

NUNO ALVES



Financial Market

Frictions and the Monetary Transmission Mechanism in the Euro Area¹

1 Introduction

During the last decade the European financial landscape witnessed an impressive structural change. The introduction of the euro was a powerful catalyst for this change. The improved integration, efficiency and depth of several segments of the market are key features of this ongoing process.

The impact of these financial market developments in the monetary transmission mechanism has been a growing area of interest, in particular in the light of the conduct of the single monetary policy by the ECB. This paper aims to uncover some ideas concerning the link between financial markets and the monetary transmission mechanism, with an emphasis on the euro area.

The paper is organized as follows. Section 2 starts by describing some recent developments in financial markets in the euro area. The main message from this section is that while there are areas of considerable financial market integration in the euro area, several heterogeneous structures across the euro area coun-

¹ *The views expressed in this paper are my own and do not necessarily reflect the views of the Banco de Portugal.*

tries still persist. Section 3 describes the main empirical features of the monetary transmission mechanism in the euro area, based on several empirical studies. In section 4, we interpret the empirical evidence in the light of a general equilibrium model that is representative of the most recent theoretical research on the subject. In this model financial intermediaries behave competitively and financial markets are frictionless. Given the accuracy of the model in replicating the empirical features reported in the literature we conclude that financial markets in the euro area do not seem to introduce significant distortions in monetary transmission mechanism.

Section 5 combines the empirical evidence on financial markets with the theoretical research on the transmission mechanism to draw some additional insights concerning their relationship. We focus on three issues: first, the role of expectations in the conduct of monetary policy; second, the role of credit market frictions; third, the impact of heterogeneous financial structures in the euro area, and the conduct of optimal monetary policy in this context. Section 6 concludes.

2 Recent Developments in Financial Markets in the Euro Area

In this section our aim will be to describe a number of features and developments in the euro area financial markets that may impact on the monetary transmission mechanism. It is important to stress from the outset that the key role of financial markets is to channel funds from net savers to net borrowers. The more frictionless financial markets are (i.e., the lower the existing bar-

riers that discriminate among agents) the less they distort the transmission of monetary policy to the real economy. We start by briefly focusing on the process of financial market integration observed in the euro area (for a full description of this process, see Baele et al., 2004). We will then highlight a number of areas where heterogeneous structures persist.

2.1 Financial Market Integration in the Euro Area

During the last years, several facts contributed to a fast integration of financial markets and an increase in market efficiency in the euro area. First, competition in the banking sector increased, due to a continuing process of deregulation and to the introduction of new financial instruments. This was reflected in a convergence of retail interest rates and bank margins in the euro area. Second, the development and widespread use of numerous technological improvements also contributed to a smoother functioning of markets.

Third, the introduction of the euro was a catalyst in restructuring financial markets. This regime change created an integrated money market, with cross-country interest rate differentials in this segment of the market virtually disappearing, and with cross-border interbank activity rising significantly, in particular during the period from 1998 to 2001. Furthermore, the average bid and ask spreads for the deposit rates declined significantly (see Galati and Tsatsaronis, 2003).

The introduction of the euro also promoted the convergence of interest rates in the bond market. This occurred before (anticipating) Stage 3

of Economic and Monetary Union (EMU). Not only did yield differentials converge markedly but there was also a sharp reduction in volatility (see chart 1). This was due to the convergence of inflation expectations, to the elimination of currency risk and to the improvement in market infrastructures.

The process of financial integration was also accompanied by a gradual process of disintermediation. To illustrate this trend, we can observe that by end-2001 the value of euro area residents' holdings of intermediated financial assets was equivalent to 47% of total financial assets.² In 1995, this figure amounted to 53%. If assets held with pension funds and other financial intermediaries were excluded from the definition of intermediated assets, the fall in the share of intermediated assets would be even greater.

Another important feature of the disintermediation process is the strong increase in the net issuance on the primary corporate bond market in the euro area, which was observed after 1998 (see chart 2).

Despite these trends it is arguable that banks will remain in the future the foremost suppliers of financial services to households and firms in the euro area. Table 1, which shows the investment and source of funding in the euro area in 2001 in each sector of the economy, illustrates this point. On the one hand, it is visible that households in the euro area have a strong

preference for currency and deposits, in particular when compared to the U.S.A.³ On the other hand, there is a strong preference by firms to finance their activities through loans instead of bonds (in 2001, bank loans to firms were more than eight-fold the market value of corporate debt securities). The role of banks in the euro area monetary transmission mechanism therefore deserves particular notice, and will be evaluated in section 5.

Overall, financial market integration brought lower costs of intermediation to economic agents (and more homogeneous costs across similar agents), an access to a broader range of financial instruments and a larger pool of liquidity.

In spite of the significant integration in some segments of financial markets – in particular the unsecured deposit market, the overnight interest rate swap market and derivatives markets (including money market futures and government bond futures) – several segments of financial markets remain fragmented, introducing frictions that may affect the monetary transmission mechanism in the euro area.

For example, the repo market, where participants exchange short-term liquidity against collateral, remains somewhat fragmented. In particular, this is due to the fragmented securities settlement infrastructure, to differences in banks' balance sheet structure, and to diverse legal and contractual aspects. Just as the Trans-European Auto-

² *The intermediated financial assets are defined as assets held with monetary financial institutions, insurance corporations, pension funds and other financial intermediaries; non-intermediated financial assets are direct holdings of shares, bonds and other securities.*

³ *In the U.S.A., the households' investment in shares amounted to 147% of GDP in 2001. Their holdings of currency and deposits stood at 48% of GDP.*

Table 1

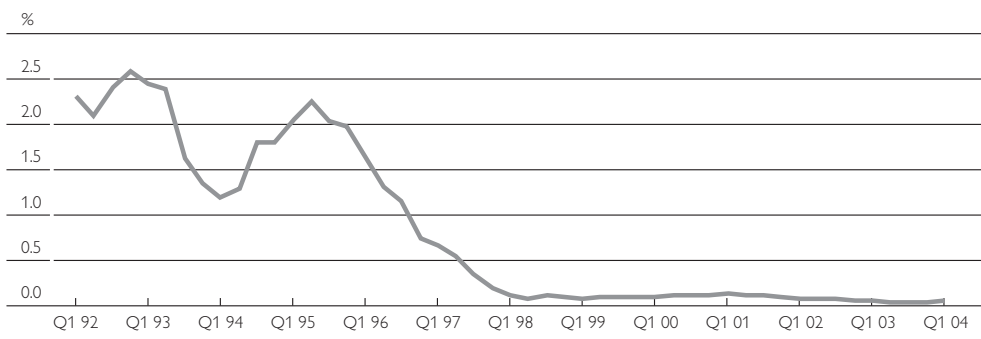
Investment and Source of Funding in the Euro Area 2001

	Source of financing				Investments		
	Loans	Debt securities	Shares	Currency, deposits	Debt securities	Shares	Currency, deposits
	% of GDP						
Households	52	0	0	0	19	67	61
Non-financial corporations	68	8	132	0	9	77	15
Financial corporations	12	50	75	170	80	69	77
Government	15	57	0	4	2	9	6
Total	95	115	207	174	110	222	159

Source: Hartmann et al. (2003).

Chart 1

Unweighted Standard Deviation of 10-Year Euro Area Government Bond Yields



Source: European Central Bank's database.

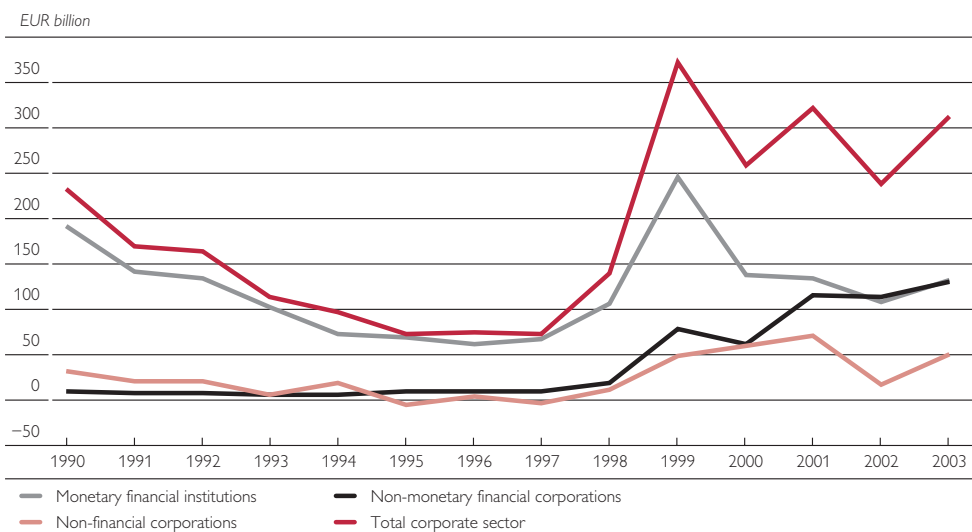
mated Real-time Gross settlement Express Transfer (TARGET) System was decisive in promoting the integration of money markets, other segments of the market did not witness such a rapid and profound change due to lack of integration of security settlement systems.⁴ This is namely the case of the secured money market, the bond market, and equity markets. Focusing for example on the government bond market, chart 3 shows that despite the rapid convergence of yields before the introduction of the euro, yield differentials vis-à-vis the German rates remain significantly different from zero, albeit decreasing in magnitude after 2001. Even taking into

account that these differentials reflect credit risk differences among issuers, there is evidence that the government bond market remains segmented to a non-negligible degree, as argued by Adjaouté and Danthine (2003). As for the equity market, there has been a moderate market integration, namely with the creation of Euronext. There has also been a clear increase of stock market capitalization, which rose from 21% of GDP in 1990 to a high of 87% in 2000, falling afterwards to 47% in 2002. Further, equity returns across the euro area seem to be now more affected by factors common to the whole euro area than in the past (see Baele et al.,

⁴ For example, in 2003 there were still 15 securities settlement systems and 13 retail payment systems in the euro area.

Chart 2

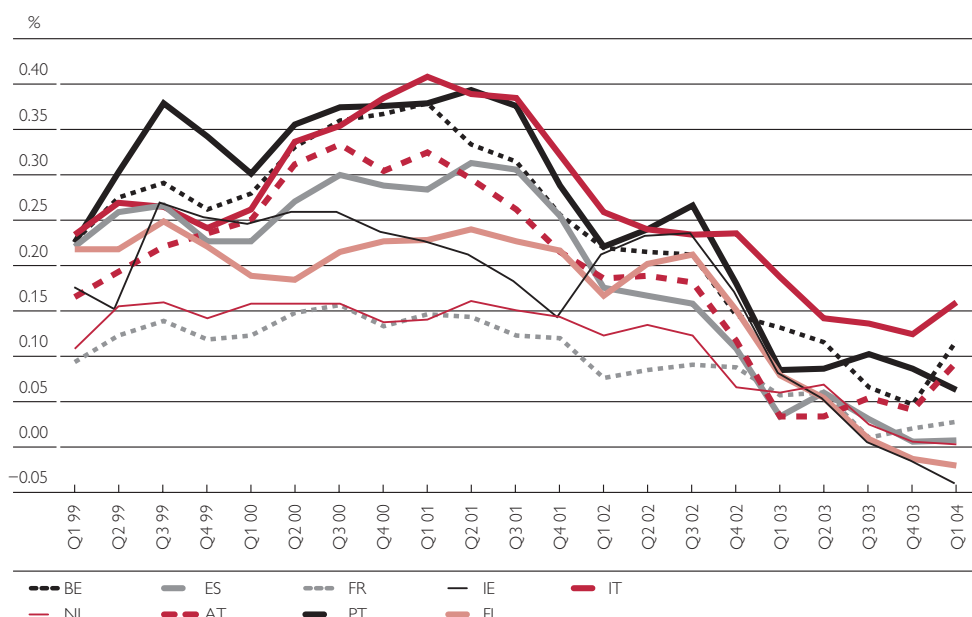
Net Issuance of Debt Securities by Euro Area Corporations



Source: European Central Bank, based on Gaspar et al. (2003).

Chart 3

Spreads of 10-Year Government Bond Yields Over the German Rate



Source: European Central Bank's database.

2004). However, it is clear that a full integration of equity markets, with the complete elimination of additional costs from settling cross-border equity transactions has yet to be achieved. This same conclusion applies to credit markets, which are

still characterized by a significant degree of “home bias.”

2.2 Persistent Sources of Heterogeneity in Financial Markets

Several authors have emphasized that since financial structures and practi-

ces differ across euro area countries, a monetary policy shock may induce asymmetric responses across countries (see Giovannetti and Marimon, 2000, and Cecchetti, 1999). In this subsection we briefly report some indicators concerning cross-country heterogeneity in the euro area financial structures. In section 5, the impact of this heterogeneity on the transmission mechanism will be assessed.

Table 2 presents some important indicators in this respect. Several features are worth highlighting from the table. The size of the banking sector, as measured by the value of bank assets as a percentage of GDP, is sizeable in all countries. This reflects the dominant role of banks in the euro area, in detriment of more market-based finance. There are nonetheless some important differences across countries, with Ireland and Germany recording the highest sizes of bank assets relative to GDP (excluding Luxembourg), and with Finland, Greece and Italy recording the lowest. The level of stock market capitalization also varies between countries, being high in Finland, the

Netherlands and Luxembourg and particularly low in Austria, Portugal and Italy.

As for the financing of the non-financial corporations, the table shows that securities amount to a very small fraction of firms' external financing (with the possible exception of France). The importance of debt securities is particularly low in Germany, Italy and Spain. Despite being a major source of financing to the corporate sector, loans vary significantly across the euro area when measured as a fraction of GDP. They reach highs of over 85% of GDP in the Netherlands, Finland and Portugal and values lower than 60% in Italy. Turning now to the household sector's indebtedness, the table shows that bank loans as a percentage of GDP are highest in the Netherlands, Germany and Portugal, and lowest in Italy and Finland. The difference between the highest and the lowest households' indebtedness levels amounted to over 70 percentage points in 2001.

A final issue that may be important for the monetary transmission mechanism relates to the structure

Table 2

Overview of Financial Markets in the Euro Area 2001

	Euro area	AT	BE	FI	FR	DE	GR	IE	IT	LU	NL	PT	ES
	% of GDP												
Total bank assets	267.1	272.1	303.0	122.6	276.7	304.3	155.4	460.8	154.4	3847.8	298.0	287.2	199.6
Stock market capitalization	71.7	13.4	72.6	157.3	90.6	58.1	71.9	73.3	48.7	125.9	131.2	42.4	80.9
Non-financial corporations' liabilities													
Securities other than shares	8.6	8.9	13.8	12.6	20.3	3.0	–	–	3.4	–	13.0	10.3	3.5
Loans	67.8	81.4	68.0	90.4	66.7	64.9	–	–	56.7	–	98.9	85.8	68.0
Shares and other equity	132.8	29.6	231.2	289.1	223.4	74.5	–	–	96.3	–	136.9	108.3	146.2
Households' liabilities													
Bank loans	51.6	40.4	38.5	32.3	37.7	72.9	–	–	23.0	–	96.5	61.7	49.9

Source: Agresti and Claessens (2003).

of loans to the private sector and, in particular, to the question of whether these loans are contracted under fixed or variable interest rates. It is difficult to obtain comparable and reliable information concerning this dimension of the data for the euro area. However, it is clear that practices vary widely across countries, due to tradition, consumer preferences and, in particular, the inflation track-record in each country. This explains the predominance of fixed-rate loans in countries like Germany, the Netherlands or France and the prevalence of variable-rate contracts in countries like Portugal, Spain or Ireland.

3 Some Empirical Features of the Monetary Transmission Mechanism

The monetary transmission mechanism is the process through which monetary policy decisions affect the economy. After the introduction of the euro, several empirical studies have attempted to uncover the effects of monetary policy shocks on the euro area economy and the respective participating countries (see, for example, Mojon and Peersman, 2003, and Angeloni et al., 2003b). Given that the introduction of the euro represents a true structural break concerning the monetary regime, all these exercises are subject to the Lucas critique. However, since most of the empirical descriptions hold across a large sample of countries and in different periods, it seems reasonable to extrapolate the empirical results estimated mostly for a pre-euro period to the current regime.

The description of the impact of a monetary policy shock in the above studies share a number of

common features. First, an expansionary policy shock corresponds to a persistent fall in the interest rate, which is mirrored by a persistent rise in the growth rate of narrow monetary aggregates. Second, output, consumption, investment and employment increase in a hump-shaped pattern, with the peak effect occurring after about 1.5 to 2 years and with investment reacting three times more than consumption. Third, there is no clear pattern in the response of real wages, since the response is usually estimated to be non-significant. Fourth, inflation initially stays broadly flat and only increases significantly after at least one year. Fifth, velocity decreases significantly after the expansionary monetary policy shock. This fall is persistent and lasts for at least a year. Finally, in the long run, the monetary policy shock is neutral, being fully transmitted to prices.

Another interesting feature of the studies that focus on the individual euro area countries is that the estimated effects of a single monetary policy shock are not statistically different across countries (see Peersman, 2002). This absence of significant heterogeneity in the description of the transmission mechanism suggests that a set of common frictions may also explain that mechanism. This is the task undertaken in the next section.

4 A General Equilibrium Model of the Transmission Mechanism

The literature usually identifies a myriad of channels to explain the empirical features identified in section 3 (see Kuttner and Mosser, 2002, for a representative view). Such channels include, in particular,

the direct monetary channel, the interest rate channel, the asset price channel, the credit channel and the exchange-rate channel. These descriptive explanations of the transmission mechanism have two problems. On the one hand, they are unable to enlighten the general equilibrium dynamics of the process. On the other, they are not helpful to study the deep frictions that underlie the transmission mechanism and, ultimately, the functioning of



the economy. As in many other macroeconomic issues, one cannot escape the need to build a general equilibrium model in order to understand the structural transmission of monetary impulses to the economy.

In the remainder of this section we will very briefly describe the mechanics of a state-of-the-art model of the transmission mechanism, as presented in Christiano et al. (2001) and Smets and Wouters (2003). The model builds on a standard real business cycle model and incorporates frictions in order to account for several features of the data that a standard frictionless model is unable to mimic. The most important frictions relate to the households' and firms' decisions.

This model is able to mimic quite closely the empirical response of many macroeconomic variables to a monetary policy shock, both in the U.S.A. and the euro area. The

model also mimics the empirical evidence for the major economies in the euro area, as emphasized in Alves (2004). Moreover, this success is far more than qualitative. In fact, reasonable calibrations of the model closely replicate the quantitative response of the economy to a monetary policy shock. This implies that an understanding of the mechanics of this model gives us the best lenses to interpret the monetary transmission mechanism in the euro area. In particular, the model is useful to identify the main frictions that impact on that transmission mechanism.

Even though a narrative presentation does not do full justice to the general equilibrium nature of the model, it is nonetheless useful to highlight some of the main propagation channels that allow the model to succeed in accounting for the monetary transmission mechanism estimated in the data.

Chart 4 shows the model's response of money growth, interest rates, GDP and inflation to an expansionary monetary policy shock. This shock corresponds to an injection of reserves by the central bank to the financial intermediaries. In the period of the shock, the monetary injection adds to the supply of loans in the financial market. After observing this shock, the households choose the level of cash-balances and the level of deposits to hold in each period. The latter are remunerated at a certain interest rate. It is assumed that cash-balances yield utility directly, which explains why households forego the interest to be gained with deposits.

Even though households increase their cash-holdings after the shock and reduce their deposits with the

financial intermediaries, there remains an abundance of liquidity in the financial market that has to be absorbed by firms, who seek these funds to finance their wage bill. To induce firms to absorb this extra liquidity, the interest rate has to fall.

The chart also shows that the model succeeds in replicating the hump-shaped response of GDP to a monetary policy shock. To mimic this feature of the data, the model assumes that households have habits in their preferences for consumption. This implies that it is the growth of consumption relative to a proportion of the previous period's consumption that is valued by households. The hump-shape in output is also a result of assuming that firms can vary their capital utilization rates and that they incur in costs for adjusting the flow of investment. This implies that investment does not surge immediately after the monetary shock.

The model is also able to reproduce the sluggish response of both inflation and wages to the policy shock. The behavior of wages is rooted in the assumption that in each period only a fraction of households is able to reoptimize wages. The remaining households update their wages with lagged inflation. The amount of labor supplied by each household in equilibrium is then determined by the intersection of this wage-level with the demand for labor by firms. This mechanism implies a slow and gradual adjustment of nominal wages, due to two reasons. First, a significant fraction of households updates nominal wages with past inflation. Second, the fraction of agents that is able to change wages balances the expected marginal utility of leisure with the

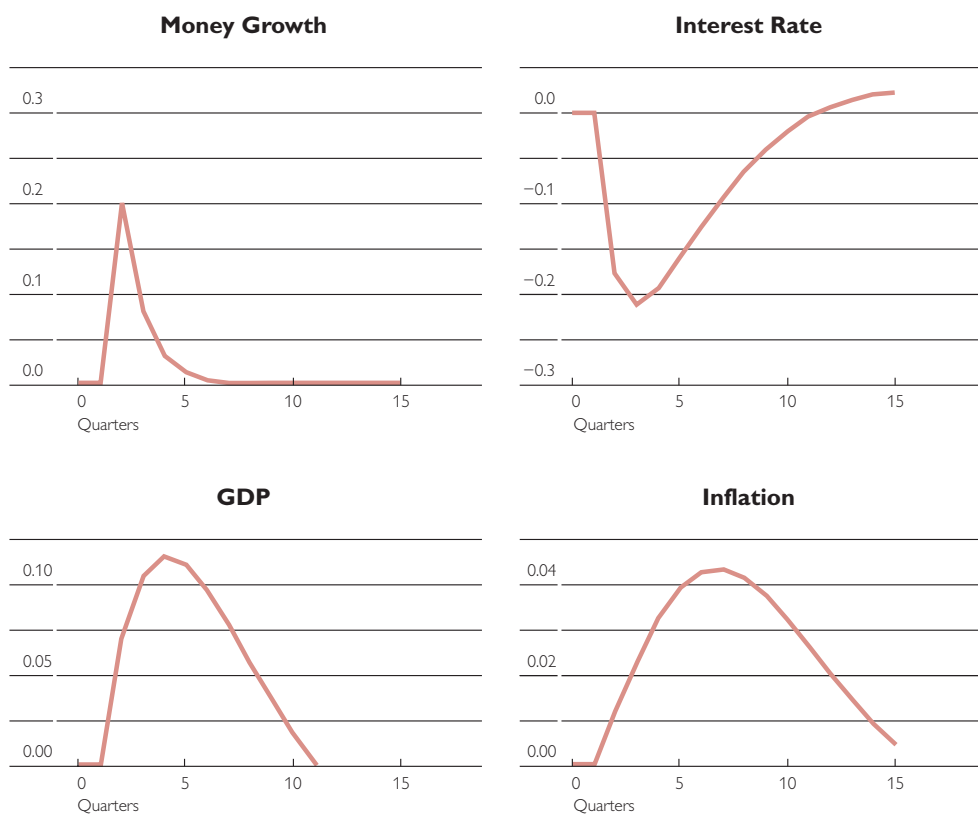
expected marginal utility of wage income. However, they know that the labor demand targeted at their labor services changes when they adjust their wages. Since households have a desire to smooth labor supply over time, they choose not to change wages by much.

The behavior of inflation is closely related to the evolution of wages. With completely flexible price-setting behavior by firms, prices are set as a constant mark-up over nominal marginal costs. The latter depend on nominal wages, the rental rate on capital and the interest rate (the latter affects marginal costs because it is assumed that firms have to borrow their wage bill in advance). The assumptions described above ensure that the response of marginal costs is muted after a monetary shock. This explains why the model displays an inertial behavior of inflation, even with perfectly flexible prices. The additional impact of assuming that a fraction of firms do not change prices each quarter contributes even further to the inertial behavior of inflation, even though it is not crucial to replicate the general equilibrium effects of the monetary policy shock.

This brief description of the transmission mechanism is important not only to depict the nominal frictions and the real features that are necessary for the model to conform with the data but also because it highlights those features that are not central to the monetary transmission mechanism. Here, we highlight three of those features.

First, the model is silent on the role of credit market frictions in the economy. This suggests, in line with Angeloni et al. (2003a), that the

**Impact of a 0.2 Percentage Point Monetary Injection
in the Theoretical Model**



Source: Author's calculations.
Note: Percent deviations from steady state, except interest rates, in percentage points.

role of banks may be less important than some studies focusing on the credit channel of monetary policy suggest. Second, asset price fluctuations do not seem to play a significant role in the propagation of monetary policy shocks. Finally, the model is a closed-economy framework, which suggests that the response of net exports to the monetary shock is not empirically important to understand the transmission mechanism in both the euro area and the U.S.A.

5 Implications of Current Financial Market Trends for the Monetary Transmission Mechanism

The model described in the last section does not assign a significant role to financial market frictions⁵ in the understanding of the monetary policy transmission mechanism. In fact, the relevant frictions in the model are the existence of habits in the households' preferences for consumption, the existence of nominal frictions in wages and prices and the possibility of variable capital utilization by firms. However, this does

⁵ Here we ignore the fact that the existence of financial intermediaries per se requires the presence of some financial market imperfections.

not mean that the importance of financial markets in the transmission mechanism should be minimized. In fact, what the model conveys is simply that we can understand the mechanics of the transmission mechanism as observed in the euro area by modelling the financial markets as frictionless and the financial intermediaries as behaving competitively. Of course, these are merely approximations to the actual behavior of financial markets in the euro area. Nonetheless they imply that, despite the heterogeneous degree of financial market integration in the euro area described in section 2, financial markets in the euro area – taken as a whole – do not seem to introduce significant distortions in the transmission of monetary policy.

It seems, therefore, that financial markets in the euro area have already achieved a stage of development where they do not induce significant frictions in the transmission of monetary policy. This obviously underscores the importance of financial markets in this process. In fact, the transmission mechanism would be radically different in a context of less efficient financial structures, in particular in what concerns the degree of competition and technological progress. In a similar vein, we should stress that the absence of a special role for a credit channel does not imply that from a microeconomic point of view this channel is non-existent. Again, the model simply teaches us that this channel is not quantitatively significant from a macroeconomic perspective.

Building on the empirical evidence described in sections 2 and 3 and the theoretical construct presented in section 4 we now try to understand the importance of financial markets in several dimensions of the transmission mechanism. This description will also highlight reasons for failing to find a significant role for financial frictions in the context of the euro area.

5.1 The Role of Expectations

In section 4 the monetary transmission was described by tracing the impact of a monetary shock throughout the economy. However, central banks do not conduct monetary policy by randomizing their policy and “shocking” the economy. Instead, monetary policy is usually conducted in such a way that the central bank responds in a systematic way to developments in the economy. This systematic part is actually the core of monetary policy. In this context, financial markets play the crucial role of interpreting monetary policy decisions and transmitting them to prices across the various segments of the market. In this process, expectations concerning the path of monetary policy in the future matter greatly.

As emphasized by Woodford (2003), a central bank affects the decisions of the private sector not only through the decisions concerning the level of intervention rates but, more importantly, through the market expectations concerning the average level of interest rates in the future.⁶ Therefore, a successful mon-

⁶ This channel is obviously present in the model described in section 4. For example, the Euler equation related to the households' intertemporal decision implies that the current level of consumption depends – among other elements – not only on the current level of interest rates but also on expectations concerning the future path of interest rates.

etary policy must aim at influencing market expectations concerning future interest rates, which, through arbitrage relations, then influence other financial market prices, such as long-term interest rates, exchange rates and asset prices.

It should be clear that better information concerning the central bank's decision process increases its ability to affect the markets' expectations and, ultimately, households and firms' decisions. In this context, both the increased transparency of central bank communication and the increased sophistication of financial markets improve the impact of monetary policy on the economy. Ultimately, in the absence of financial market frictions, monetary policy needs to be less aggressive in order to achieve its goals, since financial markets smoothly transmit the policy decisions to the overall economy.⁷

An efficient and well-integrated financial system is therefore an ally to the transmission of monetary policy. This assessment applies to all segments of the financial system. An illustration of these effects can be observed in the behavior of the short-end of the money market yield curve and the long-term inflation expectations after the introduction of the euro. As reported in Gaspar et al. (2001), there were not significant systematic errors of financial markets concerning the ECB's monetary policy announcements since 1999. This suggests that the transmission of policy changes to the fi-

ancial markets operated smoothly and efficiently. As for the long-term inflation expectations, it is interesting to observe that monetary policy movements have not changed either the level or the volatility of market inflation expectations as measured by the Consensus Economics Forecasts. This is a clear sign that both the goal and the implementation of monetary policy in the euro area are credible to the eyes of the market.

Another interesting example of the role of expectations relates to the importance of fixed-interest rate loans in the monetary transmission mechanism. In fact, the impact of variable-rate or fixed-rate contracts is less important than usually reported in the literature when the role of expectations concerning the future policy of the central bank is taken into account. In fact, even though the share of fixed-rate contracts affects the speed and extent of the pass-through of policy rates to money market rates, the impact on the remaining financial market prices depends only on expectations of future policy and arbitrage relations. With efficient financial markets,⁸ the shadow price for households and firms of a change in monetary policy should not depend on the nature of the interest-rate contract. Unless the central bank distorts the market by manipulating expectations – which is obviously unwelcome – fixed and variable rate contracts should ultimately impact similarly on the transmission of monetary policy to the real economy.

⁷ Note that here we are focusing on the anticipated part of policy. In the case of monetary policy shocks, i.e., the unanticipated changes in the central bank's policy, the absence of frictions implies that monetary policy does not affect real allocations.

⁸ This argument assumes that the share of agents with liquidity constraints, i.e., that are unable to have full access to the financial market, is not quantitatively significant from a macroeconomic point of view.

In conclusion, the ongoing process of removal of financial market frictions in the euro area is conducive to a more efficient signalling and transmission of monetary policy to the markets. In the next subsection, we will reinforce this conclusion with the case of the credit market.

5.2 The Role of Credit Market

Frictions

In the theoretical model described in section 4 no special role was assigned to credit market frictions in the transmission of monetary policy. Since that model is able to replicate qualitatively and quantitatively the effects of a monetary policy shock, we concluded that the role of credit market frictions in the transmission mechanism is not pivotal from a macroeconomic point of view.

We can try to understand this result by looking at the models that incorporate credit market frictions. These models usually focus on two distinct channels: the broad credit channel and the bank-lending channel.

In the broad credit channel, firms and consumers need have to present collateral to obtain a loan. In the presence of information and agency costs, declining collateral values increase the premium that borrowers must pay for external finance, due to adverse selection and moral hazard issues (see Gertler and Gilchrist, 1994).

The bank-lending channel focuses more directly on the role of banks. It is based on the view that bank loans and bonds are imperfect substitutes in the balance sheet of banks (Bernanke and Blinder, 1988, and Kashyap and Stein, 1995). Since banks rely on reservable demand de-

posits as a source of funds, contractionary monetary policy will reduce the availability of bank loans.

The above description suggests that the credit channel will be more operative in cases where there are significant information asymmetries between borrowers and lenders, when a large fraction of investment is financed through bank loans and when the health of the banking system is weak. There are many macroeconomic indicators concerning these dimensions of the data that suggest the existence of a role for banks in the euro area (see Bean et al., 2003). However, it is difficult, if not impossible, to deduce the importance of the credit channel from merely observing those macroeconomic variables. The literature has therefore focused on microeconomic evidence in order to test these channels. Overall, it is fair to say that the available evidence is not conclusive concerning the quantitative macroeconomic importance of these channels (see Angeloni et al., 2003a).

The recent financial trends in the euro area – namely the process of financial deregulation and innovation – tend to reduce the importance of credit channels in the transmission of monetary policy. In fact, the combination of reduced information asymmetries, increased liquidity in financial markets, increased competition between banks in the euro area and increased access by firms to direct market-based finance implies that credit interest rates are set more in line with market conditions and that banks channel funds between agents more efficiently. These trends also imply a more rapid transmission of monetary policy to the non-financial private sector. Finally,

the high degree of financial stability observed in the euro area countries in the past suggests that the banks for which the credit channel could be important may account for a small fraction of total bank lending in the euro area.

These arguments lend additional support to the conclusion that financial markets in the euro area do not impose significant frictions on the aggregate monetary transmission channel.

Another special feature of the banking system in some countries in the euro area is the presence of long-term relationships between customers and specific banks (the so-called “relationship lending”). This risk-sharing scheme usually involves small banks, which insulate some customers from adverse monetary policy shocks, in exchange for a certain premium.⁹ In the euro area, this type of reciprocal behavior is important in Austria, Finland, Germany, Italy and the Netherlands (see Ehrmann et al., 2003).

As discussed in Issing (2003), the recent trends in European financial markets may diminish the extent of relationship lending. In fact, the increased competition between financial institutions may reduce the ability of banks to insulate customers from changes in money market rates. However, the existence of bank networks may mitigate the impact of adverse monetary policy shocks in the behavior of some banks.

5.3 Impact of Heterogeneous

Financial Behavior

In section 2 we showed that certain cross-country heterogeneities exist

in the euro area (and are likely to persist in the future). These heterogeneities may introduce asymmetries in the transmission mechanism in a monetary union. For example, Cecchetti (1999) forcefully argues that the heterogeneity observed in financial structures in the euro area is rooted on differences in legal structures. He concludes that unless these structures are harmonized across countries (namely in what concerns the rights and obligations of shareholders and creditors) one cannot expect an homogeneous transmission of monetary policy in the euro area in the future.

Again, in order to evaluate this argument, one needs to think of this mechanism in the context of a general equilibrium model. It is clear, however, that the model described in section 4 is not helpful in this inquiry, since it does not introduce any financial market segmentation. Looking at models that extend a standard monetary model to a monetary union context with either heterogeneous financial structures (as in Giovannetti and Marimon, 2000) or heterogeneous household participation in the financial market (as in Alves, 2003) some interesting insights emerge.

First, the effects of the single monetary policy on the macroeconomic aggregates of the monetary union depend on the degree of financial market segmentation. Second, with segmented financial markets, there is an asymmetric distribution of liquidity in the union after a monetary policy shock. This occurs despite there being full capital mobility between countries. This asymmetric liquidity distribution im-

⁹ Relationship-lending may also guarantee the financing of businesses that become non-profitable.

plies different allocations across countries. In particular, a monetary policy shock leads to permanent trade balance and current account effects.

Even though the aggregate quantitative impact of the existing heterogeneity in financial structures across euro area countries is hard to quantify, there arguably exist heterogeneous distributive effects following a monetary policy shock in the union.

The degree of financial market segmentation may thus be an important friction to understand the monetary transmission mechanism in a monetary union. In this context, an interesting question is whether the existence of this segmentation affects the optimal monetary policy of the central bank. Adão, Correia and Teles (2003) show that if this is the sole relevant friction in the union, the optimal monetary policy remains the Friedman rule. With this rule, the financial frictions are undone, and the allocation in each country is symmetric. In this sense, the existence of financial market segmentation is irrelevant for monetary policy. However, it seems clear that there are frictions in the euro area economies other than financial market rigidities, which imply that monetary policy *per se* will be unable to undo all the distortions in the economy. This theoretical analysis has a clear policy implication: it calls for even further integration of financial markets in the euro area, in order to guarantee that these heterogeneous transmission channels cease to operate.

6 Conclusion

This paper assesses the impact of financial market frictions in the monetary transmission mechanism of the

euro area. It emphasized that there are several crucial areas where the integration and deepening of financial markets have progressed dramatically in the recent past. These are notably the cases of the integration of money markets and the increased efficiency in the banking sector. We also noted that there are some segments of the market that display fragmented structures, as the corporate bond and equity markets. Further, we illustrate a number of national asymmetries that persist between financial structures in the euro area.


We then proceed to describe the monetary transmission mechanism in the euro area, focusing on a state-of-the-art theoretical general equilibrium model. This model mimics almost to perfection the transmission mechanism that is estimated for individual euro area countries or for the area as a whole. It is therefore a solid description of the mechanics of the transmission of monetary impulses to the economy. This model does not embed any frictions in financial markets. This suggests that the functioning of financial markets in the euro area does not cause significant distortions in the transmission of monetary policy, at least from an aggregate macroeconomic point of view.

When tracing the reasons and implications of this result, we highlighted three features. First, expectations concerning the current and future path of monetary policy are the crucial element of the transmission mechanism. The integration of financial markets has allowed a smooth transmission of information concerning the systematic behavior of the monetary authority, and has contributed to the high degree of

credibility and predictability of its actions. Second, credit market frictions do not seem to be particularly relevant in the transmission of monetary policy in the euro area. This can be understood by noting the increased size and efficiency of the banking sector and the technological developments that have reduced information asymmetries across economic agents in the euro area. Third, there are several persistent sources of heterogeneity in financial markets in the countries of the area. This heterogeneity may imply asymmetric effects of common shocks across the countries of the area.

Naturally, some of these conclusions are tentative, since they rely on extrapolations from the pre-euro monetary regime. Only when long-series for the actual euro area are available may we accurately bring this assessment to the data. One should also note that the introduction of the euro has by itself contributed to endogenously remove some of the financial market frictions prevailing across countries. The convergence of inflation expectations is a clear example in this respect.

Our overall conclusion is that financial markets already perform an efficient role in transmitting monetary policy to the real economy in the euro area. Nonetheless, further removal of existing barriers in order to achieve full market integration is naturally welcome. In this context, the complete implementation of the Financial Services Action Plan, which aims at creating a single EU wholesale market and an open and secure retail market by 2005, should be high on the policy agenda. This would not only contribute to an even smoother and more efficient

transmission of monetary policy throughout the euro area but, ultimately, it would bring welfare gains to the euro area citizens. 

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