



WORKING PAPER NO. 197

Financial Market Integration Under EMU

Tullio Jappelli and Marco Pagano

April 2008



University of Naples Federico II



University of Salerno



Bocconi University, Milan

WORKING PAPER NO. 197

Financial Market Integration Under EMU

Tullio Jappelli[♥] and Marco Pagano[♥]

Abstract

The single most important policy-induced innovation in the international financial system since the collapse of the Bretton-Woods regime is the institution of the European Monetary Union. This paper provides an account of how the process of financial integration has promoted financial development in the euro area. It starts by defining financial integration and how to measure it, analyzes the barriers that can prevent it and the effects of their removal on financial markets, and assesses whether the euro area has actually become more integrated. It then explores to which extent these changes in financial markets have influenced the performance of the euro-area economy, that is, its growth and investment, as well as its ability to adjust to shocks and to allow risk-sharing. The paper concludes analyzing further steps that are required to consolidate financial integration and enhance the future stability of financial markets.

Acknowledgements. We thank John Berrigan, Marie Donnay, Christine Gerstberger (EU Commission) and Simon Hayes (Barclays Capital) for their helpful remarks and suggestions. We also acknowledge useful comments from Michael Bordo, Richard Portes and other participants to the Euro@10 Workshop, organized by DG-ECFIN of the European Commission, 26-27 November 2007.

[♥] Università di Napoli "Federico II", CSEF and CEPR

Table of contents

1. *Introduction*
2. *Financial integration and financial development*
 - 2.1. Barriers to financial integration
 - 2.2. Effect of integration on financial development
 - 2.3. How integrated are European financial markets?
 - 2.3.1. Bond and credit markets
 - 2.3.2. Stock markets
3. *Effects on growth*
 - 3.1. Cross-country studies
 - 3.2. Industry-level studies
 - 3.3. Firm-level studies
4. *Effects on macroeconomic adjustment to shocks*
5. *Effects on risk sharing*
6. *Policy implications for the future*
 - 6.1. Future security market integration
 - 6.1.1. Clearing and settlement
 - 6.1.2. Stock trading infrastructure
 - 6.1.3. Government bond issuance
 - 6.1.4. Corporate bond market transparency
 - 6.2. Future credit market integration
 - 6.2.1. Loan contract enforcement
 - 6.2.2. Information sharing systems
 - 6.2.3. Deposit guarantee schemes
 - 6.2.4. Prudential regulation and banking supervision
 - 6.3. Political sustainability problems

References

1. Introduction

The single most important policy-induced innovation in the international financial system since the collapse of the Bretton-Woods regime is the institution of the European Monetary Union (EMU). It has opened up the possibility of a fully integrated continental financial market comparable to that of the United States. By eliminating exchange rate risk, EMU has eliminated a crucial obstacle to financial integration. Before EMU, otherwise identical financial claims denominated in different euro-area currencies were imperfect substitutes and traded at different prices. EMU has eliminated this source of market segmentation.

Yet if a single currency is a necessary condition for the emergence of pan-European capital markets, it is not a sufficient one. Other frictions may still impede full integration: even after the removal of exchange rate risk, persistent differences in the regulations applying to financial intermediaries, tax treatment, standard contractual clauses and business conventions, issuance policy, security trading systems, settlement systems, availability of information, and judicial enforcement may still segment markets along national lines. In the process that preceded and accompanied the introduction of the euro, however, monetary unification also triggered a sequence of policy actions and private sector responses that swept many of these other regulatory barriers aside.

To what extent has this process of regulatory reform led to actual financial integration? And if European financial markets have actually become more integrated, to what extent have these changes spurred – or can be expected to spur – growth and investment in Europe? Will financial integration also affect the ability of households to shoulder risks, or the ability of European economies to adjust to macroeconomic shocks? This chapter seeks to answer these questions in the broader context of the burgeoning literature on the complex links between regulation, finance and real economic activity.

To put matters in perspective, Figure 1 provides a road map to the main links, underscoring that legal norms and their enforcement can spur financial development. For instance, cross-border liberalization can sharpen banking competition and thereby expand the credit industry. It is at this juncture that financial reform designed to integrate national capital markets can have an impact on financial development.

[Insert Figure 1]

Why is the development of financial markets important? As the figure shows, improved access to bank lending and to securities markets is associated with increased investment and economic activity. The vast literature on the role of financial markets in spurring growth has identified a number of channels through which financial development affects investment and growth. First, by narrowing the wedge between the cost of capital to firms and the return paid to households, a more efficient financial industry should raise the level of investment. Second, it should improve the allocation of investment across alternative projects, with the funding of higher-return and riskier ventures, thanks to enhanced risk sharing.¹

¹ See Pagano (1993) for a survey of theoretical work on the channels through which financial markets may affect the level and growth rate of income.

To evaluate the effects of financial development on investment and growth empirically, one must control for reverse causality: real economic activity may have a feedback effect on financial development, insofar as greater investment means a greater demand for external finance – an effect that Figure 1 captures in the arrow from economic outcomes to financial development. Indeed, empirical researchers in this area have been busy sorting out whether it is finance that facilitates investment and growth or the other way around.

The possible effects of financial development on the real economy go beyond the growth rate, however. Developed financial markets change the way the economy responds to shocks, insofar as they enable firms to use international capital markets to fund domestic investment, and households to invest savings abroad. More generally, financial development enhances the ability of households and financial institutions to diversify risks. It can also affect the distribution of income between social groups and industries by favoring the expansion of groups and industries with strong growth opportunities but low current resources.

Figure 1 also illustrates that regulatory change does not take place in a vacuum: it requires political support and an appropriate cultural climate. Identical formal rules can have vastly different effects depending, for instance, on prevailing social norms, as is shown by the literature on the role of trust in economic interactions.² Indeed, social norms can even have a direct impact on the development of capital markets. Franks, Mayer and Rossi (2006) show that in the early 20th century British firms could rely on a dispersed shareholder base, due more to informal relations of trust than to formal regulation.

The politics of financial regulation are important for the future of European financial integration: to command continued political support, the reforms designed to create an integrated financial market must be perceived as beneficial by a sufficiently large constituency. This of course underscores the key question: whether the degree of financial integration triggered by monetary unification has paid – or can be expected to pay – a “growth dividend”. This explains why Figure 1 also shows a feedback effect from the real effects of financial development to the political forces that determine regulation.

With these questions in mind, in this chapter we define financial integration and consider how to measure it, analyze the barriers to it and how their removal should affect financial markets, and assess whether the euro area has actually become more integrated (Section 2). Then we inquire how far these changes in financial markets have affected the performance of the real economy, that is, growth and investment (Section 3), as well as the ability of the entire economy to adjust to shocks (Section 4) and that of European households to share risks (Section 5). We conclude with some policy implications for the future of European financial markets (Section 6).

² See Guiso, Sapienza and Zingales (2006).

2. Financial integration and financial development

Financial markets are integrated when the law of one price holds; that is, when securities with identical cash flows command the same price. In other words, if a firm issues bonds in two countries or regions, it must pay the same interest rate to both sets of bondholders. Similarly, if it raises equity, it must pay the same for capital in both markets. This notion also extends to credit markets: when they are integrated, a firm or household should be able to borrow on the same terms irrespective of the location of its bank.

This definition immediately implies that to measure the degree of financial integration of a region one needs to compare prices – or rates of return – for comparable securities issued in different areas within it. This generates price-based or return-based measures, such as interest rates differentials, and calls for the analysis of interest rate convergence. But since the definition also implies the ability to access external finance on the same terms both domestically and internationally, one can also look at the cross-border provision of credit and equity financing, and especially how it has changed in the wake of financial market reforms. This produces another set of indicators, i.e. quantity-based measures of financial integration.³

2.1. Barriers to financial integration

What can stand in the way of the law of one price? First, if two jurisdictions have different currencies, exchange rate fluctuations create additional risk, and investors will require a risk premium to hold a security denominated in a foreign currency. And even if there are no exchange rate fluctuations, transaction costs for currency conversion will induce a deviation from international arbitrage. A second barrier to integration stems from differential taxes and subsidies, which drive a wedge between the after-tax cost of capital in different countries.

Next, differences in regulation and enforcement can prevent financial intermediaries from competing across borders on equal footing. For instance, regulation can create stiffer entry barriers for foreign intermediaries; similarly, judicial efficiency can differ across countries, requiring intermediaries to charge higher interest rates in inefficient jurisdictions to compensate for expected recovery costs in case of default.

Finally, entry barriers may arise not from regulatory constraints but from asymmetric information between potential foreign entrants and domestic incumbents. This is particularly relevant in credit markets, where the opacity of firms and households combines with local knowledge to give local lenders an informational advantage.

The introduction of the euro has eliminated exchange rate risk and the costs of exchange rate transactions within the euro zone, directly removing one of the main barriers to financial integration. In addition, the process leading to monetary unification triggered a sequence of policy actions and private sector responses that swept aside many other regulatory barriers to

³ It should be noticed, however, that financial integration may not necessarily be accompanied by an increase in international capital flows. Hnatkovska and Evans (2007), in a theoretical examination of how world financial market integration affects international capital flows, point out that these should be large and very volatile during the early stages of financial integration, when international asset trading is concentrated in bonds, and that as integration progresses and households gain access to world equity markets, the size and volatility of international bond flows should fall but continue to exceed the size and volatility of equity flows.

financial integration. For instance, controls on capital flows were removed, banking and financial service directives created a level playing field in the credit and securities markets, and the rules governing the issuance of public debt were harmonized. These effects are captured in Miniane's index of legal restrictions on cross-border capital flows, which dropped sharply for most Euro area countries in the 1990s (Miniane, 2004).

By eliminating some barriers to financial integration, these policy actions boosted efficiency in the financial intermediaries and markets of the euro-area countries where the financial system was more backward and more heavily regulated. To the extent that greater efficiency stimulates the demand for funds and for financial services, this also fostered the growth of domestic financial markets or improved access to foreign markets and intermediaries.

2.2. The effect of integration on financial development

The main channel through which the removal of barriers to integration can spur domestic financial development is increased competition with more sophisticated or lower-cost foreign intermediaries. This competitive pressure drives down the cost of financial services for the firms and households of countries with less developed financial systems, and thus expands local financial markets. In some cases, the foreign entrants themselves may supply the additional financial services. Direct penetration by foreign banks and cross-border acquisitions of intermediaries are likely to erode local banks' rents. If mergers bring banks closer to their efficient scale, the process will also be associated with a decreasing cost of intermediation. Sharper competition, possibly coupled with cost cutting, translates into more abundant credit and/or lower interest rates.

A second channel is through harmonization in national regulations (accounting standards, security laws, bank supervision, corporate governance), which the process of integration requires. To the extent that regulatory harmonization promotes convergence to the best international standards, it will also enhance domestic financial development and the entry of foreign financial intermediaries in more backward countries.

On both accounts, therefore, the removal of barriers to financial integration can bring about an improvement in the supply of finance in less developed markets and an increase in their depth as measured by size-based gauges of financial development, such as domestic stock market capitalization and the volume of bank lending relative to GDP. Insofar as financial integration induces this "catching-up effect", one should observe some convergence in the indicators of domestic financial development. Figure 2 displays the time pattern of the coefficient of variation across the ten initial euro-area countries for three such indicators: the GDP ratios of stock market capitalization, private bond market capitalization, and private credit, all drawn from the online database of Ross Levine.⁴

International convergence should translate into a lower cross-country dispersion in these indicators between 1990 and 2005. And in fact there is a perceptible, steady decline in the coefficient of variation for the private bond market, from almost 0.7 in 1990 to about 0.5 in 2005. For the credit market the reduction is not as large, though still appreciable (from about 0.4 to 0.3), but this market was already much more uniform across countries in 1990. For

⁴ The database is available at http://www.econ.brown.edu/fac/Ross_Levine/Publications.htm

stock market capitalization, no clear trend is to be observed possibly because this indicator is dominated by country-specific stock price swings.

[Insert Figure 2]

It is interesting that, of these three markets, the bond market has taken the largest step towards convergence. As we shall see in the next section, there are also other indicators that the bond market has been the greatest beneficiary of the single currency. As for the credit and the stock markets, Figure 2 suggests a less definitive verdict.

However, the convergence in the depth of *domestic* financial markets may give a very incomplete account of the degree of financial integration and of its true effects on the availability of finance to firms and households. Indeed, it may happen that, as financial integration proceeds, the most developed financial systems increase the provision of services to firms and households located in less developed markets. The economies of scale and the external economies involved in financial intermediation can be a powerful force for the expansion of the established intermediaries of already developed markets. The banks of the more developed countries can lend cross-border to firms in less advanced countries, in which case the additional credit will not show up as private domestic credit in those countries. Similarly, financial services provided by foreign intermediaries will not appear in the domestic supply of such services in less financially developed countries. Thus, size-based measures of local financial development alone may not fully reflect the improvement in the availability of credit and financial services.

A similar argument applies to equity markets. As these become more integrated, firms in the less financially developed countries can access major financial centers more easily by listing on foreign stock exchanges. They may want to do so for a variety of reasons: overcoming equity rationing in the domestic market, reducing their cost of capital by turning to a more liquid market, signaling their quality by accepting the scrutiny of more informed investors or the rules of a better corporate governance system (Pagano, Röell, Randl and Zechner, 2001; Pagano, Röell and Zechner, 2002; Halling, Pagano, Randl and Zechner, forthcoming). Whatever the reasons, by listing abroad these firms add to the stock market capitalization and turnover of foreign rather than their domestic exchanges, as documented by Claessens, Klingebiel and Schmukler (2002a, 2002b). Thus the increase in domestic stock market capitalization may not fully reflect the impact of financial integration on access to equity markets in the less financially developed countries.

The implication is that as financial integration proceeds, the size of a country's financial market may provide a misleading picture of its degree of financial development. Distance, and hence geographical segmentation, becomes less important in financially integrated markets. Indeed, with full integration what matters is the total size of the market of the entire integrating area. Domestic firms may have the same access as foreign ones, even if the domestic financial sector is smaller. For the same reason, countries that specialize in financial services will have a domestic financial sector that serves domestic as well as foreign firms.

[Insert Figure 3]

The importance of cross-border provision of debt and equity finance in the process of integration is illustrated in Figure 3. The international investment position – the sum of the stock of external assets and liabilities of each area vis-à-vis the rest of the world – is shown for the euro area, the United States and Japan. The figure suggests that Euro-area integration accelerated impressively, compared with the United States and Japan, starting in 1996. Most of the advance since 1999 has actually been due to the increase in external assets and liabilities *within* the euro area, as documented by Garcia-Herrero and Wooldridge (2007).

In conclusion, comparing different countries' supply of domestic finance (as measured for instance by the ratio of private credit or stock market capitalization to GDP) may well give an incomplete picture of financial integration. In the next section, accordingly, we assess the degree of financial integration of the euro area by price-based indicators, such as interest rate differentials, and by cross-border flows of credit and equity finance.

2.3. How integrated are European financial markets?

Integration and consolidation have proceeded at different paces in different financial markets. In the euro zone, the money and public debt markets integrated almost immediately with the adoption of the single currency. In the equity, repo, corporate bond and especially credit markets integration has instead proceeded more slowly and is currently still incomplete.

2.3.1. Bond and credit markets

The combination of EMU with the concomitant institutional changes produced a dramatic convergence of the yields on national public debt on the eve of monetary unification (Pagano and von Thadden, 2004). This is illustrated in Figure 4 for the 10-year benchmark bonds (and qualitatively similar patterns obtain for other maturities). The figure shows end-of-month yield spreads for euro-area benchmark government bonds relative to the 10-year German Bund from January 1993 to September 2007. The convergence toward zero is dramatic. Considering all initial EMU participants (and thus excluding Greece), the mean yield spread over the German yield fell from 218 basis points in 1995 to 111 in 1996, 39 in 1997, 19 in 1998 and 20 in 1999. It rebounded slightly in 2000-01, before resuming its downward trend.

[Insert Figure 4]

Most of the action came before the launch of the euro and derived from the convergence of the non-core EMU participants: Finland, Ireland, Italy, Portugal and Spain, and later Greece, which joined the euro area at the beginning of 2001, while Austria, Belgium, France and the Netherlands already featured low spreads over German bonds in 1996. This is because before EMU the probability of depreciation relative to the D-Mark was considerable in the first set of countries, but not in the second. For the non-core EU countries, the drastic narrowing of the 10-year yield spreads was due almost entirely to the elimination of this risk.

Baele et al. (2004) analyze the degree of integration of the corporate bond market under EMU, taking into account that corporate bonds differ in several key respects other than the country of issue (time-profile of the cash flow, likelihood of default, liquidity). They find that yields are mostly driven by common factors, while the effect of the country of issuance is

extremely small (less than 10 basis points). This suggests that the corporate bond market too has achieved a remarkable degree of integration.

The introduction of the euro promoted soaring corporate bond issuance in 1999, when volumes more than doubled from \$273 billion to \$657 billion. Issue volume in the euro area thus jumped from less than 26 percent of that in the U.S. in 1998, to over 74 percent in 1999. Rajan and Zingales (2003b) show that the boom of the corporate bond market after 1999 was stronger in the euro area than outside and suggest that the introduction of the euro was a major causal factor in this development.

That the development of an active euro-denominated corporate bond market is the true success story of EMU is confirmed by the great liquidity of the market. As Biais et al. (2006) document, euro-area corporate bonds have narrower bid-ask spreads than comparable sterling- and dollar-denominated bonds, even after the introduction of the TRACE system, which increased post-trade transparency in the U.S.. The authors attribute this finding precisely to the integration of the European corporate bond market since the advent of the euro, which allowed investors from all European countries to trade in the same market, thus attracting a large pool of professional intermediaries to compete in providing liquidity. This mutually reinforcing process between liquidity demand and supply has driven bid-ask spreads down below those in the U.S. (p. 41).

Has the convergence of euro-area government bond yields continued since the institution of EMU, so differentials should soon be a thing of the past? The distinct trend reduction in yield differentials from the Bund shown in Figure 4 might seem to suggest so, but this is only apparent. Most yield differentials have been trending downward because the Bund yield has been rising relative to most other euro-area public debt, as the German budget position has weakened. But yield differentials have not declined in absolute value since 1999, much less disappeared; euro-area sovereign bonds, that is, are still not perfect substitutes.

This can be seen in Figure 5, which is based on the same data except that it covers only the period of EMU. Even after 1999, yield differentials vary considerably across countries, from a few basis points for French, Irish or Dutch debt to a maximum of 20 points for Portuguese debt and 30 for Italian or Greek bonds after 2005. Yield differentials also vary considerably over time for some countries, notably Ireland, Italy, Greece and Portugal. The differentials have a tendency to move together (Codogno, Favero and Missale, 2003; and Geyer, Kossmeyer and Pichler, 2004), which implies that yield spread risk cannot be fully hedged by holding a diversified portfolio of euro-area bonds, so that their risk is to be taken into account and priced by investors.

[Insert Figure 5]

Figure 5 also suggests that convergence of interest rates on public debt may have reversed slightly after 2005. This visual impression is confirmed by Figure 6, which shows the cross-sectional standard deviation of the yields from 1990 to 2007: this measure of convergence bottomed out in 2005 after a long decline and has risen slightly since. It remains to be seen whether this residual difference between public debt yields will be a persistent characteristic of the euro area for years to come.

[Insert Figure 6]

Credit markets have integrated much more slowly than bond markets, presumably because of the heterogeneity of borrowers and the local nature of the information that lenders need. Legally, the rules on euro area banking markets are quite homogeneous, but interest rate differentials remain wider than in the bond market, as documented by Adam et al. (2002) and Baele et al. (2004). In particular, there are persistent differentials in the medium- and long-term corporate loan market and in the consumer credit segment. Furthermore, retail cross-border lending within the area is still limited; it only increased from 3 percent in 1999 to 4 percent in 2003. Credit market integration is now gaining momentum, especially because cross-border banking mergers and acquisitions have become more common, although much of the cross-border integration and restructuring has yet to take place. The near future is likely to witness much more sweeping changes than have occurred so far.

2.3.2. Stock markets

Assessing whether European stock markets have become more integrated since the introduction of the euro is more difficult than for bond markets. The most common approach posits that when segmented markets start to integrate, stock market returns, like interest rates, should become more closely correlated. The evidence does show that European stock returns have increasingly been driven by common European shocks since the early 1980s (Baele, 2005), but these changes in the covariance of ex-post returns do not necessarily reflect integration. Market returns may exhibit common patterns simply because markets are increasingly hit by the same shocks (oil prices, say, or monetary policy). This point is particularly relevant for the EU, where the integration of goods and labor markets is likely to have increased the common component of real shocks across countries, and where by definition monetary policy has now become common.

As a consequence some researchers, in search of the possible effects of financial integration, have turned to analyzing the ex-ante returns in European markets. Estimating and comparing expected returns is tantamount to gauging the risk premium required by investors and thus calls for the specification of an asset pricing model. According to the capital asset pricing model (CAPM), with fully integrated stock markets only covariance risk with the world portfolio is priced in ex-ante returns, while diversifiable country-specific risk commands no return. As Stulz (1999) points out, if the country-specific risk exceeds the world covariance risk, financial integration should be accompanied in equilibrium by a decrease in the risk premium required by investors, hence in the expected return on equity and the cost of capital.

Possible tests of capital market integration then involve estimating whether the evolution of the risk premium of domestic stocks is sensitive to the country-specific risk in relation to the covariance with an EU-wide portfolio. This is the approach of Hardouvelis, Malliaropoulos and Priestley (2006), who inquire whether the convergence of European economies towards monetary union led to increased integration of European stock markets. They estimate a conditional asset pricing model, allowing for a time-varying degree of integration that measures the importance of EU-wide risk relative to country-specific risk. The results indicate that the degree of integration is closely related to forward interest rate differentials vis-à-vis Germany, i.e. to the probability of a country joining the EMU. Integration increased substantially over time, especially since 1995, when these differentials began shrinking, and

by mid-1998, six months before the official launch of EMU, stock markets appear to have been almost fully integrated. An alternative measurement approach was proposed by Chen and Knez (1995), based on the law of one price and the absence of arbitrage opportunities. Using this approach, Ayuso and Blanco (2001) find that financial market integration between stock markets increased during the nineties.

Different tests of stock market integration rely on quantity indicators, such as the volume of capital flows or the composition of financial portfolios. There is abundant evidence for the “home equity bias”, i.e. investors’ failure to diversify sufficiently into foreign stocks (see for instance Tesar and Werner, 1995, and Lewis, 1999). If households hold portfolios that are not enough internationally diversified, their consumption growth will disproportionately reflect domestic shocks. In the same vein, Ayuso and Blanco (2001) study how foreign direct and portfolio investment evolved in selected countries. They find that the fraction of wealth held in foreign assets increased significantly in the last few years considered. This is also reflected in the behavior of institutional investors: Adam et al. (2002) and Baele et al. (2004) show that the home bias of euro-area investment funds decreased gradually after the introduction of the euro, while that of pension funds dropped more abruptly after 1999. Belgian and Dutch pension funds, in fact, increased the fraction of non-domestic assets from 60% in 1998 to more than 80% in 2000. Large increases also took place in Ireland, Spain and France.

For equity markets too, then, both return-based evidence and quantity measures of home bias indicate increasing integration. However, significant institutional barriers to integration remain, notably the considerable costs for cross-border trades arising from the fragmentation of the clearing and settlement system (Giovannini Group, 2001) – a point on which we shall return in Section 6.

3. Effects on growth

The evidence surveyed in the previous section indicates that the introduction of the single currency has been accompanied by a process of financial market integration, and that this has resulted both in financial deepening – as witnessed for instance by the creation of a continental corporate bond market – and by the increasing access of households and firms to financial markets and intermediaries located beyond their national borders.

The natural question is whether this has been a purely financial phenomenon or whether it has also had effects on investment and growth. To put it simply, is there a “growth dividend” from the euro? In answering, let us first recall the channels through which financial market reforms (such as those spurred by integration) may affect growth:

(i) They may increase competition between intermediaries, as by removing entry barriers, or enhance the protection of creditors and shareholders, encouraging them to provide more abundant and cheaper finance. As a result, the costs of intermediation will fall and the savings channeled to investment will increase.

(ii) Deeper and competitive financial markets can also contribute to growth by allocating capital more efficiently. First, by facilitating the trading, hedging and pooling of risks, a more highly developed financial sector allows investors to fund profitable but risky investment opportunities that would otherwise be forgone. Second, to the extent that more sophisticated intermediaries can distinguish good projects from bad, funds will go to the more profitable projects and the productivity of the economy will increase.

A significant issue is whether financial development mainly has “level effects” – that is, allows countries to raise long-run per capita output – or rather affects steady-state growth. In principle, both outcomes are possible, depending on the nature of the growth process. In endogenous growth models, financial development permanently raises the national growth rate. In traditional models with exogenous technological progress, financial development – by allowing more investment – can cause a transitory (but possibly quite protracted) increase in the growth rate and a permanent increase in per capita GDP. If it stimulates financial development in more backward countries, integration allows them to converge on the growth rate of the more technologically advanced and capital-rich countries (Aghion, Howitt and Mayer-Foulkes, 2005). These authors also show that countries that do not take part in this process and remain below a critical level of financial development are trapped in a low-growth equilibrium. So financial integration should produce income convergence within the integrating area, which becomes a “convergence club”, where faster growth in the more backward countries may be fuelled not only by domestic saving but also by resources generated in the more advanced economies. In fact, financial liberalization should be accompanied by capital flows from developed economies to developing ones.

The thesis that finance matters for growth has been tested empirically in many studies, and it has been found that countries with better financial markets grow faster. Already in 1969 Goldsmith stated that “a rough parallelism can be observed between economic and financial development if periods of several decades are considered” (p. 48). However, the correlation between finance and growth does not establish that finance actually causes growth. To identify this causal link, researchers have used econometric techniques and identification strategies that can control for possible feedback of economic growth on financial development – that is, for the fact that faster growth tends to elicit an increased supply of financial services. The work designed to disentangle this causality issue has relied on three types of data: country-level, industry-level and firm-level.

3.1. Cross-country studies

King and Levine (1993a, 1993b) attack the reverse causality issue by relating economic growth rates to measures of lagged financial development in a cross-section of 80 countries. Their main finding is that all the indicators of economic performance are positively associated with the predetermined component of financial development, as measured by the size of financial sector at the beginning of the sample period. Levine and Zervos (1998) explore the relation further, looking at the relative importance of banks and securities markets. Interestingly, the size of the stock market appears not to have any impact on subsequent growth, while its liquidity and the development of the banking system are important.

However, the use of predetermined variables to measure financial development can overcome endogeneity problems only in part. Rajan and Zingales (2003a) point out that an omitted

common variable – say, the household saving rate – could still drive both long-run growth and the initial level of financial development, generating a spurious correlation. Moreover, precedence in time does not logically imply causality: the econometrician may find in the data that financial development predicts economic growth only because financial markets anticipate future economic opportunities. For instance, stock market valuations may reflect changes in future growth opportunities, and banks may lend more in anticipation of high increasing sales by their customers. In other words, financial development could be only a leading indicator, and not a cause, of growth.

In order to effectively overcome the reverse causality problem, one must find instruments that are unquestionably exogenous, i.e. variables that affect financial development but are not correlated with economic performance. When using aggregate data, this is difficult indeed. Some scholars have identified such an instrument in the type of legal system. La Porta et al. (1998) show that the size of a country's financial market is related to the original nature of its legal system, and hypothesize that this is because common-law countries offer better investor protection than civil-law countries. The legal origin of a country can be considered exogenous to economic growth, because the English, French and German legal systems were all created centuries ago and spread mainly through occupation and colonialism. Hence Beck, Levine and Loayza (2000a) use the legal origin of the financial system as instrument for financial development. With this technique, they again find that the size of the financial sector has a positive and robust correlation both with the rate of growth of both per-capita GDP and total factor productivity. Beck, Levine and Loayza (2000b) use a wider range of instruments and show that accounting standards and the level of contract enforcement are also important instruments of financial development.

The conclusions of these studies on aggregate cross-country data are brought together by Demirguc-Kunt and Levine (2001), who examine how indicators of financial market efficiency and size correlate with long-run growth. According to their estimates, both the development of financial markets and that of intermediaries correlate with long-run growth, when they are instrumented by indicators of the quality of the legal system, such as measures of investor rights protection and of the quality of enforcement.⁵ Aghion, Howitt and Mayer-Foulkes (2005) emphasize the implications of financial development for income convergence, and present evidence that is consistent with a “convergence clubs” model, in which membership in the high-growth club depends on by a sufficiently high degree of financial development. It is only within this group that income convergence is observed.

Other strong empirical evidence on the nexus between finance and growth comes from Jayaratne and Strahan (1996), who rely on data on US states. They exploit the effects of intrastate branch deregulation and the attendant increase in competition, which came at different times in different states, and find that the states that removed restrictions on branching achieved faster economic growth than the others. Since bank lending did not grow, the authors attribute this effect to increased banking efficiency. This study provides quasi-experimental evidence on the causal nexus between finance and growth, because deregulation could hardly have occurred in anticipation of future business cycle expansions.

⁵ There is no definite evidence, however, on the relative importance of banking versus securities markets: only aggregate measures of financial development appear to matter.

Important insights into the relation between financial integration, financial development and growth are also offered by the literature on capital account liberalization and its effects on real variables, such as investment, productivity and growth. In the standard neoclassical framework, internationally open capital markets generate capital flows from capital-abundant developed countries, where the return to capital is low, to capital-scarce developing countries, where it is high. The latter should therefore experience a foreign-financed increase in investment and growth. But skeptics argue that the opening of capital markets triggers speculation and the recurrence of market crises. Rodrik (1998), using cross-sectional data, finds no correlation between the international openness of countries' capital markets and the amount that they invest or the rate at which they grow. In a careful review of the empirical evidence, Henry (2007) criticizes empirical studies based on purely cross-sectional data, suggesting that time series data are needed to determine whether countries invest and grow more in the aftermath of a change in their capital movement policy. Using this policy-experiment approach, he shows that in countries that liberalize capital flows, the cost of capital falls and investment does increase, along with the growth rate of per capita GDP. However, the effect of liberalization is often of limited magnitude, a likely reflection of capital market imperfections, asymmetric information, poor investment protection, weak institutions and government regulations distorting economic decisions.

Bonfiglioli (2007) has sought to distinguish the different effects of financial integration on productivity and investment using a panel of 70 countries from 1975 to 1999 and several indicators of capital flow liberalization. Her results suggest that financial integration does have a positive effect on productivity but not on capital accumulation, even controlling for financial market development. This study also cautions against the syllogism that since (i) capital market liberalization tends to further financial development, and (ii) financial development tends to increase investment and its efficient allocation, then capital market liberalization is necessarily associated with higher investment and productivity. In the words of Henry (2007), "without a convincing body of time series evidence that the quality of a country's capital allocation improves as its level of financial development rises, no basis exists for concluding that liberalization indirectly improves the efficiency of domestic capital allocation through its impact on financial development" (p. 917).

Since EU countries capital flows were already completely liberalized before the introduction of the euro, the literature on the real effects of capital market liberalization is not directly relevant for an evaluation of the real effects of EMU, but it has an important methodological bearing on the evaluation of the EMU itself, in that it cautions against the dangers of using cross-sectional data to gauge the effects of policy regime changes.

3.2. Industry-level studies

Another strand of empirical work relies on industry-level data to study the issue of causality. Financial market development should benefit firms or industries that are highly dependent on external finance disproportionately. The testable hypothesis of this approach is the prediction that these firms and industries will grow faster where financial markets are more highly developed. The approach was applied by Rajan and Zingales (1998) on industry-level data for a large sample of countries in the 1980s. They construct their test by first identifying each industry's need for external finance from firm-level data for the US, on the assumption that the US financial system is the most highly developed. Then they interact this industry-level

“external dependence” variable with a country-level proxy for the degree of financial development (obtaining a variable that measures how severely financial development constrains the growth of each industry in each country). Then they use that variable in a regression for industry-level growth.

One strength of this approach is that it can sort out the effect of financial development from that of other country and sector characteristics. This is a major advance, because many variables that might affect growth are typically left out in cross-country studies, creating potential biases in the estimated relationship between financial development and growth. Rajan and Zingales find that various measures of financial development (total stock market capitalization, domestic credit to the private sector accounting standards) do disproportionately affect real economic growth in the externally dependent industries.

This approach can assess the differential impact of financial integration, identifying the countries and sectors that are most likely to benefit. Clearly, the countries bound to gain more are those with backward financial markets that specialize in sectors that rely heavily on external finance. At the other end of the spectrum, countries that have already developed financial markets and that specialize in financially self-sufficient sectors are likely to gain little. Guiso, Jappelli, Padula and Pagano (2004) conduct an exercise assuming that financial integration in the EU will eventually produce the same level of financial development as the United States. They consider the US as an upper bound – a highly developed continent-wide financial market, not dissimilar from what a fully integrated European financial market would presumably look like. Averaging over all countries and sectors, the estimated impact of financial integration on the growth of manufacturing value added in the EU works out at 0.72 percentage points per year, and for manufacturing output growth 0.89 points. Considering that manufacturing accounts for about one fourth of EU total value added, this would mean incremental GDP growth of about 0.2 percentage points, assuming that financial integration has no impact on non-manufacturing growth.

This average, however, conceals quite considerable diversity by country and sector, reflecting both the degree of financial development (the more backward countries gain more) and sectoral specialization (countries that specialize in financially dependent sectors gain more). Figure 7 reports the increment to value added and output growth country-by-country. In one group, growth increases substantially, by well over 1 percentage point a year: Belgium, Denmark, Germany, Greece, Italy, Portugal and Spain. In a second group, there is an increment of 1 point or almost that much: Austria, Finland, France and Ireland. Predictably, the third group – the countries that gain just half a point or less – are the most financially developed countries: the Netherlands, Sweden and the U.K.⁶

[Insert Figure 7]

Figure 8 plots the effect on the ten industries that are expected to contribute most to total European growth. Again there is some similarity between the impact of financial integration on output and value added growth. In all the sectors considered, growth increases by over 1

⁶ The results implied by this scenario are similar to those of a slightly less optimistic scenario where the level of financial development of all EU countries is raised to that of the UK or the Netherlands. The rankings of the simulated impacts would not be affected by considering British or Dutch rather than American standards.

percentage point. And in the most financially dependent industries – notably pharmaceuticals and plastic – the yearly increment exceeds 3 percent. In conclusion, the potential growth benefits of financial integration are considerable but unevenly distributed among countries and sectors.

[Insert Figure 8]

Recognizing industry heterogeneity has proven to be important not only to study the effect of financial development on growth but also to understand the specific channels through which these effects are attained. Carlin and Mayer (2003) use the Rajan-Zingales approach to probe further into the relationships between industrial activity, financial systems and legal arrangements, concluding that in OECD countries market-based finance and legal protection of investors are correlated with the growth of equity-financed and skill-intensive industries, and particularly with R&D investment. In contrast, market-based finance and accounting standards are not important for tangible capital accumulation.

These findings indirectly support the claim of Allen and Gale (2000) that markets and intermediaries are complementary and favor growth of technologies with different characteristics. Intermediaries are most useful when a substantial amount of capital has to be raised by firms in traditional sectors, whereas new technologies in high-risk sectors are favored by the concurrent funding of diverse investors who receive different, complementary signals on a project's prospects, which allows pooling several pieces of independent information.

3.3. Firm-level studies

Further evidence on the nexus between finance and growth is offered by work using firm-level data. One advantage is that this permits to consider the structure of the financial system as exogenous to individual firm performance, especially for small and medium-sized firms. Firm-level data also make it possible to address issues that are impermeable using country or sector data: for instance, whether financial integration disproportionately affects some groups of firms.

Guiso, Jappelli, Padula and Pagano (2004) apply the Rajan-Zingales approach also to microeconomic data for companies incorporated in the EU and in Central and Eastern Europe. Their firm-level estimates prove to be consistent with the estimates produced by studies based on industry-level data. In addition the use of firm-level data allows them to investigate whether the effect of financial development differs by firm size, so that the projected effects of financial integration can also be expected to differ. Their results indicate that smaller businesses stand to be the main beneficiary of integration, which for them means access to a larger and more developed financial market than their national one. This is consistent with a study based on Italian firm-level data by Guiso, Sapienza and Zingales (2004), who show that local financial development helps the growth of small firms more than that of large firms.

Firm-level data can also be used to detect the impact of financial development on the entry of new firms and on the expansion of successful new businesses. Aghion, Fally and Scarpetta (2007) apply the Rajan-Zingales approach to harmonized firm-level data in 16 industrialized and emerging economies and find that financial development has either no effect or a negative

effect on entry by large firms but that access to finance is very relevant to the entry of small firms in the sectors that are most dependent on external finance, and also helps new firms expand. Their data is drawn mostly from business registers available in the pre-EMU years and do not directly assess the impact of the euro on firms' access to finance. But all in all the results suggest that in many countries, including those of Continental Europe, efficient financial markets play a major role in ensuring that the process of industrial restructuring typical of market economies will bring the entry and then the expansion of new (especially small) firms.

These findings are consistent with other recent studies. For European firms, Klapper, Laeven and Rajan (2006) document that financial development favors entry in the sectors that are relatively dependent on external finance. Moreover, they find that entry regulations are associated with lower entry rates and larger entry size in sectors with higher natural turnover rates. This evidence parallels that described by Bertrand, Schoar and Thesmar (2007) in their analysis of the firm-level effects of deregulation in the French Banking Act of 1985: banks became less willing to bail out poorly performing firms, while firms in bank-dependent sectors became more likely to restructure. At industry level, they document an improvement in allocative efficiency across firms, and a decline in concentration.

Recent microeconomic evidence also sheds light on the possible role of international financial integration in improving the allocation of capital across firms, and – most interestingly – on the specific role of domestic financial development in the process. Galindo, Schiantarelli and Weiss (2007) use firm-level panel data from twelve Latin American countries to investigate whether capital flow liberalization has increased the share of investment going to firms with a higher marginal return to capital. They develop an indicator of investment allocation efficiency, and find that in most cases financial liberalization has increased allocation efficiency. Since the study spans pre- and post-reform periods, it is one of the few capable of demonstrating that this improvement is actually traceable to financial development in the wake of liberalization. In the case of liberalizations, the entry of new firms also appears to be an important element at work: using cross-sectional data for approximately 24 million firms in nearly 100 countries for 1999 and 2004, Alfaro and Charlton (2007) show that easing restrictions on international capital flows enhances firm entry and other measures of entrepreneurship. They document that this effect of capital flows works both through foreign direct investment (creating new domestic firms) and through financial development, as entrepreneurship in more financially dependent industries is more sensitive to restrictions on capital mobility and more strongly affected by increased flows of finance.

Two recent studies based on firm-level data are directly relevant to evaluating the growth effects of financial integration in the EU. Bris, Koskinen and Nilsson (2006) use data from the original eleven countries that adopted the euro and a control sample of five European countries and find that the euro boosted investment by financially constrained firms. Giannetti and Ongena (forthcoming) instead investigate the effects of foreign bank entry on the performance of Eastern European firms. For a panel of 60,000 firm-year observations on listed and unlisted companies in Eastern Europe, they find that foreign lending stimulates growth in sales, assets, and use of financial debt, particularly for young firms. By contrast, firms connected with domestic banks or the government suffer, which highlights another possible benefit of financial liberalization: foreign bank entry may correct credit market distortions due to political connections and government intervention.

4. Effects on macroeconomic adjustment to shocks

Beside its beneficial effects on long-run growth, the increased capital mobility brought about by integration should have increased the ability of each country to draw on the area's common pool of savings. For instance, a country that experiences a drop in national saving due to an increase in the public deficit can more easily draw on foreign saving to maintain the level of national investment. Or an economy with sharply increasing growth opportunities can fund additional investment even if domestic households do not increase their saving correspondingly.

To test for this effect of financial integration, Feldstein and Horioka (1980) suggested studying the correlation between domestic saving and domestic investment. They argued that under perfect capital mobility and unchanged investment opportunities, an increase in a country's saving rate would be associated with an increase in investment in all countries. Therefore, a low correlation between domestic saving and investment would indicate strong integration. The Feldstein-Horioka premise has been qualified many times since, but it is still considered a useful basis to gauge the macroeconomic effects of capital market integration. Armstrong, Balasubramanyam, and Salisu (1996), in an analogous study for Europe, found low correlations between savings and investment. More recently, Blanchard and Giavazzi (2002) documented a reduced correlation between saving and investment in the euro area.

To show how financial integration has affected the saving-investment correlation, we have estimated it for each year between 1980 and 2005 for the 15 countries that belonged to the European Union when the euro was introduced. We define the investment rate as gross capital formation over GDP and the saving rate as gross saving over GDP. The data are drawn from the OECD National Accounts and the results are reported in Figure 9.

[Insert Figure 9]

The correlation declines almost monotonically from values around 0.5 in the 1980s to nil in the later part of the sample. Moreover, at first the coefficient is statistically different from zero at the 5 percent confidence level, but after 1993 the confidence bounds of the correlation bracket the zero line. Therefore, in the EU domestic investment rates are no longer significantly correlated with saving rates. In the interpretation proposed by Feldstein and Horioka, the integration of European capital markets has decoupled domestic investment from domestic saving. The question is whether this is due to EMU, to the general process of European integration or to the increasing integration of world capital markets, even beyond Europe. To this end we have re-estimated the Feldstein-Horioka correlations also for the broader group of OECD countries.⁷ The pattern of the estimated coefficients, shown in Figure 10, is similar to that of Figure 9: the coefficients are initially positive and statistically different from zero, and towards the end of the sample decline to near zero. However, in the larger OECD sample the correlation remains significantly positive until 1998, whereas in Europe it vanishes as early as 1993.

[Insert Figure 10]

⁷ The results for the subset of EMU countries are similar to those shown in Figure 9.

This evidence suggests that the decoupling of saving and investment in Europe is part of a more general, OECD-wide trend. In this sense, the introduction of the euro can be seen as one aspect of this broader pattern. Figures 9 and 10 also show that integration has proceeded faster in Europe than in the rest of the developed world. This is confirmed – and indeed amplified – by the studies that also cover the new EU eight member states in Central and Eastern Europe. Abiad, Leigh and Mody (2007) show that they have benefited from a steady inflow of capital from the more mature and capital-rich EU-15, which has fuelled income convergence. This is precisely the outcome that one would expect in the process of integration. As Caselli and Tenreyro (2006) put it, Europe has proved to be “the quintessential convergence club”.

Yet it should be noticed that European income convergence has been an exception, not the rule. In the last decade East Asian countries have been running large balance-of-payment surpluses, and the same is true of many other developing countries since 2002 (Abiad, Leigh and Mody, 2007). Therefore, despite (slowly) increasing financial integration, the savings of poorer countries have been flowing towards the richer ones. At the same time, for the world as a whole, income divergence rather than convergence has been pervasive (Pritchett, 1997).

5. Effects on risk sharing

Economic theory predicts that financial integration should have a third effect, in addition to those on growth and adjustment to macroeconomic shocks, namely facilitating risk sharing. It allows households to hold more diversified equity portfolios, and in particular to diversify the portion of risk that arises from country-specific shocks. Similarly, it allows banks to diversify their loan portfolios internationally. This diversification should help euro-area households to buffer country-specific income shocks, so that shocks to domestic income should not affect domestic consumption, but be diversified away by borrowing or investing abroad.

Accordingly, a whole line of research studies the covariance of consumption across regions or countries to test whether financial markets afford full risk sharing to consumers in different jurisdictions. Conditional on consumers exploiting all risk-sharing opportunities, the growth of consumption in all areas should be perfectly correlated when financial markets are integrated and thus depend only on common (non-diversifiable) shocks. This key point was recognized and applied to microeconomic data by Cochrane (1991) and Mace (1991), and later brought to bear on macroeconomic data by Obstfeld (1994), van Wincoop (1994), and Townsend (1994), among others.⁸

⁸ Obstfeld’s (1994) model shows that financial development can affect growth by creating more risk sharing opportunities, since individuals invest in high-profit, high-risk sectors only if they can share business risk. The reference to financial integration is direct, since access to foreign assets – promoted by integration – improves portfolio diversification. The model shows that finance can influence growth also by affecting industry specialization. Recently, Svaleryd and Vlachos (2002) have tested these predictions, using the methodology of Rajan and Zingales (1998) to study the relation between financial market development and specialization. They conclude that countries with efficient financial institutions tend to specialize in sectors that use financial services more intensively. The comparative advantage seems to derive primarily from stock markets, since only the indicators of stock market development and efficiency are significant in explaining specialization in more finance-intensive industries.

Unlike Feldstein-Horioka, the risk-sharing approach can distinguish the contributions of different financial markets and public tax-transfer mechanisms, as is shown by Asdrubali, Sorensen and Yosha (1996) and Sorensen and Yosha (1998). Using US data for 1963-90, Asdrubali et al. develop an accounting framework to break down the cross-sectional variance of individual states' gross output into components, capturing the different sources of income smoothing. They find that 39 percent of a shock to gross state product is smoothed by corporate savings, 13 percent by the federal government, and 23 percent by credit markets (the remaining 25 percent is not smoothed). Sorensen and Yosha, applying the same approach to the EU and the OECD for 1966-90, find that the unsmoothed residual is much larger, around 60 percent. They also find that half of what income risk smoothing there is comes through national government budget deficits and the other half through corporate savings.

To test whether the advent of the euro has been associated with improved risk sharing among households, one could take indicators based on the microeconomic work of Cochrane (1991) and Mace (1991). The idea is that under perfect risk sharing individual consumption growth should not depend on idiosyncratic shocks (such as a fall in income or health problems). If instead consumption growth is affected by such shocks, this is evidence of incomplete risk sharing. These tests were designed to be applied with panel data on households. In principle, they can also be applied to a sample of countries, assuming that each country is populated by identical consumers. Sørensen, Wu, Yosha and Zhu (2007) have done so for OECD countries, and report that risk sharing increased between 1993 and 2003; the increase was correlated with a concomitant reduction in home-country bias, especially for equities, but this finding is much weaker for EU countries. But these results are subject to considerable caution: for aggregate data, the tests require highly unrealistic assumptions – essentially, the heterogeneity of the population within each country is assumed away. Hopefully, future microeconomic research will use household panel data to assess how the response to shocks in EU countries has changed with the introduction of the euro.

Before concluding, it should be mentioned that some recent literature has highlighted a potential cost of financial integration, countering the benefits from improved risk sharing. In a world with imperfect capital markets, integration can make a country more vulnerable to external macroeconomic shocks and financial crises. Contagion effects, possibly amplified by “fickleness” and herding behavior of financial institutions, may actually increase output and consumption volatility, instead of lowering them as the risk-sharing thesis holds. The evidence is inconclusive (Rogoff, Kose, Prasad and Wei, 2006).

Most likely, the potential dangers of greater contagion due to financial integration are not as relevant to the euro area as to developing countries. This is because countries with relatively well developed financial systems, such as the euro area, are less vulnerable to financial crises (Lane and Milesi Ferretti, 2006). In particular, the most vulnerable appear to be countries that liberalize their financial systems without strong institutions and sound macroeconomic policies (Demirgüç-Kunt and Detragiache, 1999).

At the same time, it cannot be denied that there are ways in which integration may heighten the vulnerability of the European financial system, unless the implied increase in contagion risk is appropriately offset by regulatory convergence (as is explained in Section 6.2.4 below). First, by fostering banking concentration both within and across national boundaries, integration is creating a few pan-European banks, whose solvency is increasingly crucial to

the stability of the entire credit system. Second, the large European financial institutions' exposure to systemic risk has not been attenuated since the early 1990s, but has actually increased considerably in most countries (De Nicolò and Tieman, 2006). This is at least partly due to the fact that bond and stock returns in Europe are increasingly driven by common factors (see Section 2.3). Next we discuss the policy implications of this concern.

6. Policy implications

Financial integration has proceeded at a remarkably rapid pace within Europe in the past two decades, especially following the introduction of the euro. The process has affected not only the working of financial markets but also the real economy. But financial integration is far from complete, especially in the credit market, which is still central to the financing of small and medium-sized enterprises in much of the EU. So it is natural to ask whether the process should be expected to continue spontaneously and smoothly, or whether further regulatory intervention is required (i) to remove remaining obstacles and (ii) to cope with some of the undesired effects of financial integration, such as the danger for financial stability discussed above. In other words, can financial integration be safely entrusted to market participants alone from now onwards? Arguably, the answer will differ depending on which market is involved, in keeping with the uneven pace of integration in security markets and bank lending.

6.1. Future securities market integration

In securities markets, most of the legal obstacles to integration were removed by the 1999 Financial Services Action Plan, and since 2005 all listed EU companies have been required to prepare their consolidated accounts using International Financial Reporting Standards (IFRS). The number doing so thus rose from some 350 to 7,000. By making the accounting information available to analysts and investors more easily comparable, this is likely to provide further impetus to the integration of stock and corporate bond markets.

The four main remaining obstacles to the integration of euro-area securities markets are (i) the segmentation of the clearing and settlement system, (ii) the fragmentation of the trading infrastructure among too many stock exchanges; (iii) the fragmented issuance of government bond markets, and (iv) the poor post-trade transparency in corporate bond markets.

6.1.1. Clearing and settlement

The segmentation of the clearing and settlement system entails improperly high costs for cross-border trades. Segmentation depends partly on the persistent fragmentation of stock trading platforms. Some exchanges, such as Deutsche Börse, in fact, are vertically integrated, with both a platform to provide trading services and a proprietary clearing and settlement system for the corresponding post-trading services ("silo structure"). This limits the competition from other trading platforms, since new entrants' customers would still have to use the incumbent's post-trade clearing and settlement system.

Entry foreclosure generates rents for incumbent exchanges, and overcoming this problem is likely to require regulatory action at the EU level. This is recognized both by the EU Commission (whose competition and internal market departments conducted studies on the role of competition policy in securities trading and post-trading in 2006) and by the European Central Bank (ECB), which announced in July 2006 that it was considering the desirability of going into the settlement business itself, with a system called “Target 2 Securities” (T2S). The ECB would not be the first public institution to provide central clearing and settlement services. In the United States, the Federal Reserve Board runs a bond settlement business, and both clearing and settlement are the product of the Depository Trust and Clearing Corporation, a user-owned service company that was created as a direct result of government pressure.

6.1.2. Stock trading infrastructure

Unlike clearing and settlement, the trading infrastructure of European stock markets – once organized on a national basis – is already being restructured along transnational lines at the initiative of exchanges and financial intermediaries, although fragmentation is not necessarily being reduced. For one thing, existing exchanges have pushed for consolidation: the Paris, Amsterdam, Brussels and Lisbon stock exchanges merged into Euronext; Stockholm’s OMX AB has acquired and now operates exchanges in Sweden, Finland, Denmark, Iceland, Estonia, Lithuania and Latvia; and in 2007 the London Stock Exchange acquired Borsa Italiana. Meanwhile, the EU’s Markets in Financial Instruments Directive (MiFID) has opened the door to the creation of new trading platforms operated by intermediaries, and a consortium of seven investment banks (Citi, Credit Suisse, Deutsche Bank, Goldman Sachs, Merrill Lynch, Morgan Stanley and UBS) has already launched a new pan-European equities trading platform called “Project Turquoise”. All clearing, settlement and risk management services for “Turquoise” will be provided by a single company (European Central Counterparty Ltd), while Citi’s global transaction services unit will serve as settlement agent. So, as existing platforms are consolidated, new ones are being instituted; in both cases the tendency is towards pan-European, not national trading platforms.

6.1.3. Government bond issuance

There is room for further progress towards integration in euro-area government bond markets as well. Dunne, Moore and Portes (2006) show that in the MTS platform for euro-area bonds, trading costs (median effective bid-ask spreads) are significantly higher than in the US Treasury market. They attribute this persistent liquidity gap to greater fragmentation, with many issuers and smaller issue size than in the US (pp. 44-45). Fragmented issuance is also at the root of investors’ often imperfect hedging strategies in the euro-area market. To hedge positions in bonds issued by small countries, investors often have to use German futures contracts or the liquid Italian spot market. To overcome this hurdle, however, euro-area governments should tackle the politically thorny problem of joint debt issuance, with the attendant implications for further fiscal policy coordination. Some progress might be made by limiting joint issuance to just a few maturities, at least initially, so as to test the potential magnitude of the liquidity gains and debt servicing savings from joint bond issuance.

6.1.4. Transparency in the corporate bond market

As in the US, in the euro-area corporate bond markets are mainly organized as an OTC dealer market, where trading is decentralized and dealers satisfy customers' sell and buy orders at their bid and ask quotes. Although electronic trading platforms are now starting to emerge, most orders are still routed to brokers and dealers by telephone. For investors, in such a decentralized market information on prices of the trades effected becomes an essential sign of "where the market is going" and guide to trading strategy. Absent such "post-trade transparency", investors hesitate to place orders, and the new information about fundamentals that their orders could convey is embodied in prices much more slowly.

Biais et al. (2006) note that "currently there is no systematic post-trade transparency in the European corporate bond market" (p. 5), especially for retail investors and small institutions. As a result, price discovery is very slow: it often takes more than a day for the information content of a trade to be fully reflected in market prices. Increasing post-trade transparency is likely to speed up the price discovery process and to increase the liquidity of the market, although this prediction is not unambiguous, since greater transparency would also reduce dealers' profits and might lead some to leave the market. Biais et al. do suggest that on balance "it would be reasonable to introduce some limited post-trade transparency", as by requiring "anonymous reporting of transaction yields, after a delay of one hour, for trades below one million, and anonymous reporting of transaction yields after a delay of one day for larger trades," but not exact reporting of the trade size, only its range (p. 69).

6.2. Future credit market integration

That the credit market has been the laggard in the process of European financial integration is probably due to the intrinsic nature of lending, which depends on local and customer-specific information and on the enforceability of contracts in national jurisdictions. These obstacles to the entry of foreign lenders and to cross-border credit will not disappear soon, even though the lack of information about local customers can be attenuated by foreign banks taking over local banks and making them subsidiaries – a process that is now getting under way.

However, some changes in regulation and enforcement may help to dismantle the remaining national barriers to entry in the EU credit market and to reduce the risks of cross-border integration. Credit market integration would benefit from further EU regulatory intervention on at least four distinct fronts.

6.2.1. Loan contract enforcement

A burgeoning literature suggests that speedy and effective contract enforcement is essential to the development of the credit market, since the efficiency and honesty of the judiciary determines the real degree of creditor protection. La Porta, Lopez-de-Silanes, Shleifer and Vishny (1997) document a positive cross-country correlation between the ratio of private debt to GDP and the "rule of law". That there are dramatic cross-country differences in enforcement efficiency – even within the euro area – is demonstrated by Djankov, La Porta and Lopez-de-Silanes (2003). For example, a dispute over cashing of a cheque takes as long

as 645 days in Italy, 434 in Portugal and 420 days in Austria, and as little as 39 days in the Netherlands and 11 in Ireland; France and Germany are in the middle, at 181 and 154 days respectively.

Such enormous differences in the length (and cost) of enforcement are a barrier to credit access for firms in the most inefficient jurisdictions. Of course, bringing judicial enforcement in the more backward jurisdictions up to the best EU standards is a huge task for national legislators. The magnitude of the problem goes far beyond credit market integration, and its solution is not something that we can expect to happen swiftly.

6.2.2. Information sharing systems

Recent research has shown that information sharing arrangements or “credit reporting” systems between banks play an important role in credit markets. Based on a survey of credit reporting in 43 countries, Jappelli and Pagano (2002) show that bank lending to the private sector is greater and default rates are lower where information sharing is broader and more solidly established. Djankov, McLiesh and Shleifer (2007) confirm that the ratio of private sector credit to GDP is positively correlated with information sharing in 129 countries for the period 1978-2003.

For credit markets to integrate cross-border, information on loan applicants must become available on a comparable basis to banks in different countries. Unless data on would-be borrowers’ characteristics, repayment record and current debt exposure are available to potential foreign just as they are to domestic lenders, the national credit markets of the euro area will not be integrated. Consolidation of customer debt records on a supra-national basis is also necessary for banks to be able to estimate default risk accurately and so lend safely, in a situation where cross-border lending may become increasingly common.

Unfortunately, the information-sharing arrangements in the euro area are still predominantly national. Today’s credit registers and credit bureaus were created to serve domestic banks (and sometimes at these banks’ own initiative) and reflect a range of national regulations and privacy laws. On this front, concerted action by the agencies that manage public credit registries in Europe to harmonize and interlink their data bases could produce substantial benefits for credit market integration.

6.2.3. Deposit guarantee schemes

Another often overlooked difference in EU national regulations that heightens the segmentation of banking markets involves deposit guarantee schemes.⁹ The problem does not involve cross-border retail deposits, which are still small-scale, but banks that compete cross-border, though subject to differing rules on deposit insurance.

Deposit insurance differs from country to country both in coverage and in funding. Full deposit coverage ranges from as little as 20,000 to as much as 103,000 euros per depositor.

⁹ On this important point we draw largely on the insightful remarks of Trichet (2008).

Since larger depositors are more likely to be sophisticated and able to exert some market discipline on banks, the high-coverage countries may have less incentives for banks to protect their depositors. Deposit insurance schemes also differ in funding structure. Some are pre-funded (the amounts due in case of a bank failure are prepaid into a fund), while others are funded ex post, once a bank actually fails; still others combine the two mechanisms. Moreover, in the pre-funded schemes the premium structure also differs: some use flat rates in proportion to deposits, others make rates contingent on measures of bank risk. Due to the implied differences across the EU in “coverage ratios” (the available funds divided by the volume of deposits covered), deposit insurance generates different incentives and costs for banks in different countries and can thus affect competition.

The problem is aggravated by the fact that banks with foreign subsidiaries must comply with the deposit insurance scheme in each country where they are present. This deters banks from transforming foreign subsidiaries into branches, which would streamline their groups, because when a subsidiary is part of a national scheme, it is often impossible to recover the funds it has already paid. Again, this may impede progress towards further credit market integration.

A certain degree of convergence between deposit insurance schemes would not only remove this regulatory obstacle to financial integration but also help to deal with threats to the stability of the European banking system. This leads us to the fourth – and certainly the most important – concern for financial regulators in Europe today, namely prudential supervision.

6.2.4. Prudential regulation and banking supervision

Securing the stability of the European banking system is the key to reaping the benefits of financial integration while avoiding such unwelcome effects as the risk of financial contagion discussed in Section 5. If it were needed, the financial turmoil of 2007-08 provides a good case in point, a further pressing reminder of the need to address the interrelated issues of prudential regulation, surveillance and crisis resolution in the euro area.

The crisis has vividly highlighted the shortcomings of the current fragmented EU banking supervisory system. “Even with signs of a clear risk of contagion, no common analysis of the situation, no sharing of confidential information, no coordinated communication and no emergency meetings appear to have taken place among EU supervisors. Even the ECB, unlike the Federal Reserve, lacked the information on the soundness of counterparties normally available to national central banks” (Padoa-Schioppa, 2007). Luckily, so far no major EU-based banking groups with substantial cross-border operations have been severely affected by the market turmoil, but this is obviously no excuse to neglect preparations for such a contingency.

The problem is that despite the emergence of a few pan-European banks, prudential regulation and supervision are still mainly organized along national lines, which entails considerable risk for the stability of the credit market. For instance, if a pan-European bank were to have solvency problems at home or at one of its foreign subsidiaries, the rules for crisis management and burden-sharing are unclear. Uncoordinated actions by the various national supervisory agencies could actually exacerbate the crisis, when instead swift, coordinated action would be essential.

Admittedly, major regulatory progress has been made. The EU Commission has largely harmonized financial regulations with the Financial Services Action Plan of 1999; and in 2004 it established a common advisory body grouping all European banking supervisory agencies, the Committee of European Banking Supervisors (CEBS). These agencies have reached a whole series of bilateral “memorandums of understanding” to strengthen coordination in the event of banking crises involving joint responsibilities. However, the EU prudential regulation is still removed from the uniform framework and enforcement structure that would be needed to reduce the likelihood of crises involving pan-European banks and mitigate their effects: the CEBS has a purely monitoring role, with no direct responsibility for banking stability, and the memorandums are non-binding. These concerns are particularly serious considering that, as mentioned in Section 5, banking concentration and the lending and portfolio policies of large European financial institutions have increased their exposure to systemic risk in recent years.

Of course, this is not a call to halt or even slow down these market processes, which are part and parcel of integration. Quite the contrary, we intend to emphasize the need to accompany integration with the appropriate institutional framework to ensure the stability of credit markets, and particularly of the few EU banking groups with extensive cross-border operations.

6.3. Political sustainability

Are these further steps to consolidate financial integration and enhance the stability of financial markets likely to be taken anytime soon? Much depends on the political support that regulators will be able to build in favor of such reforms. It is important to realize that the reforms will generate losers as well as winners, and the former will try to obstruct them. For instance, some financial intermediaries and marketplaces stand to lose from the consolidation of cross-border clearing and settlement. And much more seriously, national central banks are most likely to oppose any attempt to institute centralized supranational prudential regulation and crisis management quite fiercely. For euro-area central banks, this would strip them of the last serious justification for their power, the conduct of monetary policy having already been surrendered to the ECB. It is quite likely that they will be able to mobilize support from their national politicians, especially at a time when political opinion in Europe has become less friendly towards EU institutions.

To some extent, however, these political difficulties may be mitigated by the proviso that if an integrated EU-level banking supervision were introduced, its powers would not have to extend beyond the few major banks whose operations stretch substantially beyond national boundaries, while the supervision of the thousands of purely national and sub-national banks in Europe would best be left with current regulators. This proposal, recently advanced by Padoa-Schioppa (2007), would not only be easier for national authorities to accept, but would also be efficient. That is, it would preserve the accumulated know-how of national regulators and supervisors for the vast majority of banks and – in keeping with the principle of subsidiarity – it would deploy the new central regulator only where it is strictly necessary.

True, even with this restricted jurisdiction, the proposal for a single EU banking regulator is still likely to face fierce opposition. But the consequences of stopping halfway in the process

of financial integration can be quite serious indeed: a failure to reform prudential regulation might precipitate a major banking crisis, which would be devastating to the economy and would thus threaten to dramatically undercut the political support for the financial market reforms already enacted, and even for the ECB and the single currency itself.

Even apart from the danger of a banking crisis, a deep and integrated capital market in the euro area is important to the sustainability of the single currency and the conduct of monetary policy by the ECB. This is best exemplified by the euro area's monetary reaction to the recent financial market turmoil. One wonders whether the scale of the ECB reaction to liquidity problems in August 2007 might not have been motivated by the fact that several key financial markets in the euro area remain segmented. The ECB may have felt the need to over-react to any potential systemic risk because it lacked confidence in the capacity of today's fragmented supervisory framework to manage a systemic crisis. Similar concerns could constrain the ECB's reaction to inflationary pressures, when these arise.

Finally, furthering financial integration may diminish the role of fiscal policy in countries with initially less developed financial markets. As Bertola (2007) argues, financial development may lower their need for government-provided insurance, insofar as the markets will be able to provide the risk-sharing services that people would otherwise expect from the social security system and the welfare state. This would allow these countries to focus their social welfare systems more closely on its redistributive role, and away from risk-sharing.

References

- Abiad, Abdul, Daniel Leigh and Ashoka Mody (2007), "International Finance and Income Convergence: Europe is Different," IMF Working Paper no. 07/64.
- Aghion, Philippe, Peter Howitt, and David Mayer-Foulkes (2005), "The Effect of Financial Development on Convergence: Theory and Evidence," *Quarterly Journal of Economics* **120**(1), 173-222.
- Aghion, Philippe, Thibault Fally, and Stefano Scarpetta, "Credit Constraints as a Barrier to the Entry and Post-Entry Growth of Firms," *Economic Policy* **22**(52), 731-779, October 2007.
- Armstrong, Harvey W., V.N. Balasubramanyam, and Mohammed A. Salisu (1996), "Domestic Savings, Intra-national and Intra-European Union Capital Flows, 1971-1991," *European Economic Review* **40**(6), June, 1229-1235.
- Adam, Klaus, Tullio Jappelli, Annamaria Menichini, Mario Padula and Marco Pagano (2002), "Analyze, Compare, and Apply Alternative Indicators and Monitoring Methodologies to Measure the Evolution of Capital Market Integration in the European Union," Report to the European Commission, Directorate General for Internal Affairs, January, http://ec.europa.eu/internal_market/economic-reports/index_en.htm.
- Alfaro, Laura, and Andrew Charlton (2007), "International Financial Integration and Entrepreneurship," NBER Working Paper No. 13118.
- Allen, Franklin and Douglas Gale (2000), "Financial Contagion," *Journal of Political Economy* **108**(1), 1-33.
- Asdrubali, Pierfederico, Bent E. Sørensen and Oved Yosha (1996), "Channels of Interstate Risk-Sharing," *Quarterly Journal of Economics* **111**(4), November, 1081-1110.
- Ayuso, Juan and Roberto Blanco (2001), "Has Financial Market Integration Increased during the Nineties?," *Journal of International Financial Markets, Institutions & Money* **11**(3), September, 265-287.
- Baele, Lieven (2005), "Volatility Spillover Effects in European Equity Markets," *Journal of Financial and Quantitative Analysis* **40**(2), 373-401.
- Baele, Lieven, Annalisa Ferrando, Peter Hördhal, Elizaveta Krylova and Cyril Monnet (2004), "Measuring Financial Integration in the Euro Area," ECB Occasional Paper Series No. 14.
- Beck, Thorsten, Ross Levine and Norman Loayza (2000a), "Financial Intermediation and Growth: Causality and Causes," *Journal of Monetary Economics* **46**(1), 31-47.
- Beck, T., R. Levine and N. Loayza (2000b), "Finance and the Sources of Growth," *Journal of*

Financial Economics **58**(1-2), October/November, 261-300.

- Bertola, Giuseppe (2007), "Household Finance and Welfare States in Globalizing Markets," paper prepared for the Reserve Bank of Australia conference on "Financial System: Structure and Resilience," July.
- Bertrand, Marianne, Antoinette Schoar, and David Thesmar (2007), "Banking Deregulation and Industry Structure: Evidence from the French Banking Reforms of 1985," *Journal of Finance* **62**(2), 597–628.
- Biais, Bruno, Fany Declerck, James Dow, Richard Portes and Ernst-Ludwig von Thadden (2006), *European Corporate Bond Markets: Transparency, Liquidity, Efficiency*, CEPR Report, May.
- Blanchard, Olivier, and Francesco Giavazzi (2002), "Current Account Deficits in the Euro Area: The End of the Feldstein-Horioka Puzzle?," *Brookings Papers on Economic Activity* **33**(2), 147-186.
- Bonfiglioli, Alessandra (2007), "Financial Integration, Productivity and Capital Accumulation," Institute for Economic Analysis, Barcelona, December.
- Bris, Arturo, Yrjo Koskinen and Mattias Nilsson (2006), "The real effects of the Euro: evidence from corporate investments," *Review of Finance* **10**(1), 1-37.
- Carlin, Wendy, and Colin Mayer (2003), "Finance, investment and growth," *Journal of Financial Economics* **69**(1), 191-226.
- Caselli, Francesco and Silvana Tenreyro (2006), "Is Poland the Next Spain?," *NBER International Seminar on Macroeconomics 2004*, Richard H. Clarida, Jeffrey A. Frankel, Francesco Giavazzi and Kenneth D. West, editors. The MIT Press, 459-523.
- Chen, Zhiwu and Peter J. Knez (1995), "Measurement of Market Integration and Arbitrage," *Review of Financial Studies* **8**(2), 287-325.
- Claessens, Stijn, Daniela Klingebiel, and Sergio Schmukler (2002a), "Explaining the Migration of Stocks from Exchanges in Emerging Economies to International Centers," CEPR Discussion Paper No. 3301, April.
- Claessens, Stijn, Daniela Klingebiel, and Sergio Schmukler (2002b), "The Future of Stock Exchanges in Emerging Markets: Evolution and Prospects," Robert E. Litan and Richard Herring (Eds.), *Brookings-Wharton Papers on Financial Services*, The Brookings Institution, Washington, D.C., 167-212.
- Cochrane, John H. (1991), "A Simple Test of Consumption Insurance," *Journal of Political Economy* **99**(5), October, 957-976.

- Codogno, Lorenzo, Carlo Favero and Alessandro Missale (2003), "EMU and Government Bond Spreads," *Economic Policy* **18**(37), 503-532.
- De Nicolò, Gianni, and Alexander Tieman (2006), "Economic Integration and Financial Stability: A European Perspective," IMF Working Paper no. 06/296.
- Demirgüç-Kunt, Asli, and Enrica Detragiache (1999), "Financial Liberalization and Financial Fragility," in Boris Pleskovic and Joseph E. Stiglitz, eds., *Annual World Bank Conference on Development Economics 1998*, World Bank, Washington DC, 303-331.
- Demirgüç-Kunt, Asli, and Vojislav Maksimovic (1998), "Law, Finance, and Firm Growth," *Journal of Finance* **53**(6), 2107-2137.
- Demirgüç-Kunt, Asli, and Ross Levine (2001), *Financial Structure and Economic Growth. A Cross-Country Comparison of Banks, Markets and Development*, eds. Cambridge: MIT Press.
- Djankov, Simeon, Rafael La Porta, Florencio Lopez-de-Silanes, and Andrei Shleifer (2003), "Courts," *Quarterly Journal of Economics* **118**(2), 453-517.
- Djankov, Simeon, Caralee McLiesh and Andrei Shleifer (2007), "Private Credit in 129 Countries," *Journal of Financial Economics* **84**(2), 299-329.
- Dunne, Peter, Michael Moore and Richard Portes (2006), *European Government Bond Markets: Transparency, Liquidity, Efficiency*, CEPR Report, May.
- Feldstein, Martin S., and Charles Y. Horioka (1980), "Domestic Savings and International Capital Flows," *Economic Journal* **90**(358), 314-329.
- Galindo, Arturo J., Fabio Schiantarelli, and Andrew Weiss (2007), "Does Financial Reform Improve the Allocation of Investment? Micro Evidence From Developing Countries", *Journal of Development Economics*, **83**(2), 562-587.
- Garcia-Herrero, Alicia, and Philip Wooldridge (2007), "Global Financial Integration: Progress in Emerging Markets," *BIS Quarterly Review*, September, 57-70.
- Geyer, Alois, Stephan Kossmeier, and Stephan Pichler (2004), "Measuring Systematic Risk in EMU Government Yield Spreads," *Review of Finance* **8**(2), 171-197.
- Giannetti, Mariassunta, and Steven Ongena (forthcoming), "Financial Integration and Firm Performance: Evidence from Foreign Bank Entry in Emerging Markets," forthcoming, *Review of Finance*.
- Giovannini Group (2001), "Cross-Border Clearing and Settlement Arrangements in the European Union," in European Commission Economic Paper No. 163, Brussels, November.

- Goldsmith, Raymond W. (1969), *Financial Structure and Development*, New Haven, CT: Yale University Press.
- Guiso, Luigi, Paola Sapienza and Luigi Zingales (2004), “Does Local Financial Development Matter?” *The Quarterly Journal of Economics*, **119**(3), 929-69.
- Guiso, Luigi, Paola Sapienza and Luigi Zingales (2006), “Does Culture Affect Economic Outcomes?,” *Journal of Economic Perspectives*, **20**(2), 23-48.
- Guiso, Luigi, Tullio Jappelli, Mario Padula and Marco Pagano (2004), “Financial Market Integration and Economic Growth in the EU,” *Economic Policy* **19**(40), 523-77.
- Halling, Michael, Marco Pagano, Otto Randl, and Josef Zechner (forthcoming), “Where is the Market? Evidence from Cross-Listings in the U.S.,” CSEF Working Paper No. 129, forthcoming, *Review of Financial Studies*.
- Hardouvelis, Gikas A., Dimitrios Malliaropoulos, and Richard Priestley (2006), “EMU and European Stock Market Integration,” *Journal of Business* **79**(1), 365–392.
- Henry, Peter Blair (2007), “Capital Account Liberalization: Theory, Evidence, and Speculation,” *Journal of Economic Literature* **65** (4), 887-935.
- Hnatkovska, Viktoria and Martin Evans (2007) “International Financial Integration, Macroeconomic Volatility and Welfare,” forthcoming, *Journal of the European Economic Association* **5**(2-3), 500-508.
- Jappelli, Tullio, and Marco Pagano (2002), “Information Sharing, Lending and Defaults: Cross-Country Evidence,” *Journal of Banking and Finance* **26**(10), 2017-45.
- Jayaratne, Jith and Philip E. Strahan (1996), “The Finance-Growth Nexus: Evidence from Bank Branch Deregulation,” *Quarterly Journal of Economics* **111**(3), 639-670.
- King, Robert G., and Ross Levine (1993a), “Finance and Growth: Schumpeter May be Right,” *Quarterly Journal of Economics* **108**(3), 713-737.
- King, Robert G., and Ross Levine (1993b), “Finance, Entrepreneurship and Growth,” *Journal of Monetary Economics* **32**(3), 513-542.
- Klapper, Leora, Luc Laeven and Raghuram Rajan (2006), “Entry Regulation as a Barrier to Entrepreneurship,” *Journal of Financial Economics* **82**(3), 591-629
- La Porta, Rafael, Florencio Lopez-de-Silanes, Andrei Shleifer, and Robert Vishny (1997), “Legal Determinants of External Finance,” *Journal of Finance* **52**(3), 1131–1150.
- La Porta, Rafael, Florencio Lopez-de-Silanes, and Andrei Shleifer (1998), “Law and Finance,” *Journal of Political Economy* **106**(6), 1113-55.
- Lane, Philip R., and Gian Maria Milesi Ferretti (2006), “The External Wealth of Nations

- Mark II: Revised and Extended Estimates of Foreign Assets and Liabilities, 1970-2004,” IMF Working Paper no. 06/69.
- Levine, Ross, and Sara Zervos (1998), “Stock Markets, Banks, and Economic Growth,” *American Economic Review* **88**(3), 537-558.
- Lewis, Karen (1999), “Trying to Explain Home Bias in Equity and Consumption,” *Journal of Economic Literature* **37**(2), 571-608
- Mace, Barbara J. (1991), “Full Insurance in the Presence of Aggregate Uncertainty,” *Journal of Political Economy* **99**(5), October, 928-956.
- Miniane, Jacques (2004), “A New Set of Measures on Capital Account Restrictions,” *IMF Staff Papers* **51**(2), 276-308.
- Obstfeld, Maurice (1994), “Are Industrial-Country Consumption Risks Globally Diversified?,” in Leonardo Leiderman and Assaf Razin, eds., *Capital Mobility: The Impact on Consumption, Investment and Growth* (Cambridge University Press, New York).
- Padoa-Schioppa, Tommaso (2007), “Europe Needs a Single Financial Rulebook,” *Financial Times*, 11 December, 13.
- Pagano, Marco (1993), “Financial Markets and Growth: an Overview,” *European Economic Review* **37**(2-3), 613-622.
- Pagano, Marco, Otto Randl, Ailsa A. Röell and Josef Zechner (2001), “What Makes Stock Exchanges Succeed? Evidence from Cross-Listing Decisions” *European Economic Review* **45**(4-6), 770-82.
- Pagano, Marco, Ailsa A. Röell and Josef Zechner (2002), “The Geography of Equity Listing: Why Do Companies List Abroad?,” *Journal of Finance* **57**(6), 2651-2694.
- Pagano, Marco and Ernst-Ludwig von Thadden (2004), “The European Bond Markets under EMU,” *Oxford Review of Economic Policy* **20**(4), 531-554.
- Pritchett, Lant (1997), “Divergence, Big-Time,” *Journal of Economic Perspectives* **11**(3), 3-17.
- Rajan, Raghuram G. and Luigi Zingales (1998), “Financial Dependence and Growth,” *American Economic Review* **88**(3), 559-587.
- Rajan, Raghuram G. and L. Zingales (2003a), “The Great Reversals: The Politics of Financial Development in the 20th Century,” *Journal of Financial Economics* **69**(1), 5-50.
- Rajan, Raghuram G. and L. Zingales (2003b), “Banks and Markets. The Changing Character of European Finance,” in *The Transformation of the European Financial System*, Vítor Gaspar, Philipp Hartmann and Olaf Sleijpen eds., European Central Bank, 2003.

- Rodrik, Dani (1998), "Who Needs Capital Account Convertibility?," in *Should the IMF Pursue Capital Account Convertibility*. Essays in International Finance, n. 207, Princeton International Finance Section, Princeton University.
- Rogoff, Kenneth, M. Ayhan Kose, Eswar S. Prasad and Shang-Jin Wei (2006), "Financial Globalization: A Reappraisal," IMF Working Paper No. 06/189.
- Sørensen, Bent E. and Oved Yosha (1998), "International Risk Sharing and European Monetary Unification," *Journal of International Economics* **45**, 211-238.
- Sørensen, Bent E., Yi-Tsung Wu, Oved Yosha and Yu Zhu (2007), "Home Bias and International Risk Sharing: Twin Puzzles Separated at Birth," *Journal of International Money and Finance* **26**(4), 587-605.
- Stulz, René (1999), "Globalization of Equity Markets and the Cost of Capital," *Journal of Applied Corporate Finance* **12**(3), Fall, 8-25.
- Svaleryd, Helena and Jonas Vlachos (2005), "Financial Markets, the Pattern of Specialization, and Comparative Advantages: Evidence from OECD Countries," *European Economic Review* **49**(1), 113-144.
- Tesar, Linda L. and Ingrid M. Werner (1995), "Home Bias and High Turnover," *Journal of International Money and Finance* **14**(4), August, 467-492.
- Townsend, Robert (1994), "Risk and Insurance in Village India," *Econometrica* **62**(3), May, 539-591.
- Trichet, Jean-Claude (2008), "Keynote speech at the Second Symposium of the ECB-CFS research network on 'Capital Markets and Financial Integration in Europe'," 13 February, Frankfurt am Main, http://www.ecb.int/press/key/date/2008/html/sp080213_2.en.html.
- van Wincoop, Eric (1994), "Welfare Gains from International Risk Sharing," *Journal of Monetary Economics*, **34**(2), October, 75-200.

Figure 1
Road map

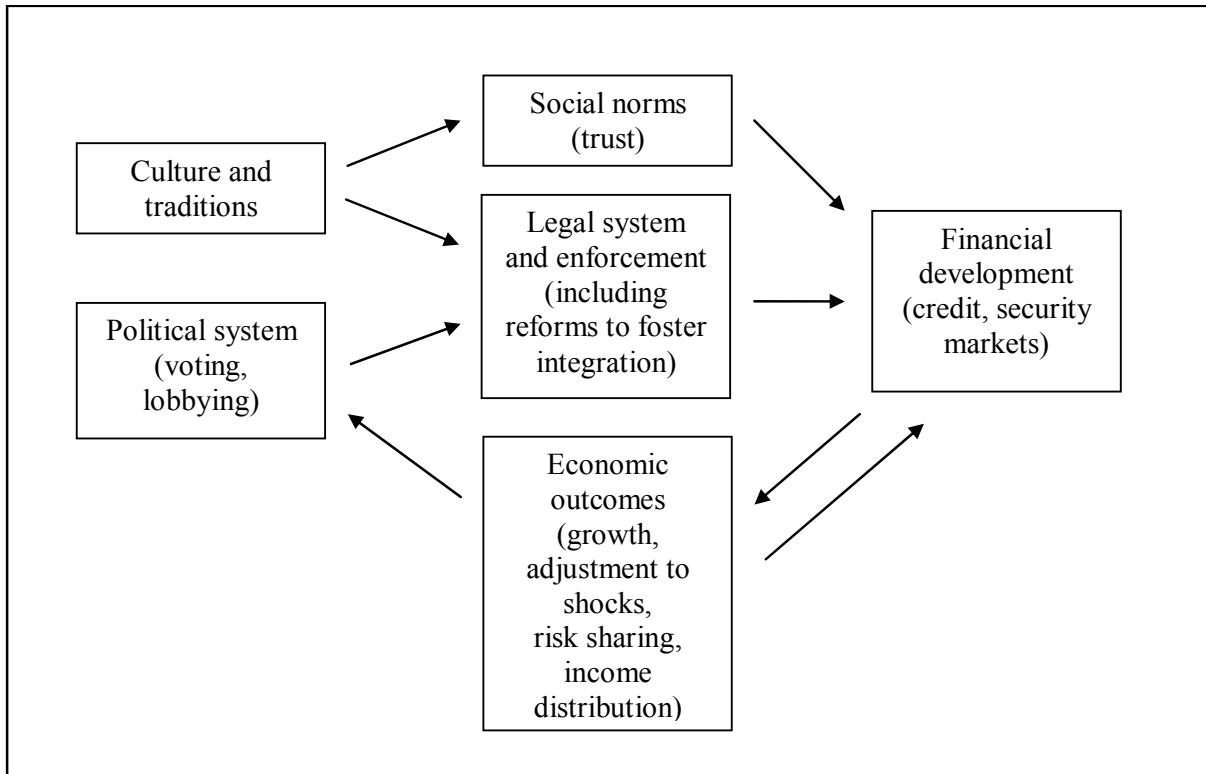


Figure 2

Indicators of domestic financial development in the euro area

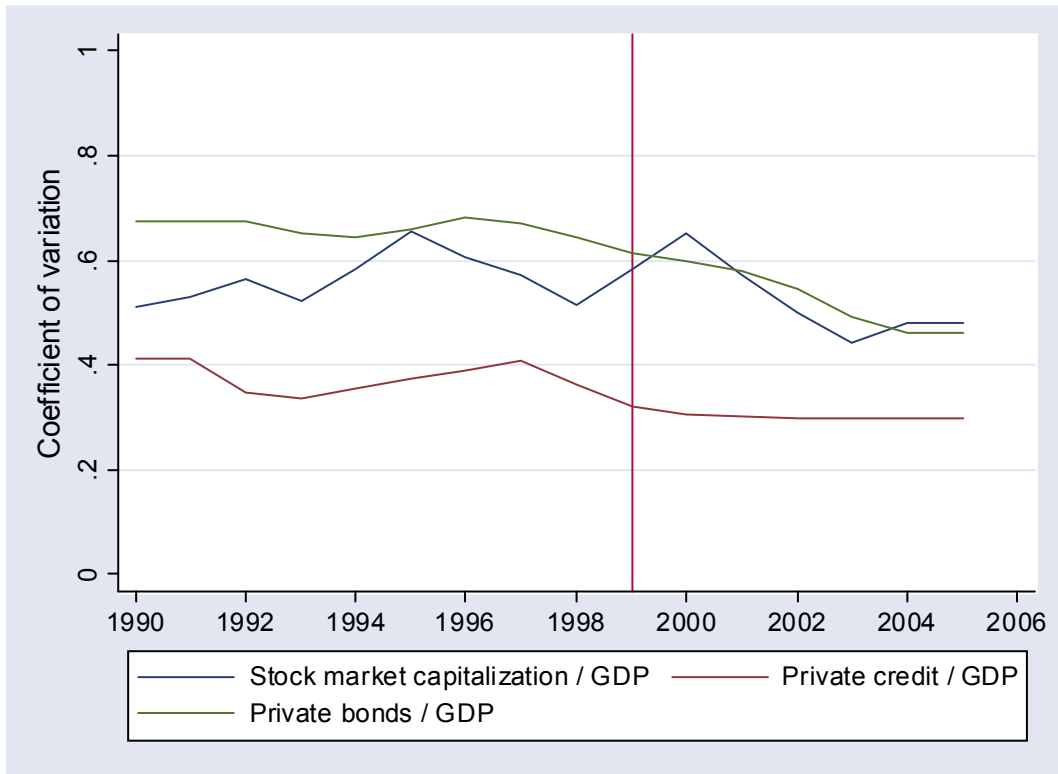


Figure 3

Gross international position in the euro area, Japan and United States

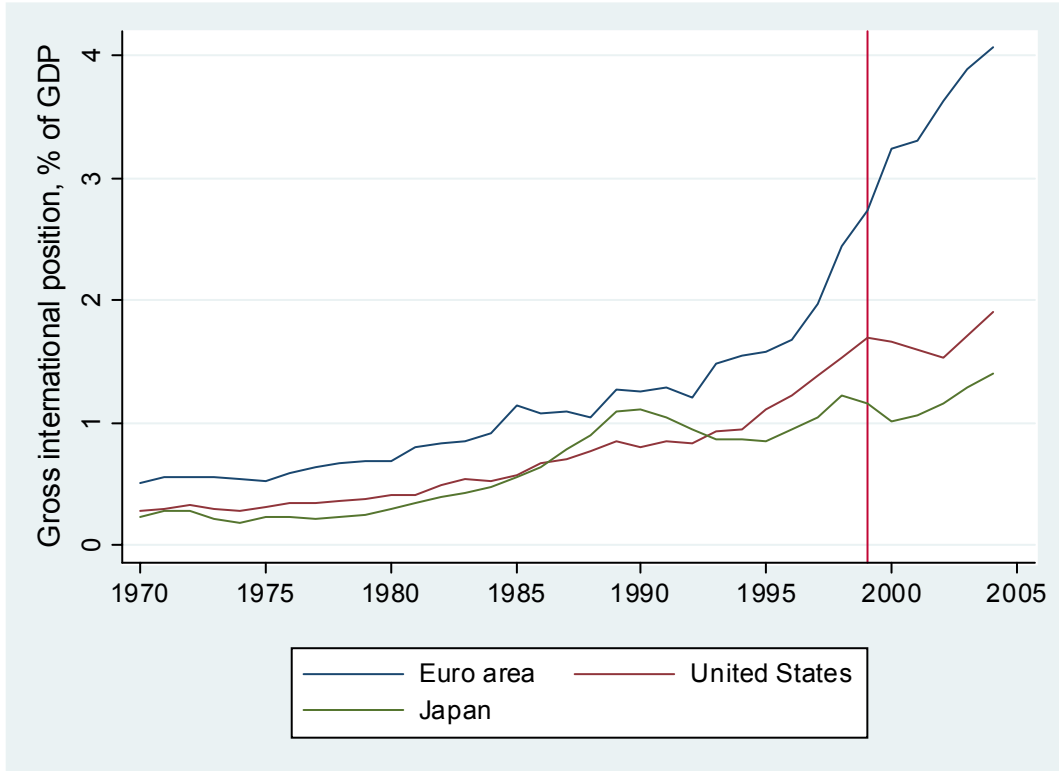
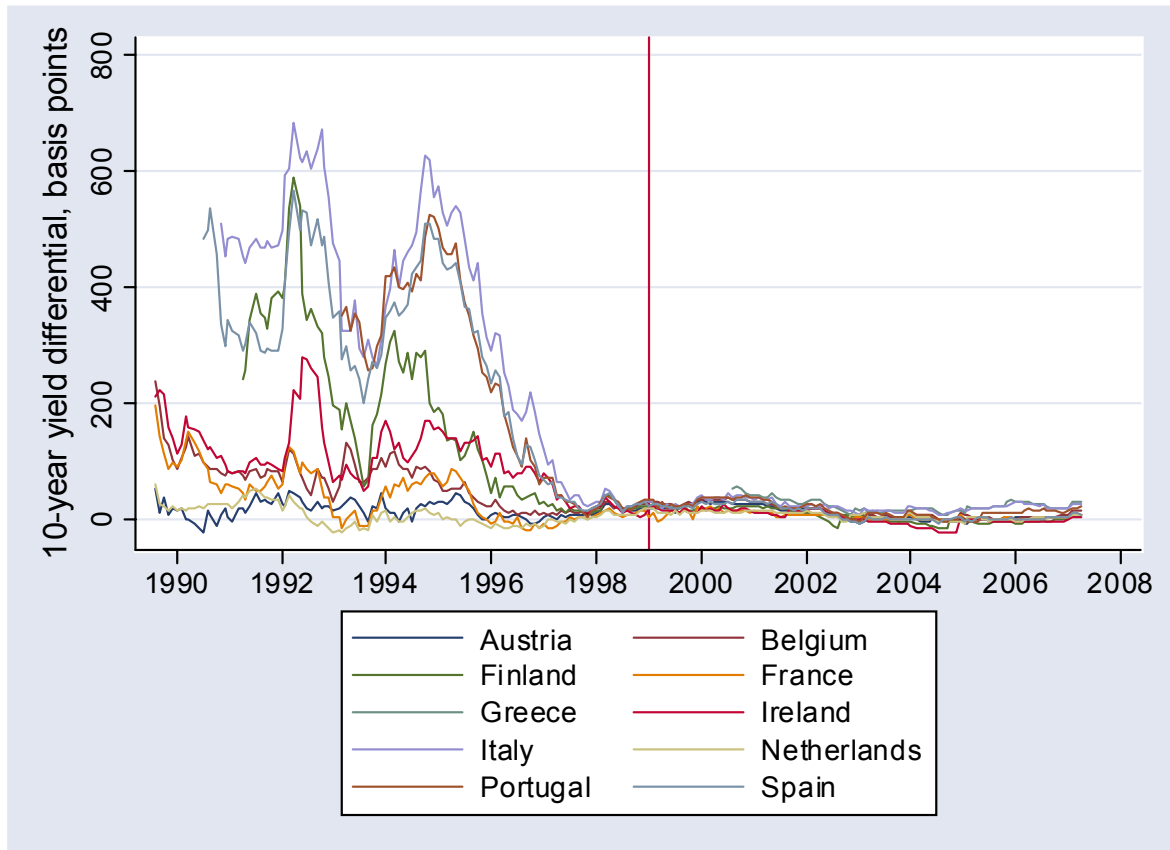


Figure 4

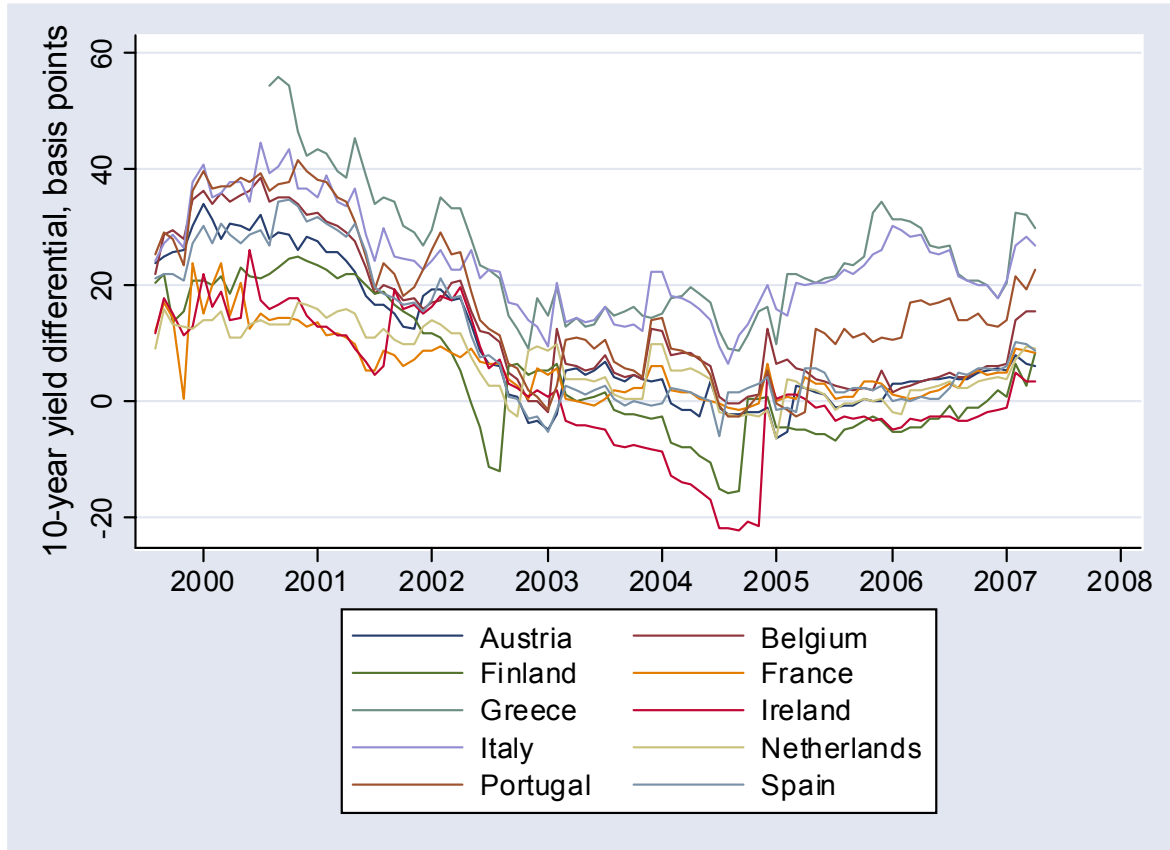
10-year benchmark bond yield spreads before and after EMU, 1990-2007



Note: Yield differentials are computed relative to the yield on the benchmark German 10-year Bund, based on monthly data (end-of-month observations). Source: Datastream.

Figure 5

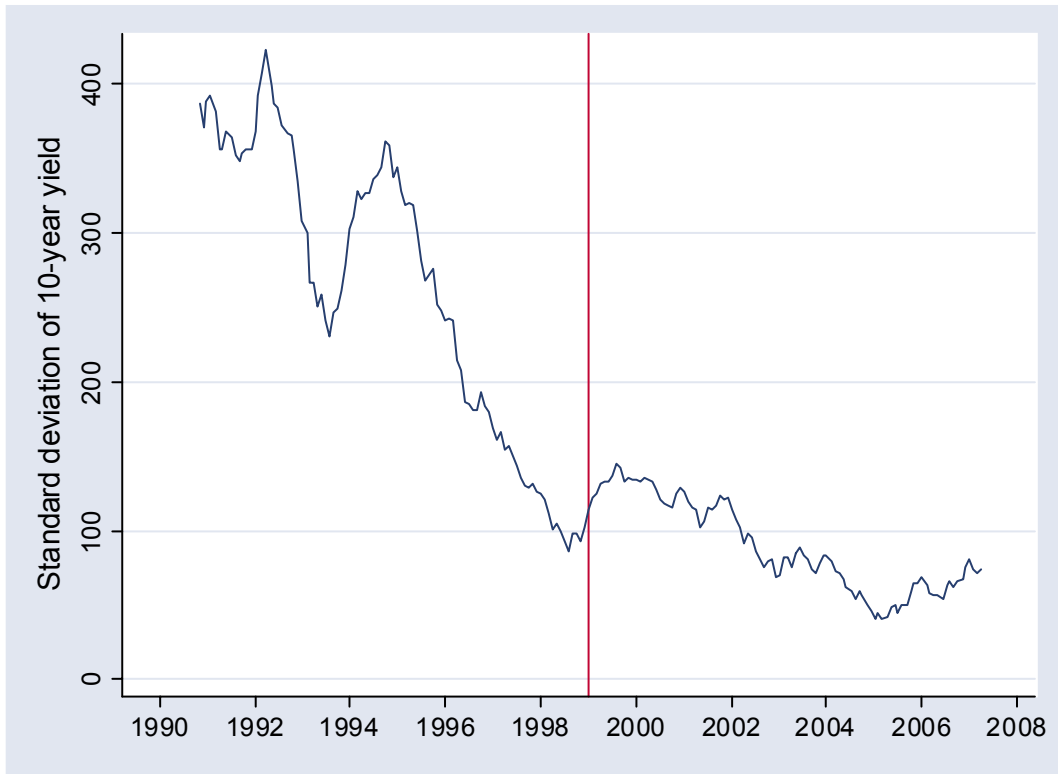
10-year benchmark bond yield spreads under EMU



Note: Yield differentials are computed relative to the yield on the benchmark German 10-year Bund, based on monthly data (end-of-month observations). *Source:* Datastream.

Figure 6

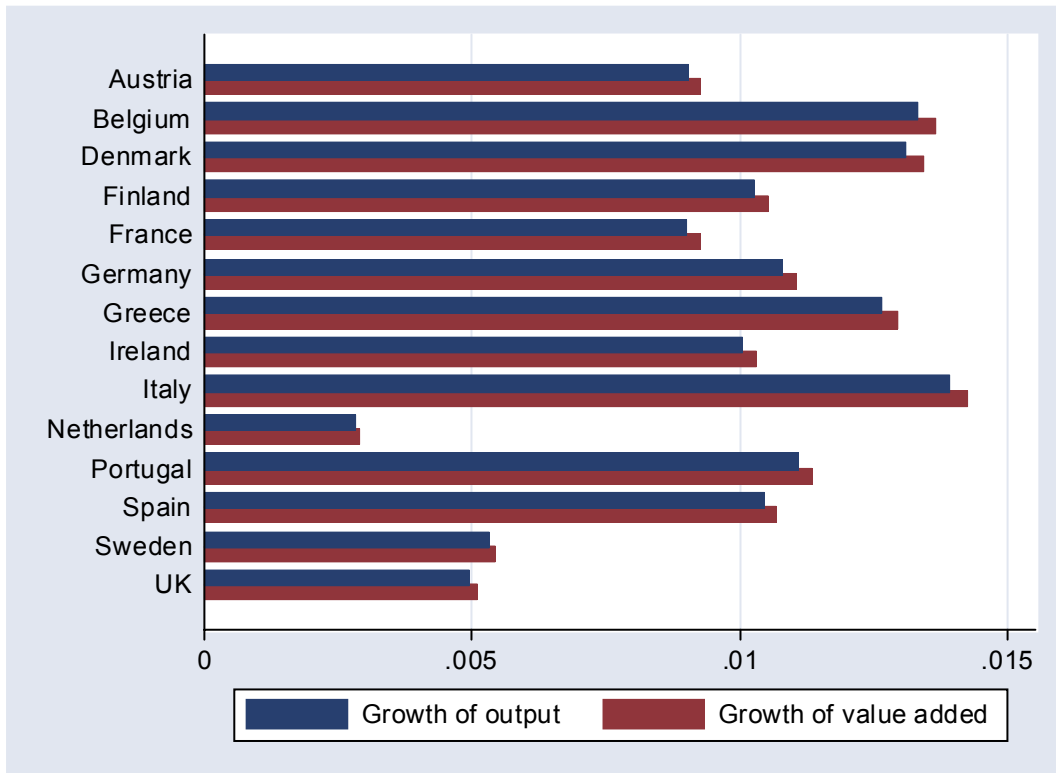
Standard deviation of the 10-year benchmark bond yield spreads



Note: The standard deviation is computed excluding Greece.

Figure 7

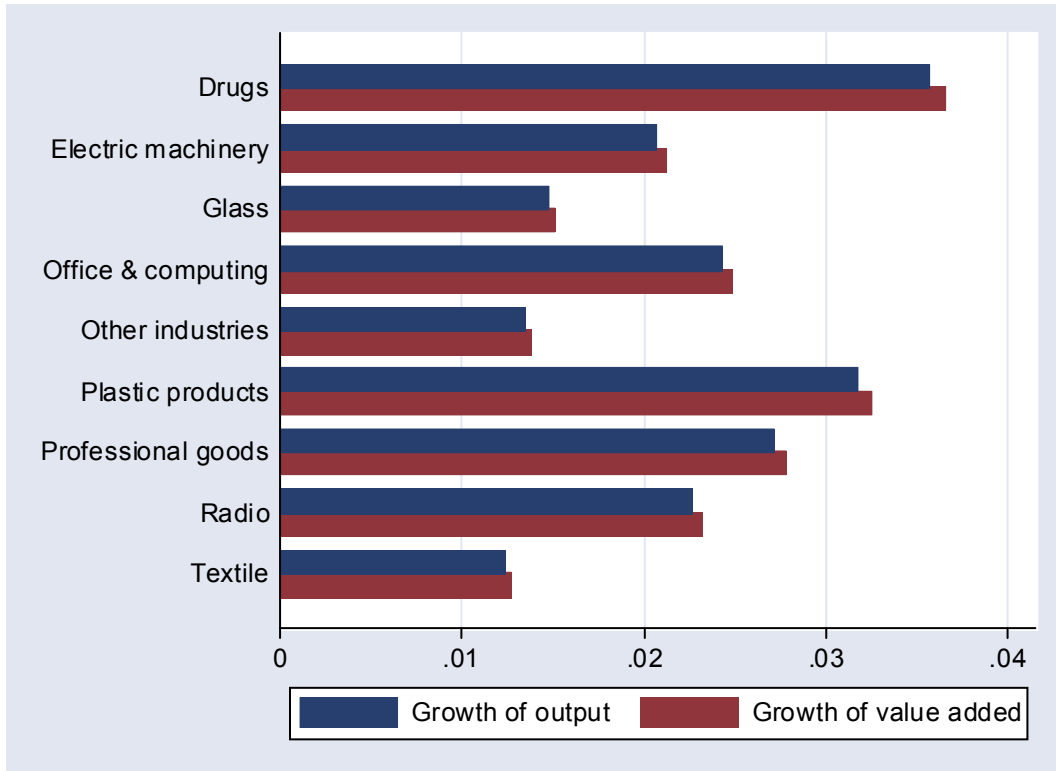
Potential growth of value added and output in manufacturing industry by country: raising financial development to the US standard



Source: Guiso, Jappelli, Padula, Pagano (2004).

Figure 8

Potential growth of value added and output in manufacturing industry by sector: raising financial development to the US standard



Source: Guiso, Jappelli, Padula, Pagano (2004).

Figure 9

Correlations between saving and investment for EU countries

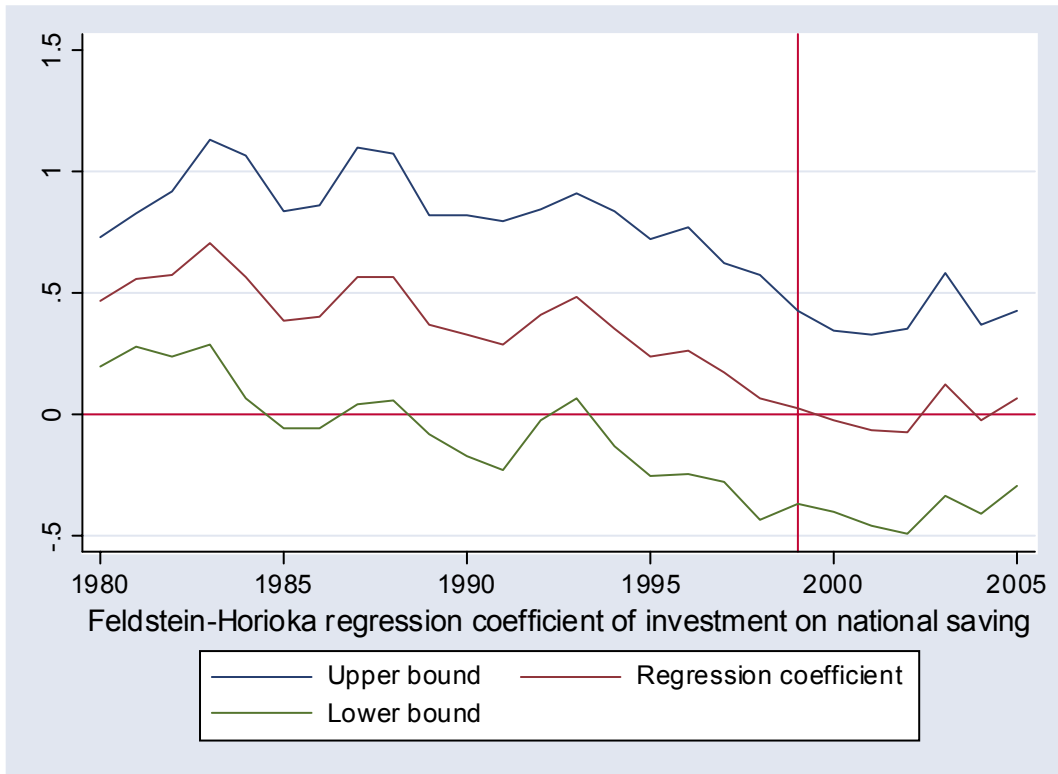


Figure 10

Correlations between saving and investment for OECD countries

