

José Manuel González-Páramo: Financial systems, new technologies and productivity growth

Speech by Mr José Manuel González-Páramo, Member of the Executive Board of the European Central Bank, at the Summer School of the University of Málaga, Ronda, 11 July 2008.

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1. Introduction¹

Ladies and Gentlemen,

It is a great pleasure for me to be here in Ronda and participate in the Summer School of the University of Málaga. I would like to thank the organisers, particularly Professors Amparo Ruiz Sepúlveda and David Bueno Vallejo, for giving me the opportunity to share with you some views on the relationship between financial systems, new technologies and productivity growth.

The notion that financial and economic activities are closely interrelated is not new. Indeed, it has a long tradition in economic theory. For instance, Clément Juglar – the French economist who was among the first to investigate the nature of business cycles – argued back in 1860 that economic fluctuations originate in the credit system.

Financial development can have a significant impact on the economic performance of our economies. Indeed, developments in the financial system can directly influence productivity growth in the euro economy, since the financial sector accounts for a significant and growing share of output and employment in our economies. More generally, developments in the financial sector have an impact on economic performance well above their relative importance in employment or output. This is because financial services represent key intermediate inputs into other sectors of the economy, and thereby provide a very important contribution to productivity, innovation and economic growth in the long term. In fact, a well-functioning financial system enables an economy to exploit its full potential for output and employment growth.

2. Productivity growth in the financial system

Developments in the financial system can *directly* influence the performance of our economies, since the financial sector accounts for a significant and growing share of output and employment in the euro area.²

More generally, the increase in the relative importance of services in developed economies has been singled out as one of the potential explanations for the substantial decline in macroeconomic volatility over the last two decades (the so-called “Great Moderation”). In particular, the share of euro area total value added and employment accounted for by the services sector has significantly risen since the 1980s. As a result, the structure of the euro area economy has increasingly shifted away from traditional manufacturing industries towards services.

¹ This speech has benefited from inputs from various ECB reports and articles in the ECB Monthly Bulletin quoted in the text. I am grateful to Angela Maddaloni, David Marqués, Alex Popov and Rolf Strauch for useful comments.

² See Taskforce of the Monetary Policy Committee of the European System of Central Banks (2006), Competition, productivity and prices in the euro area services sectors, ECB Occasional paper No. 44.

Within the services sector, over the last few decades there has been a slight increase in the importance of financial intermediation relative to other services sub-sectors. Data show that in 2005 financial and business services represented the sub-sector accounting for the largest share of value added. Their relative importance for employment is more limited, as a result of their relatively high productivity compared to other services sub-sectors.

Indeed, in contrast to other sub-sectors, financial services are substantially more exposed to international competition and the use of Information and Communication Technologies (ICT). Besides, the liberalisation of this sector started in the EU earlier than regulatory reforms in other services. As a result, the financial sector has been subjected to the combined pressure of: (1) increased competition from capital markets and foreign financial institutions, and (2) earlier deregulation. The combination of technological progress and market structural changes should have spurred productivity growth in the euro area financial industry.

Nevertheless, data from the EU KLEMS Growth and Productivity Accounts spanning the 1996-2005 period show that labour productivity growth in financial services was rather disappointing over this period, especially if compared with their corresponding performance in the US. Indeed, labour productivity growth of the financial sector was slightly negative in the euro area over this decade, while it outperformed the economy as a whole in the US.

Thus, in the euro area the financial services sector seems to have to some extent contributed to two important developments in labour productivity over this period: (1) the sharp slowdown in labour productivity growth in the euro compared to the period 1980-1995; (2) the emergence of a significant labour productivity growth gap between the euro area and the US.

Weak productivity developments in the financial services are also evident if we look at total factor productivity growth, a factor generally believed to have played a key role in determining the emergence of a significant output growth gap between the US and the euro area over 1996-2005. Indeed, over this period the financial services sector provided a significant negative contribution to euro area output growth, compared with a marginal positive contribution in the US. It should be noted that, while the negative rate of growth of TFP for this sector deteriorated in the euro area compared with the level observed over the period 1980-1995, over the same period the financial sector recorded a significant turnaround in the US. Developments across individual euro area countries were fairly mixed, but in the majority of cases TFP growth either improved at best only marginally or deteriorated significantly.

Overall, the deterioration in the productivity performance of the euro area financial services industry – and, more generally, the evidence of disappointing productivity performance also in other market-services sub-sectors making relatively intensive use of ICT – reflects insufficient technological and innovation spillovers as well as the negative impact of labour and market rigidities. From the policy point of view, these findings point to the need to continue implementing structural reforms, introducing measures aimed at increasing market competition and investing in education and human capital formation in order to achieve the objectives of the Lisbon strategy.

3. Financial sector and growth

Developments in the financial sector have an impact on economic performance well above their share in total employment or value added.³ This is because the financial sector provides an important contribution to the efficient functioning of the entire economy, by ensuring that the most valuable real investment opportunities receive the necessary financing at a reasonable cost. In particular, a well-functioning financial system fosters saving and capital

³ For a more detailed discussion see Chapter II of ECB (2008), *Financial Integration in Europe*, April.

accumulation, allows for a more efficient spatial and inter-temporal allocation of resources, enhances risk-sharing and improves the diversification of risk. It can reduce the cost of capital as well as that of financial intermediation and improve competitiveness, thereby lowering prices and stimulating economic growth, job creation and welfare. Insofar as financial services are important for the economy as a whole and enable other economic transactions to run smoothly, they are associated with strong externalities affecting the rest of the economy.

The efficiency of a financial system typically depends on several key factors, including its degree of integration, market competition, level of development and innovation capacity. In particular, many studies have found evidence of a correlation between the level of financial development and the economic growth.⁴ Indeed, there is a significant amount of empirical evidence derived from cross-country data showing that countries in which more credit to the private sector is extended typically experience stronger economic growth.

In standard neoclassical models, financial development fosters growth mainly by supporting a higher level of investment activity. Other models suggest that the positive influence of financial development may work through the accumulation of human capital (by supporting investment in education by individuals). However, recent studies have found evidence that in developed economies a more relevant channel through which financial intermediation affects economic growth may work through increases in total factor productivity.⁵

There is increasing interest in understanding the specific channels through which financial development affects productivity. Some studies have found out that this may be related to the superior ability of countries with more developed financial systems to finance investment for technological-related reasons or to enable firms to adopt new technologies more quickly. In addition, it has also been argued that finance fosters growth by stimulating “creative destruction”, in the words of Joseph Schumpeter, the famous Austrian economist who argued that fluctuations in investment and economic activity are determined by credit-financed innovation waves.

According to this argument, developed financial markets help to channel scarce capital from declining sectors to firms that are expected to grow faster and also make it easier for firm to enter industries facing good growth prospects. Hartmann et al. (2007) test this hypothesis for a group of 22 OECD countries and indeed find that in countries with more developed financial markets, industries with better growth prospects tend to benefit from more investment activity.⁶

How developed are the financial markets in the euro area? In order to answer this question, ECB staff members have developed aggregate measures of the size of stock, bond and loans markets that can be used as proxies for the degree of development of capital markets as a whole.⁷ Based on these indicators, one can conclude that on average, capital markets in euro area countries tend to be smaller than those of the UK and US, and roughly comparable in size to those of Japan. It has been suggested that differences in the degree of development and, more generally, efficiency of capital markets may have played a role in explaining the better economic performance of the US relative to the euro area in the second

⁴ For reviews see Levine, R. (2005), “Finance and growth: Theory, evidence and mechanisms”, in Aghion, P. and S. Durlauf (eds.) *The Handbook of Economic Growth*, Amsterdam: North-Holland; Papaioannou, E. (2007), “Finance and growth: A macroeconomic assessment of the evidence from a macroeconomic angle”, ECB Working Paper 787.

⁵ For a review see Papaioannou (2007), *cit.*

⁶ Hartmann, P., F. Heider, E. Papaioannou and M. Lo Duca (2007), “The role of financial markets and innovation in productivity and growth in Europe”, ECB Occasional Paper 72.

⁷ See Chapter II of ECB (2008), *Financial Integration in Europe*, April, p. 27 for more details on the methodology.

half of the 1990s.⁸ It should be noted though that there are significant differences across euro area countries, with the relative size of capital markets in some countries comparable or even bigger than in the Anglo-Saxon countries.

Of course, one important difference between the capital markets of the euro area and other developed economies regards the relative importance of their market segments. In general, the euro area still has a much more “bank-based” system compared with the rather “market-based” system in the US. However, the euro area financial landscape is changing, as a result of a number of structural developments, including the introduction of the euro, increasing financial integration, securitisation and other forms of financial innovation, the impact of long-run demographic trends, etc.

4. Financial innovation

I have mentioned securitisation as one of the factors changing the euro area financial landscape. This is an important issue since securitisation is an example of a relatively mature form of financial innovation, a factor that plays an important role in determining the degree of efficiency of a financial system. Indeed, financial innovation can render financial markets more efficient by rendering them more complete, thereby allowing firms, households and governments to interact in the market place facing lower transaction costs, enhanced risk sharing instruments and contracting possibilities. I will concentrate on two specific examples of financial innovation: securitisation and the development of venture capital financing.

Securitisation

Securitisation – the practice of transforming formerly illiquid assets into portfolios of assets that can be sold widely – is particularly common in the banking sector. In fact, asset securitisation was introduced in the 1970s in the US precisely for the purpose to allow depository institutions to sell their pools of mortgage loans before maturity, thereby providing an additional source of funding. Banks subsequently extended the securitisation model to other forms of credit, such as consumer credit and student loans, that were historically regarded as highly illiquid.

Increasing securitisation of lending-related assets, together with relentless financial innovation in credit markets, have led to the diffusion of a new business model – the “originate to distribute” model – among banks, particularly those of large size. Under this new model, banks originate loans but sell them to structured investment vehicles (often set up by themselves) to be repackaged and subsequently sold as asset-backed securities (ABSs).

In principle, this business model is attractive for banks since it provides them with a new source of financing to expand lending (thereby mitigating their funding liquidity risks), while also allowing them to economise on costly capital requirements. From the point of view of the economy as a whole, the “originate to distribute” model could be viewed as having many advantages. First, capital requirements are costly, thus the ability to sustain a given level of credit supply with a lower volume of capital enables the banking sector to reduce the costs of financing for borrowers. Moreover, it may be seen as representing a step towards more complete credit markets, thereby contributing to enhancing the efficiency of the economic system. In addition, the securitisation of loans in principle could reduce a secular source of vulnerability of the economies, by taking risk concentrations associated with loan portfolios away from the banking sector and spreading them more broadly across other sectors. As a result, the “originate to distribute” model may potentially diminish the likelihood of the credit busts and banking crises that have historically been a major source of macroeconomic and

⁸ See for instance Lamfalussy, A. (2003), “Creating an integrated European market for financial services”, Cass/IEA Financial Services Regulation Seminar Series.

financial instability in many economies. I will come back to this point later on when talking about the implications of financial developments for financial stability.

Following a relatively slow start compared to the US, the European market for structured finance products has grown rapidly during the last 5-10 years, often at double-digit rates. This development has been even more pronounced in the euro area compared with other regions due to a variety of factors, including the introduction of the single currency, further financial market integration through the use of credit derivatives and related financial instruments, and an innovative financial industry.⁹ Growth in structured finance products has also been fuelled by high demand from investors stemming from the search for yield, in an environment of relatively low yields, and diversification opportunities. Securitisation has also been positively affected by the general move towards a more market-based financial system. Nevertheless, the volume of issuance of ABSs relatively to the size of the economy for the euro area as a whole remains lower than in the UK and the US, probably reflecting regulatory and legal barriers to financial integration.¹⁰ Within the euro area, the countries in which the issuance of ABSs is more frequent are Spain, Ireland, Luxembourg, the Netherlands and Portugal.

Venture capital financing

Venture capital is a type of private equity investment provided by specialised investors as start-up money to finance new high-risk firms with large scope for growth (e.g. those involved in new technologies), in return for an equity position in the firm.¹¹ It represents an alternative source of capital financing, especially for those categories of firms (start-ups and small innovative firms) for which informational asymmetries are particularly pronounced, as it has been documented by the credit channel literature. Indeed, even bank financing may be difficult to obtain for such firms, as they are usually involved in high-risk businesses, but have little collateral to offer. Under a venture capital agreement, the investor acquires a significant equity stake in the firm, which provides him/her with the right incentive to monitor and control the firm and overcomes the potential asymmetric information problems. Venture capitalists also serve their portfolio firms by providing coaching and guidance, as well as networking for strategic alliances and further funding. Finally, venture capital financing is provided on a piecemeal basis over several stages, which reduces the entrepreneur's incentive to skimp on effort during the early life of the firm.

It should be noted that providing financing to small and medium-sized enterprises is very important in the euro area because these categories of firms represent a significant component of the economies of many of its members. Thus, the financing of small- and medium-sized firms is crucial for fostering entrepreneurship, competition, innovation and growth in Europe. In addition, venture capital financing plays an important role in supporting the diffusion of new technologies in existing sectors and in fostering the developments of new industries. In that sense, venture capital is a type of finance which is ideally suited for the purpose of transforming scientific knowledge into commercial output. For instance, a recent study of the European biotech industry by ECB Staff has shown that venture capital financing increases the number of patent applications per unit of industrial R&D, suggesting that the involvement of venture capital investors makes R&D investment more efficient.¹²

⁹ See ECB (2007), Structural Issues Report on "Corporate finance in the euro area", May.

¹⁰ These calculations do not include covered bonds which differ from ABS in that the securitised assets remain on the balance sheet of the originating bank.

¹¹ For a more detailed discussion see Chapter II of ECB (2008), Financial Integration in Europe, April.

¹² See Popov, A. and P. Roosenboom (2008), "Venture capital and innovation in the European bio-tech industry", ECB mimeo.

Despite having grown substantially over the past ten years, venture capital financing in most euro area countries remains a fraction of venture capital financing in the UK or, especially, in the US. While average euro area venture capital financing in the late 1990s was larger than in the UK, this is no longer the case. Within the euro area, only Finland has levels of venture capital financing that can rival those of the United States. A second-tier group of countries (Belgium, Germany, France, Ireland and the Netherlands) have similar amounts of venture capital financing. Finally, early-stage venture capital financing remains limited in Austria, Greece, Italy and Spain.

It is not clear whether the apparent weakness of the European venture capital sector is caused by (1) a lack of capital supplied, perhaps reflecting lack of liquidity in still somewhat nationally segmented venture capital markets, (2) legal, regulatory and tax barriers, or (3) a shortage of viable exit options for venture capitalists through liquid specialised equity markets.

5. Implications for central banks

From the point of view of central banks, developments in the financial sector have a special role that distinguishes them from other services. In so far as financial developments influence the long term output and employment growth, they can affect the wide range of indicators and tools that central banks use to monitor and model the behaviour of the economy. More specifically, changes in the banking sector may affect the monetary transmission mechanism. A more developed and efficient financial system is likely to contribute to a more effective, harmonised and smooth transmission of the single monetary policy. In addition, the stability of the financial system is also a crucial concern for central banks and for the economy as a whole. In principle, deeper and more complete financial system should provide a number of social benefits, including better risk hedging and risk diversification that render economies less vulnerable to disturbances. However, there have long been concerns that some financial developments may lead to increased speculative behaviour, market volatility and, ultimately cause or exacerbate financial crises.

Securitisation provides an interesting illustration of how financial developments may influence the traditional monetary transmission mechanism and raise questions about financial stability.

As noted above, securitisation provides banks with a new source of financing and capital regulatory relief. Therefore, under normal macroeconomic conditions, one of the anticipated consequences of securitisation should be an overall increase in the aggregate supply of loans.¹³ By affecting the ability and incentives of banks to grant credit, changes in securitisation activity are also likely to affect the way monetary policy is transmitted through credit markets. For instance, according to the “bank lending channel” theory, banks’ conditions can significantly affect how their supply of credit responds to monetary policy changes. In this respect, after a monetary tightening, the drop in the supply of credit is expected to be larger for small, less liquid and poorly capitalised banks. However, securitisation may weaken the effects of these factors on the transmission mechanism since (1) it may enable banks to provide additional lending without increasing the size of their balance sheets, (2) it allows them to obtain additional liquidity independently of their securities holdings, and (3) by removing loans from their balance sheet through securitisation, banks can improve their capital position on account of the transfer of credit risk. There is some evidence that the increase in securitisation may have reduced the impact of monetary policy changes through the “bank lending channel”, although this effect seems to

¹³ For a discussion see the article on “Securitisation in the euro area” in *ECB Monthly Bulletin*, February 2008.

be dependent on the economic cycle and other factors, such as bank risk.¹⁴ However, this does not necessarily mean that the banking sector or the credit markets have become less relevant since they transmit monetary policy impulses through several other channels (notably, balance sheets).¹⁵ Besides, securitisation affects banks in many different ways that may render them more sensitive to changes in monetary policy (e.g. by tightening the relationship between banks' funding ability and conditions in wholesale capital markets).

An additional issue that has become rather topical over the past year is the potential impact of securitisation and the "originate-to-distribute" model on financial stability. As mentioned earlier, in principle the ability to securitise loans should enhance the banking sector and reduce the likelihood of the credit busts and banking crises that have historically posed a major threat to financial stability in many economies. However, even before the outbreak of the current financial market turmoil, some commentators have argued that, while securitisation certainly spreads existing risks, it may in fact encourage the creation of further risks, particularly by relaxing the incentives for banks to screen and monitor borrowers in order to alleviate the informational asymmetries associated with credit contracts.¹⁶ In addition, it has been argued that the markets for securitised loans and credit derivatives may have failed to spread risks as effectively as expected and, by contrast, may have exacerbated information asymmetries, probably as a result of their opacity and the complexity of the underlying contracts. More generally, the recent turmoil has highlighted a number of weaknesses in the credit markets, namely in the areas of transparency, valuation, risk management practices, the current prudential framework and market functioning. However, a number of recommendations have been put forward by a wide range of fora and organisations (e.g. the Financial Stability forum) that should be fully implemented in order to restore the public's confidence in the ability of securitisation to contribute to social welfare.

To sum up, financial systems provide an important contribution to productivity, innovation and non-inflationary economic growth in the long term. Central banks have a keen interest in ensuring their orderly and efficient functioning since this is essential for the smooth conduct of monetary policy and for the safeguarding of financial stability.

¹⁴ See for instance Altunbas, Y., L. Gambacorta and D. Marqués (2007), "Securitisation and the bank lending channel", ECB Working Paper 838.

¹⁵ For a review of the development of the literature on the credit channel see Bernanke, B. (2007), "The financial accelerator and the credit channel", Speech at the Fed Atlanta Conference on "The credit channel of monetary policy in the twenty-first century", 15 June.

¹⁶ See Rajan, R. (2005), "Has financial development made the world riskier?", NBER WP 11728 and Sufi A. and A. Mian (2008) "The Consequences of Mortgage Credit Expansion: Evidence from the 2007 Mortgage Default Crisis", paper presented at the May 2008 Federal Reserve Bank of Chicago Banking Structure Conference.