsequent article, Antzoulatos et al. (2010) applied a panel convergence methodology to 13 financial development indices from the World Bank's Financial Development and Structure database to test for financial system convergence across a large set of industrial and developing countries. Their results provide further evidence on the lack of convergence, country-specific factors exerting a stronger influence on financial systems' structure than global forces. The differences in the financial systems are more pronounced for the stock market segment and private credit by banks, and less so for the bond market segment.

7.3   Analysis of Convergence: Concepts and Techniques

The literature on economic growth has devoted ample space to the empirical study of convergence. Starting with Baumol (1986) and Barro (1991), we have had a series of works based on varying methodology. For extensive surveys and an effort at systematic treatment see Temple (1999) and Islam (2003). For our purposes here, while the issue of convergence has been studied most especially in work on growth in per capita output and productivity, it has also been considered in other areas of economics. For instance, studies on the expansion of firms – in particular empirical testing of Gibrat's law – that are examined by Geroski (1999) raise a similar question using techniques analogous to those developed in the framework of growth theory. The techniques of empirical analysis of convergence have also been applied in another area different from growth theory, namely in studies of financial market integration and interest-rate convergence (e.g. Fase and Vlaar 1998; Goldberg et al. 2003).

In the following we briefly describe some of the concepts of convergence developed in the literature and examine the different statistical techniques proposed for empirical analysis. Islam (2003) classified the many, diversified acceptations of the term "convergence" in the growth literature. For our present purposes, it is essential to distinguish convergence within a given economy from convergence across different economies; β-convergence from σ-convergence; and absolute from conditional convergence.

The concept of convergence within an economy refers to the existence of a single long-term equilibrium and a stable transition path leading the economy to steady-state equilibrium. Convergence across economies designates a situation in which the differentials in per capita output between areas tend to diminish over time.

β-convergence describes a situation in which initially backward areas tend to grow faster than more advanced ones – a catching-up process whose intensity is measured by the coefficient β of the regression of the growth rate on the initial output level. In the presence of β-convergence, shocks to the initial output level do not have permanent effects on the long-term equilibrium level, so the system does not show path dependence on the initial conditions.

Originally conducted using non-micro-based regressions, the analysis of β-convergence was subsequently justified theoretically by setting it in the framework of the neoclassical exogenous growth model, as formulated by Solow and extended by the inclusion of human capital in the production function (Mankiw et al. 1992). One of the main implications of Solow's model is the existence, for each economy, of a stable dynamic equilibrium towards which the system, under certain assumptions concerning production technology and positing factor substitutability, converges independently (convergence "within"). At the same time, in the phase of transition the growth rate predicted by the model is proportional to the distance from the long-run equilibrium level. Since countries moving from a low starting point compared with the respective steady-state level will grow faster, a process of convergence "across" will be observed during the transition to the steady state.

Studies of β-convergence were severely criticized by Friedman (1992) and Quah (1993). First, β-convergence is not sufficient to ensure that the cross-sectional dispersion of output levels actually diminishes over time. Second, the approach was criticized as potentially vitiated by Galton's fallacy, i.e. a disturbance of the initial level of the key variable by transitory factors, such as measurement errors, in which case the convergence indicated by the β coefficient would only be apparent. As an alternative, these authors suggested direct measures of output dispersion such as standard deviation (σ) or the coefficient of variation. The tendency towards the progressive reduction of such dispersion is known in the literature as σ-convergence.

A final, important distinction made in the literature is that between absolute and conditional β-convergence. We have absolute convergence when the economies considered not only do not display path dependence but in the long run converge on the same equilibrium level. Convergence is said to be conditional when it is convergence "within"; that is, each of the economies is stable and converges on a single steady-state level but the level itself differs between areas. In the presence of absolute convergence the cross-sectional dispersion is determined strictly by the initial conditions and by shocks that shift the economy temporarily out of the balanced growth path. The absence of path dependence implies that in the long period the system is independent of the initial conditions, so that in the presence of absolute β-convergence the residual spatial dispersion of the phenomenon must be ascribed solely to the effect of transitory disturbances.

In the case of conditional convergence, by contrast, the cross-sectional variability of the phenomenon incorporates not only the transitory component but also a permanent component deriving from the dispersion of the individual steady-state levels. Note that only if the variance of temporary shocks tends to diminish over time will we observe not just convergence "within" but convergence "across" as well.

As for the statistical technique, at first the hypothesis of β-convergence was tested by cross-section regression of the growth rate of per capita GDP on its initial level. However, this approach has a number of serious weaknesses (Temple 1999), such as omitted variables correlated with the initial GDP level, measurement errors and simultaneousness of regressors. To overcome these problems, starting with Knight et al. (1993) and Islam (1995), panel techniques were used, which by including individual effects made it possible to control for omitted variables that

were constant over time, such as the initial level of production efficiency. Owing to the presence of the lagged dependent variable among the regressors, these dynamic panels are not easy to estimate. Originally, Caselli et al. (1996) adopted the GMM estimator (Arellano and Bond 1991). Given the high persistency of the macroeconomic variables involved, however, the Arellano and Bond estimator had problems of ineffectiveness of the instrumental variables used and of severe distortion where the sample is small. This problem was raised by Bond et al. (2001), who suggested as a solution the GMM *system* estimator (Arellano and Bover 1995; Blundell and Bond 1998). On the assumption of no serial correlation of errors, net of the individual effect, the authors showed that this estimator, through an appropriate choice of the order of lag of the instruments, could be consistent even in the presence of measurement errors and endogenous regressors.

Where the series is long enough, time-series methodologies can be used to analyse convergence properties. In our case, however, given the shortness of the series, this approach is not practicable. Nevertheless, the availability of observations repeated over time enables us to test the hypothesis of β-convergence for the financial structures of European countries using the panel methodology. In the absence of a formal theoretical model, it remains impossible to interpret the coefficients estimated in terms of a set of structural parameters, although the inferences drawn from the data may provide valuable insights in the context of an exploratory analysis.

7.4   Factorial Matrices Analysis

The internationally comparative empirical literature more and more commonly adopts a multivariate analytical approach. The use of a single synthetic indicator is considered insufficient to capture fully the morphological differences between the structures of national financial systems. This approach, though it deepens the analysis, makes it problematic to produce a single ranking of groups of countries in terms of their degree of financial development, to assess the evolution of structures in a synthetic, effective fashion, or to bring out dynamics common to the different indicators.

The usual techniques of statistical analysis, in the case of two-dimensional databases (units and variables), allow the effective reduction of the data to produce composite indicators that produce a good synthesis for operational purposes, keeping to a minimum the loss of information with respect to the set of data observed. The literature has proposed extensions of these techniques designed to operate in an analogous fashion on data sets with more than two dimensions (multiway techniques; Rizzi and Vichi 1995). Here we describe the so-called FAMA technique (factorial matrices analysis; see, e.g., Fachin et al. 2002), which has been successfully applied to the analysis of time series of macroeconomic data for a set of countries (Tassinari and Vichi 1994).

The FAMA methodology seeks to condense the information contained in a three-dimensional matrix – statistical units, variables and occasions – into a data

set with fewer dimensions while minimizing information loss. This is a three-phase technique, split into dependence analysis, synthesis and singular values decomposition. Here we provide a brief description of the three steps.

1. *Dependence analysis.* This phase measures the matrix correlation among the various "slices" making up a three-way matrix. Using X_h , $h = 1,2,\dots,T$ to designate a matrix containing the observations of K variables on N statistical units for the period (occasion) h, the following is a general expression of the relative index of dependence:

$$dip(X_h, X_m) = \frac{vec(X'_h)'C\,vec(X'_m)}{\sqrt{vec(X'_h)'C\,vec(X'_h)vec(X'_m)'C\,vec(X'_m)}}$$

Varying the definition of the matrix, one obtains different measures of dependence, the most common of which are:

- The weak dependence index, obtained by setting $C = I_N \otimes I_K$, in which I_M is the identity matrix of order M;
- The strong dependence index, obtained by setting $C = I_N \otimes U_K$, in which U_M is the square matrix of order M with all elements equal to 1.

The strong dependence index gives a broader measure of the correlation between matrix pairs, in that in evaluating the dependence between matrices of data for two different occasions it considers not only the covariance between observations for the same variable but also that between different variables.

2. *Synthesis.* In this phase, factorial matrices are defined as the normalized linear combination of the matrices X_h , $h = 1,2,\dots, T$. In particular, the g-th factorial matrix F_g is obtained as the solution to the following optimization programme:

$F_g = \sum_{h=1}^{T} a_{hg}X_h$ such that: $\sum_{h=1}^{T}\sum_{m=1}^{T} dip(X_h, X_m)a_{hg}a_{mg} = \max$ under the following constraints:

$$\sum_{h=1}^{T} a_{hg}^2 = 1$$

$$\sum_{h=1}^{T}\sum_{m=1}^{T} dip(X_h, X_m)a_{hf}a_{ml} = 0,\ f \neq l;\ f, l = 1, ..., g$$

The weights for the linear combination of the data matrices are thus defined in such a way that the factorial matrices are mutually independent with respect to the measure of matrix dependence selected and are such as to maximize the fraction of linear dependence explained by the individual matrix.

3. *Singular values decomposition.* A standard factor analysis (principal components) is performed on the individual factorial matrices identified in the second stage. Then the time trajectories of the latent variables are defined by projecting the observed data onto the factorial axes of the synthesis matrix.

7.5   Description of the Database

The database assembled for the study includes 14 indicators selected from those used in the empirical literature, considering the availability of statistics for a broad set of European countries. Table 7.1 lists the indicators with a brief description of the way the variables are calculated and the aspects of the financial system that each indicator highlights. The main descriptive statistics on the individual indicators are given in Table 7.2. Except for the indicators of stock market turnover and capitalization (TURNOVER and CAPEX, respectively), obtained from the World Bank

Table 7.1 Financial Indicators

Acronym	Description
FINAS	Total financial assets/GDP. It provides a measure of the overall size of the financial system compared with that of the real economy
FIN	Ratio of the banking sector's financial liabilities to the total financial assets, an indicator of banking development compared with the overall size of the financial system
LOMFI	Loans of MFIs/GDP. It provides an indicator of the absolute development of banking credit
CAPEX	Stock exchange capitalization /GDP. A measure of stock exchange market size
TURNOVER	Ratio of traded quoted stock to stock exchange capitalization. It provides a further indicator of the stock market development
INTOPEN	Ratio of the sum of financial assets and liabilities of the rest of the world to the sum of financial assets and liabilities of residents. It provides a measure of the degree of international openness of the financial system
BONDNF	Ratio assets/loans in the liabilities of non-financial firms. It provides a measure of the incidence of the direct financing on bond markets on the manufacturing sector's debt
HOUSDEP	Share of deposits in households' total financial assets. It represents an indicator of the preference for liquidity of the sector and of the development of the banking system, from the funding side
HOUSBOND	Share of bonds in households' total financial assets. It provides a measure of the incidence of direct holding of private and public bonds
HOUSSHAR	Incidence of shares and other equity in households' financial assets (excluding mutual fund shares). Together with the preceding indicator, it provides a measure of the relevance of not-intermediated assets in households' financial wealth
HOUSFUND	Mutual fund shares as a percentage of households' total financial assets. It provides evidence of the relevance of these non-banking intermediaries
HOUSINS	Share of insurance technical reserve and investment fund units in households' total financial assets. This indicator provides an assessment of the relevance of this kind of intermediation. It is strongly influenced by the presence of funded retirement schemes
HOUSDEB	Ratio of households' financial liabilities to disposable income. It catches the degree of development of the households' credit market
DEBGG	Ratio of general government financial liabilities to the total financial assets. It provides a measure of the weight of public finance in the financial structure

Table 7.2 Main descriptive statistics for the selected indicators

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Average														
FINAS	6.329	6.806	7.550	8.142	9.414	9.931	10.176	10.000	10.610	11.341	12.816	13.990	14.875	14.199
LOMFI	0.875	0.909	0.950	0.974	1.063	1.136	1.197	1.253	1.297	1.371	1.516	1.641	1.763	1.796
FIN	0.288	0.281	0.269	0.257	0.242	0.238	0.244	0.254	0.253	0.252	0.249	0.248	0.254	0.282
INTOPEN	0.170	0.176	0.188	0.198	0.221	0.242	0.252	0.251	0.257	0.265	0.281	0.287	0.297	0.299
CAPEX	0.388	0.459	0.575	0.699	0.903	1.053	0.899	0.658	0.587	0.661	0.735	0.852	0.927	1.013
TURNOVER	0.508	0.570	0.603	0.715	0.647	0.878	1.008	1.003	0.785	0.929	1.066	1.070	1.440	1.835
BONDNFC	0.107	0.112	0.111	0.114	0.123	0.133	0.138	0.140	0.146	0.145	0.144	0.136	0.130	0.129
HOUSDEP	0.400	0.371	0.338	0.318	0.294	0.292	0.303	0.322	0.314	0.307	0.295	0.288	0.298	0.343
HOUSSHAR	0.166	0.191	0.210	0.222	0.248	0.242	0.215	0.180	0.188	0.196	0.206	0.216	0.212	0.169
HOUSBOND	0.094	0.089	0.080	0.070	0.059	0.060	0.062	0.065	0.061	0.059	0.053	0.052	0.052	0.057
HOUSINS	0.259	0.262	0.267	0.273	0.275	0.286	0.297	0.307	0.309	0.312	0.316	0.313	0.314	0.324
HOUSFUND	0.061	0.068	0.079	0.089	0.098	0.097	0.095	0.087	0.087	0.087	0.093	0.092	0.087	0.067
HOUSDEB	0.844	0.865	0.903	0.946	1.022	1.041	1.077	1.110	1.158	1.235	1.308	1.400	1.448	1.415
DEBGG	0.128	0.123	0.111	0.103	0.087	0.081	0.080	0.084	0.080	0.077	0.070	0.063	0.058	0.063
Standard deviation														
FINAS	2.123	2.172	2.400	2.668	2.934	3.099	3.328	3.081	3.400	3.522	3.985	4.394	4.844	4.534
LOMFI	0.248	0.237	0.260	0.264	0.277	0.302	0.333	0.341	0.349	0.388	0.430	0.464	0.507	0.540
FIN	0.070	0.069	0.067	0.066	0.068	0.067	0.063	0.062	0.058	0.057	0.053	0.052	0.052	0.056
INTOPEN	0.075	0.073	0.071	0.067	0.071	0.074	0.079	0.079	0.080	0.081	0.084	0.087	0.091	0.090
CAPEX	0.293	0.339	0.374	0.407	0.567	0.706	0.532	0.351	0.292	0.288	0.303	0.325	0.323	0.336
TURNOVER	0.238	0.290	0.318	0.359	0.361	0.424	0.559	0.566	0.345	0.378	0.408	0.383	0.596	0.809
BONDNFC	0.071	0.074	0.075	0.083	0.095	0.108	0.105	0.101	0.104	0.089	0.090	0.085	0.079	0.073
HOUSDEP	0.148	0.119	0.111	0.106	0.107	0.105	0.102	0.095	0.090	0.088	0.084	0.078	0.075	0.084
HOUSSHAR	0.069	0.065	0.069	0.077	0.091	0.086	0.076	0.077	0.080	0.079	0.082	0.086	0.085	0.076
HOUSBOND	0.090	0.092	0.085	0.069	0.058	0.059	0.062	0.066	0.059	0.056	0.049	0.048	0.051	0.059

Variable														
HOUSINS	0.160	0.159	0.160	0.163	0.161	0.155	0.154	0.151	0.149	0.149	0.149	0.148	0.149	0.144
HOUSFUND	0.033	0.035	0.041	0.048	0.045	0.036	0.034	0.032	0.035	0.034	0.036	0.034	0.033	0.030
HOUSDEB	0.370	0.390	0.410	0.423	0.456	0.479	0.498	0.516	0.536	0.573	0.607	0.660	0.689	0.716
DEBGG	0.050	0.052	0.049	0.044	0.037	0.034	0.037	0.036	0.033	0.032	0.031	0.030	0.029	0.030
Coefficient of variation														
FINAS	0.336	0.319	0.318	0.328	0.312	0.312	0.327	0.308	0.320	0.311	0.311	0.314	0.326	0.319
LOMFI	0.283	0.261	0.274	0.271	0.261	0.266	0.278	0.272	0.269	0.283	0.284	0.283	0.287	0.301
FIN	0.245	0.245	0.247	0.257	0.281	0.282	0.258	0.242	0.231	0.227	0.212	0.211	0.205	0.200
INTOPEN	0.440	0.413	0.379	0.339	0.321	0.306	0.313	0.313	0.312	0.305	0.300	0.304	0.305	0.301
CAPEX	0.754	0.740	0.650	0.582	0.628	0.670	0.592	0.533	0.498	0.436	0.412	0.381	0.348	0.331
TURNOVER	0.469	0.510	0.527	0.503	0.558	0.483	0.554	0.564	0.440	0.407	0.383	0.358	0.414	0.441
BONDNFC	0.664	0.660	0.675	0.722	0.771	0.813	0.764	0.724	0.712	0.617	0.627	0.625	0.608	0.566
HOUSDEP	0.370	0.319	0.329	0.332	0.363	0.361	0.335	0.297	0.287	0.287	0.286	0.269	0.251	0.244
HOUSSHAR	0.415	0.341	0.330	0.346	0.368	0.356	0.354	0.425	0.424	0.401	0.400	0.398	0.402	0.450
HOUSBOND	0.960	1.035	1.070	0.992	0.978	0.976	0.998	1.002	0.963	0.950	0.926	0.927	0.979	1.033
HOUSINS	0.619	0.607	0.601	0.595	0.586	0.544	0.520	0.492	0.483	0.478	0.473	0.474	0.473	0.444
HOUSFUND	0.538	0.512	0.512	0.545	0.457	0.375	0.364	0.369	0.404	0.393	0.383	0.366	0.378	0.455
HOUSDEB	0.438	0.451	0.454	0.447	0.446	0.460	0.463	0.465	0.463	0.464	0.464	0.471	0.476	0.506
DEBGG	0.395	0.420	0.440	0.432	0.422	0.424	0.458	0.433	0.413	0.417	0.445	0.474	0.492	0.469

database on financial structures,[4] the indicators are constructed on the basis of the national financial and economic accounts of 13 European countries in the period 1995–2008.[5] The indicators are quite heterogeneous as they take into account the overall dimension of financial systems, the banking system weight, the stock exchange size, the composition of firm liabilities and, especially, of household assets and the general government debt.

Between 1995 and 2008 the indicator of the overall size of the financial system (FINAS) more than doubled, displaying, for the average of the 13 countries, a positive trend extending also over the years of sharply declining share prices between 2000 and 2003, to decline slightly only in 2008, at the height of the global financial crisis (see Fig. 7.1, where the behaviour of FIN is also reported). This trend is in line with the evidence recently provided by Beck et al. (2009), showing how the deepening of both financial markets and institutions has increased in high-income countries over the last decade.

While the cross-country dispersion of FINAS rose in absolute terms, the corresponding coefficient of variation remained approximately constant. A decline
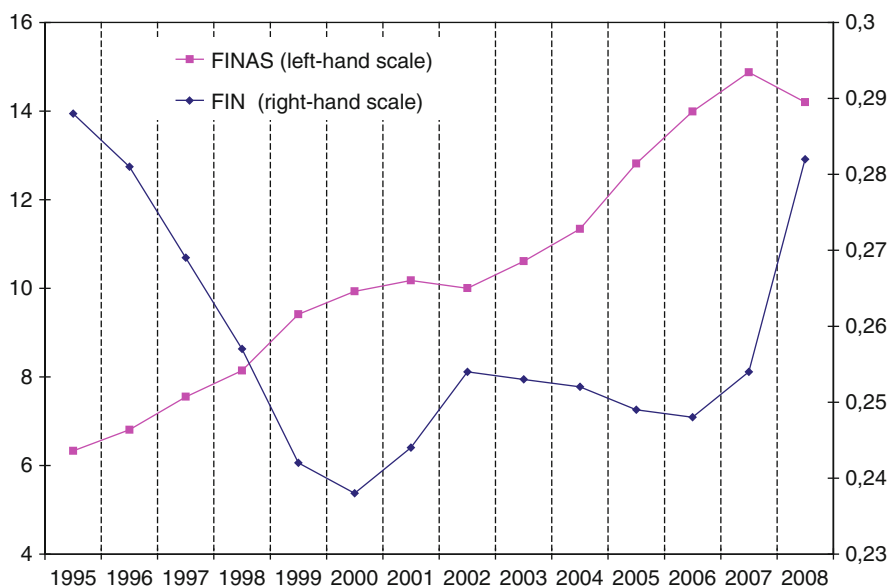
Fig. 7.1 Time series of FINAS and FIN indicators (cross-country averages)

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[4] For a description of that database, see Beck et al. (1999).

[5] The countries are Austria (AT), Belgium (BE), Germany (DE), Denmark (DK), Spain (ES), Finland (FI), France (FR), Italy (IT), the Netherlands (NL), Norway (NO), Portugal (PT), Sweden (SE) and the United Kingdom (UK).

over the sample period of the coefficient of variation is observed for the indicators of international financial openness (INTOPEN), the two proxies of degree of development of the equity markets (CAPEX, TURNOVER) and the corporate bond markets (BONDNFC).

Over the period considered the ratio of bank credit also grew faster than real economic variables. The LOMFI indicator doubled its level, while its cross-sectional dispersion, although increasing in absolute terms, stayed almost constant vis-à-vis the mean. By contrast, the relative variability increased rather steadily for the HOUSEDEB indicator, as household debt grew strongly in countries such as the UK and Spain and more weakly in France and Italy.

The dynamics of the FIN indicator shows how the volume of banking intermediation, though growing more than the real economy, declined with respect to the total growth of financial assets,[6] though there are signs of a recovery in the years 2001–04, followed by a renewed slowdown and finally a sharp pick-up with the advent of the crisis. The cross-country dispersion of this indicator increased in relative terms until 2000 and then progressively declined.

Households' portfolio of financial assets saw an increase in the proportion accounted for by non-bank intermediated instruments (HOUSINS and HOUSFUND). Direct shareholding (HOUSSHR) also increased, while bond holdings (HOUSBOND) declined. The share of bank deposits (HOUSDEP) declined until 2000 and then rose again, but not enough to regain its initial levels. A sharp rebound is observed in 2008 as the financial crisis induced savers to invest in safer assets.

The incidence of the public debt on the financial system (DEBGG) shows a downward trend over the whole sample period. The dispersion of the indicator across countries diminished progressively in absolute terms but showed a tendency to increase as a ratio to the declining average cross-sectional level.

Table 7.3 gives the simple correlations between the 14 indicators, calculated jointly including the data for the 13 countries and the 14 years considered. The principal indicator of financial development (FINAS) is correlated negatively with the indicators of relative development of banks (FIN and HOUSDEP) and with the incidence of public debt (DEBGG). It is positively correlated with the indicators of absolute development of the credit markets (LOMFI and HOUSDEB). Overall, as the size of the financial system increases in relation to the real economy, so does the volume of banking intermediation, but less than proportionally, so that the latter shows a relative decline.

Additional descriptive evidence comes from a dynamic analysis of the distance between countries, jointly measured with respect to the entire set of indicators (Table 7.4). The mean distance across countries decreased by about 13% (from 2.7 to 2.4) between 1995 and 2008, indicating a tendency towards a reduction of dispersion in national financial structures. The countries displaying the sharpest

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[6] A similar tendency is documented by Beck et al. (2009) for the set of all high-income countries.

Table 7.3 Correlation matrix (based on pooled year–country data)

	FINAS	LOMFI	FIN	INTOPEN	CAPEX	TURNOVER	BONDNFC	HOUSDEP	HOUSSHAR	HOUSBOND	HOUSINS	HOUSFUND	HOUSDEB	DEBGG
FINAS	1	0.76	−0.25	0.80	0.46	0.31	0.17	−0.45	−0.16	−0.15	0.50	−0.10	0.52	−0.63
LOMFI	0.76	1	0.16	0.44	0.22	0.40	0.03	−0.23	−0.24	−0.15	0.44	−0.16	0.71	−0.58
FIN	−0.25	0.16	1	−0.43	−0.48	−0.07	−0.10	0.52	−0.29	0.24	−0.28	0.29	−0.15	0.15
INTOPEN	0.80	0.44	−0.43	1	0.55	0.18	0.21	−0.36	−0.08	−0.16	0.43	−0.19	0.28	−0.57
CAPEX	0.46	0.22	−0.48	0.55	1	0.30	0.38	−0.54	0.29	−0.40	0.46	−0.19	0.19	−0.53
TURNOVER	0.31	0.40	−0.07	0.18	0.30	1	−0.01	−0.15	−0.01	−0.22	0.19	−0.01	0.23	−0.26
BONDNFC	0.17	0.03	−0.10	0.21	0.38	−0.01	1	−0.10	−0.29	−0.43	0.44	−0.30	0.05	−0.41
HOUSDEP	−0.45	−0.23	0.52	−0.36	−0.54	−0.15	−0.10	1	−0.24	−0.07	−0.60	0.02	−0.44	0.28
HOUSSHAR	−0.16	−0.24	−0.29	−0.08	0.29	−0.01	−0.29	−0.24	1	0.08	−0.41	0.22	−0.22	0.18
HOUSBOND	−0.15	−0.15	0.24	−0.16	−0.40	−0.22	−0.43	−0.07	0.08	1	−0.42	0.27	−0.32	0.68
HOUSINS	0.50	0.44	−0.28	0.43	0.46	0.19	0.44	−0.60	−0.41	−0.42	1	−0.46	0.70	−0.61
HOUSFUND	−0.10	−0.16	0.29	−0.19	−0.19	−0.01	−0.30	0.02	0.22	0.27	−0.46	1	−0.40	0.17
HOUSDEB	0.52	0.71	−0.15	0.28	0.19	0.23	0.05	−0.44	−0.22	−0.32	0.70	−0.40	1	−0.56
DEBGOV	−0.63	−0.58	0.15	−0.57	−0.53	−0.26	−0.41	0.28	0.18	0.68	−0.61	0.17	−0.56	1

Table 7.4 Distance matrix among national financial structures[a] (Euclidean distances based on the 14 indicators considered)

	Austria	Belgium	Denmark	Finland	France	Germany	Italy	Nether-lands	Norway	Portugal	Spain	Sweden	United Kingdom
1995													
Austria	0	2.703	2.256	1.643	2.144	1.070	2.192	3.189	2.218	2.186	1.811	2.030	4.028
Belgium	2.703	0	2.784	3.398	3.418	3.216	2.001	3.828	3.917	3.509	3.123	2.837	4.590
Denmark	2.256	2.784	0	2.786	2.869	2.027	2.718	2.614	2.295	2.815	2.633	1.572	3.548
Finland	1.643	3.398	2.786	0	2.677	2.168	2.627	3.235	1.770	2.157	1.967	2.297	3.659
France	2.144	3.418	2.869	2.677	0	1.944	3.514	3.251	2.260	2.281	1.625	2.398	3.247
Germany	1.070	3.216	2.027	2.168	1.944	0	2.859	2.788	2.027	2.467	2.002	1.742	3.815
Italy	2.192	2.001	2.718	2.627	3.514	2.859	0	4.149	3.407	3.116	2.871	2.688	4.895
Netherlands	3.189	3.828	2.614	3.235	3.251	2.788	4.149	0	2.735	3.360	3.245	1.925	2.601
Norway	2.218	3.917	2.295	1.770	2.260	2.027	3.407	2.735	0	2.063	2.041	2.064	2.960
Portugal	2.186	3.509	2.815	2.157	2.281	2.467	3.116	3.360	2.063	0	1.088	2.323	3.637
Spain	1.811	3.123	2.633	1.967	1.625	2.002	2.871	3.245	2.041	1.088	0	1.941	3.541
Sweden	2.030	2.837	1.572	2.297	2.398	1.742	2.688	1.925	2.064	2.323	1.941	0	2.981
United Kingdom	4.028	4.590	3.548	3.659	3.247	3.815	4.895	2.601	2.960	3.637	3.541	2.981	0
Average	2.289	3.277	2.576	2.532	2.636	2.344	3.086	3.077	2.480	2.583	2.324	2.233	3.625
2008													
Austria	0	1.257	2.557	2.086	1.796	1.275	3.349	2.948	2.158	1.619	2.187	2.190	2.777
Belgium	1.257	0	2.508	2.113	1.996	1.257	3.295	2.783	2.299	1.983	2.039	2.089	3.078
Denmark	2.557	2.508	0	2.570	2.407	2.312	4.372	1.874	2.005	2.150	2.154	2.178	2.769
Finland	2.086	2.113	2.570	0	1.522	2.122	4.263	2.627	1.653	1.421	1.511	0.991	2.314
France	1.796	1.996	2.407	1.522	0	1.610	4.368	2.374	1.436	1.548	2.018	1.178	1.641
Germany	1.275	1.257	2.312	2.122	1.610	0	3.461	2.762	1.854	1.884	1.802	1.960	2.678
Italy	3.349	3.295	4.372	4.263	4.368	3.461	0	4.688	4.374	3.610	4.174	4.257	4.927
Netherlands	2.948	2.783	1.874	2.627	2.374	2.762	4.688	0	1.922	2.389	2.644	2.230	1.937
Norway	2.158	2.299	2.005	1.653	1.436	1.854	4.374	1.922	0	1.648	1.867	1.629	1.991

(continued)

Table 7.4 (continued)

	Austria	Belgium	Denmark	Finland	France	Germany	Italy	Nether-lands	Norway	Portugal	Spain	Sweden	United Kingdom
							1995						
Portugal	1.619	1.983	2.150	1.421	1.548	1.884	3.610	2.389	1.648	0	1.722	1.483	2.226
Spain	2.187	2.039	2.154	1.511	2.018	1.802	4.174	2.644	1.867	1.722	0	1.755	2.851
Sweden	2.190	2.089	2.178	0.991	1.178	1.960	4.257	2.230	1.629	1.483	1.755	0	1.835
United Kingdom	2.777	3.078	2.769	2.314	1.641	2.678	4.927	1.937	1.991	2.226	2.851	1.835	0
Average	2.183	2.225	2.488	2.099	1.991	2.081	4.095	2.598	2.070	1.974	2.227	1.981	2.585

[a]To compute the distances, the indicators have been made comparable by transforming them into index numbers with respect to the cross-sectional average of each year

decreases are Belgium (-32.1%), the United Kingdom (-28.7%), France (-24.5%) and Portugal (-23.6%). Italy is the only country for which the average distance with respect to the other countries in the panel increased considerably (from 3.1% to 4.1%).

Overall, the basic descriptive evidence shows both a sharp increase in financial deepening across European countries over the last 15 years and a parallel reduction of the distance between national financial structures, when measured with respect to the common trends denoting the selected pool of statistical indicators. To qualify these general tendencies better, a small set of composite financial indicators is derived in the next section, providing the basis for the subsequent analyses.

7.6 Results of the Factorial Matrices Analysis

This section sets forth the results of the factorial matrix analysis of the database described above, separately for each of the three phases of the procedure. As a preliminary step, the individual variables are rendered comparable by transforming them into index numbers with respect to the cross-sectional mean for each year. This eliminates the differences in the level between indicators and, for each indicator, between different periods. At the same time this procedure, unlike full standardization of the variables, preserves the differentials between indicators in terms of relative variability with respect to the mean, assigning a greater weight to those that deviate more from the set of countries analysed.

7.6.1 Dependence Analysis

To study dependence between matrices of indicators in different years we have used the strong dependence index, which takes account of cross-correlations between variables. As these are indicators of level that refer to structural characteristics, one should expect a certain degree of persistence over time, and this is confirmed by the pattern of the indices of matrix correlation, which show that dependence is especially great between contiguous years and that while gradually declining it remains high even at a distance of more than a decade (Table 7.5).

7.6.2 Synthesis

The strong persistence of financial structures over time is highlighted by the spectrum of eigenvalues of the strong correlation matrix, which has one overwhelmingly dominant value (Table 7.6), showing how the pool of indicators is highly correlated across different years.

The elements of the associated eigenvector, which measure the contribution of data matrices referring to single time periods in the panel, show that all the years contribute in an essentially equal fashion to the definition of the first factorial matrix

Table 7.5 Strong correlation indices between couples of dates

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
1995	1	0.96	0.85	0.83	0.83	0.81	0.81	0.75	0.75	0.76	0.70	0.63	0.55	0.52
1996	0.96	1	0.94	0.92	0.92	0.88	0.85	0.83	0.81	0.81	0.76	0.66	0.59	0.55
1997	0.85	0.94	1	0.97	0.96	0.88	0.81	0.81	0.79	0.79	0.76	0.66	0.60	0.57
1998	0.83	0.92	0.97	1	0.98	0.91	0.85	0.85	0.84	0.85	0.83	0.74	0.70	0.72
1999	0.83	0.92	0.96	0.98	1	0.94	0.89	0.91	0.90	0.90	0.88	0.79	0.74	0.73
2000	0.81	0.88	0.88	0.91	0.94	1	0.97	0.95	0.96	0.97	0.94	0.88	0.82	0.80
2001	0.81	0.85	0.81	0.85	0.89	0.97	1	0.97	0.97	0.97	0.93	0.88	0.80	0.80
2002	0.75	0.83	0.81	0.85	0.91	0.95	0.97	1	0.99	0.97	0.95	0.89	0.80	0.78
2003	0.75	0.81	0.79	0.84	0.90	0.96	0.97	0.99	1	0.99	0.97	0.93	0.87	0.83
2004	0.76	0.81	0.79	0.85	0.90	0.97	0.97	0.97	0.99	1	0.99	0.95	0.90	0.87
2005	0.70	0.76	0.76	0.83	0.88	0.94	0.93	0.95	0.97	0.99	1	0.98	0.94	0.89
2006	0.63	0.66	0.66	0.74	0.79	0.88	0.88	0.89	0.93	0.95	0.98	1	0.97	0.90
2007	0.55	0.59	0.60	0.70	0.74	0.82	0.80	0.80	0.87	0.90	0.94	0.97	1	0.91
2008	0.52	0.55	0.57	0.72	0.73	0.80	0.80	0.78	0.83	0.87	0.89	0.90	0.91	1

Table 7.6 First eigenvalues of the strong correlation matrix

Eigenvalues	Absolute values	% explained dependence
1	12.000	85.7
2	1.257	9.0
3	0.290	2.1
4	0.215	1.5
5	0.124	0.9
6	0.046	0.3
7	0.021	0.1
8	0.018	0.1
9	0.012	0.1

Table 7.7 Contributions of the single years to the synthesis matrix

Period	Contribution
1995	0.2389
1996	0.2556
1997	0.2542
1998	0.2673
1999	0.2761
2000	0.2839
2001	0.2793
2002	0.2781
2003	0.2812
2004	0.2839
2005	0.2791
2006	0.2650
2007	0.2497
2008	0.2431

(Table 7.7). This matrix, accounting for about 86% of the dependence between the data matrices of the individual years, forms the synthesis matrix upon which the subsequent stage of the analysis is based.

7.6.3 Singular Values Decomposition

At this stage, the synthesis matrix is initially broken down into its principal components. Examining the spectrum of eigenvalues of the variance-covariance matrix, we can identify at least three components (or factorial axes) that define a set of composite indicators (obtained, that is, as a linear combination of the original indicators) explaining overall about two-thirds of the total variance of the 14 basis indicators (Table 7.8).

Table 7.8 Synthesis matrix: eigenvalues

Eigenvalues	% variance	% accumulated
5.371	38.4	38.4
2.066	14.8	53.1
1.831	13.1	66.2
1.456	10.4	76.6
1.061	7.6	84.2
0.828	5.9	90.1
0.678	4.8	94.9
0.445	3.2	98.1
0.174	1.2	99.3
0.049	0.3	99.7
0.032	0.2	99.9
0.011	0.1	100.0
0.000	0.0	100.0
0.000	0.0	100.0

The three principal components can be interpreted starting with a reading of the contributions made by the original variables to the composite indicators that define the axes or, in an analogous fashion, of the correlations of the variables with the factorial axes. The first component can be deemed to provide a broad indicator of financial deepening. For the given degree of financial deepening, the second component provides an assessment of the relative weight of the banking system, while the third component can be read as a measure of the influence of public finance on national financial structures.

The first factor, which explains 38.4% of the total variance, shows a positive correlation with the volume of financial assets (FINAS), stock exchange capitalization (CAPEX), international openness (INTOPEN), the diffusion of corporate bonds (BONDNFC) and, strongly, the portion of household assets consisting of insurance policies and retirement provisions (HOUSINS; Table 7.9). On the contrary, it is negatively correlated with households' direct holdings of shares and bonds (HOUSSHAR and HOUSBOND), deposits and investment fund units and with the incidence of public sector liabilities in the total. For the banking variables, the correlation is positive for size measures expressed in relation to real sector aggregates (LOMFI, HOUSEDEB) but negative for indicators expressed as a ratio to total financial assets (FIN, HOUSDEP).

All this evidence concurs in qualifying the first composite indicator as a measure of the overall development of the financial system, or financial deepening, driven by the advance of markets and institutional investors (insurance companies and investment funds) and the growth of cross-border transactions. The process is associated with an increase in households' utilization of credit and a decline in the direct holding of securities. As financial deepening increases the banking system expands as well, but more slowly than the financial system as a whole, thus registering a relative contraction.

Table 7.9 Contributions to the factorial axes and correlations between factors and indicators (correlations computed on pooled year–country data)

Indicators	Contributions			Correlations		
	I factor	II factor	III factor	I factor	II factor	III factor
FINAS	0.315	−0.037	0.369	0.62	−0.03	0.19
LOMFI	0.251	0.381	0.335	0.47	0.50	0.20
FIN	−0.182	0.536	0.082	−0.39	0.63	0.16
INTOPEN	0.287	−0.183	0.217	0.57	−0.27	0.06
CAPEX	0.311	−0.331	−0.135	0.70	−0.48	−0.36
TURNOVER	0.046	−0.086	−0.149	0.09	−0.07	−0.20
BONDNFC	0.208	0.066	−0.413	0.53	0.16	−0.67
HOUSDEP	−0.250	0.297	−0.328	−0.48	0.43	−0.24
HOUSSHAR	−0.138	−0.477	0.052	−0.27	−0.74	0.15
HOUSBOND	−0.234	−0.076	0.539	−0.65	−0.23	0.90
HOUSINS	0.394	0.105	0.023	0.89	0.21	−0.27
HOUSFUND	−0.280	0.058	0.214	−0.58	−0.04	0.34
HOUSDEB	0.294	0.202	0.139	0.65	0.38	−0.05
DEBGOV	−0.352	−0.186	0.147	−0.83	−0.34	0.52

The second factor, which explains about 15% of the overall variance, shows a positive correlation with the absolute size of the banking system (LOMFI, HOUSDEB) and above all with the variables measuring the relative volume of banking intermediation (FIN and HOUSDEP). It is also negatively related to the equity share of households' portfolios (HOUSSHAR). Overall, it can be interpreted as a measure of the development of the banking system for a given overall degree of diffusion of financial activity.

The third composite indicator, which captures 13% of the overall variability, is correlated directly with the incidence of public liabilities (DEBGG) and with households' holdings of bonds, especially their direct holdings (HOUSBOND) but also their holdings through investment funds (HOUSFUND). This can therefore be read as an indicator of the influence exerted on financial structures by public finances. In this respect, the negative correlation between this latent variable and the portion of private debt financed directly in the market (BONDNFC) can be interpreted as the crowding-out of private by government securities. At the same time, an increase in the weight of public sector liabilities is associated with greater international openness of the financial markets, presumably reflecting the placement of part of the debt abroad.

The positions of individual countries with respect to the three factorial axes can be represented graphically, showing groups of countries whose financial structures display the greatest affinities. In 1995, as Fig. 7.2 shows, the highest values along the first factorial axis (financial deepening) are those for the UK and the Netherlands. The highest along the second axis (banking) are attained by Germany, Austria and France, while the Netherlands and the UK display relatively low values. Italy, Belgium and Portugal are located in the third quadrant, featuring negative scores with respect to both axes.
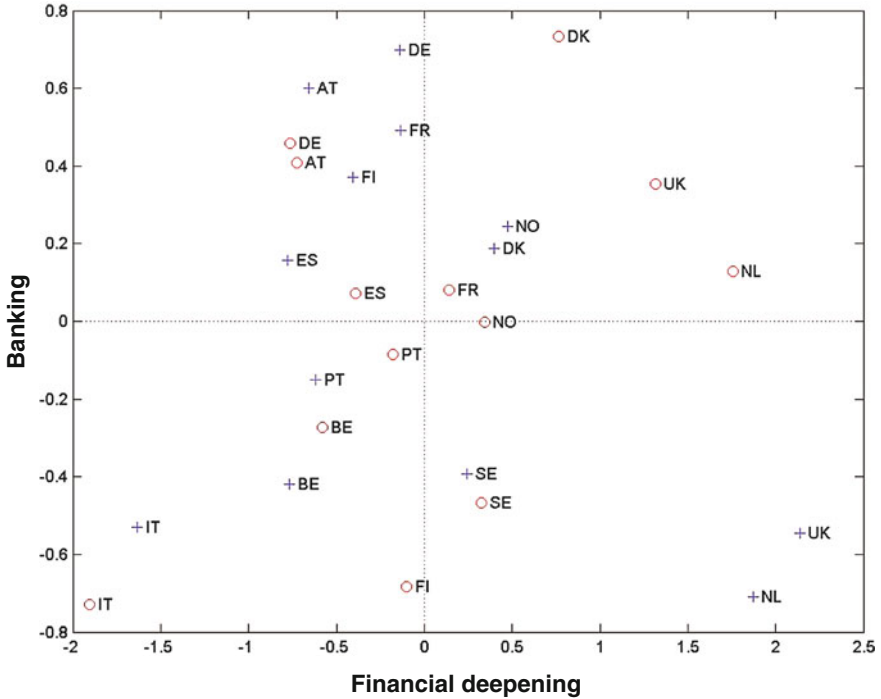
Fig. 7.2 Position of the 13 countries on the first and second factorial axes (+ = 1995; o = 2008)

By 2008 the picture has changed significantly. The UK and the Netherlands have recouped a good deal of ground along the banking axis, attaining values above the mean, while Germany, Austria and particularly France have come back towards the centre of the group. At the same time, the UK's relative level of financial deepening declines slightly while, moving from an opposite situation, the value of the indicator increases for Germany and Spain. In the group of three countries displaying low values according to both the financial deepening and the banking indicator, Portugal and Belgium show a tendency to move towards the mean, while Italy moves in the opposite direction.

Overall, apart from Italy and, along the banking axis, Finland, the overall picture provides evidence of a general pattern of reduction of cross-country disparities according to both our first and our second composite financial structure indicator.

Figure 7.3 shows the position of the various countries in 1995 and 2008 with respect to the first and third factorial axes (public finances). The graph for the initial year highlights clearly the position of the countries with high public debt (Belgium and Italy), while Norway and the UK show especially low values. The rest of the group shows little dispersion. The situation in 2008 marks no radical change but some reduction of dispersion, with a tendency to converge on the central values both from above (Belgium) and from below (Portugal, Spain and Norway).
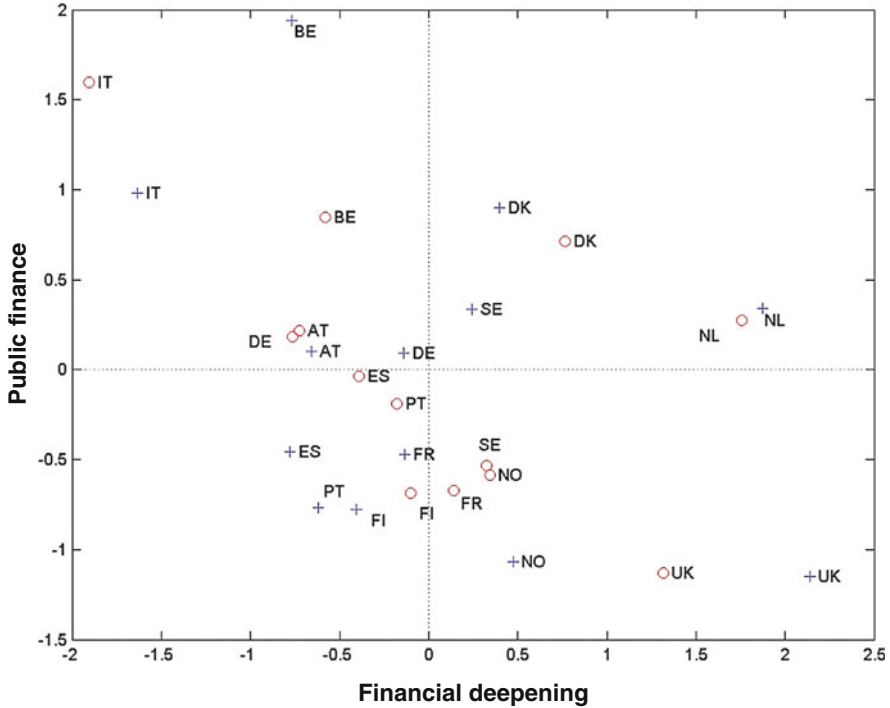
Fig. 7.3 Position of the 13 countries on the first and third factorial axes (+ = 1995; o = 2008)

7.7   Statistical Analysis of Convergence

We can now use the three composite indicators identified using the FAMA meth-
odology to assess whether the path of evolution of national financial structures
within Europe has been convergent or not. Given the great attention that the
literature has paid to determining the degree of homogeneity of national systems,
i.e. to defining convergence "across", we first analyse σ-convergence. Subse-
quently, we consider the dynamic properties of the process, with an examination
of the hypothesis of path dependence using techniques based on β-convergence.

7.7.1   σ-convergence

Simply comparing dispersion among countries with respect to the three latent
factors we have identified reveals the possible presence of σ-convergence during
the period considered here and enables us to describe its dynamics with respect to
selected aspects of the financial structure.

As for the first factor, i.e. our financial deepening proxy, apart from a slight rise at the start of the period considered in the analysis, the standard deviation[7] shows a prolonged tendency to diminish over the years, though not very sharply (see the first panel in Fig. 7.4). That is, since the second half of the 1990s there has been a progressive decrease in the degree of heterogeneity among the countries considered with respect to overall financial deepness and relative dispersion around the mean, attaining in 2008 a level that is about 10% lower than in 1995.

The outbreak of the recent financial crisis does not appear to have hindered σ-convergence in financial deepening; on the contrary, in 2008 a rather sharp drop in cross-country heterogeneity can be observed, probably because the effects of the financial crisis were more acute in countries with deeper financial systems.

With respect to the banking composite indicator, the time trend in cross-country dispersion does not appear to be monotonic. After increasing significantly in the second half of the 1990s, the standard deviation shows a steady decline in the years from 2001 to 2006, reaching a level about 10% lower than in 1995. Differently from the case of the financial deepening indicator, the convergence process appears to come to a stop in 2007, when the crisis began to manifest itself, subsequently showing a slight increase in cross-country dispersion in 2008. Overall, the observed tendency does not appear to contradict the existence of long-run σ-convergence of European financial structures as regards the relative weight of the banking system in the allocation of resources.

Some insights into the possible causes underlying the pick-up of convergence in banking observed in the first half of the current decade and the subsequent arrest can be drawn from the inspection of cross-country interest-rate differentials on loans extended to the private sector.

In 2003 (the first year for which comparable data are available) the interest rate on new loans to the private sector was significantly lower in European countries, denoted by relatively inferior levels of our banking indicator compared with the rates prevailing in Germany, the economy where the banking system development indicator attains the highest values (see Fig. 7.5).

Such a favourable interest-rate differential, by spurring demand for bank credit in relatively less banking-oriented countries, may have favoured convergence. At the same time, the subsequent reduction of the interest-rate differentials, which had largely disappeared by the end of 2007, provides a motivation for the stand-by in the convergence process observed in more recent years.

Institutional factors may help explain the observed pattern of interest-rate differentials. In particular, European countries retain substantial dissimilarities with respect to the relative diffusion of long-term loan contracts featuring

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[7] Since all the basic indicators were normalized in FAMA by taking relative deviations from the cross-country mean in each year, the standard deviations of the composite indicators defined by the three latent factors can be interpreted as providing relative measures of dispersion around a common timer trend.
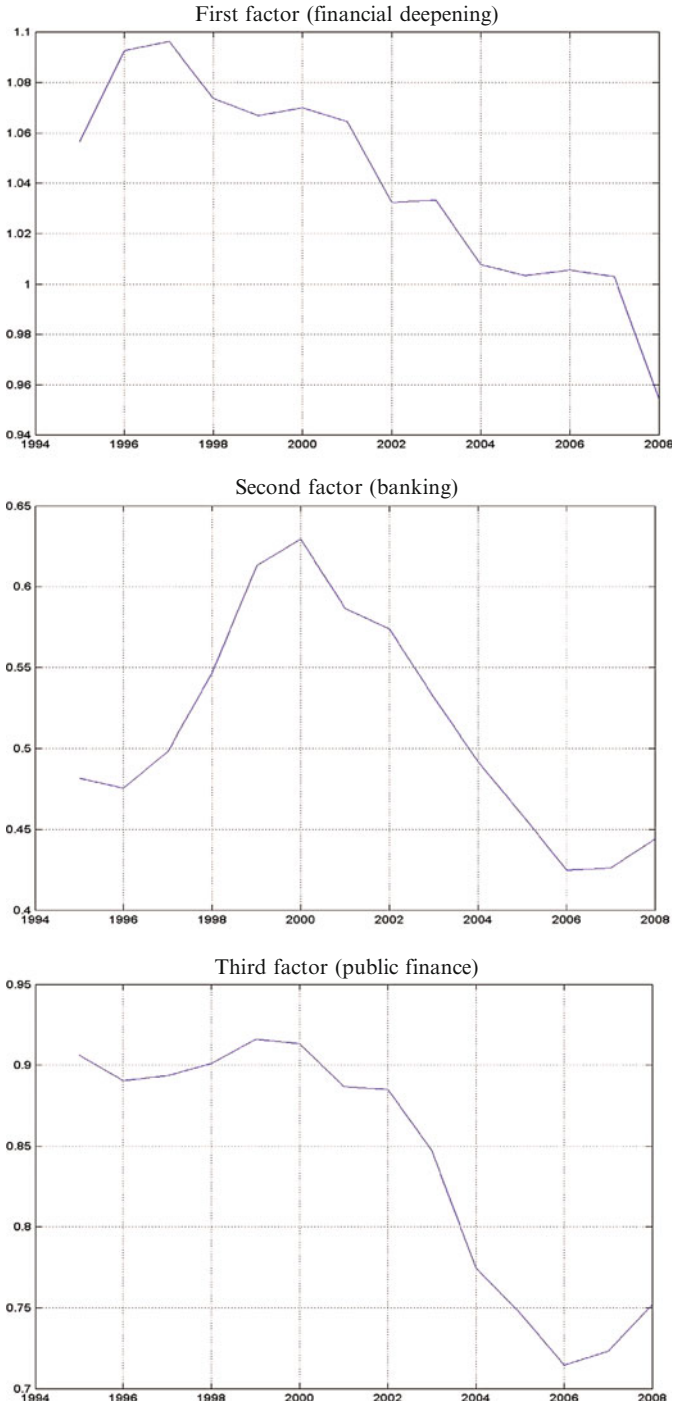
Fig. 7.4 σ-convergence analysis: time series of the standard deviation of the three factors
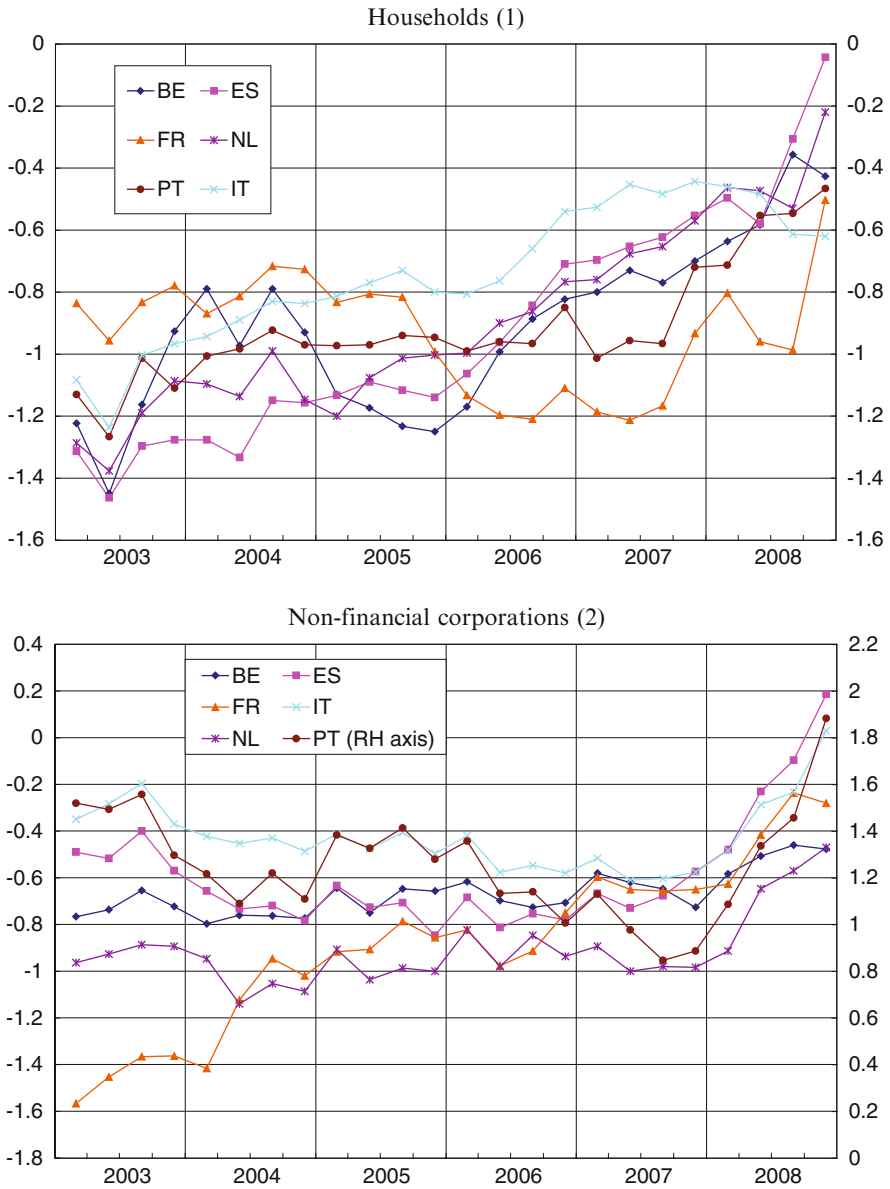
Fig. 7.5 Loans to the private sector: interest-rate differentials with respect to Germany (Source: European Central Bank. (1) Data refer to home mortgage loans: new business. (2) Data refer to other loans (non-bank overdrafts) up to EUR 1 million at a floating rate and up to 1 year initial rate fixation)

adjustable versus fixed interest rates. Calza et al. (2009), focusing on the home mortgage market, documented how fixed-rate loans (FRM) are predominant in Germany, while adjustable-rate contracts (ARM) are more typical of countries like the UK, Spain and Italy. The observed interest-rate differentials with respect to Germany may thus mainly reflect the dynamics of the (inverted) term premium in the yield curve,[8] which displays a similar profile over the same time period.[9]

The strongest empirical evidence in favour of σ-convergence is conveyed by the time series of the standard deviation of the third latent factor (public finance), which, starting from the beginning of the current decade, displays a significant decrease, equal to some 20% of the level recorded in the second half of the 1990s (Fig. 7.4, panel 3). A reduction in the cross-country differences with respect to this factor was expected in the light of the debt- and deficit-control policies required for euro-area membership and thus is confirmed by the empirical evidence provided here.

In line with what has already been found for the banking indicator, the convergence process appears to have been adversely affected by the ongoing crisis, the downward trend in cross-country dispersion showing a reversal starting from 2007 that can be related to asymmetries across European countries in the intensity of public intervention required for bailing out the financial sector. These actions were much stronger in countries like Ireland, the UK and Germany than in Italy or Spain.

7.7.2   β-convergence

To gather some first insights into β-convergence, in Fig. 7.6 the change over the entire sample period of the three composite indicators is plotted against the level of the initial year. As usual, a negative relationship provides evidence in favour of convergence. Countries attaining higher initial levels grow less than the average while the opposite occurs for countries moving from initially lower levels.

To qualify the underlying trends better, the OLS regression line is also plotted along the scatter plots of the variables. For all the three factors there is clear evidence in favour of β-convergence. Countries starting from higher/lower levels of the variable show a tendency to revert towards the mean of the process.

To provide a statistical test of β-convergence, a panel econometric analysis was subsequently undertaken. Even without a theoretical model able to produce predictions on the causes of the long-term equilibrium level of the variables, a

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[8] Recent empirical evidence of a significant influence of term premiums on households choices between ARM and FRM loans is given by Paiella and Pozzolo (2007).

[9] Data on short- and long-term yields on the euro-area securities and money market are provided in the ECB Monthly Bulletin.
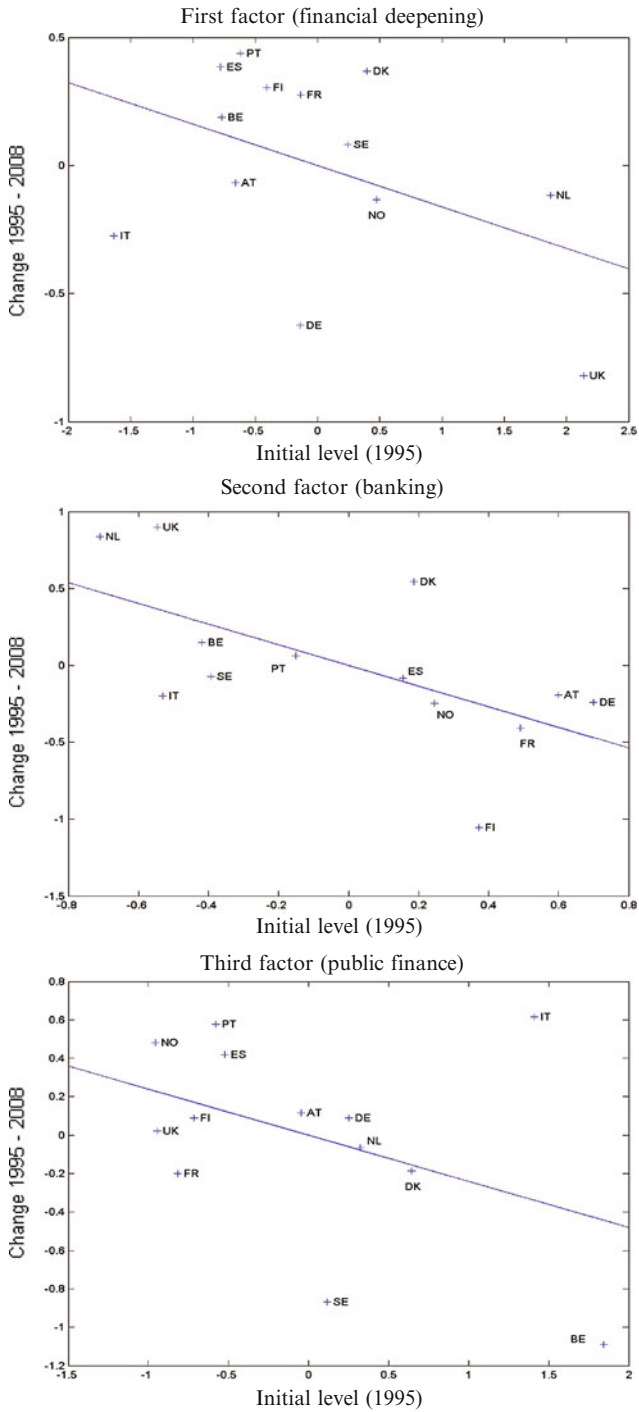
Fig. 7.6 β -convergence analysis: graphical evidence for the three factors

statistical evaluation of the tendency of the series to converge can enhance our understanding of the dynamics of the process under study.

Denoting the dependent variable as y, the model estimated is the following:

$$y_{it} = (1 + \beta)y_{it-1} + \delta_i + u_{it}$$

where u_{it} is a white-noise disturbance term, assumed to be uncorrelated either over time or over cross-section, and δ_i are individual country effects.

Assuming different effects for each country is equivalent to performing an analysis of conditional convergence.[10] Subsequently testing the hypothesis that individual effects are nil can therefore be considered to provide a test of the presence of absolute convergence.

The model was estimated by applying what is currently considered the most appropriate estimator for dynamic panels that display a high degree of persistence, as in our case: namely, the GMM system estimator as implemented in the Stata package from David Roodman's XTABOND2 routine.[11] Taking into account the fact that the variables considered in the model are proxies of the underlying unobservable latent factors, and are likely to be affected by measurement errors, to obtain consistent estimates the procedure was carried out setting the minimum lag order of the GMM instruments equal to 2, as suggested by Bond et al. (2001). Inferences on β estimates were based on robust estimates of standard errors.

The estimates were based on untransformed variables, which by construction can be treated as percentage differences from the mean, and on the basis of annual data.[12] The regression coefficient thus measures the variation, in percentage points, in response to a shock equal to 1 percentage point in the initial period. Negative values of β indicate convergence "within", i.e. independence from the initial conditions. In this case the absolute value of the coefficient measures the fraction of the adjustment effected in a year. Nil or positive values of β indicate absence of convergence, i.e. persistence of the effect of transitory shocks on the long-run level of the variable.

Estimation results are given in Table 7.10, separately for our three composite financial structure indicators. In all cases the graphical evidence of β-convergence is confirmed, as the estimated β coefficient is negative and statistically significant.

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[10] As the initial variables were already expressed as ratios to the mean for each year, time effects were not included in the model.

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[12] The empirical studies that applied panel methodology to the convergence of per capita income commonly used multi-year average growth rates, in order to reduce the influence of cyclical fluctuations. In our case, this procedure would have resulted in an excessive reduction in the number of observations. Moreover, as the raw indicators were centred on cross-section averages prior to performing the FAMA analysis, the composite indicators were shorn of the effect of any cyclical fluctuations common to the countries examined, such as those deriving from simultaneous changes in financial asset prices.

Table 7.10 β-convergence: panel regression results[a] (p-values in brackets)

Coefficients and statistics	Dependent variable					
	First factor (*financial deepening*)		Second factor (*banking*)		Third factor (*public finances*)	
Full sample period (1995–2008)						
Beta	−0.033	(0.003)	−0.040	(0.000)	−0.034	(0.025)
Obs.	169		169		169	
F-test of no country effects	8.76	(0.003)	13.72	(0.000)	5.00	(0.025)
Hansen test of overid. restrictions	12.61	(1.000)	11.43	(1.000)	12.68	(1.000)
Test AR[a] residuals	−2.30	(0.021)	−2.33	(0.020)	−2.87	(0.004)
Test AR(2) residuals	−1.02	(0.309)	−1.56	(0.119)	−0.02	(0.981)
Pre-crisis sample period (1995–2006)						
Beta	−0.028	(0.012)	−0.022	(0.121)	−0.038	(0.021)
Obs.	143		143		143	
F-test of no country-effects	6.32	(0.012)	2.41	(0.121)	5.31	(0.021)
Hansen test of overid. restrictions	10.48	(1.000)	12.04	(1.000)	12.99	(1.000)
Test AR[a] residuals	−2.34	(0.019)	−2.19	(0.029)	−2.85	(0.004)
Test AR(2) residuals	−1.07	(0.285)	−1.61	(0.108)	−0.27	(0.789)

[a]Regressions are run without the constant as all the variables have zero mean by construction. To avoid biases due to possible measurement errors, lagged values of minimum order = 2 were included in the GMM instruments matrix. *p*-values are based on robust standard errors estimates

About 3% of the past shock is absorbed each year (4% in the case of the *banking* indicator). This amount can induce substantial adjustments when confirmed for a period of one or more decades.

For all three indicators, the F-test of no country effects rejects the null, thus ruling out the hypothesis of absolute convergence. Standard diagnostic tests (Hansen's overidentification test on the goodness of the instruments and the Arellano–Bond test for serial autocorrelation) do not reveal problems in the dynamic specification of the model.

Considering the evidence of significant asymmetric impacts of the recent crisis on national financial structures conveyed by the previous σ-convergence analysis, we decided to re-estimate the model dropping the last 2 years from the sample, in order to check whether the above regression results were driven in any significant way by the recent crisis-induced evolutions. The estimation results, displayed in the lower part of Table 7.10, broadly confirm the findings obtained considering the whole period. The estimated rate of convergence is slightly smaller for the first two factors and greater for the third one. This result is in line with the idea that public finance surveillance in Europe was more effective and easier before the outbreak of

the financial crisis and the recession than later on.[13] Overall the general evidence in favour of the presence of conditional β-convergence appears to be robust with respect to the initial impact of the recent crisis on our three composite financial structure indicators.

7.8   Summary and Conclusions

Our aim has been to provide a quantitative assessment of whether or not the financial structures of European countries have converged in the wake of the institution of the Economic and Monetary Union and of the euro area. The statistical approach to measuring differences between national financial systems was bottom-up. Starting with a selection of indicators drawn from the empirical literature, the multidimensional factorial matrices analysis technique (FAMA) derived composite indicators that, by synthesizing the similarities and divergences between national systems, have allowed for a more straightforward assessment of the evolution of financial structures over time.

By implementing the FAMA technique, three latent variables were identified, jointly explaining about two-thirds of the dispersion of the individual countries' financial structures according to the selected pool of indicators. Based on the correlations of those variables with the initial indicators, the first factorial axis can be interpreted as an indicator of financial deepening, sustained mainly by the total size of financial assets and by the growth of securities markets and non-bank intermediaries. The second composite indicator can be seen as an index, holding the absolute size of the financial system constant, of the relative weight of the banking system. The third synthetic indicator can be read as a gauge of the influence of the public finances – general government liabilities – on the financial structure.

Analysing the trajectories of the composite indicators over time has allowed us to evaluate the presence or absence of convergence. The techniques used drew on the methodological apparatus developed in the study of economic growth and convergence. The path dependence of the process was studied using panel techniques for the analysis of β-convergence. The tendency towards the reduction of the dispersion of the variables between countries was also examined (σ-convergence).

The results confirm the hypothesis of both types of convergence of financial structures for a panel of European countries. For all our three composite indicators cross-country dispersion declined in the period following the launch of the euro, with a considerable drop particularly in the case of the public finance indicator. The speed of adjustment to the steady-state level was estimated to take rather similar values for all the indicators, providing evidence of strong persistence in the short term but ruling out the hypothesis of path dependence. At the present stage, the hypothesis of a common cross-country steady-state level was rejected for all our

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[13] During 2010 the European Union discussed new rules to strengthen surveillance of budgetary policies and more effective prevention of excessive deficits and debts.

composite indicators, in favour of the less stringent hypothesis of conditional convergence.

Notwithstanding the relative shortness of the time period considered, the hypothesis of a progressive convergence of the structure of the financial systems of the EU countries does not appear to be contradicted by the empirical evidence.

Having based the analysis on data up to the year 2008, our methodology has allowed us to draw some initial evidence on the impact of the recent crisis on financial convergence in Europe. The empirical findings on this respect are not uniform. During the crisis, cross-country dispersion declined as regards the level of financial deepening, while it increased slightly for the banking and public finance indicators, reversing the trend observed in the first half of the decade. Convergence in financial deepening was most likely induced by a harsher impact of the crisis on more financialized economies, like the UK and the Netherlands, compared with less developed financial systems. While asymmetries of public intervention in the bailing out of the financial sector may account for the increased dispersion of the public finance indicator, the break in convergence observed for the banking indicator appears to be unrelated to the crisis, reflecting mainly the dynamics of cross-country interest-rate differentials and the different national evolution of bank aggregates.

No major impact of the crisis was found with respect to the mean reversion properties of the three synthetic indicators. The long-run effects of the global financial crisis, of course, still remain to be assessed, as the consequences may be far-reaching, especially in the wake of possible important changes in the regulation of financial markets and intermediaries.

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The Effects of Monetary Policy in the Euro Area: First Results from the Flow of Funds

8

Riccardo Bonci

Abstract

This paper provides new evidence on the transmission of monetary policy in the euro area, assessing the effects of a monetary tightening on the lending and borrowing activities of households, firms and other economic sectors. I exploit, for the first time, the information content of the flow-of-funds statistics, representing the most complete framework for analysing the flows of funds moving from one sector (the lender) to the other (the borrower). I estimate a parsimonious recursive VAR in order to identify monetary policy shocks in the euro area. Its predictions as to the responses of the main economic aggregates are in line both with existing literature and with theoretical priors on the effects a monetary policy shock should produce, without suffering from the empirical puzzles that can be found in some previous works. The benchmark model is then extended to include the flow-of-funds variables. I find evidence of a certain degree of inertia in firms' behaviour. In fact, following a policy tightening firms increase net funds raised at impact. Households adjust their financial investment and borrowing attitude quite rapidly after the shock, reducing the overall accumulation of financial assets and switching from deposits and mutual fund shares to short-term securities. Special attention is devoted to the impact of a policy tightening on loans to the private sector. As in previous studies on the euro-area economy, we find that an interest-rate hike is followed by an increase in loans granted to households and firms in the

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short run. This result, which anyway is not as counter-intuitive as it may look, vanishes when only bank loans are taken into account in the analysis.

8.1   Introduction

The vast literature which has attempted, since Sims (1980), to assess the effect of monetary policy shocks on the economy employing vector auto-regression (VAR) models, has dealt only marginally with the borrowing and lending activities of the different economic sectors. Nevertheless, as Christiano et al. (1999) underlined ". . . a contractionary monetary policy shock has differential effects on the borrowing and lending activities of different agents in the economy. . . . these findings have been used to help assess the empirical plausibility of competing theories of the monetary transmission mechanism." This means that in order to understand the functioning of an economic system we need to be able to answer the following questions: how does monetary policy affect households' decisions about portfolio allocation and debt issuance? How quickly? What about firms? Do they cut back on new debt issuance when they experience an unexpected interest-rate hike? Does any sign of rigidity or market imperfection appear? What happens to the public deficit? To mention only a few.

While a fair amount of research is available on the impact of an interest-rate change on loans or deposits (notably, Bernanke and Blinder 1992; Bernanke and Gertler 1995; Christiano et al. 1996; den Haan et al. 2007, for the US economy; Giannone et al. 2009, for the euro area), so far those financial transactions which do not directly involve a bank have been much less investigated in the literature on the monetary policy transmission. The flow of funds would seem to be the most appropriate dataset for this kind of analysis, in that it offers a comprehensive framework for the borrowing and lending activities involving any financial instrument between all the sectors of the economy.

Indeed, Christiano et al. (1996) were the first, to my knowledge, to employ the information content of the US flow of funds to assess the impact of monetary policy by means of an estimated VAR model. One of the main findings was that firms borrowed more funds (in net terms) after a policy tightening; firm net borrowing declined only in 1 year, when the slowdown in output induced by the policy shock gained momentum. Christiano et al. (1996) argued that this pattern was not captured by existing monetary business cycle models and suggested as a possible explanation firms' difficulties in adjusting their nominal expenditures once the fall in cash-flow materialized. They also found that net funds raised by households remained unchanged for several quarters after the shock, consistent with limited participation models of the type discussed in Christiano et al. (1997). Finally, they observed a (puzzling) lower public deficit in the short run, which they explained with a temporary increase in personal tax receipts.

Bonci and Columba 2008 replicated the analysis of Christiano et al. (1996) for Italy. Differently from the latter authors, though, they found that following a

restrictive monetary policy shock non-financial corporations[1] reduced both their acquisition of new financial assets and their issuance of liabilities, so that there was no strong evidence in favour of frictions that would impinge on firms' ability to alter the level of nominal expenditures, as was the case in Christiano et al. (1996). Households were found to adjust their portfolios relatively quickly, switching from deposits and shares to securities. Finally, consistent with the slowdown in economic activity induced by the interest-rate hike, with automatic stabilizers at work on one hand and lower tax receipts on the other, the public sector's deficit increased after the shock.

Except for the cases mentioned above, the literature did not pursue this line of research further and, to our knowledge, no evidence is available for the flow of funds of other countries, nor for the euro area as a whole. Why is this? Once it had been agreed that these aspects were worth investigating both for the transmission of monetary policy and for macro-prudential purposes, the main reason for the gap in the literature is probably the lack of sufficiently long and disaggregated time series that would allow the "flow of funds-in-a-VAR" analysis to be replicated (the UK is a significant exception).[2]

This paper extends the Christiano et al. (1996) and Bonci and Columba (2008) type of analysis to the euro-area economy. Flow of funds is used to gain new insights into the impact of monetary tightening on the financing (borrowing) and financial investment (lending) decisions of households, firms, the government sector and the foreign sector. A new set of "stylized facts" on the policy transmission in the euro area develop.

We proceed in two steps. First we estimate a (benchmark) VAR model for the euro-area economy which allows us to identify movements in the short-term interest rate (our chosen policy instrument) that can be labelled as monetary policy shocks. Our results for the main macroeconomic aggregates are consistent with the VAR literature on monetary policy shocks (both in the US and in the euro area); they are also not affected by the empirical puzzles which can be found in part of the existing literature on the same issue.[3] Second, the benchmark model is extended to include

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[1] Throughout the paper we refer to firms and non-financial corporations indifferently.

[2] The Federal Reserve began to publish flow-of-funds statistics on a continuous basis as early as the 1950s (see Chap. 2 by De Bonis and Gigliobianco), while their European counterpart, the financial accounts of the euro area, are available only back to 1999. An additional explanation for this gap in the literature might be that flow-of-funds accounts, although an integral part of the National Accounts, have historically received less attention than other economic aggregates. In general, both academics and professionals are far more familiar with the "real economy" variables (GDP, consumption, investment, etc.), while some people may never encounter flow of funds at all during their economic studies. As a result, flow of funds is sometimes seen as a "difficult animal", left to statisticians and national accountants, who are generally more interested (as indeed they should be) in methodological issues relating to the proper definition and measurement of these variables rather than in their possible use in complex econometric models.

[3] The most common are the "price puzzle" and the "liquidity puzzle", which will be described later in the text.

the flow-of-funds variables (one at a time, according to the "marginal strategy") in order to evaluate their response to an unexpected short-term interest-rate hike.

The financial aggregates we take into account also include those which were considered by Christiano et al. (1996) and Bonci and Columba (2008), so that it is possible to compare our results for the euro area with those for the US and Italy. For each sector we consider net funds raised as a whole, defined as new debt issued net of new financial assets acquired, plus some assets and liabilities depending on the specific sector analysed. Moreover, moving from a cross-sector to a cross-instrument perspective, we also analyse the impact of monetary policy on credit to the non-financial private sector (households and firms), in the light of the prominent role this variable has in the context of ECB monetary analysis within the well-known two-pillar strategy.

All in all, flow-of-funds data deliver new insights into the empirical evaluation of the effects of monetary policy in the euro area. Our main results point to a certain degree of friction which makes it difficult for firms to adjust their nominal expenditure quickly after a monetary tightening. These rigidities are similar in magnitude to those found for the US economy, but larger than in Italy. This might be ascribed to the fact that firms try to smooth the impact of reduced sales by relying on external funds (e.g. loans), which do in fact increase in the short-run, as we will see later in the paper. The impact response of households is to invest less in deposits and mutual fund shares and more in securities, especially short-term. This result is closely in line with that of Bonci and Columba (2008) for the Italian economy, while households were found to respond very little in the US. Total loans to the private sector increase in the immediate aftermath of the interest-rate hike before declining below the baseline. The initial credit expansion is not necessarily a counter-intuitive or puzzling result, as we explain later in the paper. Bank loans, on the other hand, fall more in line with expectations.

The remainder of the paper is organized as follows. In Sect. 2 we describe the VAR model and examine its results in terms of the responses of the variables to an unanticipated monetary contraction. We also provide appropriate robustness analysis to check for the identification achieved. Section 3 analyses the impact of monetary shocks identified in the previous section on the flow-of-funds variables; results are contrasted with existing evidence for the US and for Italy. Conclusions are drawn in the final section.

8.2   The Benchmark VAR Model

The first step of our process is to identify monetary policy shocks in the euro-area economy. This is not straightforward because, as has been broadly suggested in the literature,[4] the economic patterns we observe are the result of the combination of two forces at work: the policy maker's decisions as regards the interest-rate level

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[4] See, for example, Christiano et al. (1996, 1999).

(policy actions), and the development of some other variables (the state of the economy) to which the central bank, in turn, responds according to its strategy and its objectives. These two driving forces need to be disentangled in order to separate the effects of the policy interventions. In other words, we need to identify the exogenous "non-feedback rule" component of monetary policy.

Some identifying assumptions are needed for this purpose, at least regarding three different issues: (1) the type of policy operating instrument, (2) the variables included in the information set available to the policy maker at the time the instrument is tuned, and (3) the nature of the interaction between these variables and the policy shock.

8.2.1   Identification

We employ a recursive identification scheme. From an economic point of view this means that variables in the policy maker's information set do not respond to monetary policy shocks at the same time, but only with a lag. This choice is in line with Christiano et al. (1996, 1999), Bonci and Columba (2008), Giannone et al. (2009), and a number of other studies in the VAR literature.

Despite the many possible ways of identifying monetary policy shocks, there is broad consensus that a contractionary monetary policy shock should result in higher short-term interest rates, lower aggregate output and employment, falling monetary aggregates, and a delayed but persistent response (fall) of the price level. In this sense, the shape of impulse response functions might be used to discriminate between competing VAR specifications. We do the same.

From a practical point of view, our identification strategy also has the advantage that policy shocks can be estimated simply using the fitted residuals in the policy instrument equation (specified as a function of all other variables). This is because monetary policy shocks are assumed to be orthogonal to the information set of the monetary authority.

We assume the economy to be described by a structural form equation such as the following:

$$A(L)y_t = u_t \tag{8.1}$$

where $A(L)$ is a matrix polynomial in the lag operator L, y_t is an n-dimensional vector of the variables of interest, and u_t is an n-dimensional vector of structural disturbances. Let $\Omega = \mathrm{var}(u_t) = E[u_t u'_t]$ be the $n \times n$ variance-covariance matrix of the *structural disturbances*; since u_t are assumed to be mutually uncorrelated, the matrix Ω is diagonal and the n diagonal elements are the variances of the structural disturbances.

Writing (8.1) in reduced form gives the following representation:

$$y_t = B(L)y_t + e_t \tag{8.2}$$

which can be estimated using OLS equation by equation. $B(L)$ is a matrix polynomial in the lag operator L and the e_t terms in (8.2) are the VAR (reduced-form) *residuals* resulting from the estimation of the n regressions. We call $\Sigma = \mathrm{var}(e_t) = E[e_t e'_t]$ the variance-covariance matrix of the residuals. It is straightforward to notice that the structural disturbances u_t and the reduced-form residuals e_t are linked by:

$$e_t = A_0^{-1} u_t \tag{8.3}$$

where the coefficients in the A_0 matrix are those of the contemporaneous relations among the variables in the y_t vector. From (8.3) and recalling that $\mathrm{var}(e_t) = \Sigma$ and $\mathrm{var}(u_t) = \Omega$, we can easily derive $\mathrm{var}(e_t) = E(e_t e')_t = E\left(A_0^{-1} u_t u' A_0^{-1'}\right) = A_0^{-1} E \times \left(u_t u'_t\right) A_0^{-1'}$, and thus:

$$\sum = A_0^{-1} \Omega A_0^{-1'} \tag{8.4}$$

The issue is now to recover the parameters in the structural-form equations (8.1) from the coefficients estimated in the reduced-form equations (8.2). Sample estimates of Σ can be used in order to obtain maximum likelihood estimates of Ω and A_0. Given that Σ is an $n \times n$ symmetrical matrix, it contains $n \times (n + 1)/2$ parameters, which can be estimated via OLS. On the right-hand side of (8.4), instead, there are n^2 parameters to be estimated in A_0 and n in Ω, that is, a total of $n \times (n + 1)$ free parameters. This means that we need at least $[n \times (n + 1) - n \times (n + 1)/2] = n \times (n + 1)/2$ additional restrictions on the right-hand side of (8.4) in order to achieve identification (n of those restrictions can simply be derived normalizing to 1 the diagonal elements of A_0), so that $n \times (n-1)/2$ further restrictions are left.

In line with the recursiveness assumption, we make use of a Choleski factorization in order to orthogonalize the residual covariance matrix Σ. In practice, this corresponds to imposing just $n \times (n-1)/2$ restrictions on the matrix A_0, which is supposed to be lower triangular (all the upper diagonal elements are set to be 0); as a result, the VAR is just identified.

8.2.2 Model Specification

Turning to the specific case under study, our model includes four endogenous variables: real GDP, a price index (HICP), a nominal short-term interest rate (3-month Euribor), and a monetary aggregate (M1)[5]

$$Y_t = \left(y_t,\ p_t,\ int_t,\ m_t\right)' \tag{8.5}$$

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[5] The HICP is seasonally adjusted and not working-day adjusted; money is the real M1 "adjusted stock", with quarterly data being equal to averages of monthly data and deflated with the GDP deflator.
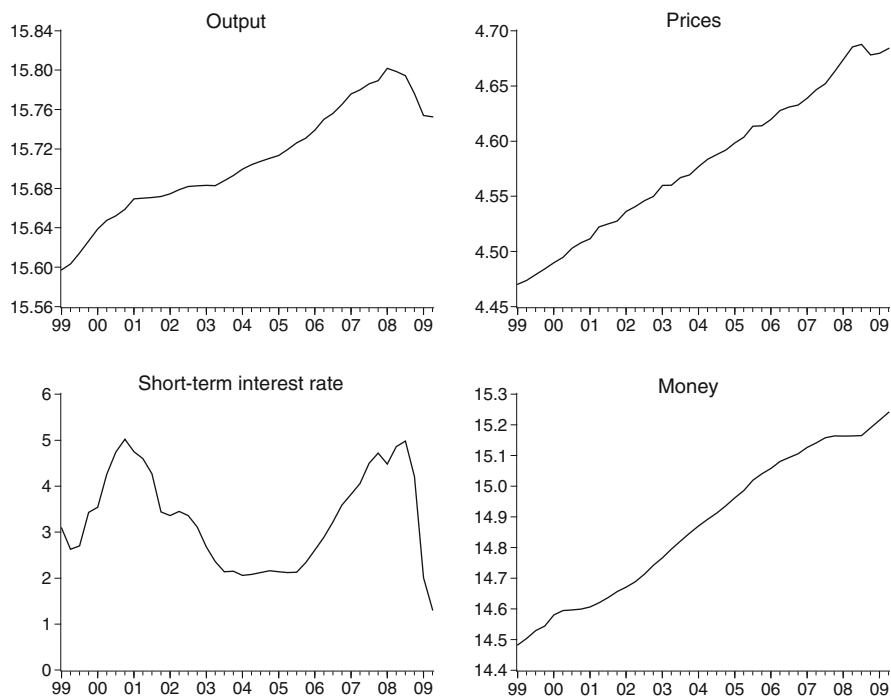
Fig. 8.1 Benchmark VAR endogenous variables

where all variables are in log-levels and seasonally adjusted, except for the interest rate, which is in levels. Our sample period is 1999q1 to 2009q2, forced by the flow-of-funds series quarterly availability for the euro area. The VAR endogenous variables are plotted in Fig. 8.1 in the Appendix; the impact of the recent financial turmoil is clearly visible in the patterns of the variables, especially the drop in output and interest rates.

We choose a short-term interest rate measure, namely the 3-month Euribor, as the policy instrument. The policy maker information set at time t includes output and the price level at the same time, plus lagged values of all variables. Monetary policy shocks are identified via the above-mentioned Choleski decomposition, with variables ordered as in (8.5), from the most exogenous, y, to the most endogenous, m. Since identification is achieved choosing a lower triangular form for the matrix A_0, we are assuming that output and the price level are determined first; then the ECB sets its policy instrument (i.e. the short-term interest rate); and, finally, the monetary aggregate M1 is determined. In turn, this is equivalent to saying that monetary policy shocks can have contemporaneous effects on money, but they can only have a lagged impact on output and prices.

Our choice of the policy instrument and of the set of non-policy variables (real GDP and the price index) parallels the one implemented by Peersman and Smets

(2003), who estimate a VAR to study the monetary transmission mechanism in the euro area.[6]

Christiano et al. (1996), on the other hand, assume that the Fed looks at current prices (including those of commodities) and output when setting the time t value of its policy instrument, implying that monetary policy has only lagged effects on these variables. The Bonci and Columba (2008) information set includes the same variables as in CE (1996), plus the exchange rate.

Moreover, differently from our specification, Peersman and Smets (2003) place the exchange rate (instead of money) as the only policy variable, i.e. the one ordered after the short-term interest rate; moreover, they also include an exogenous block in their (most basic) model (a world commodity price index, US real GDP and the US short-term interest rate) to solve the price puzzle. Their main results can be summarized as follows: after a contractionary monetary policy shock monetary, i.e. a tightening of 30 basis points of the short-term interest rate, output falls, mainly reflecting the drop in investment. The pattern of employment is very similar to that of output, but of a smaller magnitude, resulting in the pro-cyclicality of labour productivity. This latter result, together with the (puzzling) positive response of nominal wages in the short-run (also common to our study), implies that unit labour costs rise quite significantly in the first year after the shock. Peersman and Smets (2003) also find a negative, but not very significant, liquidity effect on M1 and an immediate and negative effect on credit to the private sector.

We will show shortly that including the exchange rate in our model does not make much difference in terms of the estimated impulse response functions (IRFs), and results are not affected by any puzzle even without an exogenous variable. In other words, we do not need any exogenous block or the exchange rate to attain a reasonable identification of the monetary policy shocks; this choice helps keeping our specification parsimonious and it's also supported by the fact that the euro area as a whole can be considered as a large, relatively closed, economy.

Another important contribution to the literature on the monetary transmission mechanism in the euro area is provided by Monticelli and Tristani (1999). They estimate a VAR model for the euro area employing a parsimonious 3-variable specification including real GDP, an interest rate and a price index. Their specification is similar to ours except for the absence, in their case, of money.[7] With regard to monetary shocks (aggregate supply shocks and real demand shocks are also considered in the paper), they find that following a monetary shock (which in their case is a 10 basis point fall, rather than increase, in the nominal interest rate) the (positive) response

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[6] Christiano et al. (1996) use a similar, although not identical, variable for the policy instrument, i.e. the federal funds rate (they also experiment non-borrowed reserves in an alternative specification).

[7] Monticelli and Tristani (1999) do actually also propose an alternative specification which includes money (M3), but placing it before the policy instrument. They also add three exogenous driving forces to this three-variable model (and present a larger five-variable VAR), namely innovations in spending and in aggregate supply and a monetary shock.

of output takes nearly 2 years to unfold; at its peak, which is anyway non-significant, the output level is 0.4% above the baseline. The impact on prices is negligible, with inflation showing a non-significant and short-lived rise on impact.

In our specification, adding money to the set of endogenous variables is needed to obtain IRFs with higher statistical significance, while responses would be qualitatively in line with theoretical predictions even without it. It is worth stressing that placing money after the interest rate (i.e. considering it to be the most endogenous variable) does not mean that the policy maker does not look at monetary aggregates in setting its instrument, but only that the *lagged* value of the monetary aggregate is included in his information set. This can be seen as a proxy for the fact that it is medium-term monetary developments that matter more for ECB strategy, not responding to the latest short-term development in M1. Anyway, as we will show in the next paragraph, having money before the interest rate hardly affects the shape of IRFs.

A more recent contribution to the VAR literature for the euro area is that of Giannone et al. (2009), who estimate a large VAR on the euro-area economy with 31 variables (monthly data from January 1991 to August 2009) and 13 lags. Similarly to our study, they choose the Euribor as the policy instrument and employ a Choleski identification scheme to identify innovations in the short-term rate. The large set of endogenous variables used by Giannone et al. (2009) also includes the four variables we use in our model; moreover, they are placed in the same order (relative to each other). Focussing on these shared variables, Giannone et al. (2009) find that following the unexpected short-term rate increase, industrial production declines quite persistently (although the fall begins only a few months later), prices do not respond much, while the monetary aggregate M1 falls below the baseline already on impact, later recovering at the end of the second year. Giannone et al. (2009) also provide a number of other interesting results, some of which will be recalled in the next sections in order to compare their results with ours.

8.2.3   Estimated Policy Shocks

Standard likelihood ratio tests are used to determine the lag order of the VAR, which turns out to be of order one according to all the most common criteria used for this purpose (see Table 8.1). This result significantly contributes in a positive way to the feasibility/robustness of the present results, as the relatively short sample available makes the degrees-of-freedom issue potentially very severe. Despite the low number of lags, fitted residuals show no sign of autocorrelation (see Table 8.2)[8]; also, the hypothesis of normality is not rejected, even at the individual series level, at least at the 95% confidence level based on the Jarque-Bera test (see Table 8.3).

Estimating the VAR model in log-levels allows for implicit co-integration in the data. We prefer avoiding co-integration analysis in line with much of the literature

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[8] We also make use of three time dummies to improve the whiteness of residuals, namely in 2000q1, 2008q4 and 2009q1.

Table 8.1 VAR lag order selection

Lag	LogL	LR	FPE	AIC	SC	HQ
0	225.12	NA	1.96e-10	−11.01	11.01	10.32
1	502.78	438.40[a]	2.09e-16[a]	−24.77[a]	24.78[a]	23.39[a]
2	518.21	21.12	2.30e-16	−24.74	24.74	22.68
3	529.20	12.72	3.42e-16	−24.48	24.48	21.73
4	545.83	15.76	4.23e-16	−24.51	24.51	21.07

LR sequential modified likelihood ratio test statistic (each test at 5% level), *FPE* final prediction error, *AIC* akaike information criterion, *SC* schwarz information criterion, *HQ* Hannan-Quinn information criterion

[a]Lag order selected by the specific criterion

Table 8.2 Autocorrelation LM test (H_0: no serial correlation at specified lag)

Lags	LM-Stat	Prob.
1	25.42	0.0627
2	11.52	0.7763
3	18.34	0.3040
4	20.17	0.2127
5	18.50	0.2955
6	9.32	0.8996
7	13.97	0.6005
8	10.93	0.8136

Probabilities from chi-square with 16 df

Table 8.3 VAR residual normality test

Component	Skewness	Chi-sq	df	Prob.
Output	0.605	2.505	1	0.113
Price	0.022	0.003	1	0.952
Interest rate	0.268	0.491	1	0.483
Money	0.402	1.106	1	0.292
Joint		*4.107*	*4*	*0.391*
Component	*Kurtosis*	Chi-sq	df	Prob.
Output	2.930	0.008	1	0.927
Price	1.507	3.804	1	0.051
Interest rate	2.959	0.002	1	0.958
Money	1.916	2.007	1	0.156
Joint		*5.822*	*4*	*0.212*
Component	*Jarque-Bera*	df	Prob.	
Output	2.514	2	0.284	
Price	3.807	2	0.149	
Interest rate	0.494	2	0.781	
Money	3.113	2	0.210	
Joint	*9.929*	*8*	*0.270*	

Choleski orthogonalization; the null hypothesis is that residuals follow a multivariate Normal distribution

Fig. 8.2 Estimated monetary policy shocks (three-quarter centred moving average)

on the empirical approach to modelling the effects of unexpected monetary tightening (including Peersman and Smets 2003; Giannone et al. 2009, for the euro area), and because, according to Sims et al. (1990) standard asymptotic tests are still valid if the VAR is estimated in levels, even if the variables are co-integrated.[9]

Estimated policy shocks are displayed in Fig. 8.2. We report centred three-quarter moving averages to smooth the series for ease of interpretation (shocks are by construction serially uncorrelated, thus they tend to be noisy). As usual, monetary policy is considered "tight" when the smoothed policy shock is positive and "loose" elsewhere.

Impulse response functions (IRFs) of all variables included in the benchmark VAR to a one-standard-deviation increase in the short-term interest rate (corresponding to 25 basis points) are plotted in Fig. 8.3, together with one-standard-deviation Monte Carlo error bands. The qualitative impact of a monetary policy shock on output, prices and money is in line with theoretical priors and with much of the existing empirical evidence available.

Output begins to fall at the end of the first year after the shock, reaching the maximum decline (45 basis points below its baseline) during the third year, after which it returns to the pre-shock level.[10] Compared with Peersman and Smets

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[9] This choice parallels the one made by Peersman and Smets (2003), who decided not to perform an explicit analysis of the long-run behaviour of the economy, partly because of the shortness of the sample available (quarterly data from 1980 to 1998).

[10] Peersman and Smets (2003) find that the response of output reaches a peak already within the first year, but it is much weaker (about 15 basis points) with a shock of a similar magnitude (30 versus 25 basis points). Monticelli and Tristani (1999) find that a one-standard-deviation shock (equal to 10 basis points) has a maximum impact on output of as much as 40 basis points, thus obtaining a similar peak response of GDP but with a smaller shock. In the latter case, though, the shock is defined as a decrease of interest rates and so the impact on output is positive.
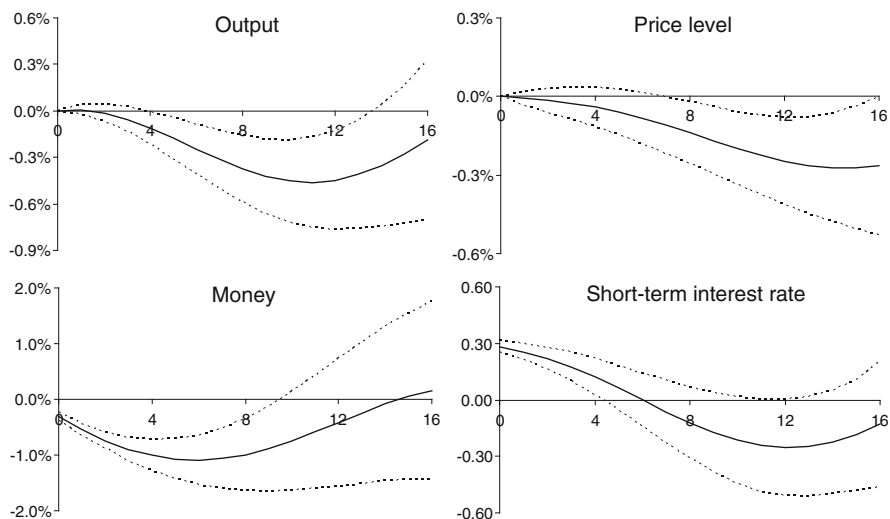
Fig. 8.3 The effect of a contractionary monetary policy shock: VAR variables. Note: deviation from baseline at various quarters following an exogenous one-standard-deviation (i.e. 25 bp) increase in the short-term interest rate. Dashed lines are ± 1 standard error bands from 1,000 Monte Carlo replications

(2003), the shape of output response is similar, but in our case the impact is stronger and occurs with a longer lag.

Prices turn out to be more sluggish than output. Their response (a decrease) becomes significant at the end of the second year after the unexpected interest-rate hike. Moreover, the impact on the price level is quite persistent. As mentioned, we have no sign of the "price puzzle", i.e. the empirical finding in the VAR literature (also on the euro area) that prices rise following an increase in interest rates. This puzzling result was found in den Haan et al. (2007), Eichenbaum (1992) and Sims (1992), among others. Sims and Zha (1995) and Christiano et al. (1996) add a commodity price index to their specification to solve the price puzzle, and this is also the reason why Peersman and Smets (2003) add a vector of exogenous variables to their three-variable VAR model.[11]

In line with the presence of a clear liquidity effect, much stronger than in Peersman and Smets (2003) and quite in line with Giannone et al. (2009), our measure of money (M1) declines immediately after the interest-rate increase, reaching the lowest value (−1%) one and a half years after the shock has

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[11] Giannone et al. (2009) observe a non-significant response of the price level after a monetary policy shock. Nevertheless, they observe that there is a lot of uncertainty about what the response of this variable should be, since "the so-called price puzzle that HICP responds positively to a monetary policy shock is one of the few responses that are not robust to data transformation".

Table 8.4 Contribution of monetary policy shocks to the forecast error variance

	Horizon 1 quarter		1 year		2 years		3 years		4 years	
Output	0.02	(0.67)	2.64	(4.94)	25.21	(14.88)	48.00	(15.32)	34.50	(15.14)
Price	0.04	(0.67)	1.05	(5.29)	12.37	(13.69)	38.17	(18.75)	48.03	(19.07)
Interest rate	88.40	(9.61)	46.73	(15.60)	23.14	(12.51)	30.47	(12.90)	30.17	(13.11)
Money	52.22	(10.13)	73.31	(11.83)	54.45	(20.38)	32.57	(20.86)	24.06	(18.43)

Percentage contribution (with standard errors)

occurred.[12] The response of money is not affected by the "liquidity puzzle", i.e. the fact that sometimes, when monetary policy shocks are identified as innovations in monetary aggregates, such innovations appear to be associated with increases rather than decreases in nominal interest rates (see, for example, Reichenstein 1987; Leeper and Gordon 1991).[13]

Table 8.4 shows the contribution of monetary policy shocks to the variance of the forecast error of output, prices, the interest rate and money at different horizons. The contribution of monetary policy shocks to monetary developments is rather large (about one-half in the short-run), while it is quite limited for output (less than 3% in the first year) and prices (1% in the short run). At the 2-year horizon, monetary policy shocks account for some 25% of output variability, a number quite close to that found by Christiano et al. (1996) for the US economy (30%) and to that of Peersman and Smets (2003) for the euro area (28%). It should also be noted that the sampling uncertainty on the relevance of policy shocks in accounting for the variance of the forecast error at the various horizons is rather large.

8.2.4   Robustness Analysis

In this section we present results of some robustness checks performed on the VAR model presented above.

We compared the benchmark VAR with some alternative models. One of these is obtained by simply changing the ordering of the endogenous variables. In other cases we tried different choices of the variables to be included in the model, with the basic aim of comparing the parsimonious benchmark specification with larger VARs, so as to verify that the loss of information in the small model is actually more than offset by the larger number of degrees of freedom.[14] To this aim we

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[12] This finding is consistent with the literature on euro-area money demand. See, for example, Fase and Winder (1993), who find a negative relationship between M1 and the short-term interest rate.

[13] Also in Peersman and Smets (2003) the response of money (M1), after falling in the very first quarters, turns positive in the second year following the policy tightening.

[14] We also estimated the benchmark VAR with money ordered before the interest rate, thus becoming part of the policy maker time t information set and, in turn, responding only with a lag to a policy tightening: we did not detect any relevant difference, except for a slightly slower dynamic of the response of output and prices.
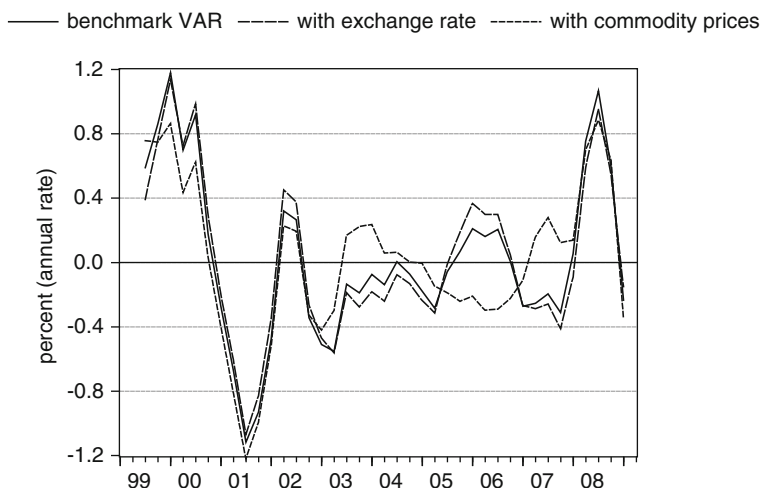
Fig. 8.4 Comparing estimated policy shocks across alternative VAR specifications (three-quarter centred moving average)

estimated three other versions of the VAR, one in which money is placed before the interest rate, thus being part of the policy maker time t information set, (y, p, m, int), and two including, respectively, the real effective exchange rate (exr) and the world market prices of raw materials (converted into euros) ($pcom$), both ordered before the policy instrument, i.e. (y, p, exr, int, m) and $(y, p, pcom, int, m)$.[15]

Estimated policy shocks resulting from the VAR including the exchange rate are very similar to those of the benchmark model (see Fig. 8.4).[16] Interestingly, excluding commodity prices from the VAR results in a looser monetary policy in late 2006 to early 2007, corresponding to a period of commodity price decrease; the opposite happens in 2003–2006, when estimated policy shocks point to an increasingly tight stance in the benchmark model and a looser one in the model that includes the commodity price index.

In Fig. 8.5 we compare the above alternative specifications in terms of the IRFs of the variables included in the various cases, i.e. the usual four variables of the benchmark VAR plus the responses of the exchange rate and of commodity prices when these variables are also included in the model. The patterns of the responses of output, prices, the interest rate and the monetary aggregate are alike across the different models, from both a qualitative and a quantitative point of view.

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[15] Results obtained placing the exchange rate or the commodity price indices in the last position in the VAR are very similar.

[16] Estimated policy shocks obtained placing M1 before the interest rate are identical to those of the benchmark specification.
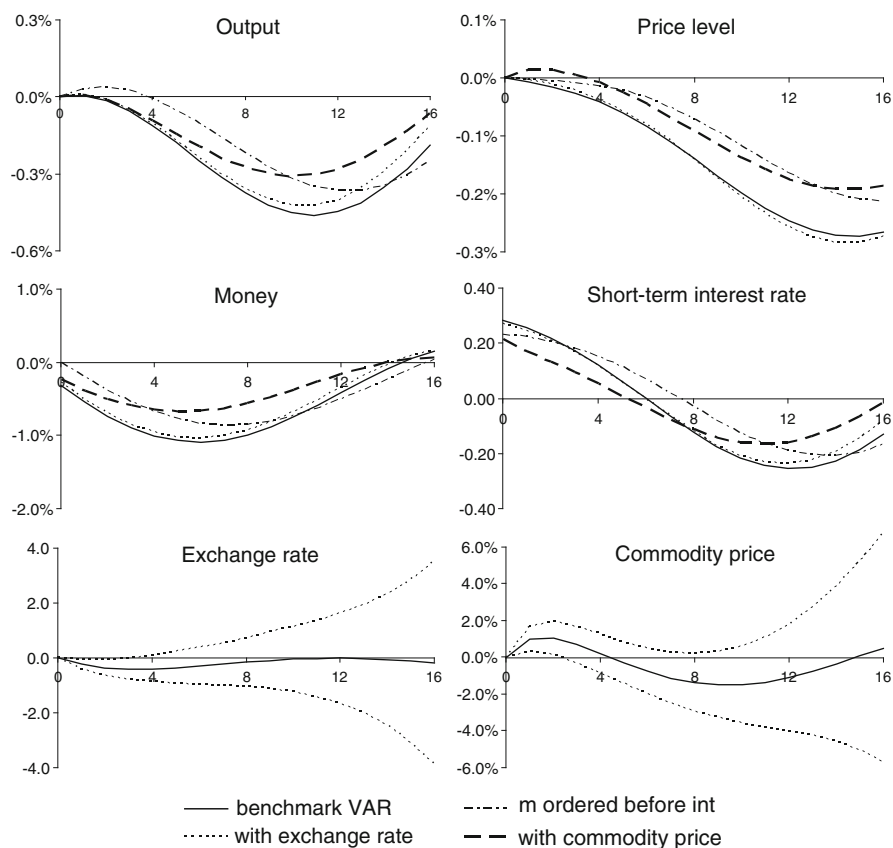
Fig. 8.5 Comparing IRFs across alternative VAR specifications. Note: since the (real effective) exchange rate and the commodity price index are only included in one specification, ± one-standard-error bands taken from 1,000 Monte Carlo replications are also shown in the respective charts. A positive IRF of the exchange rate means an appreciation of the euro vis-à-vis the other currencies

It is interesting to note that following the interest-rate hike the euro appreciates with respect to foreign currencies. This result is consistent with standard theoretical priors and also with the empirical evidence on the euro area provided by Giannone et al. (2009). This fact also confirms that our findings as to the variables analysed so far are not significantly affected by the restricted dimension of the VAR and by the relatively small sample available. Giannone et al. (2009) find IRFs for the main economic aggregates pretty much in line with ours.

All in all, given the degrees of freedom issue, we take these comparisons as providing evidence in favour of the more parsimonious model, i.e. of the benchmark VAR specification (8.5).

8.2.5   The Effect of Monetary Policy Shocks on other Variables

In order to further support the above identification, we also examined the responses to a monetary policy shock of other macroeconomic aggregates not included in the benchmark VAR.[17] This is done by simply including the new variable of interest among the VAR variables, ordering it as the last one (marginal strategy).[18] IRFs obtained from the estimation of these extended models are reported in Fig. 8.6 (the response of output is also displayed again for ease of interpretation).

Private consumption declines quickly, although the impact is limited to 10 basis points. As expected, the fall in investment is much more pronounced (30 basis points at the peak response), even though this variable starts declining only after the first year, and is thus mainly responsible for the delayed response of output. The increase in investment in the short-run might be seen as counter-intuitive and it is also not in line with Peersman and Smets (2003). We will come back to this result later in the paper, when discussing about the responses of the flow of funds.

As regards the labour market, unemployment increases from the second year after the shock, following output dynamics but with a response of much smaller magnitude. This results in a pro-cyclical pattern of labour productivity, in line with existing evidence on the euro-area economy (e.g. Peersman and Smets 2003). Wages do not respond significantly in the first year after the shock (as in Peersman and Smets 2003) but start declining afterwards, following closely on (and coherently with) the fall in production and the rise in unemployment. The response of wages and that of productivity imply that the unit labour cost increases for at least the first 2 years after the policy contraction.

Figure 8.6 also shows the impact of an unexpected policy tightening on the long-term interest rate, stock prices and house prices. Consistently with the expectations hypothesis of the term structure of interest rates, the short- and the long-term rates show pretty similar patterns, although the impact on the latter is much smaller. The peak effect (on impact) on the long-term rate is an increase of 8 basis points, which should be compared with the 25 basis point rise in the short-term rate. The relative magnitudes of the short- and the long-term rate responses (i.e. three-to-one) are very similar to the ones in Peersman and Smets (2003), who find that a 30 basis point increase in the former is paralleled by a 10 basis point increase in the latter.

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[17] These additional variables are private consumption (households' final consumption expenditure at constant prices); investment (gross fixed capital formation at constant prices); employment (number of persons employed); wages (compensation per employee in the whole economy); labour productivity; a long-term interest rate (10-year euro-area government benchmark bond yield); a euro-area stock-price index; and a residential property price index. Again, all variables are seasonally adjusted and in log-level (except the interest rate, which is in level).

[18] This implies that the estimated policy shock is not invariant across all specifications, possibly depending on the inclusion of the additional variable. However, Peersman and Smets (2003), conducting a similar experiment, showed that results obtained in this way were very similar to the ones they obtained assuming that the new macroeconomic aggregate did not affect the block of endogenous variables.
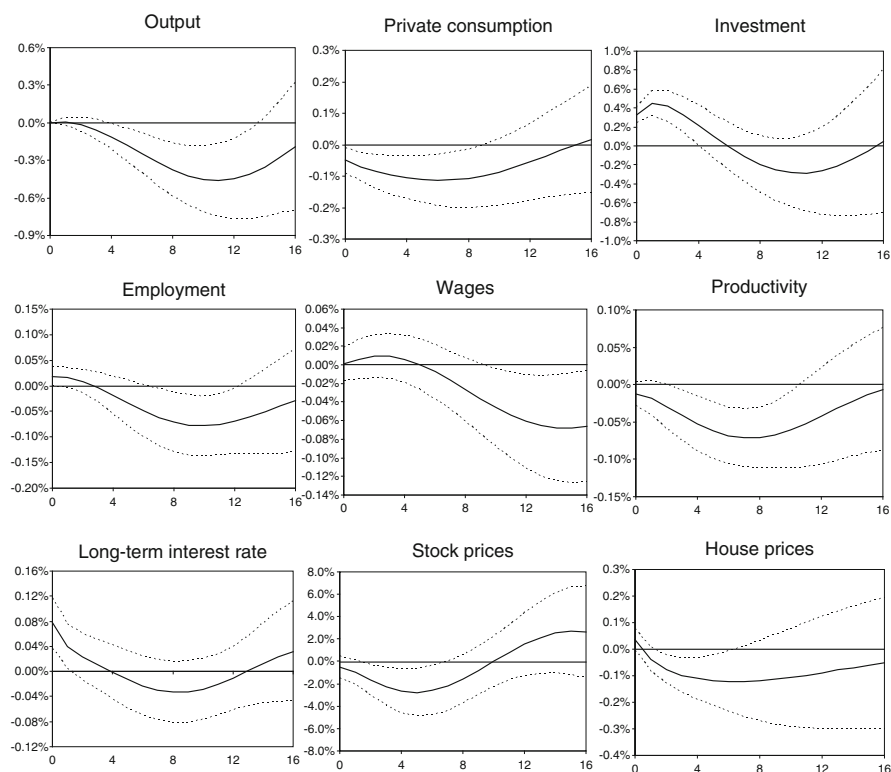
Fig. 8.6 The effect of a contractionary monetary policy shock on other macro variables. Note: percentage deviation from the baseline following an exogenous one-standard-deviation (25 basis points) increase in the short-term interest rate. Dashed lines are ± one-standard-error bands taken from 1,000 Monte Carlo replications. Each IRF has been estimated from a 5-variable VAR in which each macro variable was added in turn to the benchmark model, placed in the last position

This result is consistent with Giannone et al. (2009), who also observe that it implies that term-spreads decrease on impact after a monetary policy shock.

Taking into account that the cost of financing (proxied by the long-term rate) is already back to the baseline when the fall in investment begins, the medium-term negative dynamics of investment commented above might be ascribed to the worsening in expected future profitability rather than to higher costs.

Stock prices fall in the first 2 years, reaching the maximum loss four to five quarters after the monetary policy shock (−3%). The response of stock prices is very similar to the one observed in Peersman and Smets (2003) and Giannone et al. (2009). Finally, house prices decline less than stock prices (0.12% during the second year after the shock). The response of house prices in our model is stronger but less persistent than in Peersman and Smets (2003).

All in all, the responses of the additional macroeconomic variables considered in this section support the identification adopted.

8.3   Monetary Policy and the Flow of Funds

In this section we describe briefly the flow-of-funds statistics and then include them in the benchmark VAR model in order to assess the response of lending and borrowing by all the sectors of the economy in the aftermath of a monetary policy shock in the euro area.

8.3.1   The Euro-Area Flow of Funds

The flow of funds statistics show the financial assets and liabilities of all economic sectors (households, non-financial firms, financial corporations, general government, and the foreign sector), both those already accumulated in the form of outstanding amounts of wealth (assets) or debt (liabilities) and the transactions taking place in the different financial instruments (mainly deposits, securities and loans). In the present study we consider the latter, i.e. we focus on the flows of new financial assets acquired or financial liabilities issued in each period by the different sectors.

Aggregate flow-of-funds series for the euro area are published by the ECB in the *Integrated Economic and Financial Accounts by Institutional Sector* with a lag of about 4 months (which is currently being shortened to about 3 months). Quarterly series are available back to 1999. They are obtained from the aggregation of harmonized national data compiled according to the methodological standards set in the European System of National Accounts (ESA95). European flow of funds (financial accounts) are published on a non-consolidated basis, meaning that intra-sectoral transactions are not netted out from the accounts; this is the case, for example, of securities issued by banks and bought by other banks, or inter-company loans. Moreover, nominal non-seasonally-adjusted series are published.

In line with Christiano et al. (1996) and Bonci and Columba (2008) we consider net funds raised by sectors, defined as the difference between the net incurrence of liabilities and the net acquisition of financial assets. A positive (negative) value of net funds raised means that particular sector is a net borrower (net lender) of funds vis-à-vis the rest of the economy, foreign residents included.

Figure 8.7 presents net funds raised by the sectors of the economy in the euro area (quarterly series from 1999q1 to 2009q2). Series are deflated using the GDP deflator and also corrected for seasonality.[19] Each graph in Fig. 8.7 shows net funds borrowed/lent by sectors over the sample period.

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[19] Seasonal adjustment was achieved using Tramo-Seats. Seasonally adjusting series implies that the accounting identity according to which net lending figures must add up to zero across all sectors does not hold true any more. One possibility would be to calculate one item as a residual, but we chose not to do so at this stage.
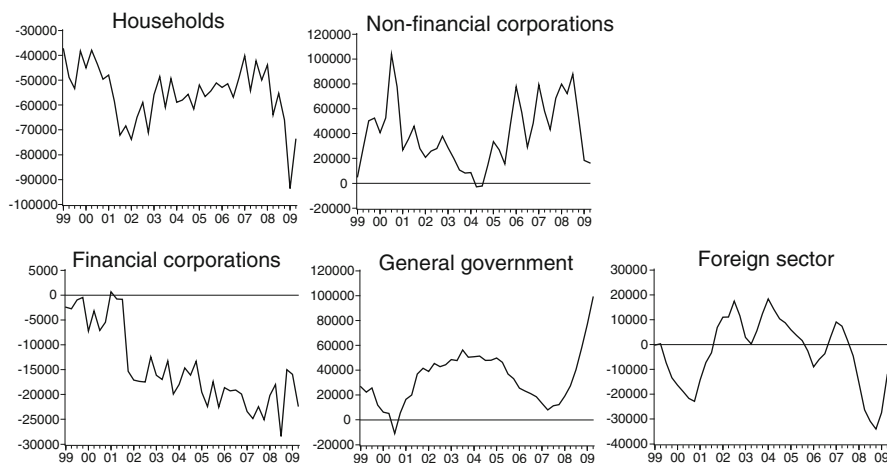
Fig. 8.7 Flow of funds: net funds raised by the sectors (quarterly flows, seasonally adjusted; millions of 1995 euros)

It is well known that in the euro-area economy households were net lenders over the whole period; from the end of 2001 onwards their financial saving, i.e. the excess of disposable income over consumption and housing investment, increased (in other words, households had more and more resources to lend to other sectors). Non-financial firms, on the other hand, displayed a net borrower position over the whole sample (their net borrowing averaged 36 billion 1995 euros per quarter), meaning that the sources of internal financing, i.e. undistributed earnings, were generally too limited to finance firms' investment.

As regards the other sectors, net funds raised by financial corporations (comprising monetary financial institutions, insurance companies, other financial intermediaries and financial auxiliaries) show a high volatility around a relatively small average (-13 billion 1995 euros). The chart for general government shows the growing budget deficit from 2000 to 2003 (although the definition of net funds raised is not exactly equivalent to our measure) and subsequent improvement from 2004 onwards. The euro area as a whole was a small net lender vis-à-vis foreign residents over the sample (around five billion 1995 euros, on average). Lastly, as in the case of financial corporations, net foreign inflows into the euro area display highly volatile patterns, making the interpretation of these variables somewhat tricky.

Focussing on the latest quarters available, corresponding to the current economic recession, Fig. 8.7 shows that net funds raised by households decreased significantly up to the end of 2008, before recovering in 2009q1 and 2009q2. Something similar happened in the case of firms. On the other hand, we observe a huge increase in the amount of funds raised by the government sector due to the massive securities issuance needed to finance the banking system bailouts and the fiscal stimulus interventions in the aftermath of the crisis.

8.3.2 Borrowing and Lending after a Policy Tightening

In this section we analyse the response of the euro-area flow-of-funds variables to an unexpected monetary policy tightening just like the one we have been using so far, that is, a 25 basis point increase in the short-term interest rate. For the sake of comparability with the existing literature, namely Christiano et al. (1996) for the US and Bonci and Columba (2008) for Italy, besides net funds raised by sectors we also focus on some selected categories of financial assets and liabilities (only for households and firms). Similarly to what was done for the macro variables not included in the benchmark VAR, this is achieved via the "marginal strategy", i.e. adding one variable at a time to the benchmark VAR specification, placing it in the last position (i.e. considering it to be the most endogenous variable).

As Christiano et al. (1996) point out, while this procedure deals with the problem of parameter profligacy, it has one drawback: estimated innovations to the interest-rate equation depend, in principle, also on lagged values of the additional variable considered in the VAR. This means that the shock measures can be slightly different across the different specifications. To address this issue, we report in Fig. 8.8 the estimated monetary policy shocks in the benchmark VAR together with those obtained in some of the flow-of-funds augmented specifications; we select those with the largest flows, such as household total financial assets, firms' debt issuance and private sector loans. From Fig. 8.8 it appears that our policy shock
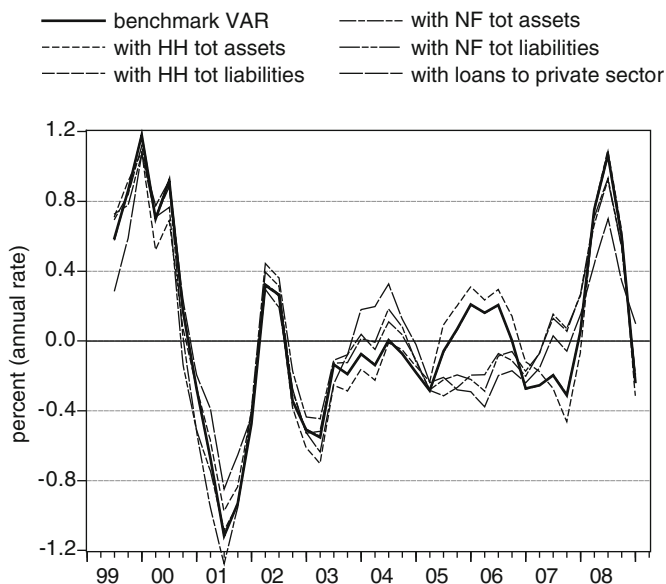
Fig. 8.8 Comparing estimated policy shocks: benchmark VAR versus flow-of-funds augmented models (three-quarter centred moving average). Note: NF is the non-financial corporation sector; HH is the household sector

estimates do not change significantly across different models, thus supporting the comparability of the results obtained for the different financial variables at study.

In the next sections we go trough the various sectors of the economy to analyse whether and how their borrowing (issuance of liabilities) and lending (acquisition of financial assets) activities are affected by monetary policy shocks, by looking at the IRFs of the flow-of-funds series.

Non-financial corporations. The response of net funds raised by firms after the interest-rate hike is displayed in Fig. 8.9. Firms increase their net borrowing immediately after the shock (by some eight billion 1995 euros), reducing it below the baseline during the second year. The increase on impact is quite substantial if we compare it with the average of the corresponding quarterly flow over the sample (about 40 billion 1995 euros).

Obviously, the response of net funds raised is the result of two underlying effects on the asset and on the liability side. IRFs of firms' financial assets and liabilities are plotted in Fig. 8.10. They follow a similar pattern in the aftermath of the tightening: after an initial increase they both return to the baseline 1 year after the shock. Nevertheless, the impact on the issuance of new debt is much stronger and accounts for the increase in firms' net borrowing. Taking into account the contemporaneous positive response of firms' capital formation, a possible puzzle arises here: with higher interest rates (both for the short- and, though to a smaller extent, for the long-term rate), firms seem to require more funds and they seem to do so both for financing capital formation (real assets) and for buying financial assets.

It might be interesting to check which categories of assets firms actually buy more after the monetary policy shock. According to the latest information available (outstanding amounts in 2009q2), 44% of firms' stock of total financial assets consists of shares, 22% of accounts receivable (mainly trade credits), 12% currency and deposits, 9% loans granted, and only 2% debt security holdings. Figure 8.10
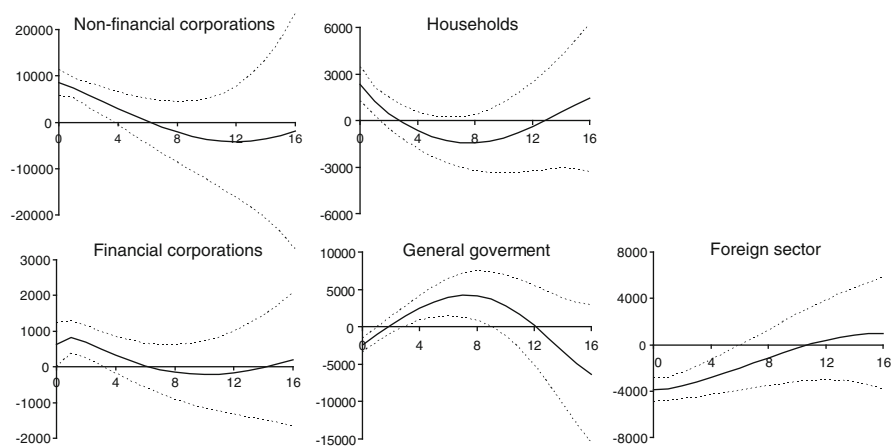
Fig. 8.9 Impact of a contractionary monetary policy shock on net funds raised (deviation from the baseline; millions of 1995 euros). See note to Fig. 8.6
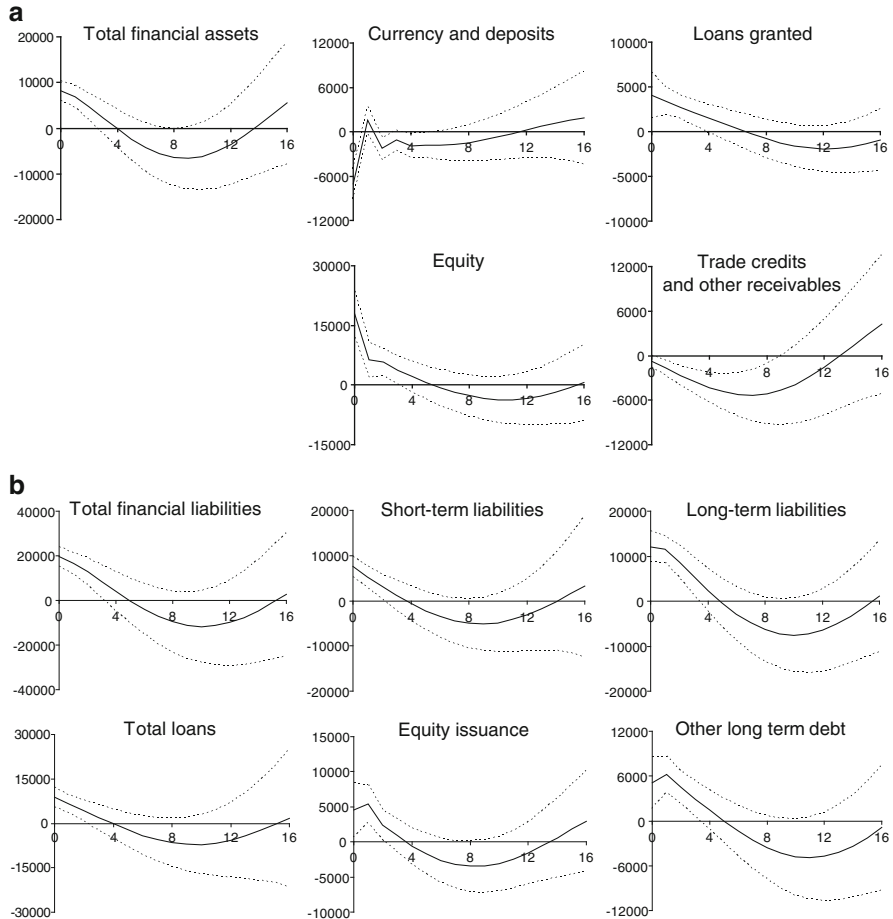
Fig. 8.10 Impact of a contractionary monetary policy shock on firms' assets and liabilities (deviation from the baseline; millions of 1995 euros). (**a**) firms' financial assets. (**b**) firms' liabilities. See note to Fig. 8.6. Note: Long-term liabilities are the sum of equity and other long-term debt; the latter comprises securities and loans, both with maturity over 1 year

(panel a) shows that firms reduce the accumulation of currency and deposits and of other accounts receivable, while they grant more loans in the short run and buy more equity. The increase in loans granted by firms, mainly inter-company loans, might be a direct consequence of the higher cost of external funds faced by firms; this would be consistent with the observed reduction of firms' deposit holdings. On the other hand, the higher accumulation of equity might be seen in the context of augmented M&A activity; keeping in mind that the latter activity often has little to do with monetary policy and economic conditions in general, nevertheless in our context it might also be viewed as a result of firms' willingness to reorganize in the light of the decrease in profitability caused by the slowdown of economic activity.

The observed increase in firms' net borrowing is in line with the US evidence provided by Christiano et al. (1996), also in quantitative terms, i.e. around 20% of the average.[20] The increase in US firms' net borrowing was found to be due mainly to the positive response of short-term liabilities issued by corporations and large manufacturing firms, which increase after the interest-rate rise. To explain this outcome Christiano et al. (1996) pointed to the existence of frictions due to contracts in place inhibiting firms from immediately adjusting their level of inventories to the new (lower) level of demand, as standard monetary business cycle models predict.

On the other hand, no significant impact of a short-term interest-rate increase on net funds raised by firms is detected in the case of Italy (Bonci and Columba 2008). The finding that costs' inertia faced by firms is smaller in Italy, compared to the euro area and the US, might be related to the average firm size in these areas which, in turn, could affect firms' ability to alter promptly their investment and current expenditures. This is of course all about the *demand* for loans and therefore it should be considered together with the credit *supply* side of the story. In this respect, there is widespread evidence supporting capital market imperfection theories, which claim that large firms are less subject to risks of credit crunch than small ones because they are less prone to asymmetric information problems; thus, a monetary-policy-induced decrease in credit supply should lead to a worsening of business conditions that is smaller for large firms (see Christiano et al. 1996; Gertler and Gilchrist 1993, 1994; Ehrmann 2000). In this respect, larger firms might find it easier to smooth the impact of reduced sales via larger debt issuance than small firms.

Households. Some evidence on the impact of a monetary policy restriction on the borrowing and lending behaviour of the household sector[21] can be derived from the IRFs plotted in Fig. 8.9 (net funds raised) and Fig. 8.11 (main categories of financial assets and liabilities).

Households initially borrow more funds (in net terms) after the tightening. The impact response of net funds raised by households is positive, like that of firms, but smaller (two billion 1995 euros, corresponding to 4% of the average quarterly flow); moreover, it vanishes earlier. Indeed, households' net financial position improves in the following quarters and net funds raised by this sector fall below the baseline by the end of the first year. This might be because households try at first to smooth consumption following the deterioration in their disposable income but then, as unemployment rises, they react by increasing their saving rate.

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[20] The authors claim that "the initial rise of net funds raised by the business sector in response to a contractionary monetary policy shock is one of the key results of the paper". Christiano et al. (1994) confirmed this finding to be robust across several samples and model specifications.

[21] Also including non-profit institutions serving households and sole proprietorships and small unincorporated businesses ("producer households"), whose definition is, to a large extent, country specific.
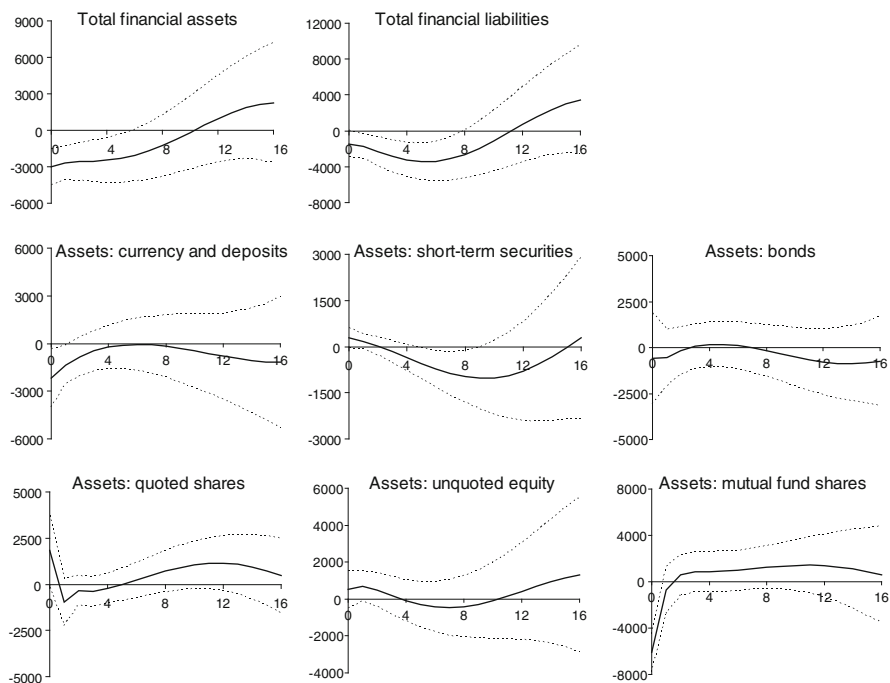
Fig. 8.11 Impact of a contractionary monetary policy shock on households' assets and liabilities (deviation from the baseline; millions of 1995 euros) See note to Fig. 8.6

The response of household net borrowing was less clear in Christiano et al. (1996), who conclude that "there is little evidence against the view that net funds raised by the household sector initially remain unchanged". Bonci and Columba (2008), on the other hand, find a decline in net funds borrowed by households in Italy already in the first year after the shock, as a result of less liabilities issued and a higher acquisition of financial assets.

Looking further at the sub-components (Fig. 8.11) it arises that the short-run increase in net funds raised by households is mainly the result of the fall in the net acquisition of new financial assets, especially due to the sales of mutual fund shares[22] (6 billion 1995 euros, equal to some 40% of the average flow). After the strong response on impact, though, acquisition of mutual funds shares recovers quickly, going back to the baseline already in the next quarter. The drop at impact might be explained with the worsening in the expected future profitability perceived by households after the restrictive shock, although it remains to be explained why

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[22] The flow of funds show transactions in the various assets and liabilities on a net basis, meaning that acquisition of any financial instrument is recorder net of dismissals of the same instrument in the same period. In other words, a negative value for a given item means that the sector is reducing holding of that instrument, i.e. selling it on a net basis.

the same pattern is not observed for shares held directly, which are note affected significantly by the policy shock (the same is true for long-term securities). Possibly, in this latter case, the price effect is strong enough (stock prices decline promptly after the shock) to off-set the worsened perspective and the overall result is negligible or even slightly positive on impact.

Currency and deposits holdings are reduced during the first year, while households slightly increase the acquisition of short-term securities. This reallocation of household portfolios might be due to an increase in the opportunity cost of holding deposits, which induces households to substitute them with other interest-bearing assets, such as Treasury short-term securities; this may be true especially as long as the deposit rate follows the increase in the interest rates only with a delay (and maybe not even fully). Although the increase in short-term securities might seem negligible, it should be kept in mind that it occurs just when households are reducing the overall amount of financial assets: this means that at the end of the period the share of household portfolio invested in securities will be much larger than in the baseline scenario.

The response of securities, i.e. more short-term securities and virtually no reaction on long-term bonds, is in line with available evidence on Italy (Bonci and Columba 2008) and could point to an interest-rate curve that is shifted up only in its short-term part, as long as the interest-rate increase is deemed as temporary.

All in all, we can conclude that households react to the policy tightening by reducing the accumulation of financial assets rather quickly, possibly in the light of the expected lower level of disposable income and higher unemployment associated with the slowdown of economic activity induced by the interest-rate increase. Moreover, at the same time households also adjust their portfolios, switching from deposits and mutual fund shares mainly towards short-term securities.

The other sectors of the economy. The increase in net funds raised by firms and households in the aftermath of a policy restriction coincides with a decline in net funds raised by the foreign sector and also, to a smaller extent, by general government, while the impact on financial corporations (banks, insurance companies and other financial intermediaries) is barely significant.

Since *financial corporations* display relatively small and very volatile net financial flows, in line with their main role in funds intermediation, implying that financial assets are generally close to liabilities, the patterns of this sector are hard to interpret. The slight increase in net funds raised at impact (Fig. 8.9) is anyway in line with existing evidence both for the US and for Italy.

On the other hand, net funds raised by the *foreign sector* decrease after the shock (Fig. 8.9). In other words, the net external position of the euro area deteriorates after the domestic interest-rate hike, meaning that euro-area resident sectors as a whole borrow more funds, in net terms, from abroad. This outcome is different from existing evidence for both the US and Italy, where no significant response was observed for foreign sector borrowing. This result might occur because the supply of funds from non-residents increases or because the acquisition of foreign assets by euro-area residents decelerates (or a combination of both). As suggested by Christiano et al. (1996), this could hint at foreign economies beginning their

recession later, reflecting the delayed reaction of foreign central banks to a euro-area (in our case) contractionary monetary policy shock.

Finally, the pattern of net funds raised by the *general government* sector, i.e. a higher deficit in the medium term after a small decrease on impact (2 billion 1995 euros, against an average quarterly flow equal to almost 40 billion in absolute value), is pretty much in line with the result obtained by Bonci and Columba (2008) for Italy. It is also consistent with the cost of automatic stabilizers and with budget worsening predicted by the theory as a consequence of the drop in tax receipts due to the slowdown in economic activity caused by the interest-rate hike.

The initial decrease in net funds raised by the government sector that we find is smaller and much less persistent than the fall in the public deficit observed for the US economy by Christiano et al. (1996). These authors ascribe this counter-intuitive outcome to a temporary increase in personal tax receipts, which vanishes only in the following quarters as economic activity decelerates. This explanation might apply to our findings as well, given that the increase in the budget deficit follows quite closely the decrease in output and, even more so, in employment.

8.3.3   The Response of Credit Growth

In this section we focus on a specific financial instrument rather than on an economic sector. We want to assess the impact of a policy contraction on total loans granted to the non-financial private sector, i.e. households and non-financial firms.[23] The analysis of private sector loans is of special interest owing to its prominent role in the assessment of monetary developments (it is one of the main counterparts of monetary aggregates) and the potential risks of future pressure on prices. As such, particular attention is devoted to this variable in the context of the monetary pillar of ECB monetary policy strategy.

The impact of the interest hike on loans is displayed in Fig. 8.12, also split by maturity and by counterpart sector. After a positive response in the very short run, total loans granted to households and firms (net of reimbursements) decline below the baseline; the peak response is a decrease of 12 billion 1995 euros (8% of the average quarterly flow), occurring 2 years after the shock. The impact increase contrasts with the finding of Peersman and Smets (2003) that private loans decline quickly and persistently in the euro area after a policy tightening.[24]

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[23] These funds (loans) are provided by monetary financial institutions (MFIs) as well as by other financial intermediaries, such as insurance corporations and pension funds, financial auxiliaries, mutual funds, securities and derivatives dealers, and all other financial corporations engaged in lending.

[24] It may be that Peersman and Smets (2003)'s definition of loans includes MFI loans, although this is not clear from the paper.
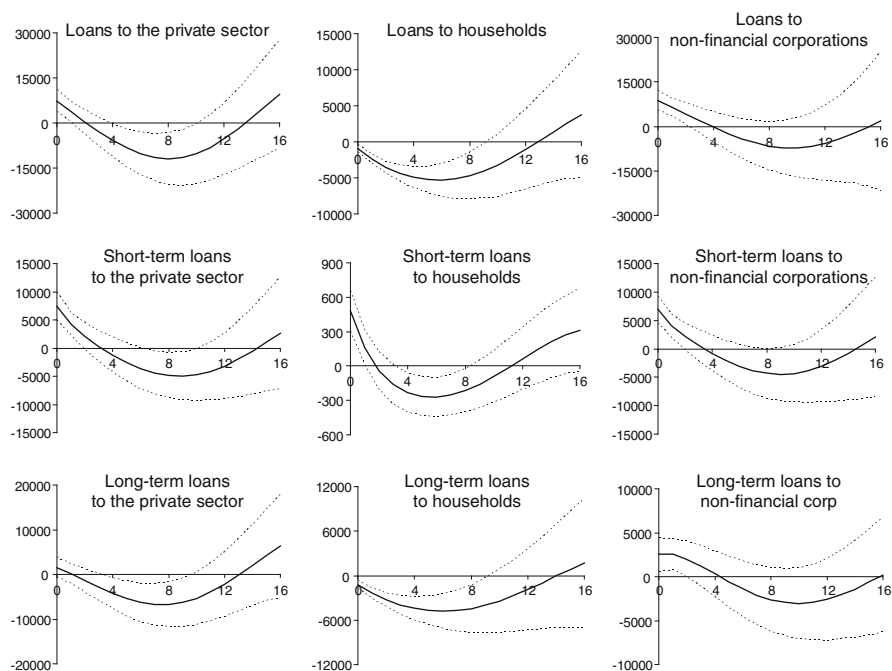
Fig. 8.12 Impact of a contractionary monetary policy shock on total loans (deviation from the baseline; millions of 1995 euros). See note to Fig. 8.6

The impact positive response of loans to the private sector is driven by the response of business loans (a 8.5 billion increase, equal to 9% of the average) which more than offsets the reduction in loans to households (one billion 1995 euros) in the immediate aftermath of the shock (Fig. 8.12). The Figure reports mainly loans for house purchase, i.e. the principal component of long-term loans to households, which decline after the shock: this is likely a result of both demand factors (residential investment falls) and supply factors (tighter credit standards). The fall in real-estate loans is consistent with the US evidence provided, for example, by Gertler and Gilchrist (1993). It is also one of the results of Giannone et al. (2009) for the euro area, although in their case the decline is more persistent than in the present study.

On the other hand, the response of short-term loans to households, mainly consumer credit, though statistically significant, is of negligible magnitude (Fig. 8.12). This finding is in line with other existing evidence on the euro area (Giannone et al. 2009) and might also be due to the fact that the risk-related component prevails over the money-market rates in accounting for the dynamic of consumer-credit cost.

Business loans increase at impact before falling below the baseline (Fig. 8.12). The increase in loans to non-financial corporations, especially short-term loans, in the immediate aftermath of a monetary tightening (after two quarters loans fall
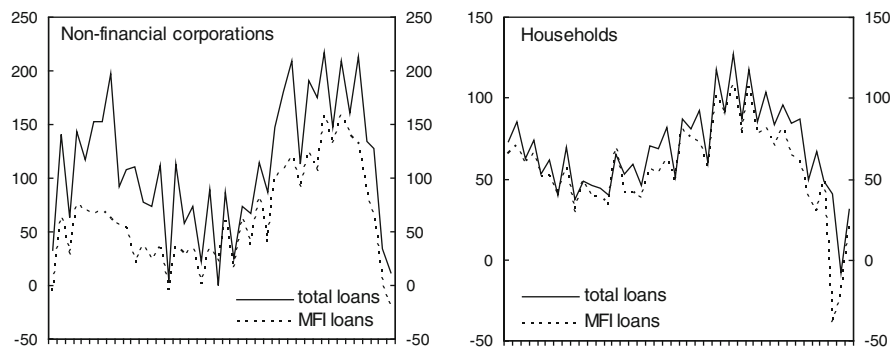
Fig. 8.13 Total loans and bank loans to firms and households (quarterly flows 1999q1–2009q2; billions of euros at current prices)

below the baseline) might be considered counter-intuitive, as we tend to think of a decline in loans as a more natural consequence of an interest-rate increase. This result is not new in the VAR literature on monetary policy effects. A similar finding was reported for the US economy by Christiano et al. (1996), Bernanke and Gerlter (1995) and den Haan et al. (2007). Also Giannone et al. (2009) find a positive response of business loans after a monetary contraction in the euro area, especially for short-term loans, and one which is much more persistent than in our case. It is also worth recalling that Bernanke and Gertler (1995) argue that the observed increase in loans granted can still be consistent with a reduction in the *supply* of loans (which is what the bank lending channel would predict) provided that firms' *demand* for new loans is only partially met by lenders.

A number of possible explanations have been suggested in the literature for the observed positive effect of an adverse monetary policy shock on lending, most of them pointing to *loan demand* as the driving force. One factor might be firms' need to finance working capital: when conditions on the trade credit market deteriorate, as normally happens in an economic downturn, firms need more time to cash their sales. This argument is in line with the explanation suggested by den Haan et al. (2007), who find that it is the C&I (commercial and industrial) component of loans that grows after a tightening. The front-loading argument was also proposed by Giannone et al. (2009). According to their explanation, firms draw heavily from pre-committed credit lines that are locked at the lower pre-shock rate, so that loans actually increase in the aftermath of a monetary contraction. Front-loading is also reinforced if banks adjust their lending rates with some delay, inducing firms to take out more loans before the expected rise in the cost of financing. This view is supported by the findings of Giannone et al. (2009) which indicate that the lending rates on short-term loans reach a maximum increase only 1 year after the policy shock has occurred.
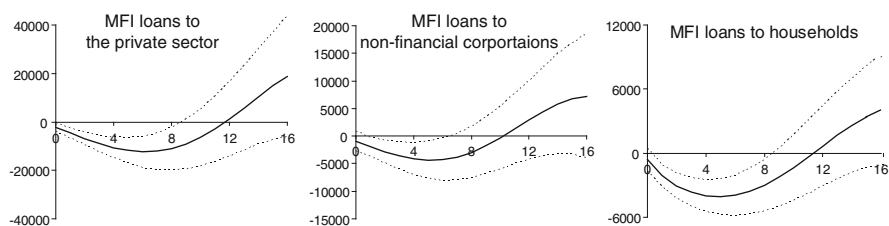
Fig. 8.14 Impact of a contractionary monetary policy shock on MFI loans (deviation from the baseline; millions of 1995 euros). See note to Fig. 8.6

On the *supply* side of financing, den Haan et al. (2007) point to banks' willingness to invest in short-term (less risky) assets (such as short-term loans) which earn a high return, given that short-term interest rates are relatively high.[25]

Interestingly, the (apparently) counter-intuitive increase in loans following a monetary tightening vanishes when we consider only bank loans.[26] In fact, both MFI loans to households and those to firms fall below the baseline for about 2 years following the policy tightening (Fig. 8.14). This means that the behaviour of total business loans must be attributed to funds granted to firms by agents other than banks. Since the flow-of-funds statistics we use here are not consolidated, such non-bank loans include funds provided by insurance companies, households and, most importantly, by other non-financial corporations. Indeed, as we have seen in the previous sections, loans granted by firms display a significant and positive response after the monetary tightening (Fig. 8.10, panel a), and most of them are likely to be granted to other firms (inter-company loans).

8.4   Conclusions

This paper investigates the transmission of monetary policy in the euro area via its impact on the borrowing and lending decisions of the economic sectors. I estimate a VAR model for the euro-area economy and identify monetary policy shocks using a Choleski decomposition. The model is not affected by any of the empirical puzzles found in part of the literature and, despite the parsimonious specification, is able to account for the stylized facts on the impact of a monetary policy shock on the main macroeconomic aggregates. When the benchmark model is augmented to include the flow-of-funds variables, a number of interesting results arise especially as regards the behaviour of households and firms. Results are also compared with existing empirical evidence on the flow of funds and some important differences are detected with respect to the US economy. These may be due to the different sample period but also to existing structural differences between the two economic

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[25] On this issue see also Jorge (2009).

[26] MFI loans account for some 60% and 80 % of total loans to firms and households, respectively in the euro area (see Fig. 8.13).

systems, e.g. private sector debt level, risk aversion, firm structure, financial markets and so on.

Following the policy tightening, firms increase their net borrowing, pointing to an inability to adjust the level of investment and current expenditures rapidly. Firms, especially large ones which theories of capital market imperfection assume to be less subject to a worsening of business conditions, may be able to smooth the impact of reduced sales through larger debt issuance. The euro-area household sector reacts to the policy tightening by rapidly reducing the accumulation of financial assets. In doing so, it also adjusts the composition of its portfolios, switching from deposits and mutual fund shares to short-term securities. This may be in response to the rise in the opportunity cost of holding deposits as the (higher) interest rate is transmitted to the deposit rate only with some delay. The foreign sector and, to a lesser extent, the public sector, are those lending funds (in net terms) to meet the larger borrowing needs of euro-area households and firms in the short run following the tightening.

The behaviour of credit is also analysed. Similarly to other evidence on the euro area, total loans to households and non-financial corporations increase at impact after the interest-rate hike. Although this result might seem counter-intuitive, a number of explanations are suggested in the paper and factors are mentioned that can contribute to the increase in both the demand and the supply of loans to the private sector. We also find that the initial increase in loans vanishes when only banks are taken into account as lenders, suggesting that it is actually non-bank loans taken out by firms (for instance inter-company loans) that grow after the tightening.

All in all, the heterogeneity of the sectors' responses hints at the relevance of the analysis based on the flow of funds for the monetary policy transmission. It would be interesting to contrast the present results with similar analyses conducted at the country level in order to find any differences that might have an impact on the transmission of the (common) monetary policy to the various economic systems belonging to the euro area.

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Imbalances in Household, Firm, Public and Foreign Sector Balance Sheets in the 2000s: A Case of "I Told You So"?

9

Luigi Infante, Alberto Franco Pozzolo, and Roberto Tedeschi

Abstract

In the mid-1990s, the International Monetary Fund promoted a new approach to country analyses that was better able to recognize the signs of impending financial crisis. However, the size of internationally exchanged assets and the links between resident and non-resident real and financial sectors increased considerably in the following decade, at a similar pace to (perceived) liquidity, making the effects of imbalances in the international economic system more difficult to control. The enormous increase in liquidity diverted attention from maturity mismatches, sewing the seeds of the 2008–09 "Great Recession". In this chapter we consider whether a closer look at financial accounts statistics would have made it possible to anticipate the mounting turmoil. Our conclusion is that it would have helped only partially. The massive increase in international integration, which made it clear that any financial shocks would have global effects, and the strong reduction in household savings could have been anticipated. However, maturity mismatches and unsustainable prices of real and financial assets, two other major causes of the financial crisis, could not easily be seen from the financial accounts. It also emerges clearly that stock imbalances are less capable of signalling upcoming problems, while too rapid changes in financial positions provide stronger pointers and therefore need to be monitored closely. Indeed, a more careful scrutiny of financial accounts would have given at least some indication of the magnitude of the dangers ahead.

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9.1   Introduction

Many of the recent developments in international macroeconomics have stemmed from international financial crises, with exchange rates, official reserves and international financing at centre stage. In the view of academics and policymakers, the determinants of "sudden stops" in developing (or what are now called emerging) and emerged economies have changed gradually from financial to real-economy disequilibria. For example, in Krugman's (1979) balance-of-payments crisis model, fixed exchange rates suddenly become flexible and crash in response to persistent current-account deficits (with official reserves well above zero), which provides a partial picture of the economy, ignoring the reasons for prolonged and unsustainable current-account deficits. However, in the 1992 European currency crisis, and the 1994 Mexican and 1998 Asian crises, real and financial imbalances figured much more in analyses (see e.g. Gordon 2000; Dornbusch 2002, who uses the term "balance-sheet crisis"), accompanied by a focus on microeconomic disequilibria in the credit and production areas of the affected economy (Corsetti et al. 1998). Also, the disruption to bank intermediation in the aftermath of major adjustments to the prices of assets and liabilities, due to exchange-rate and interest-rate movements, has been identified as a key propagating mechanism (e.g. in "credit" views of these crises; Bernanke 1983).

In the mid-1990s, the International Monetary Fund promoted a wide research agenda aimed at laying the foundations for a new approach to country analyses that would be better able to recognize the signs of impending financial crisis. The focus on inflation, public sector and balance-of-payments flow imbalances, which was at the heart of previous frameworks, was shown to be incapable of forecasting the financial collapse in the Asian countries. It was concluded that greater attention to stock variables was required and a focus on not only the public and external sectors, but also the private and banking sectors. While the attention has continued to be on developing/emerging countries, the most recent set of indicators is capable of anticipating some of the imbalances that preceded the 2008–09 crisis. With hindsight, it was unfortunate that, in most cases, the corporate and household sectors were merged within one balance sheet (Allen et al. 2002), making predictions about the 2008–09 "Great Recession" more difficult.

New features of the real and financial sectors that have developed since the mid-1990s have made the effects of imbalances in the international economic system more difficult to control. The enormous increase in the degree of financial assets liquidity since 1995 has diverted attention from maturity mismatches in the financially advanced countries (Rajan 2006). The size of internationally exchanged assets and the links between resident and non-resident real and financial sectors has increased considerably and at a similar pace to (perceived) liquidity. For any given level of net external assets (in balance of payments terms, for a given international investment position), gross positions are shown to have grown substantially. This has made the risk of imbalances much more likely. A change in the stock position between two points in time is due to: (a) the flow in between; and (b)

the value adjustments from changes in prices, including exchange rates for foreign-denominated assets. If the composition of assets and liabilities differs – in terms of maturity, currency denomination, category of instrument (bonds or shares) or the geographic composition of borrowers (with different abilities to repay or different cyclical positions) – the value adjustments will affect net stock positions. The larger the gross positions, the more likely it is that there will be huge imbalances.

The obvious example is the effect of excessive leverage in the financial sector, one of the aspects of the financial crisis that led to the Great Recession. The emergence of bank imbalances forced a leverage reduction, obliging banks to sell their assets to cover capital losses and rebalance their positions. This in turn caused a drop in market prices which precipitated a domino effect across the world based on the extensive internationalization of financial intermediaries' portfolios. At the same time, this effect was probably fostered also by a sharp increase in levels of risk aversion after (supposedly) very low risk financial instruments, produced as a result of financial innovation (and often very highly rated), turned out to be rather ill-defined, but certainly high risk.

Could all this have been foreseen? And, if so, based on what evidence? In fact, the data required to conduct balance-sheet analyses almost exactly mirror the financial accounts. Our key research question therefore is how far was the financial accounts statistical framework able to anticipate, if not firmly forecast, the Great Recession?

The rest of this chapter is organized as follows. Section 9.2 reviews the relevant literature on the recent financial downturn and past crises. Section 9.3 describes the differences in the financial positions of the major sectors in a set of countries at the turn of the century, which we take as our benchmark for an equilibrium period. Section 9.4 describes the changes in sector balances in the years before the 2007–09 crisis, highlighting the build-up of imbalances that drove the downturn. Section 9.5 concludes by highlighting the strengths and the weaknesses of financial accounts in predicting financial crises and suggests some changes for the collection of data that might be helpful for future analyses.

9.2 Past Currency and Financial Crises and the Current Great Recession

9.2.1 The Evolving Theoretical Framework

The literature on the determinants of currency and financial crises is broad. It can be categorized in three generations of models (see e.g. Burnside et al. 2007). The archetypal first generation currency crisis models were proposed by Krugman (1979) and Flood and Garber (1984). In both these models, crisis originates from the presence of a large fiscal deficit that eventually causes a speculative attack, forcing the collapse of a fixed-exchange-rate regime (see also Krugman 1999). The second generation of models (e.g. Obstfeld 1986) builds on a similar intuition, but

emphasizes that crisis can also be generated by self-fulfilling prophecies, similar to models of bank runs (Diamond and Dybvig 1983).

In the third generation of models constructed following the 1998 Asian crisis, the strong relation between currency and banking crises shifts the focus towards the private sector. In this framework, a currency depreciation following a speculative attack or, more generally, a "sudden stop" in capital inflows causes the emergence of imbalances in private sector net positions.[1] In particular, sectors holding liabilities denominated in foreign currencies experience huge value adjustments as a result of devaluation, which in turn cause their debt positions to increase, forcing reductions in investment and output (Krugman 2010). For these reasons, mismatches within specific sectors of economic activity in the credit and production areas have been seen as key factors in engendering crisis (Corsetti et al. 1998). At the same time, interpretations based on self-fulfilling prophecies have continued to be part of the overall picture (Radelet and Sachs 1998).

In the third generation model frameworks, the financial system is seen as a network of close interconnections between sectors, in which bilateral exposures can cause spillovers capable of triggering cross-border instability, possibly at global level. To analyse these linkages between sectors, Allen et al. (2002) advocate a balance-sheet approach, focusing on the financial stocks of the major sectors of economic activity in each country. The paper by Allen and co-authors is positioned at the crossroads of much of the academic work on international crises. Its main contribution is its focus on risk and the vulnerabilities created by (and displayed in) the mismatches in national balance sheets and domestic sectors. The major conceptual innovation is that the emphasis shifts from flows, in particular fiscal and trade deficits, to stocks. In this view, the emergence of an imbalance between the asset and the liability sides, due for example to price adjustments, calls for a portfolio rebalance that may foster additional price adjustments and the need for further rebalancing, thereby spreading the effect of the initial imbalance to the entire economy.

The framework briefly described above is the starting point for our analysis of the recent financial crisis. The rest of this section summarizes theses and conjectures on the role of imbalances in the build-up to the Great Recession, and how balance-sheet adjustments in each sector helped to spread the crisis across the world. We start by examining changes in size and major characteristics of the assets and liabilities of the most important sectors of economic activity, and continue by focusing on the role of mismatches.

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[1] E.g. the roll-off of cross-border interbank lines to Korean banks during the Asian crisis introduced other vulnerabilities in the corporate and financial sectors of this economy.

9.2.2 Evolution of Financial Assets and Liabilities: their Size and Characteristics during the 2000s

The minor economic slowdown of 2001 was followed by a period of sustained economic growth, low inflation and generally good macroeconomic conditions, which induced policymakers to maintain an expansionary monetary policy and favoured a rapid expansion of credit (Borio 2008; Visco 2009). Fears of a deflationary phase, after the new-economy bubble, may have spurred the Federal Reserve to adopt an accommodating monetary policy, but with no recognition of the potential problems from a bubble in the housing market.

In the same period there was a structural change in the financial markets (Rajan 2006). New players, such as hedge fund and private equity firms, entered with large amounts of liquidity to invest. Supported by changes in technology, financial innovation produced ways to satisfy clients' demands. Deregulation increased competition in the financial sector, removing barriers to entry and reducing supervisory standards.

Financial innovation allowed banks to transform risky assets into seemingly safe securities, although they were characterized by very high levels of complexity and opaqueness. The traditional financial intermediation model was transformed into an originate-to-distribute model, especially in the UK and the US, where the banks created the risk and offloaded it to the entire economy. In a nutshell, on the one side assets were pooled and sold through so-called special purpose vehicles (SPV), and on the other matching liabilities were tranched into securities with different levels of riskiness, from the high-risk equity tranches to (supposedly) riskless AAA-rated tranches. The less risky tranches of structured products, especially from US, encountered large demand from banks keen to avoid the regulatory capital requirements imposed by the Basel II framework (Obstfeld and Rogoff 2009; Brunnermeier 2009) and "searching for yields" in years of low interest rates. The large share of demand for dollar-denominated structured products coming from European banks was funded mainly short term, leading to a rapid increase in gross external assets and liabilities (Lane and Milesi-Ferretti 2007; McGuire and von Peter 2009).

At the same time, the availability of a large supply of low-risk securities was helping to finance the huge international imbalances that were developing. Caballero and Krishnamurthy (2009) reckon that the surge in demand for safe assets caused the rise in leverage and macroeconomic concentration of risk in some financial sectors. The rapid growth of China and other East Asian countries and their huge current account surpluses increased their demand for assets in which to store their savings, reversing the direction of international financial flows (Catte et al. 2010). The excess of emerging and oil-exporting countries in domestic savings has several explanations. In China, precautionary motives related to low social security provision forced households to limit consumption relative to disposable income (Chamon and Prasad 2010). Also, the poorly developed emerging-economy financial markets made investors, and monetary authorities, more willing to acquire liquid securities issued by the public and private sectors of the advanced

countries than to invest in domestic stocks and bonds (see e.g. Caballero et al. 2008). As Mendoza and Quadrini (2010) and Bacchetta and Benhima (2010) show, in the presence of sizeable imbalances and gross positions, a relatively small shock is amplified and can generate huge domestic and international spillovers. The large supply of funds from abroad presented the US financial system with huge profit opportunities, through a surge in the leverage of the financial intermediaries and the creation of structured financial products. The US economy was absorbing large capital inflows from abroad as Asian countries kept buying American securities to avoid the appreciation of their own exchange rates and to hedge against a possible recurrence of the type of currency crisis that had emerged at the end of 1990s (Brunnermeier 2009). However, the risk was not really offloaded, and most of the structured products were insufficiently transparent to allow investors to price them correctly (Duffie 2008).

Ultimately, the poor transparency of single securities plagued the entire asset portfolios of financial institutions. The decline in house prices that caused the drop in the aggregate value of the subprime mortgage loans granted to excessively leveraged households was the trigger for a huge adjustment in the price of structured products. The drop in the value of banks' loan portfolios was swiftly transmitted to the price of structured products, leading to huge changes in the value of the financial sector's total assets. Furthermore, the inception of the crisis promoted increased volatility in asset prices, which for several years had been extraordinarily low. This prompted a rapid increase in the required risk premia which further depressed the price of structured products and the portfolios holding them. As Caballero (2010) highlights, even the senior tranches of structured securities were highly exposed to systemic risk. This risk was largely underestimated by the financial intermediaries who had been stocking opaque assets in their balance sheets, attracted by the high returns and low capital requirements (the more so when – as frequently happened – they were loaded in the trading book of securities), which increased the financial fragility of the system, multiplying the sources of systemic risk. The promise of wide distribution of risk through securitization, tranching and sale to unleveraged investors proved unfounded.

Among the candidate imbalances, the level of indebtedness played an important role, both in the phase preceding the eruption of the financial crisis and during the disordered adjustment period that followed. Household debt had increased substantially in the years before the crisis (for the US, see Palumbo and Parker 2009), especially among the lower income classes. This fact is strictly related to the reduction registered during the 2000s in the saving rates of households, whose net lending worsened and who switched their position from a lending sector to the largest borrowing sector. Although the value of debt was fixed in nominal terms, its service costs were often bound to rise after a few initial years following the switch from teaser loan rates to normal interest rates. Once house prices stopped increasing, it became impossible to continue the widespread formula of renewing mortgage loans at more favourable conditions when the period of teaser rates ended. The effect on household debt was the same as an increase in the nominal value of the debt.

The liabilities of the financial sector were also affected by the value adjustments that took place during the crisis. As stressed by Adrian and Shin (2008), banks and other financial institutions make pro-cyclical use of their leverage, increasing their liabilities during booms and reducing them in downturns. Although the heterogeneity of the institutions within the financial sector hampered the detection of a steady increase in leverage, Palumbo and Parker (2009) find that the sector's aggregate liabilities increased faster than its assets during the mid-2000s. The commercial banks of many countries experienced increased leverage between 2000 and 2006 (Astley et al. 2009), the exception being the US, where the surge was confined to investment banks (Panetta and Angelini 2009).

9.2.3 The Role of Mismatches

Typically, financial crises are triggered by the fear that some economic agents might default and that this might affect an entire sector or even an entire economy. In normal conditions, the balance sheet of a representative economic agent is in equilibrium, with the value of (total) assets at least matching that of its liabilities. As Allen et al. (2002) highlight, mismatches between the characteristics of the assets and the liabilities – for example, in terms of maturity, currency of denomination, liquidity or riskiness – make insolvency much more likely.

Indeed, matched portfolios are never "vulnerable". Unmatched portfolios can be low risk if they are diversified and until a systemic macroeconomic downturn hits a large share of the issuers. In most episodes of financial crisis, the trigger is a negative currency shock that increases market perception of a country's default risk, causing problems in rolling-over short-term government debt (e.g. in Mexico, Russia, Turkey, Argentina) or short-term bank liabilities (e.g. Korea, Thailand, Brazil), in both cases leading to a sharp increase in interest rates. The currency shocks may have different origins, but Corsetti et al. (1998) argue convincingly that persistent current-account imbalances leading to the accumulation of sizeable net foreign liabilities are the most likely cause.

Chang and Velasco (1999) point to the link between currency, maturity, and liquidity mismatches. When domestic banks are highly exposed with short-term liabilities denominated in foreign currencies, any exogenous shock that halts capital inflows can trigger a crisis. For example, a decrease in international capital inflows can trigger a crisis, and especially in countries where banks are heavily indebted to short-term maturities can further exacerbate it by causing a withdrawal of funds from banks. Jeanne and Wyplosz (2001) use a similar argument in documenting the effects of an international liquidity gap in the mid-1990s that affected Indonesia, Malaysia, and Thailand. Moreover, they argue that mismatches in the manufacturing sector, which typically are not hedged against currency shocks, can precipitate a crisis that eventually also affects the banking system.

Leverage is probably the most emblematic case of mismatch. Excessive leverage in the banking sector was at the root of the crisis that hit Korea and Thailand at the end of the 1990s, when many intermediaries were unable to meet the capital

standards required by the Basel agreement after liquidity and currency shocks to their balance sheets. Moreover, pro-cyclical leverage can work as a propagating mechanism during downturns. A drop in asset prices, for example, frequently produces losses and leads to larger drops in bank capital than in total assets, causing leverage to rise. Banks cope with this reduction by raising new capital, which may be difficult during a downturn, or by selling parts of their assets, a strategy which has the effect of further reducing asset prices and possibly triggering a fire sale mechanism (Diamond and Rajan 2009).

Many of the mechanisms described above were at work during the most recent financial crisis. Brunnermeier (2009) lists a number of them. The first involves adjustments to the balance sheets of borrowing financial institutions (e.g. issuers of asset-backed financial paper): a reduction in asset value increased their leverage, reducing their ability to raise funds. The need to adjust their positions prompted borrowers to sell assets, with a negative effect on prices. Margin calls and haircuts in repurchase agreement operations reinforced this mechanism, making it difficult for these institutions to roll over their debt. Another mechanism that triggers crisis occurred on the lenders' side: a reduction in the value of assets caused an increase in leverage that forced the banks to reduce their lending. This produced a liquidity shortage in the short-term interbank market, triggering a "wholesale bank-run" (see also Allen and Carletti 2008). Finally, network effects caused by the large interbank positions of most financial intermediaries spread the effects of the crisis further. Caballero and Krishnamurthy (2008) suggest that the drop in liquidity might also have been caused by the excessive complexity of the structured products and the lack of past observations of their performance, which made it difficult to assess their riskiness reliably.

The literature described so far points to the role of imbalances in causing financial crises, spreading their effects across sectors, and making them harsher. But as Visco (2010) clearly states, in the years before the crisis, imbalances and asset price misalignments went on basically unchecked. In other cases, economists thought that markets were able to manage asset price misalignments and sector unbalances. The question that we ask relates to the extent to which the building of imbalances and mismatches was visible in financial accounts statistics, and whether a closer look at the positions of the different sectors might have helped to explain the way in which the crisis unfolded. To investigate this, we describe what we deem were the sustainable differences in financial positions at the end of the 1990s, and then analyse their evolution since 2000.

9.3   When we were in Balance

Financial accounts provide a great deal of information on a country's financial condition, and constitute a valuable tool to uncover those sector imbalances that might lead to financial distress or even default, highlight potential weaknesses that could dampen a country's financial stability were it to be hit by an exogenous

shock, and identify which sectors would be most severely hit in the event of financial turmoil. In a nutshell, studying a country's flow of funds enables some assessment of the soundness of its overall financial system.

Major differences in the size and composition of the financial assets and liabilities of different sectors are still present, even across the most developed countries (see the analyses in Chaps. 4 and 6 on the financial positions of households, firms and intermediaries, and Chap. 7 on their convergence within European countries). It is common wisdom that households hold a larger share of financial assets in Anglo-Saxon countries and that the role of the public sector is more prominent in Italy and Japan. More careful analysis, however, reveals a number of other features that can prove very useful for interpreting the impact and unfolding of the recent financial crisis, and the possible adjustments required in the coming years.

In this section we provide a picture of the major features of the financial structure of the G7 and some smaller European countries,[2] and analyse the gross and net positions of each institutional sector and its interrelations. Following the usual classification of the European flow of funds, we distinguish between households, non-financial firms, monetary financial institutions, insurance companies and pension funds, other financial intermediaries (in the following, the label comprises financial auxiliaries), general government, and the rest of the world. We focus on average stock data between 1997 and 1999,[3] a period when financial positions were relatively more balanced, before the take-off in imbalances that led to the financial turmoil of 2007–08.

9.3.1 Cross-Country Differences

Before we begin to analyse the financial positions of the different institutional sectors, it is interesting to draw a broad picture of total financial depth. Table 9.1 shows that in the period 1997–99, total financial assets were on average more than 20 times the value of GDP in Ireland, 12.5 times in the UK and 11.3 times in Japan. The US had total financial assets worth slightly less than nine times GDP. Within our sample, the countries with the least developed financial markets were Greece (5.2) and Italy (6.4).[4]

Clearly, the huge differences presented in Table 9.1 reflect various factors, from the role of a country as a financial centre, to the level of financial education of its

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[2] The latter include those economies severely hit by the 2007–09 crisis and the subsequent 2010 euro-area "government debt uncertainty". In Table 9.1, countries are grouped according to dimension and euro/non-euro membership. We do not report data for Canada.

[3] Since data for Ireland are available only from 2000, we provide averages for 2000 and 2001.

[4] Although in absolute terms these ratios depend on the prices of financial assets, and especially stocks, country rankings and relative differences are fairly stable over time, making cross-section comparisons quite robust.

Table 9.1 Financial assets and liabilities of the major sectors of the economy (year-end averages 1997–1999; percentage points over GDP)

	Assets						
Countries	Non-financial corporations	Monetary financial institutions	Other financial intermediaries[a]	Insurance corporations and pension funds	General government	Households	Rest of the world
Germany	100.6	289.1	30.5	54.3	27.8	162.3	98.6
Spain	124.6	197.6	35.2	23.8	26.3	169.3	101.8
France	191.9	259.3	50.5	60.2	38.0	164.0	120.3
Italy	79.8	143.0	54.9	18.3	34.4	227.0	84.8
Japan	146.1	316.0	186.7	83.4	79.2	275.7	42.5
United Kingdom	87.1	302.5	88.4	162.9	27.1	314.6	272.1
United States	89.5	94.1	133.5	119.5	22.5	345.3	60.7
Netherlands	119.7	230.2	257.0	170.1	35.1	291.2	421.6
Portugal	193.2	208.4	41.0	28.4	33.2	227.1	125.4
Greece	71.9	150.0	14.4	4.1	35.2	166.9	76.4
Ireland[b]	188.5	449.8	322.1	91.0	24.8	150.6	795.4
	Liabilities						
Countries	Non-financial corporations	Monetary financial institutions	Other financial intermediaries[a]	Insurance corporations and pension funds	General government	Households	Rest of the world
Germany	175.4	280.5	31.0	62.8	62.7	70.1	90.2
Spain	223.8	198.9	35.4	23.2	77.9	47.2	72.0
France	280.5	247.3	47.3	61.0	76.8	44.4	126.8
Italy	169.9	147.6	44.7	23.7	138.6	29.8	83.9
Japan	270.2	317.3	184.8	81.2	124.5	86.1	62.0
United Kingdom	264.6	297.5	124.2	182.2	58.1	71.8	256.3
United States	284.1	105.0	144.0	120.7	60.3	70.6	50.8
Netherlands	274.5	237.6	279.4	174.8	80.0	73.9	397.2

Portugal	343.4	220.7	42.5	29.2	64.7	60.3	117.6
Greece	159.8	156.6	14.5	8.4	108.5	15.7	55.4
Ireland[b]	286.7	468.2	302.0	97.0	38.4	54.2	775.7

Net worth

Countries	Non-financial corporations	Monetary financial institutions	Other financial intermediaries[a]	Insurance corporations and pension funds	General government	Households	Rest of the world
Germany	−74.8	8.6	−0.5	−8.5	−34.9	92.2	8.4
Spain	−99.2	−1.4	−0.3	0.6	−51.6	122.0	29.8
France	−88.6	12.0	3.1	−0.7	−38.8	119.6	−6.5
Italy	−90.1	−4.5	10.3	−5.3	−104.2	197.2	1.0
Japan	−124.0	−1.2	2.0	2.1	−45.3	189.6	−19.5
United Kingdom	−177.5	5.1	−35.7	−19.3	−31.1	242.9	15.7
United States	−194.5	−10.9	−10.6	−1.2	−37.7	274.6	9.9
Netherlands	−154.8	−7.3	−22.4	−4.6	−44.9	217.2	24.4
Portugal	−150.2	−12.2	−1.5	−0.8	−31.4	166.8	7.9
Greece	−87.9	−6.6	−0.1	−4.3	−73.3	151.2	21.0
Ireland[b]	−98.2	−18.4	20.1	−6.0	−13.6	96.4	19.7

[a]Other financial institutions include financial auxiliaries
[b]For Ireland the averages refer to the period 2001–02

population, to the relative importance of intermediated as opposed to arm's-length finance. For example, if we exclude the assets held by foreign investors (rest of the world), the value of total gross financial assets in the UK drops below the level for Japan. Indeed, while both countries host major financial centres, the relative importance of international financial intermediation, especially wholesale, in the London markets is much larger than in Tokyo. The varying incidence of financial intermediation explains much of the overall differences: the US, UK and Japan and, among the smaller countries, the Netherlands and Ireland, are where the assets of financial intermediaries, insurance companies and pension funds were the highest; in Greece, Italy and Spain they are the lowest. In terms of financial education, this is known to be a key determinant of the level of financial depth in the household sector (see e.g. Van Rooij et al. 2007), an aspect we analyse below.

Households. Chap. 4 by Bartiloro et al. shows that total net household worth, which also includes real wealth, is extremely high in Spain, intermediate in Italy, France, the UK and Japan, and low in Germany and the US. Clearly, it depends in large part on the incidence of home ownership, which is particularly widespread in Spain and Italy. At the same time, it also mirrors the different usage of financial products by some families in the different countries.

A first measure of financial depth in the household sector is the sum of total financial assets and liabilities as a ratio of GDP. Table 9.1 shows that this ratio is highest in the US (4.2 times GDP), the UK (3.9), the Netherlands (3.7) and Japan (3.6). In the other countries, it takes values between 1.8 and 2.9 times GDP. These differences depend on heterogeneities on both the asset and liability sides. It is interesting, however, that households in countries with a higher incidence of financial assets over GDP typically also show a higher incidence of liabilities, while this seems not to be the case for real assets, implying that the large home ownership in Spain and Italy is not financed by the financial sector.

The countries where households have the highest ratios of financial assets to GDP are the countries with overall more highly developed financial markets: US (3.5 times GDP), UK (3.1) Netherlands (2.9) and Japan (2.8). Germany, France, Spain and Greece show correspondingly low levels, between 1.6 and 1.7 times GDP. Ireland is an exception, with very high financial depth but a low level of household assets (1.5), while Italy and Portugal are in the middle range, at about 2.3. A key factor explaining these differences is the diffusion of public pension schemes, as argued by Semeraro in Chap. 5, and discussed in more detail below. But holdings of financial assets are also influenced by the propensity to invest in real assets: countries where households have higher levels of net financial wealth show accompanying lower levels of real assets.

The composition of households' financial assets is fairly heterogeneous across countries in this period. The incidence of deposits is large in most countries, well above 20% almost everywhere and up to more than 50% in Japan. The exceptions are the US and the UK among the larger countries, with respectively 10% and 21% of total households' assets, and the Netherlands (19%). Shares, including unlisted participations and mutual fund shares, represent a large portion of households' assets in the US, Italy and Spain, but are substantial in most other countries except

Japan (10%). The liabilities of insurance companies and pension funds account for a very large share of households' assets in the UK and the Netherlands. Their share is also fairly large in many other countries, except those in the Mediterranean where it is negligible, partly thanks to the generous coverage provided by public pension schemes. Finally, only in Italy bonds account for a substantial share of households' financial assets, as a counterpart of public sector and bank indebtedness.

On the liability side, in the group of the largest countries, Japanese households show the highest level of gross indebtedness, at 86% of GDP, while Germany, the UK, the Netherlands and the US are in the middle range at about 70%. In Spain and France, the level is around 45%, while Italian households have a fairly low level of financial liabilities (30%), despite widespread home ownership. As expected, almost all households' financial liabilities consist of loans.

By and large, households' net positions reflect the incidence of financial assets. The US and the UK stand out with values of 2.7 and 2.4 times GDP, suggesting a large capability of the household sector to absorb potential exogenous shocks, but also a large dependence on financial market conditions. The value is about twice the size of GDP in the Netherlands and Japan, as well as in Italy, owing to the very low level of indebtedness. Germany, Ireland, Spain and France show much lower levels, between 0.9 and 1.2 times GDP.

Non-financial firms. Chap. 6 by Bartiloro and di Iasio analyses the financial position of non-financial firms in detail, focusing on the composition of the liability side. As is well known, structurally, non-financial firms are net borrowers in the financial markets. However, the differences across the countries considered in our analysis are much starker than in the case of households. For instance, in the period 1997–99 the net liabilities of US and UK firms were nearly twice the size of GDP (respectively 1.9 and 1.8 times), while in Germany they were less than 0.8 of GDP. The Netherlands and Portugal showed values of around 1.5 times GDP, while all other countries were in a narrow range between 0.9 and 1.3.

On the asset side, cross-country differences are generally less marked, with the exception of Portugal, France, and Ireland, where firms' holdings of financial assets are about twice the size of GDP. All the other countries show values between 0.7 and 1.5 times GDP. The majority of these assets consist of shares in other firms, most likely pointing to the diffusion of cross-participations and pyramid ownership structures. In Italy, the incidence of commercial credits, which are included in other assets, is also relatively high.

Among the largest countries in our sample, the gross liabilities of non-financial firms range from values of 1.8 times GDP for Germany to 2.8 for the US. Overall, we can identify three broad groups: Greece, Germany and Italy with relatively low values, between 1.6 and 1.8; Spain in the middle range (2.2); and the US, France, Japan, Ireland, and the UK with the highest values; Portugal is a clear outlier (3.4). In all the countries except Japan, the largest share of the liabilities of non-financial firms consists of shares. Their incidence is particularly high for Greece, a pattern probably related to the similarly large number of shares held by firms on the asset side, and also for the UK and the US. The incidence of bank loans is highest in Japan (40%). This is consistent with the widely accepted classification of some

countries as bank oriented (e.g. Allen and Gale 2001, and Beck et al. 2001), and indeed the incidence is relatively high also in Germany, Italy, Ireland, the Netherlands and Portugal, at around 30%. Bonds are less important, representing a non-negligible share of total liabilities in only the US, Japan, the UK and, to a smaller extent, France.

Government. The public sectors of all the countries in the sample are net debtors, but with considerable differences across countries. Italy's net debtor position is roughly equal to its GDP, with total gross liabilities amounting to more than 100%. The second most indebted large country is Japan, with a net position worth 45% of GDP based on its substantial gross liabilities (124% of GDP) and gross assets (79% of GDP, the largest value in our sample). Next is Greece, with net liabilities amounting to 73% of GDP. Spain's net liabilities total 52% of GDP due to the persistently low levels of its public deficit in the years before 1997, partly thanks to net transfers from the EU and large FDI inflows. The remaining countries – including France, Germany, the UK and the US – show much lower levels of net indebtedness, between 14% of GDP in Ireland and 45% in the Netherlands. In terms of composition, assets are fairly heterogeneous across countries, partly because of the different roles of public pension schemes (see Chap. 5 by Semeraro), while bonds show by far the highest incidence in liabilities.

Aggregate non-financial sector. In the recent debate on public sector debt some commentators have stressed that a more objective view of a country's financial imbalances can be gained from looking at the overall net position of the non-financial sectors. From a broad perspective, this can be linked to the literature on Ricardian debt neutrality (e.g. Barro 1974). If, in a given country, a high level of public sector debt is matched by low levels of indebtedness among households and non-financial firms, and the composition of asset portfolios is relatively stable, resilience to exogenous shocks that might disrupt financial stability is significantly higher. On the other hand, given the broadly balanced position of financial intermediaries, the net indebtedness of the three sectors above (households, non-financial firms, and government) roughly mirrors the net credit position of the rest of the world.

At the end of the 1990s, the total net assets of US and UK non-financial sectors were worth respectively 42% and 34% of GDP, mainly owing to the large asset portfolios of households and the relatively low level of general government debt. At the other extreme, Spain's non-financial sector was a large debtor, at nearly 30% of GDP. In all the other countries, the position was much more balanced, ranging from a debit balance of 18% of GDP to a credit balance of about the same size. This applied to Japan, the Netherlands and Italy. In the case of Italy, the very high level of net public sector debt was matched by lower indebtedness of households and non-financial firms, but most of the rebalancing came from the low level of net liabilities of non-financial firms. At the aggregate level this can be seen as a positive feature of the financial position of Italy's non-financial sector. However, it is also an effect of the reduced ability and willingness of small Italian firms to access financial markets, which it has been argued has huge negative effects on their ability to grow

and take up profitable investment opportunities in the fastest growing sectors of industrial activity.

Financial sector. The depth of the financial sectors in our sample of countries varies widely. While overall net positions are relatively balanced, ranging from a debit balance of about half of GDP in the UK, to a credit balance of 14% of GDP in France, the sum of assets and liabilities ranges from 4.3 times GDP in Italy to 17 times in Ireland and more than 10 times GDP in large countries such as the UK and Japan. The sum of assets and liabilities is low in Spain, Greece and Portugal and, quite surprisingly, amounts to 7.2 times GDP in the US, a market-based financial system.

In all countries except the US, monetary financial institutions constitute the largest share of the financial sector, with values ranging from about 35% in the Netherlands to 77% in Spain (and 89% in Greece). In the US, the largest share is that of insurance companies and pension funds (34%, about 2.4 times GDP), while gross assets and the liabilities of monetary financial institutions amount to only twice GDP, the lowest level in our sample of countries. Insurance companies and pension funds figure prominently in the UK and the Netherlands (about 3.4 times GDP), but not the Mediterranean countries, which show values of less than half of GDP. Since the positions of these intermediaries are broadly balanced, the figures imply that insurance company and pension fund liabilities, which are held mostly by families, are comparable to assets.

The relative incidence of other financial institutions is highest in the Netherlands, the UK, the US (because of the large weight of investment banks), and Japan, and lowest in Greece, Germany, and Spain. With the exception of the residual sector of other financial intermediaries, the composition of assets and liabilities in the financial sector is fairly similar across countries, with some differences in the incidence of deposits on the asset side.

Rest of the world. Gross external positions provide a neat picture of the degree of internationalization of each country's financial sector. Within the largest countries in our sample, the sum of assets and liabilities ranges from values around 1.1 times GDP in Japan and the US, despite their large financial sectors, to 5.3 times GDP in the UK, a relatively smaller country hosting one of the world's largest financial centres. In Ireland, a small country with many financial institutions, the value is 15.7 times GDP, and in the Netherlands it is 8.2 times. All the other countries record values between 1.3 and 2.5 times GDP.

Statistical discrepancies aside, each country's financial position with respect to the rest of the world should be equal to the sum of the positions of all the other sectors of economic activity. Since the position of financial intermediaries is broadly balanced, a large private sector debit balance is typically mirrored by a credit position in the rest of the world or, to use balance-of-payments terminology, a negative net external position. This was the case at the end of the 1990s in countries such as Spain, the Netherlands, Ireland and the UK, which had negative net external positions between 16% and 30% of GDP. Italy, Portugal and Germany had rather more balanced positions, while France and, even more so, Japan had positive positions (respectively 7% and 20% of GDP).

In aggregate, the countries analysed show a largely negative aggregate net external position, mostly due to US foreign indebtedness, which was not as large with respect to its GDP in the period examined, but was already huge in absolute terms. Clearly, this mirrors the net external surpluses of the oil-exporting countries and Japan (Visco 2009).

With the benefit of the literature on the determinants of the financial crisis and the danger of mismatches (e.g. Allen et al. 2002), three facts stand out neatly from these data. First, the very high incidence of financial wealth of US and UK households, which might suggest powerful wealth effects on consumption. Second, the large heterogeneity of the gross positions of financial intermediaries, which probably hinder dangerous maturity and exchange-rate misalignments. Third, the weight of external imbalances, which are sustainable over time only if sizeable productivity increases in the traded goods sector are expected. In many cases, imbalances have increased since the beginning of the new millennium, laying the foundations for a crisis. We turn to this in the next section.

9.4 Financial Accounts before and during the 2007–09 Crisis: What the Data Show

There is widespread agreement that the 2007–09 world crisis originated in the US housing market, and was transmitted to the financial sectors of a number of advanced economies before or at almost the same time as it invaded the real economy. Ex post – and too quickly, based on the number of economists and institutions that had backed the sustainability of house price development – there was talk of a bubble bursting. The crisis was precipitated not by the inability of households to repay mortgages, which would have had a severe effect on the balance sheets of mortgage-granting financial institutions but would have stopped there; it was due to the link between the liability side of the latter and the asset side of almost all financial intermediaries in a large number of countries.

The same financial multiplier mechanism was at work in fast growing, financially unrepressed economies such as Ireland. Transmission to the real economy, on the other hand, was unavoidable: the collapse of real-estate values on the asset side of households prompted a sudden increase in saving to reduce indebtedness, and led to the fall in demand that accounted for a large share of the recession.

Here we consider the message that was being conveyed by the levels of and changes in financial stocks as reflected in sector balance sheets. Financial flows differ from changes in balance sheets in terms of capital gains or losses. If large capital gains or losses capable of disconnecting flows accumulated over years from stocks are unusual, balance-sheet figures are a kind of "sufficient statistics" of the overall picture, especially in relation to net balances. In the medium run, reliance on continuous future capital gains to compensate for a declining balance sheet should be treated with suspicion (although there are opposing views, such as Gourinchas and Rey 2007). The flows are the key reference for evaluating the sustainability of a worsening balance-sheet position in the longer run. Moreover, in the case of

households and government, the concept of "excessive leverage" cannot be properly defined because there is no "capital" to wipe out, and sustainability is strictly related to the ability to save and the ability to obtain a sufficiently large primary surplus, i.e. with a flow dimension. When the increase in savings that would be necessary to cover the capital losses suffered by families, or the primary surplus needed to cover future repayments of additional public debt, are large compared with actual flows, the adjustment process may become unfeasible, or the required drop in aggregate demand may dampen economic growth for years (Eggertson and Krugman 2010).

This measure of "excessive leverage" is only part of the story. There are also the unexpected and unforeseen consequences of risk sharing on a worldwide scale. The liability side of mortgage-granting financial institutions and other loan-to-family-granting financial institutions was connected with the asset sides of innumerable banks, insurance companies, and pension funds in the US and other advanced economies, thanks to the repackaging and redistribution of bonds allegedly representing the no-risk share of loans. The exceptional liquidity of these bonds eased their spread to balance sheets all over the world. The period of low interest rates and easy finance of the 1990s made these securities even more appealing to financial institutions in search of profits through the sale and purchase of growing amounts of self-proclaimed risk-free bonds. The risk-free tag, gained through the process of dissecting and repackaging certified by the major credit-rating agencies, was essential to justify the lower accumulation of own capital by financial institutions, permitting huge increases in leverage, and the use by a large number of intermediaries of short-term or very-short-term liabilities, such as repos, to finance the purchase of such self-proclaimed risk-free and highly liquid long-term bonds.

The recent work of international institutions and academic analysts has already produced some consensus on the importance of the financial accounts of the domestic sectors and of the resulting international investment position of a country for assessing financial soundness. Two studies in particular are aligned to our approach. Palumbo and Parker (2009) and Eichner et al. (2010) investigate (in loose terms) whether looking at US sector financial accounts might have signalled the weaknesses and imbalances that subsequently precipitated the crisis. Eichner et al. (2010) go further, asking whether existing, well-established data on macro financial flows could have helped to identify areas of financial weakness that, might eventually have led to further explorations into the macro or micro dimension using additional available data.

Indeed, it can be said that the US was at the core of the financial crisis and the origin of the financial innovation that spread internationally through financial intermediaries. The process built new vulnerabilities in balance sheets in a large number of countries. From this perspective, a focus on the US is justified. However, if the picture described above is consistent, vulnerabilities should have been evident in other countries as well. Was this the case.

To answer that question, in Figs. 9.1–9.3 we compare the evolution of domestic and country balance sheets for the same G7 and European countries analysed in Sect. 9.3. Of the distinctive structural differences between the countries highlighted
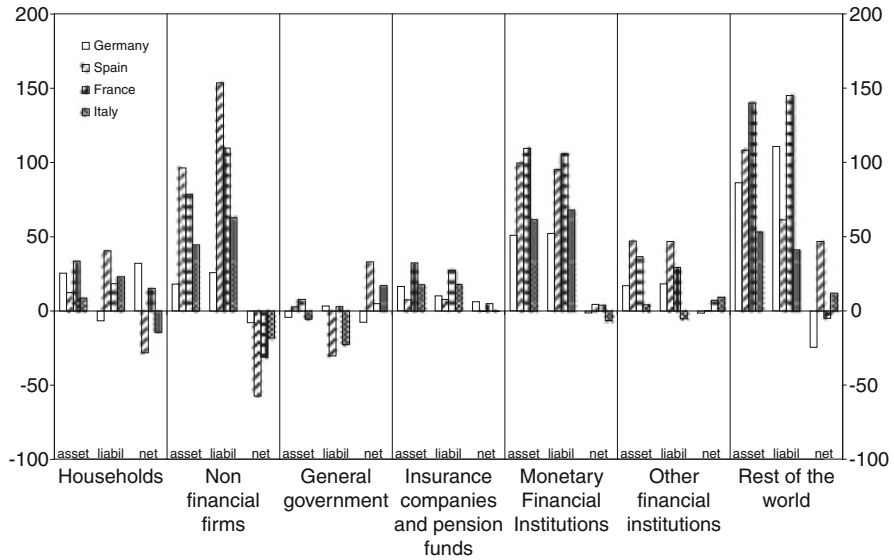
Fig. 9.1 Large euro countries: financial accounts (absolute changes of stock values over GDP between 2007 and 1997–1999 year averages; percentage points)
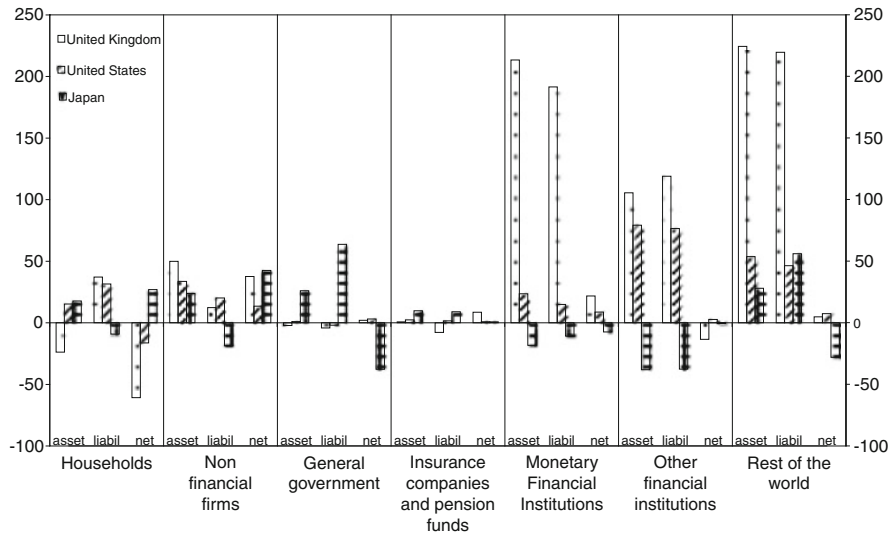

Fig. 9.2 Large non-euro countries: financial accounts (absolute changes of stock values over GDP between 2007 and 1997–1999 year averages; percentage points)
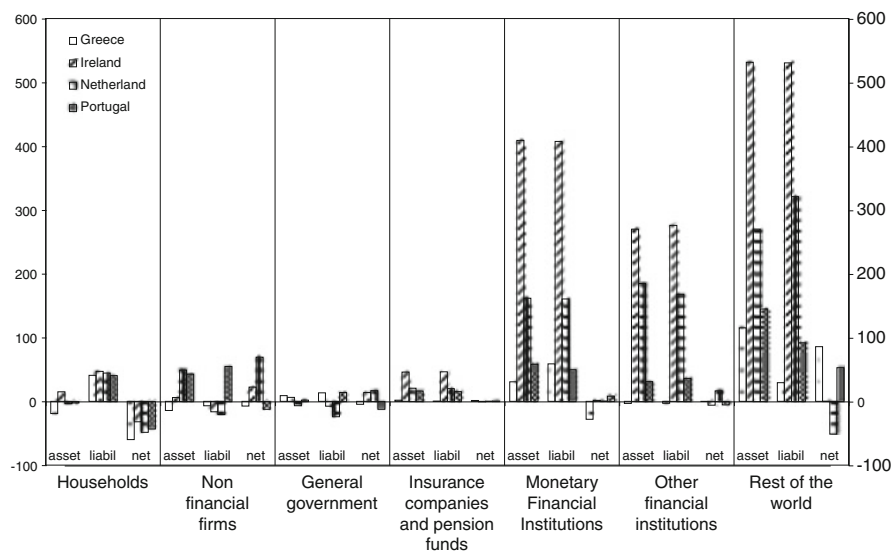
Fig. 9.3 Small euro countries: financial accounts (absolute changes of stock values over GDP between 2007 and 1997–1999 year averages (1); percentage points). (1) For Ireland year averages refer to the period 2001–02

above, some persisted over 10 years, some underwent sizeable regression to the mean, and some increased.

The common pattern between the end of the 1990s and 2007, just before the outbreak of the crisis, is the extraordinary increase in international integration: all countries experienced increased integration of their assets and liabilities with the rest of the world. In the smaller countries (Austria, Belgium, Greece, the Netherlands, Portugal, but including the UK), this increase was very large, of the order of 200% of GDP. In Ireland, the increase was from 800% of GDP to a skyrocketing 1,400%, but with an almost balanced net external position due to banking intermediation, SPV and mutual funds. Gross assets and liabilities with the rest of the world increased in Italy, Japan and the US by smaller amounts, around 50 percentage points of GDP.

In terms of trends, in one group of countries in our sample we can see a large decrease in households' net assets due to a surge in gross liabilities of the order of 30–40% of GDP (in Spain, Portugal, Greece, Ireland, the Netherlands, the UK, and the US), compared with improvements in the net positions in some other countries (Germany, Japan, and France). The reduction in the net position of households in Italy was comparatively minor, amounting to 14% of GDP.

The pattern for the rest of world net positions reflects the well-known global imbalances. France's position remained almost exactly balanced (the official figure in 2007 was −8% of GDP), Germany showed a rapid accumulation of net assets (from around 2% to 26%), and the countries with persistent current-account deficits (Spain, Portugal, Greece) shifted from net liabilities of around 30% of GDP at the end of the 1990s to 80–90% of GDP at the onset of the crisis.

In the UK and US, the position of general government shifted from a surplus at the end of the 1990s, to a deficit in 2007, but with modest effects on the ratio of public debt to GDP thanks to the sustained economic growth experienced in those years. In most of the other countries, the persistent public sector deficit tended to contract up to 2007, but on average was high in Japan and Greece, and lower in France, Italy, and the UK.

The net worth of the non-financial firm sector tended to follow the business cycle, with a reduction of debt in the slowdown following the "dotcom" crisis, followed by a progressive increase until 2008. Overall, this sector contributed positively to aggregate private saving in Japan, the UK, the Netherlands, and the US, which reduced indebtedness before the crisis years. France, Italy, and Spain followed a more historically traditional pattern, with corporations financing new investment, partly adding to their debt. In Portugal and Greece, the overall contribution of the non-financial sector was almost neutral.

This completes our analysis of evolutions before the crisis. However, we should also consider the relative levels and the aggregate of sectors. Japanese firms' net liabilities decreased while household net assets increased; the public deficit, although large, did not compensate entirely for domestic private sector saving. The already huge net assets on the rest of the world increased. In Portugal and Greece, non-financial firms and public sector deficits increased by small amounts, while the already low levels of household saving were eroded by more and more liabilities. In Spain also, the contribution of corporations was large, with similar increasing debt with the rest of the world, which the virtuous public sector balance was unable to offset. In France and Italy, structurally high household net stocks of savings changed only marginally due to small increases in assets and modest rises in liabilities.

The overall view of some 10 years of financial accounts as an indicator of growing disequilibrium and vulnerability is mixed. Certainly, the large changes in one direction in the balance sheets of some sectors warranted closer inspection, but the country with the greatest vulnerabilities, the US, was producing comprehensive statistics. Inspection of the integrated US real and financial accounts (not available for most of the other countries examined here), as Palumbo and Parker (2009) suggest, would not have shown an increase in household leverage, precisely because of the continuous increases in house prices in the US (as in the UK, Ireland, and Spain). What the financial accounts on their own would have suggested was a closer look at the huge amount of selling, to the rest of the world, of assets representing US household liabilities and the financing of their purchase by short-term liquidity.

The imbalances were accumulating in the balance sheets of households and the financial sectors of countries other than the US. It is received wisdom that negative savings at national level are sustainable if foreign debt finances new investment in productive capital. Doubts were being cast on the large and increasing current-account deficits in rich countries (Blanchard 2007) even when they resulted in imbalances between private savings and private investment. In the case of Spain, for example, the current-account deficit partly financed a consumption boom. In addition, debts are not all alike. As suggested by Giavazzi and Spaventa (2010), net

indebtedness to the rest of the world should finance investment in the traded goods and service sectors, because it is only a future surplus in goods and services that can satisfy the condition of sustainability of the present-day deficits. Again, in Spain, the increase in net indebtedness with the rest of the world had its counterpart in the real investment stock of non-financial firms, and in the smaller net financial position of households. Further analysis could have shown that part of this investment by firms was in the real-estate sector, a non-traded sector, with a small share in buildings and equipment associated with international travel. Private deficit was only partly balanced by the reduction in general government net debt, helped by significant economic growth and fiscal discipline.

UK data show that the balance with the rest of the world did not change in the 10 years before 2007. The net balance of households decreased dramatically as a result of more loans on the liability side and a reduction in assets, mainly shares and mutual funds. At the same time non-financial firms reduced their net liabilities, financing investment and an increase in financial assets with corporate saving (retained earnings). The almost unchanged net foreign position was the result of a huge increase in both financial assets and liabilities, which corresponded to the increase in gross assets and liabilities in the banking and financial sectors. In terms of the composition of assets and liabilities by instrument, it is apparent that the growth of banks' own capital (shares on the liability side) did not compensate for the enormous increase in intermediation. In other words, aggregate leverage by banks and financial intermediaries increased substantially, sidestepping the capital regulations set by supervisory authorities.

In other countries, such as Germany, France, and Japan, households continued to add to their comparatively large net assets, with oscillations governed by the ups and downs of stock markets and stock prices. In Japan and Germany, physical investment by firms remained small, with negative or small financing needs. In Italy, the public sector reduced its large net debt by a few percentage points thanks to the discipline imposed by the Maastricht Treaty. This more "traditional" behaviour meant that the countries in this group, for different reasons but based on a decade of lower growth, were on safer ground when the financial crisis hit. It was real sector transmission that subsequently hit Italy hard through the collapse of external trade.

The outcome of the process of financial deepening was a large increase in network connections between sectors and countries that resulted in a "faster than ever" transmission of "relatively small" losses. Castrèn and Kavonius (2009) examine and document links and channels that may undermine financial stability, looking at the bilateral exposures between sectors in the euro area. Since this is an applied work on a balance-sheet crisis, the authors correctly refer to "a loss" and not a shock triggering the crisis. This loss, in turn, is the result of an imbalance built up over the years. The authors do not, as we try to do here, attempt to identify the originating imbalance in the data, but their account of the balance-sheet propagation mechanism complements our work. The existence of a multiplicative effect of financial links is documented by Adrian and Shin (2010; see also the references therein using a balance-sheet approach). They interpret leverage as a strongly pro-cyclical variable, resulting in a "local" asset price downturn which translates into

a larger aggregate loss. During an asset price increase (a boom), financial inter-
mediaries find themselves with increased capital (i.e. lower leverage) and react,
expanding balance-sheet size by creating new assets and increasing liabilities (i.e.
higher leverage). A larger size of financial intermediaries corresponds to larger
aggregate liquidity. This is matched by the lower liquidity of assets during a de-
leveraging cycle, with a negative feedback on asset prices and a further deteriora-
tion in balance-sheet size. The macroeconomic risk incurred by the countries most
severely hit, principally through the collapse of banks and financial firms, was
due to a combination of rapidly increasing leverage of households, public sector,
financial intermediaries (or some of them), and increased domestic and interna-
tional connections. The origins of these events can be traced back to policies:
according to Visco (2009), in the US, accommodative monetary policies were
kept in place for too long, and the export-led strategies of countries that pegged
their money to the one of largest importers went too far, destabilizing world
asset prices.

9.5   Conclusions

We began this chapter by asking whether a closer look at countries' financial
accounts might have helped us to foresee the Great Recession. Our analysis
shows that the answer is, only partially.

Two aspects of the way in which the crisis unfolded could have been anticipated
had more attention been paid to some of the characteristics of the evolution of
financial accounts in recent years. First, and most important, the massive increase in
international integration should have made it clear that any financial shocks would
have global effects. There is also an impression that, once the crisis erupted, those
countries (such as Ireland) that integrated most aggressively were among those
most severely hit; however, more careful analysis is required to confirm this.
Second, countries where the reduction in household savings caused a sharper
reduction in the net assets of the non-financial sector – in particular the UK, the
US, and Ireland, but also Spain, Portugal, and Greece, where the increased net
liabilities of non-financial firms were an added effect – were, almost without
exception, also severely affected by the crisis.

Better data on maturity composition and more careful analysis would have
helped to highlight the risks of the huge sales abroad of assets representing US
household liabilities financed by short-term liabilities of banks and other
intermediaries. To make the situation even worse, these intermediaries did not
increase their own capital at a rate that could match the surge in intermediation,
and the underlying collateral did not prove a substitute for own capital. Other
statistical sources might have shown this trend better, but it could be seen from
the financial accounts. The advantage of financial accounts is that they show the
links between these patterns, between households and the financial sector, and the
financial sector and the rest of the world.

An interesting feature that emerges from the data is that flows and balance-sheet changes are much more important in understanding the crisis than actual stocks. In most cases, structural differences in the value of financial assets and liabilities across countries since 2000 had a much smaller effect on the unfolding of the crisis than their evolution. The UK and the US, for example, have been severely hit by the crisis, but they are still among the countries where households hold the largest amount of financial assets. It was precisely the drop in these values that precipitated the crisis.

So can we learn from this analysis? Financial crises are always similar, but never identical. One clear message seems to be that too rapid changes in financial positions need to be monitored closely, since they may hide dangerous imbalances and mismatches. Another important lesson is that financial accounts are not enough to understand the soundness of the system. A careful look at the sustainability of the prices of real and financial assets is essential: it should always be remembered that the Great Recession was triggered by a drop in house prices, whose high level hindered the upsurge of households' leverage in the US, Spain, and Ireland.

Can we learn something for the process of recovery from our analysis? In the aftermath of the financial crisis, wide adjustments took place within and across sectors. He et al. (2010) document that assets moved from the private to the public sector. For example, governments bought non-banking financial sector assets (e.g. agency-backed MBS), when intermediaries proved unable to refinance their positions due to the contraction in the repos market and began a quick de-leveraging. Also, governments and central banks helped the banking sector by indirectly absorbing part of their structured products (e.g. offering debt guarantees), and bailing-out the most fragile institutions.[5] In the coming years it will be necessary to monitor closely the emergence of new imbalance and mismatches, which most likely will involve the public sector, households, and the rest of the world, and the key role of financial intermediation.

Finally, do we need more data? Following the crisis, international institutions are promoting new initiatives to cover the information gaps that may have contributed to the general misunderstanding of the threat from the progressive build-up of imbalances. Hindsight is always suspect, but the exercise would seem to have merit. We have shown that some statistics which hinted at the accumulation of imbalances were available before the crisis; however, there are others that were not. Maturity mismatches stand out as culpable: they played a major role in triggering and spreading the financial crisis, but they were not easily detectable from a scrutiny of financial accounts. Currency mismatches, even less easily detectable from these sources, did not bite in the Great Recession, possibly due to the rapid interventions of the monetary authorities to accommodate short-term excess demand for US dollars on the interbank market.

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[5] See, for example, Panetta et al. (2009).

In the aftermath of the worst crisis since the Great Depression of 1929, it would seem obvious that any tool that could have helped to forecast and avoid another such event should have been used, and must be used in the future. As we argue above, financial accounts may help us to understand the potential effects of financial imbalances on the real sector, by showing the evolution of the links between sectors in surplus and sectors in deficit. However, the picture they provided was probably insufficient to depict the true extent of the problems masked by apparent stability in the real and financial sectors in the years before the crisis. Nevertheless, more careful scrutiny would have given an indication of the magnitude of the dangers ahead.

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