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THE ROLE OF FINANCIAL MARKETS AND INNOVATION IN PRODUCTIVITY AND GROWTH IN EUROPE

by Philipp Hartmann,
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In 2007 all ECB publications feature a motif taken from the €20 banknote.

This paper can be downloaded without charge from http://www.ecb.int or from the Social Science Research Network electronic library at http://ssrn.com/abstract_id=1005850.

1 An earlier version of this paper was prepared upon request of the Finnish Presidency as a background document for a discussion of European Union finance ministers and central bank governors at the Informal ECOFIN Meeting in Helsinki on 8 and 9 September 2006. It partly draws on work and papers to which also the following persons contributed: Annalisa Ferrando, Angela Maddaloni, Simone Manganelli, Markus Baltzer, Antonio Ciccone (Universitat Pompeu Fabra), Friedrich Fritzer (Oesterreichische Nationalbank) and Bernadette Lauro. We are grateful for the encouragement and the many comments we received from Franklin Allen, Asli Demirgüç-Kunt, Lucas Papademos, Lucrezia Reichlin, Antti Suvanto, Martti Hetamäki, the participants of the ECOFIN Meeting, Torsten Beck, Violetta Damia, Frank Dierick, Francesco Drudi, Corinna Freund, Doris Keller, Hans-Joachim Klöckers, Philippe Moutot, Anssi Rantala and many other people who cannot all be listed here. None of the persons listed, however, should be held responsible for the content of the paper. The results presented have been derived from internal and external research. They do not necessarily reflect the position of or bind the European Central Bank.

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ABSTRACT

The extended period of limited growth experienced until recently in many European countries raises the issue as to which policies could be most effective in improving their economic performance. This paper argues that further financial sector reforms may be a valuable complement to ongoing efforts to reform labour and product markets. There is a long-standing view in the economic literature that well-functioning financial systems allow economies to exploit the benefits of innovation in terms of productivity and growth. Moreover, measured productivity differentials between Europe and the United States seem to originate particularly in the financial sector and from sectors that are particularly dependent on external financing.

Building on and summarising the existing literature, this paper first introduces a number of concepts that are important for financial sector analyses and policies. Second, it presents a selection of indicators describing the efficiency and development of the European financial system from the perspective of a variety of dimensions. Third, an attempt is made to estimate the extent to which greater financial efficiency might improve the allocation of productive capital in Europe. While in the recent past the research and policy debate in Europe has focused on fostering financial integration, the present paper puts the main emphasis on financial development or modernisation in the context of the finance and growth literature.

The results suggest that there are a number of ways in which the financial market framework conditions in Europe can be improved to increase the contribution of the financial system to innovation, productivity and growth. The most robust conclusions can be drawn for certain aspects of corporate governance, the efficiency of legal systems in resolving conflicts in financial transactions and some structural features of European bank sectors. For example, econometric estimations indicate that improving these conditions is likely to increase the size of capital markets – a summary measure of overall financial development – and thereby enhance the speed with which the financial system helps to reallocate capital from declining sectors to sectors with good growth potentials.

JEL codes: G00, O16, O43, E61

EXECUTIVE SUMMARY

The extended period of relatively slow growth and high unemployment experienced until recently in many European countries has led to increased efforts to identify policies that could improve economic performance. The reasons for the structural economic weakness are manifold, and the Lisbon Agenda underlines the need for a multi-sector approach. This paper focuses on the financial sector and, in particular, on potential ways of improving its functioning and contribution to productivity, innovation and growth in Europe.

The paper has three main parts. Building on and summarising the existing literature, Section 2 introduces a number of concepts that are important for financial sector analyses and policies. Section 3 presents a selection of indicators that describe the efficiency and development of the European financial system from the perspective of a variety of dimensions. Section 4 makes a first attempt to estimate the extent to which greater financial efficiency might improve the allocation of productive capital in Europe. As some of the empirical results are based on relatively recent research, their robustness has not yet been fully examined. They should therefore be interpreted with caution.

This summary briefly describes a few key concepts used in the paper and the methodologies and data of the analysis before going on to discuss the main research conclusions with policy relevance. The last part summarises other conclusions drawn in the paper.

CONCEPTS AND METHODOLOGY

The efficiency of a financial system, that is the set of intermediaries, markets and infrastructures through which households, corporations and governments obtain funding for their activities and invest their savings, is positively influenced by financial development. Financial development (which, for industrial countries, is perhaps better described as financial modernisation) refers to the process of financial innovation as well as institutional and organisational improvements in a financial system that reduce asymmetric information, increase the completeness of markets, add possibilities for agents to engage in financial transactions through (explicit or implicit) contracts, reduce transaction costs and increase competition.

While previous research and policy work has emphasised the importance of financial integration, this paper focuses on the role of financial development/modernisation, contributing to the debate on financial reforms in Europe. Financial integration and financial development are distinct, but interrelated. On the one hand, financial integration and financial development are mutually reinforcing in improving the performance of a financial system. Integration, for example, fosters development by enhancing competitive pressures and offering new financing and investment opportunities, while development contributes to integration as new financial instruments may facilitate the trading of risks. On the other hand, progress in financial development can also be achieved independently of financial integration and vice-versa.

One major contribution of the paper is to present 17 indicators that describe different aspects of the efficiency of a financial system (see Section 3). These are selected from a large and comprehensive set of indicators currently assembled by ECB staff. All indicators are derived from economic theory in the context of an encompassing conceptual framework and from the empirical literature on finance and growth. They can be grouped into eight dimensions that comprise the functioning of a financial system: 1) size of capital markets and financial structure; 2) financial innovation and market completeness; 3) transparency and information; 4) corporate governance; 5) legal system; 6) financial regulation, supervision and stability; 7) competition, openness and financial integration; and 8) economic freedom and political and socio-economic factors. This paper offers a selection of one to two indicators for

each dimension. The indicators were chosen on the basis of the robustness of the messages they convey and whether lower outcomes for many or at least some European countries are of relevance for policy-making.

To the extent that data are available, each indicator is tracked over time and across countries. Results for the 12 euro area countries are compared with other European countries (Sweden, Switzerland and the United Kingdom), as well as with Japan and the United States.[1] In contrast to most of the existing literature, this paper concentrates on assessing the performance of financial systems for industrial countries with relatively well-developed financial systems.

A second major contribution of the paper is to employ the indicators presented above to investigate empirically specific channels through which financial development and ultimately greater financial efficiency promote productive investment and economic growth. Specifically, the paper presents econometric estimations of whether a more developed financial system accelerates the reallocation of capital from declining industries to industries with better growth prospects (Section 4). Building on and refining previous academic research, the analysis proceeds in two steps. First, real investment growth is regressed on measures of growth prospects for 28 manufacturing industries in 65 countries between 1963 and 2003. Sectors that are expanding should invest more to exploit their potential. The elasticity derived from this estimation describes the "speed of capital reallocation" for each country. It serves as a capital efficiency (productivity) measure. Second, the estimated "speeds of capital reallocation" from the first step are regressed on the financial indicators described above and on non-financial control variables that may also influence the reallocation of capital, e.g. income or human capital. The results of such estimations are informative about the extent to which a financial system contributes to the "process of creative destruction" in the sense of Schumpeter.

In the presentation of the results, special attention is given to the group of industrial countries most relevant for the euro area.

MAIN RESULTS

The main results of the paper are those that are supported by all elements of the analysis presented, namely: 1) the empirical and theoretical results of the existing literature; 2) the implications drawn from relevant indicators; and 3) the results of the econometric analysis. For example, the literature and own econometric analysis may suggest which financial variables drive productivity and growth in industrial countries in general. The indicators may then show for which dimensions of a financial system European capital markets or the capital markets of specific European countries underperform. If all the elements point in the same direction, then it seems worthwhile considering whether any problems in the European financial system can be addressed with policy.

Overall, the main results suggest that there is significant room for further modernisation and development of European financial markets. A first finding is that, in terms of their size, euro area capital markets have considerable potential for further growth. Their (relative) size is roughly comparable to Japan, but much smaller than the Netherlands, the United Kingdom, Switzerland or the United States. Moreover, the econometric estimations suggest that overall capital market size (defined as the aggregate of bank, corporate bond and stock market financing as a share of GDP) is the main financial determinant of the speed of capital reallocation. Other economic variables or specific aspects of financial development/modernisation play much lesser roles. Hence capital market size constitutes a useful summary measure for gauging the overall financial development of industrial countries.

1 Slovenia became the 13th member of the euro area on January 1 2007. It is not included as all the data refer to the period before its entry.

More specifically, the analysis identifies three areas where the financial market framework conditions in Europe could be improved:

1) The first concerns certain aspects of corporate governance. The literature strongly suggests that minority shareholder rights are an important aspect of well-functioning securities markets. Better governance ensures that: 1) there are fewer conflicts of interest among investors, as well as between investors and managers; 2) investors obtain a better return; and 3) there will be a smaller loss of efficiency due to opportunistic behaviour by managers. While general shareholder rights for publicly traded firms have significantly improved over time in many European countries, the anti-self dealing index obtained from the academic literature and displayed in this paper suggests that, in many countries, it is still quite difficult for minority shareholders to enforce protection against self-dealing by controlling shareholders or company directors of public firms. Previous literature suggests that the ease with which this protection can be enforced is associated with various measures of financial modernisation, such as higher stock market capitalisation, a larger number of initial public offerings (IPOs), more developed corporate bond markets, etc. The econometric evidence presented in this paper shows that protection against self-dealing has a significantly positive effect on the size of capital markets and therefore on the speed of capital reallocation. In conclusion, it may be advisable to remove obstacles preventing efficient legal action by minority shareholders against self-dealing by corporate insiders.

2) The second area is the efficiency of the legal system in resolving financial conflicts. The literature emphasises the great importance of efficient legal systems for the well-functioning of financial systems, since the inter-temporal nature of financial contracts and the large values contracted upon require a high degree of confidence in their enforcement. Slow and formalist legal systems, i.e. systems with many formal steps that regulate legal disputes, discourage savers and investors from entering financial markets, as they face greater expropriation risk, thereby limiting the supply of capital and the liquidity of markets. A widely used indicator of the speed with which legal systems solve financial conflicts suggests that legal efficiency could be enhanced in a small number of European countries. The econometric analysis confirms that the fast resolution of financial conflicts by a legal system has a positive effect on capital market development and thus improves the reallocation of capital in an economy.

3) The third area relates to the structural features of European bank sectors. In recent decades most banking systems in industrial countries have been liberalised extensively, but a small number of European countries still have relatively significant levels of public bank ownership. A substantial strand of the academic literature argues that public bank ownership can have a distortionary effect. For example, publicly owned or controlled banks have been found to pursue political objectives. They may also adversely affect competition, for example by constraining domestic and foreign entry. Furthermore, the econometric analysis presented in this paper and the literature indicate that larger ownership of banks by the public sector may be associated with smaller and less developed capital markets, which in turn hampers the reallocation of capital. The countries that still have significant shares of bank ownership by the public sector should consider whether their banks perform better than the average recorded in the literature for banks owned by the public sector.

The literature has also found that high concentration in the banking sector can have adverse effects on economic growth, although it has not been successful in

establishing a clear link between concentration and the level of competition in the bank sector. To some extent, the econometric results in this paper corroborate this finding. Higher concentration in the banking sector is associated with smaller capital markets and a slower reallocation of capital. The high levels of bank concentration observed at the national level in some European countries could, for example, be countered by more integration, such as an enhanced provision of financial services across borders. In the light of the continuing need for further financial consolidation in many European countries exposed to the consequences of globalisation, cross-border bank mergers could be helpful for avoiding excessive concentration in geographically limited retail markets caused by this consolidation.

Moreover, the analysis also singles out European risk capital markets as an important part of the financial system to improve. For the two main areas of risk capital markets identified, however, there is insufficient information available at present to derive strong conclusions for policy. While it is possible to make the following points, both these areas would benefit from further research.

1) Start-ups and other small innovative firms are an important source of economic value-added and growth. However, the financing of their investment projects is particularly difficult. They have no access to public capital markets and may have difficulties obtaining private bank financing due to asymmetric information e.g. related to the absence of a track record, high risk and little collateral. Significant private equity and venture capital markets help to overcome these difficulties in modern financial systems. The indicators show that venture capital financing in the euro area is much lower than that observed, for example, in the United States relative to the size of the two economies. This is particularly visible in early-stage financing but holds also for expansion and replacement-stage financing. While the lack of venture capital activity means that many new and innovative firms do not emerge, the available evidence is insufficient to prove whether this is caused by a lack of capital supplied, a lack of liquidity in still somewhat nationally segmented venture capital markets, a lack of demand from entrepreneurs or by a shortage of exit options for venture capitalists through liquid equity markets.

2) An important aspect of the ongoing development of financial systems in industrial countries in general is the securitisation of illiquid assets. Securitisation markets are, however, much larger in the United States than in Europe. Further significant growth in European securitisation could help to improve the allocation of risks and free bank capital for increased lending to firms. A specific improvement that could be made to further accelerate securitisation would be to make it possible for issuers to easily include illiquid assets from European Union countries, irrespective of their location and without being hampered by obstacles in the areas of financial regulation, consumer protection or taxation. There are, however, some issues as to whether all securitisation activities are unambiguously beneficial (some could, for example, be motivated by regulatory or tax arbitrage) and whether they could also pose risks to financial stability. Overall, the benefits and risks of securitisation activities need to be better understood.

OTHER RESULTS

The paper finds a number of other results that are supported by at least two, but not all three elements of the analysis. These less strong conclusions are the following:

1) An important function of financial systems in general and stock markets in particular is to provide information about real investment opportunities. Various indicators suggest that in a few European countries, there is

greater uncertainty about firm prospects and a lesser pricing of idiosyncratic risk. It has been shown in the literature that a low pricing of idiosyncratic risk is associated with less developed financial systems and with inefficient investment by firms. So, there seems to be some room for improving the information processing capacity of stock markets in these countries.

2) In contrast to shareholder rights, the rights of creditors in case of bankruptcy have not really improved in Europe over time. At the same time, previous research shows that giving secured creditors priority on the proceeds of a firm in liquidation and allowing bond holders to have a say in reorganisations increases the breadth and depth of capital markets. This raises the question as to whether some European countries may benefit from enhancing those rights.

3) There is a debate on whether more dispersed or more concentrated firm ownership is better for corporate performance. According to recent research, the costs of concentration appear to outweigh the benefits, but the presence of large institutional shareholders improves external monitoring. Based on the indicators of ownership concentration presented in this paper, it would seem beneficial for European capital markets if firm ownership became less concentrated, except in a few countries where the concentration is already low, and if the role of institutional investors in ownership was enhanced.

4) Financial regulation and supervision play a significant role in financial sectors by addressing market failures and enhancing stability. Available indicators suggest, however, that in a number of European countries some aspects of banking regulation and supervision could be improved in terms of the incentives they give banks to take and manage risks. In particular, the moral hazard implications of deposit insurance funds could be further limited. Also deposit insurance schemes could benefit from better funding solutions and more accurate pricing.

I INTRODUCTION

The extended period of relatively slow growth and low employment experienced until recently in many European countries has led to increased efforts to identify policies that can improve economic performance. The reasons for the economic slowdown are manifold, and the Lisbon Agenda underlines the need for a multi-sector approach. This paper focuses on the financial sector and potential ways to improve both its functioning and contribution to productivity, innovation and growth in Europe.

This focus on the financial system seems to be particularly timely, as various recent events have put a question mark on the global competitiveness of European financial institutions and markets. For example, in parallel with the introduction of the euro overseas, financial institutions significantly extended their market share in the underwriting of the growing market for European corporate bonds (see e.g. Santos and Tsatsaronis, 2003). Recent research also suggests that US banks may have a comparative advantage in the cross-border provision of financial services, whereas non-US banks find it difficult to conduct this business profitably (see e.g. Berger et al., 2000 and 2004). Moreover, a major European stock exchange, Euronext, has merged with the New York Stock Exchange and another one, London Stock Exchange, is partly owned by NASDAQ. Last but not least, settling securities across European borders remains very costly compared, for example, to settling them in the United States (see e.g. Schmiedel et al., 2006).

These developments are particularly surprising, as the introduction of the euro and further integration of European capital markets were very much expected developments and, in many respects, they did strengthen the internal market for financial services and increase the competitiveness of European financial institutions and markets. The relative success of overseas operators compared with domestic European markets and institutions may be indicative of a more pressing need for further reforms to increase their international competitiveness and enhance the contribution of the single market for financial services to employment and growth in Europe.[2]

Based on an extensive literature underlining the role of financial systems in productivity, innovation and growth, this paper analyses the performance of European capital markets and their contribution to the performance of European economies. In contrast to the finance and growth literature, which concentrates very much on developing countries and emerging market economies, the emphasis is placed more on industrial countries to allow stronger conclusions for the "old" European Union Member States to be drawn.

This paper is structured as follows. The next section outlines a conceptual framework for the analysis of the functioning of financial systems and their contribution to economic performance. In so doing, it also summarises briefly the main results from the relevant literature on the effect of financial development and modernisation on productivity and overall growth. Section 3 presents 17 indicators for the performance of the euro area financial system, in particular its efficiency, as compared to similar systems. Apart from 12 euro area countries, this paper covers other European countries (Sweden, Switzerland and the United Kingdom), as well as Japan and the United States.[3] The indicators span eight dimensions of a financial system that can be used to characterise its performance. Since the European Central Bank has already published a wide set of indicators for financial integration (see ECB, 2007a), the emphasis here is more on indicators of financial development or modernisation. Section 4 summarises the main results of current research that investigates a specific channel how the efficiency of a financial system contributes to productivity growth. This approach tests whether economies with more developed financial systems allocate capital faster from declining industries to those with better growth opportunities. The aim is to identify, in particular, those features that would

2 For a comprehensive up-to-date volume on the state of European financial markets and institutions, see Freixas et al. (forthcoming).
3 See footnote 1.

accelerate this reallocation of capital in the EU-15, which already comprises relatively developed financial systems. The results of Sections 3 and 4 indicate the areas in which further European policy efforts may be justified.

The results are derived from internal and external research. They do not necessarily reflect the position of the European Central Bank (ECB) and the ECB is not committed by them. They are presented to generate discussion and identify areas in which more work could be undertaken to further substantiate advice for policy-makers. They also have to be interpreted in relation to the economic literature, to specific assumptions made by the different approaches used and keeping in mind other caveats listed below. Some indicators used that refer to legislation and law enforcement should not be interpreted from a legal or even criminal perspective, but only in terms of their relevance for financial system efficiency.

2 FINANCIAL SYSTEMS AND ECONOMIC PERFORMANCE – CONCEPTS AND LITERATURE

There is no widely accepted theory of financial systems that can be easily used to structure the practical discussion in the following sections. Against this background, the present section outlines a number of key concepts for financial sector work and how they relate to one another. This discussion is inspired by standard theories, which describe the role of a financial system as allocating resources from agents which have a surplus to those which have a shortage of funds (early work in this area includes Schumpeter, 1912, Goldsmith, 1969, and McKinnon, 1973), and by the most relevant empirical evidence.[4]

For example, firms may see profitable real investment opportunities, but not have enough internal funds to finance them. Households may have more income than they wish to consume during part of their life-cycle and invest it in assets that return the difference with a profit at some future time, such as when their regular income is much reduced due to retirement. Finally, governments may wish to increase investment spending during recessions, drawing on the savings of other sectors.[5] A financial system can then be defined as the set of markets, intermediaries and infrastructures through which households, corporations and governments obtain funding for their activities and invest their savings (see Hartmann, Maddaloni and Manganelli, 2003)

2.1 CONCEPTUAL FRAMEWORK

A simple conceptual framework that distinguishes three levels of the analysis is summarised in Chart 1. The first level (top of the Chart) concerns "conditioning" elements of financial systems that do not change very fast and therefore tend to be taken as given by market participants ("fundamentals"). The second level (middle of the Chart) relates to the outcomes of financial systems; how well they function ("performance"). The third level (bottom of the Chart) anchors the discussion in the performance of the economy as a whole, focusing on standard economic objectives (notably growth and price stability).

The performance of a financial system has two basic dimensions, its efficiency and its stability.[6] The efficiency of a financial system can be understood as a condition in which the resources available in a financial system are allocated

4 Levine (2005) lists four financial system functions that support the allocation of savings to investment: the ex-ante production of information about real investments and the allocation of capital; the monitoring of investments and the exertion of corporate governance after the provision of finance; the facilitation of trading, diversification and management of risk; and the mobilisation and pooling of savings. He also adds a fifth function of a financial system: easing the exchange of goods and services. These functions will be discussed below in terms of how financial systems help to solve certain frictions that emerge among savers and investors.

5 Accordingly, the flow of funds in the euro area shows that the household sector is a net provider of funds, whereas the government and non-financial firm sectors are net receivers of funds. In line with its intermediation role in these flows, the financial sector is in balance (ECB, 2002).

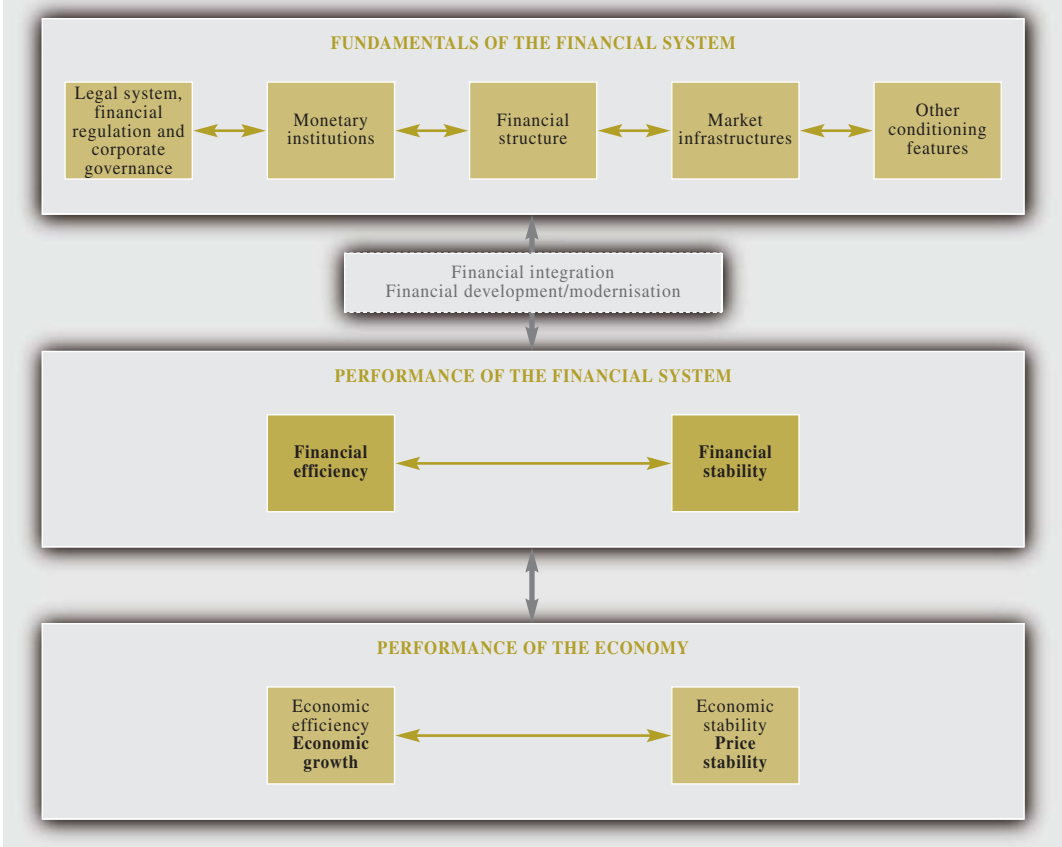
6 The distinction between these two concepts is based on standard economic theory, which distinguishes, for example, the efficiency and the stability of equilibria in an economic system, and on the fact that ensuring efficiency and stability requires often quite different policies.

towards the most valuable investment opportunities at the lowest possible costs. In an efficient financial system markets are competitive, information is accessible and widely distributed, and agency conflicts are resolved through contracts enforced by legal systems. Market failures lead to inefficiency, and lack of efficiency usually impairs the contribution of finance to growth, as illustrated in Chart 1 by the arrow between Level 2 and Level 3.[7]

Certain aspects of financial systems respond to market failures and frictions, thereby improving efficiency. A first very important friction is asymmetric information among economic agents active in the financial system. For example, financial investors mostly delegate real investment decisions to firm managers who usually have better information about them. Since the financial investors, however, cannot perfectly monitor the firm managers they demand a premium on their investment return that increases the cost of capital for firms and may therefore yield under-investment with respect to the first best outcome (the under-investment problem reflects adverse selection as in Stiglitz and Weiss, 1981, or Myers and Majluf, 1984). Through accounting systems, and well-defined and enforced investor rights, well-functioning financial systems deal with information frictions better, thus mitigating these credit constraints emerging from adverse selection. (See also the parts on transparency and information in Section 3 and Hartmann et

7 One needs, however, to keep the theory of "second best" in mind, which states that in the presence of several market failures, the removal of one does not need to improve growth and welfare (see Lipsey and Lancaster, 1956).

Chart 1 Financial system concepts and their interrelation



al., 2006.) Venture capital financing and bank relationship financing are further responses of financial systems to this problem, which is particularly pronounced for small and medium-sized firms that constitute large parts of the corporate sector and employment in European economies. For larger and more mature firms, the pricing mechanism in stock markets is of great importance for reducing asymmetric information.

Second, an important related friction is associated with agents that provide funds and agents that use funds having different investment objectives. For example, firm owners may wish to maximise value, whereas managers (or unions) may have different interests (maintaining control, increasing the size of the firm or preserving employment; see for example Jensen and Meckling, 1976). Similarly, borrowing households may have different risk preferences to lending banks (who are primarily interested in loan repayment). These differences can lead either to under-investment (moral hazard leads to lack of effort) or to over-investment (e.g. managers enjoy private benefits of control). Good corporate governance and reliable enforcement through the legal system help financial systems to minimise such inefficiencies (see the respective part in Section 3 and Hartmann et al., 2006).

Third, financial systems help to overcome the dispersion of capital across many investors and mismatches between the time horizons of financial investors and real investment projects (see for example Allen and Gale, 1997). The dispersed supply of capital needs to be pooled through intermediaries and markets using standardised contracts, rather than an unrealistic network of bilateral contracts. Moreover, human capital and physical assets used in production are usually highly illiquid, whereas households often wish to preserve the flexibility to use their savings for consumption. Financial institutions and markets solve these problems to a large extent by pooling large numbers of investors and performing maturity transformations.

Finally, there are frictions in the exchange of goods and services more generally, such as transaction costs, which can be alleviated through an efficient financial system. On the side of household sight deposits, credit cards with overdraft possibilities and special forms of finance, such as consumer credit, help the general exchange process.

Distinct from financial efficiency, financial stability can be understood as a condition in which the financial system – comprising financial intermediaries, markets and market infrastructures – is capable of withstanding shocks and the unravelling of financial imbalances, thereby mitigating the likelihood of disruptions in the financial intermediation process which are severe enough to significantly impair the allocation of savings to profitable investment opportunities. Severe forms of financial instability (financial crises) disturb the intermediation process that allocates savings to real investment opportunities and therefore usually have strong negative effects on growth and welfare (see again the vertical arrow in Chart 1).[8] Conversely, a more efficient financial system will usually enhance stability, in particular in the long term.[9] In this paper, the main emphasis is on the efficiency of financial systems and its implications for productivity, innovation and growth. A comprehensive analysis of financial stability would require a detailed discussion in itself, which cannot be undertaken here. The ECB Financial Stability Review regularly presents a practical analysis for the European Union (EU) (see ECB, 2007b).

8 Caprio and Klingebiel (1996) or Hoggarth et al. (2001), for example, estimated the adverse real effects of financial crises. Some researchers argue, however, that emerging countries with occasional financial crises grow on average faster (over longer periods of time) than countries without such crises (see Ranciere, Tornell and Westermann, 2003).

9 There can, however, also be conflicts between efficiency and stability, in particular, in the short term. For example, periods of significant innovation and development in financial systems can be associated with instabilities in the transition, as not all financial actors are fully accustomed to the new techniques and risks associated with them and some actors may lose out (e.g. default) and others may win (see e.g. Keeley, 1990). Also, excessive regulatory and public control may lead to a high level of stability, but at the same time impair efficiency (see e.g. Guiso et al., 2005b).

The performance of a financial system, notably its efficiency, is influenced by its fundamentals (top level in Chart 1) in conjunction with the processes of integration and financial development (arrow between the top and middle level). The fundamentals include: 1) the legal system, financial regulation and corporate governance; 2) monetary institutions; 3) financial structure (balance between markets and intermediaries); 4) market infrastructures (payment, clearing, settlement and trading systems); and 5) other conditioning features (e.g. social norms, basic freedoms and political systems). The empirical literature strongly suggests that the quality of many of these fundamentals is of great importance for the efficiency of financial systems and their contribution to productivity and growth (see, for example, the survey by Papaioannou, forthcoming).[10]

2.2 LITERATURE ON THE DETERMINANTS OF FINANCIAL SYSTEM EFFICIENCY AND GROWTH

Explicit evidence is available particularly for legal systems, corporate governance, financial regulation and socio-economic factors. For example, in a country with an inefficient and slow-proceeding legal system, financial contracts cannot be enforced effectively and creditors have more limited rights (Djankov et al., 2003, 2006a and 2006b, La Porta et al. 1998 and 2006). Countries with well defined and adequately enforced investor rights exhibit more entrepreneurship and greater product market competition. Moreover, they have more liquid private bond, venture capital and primary equity markets (see La Porta et al., 1997, 1998 and 2006). There is also evidence that sound investor protection rights and a fast-proceeding legal system attract foreign capital (Alfaro et al., 2005; Papaioannou, 2005) and spur cross-border mergers and acquisitions (M&As) (Rossi and Volpin, 2004). Finally, efficient and fast-proceeding legal systems foster syndicated lending (Quian and Strahan, 2005) and the financing of large projects (Esty and Megginson, 2003). Without good corporate governance, managers may be able to steer funds away from owners, raising the cost of capital (see for example La Porta et al., 2000).

Ill-designed financial regulations may hamper the savings-investment process in a variety of ways (see Strahan, 2003, Bertrand et al., forthcoming, Guiso et al., 2005b, and Barth et al., 2006). As regards financial structure, it can be argued theoretically that financial systems with under-developed securities markets limit large firms' investment strategies and cross-sectional risk sharing (see Allen and Gale, 1997, on the latter point). Even though market infrastructures are not a popular theme in the research literature, unsafe payment systems may hamper banks' liquidity management, and the absence of efficient settlements systems is likely to limit the growth of securities markets. Last but not least, social coherence helps agents to rely on financial contracts (see Guiso et al., 2004 and 2005a).

In regions like the EU or the euro area, which are composed of separate countries, the process of financial integration is of particular importance. Fragmentation across countries will usually reduce the efficiency of the area-wide financial system, as it will constrain the range of financing sources and investment opportunities, limit scale economies and leave possible liquidity advantages unexploited. The market for a given set of financial instruments and/or services can be regarded as fully integrated if all potential market participants with the same relevant characteristics 1) face a single set of rules when they decide to deal with those financial instruments and/or services; 2) have equal access to the above-mentioned set of financial instruments and/or services; and 3) are treated equally when they are active in the market (see Baele et al., 2004). One implication of this definition of financial integration is the validity of the law of one price in financial markets, i.e. assets with the same

10 While there is a vast empirical literature showing that these fundamentals matter for financial performance, there is little theoretical work about them. An exception is by Shleifer and Wolfenzon (2002), who present an equilibrium model of corporate investment and financing decisions with different sets of legal institutions.

risk-return characteristics should trade at the same price, irrespective of their origin or the location of trading.

The literature has provided some clear evidence of cases in which increased financial integration has contributed to greater productivity, growth and economic stability, notably the case of the removal of branching restrictions in US banking, which allowed a much higher level of integration of markets for banking services across and within states (see Jayaratne and Strahan, 1996 and 1998).

A different process that is highly relevant for the performance of financial systems more generally is financial development.[11] This can be understood as a process of financial innovation and institutional and organisational improvements in the financial system that reduces asymmetric information, increases the completeness of markets and contracting possibilities, reduces transaction costs and increases competition.[12] Theoretically, there is a strong positive link between the level of development and the efficiency of a financial system and its contribution to productivity and growth (see for example Greenwood and Jovanovic, 1990). Allen and Gale (1997) argue that banks support inter-temporal risk sharing, whereas stock markets support cross-sectional risk sharing. Also, many new financial instruments and institutions improve risk sharing between agents in the economy (see e.g. DeMarzo, 2005). Well-functioning financial intermediaries also help to reduce transaction costs (Gurley and Shaw, 1960) and minimise informational asymmetries between suppliers and users of funds (Diamond, 1984).

A vast empirical literature substantiates more and more the importance of financial development for the contribution of a financial system to productivity and growth (see Levine, 2005, for a general survey and Papaioannou, forthcoming, for a survey of the most relevant results for industrial countries). Based on a wide cross-country panel data set, King and Levine (1993) provide early econometric evidence that overall credit to the private sector matters for economic growth. Levine and Zervos (1998) add that both the extent of bank lending and the development of stock markets have independent beneficial effects on cross-country growth. Levine et al. (2000a, b) and Benhabib and Spiegel (2000) further show that the positive effect of financial intermediation on growth is due to increases in total-factor productivity rather than increased investment and the accumulation of human capital. Rajan and Zingales (1998) add that in financially developed countries (as proxied by bank credit, stock market capitalisation and the quality of accounting standards), sectors that for technological reasons depend more on external financing grow faster than in less financially developed countries. Demirgüç-Kunt and Maksimovic (1998) add evidence along similar lines using individual firm data. Further empirical work suggests that higher levels of financial development allow countries to adopt new production technologies faster (see Aghion et al., 2005), accelerate the reallocation of productive capital to rising industries (see Wurgler, 2000, Fisman and Love, 2003, 2004, and Ciccone and Papaioannou, 2006), and stimulate Schumpeterian "creative destruction" through enhanced firm entry (Beck et al., 2004).

One complication with most of the finance and growth literature is that it is very much based on large cross-country studies, which do not always distinguish very clearly between industrial and developing countries. Also, some studies are of a more historical nature, when the level of regulation was much higher and the level of financial development much lower than in the present European context. Although a number of studies control for the level of income and general economic development, it is not clear whether all the results are directly

11 As this paper mainly focuses on industrial countries, such as the countries of the euro area, that typically have already highly developed financial systems, it may be preferable to use the term financial modernisation.

12 Strictly speaking, the absence of distortionary taxes is also a requirement for financial markets to be perfect and fully developed.

applicable to the euro area or the EU-15. The recent studies by Strahan (2003) and Bertrand et al. (forthcoming) on US and French banking sector deregulations appear to be most directly applicable to the European context. The next two sections are therefore geared towards identifying aspects of financial systems, which, if improved, would have beneficial effects on industrial countries.

3 MEASURING THE EFFICIENCY OF THE EUROPEAN FINANCIAL SYSTEM

There are many indicators that could be used to assess how well a financial system performs its functions and overcomes the frictions described in Section 2. This section builds on the empirical finance and growth literature that has already proposed a large variety of indicators to measure and quantify the functioning of financial systems and their contribution to productivity and economic growth. It presents a selection of indicators, both new and updated, which seem to suggest more substantive conclusions for European countries, and discusses their implications. A much larger and more comprehensive set of indicators can be found in Hartmann et al. (2006), on which this Section draws.[13]

In order to structure the analysis, the indicators are divided into eight groups, each describing an important dimension or characteristic of a financial system. The groups, which are summarised and briefly explained in Table 1, span the fundamental features of a financial system and the processes of financial development and integration (with the main

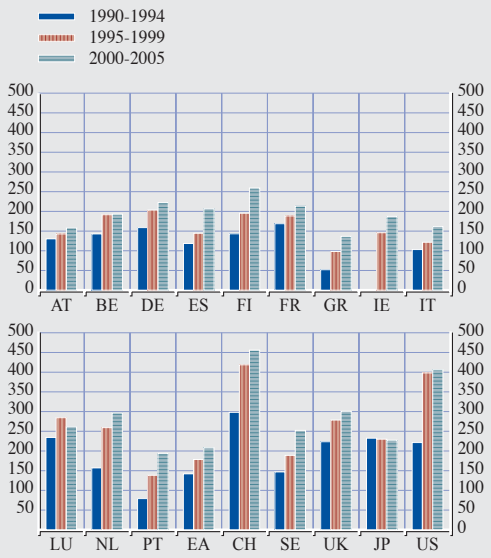
13 A smaller set of indicators has already been published in the ECB's Monthly Bulletin (see ECB, 2005b).

Table 1 Dimensions of financial system performance covered by the indicators

1. Size of capital markets and financial structure	Financial systems with larger overall capital markets provide easier financing for real investment. This relates to both larger securities markets and to more bank credit. Systems that rely primarily on one but not the other may be less efficient. Also the liquidity of the different markets is relevant for this dimension.
2. Financial innovation and market completeness	Many financial innovations reduce capital market imperfections and make markets more complete. This opens up new possibilities to allocate capital across space, time and risk preferences. New financial instruments and practices, for example, allow firms to manage certain risks by shifting them to investors who have a better ability to bear them.
3. Transparency and information	Financial systems help produce and spread information about investment opportunities, market conditions and the behaviour of agents. The better they function, the lower the asymmetric information between firms and outsiders and the more information should be incorporated into stock and corporate bond prices.
4. Corporate governance	There are conflicts between insiders who control a firm and outside investors who provide financing. Better governance ensures that investors receive the full return on their investment and that there will be few deadweight costs due to opportunistic behaviour by firm insiders, with beneficial effects on the cost of capital.
5. Legal system	A key aspect of a financial system is how well it enforces contracts. As it allocates capital across time and space, contracts – either explicit or implicit – are needed to connect providers and users of funds. The legal system and the way in which it is applied by legal institutions determine the "distance" over which capital can be reallocated.
6. Financial regulation, supervision and stability	Government intervention in financial systems tends to be stronger than in other economic sectors. Well designed regulation and supervision should correct for market imperfections and enhance stability, whereas imperfect policies may have adverse effects on the performance of the financial sector.
7. Competition, openness and financial integration	Greater openness of a financial system and more competition among banks and other financial intermediaries lower capital market imperfections. Pressure from competition, for example, should ensure that financial institutions operate efficiently, earn fewer rents from market power and provide new instruments to customers.
8. Economic freedom, political and socio-economic factors	Economic freedom means the absence of constraints to economic activities, e.g. corruption, administrative burdens or political interventions that are unrelated to efficiency. Given the great importance of information, contract enforcement and ease of exchange in financial transactions, there is also a significant role for social capital in the form of cooperativeness, ethics and trust.

Chart 2 Size of capital markets

(as a percentage of GDP)



Sources: BIS, ECB, Eurostat, IMF and World Federation of Exchanges.
Notes: Sum of (i) stock market capitalisation, (ii) bank credit to the private sector and (iii) domestic debt securities issued by the private sector divided by GDP. Data for Luxembourg (LU) exclude debt securities. Data for Germany (DE) start in 1991. Data for Ireland (IE) start in 1995. For the United States (US), stock market capitalisation is the sum of the NYSE and NASDAQ markets. Euro area (EA) figures are averages of EA country data weighted by GDP.

emphasis on the former), i.e. they relate to the top two levels of analysis shown in Chart 1. The following sub-sections are organised according to the groups displayed in Table 1.

The use of indicators has a number of advantages. First, it allows for a fairly comprehensive view of a financial system, from which a smaller number of areas in which the results signal a greater need for further attention can be selected. Second, each indicator is firmly grounded in the economic literature and many have been used previously in various (including quantitative) studies on financial systems. Third, it allows for the cross-checking of the results of the econometric analysis in Section 4 and reveals whether European countries score high or low on indicators that are statistically significant. It is important, however, to bear in mind a number of caveats. First, despite the breadth of information from which the presented indicators are chosen, it should be noted that not all aspects of European financial systems may be fully captured. The analysis is constrained by data unavailability and non-comparability across countries for a number of markets, for example relatively new markets and financial innovations. Moreover, publicly available data and the literature may not provide access to some issues that are only identified by individuals that are active in the respective market. Similarly, while formal laws and rules are easier to measure, informal rules could be just as influential. Second, typically more information is available on wholesale activities and market-based forms of financing than about retail activities and relationship-based forms of financing. Third, the quality and timeliness of available data may vary across indicators. These caveats notwithstanding, there are clear benefits to discussing the efficiency of the European financial system with the help of explicit indicators and a transparent description of data compared with a discussion that had not been informed in that way.

3.1 SIZE OF CAPITAL MARKETS AND FINANCIAL STRUCTURE

Several contributions to the literature have shown that the sizes of various capital markets, such as private credit or stock market capitalisation, can be important indicators of financial development (see for example King and Levine, 1993, Levine and Zervos, 1998, and Rajan and Zingales, 1998). An important aspect of this finding is that the often cited relative share of market versus bank financing ("financial structure") is not the key variable, but that both the size of securities markets and the amount of bank lending positively affect growth (see Levine, 2002).

As industrial countries are the main focus of the paper, a broad measure of capital market size is preferable to the narrower measures typically used in the context of developing and emerging market countries. Therefore, Chart 2 shows the aggregate size of stock, bond and loan markets in proportion to GDP for the sample countries.

This choice is confirmed by the empirical results reported in Section 4, which suggest that the breadth of capital markets is an important variable that captures the overall level of financial development in an economy and drives the allocation of real investment and productivity.

This paper found that Switzerland and the United States have the largest capital markets relative to their own economies, followed by the United Kingdom and the Netherlands. Euro area capital markets tend to be smaller and are roughly comparable in size to Japanese capital markets. However, some euro area countries with smaller financial sectors have experienced strong growth in their capital markets over the past 15 years (e.g. they have more than doubled in Greece and Portugal). Overall, European capital markets do not seem to be as developed as they could be.

3.2 FINANCIAL INNOVATION AND MARKET COMPLETENESS

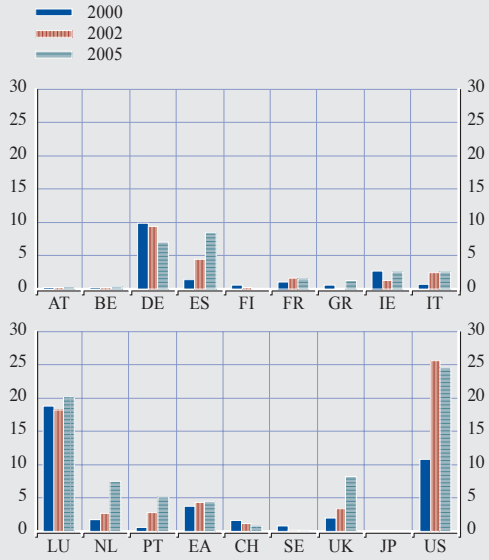
The principal role of financial innovation is to make markets more complete so that firms, households and governments can better finance, invest and share risk among each other (see for example Allen and Gale, 1997, or Acemoglu and Zilibotti, 1997). This sub-section focuses on two aspects of innovation, securitisation and venture capital financing.

Securitisation allows for the transformation of formerly illiquid assets into portfolios of assets that can be sold widely. The risks of the associated assets can therefore be sold to economic agents that have additional capacity to bear them. Banks, for example, need to retain costly economic capital as a buffer against their risky lending activities. Selling off some of this risk via securitisation allows them to hold less costly capital and to reinvest freed up resources into the economy. Moreover, the prices of asset-backed or mortgage-backed securities convey additional information to the market (see for example DeMarzo, 2005). Some securitisation may, however, be motivated by regulatory or tax arbitrage, which could entail efficiency losses. Generally, the empirical effects of European securitisation have only recently started to be analysed more carefully. It is therefore somewhat difficult to clearly assess to what extent the undoubted benefits of securitisation in Europe compare with open issues and risks.

Securitisation has recently grown substantially in a number of developed financial systems. Arguably, this growth constitutes – together with the growth of credit derivatives – the most important recent structural development in modern financial systems. Chart 3 shows the extent of securitisation of loans, mortgages or receivables for the sample countries relative to GDP, using the location of the collateral as the geographic entity.

Chart 3 Securitisation

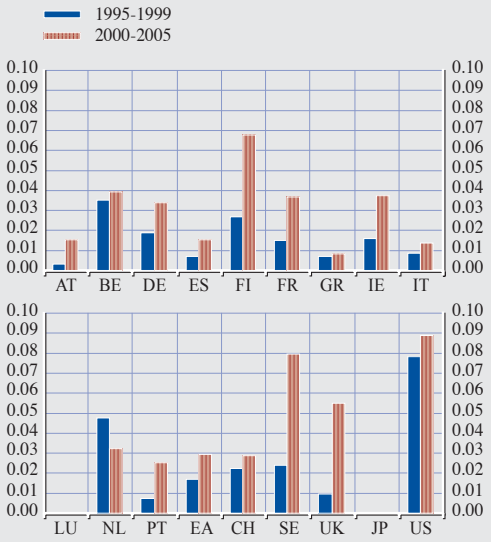
(as a percentage of GDP, by country of collateral)



Sources: European Securitisation Forum, Bond Market Association and Eurostat.
Notes: For European countries, data report the issuance placed in the Euromarket or in European domestic markets. For the United States (US), data refer to issuance placed in the US market. As there is no information about the country of collateral for the US, it is assumed that US issuances have mainly domestic collateral. Data include asset-backed securities, mortgage-backed securities and Pfandbriefe. Data for Japan (JP) and Finland (FI) are not available in 2005. Euro area (EA) figures are averages of EA country data weighted by GDP.

Chart 4 Venture capital financing (early investment stage)

(as a percentage of GDP, by country of management)



Sources: European Private Equity and Venture Capital Association, PricewaterhouseCoopers and Eurostat.
Notes: Venture capital early-stage investment is defined as private equity raised for seed and start-up financing. Data report investment by venture capital firms according to their country of residence. Data for Luxembourg (LU) and Japan (JP) are not available. Data for Switzerland (CH) start in 1999. Euro area (EA) figures are averages of EA country data weighted by GDP.

Due to the Pfandbriefe, Germany has a relatively active securitisation business and Spain, the Netherlands, Portugal and the UK have caught up recently. However, for most other EU countries covered (except Luxembourg), the tradability of illiquid assets has not really picked up. Average euro area securitisation remains a fraction of the level seen in the United States. It seems that significant further growth of asset and mortgage-backed securities in the EU countries could help the allocation of risks and extend the financing capacity of European capital markets. More concretely, as the lack of integration in the European mortgage markets suggests (see e.g. ECB, 2005a, and EU Commission, 2005a), the ease with which issuers can include illiquid assets from any European country, irrespective of their own location, seems to be an important determinant of further securitisation. Obstacles to this may include financial regulations, consumer protection rules or aspects of taxation. At the same time, however, many issues regarding the driving forces and effects of enhanced securitisation remain unexplored in Europe. More research is needed before any definitive policy conclusions can be drawn.

Financing real investment projects is particularly difficult for start-ups and young and small firms which need additional capital. For these firms, asymmetric information is particularly pronounced, so that they have no access to public capital markets. Even bank financing may be difficult, as they usually have little collateral to offer. Modern financial systems therefore provide significant private equity and venture capital funds. The related investors maintain an equity stake in firms and monitor and advise them in order as to overcome asymmetric information problems. Active venture capital markets ensure that competition and "creative destruction" promote the emergence of new firms and products. Chart 4 measures total venture capital financing (at early investment stage) as a share of GDP for the sample countries.

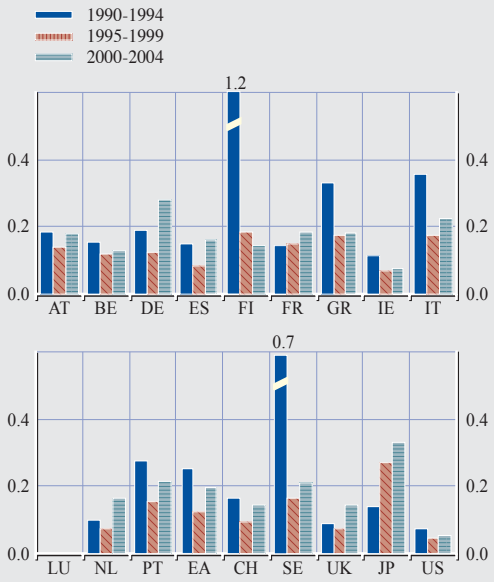
Despite having grown substantially in the past ten years, venture capital financing in European countries remains only a fraction of venture capital financing in the United States, except in Finland, Sweden and the UK, which have the highest level of early-stage VC financing in Europe in more recent times.[14] Particularly low levels of early-stage VC financing are recorded for Austria, Greece, Italy and Spain. While average euro area venture capital financing in the late 1990s was larger than in the UK, this is no longer the case.

These findings suggest that the promotion of venture capital financing in some EU countries could give a stimulus to entrepreneurship, innovation and productivity growth. However,

14 The results are quite similar if venture capital that finances later stage replacements and venture capital by country of destination are taken into consideration (see Hartmann et al., 2006). The differences with the United States are not driven by the stock market bubble of 1999-2000, as it affected most countries in a similar fashion (only Finland, Sweden and Portugal seem to have been significantly less affected by it).

Chart 5 Dispersion of analysts' forecasts

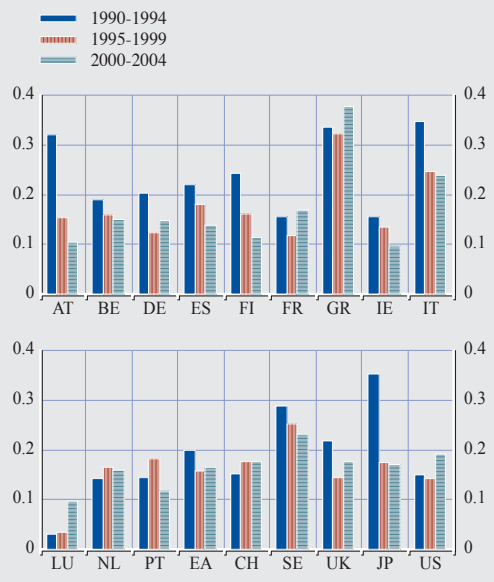
(relative to the level of earnings per share forecasts)



Source: Thomson Financial's First Call database.
Notes: Average standard deviation of the earnings per share (EPS) forecasts for a given year divided by the level of the EPS forecasts for that year. The average standard deviation of the EPS is an average of firm-level standard deviation of EPS forecasts weighted by the market capitalisation of firms. The level EPS forecast is an average of the firm-level EPS forecast weighted by the market capitalisation of firms. Data for Luxembourg (LU) are not available, while for the Netherlands (NL) and Portugal (PT) the data end in 2001. Euro area (EA) figures are averages of EA country data weighted by the stock market capitalisation covered by analysts in each country.

Chart 6 Pricing of firm-specific information

(R^2 statistics)



Source: Datastream and own calculations.
Notes: Average R^2 statistics for each country are obtained by regressing firms' stock prices on market factors, i.e. the returns on domestic, euro area, US and emerging countries' stock market indices. Low bars indicate that stock prices reflect more firm-specific information. Euro area (EA) figures are averages of EA country R^2 statistics weighted by stock market capitalisation.

the available evidence is insufficient to prove whether the lack of venture capital financing is caused by a lack of capital supplied, a lack of liquidity in still somewhat nationally segmented venture capital markets, a lack of demand from entrepreneurs or a shortage of exit options for venture capitalists through liquid equity markets. It is necessary to explore the reasons behind the weakness of venture capital financing in Europe before drawing any policy conclusions.

3.3 TRANSPARENCY AND INFORMATION

The production and dissemination of information is a crucial part of the functioning of a financial system. For example, sufficient public reporting by firms and efficient intermediaries processing this and other information alleviates the control problem between outside investors and firm insiders, with beneficial effects for the cost of capital (see for example Holmström and Tirole, 1993). This sub-section focuses on indicators that measure how information is processed in the stock market. The first indicator shows differences in opinion among equity analysts for the same firm and the second describes to what extent firm-specific information is priced.

Chart 5 exhibits differences among analysts' earnings forecasts. The more analysts disagree on the prospects of firms in a given country, the more asymmetric information there is about firms and the less efficient the financial system's processing of information. By this measure, the United States and to some extent Ireland have more homogenous earnings

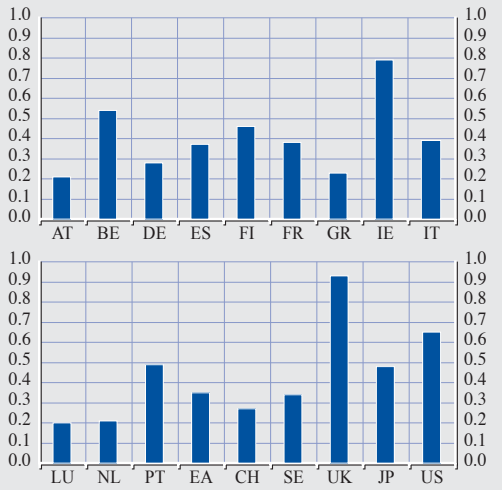
forecasts. Japan and other European countries, in particular, Germany, Italy and Portugal seem to have greater asymmetric information about their firms, although in recent times, the differences have not been particularly large in Europe.[15]

Chart 6 displays an econometric indicator estimated from stock returns that measures the degree to which firm-specific information is priced. The higher the bars in the chart, the greater the role of market-wide factors in stock market pricing in the respective countries. The lower the bars, the more idiosyncratic firm-specific information is included in the stock market valuation of firms. Countries with less developed financial systems (Morck et al., 2000) and firms that invest inefficiently (Durnev et al., 2003) were found to have a high score on this measure.

The results suggest that the informational efficiency of stock markets in the euro area is comparable to the United Kingdom and the United States. Nevertheless, a few European countries, notably Greece, Italy and Sweden, seem to have stock markets that incorporate less firm-specific information into stock prices. Overall, there seems to be some room for improving the information processing for listed firms in specific EU countries.[16]

Chart 7 Enforcement of shareholder rights against self-dealing

(anti-self-dealing index)



Source: Djankov et al., 2006b.
Notes: The index ranges from 0 to 1. Higher bars indicate better shareholder protection. The index incorporates ex ante and ex post private control of self-dealing transactions. Ex ante control includes the following issues for a transaction between a corporate insider and an outside buyer: 1) Must disinterested shareholders approve the transaction? 2) Must the buyer disclose the nature of the transaction and a possible ownership of the buyer by the corporate insider? 3) Must the corporate insider disclose the transaction and its nature? 4) Is an independent review, e.g. by a financial expert, required? Ex-post control considers the following points: 1) Are transactions disclosed in periodic filings such as annual reports? 2) Can a 10% shareholder sue the corporate insider for damages suffered as a result of the transaction? 3) How easy is it to rescind the transaction? 4) How easy is it to hold the corporate insider liable for civil damages? 5) How easy is it to hold approving corporate bodies liable for civil damages? 6) How easy is it to access evidence about the transaction? Euro area (EA) figures are averages of EA country data weighted by stock market capitalisation. Data refer to 2003.

3.4 CORPORATE GOVERNANCE

Corporate governance addresses potential conflicts between investors and firm managers and among investors, e.g. large versus minority shareholders. Better governance ensures that their interests are more aligned, so that investors obtain a better return and that there will be a smaller loss of efficiency due to opportunistic behaviour by managers. Two corporate governance issues are addressed in the sub-section: laws on securities that protect shareholders against expropriation and the pros and cons of ownership concentration.

A classic measure of good governance is the protection of minority shareholder rights in shareholder meetings (see La Porta et al., 1997, 1998 and 2000).[17] Since the voting rights of shareholders at company meetings have generally improved in Europe, this measure is not reported here.[18] A related (improved and

15 The peaks of analyst forecast dispersion in Finland and Sweden in the early 1990s reflect those countries' financial crises and should therefore be discounted.

16 A similar conclusion can be reached when looking at mandatory and voluntary disclosure in the annual reports of firms, where Austrian, Greek and Portuguese firms provide less information than firms in other EU-15 countries. See the CIFAR disclosure index displayed, for example, in Hartmann et al. (2006).

17 See Hartmann et al. (2006) for the most recent information. There is also some debate regarding the accuracy of this early measure of minority shareholder protection (see, for example, Spamann, 2006).

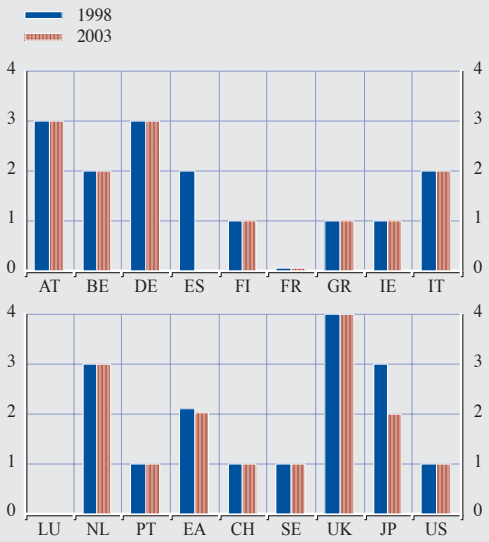
18 See, for example, the Market Abuse Directive 2003/6/EC or the Commission Recommendation of 14 December 2004 on directors' remuneration in listed companies.

more recent) measure used in the literature quantifies the enforcement of shareholder rights against expropriation by corporate insiders through self-dealing (see Djankov et al., 2006b). There are various forms of self-dealing, including executive perquisites to excessive compensation, transfer pricing, self-serving financial transactions, such as directed equity issuance or personal loans to insiders, and outright theft of corporate assets. Several approaches can be adopted to counter self-dealing. One possibility is to facilitate ex-ante private enforcement of good behaviour through extensive disclosure and approval procedures for transactions. Another possibility is to facilitate ex-post private litigation when self-dealing is suspected.

Chart 7 shows that the enforcement of shareholder rights against self-dealing by corporate insiders is particularly easy in the United Kingdom, the United States and Ireland. Shareholder rights are much weaker in Austria, Greece, Luxembourg and the Netherlands. The average score of the euro area on this index of shareholder protection is about one-half that of the United States and about one-third that of the United Kingdom. Overall, it may be advisable to remove obstacles that prevent minority shareholders taking efficient legal actions against self-dealing by corporate insiders in a large number of European countries. The econometric results in Section 4 suggest that this would promote stock markets and improve the reallocation of capital among industries.

A related but different measure assesses the protection of creditor rights, including, for example, information on whether secured creditors have priority on the proceeds of a firm in liquidation or whether bond holders have a say in reorganisations. It has been shown that a better protection of creditor rights increases the breadth and depth of capital markets (see La Porta et al., 1997, 1998 and 2000). This measure of creditor rights therefore covers rights in the case of both reorganisation and liquidation. In fact, the aim is to make this measure as neutral as possible with regard to the separate issue as to whether bankruptcy laws should favour early liquidations or leave ample room for reorganisations.[19]

Chart 8 Creditor rights



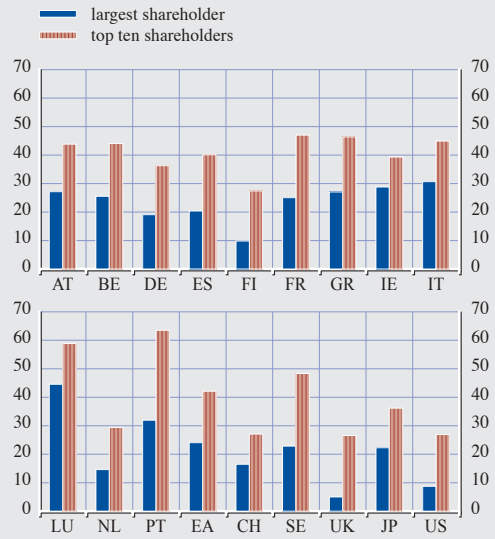
Sources: Djankov et al., 2006a and World Bank.
Notes: The index ranges from 0 to 4. The higher the score, the higher the protection. A score of 4 is assigned when each of the following rights of secured lenders is defined in laws and regulations: First, there are restrictions, such as creditor consent or minimum dividends, for a debtor to file for reorganisation. Second, secured creditors are able to seize their collateral after the reorganisation petition is approved, i.e. there is no "automatic stay" or "asset freeze". Third, secured creditors are paid first out of the proceeds of liquidating a bankrupt firm, as opposed to other creditors such as government or workers. Finally, management does not retain administration of its property pending the resolution of the reorganisation. Data for Luxembourg (LU) and 2003 data for Spain (ES) are not available. Euro area (EA) figures are averages of EA country data weighted by GDP.

Chart 8 suggests that there are large differences across countries in terms of creditor rights. Whereas the United Kingdom has strong creditor rights, the United States has much weaker ones and is in this respect similar to a number of European countries (including Finland, France, Greece, Ireland, Portugal, Sweden and Switzerland). On the other hand, other European countries, such as Austria, Germany and the Netherlands, have quite strong creditor rights. This raises the question as to

19 It is a matter of debate as to which is preferable from a social viewpoint (see Aghion et al., 1992). Most countries rely to some extent on both procedures.

Chart 9 Ownership concentration in top ten quoted companies

(fraction of shares held by the largest and by the ten largest shareholders; percentages)



Sources: Own calculations using Reuters Kobra database.
Notes: Calculated on the basis of data available for the largest shareholders in the top ten quoted companies in terms of market capitalisation in each country. The comparison highlights the concentration of share capital in the hands of the largest compared with the ten largest shareholders. Euro area (EA) figures are averages of EA country data weighted by market capitalisation. Data refer to 2005.

Chart 10 Proportion of institutional shareholders in top ten quoted companies

(proportion of companies whose largest shareholder is an institution and proportion of institutions among ten largest shareholders)

Sources: Own calculations using Reuters Kobra database.
Notes: Calculated on the basis of data available for the largest shareholders of the top ten quoted companies in terms of market capitalisation in each country. Institutional holdings are defined as holdings by buy-side institutions (the investing institutions such as mutual funds, pension funds, and insurance firms). An institution is an entity in the business of investment management (e.g. they employ investment professionals, have assets under management, etc.). Investments may be managed on behalf of third parties or proprietary. Euro area (EA) figures are averages of EA country data weighted by market capitalisation. Data refer to 2005.

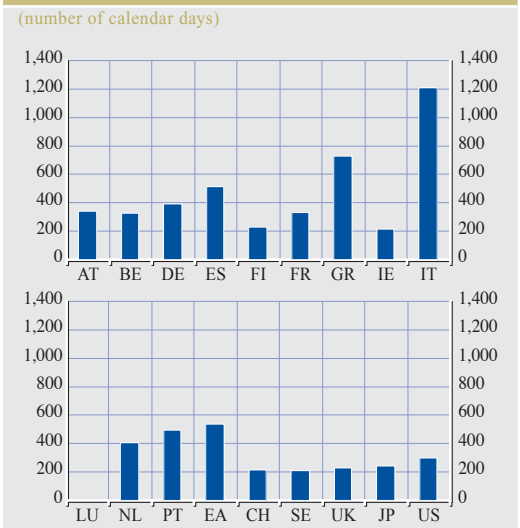
whether creditor rights should be strengthened in specific European countries. While in the short term the strengthening of creditor rights could reduce the demand for debt financing, the idea is that the benefits of a greater willingness to lend should dominate in the long term.

The relative merits of dispersed versus concentrated firm ownership structures are theoretically ambiguous. On the one hand, large outside shareholders can monitor firms and facilitate takeovers. On the other, large shareholders may themselves derive private benefits of control and may not act in the interest of minority shareholders (see Shleifer and Vishny, 1986). La Porta et al. (1999 and 2000) argue that the costs of concentrated ownership outweigh the benefits.[20] Chart 9 exhibits two measures of ownership concentration, suggesting that the countries with relatively dispersed shareholdings are Ireland, the Netherlands, Switzerland, the United Kingdom and the United States. In most other European countries corporate ownership is much more concentrated.

The literature has found that the identity of large shareholders is relevant for good governance. In particular, institutional investors monitor firms carefully and actively intervene when needed (see for example Hartzell and Starks, 2003), whereas large family shareholders (or other entrenched individuals) tend to act less favourably (see for example Morck et al.,

20 As far as banks are concerned it is quite common, and indeed often appropriate, that small banks have controlling shareholders (see Basel Committee on Banking Supervision, 2006).

Chart 11 Duration of enforcement



Source: World Bank.
Notes: Total number of calendar days needed to recoup a bounced cheque, i.e. the time between the moment of issuance of judgement and the moment the creditor obtains payment of a cheque. This is the sum of: (1) duration until completion of service of process; (2) duration of trial; and (3) duration of enforcement. The survey refers to a cheque worth the equivalent in local currency of 200% of GNP per capita of the respondent country. The survey also considers administrative procedures for the collection of overdue debt. Data for Luxembourg (LU) are not available. Euro area (EA) figures are averages of EA country data weighted by GDP. Data refer to 2005.

2005). Therefore, Chart 10 reports the proportion of institutional shareholders among the largest shareholders of firms in our sample countries. Institutional shareholders play a large role in Ireland, the United Kingdom, Sweden, Switzerland and the United States. They play a smaller role in Italian, Luxembourg, Portuguese, Spanish or Japanese firms. In short, it could be beneficial for the European financial system if ownership were to become more dispersed and include more institutional investors.

3.5 LEGAL SYSTEM

The reliability and efficiency of legal systems are important for the performance of financial systems. The inter-temporal nature of many financial contracts implies that investors relinquish control of their funds for a promise of future cash flows. The legal system enforces the honouring of such contracts. This is exemplified by the way in which the legal system helps to enforce the creditor and shareholder rights discussed in the previous sub-section. Research shows, for example, that international banks' investment decisions are sensitive to the enforcement of creditor rights (Papaioannou, 2005) and that stock-market turnover, block premia, private credit and market capitalisation are strongly correlated with the enforcement of shareholder rights (La Porta et al., 2006).

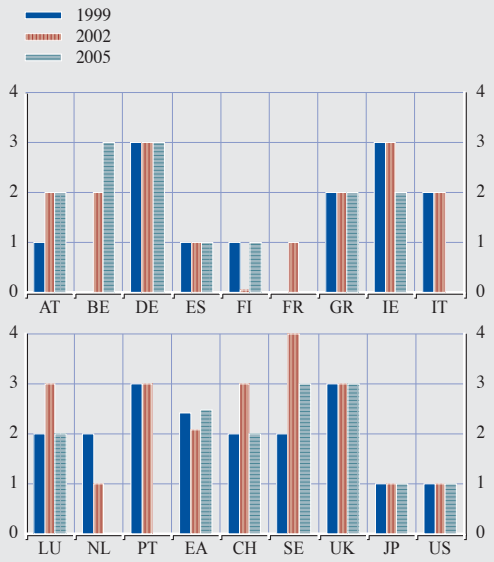
Chart 11 displays a measure of legal efficiency called "duration of enforcement" (see Djankov et al., 2003). It indicates the speed with which financial conflicts are resolved in the courts, by counting the number of days it takes on average to resolve a simple financial conflict. The legal system seems to be particularly slow in Italy, where the average time taken to resolve a simple financial conflict is nearly four years, and in Greece (about two years). The legal systems in Finland, Ireland, Switzerland and Sweden are much faster. In other words, this indicator suggests that there is room in a small number of European countries to improve the speed with which legal systems solve financial conflicts.[21] Section 4 underlines the importance of legal efficiency using a related index on legal formalism. The regressions reported there suggest that less legal formalism and faster processing of financial conflicts foster capital market growth and the efficient reallocation of capital.

3.6 FINANCIAL REGULATION, SUPERVISION AND STABILITY

The financial sector is distinct from other sectors owing to its greater potential for

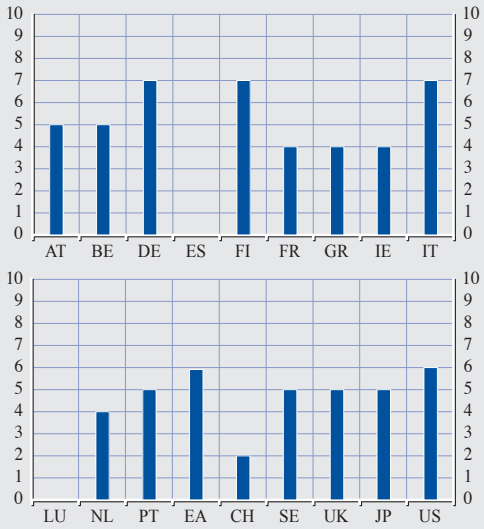
21 A legal system also supports the functioning of a financial system through the protection of property rights. As reported in Hartmann et al. (2006), property rights are subject to quite a high level of protection and this varies only to a limited extent across the sample countries. A similar finding (except for a very small number of EU countries) emerges for a "law and order" indicator that assesses the observance of the law, its strength and impartiality.

Chart 12 Supervisory forbearance discretion



Sources: World Bank for 1999 and 2002, own survey for 2005.
Notes: The index ranges from 0 to 4. The higher the index, the higher the discretion. The index is the sum of the values given for the answers to the following questions. Does the law establish pre-determined levels of solvency deterioration which force automatic actions such as intervention? No = 1. Can a supervisory agency or any other government agency forbear certain prudential regulations? Yes = 1. Must infraction of any prudential regulation found by a supervisor be reported? No = 1. Any mandatory actions in these cases? No = 1. 2005 updates for France (FR), Italy (IT), Netherlands (NL) and Portugal (PT) are not available. 1999 data for Belgium (BE) and France (FR) are not available. Euro area (EA) figures are averages of EA country data weighted by total assets of the banking sector. Owing to data availability, 2005 data had to be weighted with 2004 assets.

Chart 13 Deposit insurance moral hazard



Source: Demirgüç-Kunt and Detragiache (2002).
Notes: The index ranges from 0 to 10. The higher the index, the higher the risk of moral hazard. Index values are the sums of the values assigned to the following questions: 1) coinsurance is required (yes = 1, no = 0); 2) foreign currency deposits are covered (yes = 1, no = 0); 3) interbank deposits are covered (yes = 1, no = 0); 4) deposit insurance is funded (yes = 1, no = 0); 5) source of funding (the scores are: 2 if government, 1 if government and banks, 0 if banks only); 6) type of management of deposit insurance (the scores are: 3 if private, 1 if official, 2 if joint); 7) type of membership (the scores are: 1 if compulsory, 0 if voluntary). Data for Spain (ES) and Luxembourg (LU) are not available. Data refer to the period 1999-2000. Euro area (EA) figures are averages of EA country data weighted by total deposits.

instability and the need to protect small and relatively uninformed investors (see e.g. Dewatripont and Tirole, 1993, or Goodhart et al., 1998). The regulations and supervisory practices, which are mostly motivated by financial stability considerations, may correct for market imperfections, but if they are not well designed they could also impair financial efficiency (see for example Barth et al., 2004). This sub-section considers two dimensions of supervisory interventions: discretion in bank supervisory interventions ("forbearance") and proneness of deposit insurance arrangements to bank moral hazard.

The indicator in Chart 12 assesses the scope for supervisory forbearance by combining information on the existence of prompt corrective action provisions, possibilities to forbear prudential regulations and reporting requirements about infractions of prudential regulations. The higher the bars, the greater the room for discretion ("forbearance"). Some experiences suggest that too much forbearance may distort banks' risk-taking decisions and increase the costs of financial crises (see Kane and Yu, 1995, Calomiris et al., 2004, and Honohan and Klingebiel, 2003). The chart shows that there are significant differences across countries, with some benefiting from a lot of discretion (e.g. Germany, Sweden, the United Kingdom and perhaps Belgium) and others not (including Finland, Spain, Japan and the United States).

The second indicator on regulation combines information about features of bank deposit insurance schemes that could lead to moral hazard, i.e. banks could develop a tendency to rely too much on them and not adequately control risks (see Demirgüç-Kunt and Detragiache, 2002). These features include, for example, whether the scheme also covers wholesale deposits and whether it is fully funded or not. Chart 13 shows significant differences across countries. High bars, indicating a significant risk of moral hazard, are found for Finland, Germany, Italy and even the United States. In contrast, the risk of bank moral hazard due to deposit insurance seems to be low for Switzerland.

Overall, there seems to be room for improving the incentives of banks given by some specific aspects of European banking regulation and supervision. On the one hand, provisions for prompt corrective action and the reduction in discretion leading to forbearance could be considered. On the other, deposit insurance schemes could be limited to retail deposits, more accurately priced and provided with better funding solutions. Other bank regulations supporting market discipline are, however, in place in most sample countries (see Hartmann et al., 2006).

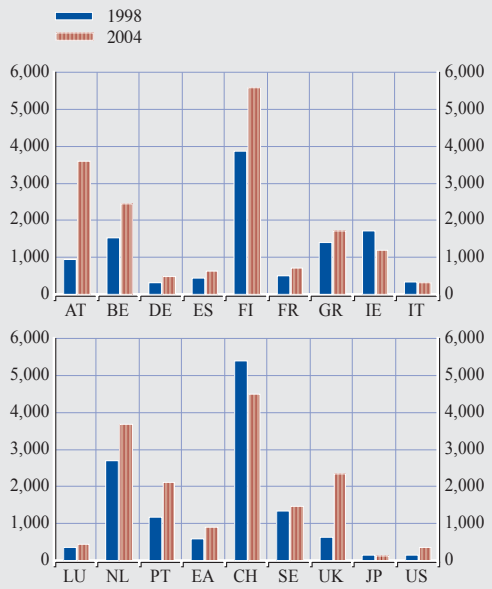
3.7 COMPETITION, OPENNESS AND FINANCIAL INTEGRATION

Competition among financial intermediaries lowers lending rates and increases the provision of credit (see for example Claessens and Laeven, 2005). It also gives incentives for intermediaries to explore the provision of new financial services. Competition is fostered, inter alia, by the openness of a financial system to entry and the provision of services from abroad, which will promote financial integration. The focus in this sub-section is on concentration, public ownership and foreign penetration of banking markets.

Market concentration is one possible, but admittedly imperfect measure of competition

Chart 14 Bank concentration

(Herfindahl index computed on total assets)



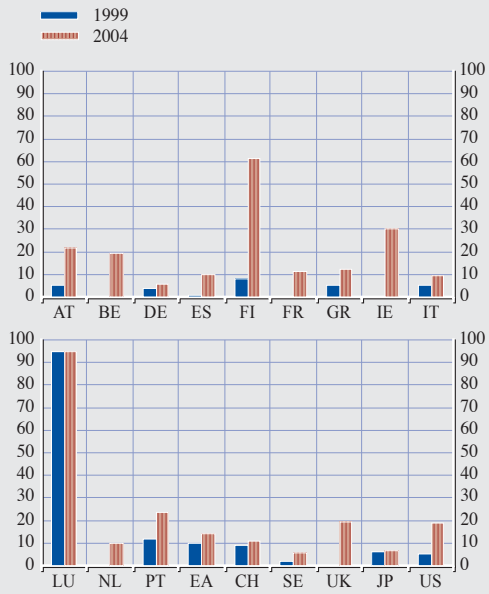
Sources: Bankscope and own calculations.
Notes: The Herfindahl index is computed by summing the squares of the market share of each bank using unconsolidated accounts in terms of total assets. The index has been rescaled to range from 0 to 10,000, with higher scores indicating more concentrated markets. Euro area (EA) figures are averages of EA country data weighted by total assets of the banking sector.

(see for example Cetorelli and Strahan, 2006, as well as Demirgüç-Kunt et al., 2004). The more concentrated a product-differentiated market such as a loan market, the greater the potential for monopoly profits and the higher the loan rates. Chart 14 shows the Herfindahl index, which is based on banks' assets for the sample countries. Section 4 provides some evidence that too much bank concentration may hamper the contribution of a financial system to efficient real investment in high-income countries. The issue seems important given the high level of bank concentration in a number of European countries, as shown in Chart 14.

One way to counter domestic bank concentration is to encourage foreign entry. Foreign entry in loan and deposit markets, e.g. through cross-border mergers and acquisitions, is pro-competition. Chart 15 shows the asset market shares of foreign bank branches and subsidiaries

Chart 15 Foreign bank penetration

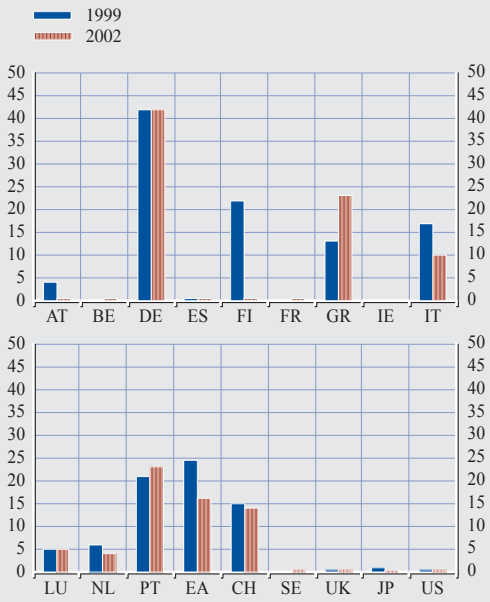
(assets of foreign-owned banks over total domestic assets, as a percentage)



Sources: World Bank for 1999 and ECB for 2004.
Notes: 1999 data for Belgium (BE), France (FR), Ireland (IE), Netherlands (NL) and the United Kingdom (UK) are unavailable. For Luxembourg (LU), Switzerland (CH), Japan (JP) and the United States (US), World Bank data are available only until 2002. Euro area (EA) figures are averages of EA country data weighted by total assets of the banking sector.

Chart 16 State ownership of banks

(as a percentage of total banking assets)



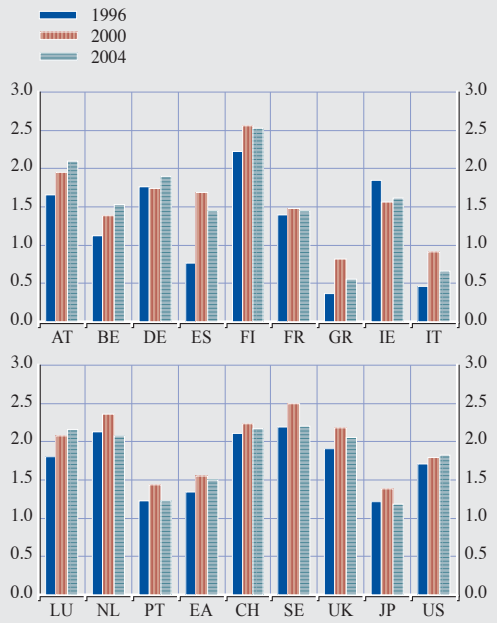
Source: World Bank.
Notes: Data for Ireland (IE) and 1999 data for Belgium (BE), France (FR) and Sweden (SE) are unavailable. Euro area (EA) figures are averages of EA country data weighted by total assets of the banking sector.

in the sample countries. With the exceptions of Luxembourg and recently Finland, and perhaps Ireland, foreign penetration is still limited, and not only in western Europe.[22] In other words, foreign bank penetration has not yet been able to limit domestic concentrations.[23] So, one way to counter the potentially adverse effects of domestic concentration, while permitting consolidation, is to allow for more foreign entry, e.g. through cross-border bank M&As. Previous work using cross-country data and the experience of bank deregulation in the United States also suggests that higher within-state bank concentration is associated with lower growth, whereas cross-state entry of banks had a number of positive effects (see Cetorelli and Gamberra, 2001, Strahan, 2003, and Cetorelli and Strahan, 2006.)

One possible obstacle to foreign bank entry is the public ownership and control of domestic banks. Moreover, extensive public ownership may distort competition in national banking markets, e.g. it could be associated with funding advantages. Research also suggests that government owned and controlled banks may pursue political objectives (e.g. lending to politically connected firms and entrepreneurs) at the expense of profit maximisation (see for example Dinc, 2005, for emerging markets or Sapienza, 2004, for Italy in the early 1990s) and that countries with a large share of state owned banks have less developed financial markets (La Porta et al., 2002). The econometric analysis in Section 4 and the literature further indicate that public banking may be associated with smaller and less developed capital markets, which in turn hampers the reallocation of capital.

22 The situation is very different in central and eastern Europe, where high foreign bank ownership is observed in many countries. The present paper does not cover those countries.
23 See also EU Commission (2005b) for a list of current obstacles to foreign bank entry in a number of areas.

Chart 17 Control of corruption



Source: World Bank.
Notes: Higher values indicate better control of corruption. The index is constructed using an unobserved components methodology and uses indicators of corruption from a large number of different sources (see Kaufmann et al., 2006, for details). The index measures the exercise of public power for private gain (e.g. nepotism, state capture or corruption). Euro area (EA) figures are averages of EA country data weighted by GDP.

Chart 16 displays public involvement by assets in the sample countries. Only a small number of industrial countries still have significant shares of public banks.[24] Many countries have no public banks anymore. Even though the results from the literature and the econometric analysis in Section 4 refer to earlier time periods and averages across countries, the countries that still have significant public banking may find it advisable to verify that their public bank sectors function better than the averages described in those results.

3.8 ECONOMIC FREEDOM, POLITICAL AND SOCIO-ECONOMIC FACTORS

Economic freedom means the absence of constraints to economic activities, e.g. corruption, administrative burdens or political interventions that are unrelated to efficiency. Given the great importance of information, contract enforcement and ease of exchange in financial transactions, there is also a significant role for social capital in the form of cooperativeness, ethics and trust. There are a large number of indicators that attempt to capture these aspects. This sub-section presents one such indicator that figures prominently in the finance and growth literature, namely the control of corruption (see La Porta et al., 1997 and 1998). Higher levels of corruption make it more difficult for private investors to enforce their rights through courts or for firms without political connections to obtain credit.

The measure in Chart 17 refers to the exercise of public power for private gain, for example, excessive patronage, state capture by vested interest or outright theft. As one would expect, a large number of European countries have very good control of public power for private gain and only very few have lower levels of control. These findings are mentioned only in relation to the efficiency of financial systems and not in relation to legal or criminal issues.

4 FINANCIAL DEVELOPMENT, REALLOCATION OF CAPITAL AND PRODUCTIVITY – ECONOMETRIC RESULTS

The last step is to establish a direct empirical link between the performance of the financial system and the performance of the economy (see Chart 1 in Section 2). Building on the large literature on financial development and economic growth (see Levine, 2005), this section discusses one possible approach, employing a number of the indicators presented in Section 3.[25]

The basic idea behind the approach chosen goes back to Schumpeter (1912) and Bagehot (1873), who argued that a well developed financial system

24 The Portuguese figure refers to just one large public bank, whereas the German figure includes many small banks that are part of a large network.
25 This section is based on a more extensive analysis presented in Ciccone and Papaioannou (forthcoming).

enhances productivity by accelerating the speed of capital reallocation in the process of "creative destruction". The idea is that financial markets help to channel resources (mainly capital) from declining industries to firms, entrepreneurs and sectors with good growth prospects. So, financially well developed economies converge faster to the efficient production frontier and experience higher overall productivity growth, since capital is allocated to the sectors that earn higher returns.[26]

Recent empirical research using industry data has shown that financially developed and open countries manage to exploit technological innovations better (e.g. Fisman and Love, 2003 and 2004, Bekaert et al., forthcoming, Ciccone and Papaioannou, 2006).

Wurgler (2000) develops an intuitive test for examining how financial development supports the alignment of actual with optimal industry investment. The main hypothesis is that industries with better growth prospects should experience faster investment growth in countries that benefit from a higher level of financial development. Wurgler founds this notion on the *q*-theory of investment (see Tobin, 1969), which establishes a positive linear relationship between capital growth (at the firm and industry level) and Tobin's *q* (formally the market value of capital divided by its replacement cost – it is often approximated by the market-to-book ratio of a firm's or industry's assets). The higher *q* is for a given industry, the better the growth prospects for this industry and the more should be invested in it.[27]

In this paper, this intuitive approach is implemented following a sequence of estimations akin to Wurgler's (2000) two-step approach. It significantly refines, however, the economic argument and econometric specification, focuses on high-income countries and adds more recent industry data. In a first step, real investment growth is regressed on value-added growth at the industry level, controlling for time, country, industry effects and interactions between them (to account for all possible sources of unobserved heterogeneity). Value-added growth is used to measure sector investment opportunities.[28] The idea is that expanding sectors, i.e. those with high growth in value-added, should invest more to further exploit positive future growth opportunities. This first estimation yields an elasticity of investment to value-added (the "speed of inter-sectoral capital reallocation") for each country. In a second step, the estimated country-specific elasticity is regressed on a variety of variables from Section 3 that measure the efficiency of financial systems and on non-financial variables that account for other influences on capital reallocation, such as income or human capital. As discussed below, the aggregate size of capital markets turns out to be the most significant predictor of cross-country variations in the inter-sectoral speed of capital reallocation. Therefore, an instrumental variable, i.e. two-stage, regression is added as a third step. In the first stage, various institutional and structural variables (many of which correspond, for example, to the "fundamentals" of a financial system, as defined in Section 2) are regressed on capital market size. The predicted part of capital market size is then regressed in a second stage on the speed of capital reallocation.

The three sub-sections below follow the steps of the analysis. The first subsection shows

26 In this vein, some observers have attributed the surge in productivity growth in the United States after the mid-1990s, which was mainly concentrated in information technology and R&D intensive sectors, to the efficiency with which US financial markets channelled capital to start-up firms in software, biotech, pharmaceuticals and telecommunications industries (see the literature reviewed in Papaioannou, forthcoming).

27 Ciccone and Papaioannou (2006) establish more developed foundations for the Schumpeterian capital reallocation hypothesis by examining a multi-industry world equilibrium model where industries are subject to country-specific, as well as global demand and technology shifts. These (partly anticipated) shocks drive a gap between the actual allocation of capital and the target allocation across industries, i.e. the optimal allocation that would emerge if capital was reallocated immediately to where it is most productive. Financial development is modelled as an adjustment mechanism that potentially speeds up the flow of capital from declining to rising sectors.

28 Wurgler (2000) argues that, in countries with adequate data availability, value-added growth is significantly correlated with Tobin's *q* and other proxies of investment opportunities (e.g. sales growth).

graphically the estimated speed of capital reallocation for each country. The second estimates the role of capital market size as one of the economic variables determining the speed of capital reallocation. The third sub-section estimates the determinants of capital market size and assesses their importance for the reallocation of capital.

There are a number of advantages to the approach chosen and the use of quantitative econometric evidence. First, the reallocation of capital across industries is clearly one important mechanism though which a financial system fosters productivity, especially in industrial countries. Second, the estimation approach addresses a number of technical problems, such as biases arising from omitted variables, unobserved heterogeneity and reverse causality. Third, the use of econometric analysis makes it transparent under which assumptions the results hold. Last, the results found are fully in line with those of the more structural analysis presented by Ciccone and Papaioannou (2006) using different data.

These advantages have to be set against a number of challenges and caveats. First, the reallocation channel analysed is only one among many through which a financial system may affect productivity and economic growth (see inter alia Section 2). The literature has also highlighted, for example, the importance of financial intermediation in fostering investment (capital deepening), education (human capital accumulation), and the adoption of new technologies (see Levine, 2005; Papaioannou, forthcoming). The approach followed is silent about the existence of such other channels and whether the financial variables identified play similar or different roles in them. Second, since many of the indicators from Section 3 are used, the same caveats that are listed above apply. In addition to measurement error, this also relates to the unavailability of some data for the earlier and later periods of the sample. Furthermore, industry data are quite noisy and thus may not accurately reflect economic conditions across countries. However as long as mis-measurement is not systematic, the regressions will yield conservative rather than inflated estimates. Third, the parts of the estimations that use only the small number of high-income OECD countries may exhibit some small sample problems. Fourth, the estimations are new and have not yet been exposed to scientific peer review.

4.1 DATA AND DESCRIPTION OF THE ESTIMATED SPEED OF INTER-SECTORAL CAPITAL REALLOCATION

The speed of capital reallocation is estimated using international data on sectoral investment (gross fixed capital formation) and production (value-added) from the Industrial Statistics

Chart 18 Speed of capital reallocation and financial development in the full sample

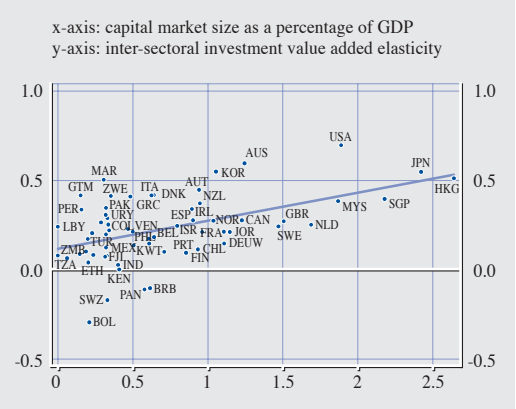
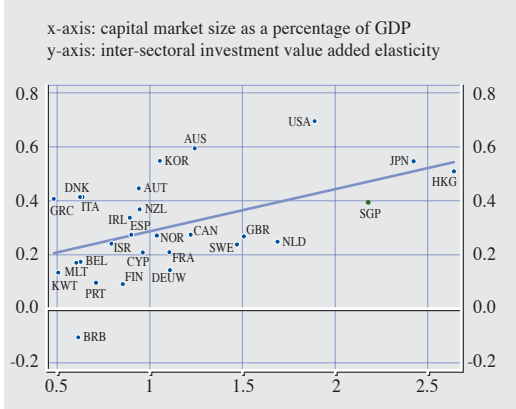


Chart 19 Speed of capital reallocation and financial development in the sample of high-income countries



Database of the United Nations Industrial Development Organization (UNIDO). These cover 28 manufacturing industries in 65 (non-socialist) economies during the period 1963-2003. In this section, results are presented for the entire sample of countries (since this is the most efficient statistical approach), but special attention is paid to industrial countries by also i) excluding low-income countries; and ii) considering only 28 high-income countries.

Chart 18 plots the estimated speed of capital reallocation on the vertical axis against capital market size as a measure of financial development for the full sample. It shows a clear positive relationship. For example, inter-sectoral capital reallocation is significantly faster in the group of industrial countries; than in emerging and developing countries.

A natural question is then whether the positive association between financial development and capital reallocation is driven by differences between industrial and developing countries other than the size of capital markets. Chart 19 shows the same information as Chart 18 for the sub-sample of high-income countries and, again, there is a positive relationship.[29] High-income countries with low levels of financial development also tend to have a slower reallocation of capital. Moreover, there is considerable variation in the speed of capital reallocation ranging from 0.1 (Portugal) to 0.7 (United States). This is only slightly less than

29 The high-income countries are 22 OECD countries (Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Japan, South Korea, the Netherlands, Norway, New Zealand, Portugal, South Korea, Spain, Sweden, the United Kingdom and the United States) and Barbados, Cyprus, Hong Kong, Israel, Kuwait, Malta and Singapore.

Table 2 Econometric results on the relationship between financial development and capital reallocation

	All countries	No low-income	High income	All countries	No low-income	High income
	(1)	(2)	(3)	(4)	(5)	(6)
Capital market size	0.236**	0.253***	0.350**	0.319***	0.318***	0.413***
stand.error	(0.082)	(0.085)	(0.112)	(0.087)	(0.088)	(0.108)
p-value	*0.01*	*0.00*	*0.01*	*0.00*	*0.00*	*0.00*
Income-real GDP per capita	0.019	0.019	0.019	0.033	0.046	0.032
stand.error	(0.015)	(0.018)	(0.072)	(0.023)	(0.036)	(0.075)
p-value	*0.19*	*0.28*	*0.80*	*0.17*	*0.21*	*0.68*
Schooling				0.013	0.014	0.031**
stand.error				(0.012)	(0.012)	(0.014)
p-value				*0.30*	*0.26*	*0.04*
Institutional quality				-0.066	-0.070	-0.133*
stand.error				(0.041)	(0.045)	(0.067)
p-value				*0.12*	*0.12*	*0.06*
Intercept	-0.049	-0.057	-0.124	-0.238	-0.362	-0.324
stand.error	(0.101)	(0.131)	(0.677)	(0.157)	(0.274)	(0.651)
p-value	*0.63*	*0.67*	*0.86*	*0.14*	*0.19*	*0.62*
adjusted R-squared	0.256	0.249	0.255	0.300	0.300	0.393
Countries	62	54	28	59	50	28

Notes: The dependent variable is the estimated country-specific elasticity of investment to value-added. The OLS estimation controls for country, industry, time, country-industry, industry-time and country-year fixed-effects. Capital market size is the sum of private credit by deposit money banks (and other financial institutions) and stock market capitalisation as a share of GDP, averaged over the period 1980-1995 (Source: World Bank Financial Structure Database; see also Beck et al., 1999). Income-real GDP per capita is in logs and from 1981 at constant 1995 international US dollars (Source: World Bank). Schooling is average years of schooling in the population aged 25 and over in 1980 (Source: Barro and Lee, 2001). Institutional quality is a composite index based on three sub-indicators of government effectiveness (which proxies mostly bureaucratic efficiency and functioning), rule of law (which proxies for contract enforcement, protection of intellectual property rights and judicial efficiency) and corruption (which proxies for corruption among public officials, effectiveness of anticorruption initiatives, and mentality regarding corruption) (Source: World Bank Aggregate Governance Indicators Database; see also Kaufmann et al., 2006). Heteroscedasticity-adjusted standard errors are reported in parenthesis below the coefficients. P-values are reported in italics below the standard errors. ***, ** and * denote statistical significance at the 1%, 5% and 10% level respectively.

the variation for the full sample that includes developing countries. It suggests that the results obtained for the full sample of countries are not driven by differences between industrial and developing countries, and that the results hold for industrial countries too.

4.2 ROLE OF CAPITAL MARKET SIZE

To explore the role of financial development in determining the speed of capital reallocation more formally, Table 2 shows results from regressing the estimated elasticity of investment to value-added (speed of capital reallocation) on capital market size (financial development) and other controls, such as income (economic development), human capital and the overall quality of institutions. In columns (1)-(3), the effect of capital market size on the investment-value added elasticity is estimated controlling for the overall level of economic development. In columns (4)-(6), controls for human capital and the overall efficiency of institutional structures are added.

It turns out that capital market size is a statistically and economically significant determinant of capital reallocation. Furthermore, it is a much stronger determinant than any of the other variables. This result is present in the

Table 3 Driving factors of financial development and capital reallocation (separate two-stage estimations)

	All countries	No low-income	High income	All countries	No low-income	High income	All countries
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Panel A: Second Stage Estimates							
Capital market size	0.341*	0.347**	0.382*	0.520***	0.515***	0.419	0.415**
stand.error	(0.183)	(0.163)	(0.221)	(0.182)	(0.176)	(0.320)	(0.151)
p-value	*0.07*	*0.04*	*0.10*	*0.01*	*0.01*	*0.20*	*0.01*
Panel B: First Stage Estimates							
Legal formalism	-0.130***	-0.151***	-0.124**				
stand.error	(0.031)	(0.028)	(0.049)				
p-value	*0.00*	*0.00*	*0.02*				
Investor protection				0.556***	0.591***	0.386*	
p-value				(0.159)	(0.157)	(0.192)	
				0.00	*0.00*	*0.06*	
Insider trading Legislation							0.025***
stand.error							(0.005)
p-value							*0.00*
Gov. ownership of banks							
stand.error							
p-value							
Bank concentration (HHI)							
stand.error							
p-value							
1st stage R-squared	0.231	0.388	0.200	0.214	0.262	0.155	0.273
countries	59	49	28	47	42	24	60

Notes: The table reports second-stage (in panel A) and first-stage (in panel B) estimates of two-stage least squares (2SLS) models. The dependent variable in the second-stage is the country-specific elasticity of investment to value-added. The estimation controls for country, industry, time, country-industry, industry-time and country-year fixed-effects. See Table 2 for a definition of capital market size. Capital market size is instrumented in the first-stage model with i) legal formalism, ii) investor protection, iii) insider trading legislation, iv) government ownership of banks or v) bank concentration. Legal formalism measures substantive and procedural statutory intervention in judicial cases of lower-level civil trial courts, and it is composed of 1) professionals vs. laymen, 2) written vs. oral elements, 3) legal quantification, 4) statutory regulation of evidence, 5) control of superior review, 6) engagement formalities and 7) independent procedural actions. The index ranges from 0 to 7, with higher scores meaning more control of the judicial process (see Djankov et al., 2003). Investor protection is the anti-self-dealing index that measures the de facto ex-ante and ex-post private control of self-dealing transactions. The ex-post components are the disclosure requirements in periodic filings and the ease of proving wrongdoing. The ex-ante components are approval requirements of disinterested shareholders and ex-ante disclosure. The index ranges

full sample of countries (column (1)), the sample without low-income countries (column (2)), and the sample of high-income countries (column (3)). In other words, financial development also fosters the reallocation of capital in major industrial countries. Even controlling jointly for income, education, and institutional quality, capital market size remains highly significant across all samples (columns (4)-(6)). Moreover, no other financial variables, such as the ones discussed in Section 3, seem to be significant direct determinants of capital reallocation when added to the estimation. In other words, aggregate capital market size seems to constitute a summary measure of overall financial development in both developing and industrial countries.

The economic significance of capital market size as an explanatory variable for capital reallocation can be illustrated with a simple example. Between 1980 and 1995, Austria had a capital market size of 94% of GDP (roughly the mean value for high-income countries). According to the estimations in Table 2, if Austria were to enlarge its capital markets to the size of the Netherlands (169% of GDP, and the most financially developed country in the EU by this measure), then the inter-sector elasticity of investment to value-added in Austria would

No low-income	High income	All countries	No low-income	High income	All countries	No low-income	High income
(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Panel A: Second stage estimates							
0.427**	0.473	0.276**	0.202**	0.284	0.476**	0.684*	1.057**
(0.177)	(0.300)	(0.096)	(0.101)	(0.215)	(0.211)	(0.395)	(0.459)
0.02	*0.13*	*0.01*	*0.05*	*0.20*	*0.03*	*0.09*	*0.03*
Panel B: First stage estimates							
0.022***	0.014***						
(0.005)	(0.005)						
0.00	*0.00*						
		-0.586***	-0.600***	-0.473***			
		(0.095)	(0.099)	(0.129)			
		0.00	*0.00*	*0.00*			
					-0.140**	-0.095	-0.098
					(0.509)	(0.059)	(0.058)
					0.01	*0.11*	*0.1*
0.260	0.239	0.403	0.423	0.358	0.101	0.336	0.104
50	28	56	48	26	60	48	27

from 0 to 1, with higher values indicating better protection against insiders' self-dealing activities (i.e. higher de facto investor protection) (Source: Djankov et al., 2006b). Insider trading legislation is the number of years in 1995 that the country had established and implemented legislation against insider trading (Source: Bhattacharya and Daouk, 2002). Government ownership of banks is the share of the assets of the ten largest banks in a country controlled or owned by the government of this country in 1970. The percentage of the assets owned by the government in a given bank is calculated by multiplying the share of each shareholder by the share that the government owns in that shareholder, and then summing the resulting shares (Source: La Porta et al., 2002). Bank concentration is the Herfindahl-Hirschman Index of the banking system, based on unconsolidated (domestic) financial statement data on all (commercial, saving, investment, etc) banks' assets. The HHI for each country is defined as the sum of squared market shares. The variable is the average in the period 1994-1996 and is expressed in logs (Source: Bankscope). The table reports the first-stage R-squared. Heteroscedasticity-adjusted standard errors are reported in parentheses below the coefficients. P-values are reported in italics below the standard errors. ***, ** and * denote statistical significance at the 1%, 5% and 10% level respectively.

increase by 8.6 percentage points per year. Austria would then reach the speed of capital reallocation found in New Zealand.[30]

4.3 DRIVING FACTORS OF CAPITAL MARKET SIZE

The final step of the analysis is aimed at gaining insight into which financial sector policies could promote the ability of European countries to reallocate capital faster from declining to rising industries. To this end, capital market size is first regressed on a variety of fundamental and structural financial variables and then the speed of capital reallocation is regressed on the explained part of capital market size from the first stage. If both parts yield significant results, then policies that improve these fundamental and structural features of a financial system are also likely to improve capital reallocation (via financial development).

Table 3 reports such two-stage regressions for four groups of variables from Section 3. Legal efficiency refers to a first-stage regression in which a measure of legal formalism is the main explanatory variable of capital market size (see Djankov et al., 2003, Acemoglu and Johnson, 2006). This measure indicates to what extent a legal system has formal procedures that can delay even simple legal cases (similar to the duration index reported in Section 3). It is widely used in the finance and growth literature to describe how well a legal system supports financial transactions. The expected sign of it is negative, as more formal and slow-proceeding legal systems hamper the development of capital markets. In line with previous work, countries with a slow-proceeding judiciary have on average smaller capital markets. This result also holds for the group of high-income countries.

Investor protection refers to a regression in which the anti-self-dealing index devised by Djankov et al. (2006b) is inserted as the main explanatory variable. As discussed in Section 3, this index describes how well an important component of good corporate governance can be enforced in a given country. More precisely, it describes how easy it is for minority shareholders to enforce rules against self-dealing transactions by majority shareholders or company directors. The expected sign of the index is positive, as less protection against self-dealing will increase the cost of capital and deter savers from investing in capital markets. The evidence in Table 3 shows that countries where shareholders can better enforce protection against self-dealing have larger capital markets.

The third regression in Table 3 relates to insider trading in stock markets. The main explanatory variable in the first-stage regression there is the number of years it took a country to enforce insider legislation for the first time following its introduction (see Bhattacharya and Daouk, 2002). A laxer enforcement of insider trading should raise the cost of capital, since investors expect to sometimes trade against better informed insiders. The results indicate that a quicker enforcement of insider trading has a positive effect on capital markets.

The last two regression models concentrate on some structural features of the banking sector. More competition among banks is expected to lower the cost of lending and ease access to credit (see for example Claessens and Laeven, 2005). Using concentration to measure competition, albeit imperfectly, the expected sign on the size of capital markets is negative. The extensive public ownership of banks constitutes one possible distortion of competition in banking (see also La Porta et al., 2002). The impact of the extent of state ownership of banks before the wave of privatisation started in the 1980s on the size of capital markets is expected to be negative. Table 3 confirms these predictions, although the result for bank concentration is only marginally significant.

30 The regressions were also run using the smaller sub-sample of 21 (22) high-income OECD countries (including South Korea). In spite of the small sample size, the point estimates were quite similar to the ones in Table 2 (although marginally insignificant). Ciccone and Papaioannou (forthcoming) provide additional sensitivity checks indicating that the positive association between capital market size and the speed of capital reallocation is quite robust.

Table 4 Driving factors of financial development and capital reallocation (joint two-stage estimations)

Dependent variable	All countries	No low-income	High income	All countries	No low-income	High income
Intersectoral investment responsiveness	(1)	(2)	(3)	(4)	(5)	(6)
			Panel A: Second stage estimates			
Capital Market Size	0.341***	0.329**	0.367*	0.360***	0.350***	0.421**
stand.error	(0.095)	(0.110)	(0.190)	(0.088)	(0.105)	(0.162)
p-value	*0.00*	*0.01*	*0.07*	*0.00*	*0.00*	*0.02*
			Panel B: First stage estimates			
Legal formalism	-0.058**	-0.079**	-0.066**	-0.084**	-0.075**	-0.0850
stand.error	(0.028)	(0.028)	(0.046)	(0.032)	(0.033)	(0.051)
p-value	*0.04*	*0.01*	*0.02*	*0.01*	*0.03*	*0.11*
Insider trading legislation	0.013***	0.011***	0.008**	0.013***	0.010***	0.008**
stand.error	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
p-value	*0.00*	*0.00*	*0.03*	*0.00*	*0.00*	*0.02*
Gov. ownership of banks	-0.381***	-0.326***	-0.308**	-0.394***	-0.343***	-0.363**
stand.error	(0.089)	(0.099)	(0.136)	(0.084)	(0.100)	(0.138)
p-value	*0.00*	*0.00*	*0.03*	*0.00*	*0.00*	*0.02*
Legal origin	No	No	No	Yes	Yes	Yes
OID test; J-statistic	0.279	1.344	1.7220	1.2470	2.5050	2.3670
p-value	*0.86*	*0.51*	*0.42*	*0.94*	*0.78*	*0.80*
1st stage R-squared	0.606	0.616	0.475	0.655	0.646	0.536
countries	56	48	26	54	46	26

Notes: The table reports second-stage (in Panel A) and first-stage (in Panel B) estimates of two-stage least squares (2SLS) models. The dependent variable in the second-stage is the country-specific elasticity of investment to value-added. The estimation controls for country, industry, time, country-industry, industry-time and country-year fixed-effects. See Table 2 for a definition of capital market size. Capital market size is instrumented in the first-stage model with i) legal formalism, ii) insider trading legislation, iii) government ownership of banks and iv) legal origin (in columns 4-6). See Table 3 for the definition of legal formalism, insider trading legislation and government ownership of banks. Legal origin is a dummy variable that identifies the legal origin of the company law or commercial code of each country. There are five legal families: English (Common Law), French (Civil Law), German (Civil Law), Nordic (Civil Law) and Socialist (although socialist countries are excluded from the analysis altogether) (Source: La Porta et al., 1999). The table also reports the first-stage R-squared and a test of overidentifying restriction (OID), where under the null hypothesis the instruments are valid. Heteroscedasticity-adjusted standard errors are reported in parentheses below the coefficients. P-values are reported in italics below the standard errors. ***, ** and * denote statistical significance at the 1%, 5% and 10% level respectively.

Overall, the results in Table 3 suggest that all these factors play a role for financial development, and all the factors have the expected signs. Overly formal and inefficient legal systems, government ownership (or other forms of public control) of banks and bank concentration tend to limit the development of capital markets. Good enforcement of corporate governance (in particular, protection against corporate self-dealing) and solidly implemented insider trading legislation tend to foster capital market development.[31] Turning to the effect of capital market size on the speed of inter-sectoral capital reallocation (Panel A: second-stage estimates), the estimates show that the respective components of financial development explained by the above factors are significant explanatory variables for the speed of capital reallocation in a country. When the focus is on the 28 high-income countries, the results weaken somewhat, but remain statistically and economically significant. In short, the components of capital market size predicted separately by legal formalism, investor protection, insider trading

31 Various other institutional factors and measures, such as banking system competition, foreign bank penetration, banking supervision (see Section 3) have been tested, but legal efficiency, corporate governance and state-ownership of banks appear to be the most significant drivers of capital market size across all country samples.

legislation, government ownership of banks and, to a lesser extent, bank concentration foster the speed with which capital is reallocated from declining to growing industries in a country.

A final check is to estimate the effect of capital market size on capital reallocation using the drivers of financial development simultaneously in the first-stage. The results are shown in Table 4. Legal formalism, insider-trading legislation and government ownership of banks are significant predictors of the size of capital markets in the different country samples. Moreover, the component of financial development explained by these institutional factors is a significant correlate of the inter-sectoral capital reallocation.[32] All the conclusions drawn from Table 3 continue to hold in this specification.

32 The results are similar when one replaces legal formalism with the anti-self-dealing index due to their collinearity.

5 CONCLUSION

Building on an extensive literature underlining the role of financial systems in productivity, innovation and growth, this paper analyses the performance of European capital markets and their contribution to the performance of European economies. The results are derived from internal and external research. They do not necessarily reflect the position of the European Central Bank (ECB), and the ECB is not committed by them. They are presented to generate discussion and identify areas in which more work could be undertaken to further substantiate advice for policy-makers. They also have to be interpreted in relation to the economic literature and to specific assumptions made by the different approaches used.

The main results of the paper are those that are supported by three different elements of analysis. First, do they match the empirical and theoretical results of the existing literature? Second, are they confirmed by indicators that quantify the state of development of European financial systems? And third, does the econometric analysis show a link between certain indicators of financial development and the speed with which capital is reallocated from declining to rising industry sectors?

The main results are that i) the size of capital markets is a useful summary statistic of the overall financial development of an economic region, ii) it may be advisable to remove obstacles preventing efficient legal action by minority shareholders in publicly traded firms against self-dealing by corporate insiders, iii) a fast resolution of financial conflicts by a legal system improves financial development and the swift reallocation of capital, and iv) certain structural features of European bank sectors may hamper financial development.

The paper also derives a number of other results that are supported by at least two but not all three elements of the analysis. These less strong results relate to the information processing capacity of European stock markets, creditor rights, ownership concentration in large publicly traded firms and the regulation of banks. Finally, the paper points out that more research is needed on the important issue of European risk capital markets, i.e. venture capital financing and the securitisation of illiquid assets.

The elements of analysis employed in the paper have some advantages and disadvantages that must be kept in mind. The use of indicators of financial development gives a comprehensive view of a financial system and allows identifying those issues that require further attention. The indicators are firmly grounded and have been used before in the comprehensive economic literature, and they allow to cross-check the econometric analysis. But not all aspects of European financial systems may be fully captured by the indicators. The constraints imposed by data unavailability and non-comparability are significant. Moreover, publicly available data may not capture issues that can only be identified by those individuals that are active in financial markets. While formal laws and rules are easier to measure, informal rules could be just as influential. Information is often available on wholesale, market-based activities but not on retail, relationship-based activities.

The econometric analysis in this paper focuses on the reallocation of capital across industries. Although important, it is only one among many mechanisms through which a financial system may affect productivity and economic growth, e.g. capital deepening, human capital accumulation or the adoption of new technologies. The econometric analysis is silent about the existence of such other mechanisms and whether the issues identified here are similar or different for them. The estimation approach addresses a number of identification problems, such as biases arising from omitted variables, unobserved heterogeneity and reverse causality. But since it uses many of the indicators of financial development, the same caveats listed above apply.

REFERENCES

Acemoglu, D., and S. Johnson, 2006. "Disease and Development: The Effect of Life Expectancy on Economic Growth", NBER Working Paper, 12269.

Acemoglu, D., and F. Zilibotti, 1997, "Was Prometheus Unbound by Chance? Risk, Diversification and Growth", *Journal of Political Economy*, 105, 709-751.

Aghion, P., O. Hart and J. Moore, 1992, "The Economics of Bankruptcy Reform", *Journal of Law, Economics and Organization*, 8, 523–546.

Aghion, P., P. Howitt, and D. Mayer-Foulkes, 2005, "The Effect of Financial Development on Convergence: Theory and Evidence", *Quarterly Journal of Economics*, 120, 173-222.

Alfaro, L., S. Kalemli-Ozkan, and V. Volosovych, 2005, "Why Doesn't Capital Flow from Rich to Poor Countries? An Empirical Investigation", NBER Working Paper, 11901.

Allen F. and D. Gale, 1997, "Financial Market, Intermediaries and Intertemporal Smoothing", *Journal of Political Economy*, 105, 523-546.

Baele, L., Ferrando, A., Hördahl, P., Krylova, E. and C. Monnet, 2004, "Measuring Financial Integration in the Euro Area", ECB Occasional Paper 14, May.

Bagehot, W., 1873, *Lombard Street: A Description of the Money Market* (1962 ed) (Irwin, Homewood, IL.).

Barro, R. J. and J. W. Lee, 2001, "International Data on Educational Attainment: Updates and Implications", *Oxford Economic Papers*, 53, 541-563.

Barth, J. R., G. Caprio and R. Levine, 2004, "Bank Regulation and Supervision: What Works Best?", *Journal of Financial Intermediation*, 13, 205-248.

Barth, J. R., G. Caprio, and R. Levine, 2006, *Rethinking Bank Regulation: Till Angels Govern* (Cambridge University Press: New York).

Basel Committee on Banking Supervision, 2006, "Enhancing Corporate Governance for Banking Organisations", Bank for International Settlements.

Beck, T., A. Demirgüç-Kunt and R. Levine, 1999, "A New Database on Financial Development and Structure", Policy Research Working Paper Series 2146, The World Bank.

Beck T., A. Demirgüç-Kunt, L. Laeven, and R. Levine, 2004, "Finance, Firm Size and Growth", NBER Working paper, 10983.

Bekaert, G., C. R. Harvey, C. Lundblad, and S. Siegel, forthcoming, "Global Growth Opportunities and Market Integration", *Journal of Finance*, forthcoming.

Benhabib, J. and M. Spiegel, 2000, "The Role of Financial Development in Growth and Investment", *Journal of Economic Growth*, 5, 341-360.

Berger, A. N., C. Buch, G. DeLong, and R. DeYoung, 2004, "The Comparative Advantage of Nations at Exporting Financial Institutions Management via M&As", *Journal of International Money and Finance*, 23, 333-366.

Berger, A. N., R. DeYoung, H. Genay, and G. F. Udell, 2000, "Globalization of Financial Institutions: Evidence from Cross-Border Banking Performance", *Brookings-Wharton Papers on Financial Services 2000*, 23-120.

Bertrand, M., A. Schoar, and D. Thesmar, forthcoming, "Banking Deregulation and Industry Structure: Evidence from the French Banking Reforms of 1985", *Journal of Finance*, forthcoming.

Bhattacharya, U., and H. Daouk, 2002, "The World Price of Insider Trading", *Journal of Finance*, 57, 75-108.

Calomiris, C. W., D. Klingebiel, L. Laeven, 2004, "A Taxonomy of Financial Crisis Resolution Mechanisms: Cross-Country Experience", in L. Laeven and P. Honohan, (eds), *Systemic Financial Crises: Containment and Resolution* (Cambridge, UK: Cambridge University Press).

Caprio, G. and D. Klingebiel, 1996, "Bank Insolvencies: Cross-Country Experience", World Bank Policy Research Working Paper 1620, July.

Cetorelli, N., and M. Gamberra, 2001, "Banking Market Structure, Financial Dependence and Growth: International Evidence from Industry Data", *Journal of Finance*, 56, 617-648.

Cetorelli N., and P. E. Strahan, 2006, "Finance as a Barrier to Entry: Bank Competition and Industry Structure in Local U.S. Markets", *Journal of Finance*, forthcoming.

Ciccone A., and E. Papaioannou, 2006, "Adjustment to Target Capital, Finance, and Growth", mimeo, Frankfurt.

Ciccone A., and Papaioannou E., forthcoming, "Financial Development and Intersectoral Investment: New Estimates and Evidence", forthcoming, ECB WP Series.

Claessens S., and L. Laeven, 2005, "Financial Dependence, Banking Sector Competition, and Economic Growth", *Journal of the European Economic Association*, 3, 179-207.

DeMarzo, M., 2005, "The Pooling and Tranching of Securities: A Model of Informed Intermediation", *Review of Financial Studies*, 18, 1-35.

Demirgüç-Kunt, A., and E. Detragiache, 2002, "Does Deposit Insurance Increase Banking System Stability? An Empirical Investigation", *Journal of Monetary Economics*, 49, 1373-406.

Demirgüç-Kunt A., L. Laeven and R. Levine, 2004, „Regulation, Market Structure, Institutions and the Cost of Financial intermediation", *Journal of Money Credit and Banking*, 36, 593-622

Demirgüç-Kunt, A., and V. Maksimovic, 1998, "Law, Finance, and Firm Growth", *Journal of Finance*, 53, 2107-137.

Dewatripont, M., and J. Tirole, 1993, *La réglementation prudentielle des banques* (Lausanne: Editions Payot).

Dinc, S., 2005, "Politicians and Banks: Political Influences on Government-Owned Banks in Emerging Countries", *Journal of Financial Economics*, 77, 453-479.

Diamond, D., 1984, "Financial Intermediation and Delegated Monitoring", *Review of Economic Studies*, 51, 393-414.

Djankov, S., R. La Porta, F. López-de-Silanes, and A. Shleifer, 2003, "Courts: The Lex Mundi Project", *Quarterly Journal of Economics*, 65, 453-517.

Djankov, S., C. McLiesh, and A. Shleifer, 2006a, "Private Credit in 129 Countries", *Journal of Financial Economics*, forthcoming.

Djankov, S., R. La Porta, F. Lopez-de-Silanes, and A. Shleifer, 2006b, "The Law and Economics of Self-dealing", working paper.

Durnev, A., R. Morck, and B. Yeung, 2003, "Value Enhancing capital Budgeting and Firm-specific Stock Returns Variation", *Journal of Finance*, 59, 65-106.

Esty, B. C., and W. L. Megginson, 2003, "Creditor Rights, Enforcement, and Debt Ownership Structure: Evidence from the Global Syndicated Loan Market", *Journal of Financial and Quantitative Analysis*, 38, 37-59.

European Central Bank (ECB), 2002, Report on Financial Structures, October.

European Central Bank (ECB), 2005a, Indicators of Financial Integration in the Euro Area, September.

European Central Bank (ECB), 2005b, Assessing the Performance of Financial Systems, *Monthly Bulletin*, October.

European Central Bank (ECB), 2007a, Financial Integration in Europe, March.

European Central Bank (ECB), 2007b, Financial Stability Review, June.

EU Commission (2005a), White Paper – Financial Services Policy 2005-2010, Brussels, December.

EU Commission (2005b), Cross-border consolidation in the EU financial sector, *Commission Staff Working Document*, SEC (2005) 1398.

Fisman, R., and I. Love, 2003, "Trade Credit, Financial Intermediary Development, and Industry Growth", *Journal of Finance*, 58, 353-374.

Fisman, R., and I. Love, 2004, "Financial Development and Growth in the Short and Long Run", NBER Working Paper, 10236.

Freixas, X., P. Hartmann and C. Mayer (eds.), forthcoming, *Handbook of European Financial Markets and Institutions* (Oxford: Oxford University Press).

Goldsmith, R., 1969, *Financial Structure and Development* (New Haven, Connecticut: Yale University Press).

Goodhart, C., P. Hartmann, D. Llewellyn, L. Rojas-Suarez and S. Weisbrod, 1998, *Financial Regulation: Why, How and Where Now?* (London: Routledge).

Greenwood, J., and B. Jovanovic, 1990, "Financial Development, Growth, and the Distribution of Income", *Journal of Political Economy*, 98, 1076-1107.

Guiso, L., P. Sapienza, and L. Zingales, 2004, "The Role of Social Capital in Financial Development", *American Economic Review*, 94, 526-56.

Guiso, L., P. Sapienza, and L. Zingales, 2005a, "Cultural Biases in Economic Exchange", CEPR Discussion Papers, 4837, January.

Guiso, L., P. Sapienza, and L. Zingales, 2005b, "The Cost of Banking Regulation", working paper, Northwestern University, September.

Gurley, J. G., and E. S. Shaw, 1960, *Money in a Theory of Finance* (Washington: Brookings Institution).

Hartmann, P., A. Maddaloni, and S. Manganelli, 2003, "The Euro Area Financial System: Structure, Integration and Policy Initiatives", *Oxford Review of Economic Policy*, 19, 180-213.

Hartmann, P., A. Ferrando, F. Fritzer, F. Heider, Lauro B. and Lo Duca M., 2006, "The Performance of the European Financial System", Mimeo.

Hartzell, J. T., and L. T. Starks, 2003, "Institutional Investors and Executive Compensation", *Journal of Finance*, 58, 2351-375.

Hoggarth, G., R. Reis and V. Saporta, 2001, "Costs of Banking System Stability: Some Empirical Evidence", *Financial Stability Review*, 10, 175-182.

Holmström, B., and J. Tirole, 1993, "Market Liquidity and Performance Monitoring", *Journal of Political Economy*, 101, 678-709.

Honohan P. and D. Klingebiel, 2003, "The Fiscal Cost Implications of an Accommodating Approach to Banking Crises", *Journal of Banking and Finance*, 27, 1539-1569

Jayaratne, J., and P. E. Strahan, 1996, "The Finance-Growth Nexus: Evidence from Bank Branching Deregulation", *Quarterly Journal of Economics*, 111, 639-670.

Jayaratne, J., and P. E. Strahan, 1998, "Entry Restrictions, Industry Evolution and Dynamic Efficiency", *Journal of Law and Economics*, 41, 239-274.

Jensen, M. C., and W. H. Meckling, 1976, "Theory of the Firm: Managerial Behaviour, Agency Costs and Ownership Structure", *Journal of Financial Economics*, 3, 303-360.

Kane E. J. and M. T. Yu, 1995, Measuring the True Profile of Taxpayer Losses in the S&L Insurance Mess, *Journal of Banking and Finance*, 19, 1459-1477.

Kaufmann, D., A. Kraay and M. Mastruzzi, 2006, Governance Matters V: Governance Indicators for 1996-2005, World Bank Institute (www.worldbank.org/wbi/governance/index.html).

Keeley, M., 1990, "Deposit Insurance, Risk and Market Power in Banking", *American Economic Review*, 80, 1183-1200.

King R., and R. Levine, 1993, "Finance and Growth: Schumpeter Might Be Right", *Quarterly Journal of Economics*, 153, 717-738.

La Porta, R., F. López-de-Silanes, A. Shleifer, and R. Vishny, 1997, "Legal Determinants of External Finance", *Journal of Finance*, 52, 1131-1150.

La Porta, R., F. López-de-Silanes, A. Shleifer, and R. Vishny, 1998, "Law and Finance", *Journal of Political Economy*, 106, 1113-1155.

La Porta, R., F. López-de-Silanes, A. Shleifer, and R. Vishny, 1999, Corporate Ownership Around the World, *Journal of Finance*, 49, 471-517.

La Porta, R., F. López-de-Silanes, A. Shleifer, and R. Vishny, 2000, "Investor Protection and Corporate Governance", *Journal of Financial Economics*, 58, 3-27.

La Porta, R., F. López-de-Silanes, A. Shleifer, and R. Vishny, 2002, "Government Ownership of Banks", *Journal of Finance*, 57, 265-302.

La Porta, R., F. Lopez-De-Silanes, and A. Shleifer, 2006, "What Works in Securities Laws?", *Journal of Finance*, 61, 1-32.

Levine, R., 2002, "Bank-based or Market-based Financial Systems: Which Is Better?", *Journal of Financial Intermediation*, 11, 1-30.

Levine, R., 2005, "Finance and Growth: Theory, Evidence, and Mechanisms", in P. Aghion and S. Durlauf, (eds), *The Handbook of Economic Growth* (Amsterdam: North Holland).

Levine, R., N. Loyaza, and T. Beck, 2000a, "Financial Intermediation and Growth: Causality and Causes", *Journal of Monetary Economics*, 46, 31-77.

Levine, R., Norman L., and T. Beck, 2000b, "Finance and the Sources of Growth", *Journal of Financial Economics*, 58, 261-300.

Levine, R., and S. Zervos, 1998, "Stock Markets, Banks, and Economic Growth", *American Economic Review*, 88, 559-586.

Lipsey, R. G., and K. Lancaster, 1956, "The General Theory of Second Best", *The Review of Economic Studies*, 24, 11-32

McKinnon, R.I., 1973, *Money and Capital in Economic Development* (Washington, DC: Brookings Institution).

Morck R., B. Yeung and W. Yu, 2000, "The Information Content of Stock Markets: Why Do Emerging Markets Have Synchronous Stock Price Movements?", *Journal of Financial Economics*, 58, 215-260.

Morck, R., D. Wolfenzon, and B. Yeung, 2005, "Corporate Governance, Economic Entrenchment and Growth", *Journal of Economic Literature*, 43, 657-722.

Myers, S., and N. Majluf, 1984, "Corporate Financing and Investment Decisions when Firms have Information that Investors Do Not Have", *Journal of Financial Economics*, 13, 187-221.

Papaioannou, E., 2005, "What Drives International Bank Flows: Politics, Institutions and Other Determinants", ECB Working Paper 437, February.

Papaioannou, E., forthcoming, "Finance and Growth: A Macroeconomic Assessment of the Evidence from a European Angle." In X. Freixas et al., (eds), *Handbook of European Financial Markets and Institutions* (Oxford: Oxford University Press).

Quian, J., and P. Strahan, 2005, "How Law and Institutions Shape Financial Contracts: The Case of Bank Loans", NBER Working Papers 11052.

Rajan, R.G., and L. Zingales, 1998, "Financial Dependence and Growth", *American Economic Review*, 88, 559-586.

Ranciere, R., A. Tornell, and F. Westermann, 2003, "Crises and Growth: A Re-Evaluation", NBER Working Papers, 10073.

Rossi, S., and P. Volpin, 2004, "Cross-Country Determinants of Mergers and Acquisitions", *Journal of Financial Economics*, 74, 277-304.

Santos, J., and K. Tsatsaronis, 2003, "The Cost of Barriers to Entry: Evidence from the Market for Corporate Euro Bond Underwriting", BIS Working Paper, 134.

Sapienza, P., 2004, "The Effects of Government Ownership on Bank Lending", *Journal of Financial Economics*, 72, 357-384.

Schmiedel, H., M. Malkamäki, and J. Tarkka, 2006, "Economies of Scale and Technological Development in Securities Depository and Settlement Systems", *Journal of Banking and Finance (Special Issue on Frontiers in Payment and Settlement Systems)*, 30, 1783-1806.

Schumpeter, J., 1912, *Theorie der wirtschaftlichen Entwicklung* (Duncker und Humblot, Leipzig).

Shleifer, A., and R. Vishny, 1986, "Large Shareholders and Corporate Control", *Journal of Political Economy*, 94, 461-488.

Shleifer, A., and D. Wolfenzon, 2002, "Investor Protection and Equity Markets", *Journal of Financial Economics*, 66, 3-27.

Spamann, H., 2006, "On the Insignificance and/or endogeneity of La Porta et al.'s Anti-Director Rights Index under Consistent Coding", John M. Olin Center for Law, Economics and Business Fellows Discussion Paper Series, No. 67/2006.

Stiglitz, J. E., and A. Weiss, 1981, "Credit Rationing in Markets with Imperfect Information", *American Economic Review*, 71, 393-410.

Strahan, P. E., 2003, "The Real Effects of US Banking Deregulation", *The Federal Reserve Bank of St. Louis Review*, 85, 111-128.

Tobin, J., 1969, "A General Equilibrium Approach to Monetary Theory", *Journal of Money, Credit, and Banking*, 1, 15-29.

Wurgler, J., 2000, "Financial Markets and the Allocation of Capital", *Journal of Financial Economics*, 58, 187-214.

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