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Financial Crisis, Financial Integration and Economic Growth

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Abstract

The aim of the paper is to analyze the process of financial integration in Europe and its impact on economic growth since the introduction of the Euro in 1999. In particular, we focus on how the international financial crisis that started in 2007 has affected integration and growth. By combining information at country, sector and firm level, we quantify the effect of financial integration on financial development and therefore on economic growth. Our results illustrate that a significant part (65%) of financial development is attributable to progress in integration, accounting for 1% of the euro area's GDP growth over the period 1999-2008. The financial retrenchment due to the crisis in 2008 has limited GDP growth by 0.75 pp which accounts for a very significant part (58%) of the observed contraction of GDP. However, the global nature of the crisis implies that financial integration has not been strongly reversed in comparison to financial development. Therefore, the decline in the degree of integration in 2008 explains a small percentage of the drop in total capitalization and, as a result, its impact on growth is also small.

Key words

Crisis, financial development, financial integration, economic growth.

Resumen

El objetivo de este documento de trabajo es analizar el proceso de integración europea desde la introducción del euro en 1999 y su impacto en el crecimiento económico. Además, se analiza cómo la crisis financiera internacional que comenzó en 2007 ha afectado tanto al proceso de integración financiera en Europa como al crecimiento económico. Combinando información a nivel de país, de sector y de empresa se cuantifica el efecto de la integración sobre el desarrollo financiero, y el efecto de éste sobre el crecimiento económico. Los resultados muestran que una parte significativa (65%) del desarrollo financiero es atribuible al proceso de integración financiera, representando el 1% del crecimiento del PIB de la euroárea en el periodo 1999-2008. La contracción del desarrollo financiero debido a la crisis en 2008 ha reducido el crecimiento del PIB en 0,75 puntos porcentuales, lo que representa una parte muy importante (58%) de la contracción observada del PIB. Sin embargo, la naturaleza global de la crisis ha implicado que la caída de la integración financiera no haya sido mayor que la del grado de desarrollo financiero, por lo que el retroceso en la integración en 2008 explica un pequeño porcentaje de la capitalización total y, como consecuencia, su impacto en el crecimiento ha sido reducido.

Palabras clave

Crisis, desarrollo financiero, integración financiera, crecimiento económico.

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1. Introduction

AMONG the issues brought to light by the current crisis is the key role the financial sector plays in developed economies. The international financial crisis that started in the summer of 2007 with the subprime crisis in the U.S. and became more widespread since the summer of 2008, has led financial markets to witness a dramatic decline in their activity. According to the World Federation of Exchanges, world market capitalization reduced in 2008 by 46.5% in one year. This reduction in capitalization has occurred in all equity markets in the world[1]. New York Stock Exchange fell by 41%, NASDAQ by 40.3%, NYSE Euronext (Europe) by 48%, Nasdaq OMX Nordic Exchange by 52%, London Stock Exchange by 33% and Deutsche SE by 45%. At the same time market values plunged, public debt markets became refuge markets during the peak of the crisis, at certain moments even presenting zero returns.

Banking activity also fell significantly owing to various factors. Distrust between institutions caused that the market value of interbank transactions declined. The first stages of the crisis also saw bank credit plunge in the most developed countries, given that financial institutions were forced to restructure their balance sheets due to either exposure to toxic assets or the excessive concentration in real estate markets, or both. In the United Kingdom, the supervisory authority rescued Northern Rock from the possibility of a bank run. Faced with the growing distrust of depositors regarding the health of the banking system, the European Union authorities were forced to increase deposit insurance. During this period, intervention in Europe was needed to recapitalize numerous banks with an injection of around 350,000 million euros. A recent paper (European Central Bank, 2009a) calculates that government support to the banking sectors will increase public debt by 3.3%. Once the financial turmoil exploded, it spread rapidly to the rest of the economy, having a virulent impact. As a result of all these factors mentioned above, many of the economies around the world have entered one of the worst recessions since the 1929 crash and the Great Depression of the 30s. Never before have economic agents and the media as a whole been so aware of the importance of the financial sector in the economy. This importance stems from the fact that it is

[1] With the exception of Tehran Stock Exchange.

the financial sector which provides investors with the financial surplus of ultimate savers. As a result, either directly in the markets or indirectly through financial intermediaries, this sector helps to finance investment and thus output and employment growth. Furthermore, it makes a direct contribution to economic growth, representing 5.8% of GDP (2006) and 2.7% of employment (2007) in the euro area in the most recent years available.

European authorities have been aware of the importance of development and financial integration for economic performance for one reason: financial integration contributes to the development of the financial system by increasing competition, expanding markets and increasing the efficiency of financial intermediaries, thereby resulting in lower intermediation costs and a more efficient allocation of capital (Obstfeld, 1994). In addition, financial integration increases the depth and liquidity of financial markets, and consequently enhances the resilience of the European financial system. It also offers greater scope for geographical risk diversification, promoting consumption and income risk sharing. But as Brezigar, Coricelli and Masten (2008) point, financial integration can also stimulate growth indirectly by means of improvements in the institutional framework (improved regulation and corporate governance). This will enhance the overall stability and reduce problems of asymmetric information. Another channel of influence of financial integration on growth is by allowing domestic firms to access foreign financial markets (direct lending and listing on foreign stock markets).

It was precisely for these reasons that the integration process of financial markets started in the mid 1980s in the EU, with the objective of achieving a single perfectly integrated internal market. Among the measures implemented were the first and second banking directives, freedom of capital movements, the harmonization of deposit insurance, the introduction of the Euro, the Financial Services Action Plan (FSAP), etc. In general, the studies available illustrate that the integration process has indeed advanced (much more so in the wholesale markets than in retail), and has had a positive effect on economic growth (see European Central Bank, 2009; European Commission, 2009, among others).

The financial turmoil that started in mid 2007 in the USA and rapidly spread to the rest of the world was a shock of such magnitude that it has affected not only the level of financial flows but also the progress of financial integration in Europe. In fact, the report by the European Central Bank in May 2009 noted a slowdown and even a reversal of the financial integration process, although the effect is uneven across different market segments. One

of the reason for this decline is the protectionist measures implemented by some countries as a reaction to the turmoil, along with a preference for national institutions (with the increase in the home bias), given the lack trust in international markets.

It is therefore fundamental to examine how the current turmoil has affected financial integration, and by this means to quantify its impact on economic growth. Furthermore, it will be useful to compare the impact of the crisis over an extensive time period and assess the financial integration process as a whole rather than merely over the last year. The aim of our paper is to analyze the impact of both financial development and integration on the economic growth of euro area countries since the introduction of Euro and the implementation of the FSAP in 1999, quantifying the differential impact of the financial crisis in 2008. In order to achieve this, our work evaluates the part of financial development growth which is attributable to financial integration over the period analyzed, so as to isolate its contribution to growth. Thus, we decompose the total financial development observed in each EU country into a component related to financial integration and into another component which could be considered "pure" financial development. By doing this, it is also possible to quantify the impact of the crisis on integration and economic growth.

The results illustrate that both financial development and financial integration have been important driving forces behind the growth of European economies. In fact, from 1999 to 2008 estimations show that financial development contributed 0.09 percentage points (pp) per year to the GDP growth of the euro area, thus explaining 4.3% of annual GDP growth. The contribution was found to be highest in those countries which had increased more their level of financial development. If we perform the analysis until the year prior to the beginning of the crisis (2007), we note that estimates are higher. Following the international crisis, there has been a fall of financial flows and, therefore, a financial retrenchment, explaining 0.75 pp of the GDP fall in 2008. This accounts for 58% of the observed contraction of euro area GDP. In the case of integration, progress made until 2008 accounts for an important part of financial development growth (65%), with its contribution to GDP growth being 0.021pp per year (explaining 1% of annual GDP growth). However, the decline in the degree of integration owing to the crisis barely explains the 1.4% drop in total capitalization. Consequently financial integration has a minor contribution to the fall of GDP in 2008 (2.2% total GDP fall is explained). This result shows that the turmoil which started in mid-2007 was global, and

thus the fall in funding levels from other European countries was not higher than from the rest of the world.

Our paper is structured as follows. Section 2 reviews the literature analyzing the impact of financial development and financial integration on economic growth. Section 3 provides evidence on the degree of financial development achieved in Europe from the mid 1990s to 2007, as well as its decline owing to the financial crisis in 2008. Furthermore, we show evidence of the advance of financial integration in Europe since 1999 and the regression in 2008. Sections 4 and 5 outline the methodology used to measure the impact of development and financial integration on economic growth (the finance-growth nexus), and also to decompose the part of observed financial development which is due to integration. The effect of financial development and integration on growth is evaluated in section 6, while a summary and conclusion is presented in the last section.

2. Financial Development, Financial Integration and Economic Growth: Background

THE work of Goldsmith (1969) is the seminal contribution on the nexus between financial development and economic growth. As an indicator of financial development, he used the value of intermediate assets as a percentage of GDP under the assumption that the size of the financial sector is positively correlated with the provision and quality of their services. Using data from 35 countries over the period 1860 to 1963, he reached the conclusion that there was a correlation between economic growth and financial development over periods of several decades. However, as Levine (1993) notes, Goldsmith's work has several limitations: a) it does not control for the effect of other relevant variables in the explanation of growth, b) the proxy variable used to measure the proper functioning of the financial sector presents some serious objections, and c) non-identification of the direction of causality.

Several research studies contributed empirical evidence in the 1990s which attempted to solve the problems arising in Goldsmith's work (1969). King and Levine (1993a and b) significantly broadened the sample of countries used (80 countries), and controlled for the influence of other variables that affect economic growth. They also built new indicators

of financial development, as well as analyzing their influence on various dimensions of economic growth (per capita GDP, capital deepening and total factor productivity). Their results illustrate a significant positive correlation between indicators of financial development and economic growth, and also that the initial levels of financial development are good predictors for production, capital and productivity growth rates for the next 30 years.

Levine and Zervos (1998) use a sample of 49 countries for the period 1976-93 and examine whether various measures of financial development predict future output, capital, productivity and savings growth rates. Their results show a positive and significant correlation between the two groups of variables even when estimation controls for other variables. The results also indicate that markets and financial institutions provide the necessary services to ensure long-term economic growth.

The work of Levine, Loayza, and Beck (2000) evaluates whether the exogenous component of financial development influences economic growth and whether cross-countries differences in legal and accounting systems explain differences in the level of financial development. Their results illustrate firstly that the exogenous component of financial intermediary development is positively associated with economic growth, and secondly that cross-country differences in legal and accounting systems help account for differences in financial development. These two results indicate that the legal and accounting reforms which strengthen creditor rights, as well as implementing contracts could then boost financial development and accelerate economic growth.

Finally, Loayza and Rancière (2006) explore the obvious contradiction in two strands of literature on the effects of financial development on growth. On one hand, the literature on economic growth finds the positive relationship we have been presenting before. On the other hand, the literature on banking crises finds that monetary aggregates are good predictors of economic crisis. The authors show that this obvious contradiction can be explained in terms of the difference between short-term effects (negative) and those produced in the long-term (positive) associated with the task of intermediation between savings and investment.

But it is the work of Rajan and Zingales (1998) which explains the mechanism through which financial development promotes economic growth. Studies up until then had merely confirmed the existence of a positive correlation between both variables, without establishing the direction of causality. Although the work of King and Levine (1993a) exam-

ined this problem of causality and illustrated that the predetermined component of financial development is a good predictor of growth over a period of 10 to 30 years, Rajan and Zingales presented two arguments which question the validity of the results. First, the positive correlation between financial development and economic growth could be driven by a problem of an omitted relevant variable, such as the savings rate, related to both variables. And second, the variables that approximate financial development (market capitalization as a percentage of GDP) might be forward indicators of future economic growth rather than causal factors. It was for these reasons that Rajan and Zingales designed an empirical contrast which clearly explains the mechanisms through which financial development affects growth. Thus, they proposed a causality test which corrects for country effects as well as industry effects. Rajan and Zingales considered a mechanism in which financial development facilitates access to external financing of firms, in particular those most dependent on external funds, thereby increasing investment and economic growth.

Several papers have applied Rajan and Zingales (1998) methodology. Cetorelli and Gambera (2001) extend Rajan and Zingales' (1998) model by introducing bank market concentration as an explanatory variable for growth. Claessens and Laeven (2005) analyze the effect of bank competition on economic growth using an indicator of competition (H-statistic). Maudos and Fernández de Guevara (2006) analyze the effect of financial development and bank competition on economic growth using both structural measures of competition and measures based on the new empirical industrial organization literature. It is interesting to note that Fernández de Guevara and Maudos (2009) use Rajan and Zingales specification to test the relevance of financial development on growth at a regional level within a country (Spain) rather than in a cross-country setting, as all papers in this literature do. In general, all the papers which apply this methodology find robust evidence of the role financial development plays in economic growth.

In the case of financial integration in Europe and its impact on economic growth, the European Commission has supported some studies to evaluate the contribution of integration to EU economic growth in terms of output and employment. Two studies are particularly worth mentioning: one by London Economics in association with PricewaterhouseCoopers and Oxford Economic Forecasting in 2002, and the aforementioned study by Guiso, Jappelli, Pauda and Pagano (2004).

The first study focuses on examining how integration affects the reduction of financing costs in the debt and equity markets, as well as the cost of bank financing. The report's findings suggest that integration in European financial markets represents 1.1% long-term GDP growth and 0.8% employment. The largest contribution to growth (45%) comes from the reduction in the cost of equity capital. The contribution of bank financing is lower and even negligible for the bond market. The results show significant differences between countries in terms of the potential benefits of integration.

Guiso et al. (2004) analyze the economic impact of financial integration by evaluating its expected impact on the level of financial development. That is, after the authors quantified the effect of financial development on growth using the methodology of Rajan and Zingales (1998), they simulated a scenario of a single financial market in Europe, with a similar level of financial development to that of the United States. Indeed, as confirmed by the indicators which compare financial development in Europe and the United States, the degree of total capitalization (market capitalization + bonds + loans to private sector) as a percentage of GDP is higher in the U.S. than in most EU countries. However, the effect on growth is simulated in a second scenario that controls for the influence that other institutional variables[2] might have on the level of financial development.

In the first scenario, the manufacturing industry's potential growth of value added amounted to 0.72% per year, representing 0.2% of GDP of the EU assuming a zero impact of integration on the other sectors of the economy. In the second scenario, the estimation is downward corrected taking into account the effect of other variables that affect financial development. The contribution of financial integration in this case is 0.53 pp.

The studies carried out until now are limited given that they quantify the potential benefit of financial integration in a scenario of full integration corresponding to a single European market (which does not reflect reality, especially in retail markets, as shown by different studies). However, the economic impact related to the effective advance of integration has not been estimated. The contribution of our work is therefore to evaluate the economic impact of the progress achieved to date in the degree of financial integration. More-

[2] Among these variables we can quote the efficiency of the judicial system, the degree of fulfillment of contracts, the legal origin of the financial system, etc.

over, unlike the work of Guiso et al. (2004), the estimated impacts cover the total economy including not only the manufacturing sector but all sectors of the economy.

3. Recent Evolution of Financial Development and Integration in Europe

3.1. Financial development

The purpose of this section is to provide empirical evidence on the evolution of financial development in EU-15 countries[3] in the period 1999-2008. The choice of 1999 as the starting year is justified given that it was in 1999 when the two most recent important measures were implemented to move towards a single market: the birth of the euro as the main catalyst for integration and the implementation of the Financial Services Action Plan (FSAP).

Our paper approximates the level of financial development by employing the most widely used variables such as the outstanding amount of bond markets, the stock market capitalization and bank credit, all expressed as a percentage of GDP. The first variable is from the Debt Securities Statistics published by the Bank for International Settlements (BIS) completed with the European Central Bank (ECB) for Luxembourg. Basic data for market capitalization is obtained from Eurostat, and is completed with additional sources (World Bank; World Federation of Exchanges, OMX -Nordic Exchange- and Euronext). The value of bank credit is obtained from European Central Bank statistics, while GDP is obtained from Eurostat.

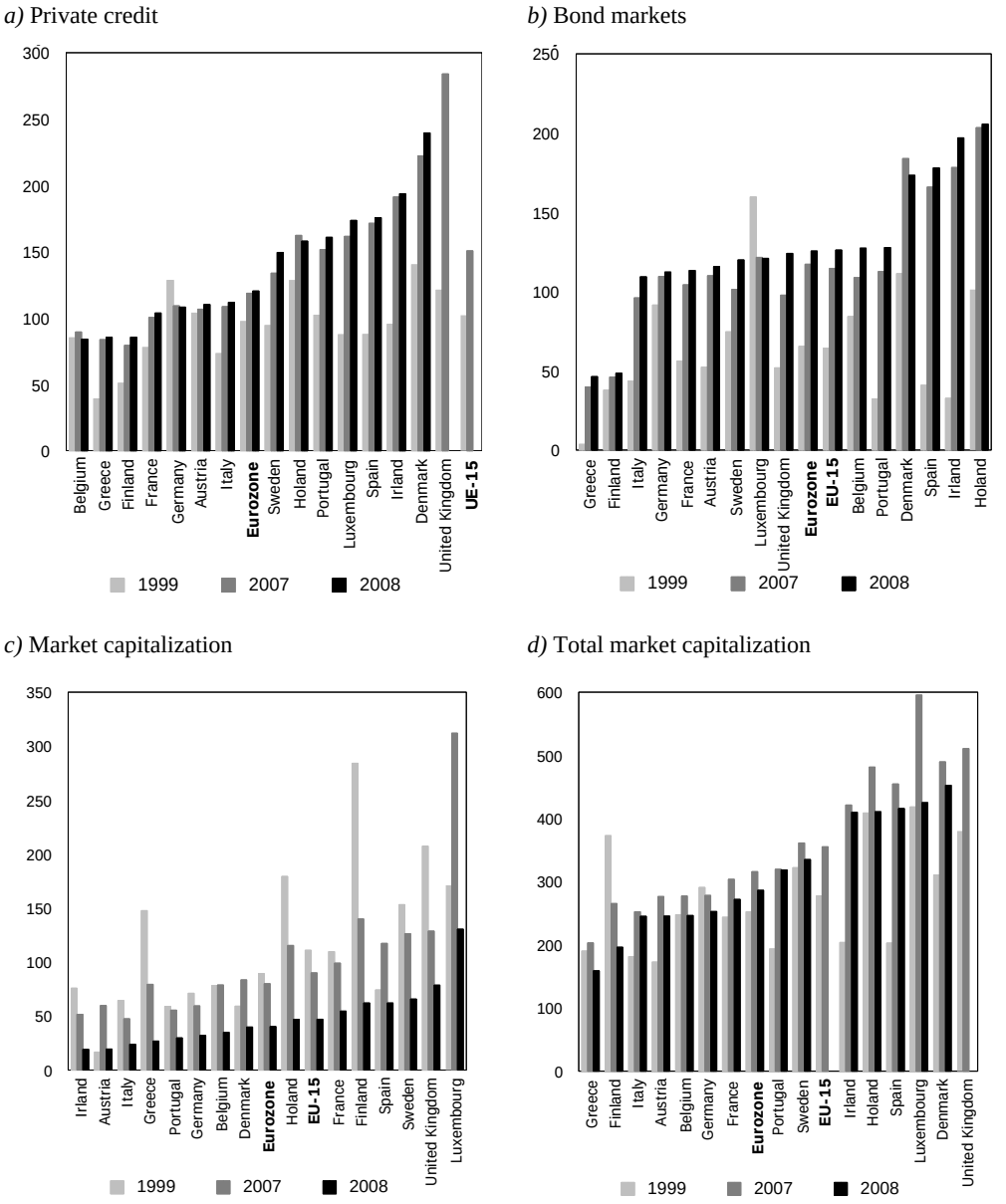
Figure 1 shows the value of total capitalization (as a percentage of GDP) of the EU-15 as well as its decomposition into bond, equity and credit markets in 1999, 2007 and 2008. The data demonstrates that there are significant differences both in structure and in the financial development of the countries analyzed. While the United Kingdom, Denmark and

[3] The analysis covers EU-15 or the Eurozone, according to the data available.

Luxembourg are the most financially developed, at the opposite extreme stand Greece, Finland and Italy.

FIGURE 1: Financial development indicators

(percentage of GDP)



Note: Total capitalization is proxied as the sum of outstanding debt (domestic and issued abroad), stock market capitalization and credit of IFMs to the non-financial sector.

Source: European Central Bank, BIS, Eurostat, World Federation of Exchanges, EURONEXT, OMX, World Development Indicators (World Bank).

3.2. Financial integration

A widely used definition considers a financial market to be perfectly integrated when it satisfy the one price law. That is to say, financial assets with the same characteristics (in terms of risk, liquidity, maturity, etc) must provide the same return regardless of the origin of the issuer and investor. Another more complete definition is that adopted by the European Central Bank (2007) which considers "the market for a given set of financial instruments or services to be fully integrated when all potential market participants in such a market (i) are subject to a single set of rules when they decide to deal with those financial instruments or services, (ii) have equal access to this set of financial instruments or services, and (iii) are treated equally when they operate in the market". Under these conditions, it is expected that the one price law is satisfied.

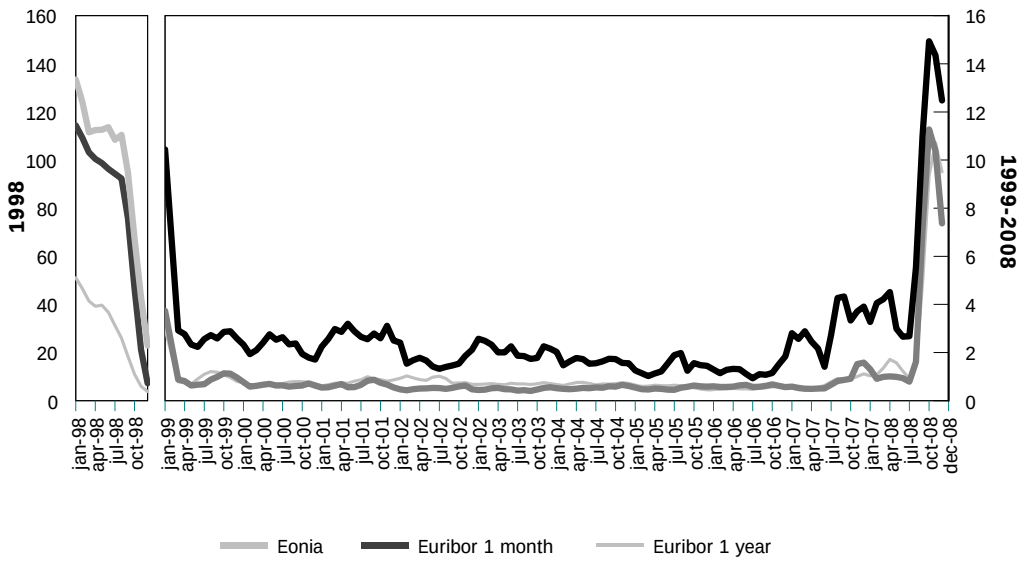
In line with these definitions, indicators of financial integration are based on price and quantities. In the first case, data is used primarily on interest rates / yields, while in the case of quantities indicators are based on variables such as the importance of foreign intermediaries in the domestic markets (in number and market share), cross-border activity, etc. In addition, the literature also uses indirect indicators of financial integration based on how integration affects the asset portfolio composition (distinguishing between domestic and foreign assets in order to measure home bias), and based on business decisions (such as mergers with national or foreign companies, etc.).

The evidence provided in other studies (European Central Bank, 2009, European Commission, 2009, etc) demonstrates that there are significant differences in the degree of integration between wholesale and retail financial markets. Therefore, our analysis uses this reality as a starting point, separating the analysis in wholesale markets from retail markets. That is, we examine the integration in wholesale markets such as that of bonds, equity and the interbank market, while in retail markets we explore banking markets.

Figure 2 shows the evolution of the standard deviation of interbank market interest rates at various maturities. The standard deviation among countries of the 1 day (Eonia), 1 month and 12 months (Euribor) interbank interest rate almost falls to zero with the adoption of the euro, thus confirming the existence of an interbank market fully integrated. Nevertheless, interbank interest rate volatility increased as soon as international financial markets

started showing signs of instability in the wake of the U.S subprime crisis in the summer of 2007. The financial turmoil also led to a rise in interest rates as a result of loss of trust in markets. Since August 2008 the differences in interest rates between countries increased drastically, reaching high levels as shown by the standard deviation, especially in the overnight rate (Eonia). The rise in risk premiums can also be observed as well as increased home bias owing to the preference for domestic banks as they are better known in domestic markets. But in spite of the recent increase of interest rate differentials between countries, the degree of interbank market integration is much higher than in other markets, and much higher than that existing before the introduction of the euro.

FIGURE 2: **Cross-country standard deviation of the average unsecured interbank lending rates across euro area countries**

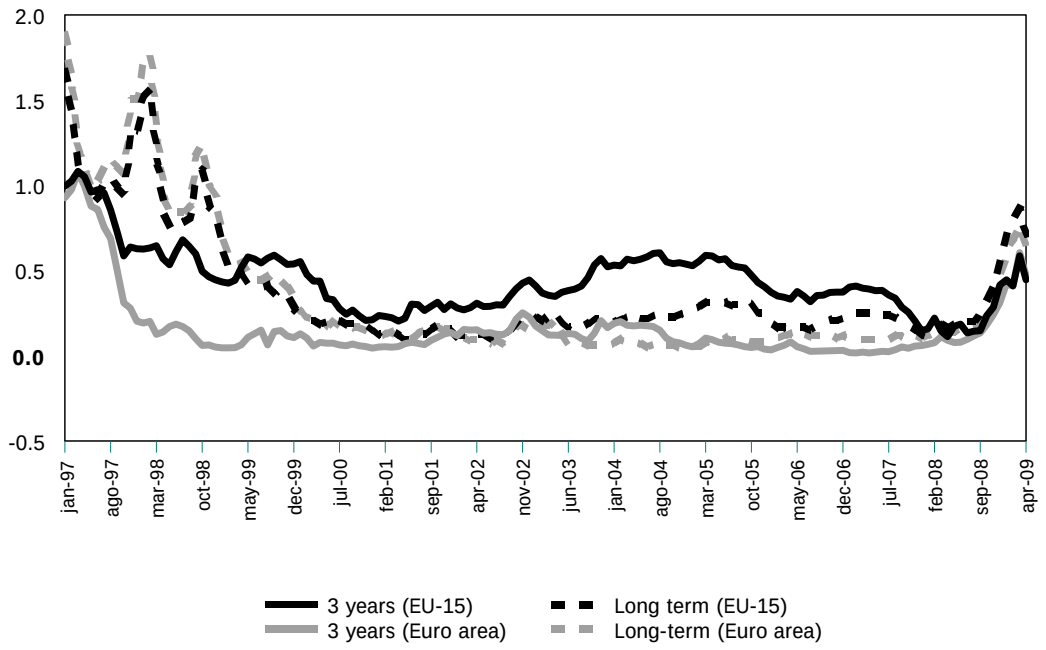


Source: European Central Bank.

In the case of bond markets (government bonds), figure 3 shows that with the demise of the foreign exchange risk after the euro was introduced in 1999, differences between European countries' bond spreads lessened considerably, which in turn helped the integration process to advance. Thus, the standard deviation of the euro area sovereign spreads with respect to Germany decreased by almost half from 1998 to 1999, while the largest decline occurred one year earlier as markets anticipated the consequences of the exchange rate risk

disappearing. The standard deviations are generally lower in the euro area than in the EU-15, suggesting that the euro has had a positive impact on the financial integration process. Nevertheless, when the euro was introduced, the differences in spreads remained relatively stable at low levels, although they increased again in the last quarter of 2008, illustrating once more that the turmoil has had a negative impact on financial integration.

FIGURE 3: **Cross-country standard deviation of public debt spreads (w.r.t. Germany) in the euro area**



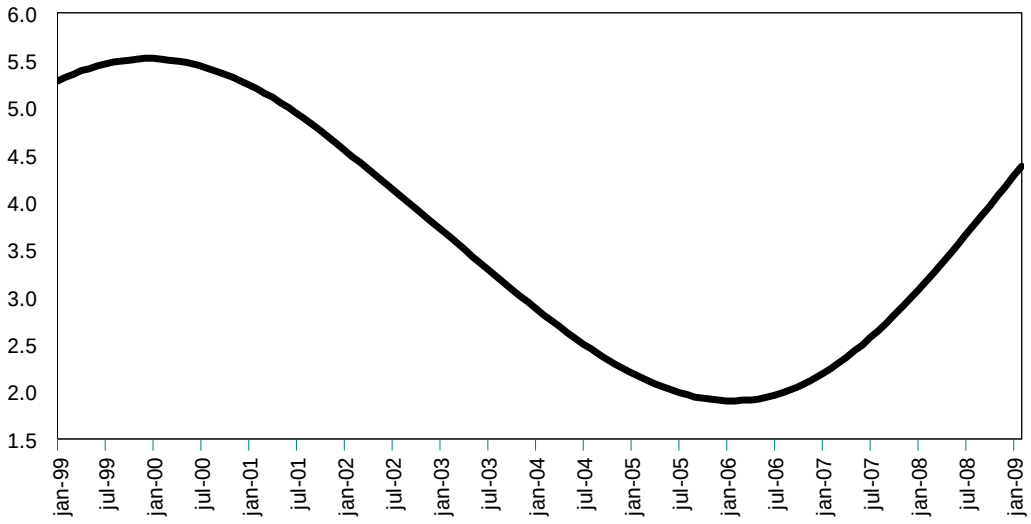
Source: European Central Bank.

Figure 4 represents the standard deviation of the euro area equity returns. From late 1999 until mid 2006, the differences decreased by more than half, demonstrating the rapid progress in financial integration in the equity markets. However, integration has declined more intensely since mid-2007 under the influence of the turmoil that has affected financial markets.

In the case of retail markets, the greater or lesser degree of compliance with the law of one price in banking markets can be analyzed by examining the disparities in bank products' interest rates applied by different banking sectors in the euro area. It is for this reason

that the European Central Bank has provided homogeneous detailed data by countries according to interest rates of different assets and liabilities, on a monthly basis since January 2003.

FIGURE 4: Cross country standard deviation of stock market returns (euro area)



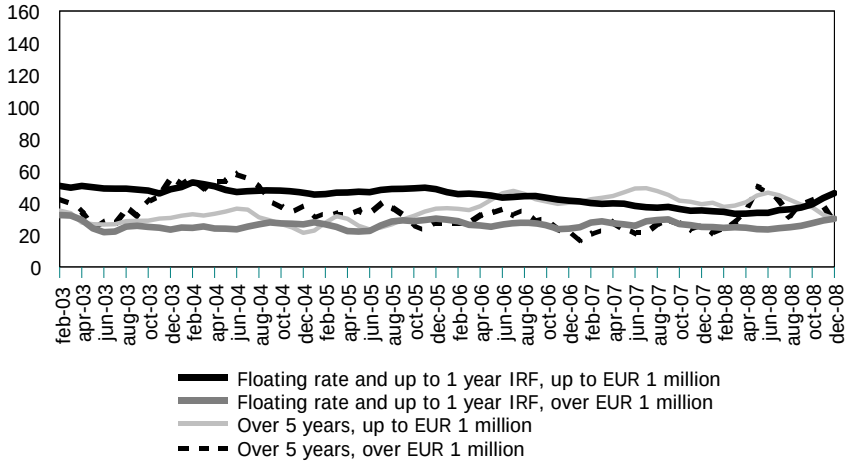
Source: European Central Bank.

Figure 5 includes the euro area cross-country dispersion (standard deviation) of interest rates on various banking assets and liabilities, for non-financial firms as well as for households. A particular characteristic worth noting is the existence of a very uneven degree of integration according to banking products. While the most significant disparity in interest rates (less integration) can be found in loans to household, the degree of integration is greater in the credit market for house purchases, as well as for business loans of a large amount (more than one million euros).

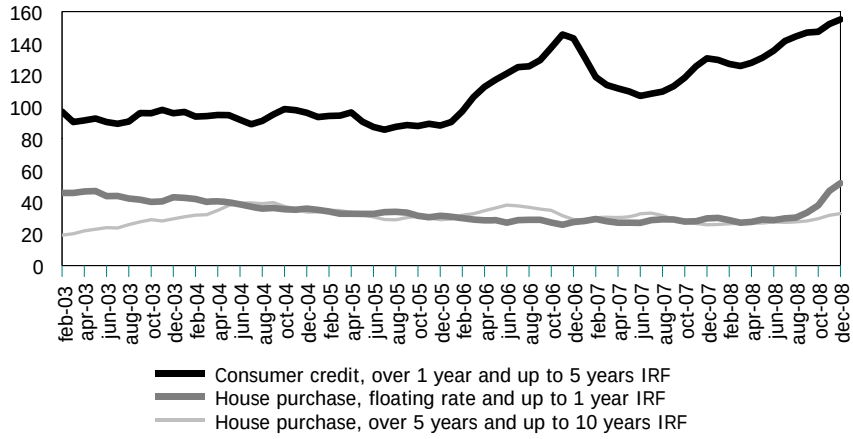
Also deserving a special mention is the fact that interest rates have evolved differently in the euro area countries over time, as the standard deviation shows. Thus, while financial integration has advanced in loans to non-financial corporations and home purchase, the differences between countries have increased in consumer loans and time deposits from late 2005. In addition, it is worth noting that dispersion of interest rates increased in virtually

FIGURE 5: Cross-country standard deviation of bank interest rates (Euro area)

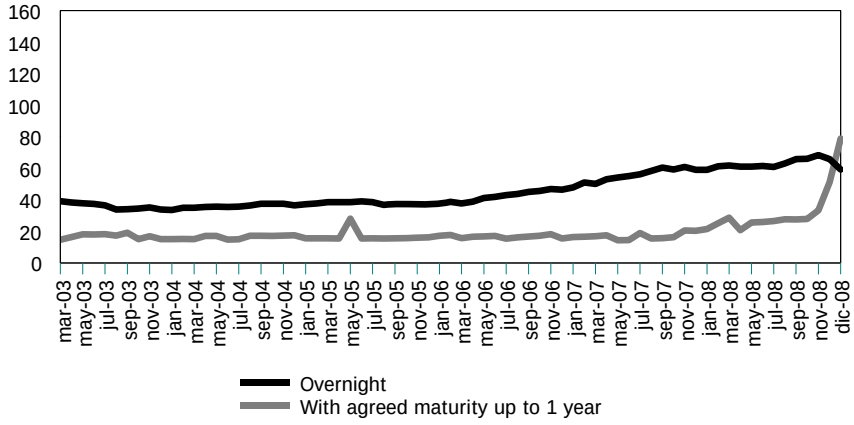
a) Loans to non-financial corporations



b) Loans to households



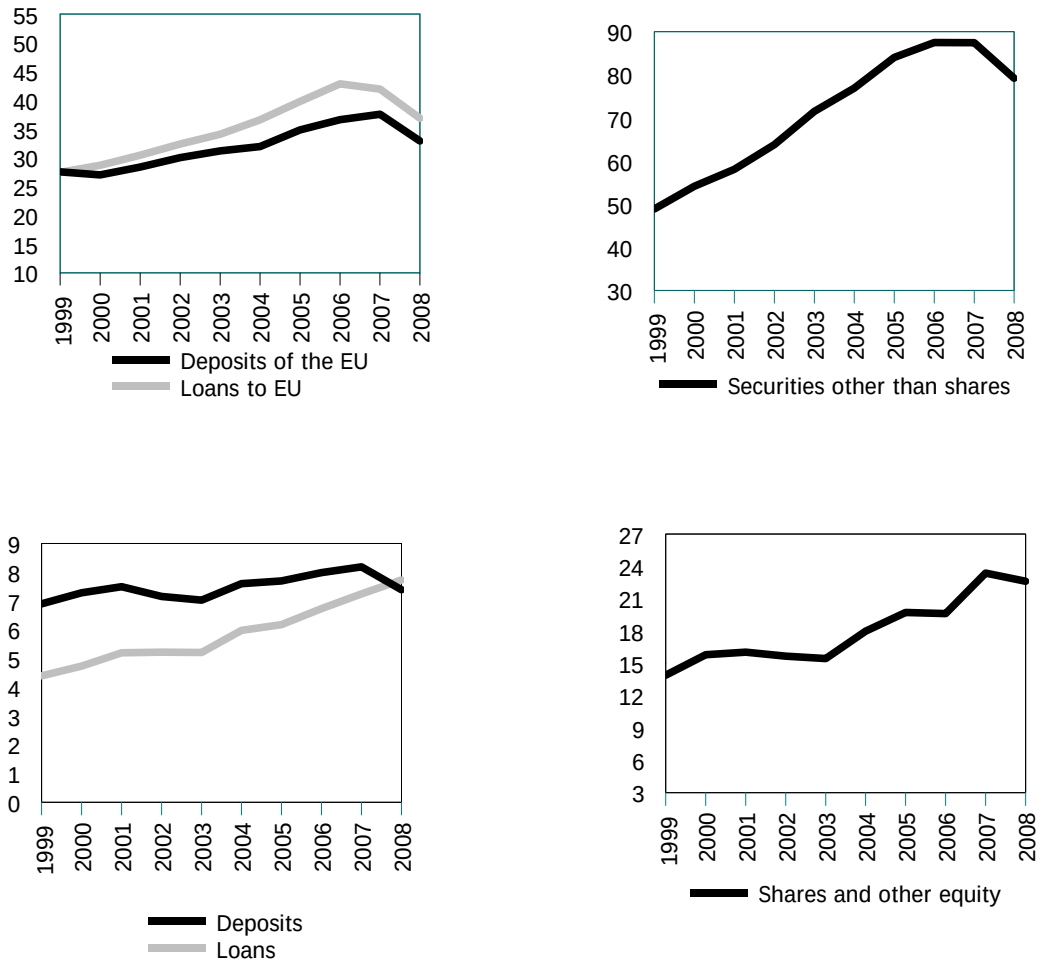
c) Households deposits



Note: IRF = Initial rate fixation.
Source: European Central Bank.

FIGURE 6: Cross-border provision of financial services in the euro area

(percentage of the total euro area provision of financial services over total bank product)



Source: European Central Bank.

all banking products in 2008, which shows that the degree of integration has declined with the financial crisis.

Indicators based on cross-border activity with other EU-15 countries clearly demonstrate an advance in the integration of banking markets until 2007, in spite of significant disparities according to products (figure 6). The highest percentage of activity with other European countries occurred in interbank loans and deposits, as well as investment in bonds. In 2008, interbanking loans (deposits) with other European countries represented 36.9% (33%) of the total, with less home bias being found in this market. Share of assets with other

EU-15 countries were also high in bonds, reaching a value of 79.3% in 2008, almost double that of 1999. Cross-border activity in the EU-15 equity markets has significantly increased in recent years. In 2008, the total EU-15 banking sector equity investments reached 22.6%, with the fastest growth having occurred since 2003.

A further indicator of the low degree of integration of retail markets in comparison with wholesale ones is that cross-border activity is scarce in European banking markets in loans and deposits with non-financial firms and households. As a result, current level is very low despite the increase in recent years. In 2008 only 7.4% and 7.7% of deposits and bank loans, respectively, were from residents of other EU-15 countries.

Given the main objective of this paper, it is worth noting that European cross-border banking activity fell significantly in 2008, which can obviously be explained by the impact of the international financial crisis. In almost all the products reviewed above, the percentage of cross-border activity decreased in 2008, and more considerably in bonds and in interbank activity. This clearly shows the increase in home bias in an environment of uncertainty as well as lack of trust in international markets, and thus a decline in financial integration.

4. Methodology: Financial Development and Growth

THE basic framework for analyzing the effect of financial development and integration on economic growth is the specification adopted by Rajan and Zingales (1998). The intuition of the test is simple, and is based on testing whether the sectors most dependent on external finance present higher growth rates in countries with a higher level of financial development, once the characteristics of the different sectors and countries have been controlled for. The novelty of the specification is to introduce the interaction between a country characteristic (financial development) and an industry characteristic (financial dependence), therefore avoiding some problems of identification present in the cross-country regressions habitual in the literature on economic growth. Moreover, as commented by Claessens and Laeven (2005), the specification is less subject to criticism regarding an omitted variable bias or model specification than are the traditional approaches that relate financial sector development directly to economic growth.

Specifically, the estimated model is the following:

$$Growth_{j,k} = Constant + \psi_1 Sector\ dummies_j + \psi_2 Country\ Dummies_k + \psi_3 \left[\frac{Value\ added_{j,k}}{Value\ added_k} \right] + \psi_4 Financial\ dependence_j * Financial\ development_k + \varepsilon_{j,k} \quad (1)$$

where j = sector, k = country , Growth = Annual real value added growth rate of sector j in country k, and Financial development is a variable that approximates the degree of efficiency in financial intermediation (measured by the usual total capitalization/GDP). The sectorial and country dummies capture the influence of specific effects of each sector or country, respectively. The weight of each sector in the total value added of each country in the initial year captures the possible effect of convergence at the industry level. According to this effect, sectors that initially have a higher weight in total production tend to grow at a slower rate, so a negative ψ_3 can be expected. Moreover, Guiso et al. (2004) observe that by including the weight of each sector in total value added in the initial year the bias of possible correlation between financial development and industry structure is avoided. Hence, the effect of financial development on industry growth is estimated net of any effect it may have on growth through the pattern of specialization.

As Rajan and Zingales (1998) specify, financial dependence used in the test does not correspond to the actual financial dependence of firms in the sample, but a theoretical level of financial dependence that an industry needs to be able to perform its activities. It is therefore necessary to use a benchmark of financial dependence under the assumption that there are technological reasons (scale of the project, maturity period, etc.) for some sectors to be more dependent on external finance than others and these reasons are the same in all countries. Given that there are technological reasons determining the degree of a particular sector's financial dependence, it would be more appropriate to use the average of the financial dependence indicator over a long enough period of time so as not to affect the possible supply or demand shocks of external financing to firms. However, too extensive period could imply that the sector's production technology might have changed, and also the degree of financial dependence.

Furthermore, the degree of financial dependence is usually calculated for listed companies in the benchmark country. As was mentioned in the previous paragraph, what we

want to measure is the availability (supply) of finance rather than the equilibrium between supply and demand in frictionless capital markets. Therefore, given that the amount of funding received will tend to match that desired in the case of listed companies, these firms have less restricted access to external financing compared to other smaller ones whose only sources of funding are from entrepreneurs or banks. In other words, the assumption is that listed companies face a perfectly elastic supply curve of funds.

Since the objective of this paper is to analyze the effects of financial development and integration on growth, and particularly to quantify the effects of the current financial crisis, we will use the results obtained by Maudos and Fernández de Guevara (2006). This work applies the methodology of Rajan and Zingales (1998), and quantifies the effect of financial development on economic growth. That is, the authors apply the specification of Rajan and Zingales (1998) using a sample of 53 sectors in 21 countries over the period 1993-2003. The main advantage of that paper is that they extend the sector coverage of the sample including the services sectors, whereas up until then the Rajan and Zingales methodology had been tested in several papers only for the manufacturing sector (for example, Rajan and Zingales, 1998; Cetorelli and Gambera, 2001; and Claessens and Leaven, 2005). Furthermore, this paper updates the financial dependence indicator, calculating it for a more recent period (mid 1990s to early 2000s) instead of the original indicator calculated for the 1980s by Rajan and Zingales (1998), and used in most of the papers that apply this methodology. Maudos and Fernández de Guevara (2006) calculate the indicator of financial development using balance-sheet data obtained at firm level (9.087 firms) from AMADEUS (Bureau Van Dijk). As a benchmark for the indicator of financial dependence, they use the average of the external financial dependence of listed UK firms, instead of US firms as Rajan and Zingales (1998) did. The election of the UK as a benchmark is justified for 3 reasons: a) UK is one of the European countries with the highest level of financial development; b) it has a sufficient diversified economy as to have listed companies in most sectors; and c) the database used to measure the financial dependence only covers European countries[4].

[4] The degree of external financial dependence is proxied as the ratio of debt with cost to current liabilities. This ratio may also be expressed as Interest Bearing Debt / [Stockholders' Equity + Interest Bearing Debt] and represents the debt to total capital ratio, excluding accounts payable and accrual liabilities from the numerator and the denominator of the ratio.

Real sectorial growth used in Maudos and Fernández de Guevara (2006) is obtained from the 60-Industry Database (Groningen Growth and Development Centre) which offers the evolution of value added of 26 countries broken down in 57 sectors (classified in ISIC rev. 3). These authors calculate the impact of financial development on economic growth for the period 1993-2003, which is somewhat different to the period we are using in this paper (1999-2008). Therefore, we adopt the assumption that the impact of financial development on growth is constant over time (at least in the last years).

Table 1 shows Maudos and Fernández de Guevara's (2006) results where the effect of financial development on economic growth is estimated. Columns of table 1 illustrate the results of the basic specification of Rajan and Zingales. In line with these authors, the results show that the sectors most dependent on external finance grow faster in countries with more developed financial markets, irrespective of the indicator of financial development used (stock market capitalization /GDP, credit/GDP or total capitalization/GDP). Specifically, the economic impact of going from a situation of low financial development to another of higher development, translates into approximately 0.50 percentage points of growth of the more financially dependent sectors. Consequently, in line with the prior studies by Rajan and Zingales (1998), Cetorelli and Gambera (2001), Guiso et al. (2004), etc., Maudos and Fernández de Guevara (2006) obtain evidence favorable to the hypothesis that financial development facilitates economic growth. The following section uses this elasticity to calculate the effect of both financial development and financial integration on economic growth. Because both of these variables (financial integration and financial development) interact with financial dependence in the model, the calculations are made at the sectorial level.

TABLE 1: Economic growth and financial development

	(1)	(2)	(3)
Constant	0,0126	-0,0015	-0,0201
	(0,0151)	(0,0167)	(0,0193)
Initial share in value added.	-0,0905	-0,0843	-0,0954
	(0,1356)	(0,1352)	(0,1350)
Financial dependence*Credit/GDP	0,0005*		
	(0,0003)		
Financial dependence*Market capitalisation/GDP		0,0006**	
		(0,0002)	
Financial dependence*Total capitalisation/GDP			0,0006***
			(0,0002)
R^2 adj.	0,8222	0,8229	0,8236
Number of observations	995	995	995
Differential in real growth rate	0,40	0,53	0,49

Note: The dependent variable is the annual growth rate in value added over the period 1993-03 for each sector in each country. The differential in real growth rate measures (in percentage terms) how much faster a sector at the 75th percentile level of financial dependence grows with respect to a sector at the 25th percentile level when is located in a country at the 75th percentage of financial development rather than in one at 25th percentile. All regressions include both country and sector fixed effects (not reported). Robust standard errors are reported in parentheses. * Significant at 10%; ** significant at 5%; *** significant at 1%.

Source: Maudos and Fernández de Guevara (2006).

5. Decomposing Financial Development: Pure Financial Development *vs.* Integration

GIVEN that this work aims not only to assess the impact of financial development on growth, but also the role that European integration has had as a catalyst for financial development, we need to isolate the part of progress in financial development attributable to integration. In this way, and on the basis of the assumptions described below, we decompose total financial development into two parts: one part attributable to financial integration, and

the other part that we shall call "pure" financial development. The "pure" financial development is the financial development which would have been attained regardless of progress in integration. In particular, each asset[5] considered in Figure 1 can be decomposed into three parts: one which has been financed with domestic funds, another with EU-15 funds, and a third with funds from the rest of the world. The exercise will therefore consist of assuming how much funding each country would have obtained from its EU partners in the absence of financial integration in Europe.

In a first stage, for each asset we disaggregate the domestic and the foreign component by using data from the Eurostat Financial Accounts. Of the total liabilities of each country provided by Eurostat, we calculate the percentage represented by both domestic and foreign funding for each of the assets considered (bonds, securities and bank loans). We use these percentages to disaggregate each component of our financial development indicator in Figure 1. Once we know how much funding each asset type receives from the rest of the world (non-domestic financing), we then disaggregate the foreign component between funding obtained from European countries (EU-15) and that from third countries. In order to carry out this breakdown, we use other sources of data described below.

The statistics from the Coordinated Portfolio Investment Survey[6] conducted by the International Monetary Fund provide the geographical breakdown of each country's issues of debt and securities. The percentage distribution of total financial liabilities (bonds on the one hand, and equity on the other) of each year is applied to data on foreign funding that has been calculated as described in the paragraph above. In this way, we have an estimate of funding from the EU-15 and elsewhere. In the case of bank financing (loans), we use the percentage distribution of funding received from countries in the EU-15 *vs*. rest of the world provided by BIS in the Consolidated Bank Statistics. By using this distribution, and based on the total of amount of loans from abroad calculated as was stated in the previous paragraph, we estimate the amount of loans from the rest of the EU-15 *vs*. third countries. We can ob-

[5] Private credit, bonds and securities.

[6] The IMF Coordinated Portfolio Investment Survey provides data for 1997 and 2001-07. For this reason, the geographical breakdown of the 1999 financial indicator is carried out using the percentage distribution of funding from the EU-15 vs. the rest of the world in 1997.

tain the total capitalization by summing the disaggregation of the three assets (credit, bonds and market capitalization) in the domestic component from the EU-15 and elsewhere. [7]

The total capitalization disaggregated according to the geographical origin of the funding is used to estimate a hypothetical degree of lower financial development in a scenario of no integration. First of all we decompose the growth of the financial development indicator (total capitalization, C_t) shown in Figure 1 in its three geographic components: domestic finance, fundings obtained in other EU-15 countries, and fundings obtained in the rest of the world. That is, the accumulated variation of the total financial development (as % of GDP) between years *t* and *t-i* is decomposed into a weighted sum of the variations in domestic capitalization (C^D), capitalization from other EU-15 countries (C^{EU}) and from the rest of the world (C^{RW}). The weighting factors correspond to the percentage each source of funding represents in total in the initial year:

$$\frac{C_t - C_{t-i}}{C_{t-i}} = \frac{C^D{}_t - C^D{}_{t-i}}{C^D{}_{t-i}}\left(\frac{C^D{}_{t-i}}{C_{t-i}}\right) + \frac{C^{EU}{}_t - C^{EU}{}_{t-i}}{C^{EU}{}_{t-i}}\left(\frac{C^{EU}{}_{t-i}}{C_{t-i}}\right) + \frac{C^{RW}{}_t - C^{RW}{}_{t-i}}{C^{RW}{}_{t-i}}\left(\frac{C^{RW}{}_{t-i}}{C_{t-i}}\right) \quad (2)$$

in which the total capitalization in year *t* (C_t) corresponds to the amount of bonds, securities and bank loans.

By decomposing the growth of total financial assets we can assume what would have been the growth of the total capitalization if financial integration had not advanced. To this end, we assume that if the degree of integration had not advanced, the growth of funds received by each European country from other EU-15 countries would have been equal to the growth in funding obtained from the rest of the world[8]. In fact, since 1999 growth in funding from other countries in the EU-15 (as % of GDP) has been higher than the growth of financial liabilities with the rest of the world (outside Europe). The simulation exercise therefore estimates the level of financial development (total funding collected as a percentage of GDP)

[7] In 2008, the geographical breakdown was made using statistical data on the domestic and cross-border position of the monetary Financial Institutions of the European Central Bank, the only source available.

[8] Although we think that our underlying assumption is reasonable, we are conscious that our counterfactual exercise for estimating net financial development of financial integration is based on a somewhat arbitrary assumption. For that reason, the results shown in the paper should be interpreted with caution and considered as a simulation exercise.

that would have been reached in 2008 if the growth of funds received from EU-15 countries (excluding domestic finance) would have been equal to the growth of funding from non-European countries. With this assumption, equation (2) can be expressed as follows:

$$\frac{C_t^* - C_{t-i}^*}{C_{t-i}^*} = \frac{C^D{}_t - C^D{}_{t-i}}{C^D{}_{t-i}}\left(\frac{C^D{}_{t-i}}{C_{t-i}}\right) + \frac{C^{RW}{}_t - C^{RW}{}_{t-i}}{C^{RW}{}_{t-i}}\left(\frac{C^{RW}{}_{t-i}}{C_{t-i}} + \frac{C^{EU}{}_{t-i}}{C_{t-i}}\right) \tag{3}$$

where C_t^* is the volume of capitalization that would have been presented in year t if the European integration process had not taken place.

Using the approach and assumptions discussed earlier, table A.1 of the appendix contains the observed values of growth in total capitalization (financial development indicator) and their decomposition in the contribution of domestic funding, funding from other EU-15 countries, and funding from elsewhere during 1999-2007, 1999-2008 and 2007-2008. In the first period, the total capitalization increased on average by 25% for Eurozone countries[9], with a significant contribution of capital from the EU-15. That is to say, 50.5% growth in total funding (provided as % of GDP) can be explained by the financial contribution of the EU-15, with domestic financing being lower (45.5%), and especially that obtained from other countries (4%).Thus, growth in funding from the EU-15 was 104.3% compared to 11.7% in the case of other countries over the period 1999 to 2007. This increased growth of funding from the EU-15 shows the beneficial effect of the progress made in European financial markets integration, which has allowed the EU-15 to access sources of funding from others EU members.

Table A.2 shows the results of what would have been the growth in total capitalization if the change in funding obtained from other EU-15 countries was equal to the rest of the world without the advance of financial integration according to equation (3). It is clear that funding from the EU-15 increased more quickly than the rest of the world from 1999 to 2007, as has already been proven. It is for this reason that the hypothetical scenario means reducing capitalization growth and therefore, the level of financial development achieved. To

[9] Tables reported in the paper do not provide information for UK, Luxembourg, Ireland and Denmark. In the three first countries, the reason is that Eurostat does not provide information for them. In the case of Denmark, the reason is that the ECB does not provide information about cross-border activity of the MFI.

be specific, instead of financial development increasing by 25.3%, non-integration would have meant a growth of 13.9%, and therefore 11.3 pp. less financial development (see last column of table A.2).

Panel c) of tables A.1 and A.2 shows the same calculations for the years 2007-2008. We can see that the financial turmoil has caused a reduction of 9.4% of the total financial development in the euro area. What it is more interesting is the fact that if we compare this reduction of financial development with what we would have observed if financial integration had not taken place, the reduction of financial development would almost be identical (9.2%). This fact indicates that the crisis is of a global nature and that although the process of financial integration has come to a halt because of the crisis, the financial transactions with the rest of the world have reduced almost in the same percentage.

In order to examine the impact of the crisis, Table 2 decomposes the growth of total capitalization into its "pure" component (calculated as the difference between the observed growth of total capitalization and the effect of financial integration) and also into the effect of integration over the periods 1999-07, 1999-08 and 2007-08. The results illustrate that, although there are significant differences between countries, integration accounts for 44.8% of financial development growth in Eurozone countries until 2007. If we extend the decomposition to 2008, the contribution of integration increases to 65.2%, since the difference in the growth of funding from the EU-15 and elsewhere increases its influence on the variation of total capitalization. In 2008, the regression in integration accounts for only 1.4% of the drop in financial development with respect to 2007, explaining its low impact on economic growth, as we shall see further on.

6. Financial Development, Financial Integration and Growth: Results

IN this section we quantify the economic growth brought about by financial development in each EU-15 country since 1999 by applying the estimated elasticity of economic growth to financial development presented in Table 1. This estimate is simply the product at the sector

TABLE 2: Decomposition of total capitalization / GDP growth: "pure" financial development vs. financial integration

(percentages)

	1999-2007				1999-2008				2007-2008			
	Financial development				Financial development				Financial development			
	Total	Pure financial development	Financial integration	% financial integration	Total	Pure financial development	Financial integration	% financial integration	Total	Pure financial development	Financial integration	% financial integration
Germany	-4,31	-8,66	4,35	-100,83	-13,13	-15,90	2,76	-21,05	-9,22	-8,14	-1,07	11,64
Austria	60,15	44,40	15,75	26,18	42,13	31,98	10,15	24,09	-11,25	-10,03	-1,22	10,85
Belgium	11,98	-4,58	16,56	138,27	-0,43	-13,58	13,16	-3074,13	-11,08	-13,47	2,39	-21,55
Spain	124,24	112,13	12,11	9,74	105,09	94,65	10,44	9,93	-8,54	-8,35	-0,19	2,17
Finland	-28,81	-34,62	5,81	-20,17	-47,37	-50,92	3,54	-7,48	-26,07	-24,23	-1,84	7,06
France	24,66	14,10	10,56	42,82	11,54	3,44	8,10	70,21	-10,53	-10,58	0,05	-0,51
Greece	6,68	4,43	2,25	33,69	-16,51	-15,91	-0,61	3,67	-21,74	-19,00	-2,74	12,60
Italy	39,17	25,55	13,62	34,77	35,32	25,53	9,79	27,71	-2,77	-0,57	-2,20	79,56
Netherlands	17,76	-0,60	18,36	103,41	0,49	-8,45	8,94	1826,25	-14,66	-9,44	-5,22	35,61
Portugal	65,38	42,15	23,23	35,53	64,78	46,52	18,26	28,19	-0,36	-0,52	0,16	-43,75
Sweden	12,21	2,56	9,65	79,04	4,04	-4,91	8,95	221,42	-7,28	-7,28	0,00	0,00
Euro area	**25,25**	**13,93**	**11,32**	**44,84**	**13,52**	**4,70**	**8,82**	**65,23**	**-9,37**	**-9,23**	**-0,13**	**1,42**

Source: Eurostat, IMF, BIS and own elaboration.

level of the elasticity estimated by the increase in the level of financial capitalization (as a percentage of GDP) in the period 1999-2008, taking into account the degree of financial dependence of each sector. The country aggregated effect is calculated weighting each sector according to its relevance in the country's value added.

Table 3 illustrates the annual contribution (percentage points) of financial development to GDP growth in each of the euro area countries from 1999 to 2008. On average, the annual contribution in the Eurozone was 0.09 pp., accounting for 4.3% increase of GDP. The detailed information by countries show that financial development made the most significant contribution in Spain and Portugal (0.58 and 0.34 pp. per year, respectively). It is clear that the countries with the highest contribution of financial development to economic growth are those that more increased the value of financial capital relative to GDP[10].

Table 3 also shows the effect of financial development on growth during the periods 1999-2007 and 2007-2008. It is obvious that the fall of financial flows in 2008 (see figure 1 and panel c) of table A.1) implies a reduction in our proxy of financial development and therefore a reduction in the impact of financial development on growth[11]. For the Eurozone average (excluding Ireland and Luxembourg due to lack of data in the Eurostat Financial Accounts), the crisis of 2008 reduced GDP growth by 0.751 pp. That is, 58% of the 1.3% fall in the euro area's GDP in 2008 is because of the fall in the degree of financial development, demonstrating the magnitude of the financial crisis.

In terms of countries, if the financial retrenchment were to be permanent, the crisis would have the most considerable impact on those countries whose level of total capitalization fell more sharply in 2008. The countries most affected would be the Netherlands (with a 1.81 pp decline in GDP due to the reduction of financial development), Finland (1.75pp.) and Greece (1.06 pp.) while at the other extreme stand Italy (0.18 pp.) and Portugal (0.03) with more modest declines.

[10] The negative contribution of financial development to GDP growth in Germany, Belgium, Finland and Greece is due to the fact that total capitalization in these countries was lower in 2008 than in 1999.

[11] Our calculations reflect the medium term effects on growth of financial development (Rajan and Zingales, 1998). Therefore, the exercise of the effect of the crises on growth has to be understood as a simulation exercise in which we assess the effect of the crisis as if the financial retrenchment were permanent.

TABLE 3: Impact of financial development and financial integration on economic growth

(annual contribution to GDP growth, in percentage points)

	1999-2007				1999-2008				2007-2008			
	Financial development				Financial development				Financial development			
	Total	Pure financial development	Financial integration	% financial integration	Total	Pure financial development	Financial integration	% financial integration	Total	Pure financial development	Financial integration	% financial integration
Germany	-0,041	-0,055	0,014	34,68	-0,110	-0,118	0,008	7,24	-0,663	-0,636	-0,028	4,18
Austria	0,328	0,278	0,050	15,17	0,204	0,176	0,028	13,95	-0,786	-0,755	-0,031	3,92
Belgium	0,100	0,044	0,056	55,88	-0,003	-0,042	0,039	1242,30	-0,826	-0,890	0,064	7,78
Spain	0,772	0,735	0,037	4,81	0,581	0,552	0,028	4,90	-0,952	-0,948	-0,005	0,48
Finland	-0,339	-0,357	0,018	5,41	-0,495	-0,505	0,010	2,01	-1,745	-1,699	-0,046	2,66
France	0,187	0,154	0,033	17,57	0,078	0,055	0,022	28,82	-0,798	-0,799	0,001	0,17
Greece	0,038	0,031	0,007	17,71	-0,084	-0,082	-0,002	1,93	-1,056	-0,991	-0,066	6,21
Italy	0,228	0,184	0,044	19,19	0,183	0,155	0,028	15,30	-0,179	-0,123	-0,057	31,56
Netherlands	0,234	0,174	0,059	25,30	0,006	-0,020	0,026	446,87	-1,817	-1,682	-0,134	7,40
Portugal	0,382	0,312	0,070	18,38	0,336	0,287	0,049	14,58	-0,028	-0,032	0,004	13,69
Sweden	0,126	0,095	0,031	24,54	0,037	0,012	0,026	68,75	-0,677	-0,677	0,000	0,00
Euro area	**0,195**	**0,162**	**0,033**	**16,91**	**0,090**	**0,069**	**0,021**	**22,99**	**-0,751**	**-0,723**	**-0,028**	**3,74**

Source: Eurostat, IMF, BIS and own elaboration.

The results obtained thus far quantify the contribution of progress in financial development to economic growth, and the impact of the financial crisis in 2008. However, progress in financial development is not only because of the financial integration process having advanced (with measures such as those implemented in the FSAP, as well as the introduction of the euro as a single currency and catalyst for the integration process) but could also be influenced by other factors.

By applying these simulated values of a lower level of financial development in the absence of financial integration advancing, and following Rajan and Zingales (1998) approach, we can quantify the impact of financial integration on economic growth. As Table 3 illustrates, financial development's contribution to growth is lower given the fact that there is less growth in the value of total capitalization relative to GDP. Specifically, the table reports the percentage point reduction in the GDP annual growth rate in a scenario in which the degree of financial integration has not advanced. On average the progress made in financial integration following the adoption of the FSAP and the introduction of the euro contributed 0.021 pp. to GDP growth in the euro area until 2008, representing an accumulation of 0.30 pp. over nine years in the period 1999-2008. On average over this period, financial integration explains 1% of annual GDP growth.

Finally, because the decline in the degree of financial integration in 2008 explains a small percentage of the fall in the value of total capitalization (1.4%), if this retrenchment were permanent, its impact on growth would be modest. Concretely, the decline in the level of financial integration would explain 2.2% of the decline in the euro area's GDP in 2008.

7. Conclusions

WE are currently witnessing the most serious economic crisis since the 1929 crash and the Great Depression. The majority of developed economies are in recession and unemployment rates are soaring. Many blame the financial system for the situation given its rapid growth over the last decade, its failing to measure and evaluate risk properly, the problems of corporate governance, and so on. In sum, financial systems seem to have jeopardized modern economies. The crisis we are experiencing, however, is a complex phenomenon. In addition

to the problems that have occurred in the financial sector, other factors also led to the outbreak and its virulence: the housing bubble, lack of liquidity in markets, high oil and commodities prices, expansive monetary policies, and so on.

This crisis clearly demonstrates the key role played by the financial system in the economy, as it provides investors with the savings of the economy, thereby financing economic growth. Additionally, it is a sector that directly contributes to the growth of both GDP and employment. Unquestionably, the more efficient the financial system is in performing its functions, the greater its contribution to growth.

This paper sheds some light on the role of the financial system in the crisis, quantifying its impact on growth in the case of countries in the euro area. In order to do this, we combine data at country, sector and firm level, and quantify the effect of financial development on growth, isolating the effect of financial integration on financial development and therefore on economic growth.

All the indicators presented in this paper demonstrate that financial development has increased significantly since 1999 in all three segments of the financial markets (bonds, equity and credit markets). This increase has occurred in an environment in which European financial markets are more integrated, especially in wholesale markets. On the other hand, the effects of financial integration have not been as sharp in retail markets. Furthermore, the international financial crisis that we have been witnessing since mid 2007 has caused financial flows to fall and has slowed down (even declined) European integration, given that home bias is increasing along with the difference in interest rates in countries. In fact, as the European Central Banks (2009) affirms, "signs of retrenchment within natural borders have recently emerged in certain financial market segments". The protectionist measures implemented in many countries, lack of trust in international markets, the fall in funding sources, etc., have increased home bias, while cross-border activity across European countries has decreased. However, although the degree of integration fell in 2008, this only accounts for a small part of the decline in the degree of financial development given that the fall in capitalization has been indiscriminate, affecting equally those from the EU-15 and elsewhere.

Estimates in this paper demonstrate that both financial development and financial integration have been fundamental in driving the recent growth in European economies. Specifically, from 1999 to 2008, the economic impact of progress in the degree of financial de-

velopment has contributed 0.09 pp. of annual GDP growth in the Eurozone, which accounts for on average 4.7% of the observed economic growth.

Given that the financial crisis which started in the summer of 2007 in the USA with the subprime crisis led to a general decline in the values of total capitalization in economies, there has been a financial retrenchment in 2008. This fall in financial flows means a lower contribution to GDP growth in comparison to that observed up to 2007. To be specific, the financial retrenchment due to the crisis implies a fall in our measure of financial development of 9.4% in the Eurozone from 2007 to 2008, which explains a decrease of 0.75 pp. in annual GDP growth. Taking into account that Eurozone GDP fell by 1.3% in 2008, the reduction of total capitalization accounts for 58% GDP reduction, demonstrating the importance of the financial crisis as a trigger for the crisis in the real sector.

Results indicate that Eurozone GDP increased by 0.021 pp. per year from 1999 to 2008 owing to progress in financial integration, and that financial development would have progressed at a slower pace in the absence of integration. The measures that were implemented with the objective of achieving a single financial market in Europe account for 65% of the growth of financial development and 1% of GDP growth. Nonetheless, with the crisis and the consequent decline in the degree of integration, its contribution to the decrease of financial development is very low (1.4%), and thus explains a very small percentage (only 2.2%) of the fall in GDP in 2008.

The results obtained indicate that as the financial crisis and national protectionist reactions have led to a reversal in integration (and therefore in the financial development), it is necessary to return to the pace of progress in integration before the crisis, given the cost in terms of economic growth of not moving forward. Initiatives such as the recent G20 summit in London to seek coordinated measures at an international rather than a national level are moving in the right direction. However, the decline of financial integration in 2008 explains a small percentage of the drop in both financial development and GDP. This reflects the global nature of the crisis, even without a fall in funding from other European countries in relation to that from third countries.

8. Appendix

TABLE A.1: Decomposition of total capitalization / GDP growth (percentages)

a) 1999-2007

	C^D_{t-i}/C_{t-i} (1)	$(C^D_t-C^D_{t-i})/C^D_{t-i}$ (2)	C^{EU}_{t-i}/C_{t-i} (3)	$(C^{RW}_t-C^{RW}_{t-i})/C^{RW}_{t-i}$ (4)	C^{RW}_{t-1}/C_{t-i} (5)	$(C^{RW}_t-C^{RW}_{t-i})/C^{RW}_{t-i}$ (6)	$(C_t-C_{t-i})/C_{t-i}$ (7)=(1)*(2)+(3)*(4)+(5)*(6)	Difference of growth EU-15-RW (4)-(6)
Germany	84,10	-13,16	8,63	65,54	7,27	15,12	-4,31	50,42
Austria	80,62	34,66	12,84	207,53	6,53	84,92	60,15	122,61
Belgium	68,11	-6,20	18,96	86,24	12,93	-1,13	11,98	87,37
Spain	87,50	109,82	8,34	273,57	4,17	128,35	124,24	145,22
Finland	89,33	-41,67	4,52	153,04	6,16	24,36	-28,81	128,68
France	77,79	10,04	10,34	130,43	11,87	28,31	24,66	102,11
Greece	97,37	-2,01	1,77	369,78	0,86	242,50	6,68	127,28
Italy	80,89	38,90	11,55	86,91	7,56	-30,96	39,17	117,87
Netherlands	64,46	10,88	17,20	85,30	18,34	-21,43	17,76	106,73
Portugal	86,30	52,28	9,80	215,27	3,90	-21,71	65,38	236,98
Sweden	79,04	4,71	8,71	105,19	12,25	-5,54	12,21	110,73
EuroArea	**79,00**	**14,53**	**12,23**	**104,28**	**8,78**	**11,66**	**25,25**	**92,62**

b) 1999-2008

	C^D_{t-i}/C_{t-i} (1)	$(C^D_t-C^D_{t-i})/C^D_{t-i}$ (2)	C^{EU}_{t-i}/C_{t-i} (3)	$(C^{RW}_t-C^{RW}_{t-i})/C^{RW}_{t-i}$ (4)	C^{RW}_{t-1}/C_{t-i} (5)	$(C^{RW}_t-C^{RW}_{t-i})/C^{RW}_{t-i}$ (6)	$(C_t-C_{t-i})/C_{t-i}$ (7)=(1)*(2)+(3)*(4)+(5)*(6)	Difference of growth EU-15- (4)-(6)
Germany	84,10	-18,97	8,63	32,40	7,27	0,35	-13,13	32,05
Austria	80,62	29,55	12,84	121,11	6,53	42,10	42,13	79,00
Belgium	68,11	-2,42	18,96	31,96	12,93	-37,43	-0,43	69,40
Spain	87,50	93,21	8,34	229,94	4,17	104,73	105,09	125,21
Finland	89,33	-57,46	4,52	82,30	6,16	3,86	-47,37	78,45
France	77,79	5,10	10,34	75,95	11,87	-2,38	11,54	78,33
Greece	97,37	-23,16	1,77	218,05	0,86	252,36	-16,51	-34,30
Italy	80,89	39,80	11,55	49,87	7,56	-34,85	35,32	84,72
Netherlands	64,46	6,41	17,20	16,58	18,34	-35,42	0,49	52,00
Portugal	86,30	60,14	9,80	146,97	3,90	-39,34	64,78	186,31
Sweden	79,04	-2,92	8,71	90,26	12,25	-12,41	4,04	102,67
EuroArea	**79,00**	**8,98**	**12,23**	**60,77**	**8,78**	**-11,38**	**13,52**	**72,15**

c) 2007-2008

	C^D_{t-i}/C_{t-i} (1)	$(C^D_t-C^D_{t-i})/C^D_{t-i}$ (2)	C^{EU}_{t-i}/C_{t-i} (3)	$(C^{RW}_t-C^{RW}_{t-i})/C^{RW}_{t-i}$ (4)	C^{RW}_{t-1}/C_{t-i} (5)	$(C^{RW}_t-C^{RW}_{t-i})/C^{RW}_{t-i}$ (6)	$(C_t-C_{t-i})/C_{t-i}$ (7)=(1)*(2)+(3)*(4)+(5)*(6)	Difference of growth EU-15- (4)-(6)
Germany	76,33	-6,69	14,92	-20,02	8,75	-12,83	-9,22	-7,19
Austria	67,79	-3,80	24,66	-28,10	7,54	-23,15	-11,25	-4,95
Belgium	57,05	4,03	31,53	-29,15	11,42	-36,72	-11,08	7,57
Spain	81,87	-7,91	13,89	-11,68	4,24	-10,34	-8,54	-1,33
Finland	73,19	-27,07	16,05	-27,96	10,76	-16,49	-26,07	-11,47
France	68,67	-4,49	19,11	-23,64	12,22	-23,92	-10,53	0,28
Greece	89,44	-21,58	7,78	-32,30	2,77	2,88	-21,74	-35,17
Italy	80,74	0,64	15,52	-19,82	3,75	-5,63	-2,77	-14,19
Netherlands	60,70	-4,03	27,07	-37,08	12,23	-17,79	-14,66	-19,29
Portugal	79,47	5,16	18,69	-21,67	1,84	-22,52	-0,36	0,85
Sweden	73,75	-7,28	15,93	-7,28	10,31	-7,28	-7,28	0,00
EuroArea	**72,23**	**-4,85**	**19,94**	**-21,30**	**7,83**	**-20,63**	**-9,37**	**-0,67**

Source: Eurostat, IMF, BIS and own elaboration.

TABLE A.2: Decomposition of total capitalization/ GDP growth in a scenario of non-financial integration

(percentages)

a) 1999-2007

	C^D_{t-i}/C_{t-i} (1)	$(C^D_t-C^D_{t-i})/C^D_{t-i}$ (2)	C^{EU}_{t-i}/C_{t-i} (3)	$(C^{RW}_t-C^{RW}_{t-i})/C^{RW}_{t-i}$ (4)	C^{RW}_{t-1}/C_{t-i} (5)	$(C^{RW}_t-C^{RW}_{t-i})/C^{RW}_{t-i}$ (6)	$(C_t-C_{t-i})/C_{t-i}$ (7)=(1)*(2)+(3)*(4)+(5)*(6)	Difference of less growth
Germany	84,10	-13,16	8,63	15,12	7,27	15,12	-8,66	4,35
Austria	80,62	34,66	12,84	84,92	6,53	84,92	44,40	15,75
Belgium	68,11	-6,20	18,96	-1,13	12,93	-1,13	-4,58	16,56
Spain	87,50	109,82	8,34	128,35	4,17	128,35	112,13	12,11
Finland	89,33	-41,67	4,52	24,36	6,16	24,36	-34,62	5,81
France	77,79	10,04	10,34	28,31	11,87	28,31	14,10	10,56
Greece	97,37	-2,01	1,77	242,50	0,86	242,50	4,43	2,25
Italy	80,89	38,90	11,55	-30,96	7,56	-30,96	25,55	13,62
Netherlands	64,46	10,88	17,20	-21,43	18,34	-21,43	-0,60	18,36
Portugal	86,30	52,28	9,80	-21,71	3,90	-21,71	42,15	23,23
Sweden	79,04	4,71	8,71	-5,54	12,25	-5,54	2,56	9,65
EuroArea	**79,00**	**14,53**	**12,23**	**11,66**	**8,78**	**11,66**	**13,93**	**11,32**

b) 1999-2008

	C^D_{t-i}/C_{t-i} (1)	$(C^D_t-C^D_{t-i})/C^D_{t-i}$ (2)	C^{EU}_{t-i}/C_{t-i} (3)	$(C^{RW}_t-C^{RW}_{t-i})/C^{RW}_{t-i}$ (4)	C^{RW}_{t-1}/C_{t-i} (5)	$(C^{RW}_t-C^{RW}_{t-i})/C^{RW}_{t-i}$ (6)	$(C_t-C_{t-i})/C_{t-i}$ (7)=(1)*(2)+(3)*(4)+(5)*(6)	Difference of less growth
Germany	84,10	-18,97	8,63	0,35	7,27	0,35	-15,90	2,76
Austria	80,62	29,55	12,84	42,10	6,53	42,10	31,98	10,15
Belgium	68,11	-2,42	18,96	-37,43	12,93	-37,43	-13,58	13,16
Spain	87,50	93,21	8,34	104,73	4,17	104,73	94,65	10,44
Finland	89,33	-57,46	4,52	3,86	6,16	3,86	-50,92	3,54
France	77,79	5,10	10,34	-2,38	11,87	-2,38	3,44	8,10
Greece	97,37	-23,16	1,77	252,36	0,86	252,36	-15,91	-0,61
Italy	80,89	39,80	11,55	-34,85	7,56	-34,85	25,53	9,79
Netherlands	64,46	6,41	17,20	-35,42	18,34	-35,42	-8,45	8,94
Portugal	86,30	60,14	9,80	-39,34	3,90	-39,34	46,52	18,26
Sweden	79,04	-2,92	8,71	-12,41	12,25	-12,41	-4,91	8,95
EuroArea	**79,00**	**8,98**	**12,23**	**-11,38**	**8,78**	**-11,38**	**4,70**	**8,82**

c) 2007-2008

	C^D_{t-i}/C_{t-i} (1)	$(C^D_t-C^D_{t-i})/C^D_{t-i}$ (2)	C^{EU}_{t-i}/C_{t-i} (3)	$(C^{RW}_t-C^{RW}_{t-i})/C^{RW}_{t-i}$ (4)	C^{RW}_{t-1}/C_{t-i} (5)	$(C^{RW}_t-C^{RW}_{t-i})/C^{RW}_{t-i}$ (6)	$(C_t-C_{t-i})/C_{t-i}$ (7)=(1)*(2)+(3)*(4)+(5)*(6)	Difference of less growth
Germany	76,33	-6,69	14,92	-12,83	8,75	-12,83	-8,14	-1,07
Austria	67,79	-3,80	24,66	-23,15	7,54	-23,15	-10,03	-1,22
Belgium	57,05	4,03	31,53	-36,72	11,42	-36,72	-13,47	2,39
Spain	81,87	-7,91	13,89	-10,34	4,24	-10,34	-8,35	-0,19
Finland	73,19	-27,07	16,05	-16,49	10,76	-16,49	-24,23	-1,84
France	68,67	-4,49	19,11	-23,92	12,22	-23,92	-10,58	0,05
Greece	89,44	-21,58	7,78	2,88	2,77	2,88	-19,00	-2,74
Italy	80,74	0,64	15,52	-5,63	3,75	-5,63	-0,57	-2,20
Netherlands	60,70	-4,03	27,07	-17,79	12,23	-17,79	-9,44	-5,22
Portugal	79,47	5,16	18,69	-22,52	1,84	-22,52	-0,52	0,16
Sweden	73,75	-7,28	15,93	-7,28	10,31	-7,28	-7,28	0,00
EuroArea	**72,23**	**-4,85**	**19,94**	**-20,63**	**7,83**	**-20,63**	**-9,23**	**-0,13**

Source: Eurostat, IMF, BIS and own elaboration.

9. References

BREZIGAR, A., F. CORICELLI and I. MASTEN (2008): "Non-linear effect of financial development: does financial integration matter?", *Journal of International Money and Finance*, 27, 295-313.

CETORELLI, N. and M. GAMBERA (2001): "Banking market structure, financial dependence and growth: international evidence from industry data", *Journal of Finance* 56, 617-648.

CLAESSENS, S. and L. LAEVEN (2005): "Financial dependence, banking sector competition, and economic growth", *Journal of the European Economic Association* 3 (1), 179-207.

EUROPEAN CENTRAL BANK (2004): *Developing statistical indicators of the integration of the euro area banking system*, January, Frankfurt.

____ (2007): *Financial Integration in Europe*, March, Frankfurt.

____ (2009a): "The impact of government support to the banking sector on euro area public finances", *Monthly Bulletin*, Frankfurt, July, 63-74.

____ (2009b): *Financial Integration in Europe*, April, Frankfurt.

EUROPEAN COMMISSION (2009): *European financial integration report*, Brussels.

FERNÁNDEZ DE GUEVARA, J. and J. MAUDOS (2009): "Regional financial development and bank competition: effects on firms' growth", *Regional Studies* 43 (2), 211-228

GOLDSMITH, R. (1969): *Financial structure and development*, New Haven and London: Yale University Press.

GUISO, L., JAPPELLI, T., PADULA, M. and M. PAGANO (2004): "Financial market integration and economic growth in the UE", *Economic Policy*, October, 523-577.

INTERNATIONAL MONETARY FUND (2006): *Financial Soundness Indicators. Compilation Guide*, Washington, DC, March.

KING, R. and R. LEVINE (1993a): "Finance and growth: Schumpeter might be right", *Quarterly Journal of Economics* 108, 717-737.

____ (1993b): "Finance, Entrepreneurship and Growth: Theory and Experience", *Journal of Monetary Economics* 32, 513-542.

LEVINE, R. (1993): "Financial development and economic growth: views and agenda", *Journal of Economic Literature* XXXV, 668-726.

____ (1997): "Financial development and economic growth: views and agenda", *Journal of Economic Literature* 35, 688-726.

____ (2005). "Finance and Growth: Theory and Evidence" in P. Aghion and S. Durlauf, eds. *Handbook of Economic Growth*, The Netherlands: Elsevier Science.

LEVINE, R. and S. ZERVOS (1998): "Stock markets, banks, and economic growth", *American Economic Review* 88, 537-58.

LEVINE, R., N. LOAYZA and T. BECK (2000): "Financial Intermediation and Growth: Causality and Causes", *Journal of Monetary Economics* 46, 31-77.

LOAYZA, N. and R. RANCIÈRE (2006): "Financial development, financial fragility, and growth", *Journal of Money, Credit and Banking* 38 (4), 1051-1076.

MAUDOS, J. and J. FERNÁNDEZ DE GUEVARA (2006): "Bank competition, financial dependence and economic growth", Documento de Trabajo No. 269, Madrid: Fundación de las Cajas de Ahorros.

OBSTFELD, M. (1994): "Risk-taking, global diversification and growth", *American Economic Review* 84, 1310-1329.

RAJAN, R. and L. ZINGALES (1998): "Financial dependence and growth", *American Economic Review* 88, 559-587.

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