An evaluation of monetary policy transmission in the context of the European Central Bank

A Report to the European Parliament

by

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1 Introduction

In preparing for EMU, a large number of studies have been written which ask the time-honoured question: Is the EMU an optimal currency area ? In the tradition of Mundell (1961), this literature focused on the symmetry of supply shocks (Bayoumi and Eichengreen, 1993), on the working of fiscal shock absorbers (Eichengreen and Wyplosz, 1998), on the ability of capital and credit markets to smooth regional fluctuations in income (Asdrubali et al., 1996, Fatàs, 1998), on factor mobility, on relative price flexibility, and on redistribution (Obstfeld and Peri, 1998.) These studies typically assume that the countries joining to form a currency union share similar economic structures, and ask how they could cope with asymmetric shocks once they were to lose the ability to set monetary policy independently.

The focus of this Report is different. We overlook the question—by now *passeé*—whether a single monetary policy in Europe is desirable, and ask instead how is the same monetary policy transmitted to the economies of the different member states.

When faced with the issue of the transmission mechanism inside EMU, two question become relevant: (i) What do we know on the way the transmission mechanism works today ? (ii) Is the transmission mechanism likely to change as a result of EMU ?

Think, as an example, at the consequences of a decision, by the ECB Board, of adding 50 basis points to the Euro money-market rate. How effective would such a rise be at dampening EMU-wide demand ? And how different, both in terms of timing and magnitude of the effects, wiould the impact be on the various member states?

The importance of these questions can hardly be exaggerated. The extent to which the monetary transmission mechanism works asymmetrically across EMU is critical for the ability of the European Central Bank to run a single monetary policy. If the consequences of, for instance, a monetary contraction were different from one country to another--both in terms of the timing and the magnitude of the responses of the relevant variables--the output cost of maintaining price stability could be quite unevenly distributed across EMU.

The available evidence on the transmission mechanism in Europe is, however, difficult to interpret. What we know is based on data generated, at best, during the EMS period--quite a different regime from EMU. The evidence thus has to be interpreted in order to understand to what extent it is affected by the particular policy regime from which the data are drawn.

In what follows we shall first analyse the issue of asymmetries in monetary mechanisms by looking, in turn, at theory, institutional evidence and empirical evidence. Finally we shall point to what we believe are some of the most urgent policy implications.

2 Theory and institutional evidence: how does the monetary transmission mechanism work in Europe?

The *regional* impact of a monetary tightening is rarely at the forefront of debate. Even in large countries, such as the U.S., that include regions with a very different make-up of economic activity there is typically more discussion of the regional impact of oil prices than of a monetary tightening. Some studies have addressed the regional issue in the case of the U.S. (see e.g. Carlino and deFina, 1996). The finding, not surprisingly, is that monetary policy has an above average effect on the Great Lakes States and a below average impact on the South West and Rocky Mountain States. Most other regions, accounting for about 70 percent of U.S. income, respond like the country-wide average.

It is perhaps the good fortune of the Federal Reserve that the discussion really never got to this point. Yet, one cannot assume that in the EMU, with countries still largely the frame of reference, this issue will not become a very lively one. As a matter of fact, it is already alive, since for a decade at least it has been at the core of the discussions on the appropriateness of German monetary policy for, say, France or Italy.

Monetary policy exerts its impact via interest rates, credit allocation effects and asset prices. We shall thus analyse the importance of asymmetries by looking in turn at these three channels of monetary transmission. Note that they are not alternative channels: they can in principle operate simultaneously. We start from the interest rate channel.

2.1 The interest rate channel

The interest rate channel is the textbook channel: a change in interest rates affects new marginal spending by modifying the cost of capital and borrowing conditions. This direct effect works on consumption and investment, and it is generally believed to act most strongly on the consumer durables and investment, via user cost.

The impact of monetary policy on consumers expenditure on non-durables goes through income and substitution effects. The substitution effect predicts unequivocally a reduction in consumption: when real interest rates increase, the returns to saving increase thus depressing consumption. The income effect is not so clearly determined a priori. If consumers' decision are based on current and discounted future income, then higher interest rate will have a contractionary impact on consumption as they reduce future discounted income. Such effect, however, can be compensated by a higher return on wealth: if consumers are net creditors, a rise in interest rates increases their wealth. On the other hand, consumers indebted at a floating rate linked to short-term rates, will see their cash flows reduced by the rise in short-term rates, and will thus cut their spending. Such effects will be weaker where additional finance is readily available. There are large cross-country differences in the proportion of consumer debt at floating rates. There are also cross-country differences in whether tax relief is accorded for interest payments on debt—with the result that a given percentage point rise in the interest rate on debt will have different after-tax effects in different countries.

Additional effects can be generated by the impact of monetary policy on the perceived uncertainty of income. Income uncertainty can plausibly be proxied, in empirical models, by changes in the unemployment rate: this captures well the perception of consumers of the probability of job losses. The unemployment rate tends to respond with a lag to rises in short-term interest rates, thus capturing part of the dynamic response of consumption.

European consumers differ a great deal in their net asset positions (see Table 1). In northern countries, the UK and Sweden in particular, consumer borrowing is widespread, and households have substantial financial liabilities. In Southern Europe, instead, consumer credit is underdeveloped, and the same applies to the high-debt states, Belgium, the Netherlands and Italy, where the need to finance large budget deficits has been one reason for preventing the growth of the consumer-debt industry. Germany's relatively higher level of consumers' debt is mostly accounted for by housing mortgages. As mentioned above, the maturity of households debt affects the impact on individuals' cash flows of a change in short term rates. Italy stands out on three accounts: for the particularly low level of consumer debt, for the fact that it is mostly short term (the share of consumer debt at adjustable interest rate is very high also in the UK), and for the high level of net interest income as a share of total disposable income – the result of the very large share of public debt directly held by households.

An increase in interest rates depresses consumption where financial liabilities are high, as in the UK and Sweden, but also in Spain, while it raises disposable income and spending in Italy, Belgium and the Netherlands. In the UK, for instance (Bank of England simulation discussed below) following a 1 percent increase in short term rates, consumption falls 27 basis points below the baseline; in Belgium and the Netherlands it initially remains essentially flat, independently of the exchange rate regime assumed.

Table 1 The balance sheet position of households
(percent of annual disposable income, 1993)

	Households financial liabilities (% of dispos. income)	Composition of household debt:		Borrowing at adjustable interest rate		Net interest received by by househ.
		bank loans	l-t debt	% of total	mortgages	
Germany	77.9	100.0	72.4	36	90	4.2
Netherlands	64.9	75.8	59.0	8	> 90	10.1
Belgium	41.5	n.a.	23.5	18	majority	6.1
France	51.0	82.2	43.9	13	5 (*)	0.2
Spain	58.0	88.3	n.a.	n.a.	80	4.2
Italy	31.4	94.6	14.7	59/69	75	11.4
Sweden	100.3	90.2	57.3	n.a.	10	-5.5
UK	102.0	97.5	77.6	90	90	5.2 (**)
United States	92.0	39.2	67.9	34	15	7.3

Source: BIS (1995)
(*)The lender retains discretion over the time ad size of adjustments.
(**) The UK number includes dividend income.

The maturity of firms' and households' debt is thus an important determinant of an asymmetric transmission along the interest rate channel. The share of bank lending at short, or adjustable, rates is very different across Europe. There are two countries, the UK and Italy, where most of firm borrowing is short-term, either because, as in Italy, the nature of the contract is short-term, or because contracts are indexed to short term interest rates, or in any case are adjustable at relatively short frequencies. On the contrary, in the countries traditionally characterised by low inflation, lending is predominantly at fixed rates.

The relevant lending rate is also an important variable, because a decision by the ECB to change the policy rate can have different effects at the short and at the long end of the yield curve. For instance, if the ECB reacts to an «inflation scare» by raising the short rate, the long rate may actually fall. It thus makes a great deal of difference if a firm borrows long or short. Given the distinction between Italy and the UK, on the one side, and the rest of continental Europe on the other, a common monetary impulse from the ECB should thus translate relatively faster into changes in spending in the first two countries.

Table 2 documents the conditions of lending contracts in Europe and, for comparison, in the United States. The share of lending at short term rates is particularly short in Italy, in Austria and in the UK. Lending terms appear to be short also in Spain – a finding that seems at odds with the evidence indicating a very slow transmission mechanism in that country. Borio (1996) notes that Spanish lending rates, although adjustable at short intervals, really tend to behave like long-term rates because of the sources of financing of Spanish banks.

Table 2 Credit at adjustable interest rates

Short-term credit, plus medium and long term credit indexed at s-t interest rates, or adjustable at a frequency < one year, percent of total credit

		by sector:		by instrument:
	all sectors	households	firms	bank loans
Germany	39	36	40	45
Austria	74	--	--	76
Netherlands	25	8	37	35
Belgium	44	18	67	51
France	44	13	56	--
Spain	43/64 (*)	--	--	47/70
Italy	73	59/69	77	79
Sweden	35	--	--	70
UK	73	90	48	85
United States	34	31	35	35

Source: BIS (1995)

(*) 43 percent indexed to short-term rates, 64 percent adjustable within a year.

2.2 The credit channel

A change in interest rates can affect spending decisions through two additional channels that are related to a country's financial structure (The so-called «credit» and «broad credit» channels, see Bernanke and Gertler, 1995). The credit channel works when loans and bonds are imperfect substitutes in the balance sheets of banks and firms: following a squeeze in liquidity, banks reduce the amount of loans they supply; firms could turn to the bond market, but if bonds and loans are imperfect substitutes, the external finance premium will go up, amplifying the effects of the monetary tightening. A broad credit channel, instead, works independently of the imperfect substitutability between loan and bonds: it is associated with the credit constraints which may arise when firms' ability to borrow depends on the availability of collateral. An increase in interest rates reduces the market value of collateral (real estate values, for instance) thus affecting a firm's access to bank lending. (See Kiyotaki and Moore, 1997.)

As is well known, macroeconomic time-series are ill-suited to identify a "credit" channel from a "money" channel in the transmission of monetary policy from the central bank to banks. This is

because the money channel works through banks' liabilities, while the credit channel works through their assets, but assets and liabilities are tightly related by accounting identities. For this reason the evidence proposed by macroeconomic studies which look at output and price fluctuations in response to shifts in the quantities of loans and deposits is rarely decisive (see Bernanke-Blinder, 1992). For these reasons the most convincing empirical studies on the relevance of the credit channel have used microeconomic data, and have investigated whether the responses of banks and firms to a shift in monetary policy differ according to their characteristics, their size in particular. Small firms are more likely to be liquidity constrained and to depend on banks for financing. Similarly small banks find it more difficult to insulate their loans' portfolio from a squeeze in central bank liquidity. This is because a small bank typically cannot use bond holdings as a buffer (Kashyap Stein, 1995, Kashyap, Stein and Wilcox 1993).
The credit channel will be relevant in the EMU because, especially in continental Europe (see Tables 3 and 4), banks provide the bulk of firms' financing needs. The contrast with the US and the UK is particularly striking: British and American firms raise on the capital market 3-4 times as many funds as any continental European firm, with the possible exception of France, where securities' markets have recently developed quite fast.

Table 3 Liabilities of non-financial enterprises

	Securities (loans+securities = 100)		Share of bank loans in total debt liabilities	
			all non-financial enterprises	239 world largest mftg. co.
	1993	1983	1993	1995
Germany	6	2	85.1	63.1
Netherlands	3	4	78.6	47.8 (Benelux)
Austria	2	3	n.a.	--
Belgium	7	12	89.9	--
France	15	8	80.2	46.8
Spain	9	10	77.3	--
Italy	5	7	94.6	73.1
Sweden	4	5	80.9	46.8 (Scandinavia)
UK	19	17	49.4	36.0
United States	20	17	32.4	11.0

Sources: BIS (1995), R&S (1997). Private placements of long-term securities, whose status lies somewhere in-between loans and market instruments, in some countries (US) are counted among securities, in other among loans.

Table 4 Financial Structure
(1996, Share of GDP)

	Debt & Equity	Bank Assets
EU	147.8	175.6
US	246.3	68.9

Source: Authors' calculations based on IMF data

Evidence on the role of collateral in the provision of bank loans also points to significant differences across Europe. Sweden and the UK stand out: more than one half of total loans are backed by collateral, suggesting that in these countries a change in interest rates may have a stronger effect on real activity. The ratio is high also in France, as witnessed by the collapse of Credit Lyonnais following the fall in French real estate prices.

Table 5 Collateral
percent of total loans backed by real estate
households and firms, 1993

Germany	36
Austria	31
Netherlands	36
Belgium	34
France	41
Spain	33
Italy	40
Sweden	>61
UK	59
United States	66

Source: BIS, (1995).

One reason why the role of banks could give rise to asymmetries in the monetary mechanism, is related to the special relationship between a bank and its customers. When lending is organised in a competitive securities' market, lenders have no reason to cushion the effect on the borrower of a change in policy-determined interest rates. Instead, a bank which appreciates the long-term relationship with its customer, will be prepared to absorb, at least temporarily, some of the consequences on an interest rate hike, anticipating that it will be able to make up in the future (see Allen and Gale, 1997.) The evidence in Table 6 points to significant differences in the magnitude, and especially in the timing of the response of bank lending rates to a change in central bank controlled interest rates. The adjustment is instantaneous and complete in the UK. In Germany, one quarter after the change in the policy rate, only a third of such change has been transferred to the loan rate, and the adjustment is still far from complete after one year. This evidence confirms the tight relationship between banks and firms in Germany. The response is even slower in France, where a year after the change in policy rates only one half has made it to the lending rate. Sluggishness is lower in Italy, Spain, Belgium and the in Netherlands.

Table 6 The response of bank lending rates to a change in the rate controlled by the central bank

Response to a 100 basis points increase in policy rates
Lending rates are on short-term loans, typically overdrafts of business clients.

	after:	one month	one quarter	two quarters	one year
Germany		0	36	53	74
Netherlands		71	95	102	103
Belgium		63	95	93	93
France		51	53	55	58
Spain		0	100	104	105
Italy		19	72	97	106
UK		100	100	100	100
United States		70	77	83	85

Source: BIS (1995).

A similar exercise run by the IMF (World Economic Outlook, October 1996, p. 44) confirms these findings. In the IMF estimates a one hundred basis point increase in the policy rate raises bank lending rates by 45 basis points in Germany, 51 in France, 73 in Italy.

Kashyiap and Stein (1997) provide an interesting summary of factors affecting the lending channel in Europe, by grading each of them from A to C. A indicates low effect of lending channel sensitivity to moneary policy , C indicates high sensitivity. We report their evidence in Table 7.

Table 7 Summary of factors affecting the lending channel in Europe

	Importance of Small banks	Bank health	Importance of small firms	Availability of nonbank finance	Overall potency
Germany	C	B	A	B	B
Netherlands	A	A	C	B	A/B
Belgium	A	B	B	A	A/B
France	B	C	B	B	B/C
Spain	B	B	C	B	B
Italy	B	C	C	C	C-
UK	A	A	A	A	A

Source: Kashyap-Stein (1997).

2.3 The assets' price channel

Lastly, monetary policy is transmitted to the economy activity via asset prices: the exchange rate, equity prices, the price of houses.

The exchange rate channel is set in motion when monetary policy affects the external value of the Euro, thus opening up the potential for differential effects across countries. A rise in Euro-rates, other things equal, will lead to an appreciation. This in turn leads to reduced import prices, including imported intermediate goods and materials, but also to a loss of competitiveness for exporters and import-competing firms. Terms of trade improvements, as a result of an appreciation, imply a gain in real income, but the competitiveness effect may lead to a decline in output and employment.

The degree of openness across European countries differs significantly. Part of those differences involve intra-European trade and does not interest us here. But the part that involves extra-European trade is large enough to be of interest (see Table 8). The UK and Ireland, and to some extent also Germany, are relatively more exposed to fluctuations in cross-Atlantic competitiveness. Given these differences in extra-European openness, monetary policy will have a differential impact. Countries that are more open will experience more of the loss in competitiveness that comes with tight money, and more of the terms of trade improvement.

Table 8 Openness of EMU Members

	Overall	Share of exports directed:				
		outside EMU-7	outside EMU-11	outside EMU-15	to North-America	to Cz,Hun,Pol
Austria	24,2	59,0	46,0	41,0	4,1	4,9
Bel-Lux	51,4	51,0	40,0	29,0	7,9	0,1
Denmark	26,5	-	-		4,1	2,0
Finland	27,5	-	43,0	39,0	7,6	1,8
France	18,2	68,0	49,0	38,0	7,5	0,5
Germany	19,7	69,0	57,0	44,0	8,1	4,5
Ireland	58,9	65,0	57,0	28,0	13,0	0,1
Greece	16,1	-	-	46,0	6,2	1,0
Italy	20,0	-	53,0	45,0	7,0	0,2
Netherlands	37,5	47,0	38,0	25,0	7,0	0,1
Portugal	27,6	-	36,0	20,0	4,3	0,1
Spain	18,4	-	38,0	29,0	5,9	1,1
Sweden	28,4	-	-	44,0	6,0	1,4
UK	22,7	-	-	47,0	13,2	0,9

Source: European Economy. Data refer to 1995.

Consider next the impact of a change in interest rates on the housing market. As pointed out by Mc Lennan et al. (1998), in many European countries housing wealth accounts for over half of total household net wealth: we should thus observe substantial interest rate effects on consumer expenditure via changes in housing wealth.

Simple life-cycle consumer theory suggests that a long-lasting rise in real house prices has both a positive wealth effect on non-housing consumption, and negative income and substitution effects. The positive wealth effect will dominate for owner-occupiers. However, for tenants in the rental market, the effect is unambiguously negative. The intuition for this is that those continuing to rent can expect higher future rents when house prices rise, while those aiming to purchase a house will have to save more for a deposit, and can expect to have higher total costs. However, we also have to consider the wealth effect for landlords or the institutional investors owning rental housing. If these wealth effects are smaller per unit of wealth than for owner-occupiers, (e.g. because of liquidity considerations discussed below), then, other things being equal, the higher the proportion of owner-occupiers and the lower the proportion of households in the rental market, the larger will be the consumption response to a rise in house prices. Table 9 reports large variations in these structural characteristics across Europe.

The simple life-cycle model does not capture the whole story. Liquidity is an important characteristic of housing—and one that exhibits a lot of variation across Europe. The key liquidity characteristics concern transactions costs and restrictions, asset price volatility and the collateral role of the asset. We report in Table 10 evidence on transaction costs and taxation on housing .

Table 9: Tenure and Public Spending in Housing

Country	**Owner occupied**[1]	**Social rented**	**Private rented**	**Other**	**Outstanding mortgage debt (percent of GDP.)**
Belgium	67	6	27	0	22
Denmark	50 (1995)	18	18	13[3]	65
Germany	38	26	36	0	51
Greece	76	0	24	0	6
Spain	78	1	13	8[4]	22
France	54	17	21	8[5]	21
Ireland	79	10	8	3	27
Italy	68	6	18	8[6]	7
Lux	70	…	26[2]	4	…
Netherlands	48 (1995)	38	14	0	60
Portugal	67	3	24	6	26
UK	67 (1995)	23	10	0	57
Austria	54 (1995)	20	18	7[7]	31
Finland	62 (1995)	16	14	8[8]	30.8 (1996)
Sweden	39	22	22	17[9]	51
EU-15	56	18	21	5	…

Source: McLennan et al. (1998)
Notes:
1. Tenure expressed as % housing stock; around 1990, unless stated otherwise.
2. Includes small social rented sector
3. Includes vacant dwellings, co-operatively owned dwellings, publicly owned dwellings, and dwellings whose ownership is unknown
4. Includes vacant dwellings, dwellings whose ownership is unknown, and dwellings provided without charge
5. Includes furnished tenancies, subtenancies and dwellings provided without charge
6. Includes dwellings provided without charge
7. Includes official dwellings and dwellings provided as payment in kind
8. Includes vacant dwellings
9. Includes co-operative sector

Table 10: Transaction Costs and Labour Mobility

Country	Total Transaction Cost as % Price[1]	Taxation Tax as % Price[1]	Inter-regional Mobility (% of population) 1993
Spain	10.4	6.4	0.56
France	13.8	10.0	1.07
Germany	7.1	2.0	1.23
Italy	7.4	4.2	0.50
UK	2.0	1.0	1.58

Source: McLennan et al. (1998)
Notes:
1. on £80,000 property

Institutional and historical differences can also impact profoundly on the link between short-term interest rates and house prices. Where pension funds and similar institutional investors own a large fraction of rental housing, the wealth effects on consumer expenditure of higher house prices would be smaller, per unit, than for the owner-occupied sector. The reason is that pension wealth is a rather illiquid component of consumers' portfolios.

To summarise, countries with pay-as-you-go social security and pension systems, a large rental market, high transactions costs for housing, limited availability of consumer credit, and fixed-rate mortgage markets, are likely to exhibit weak asset price effects.

2.4 Summing up the institutional evidence on financial structure and the monetary mechanism

To sum up the institutional evidence presented above, we extend the exercise shown by Kashyap and Stein (1997) whose purpose is to grade the importance of each channel of monetary transmission in Europe. We report our results in Table 11. The table reports marks attributed on the basis of the institutional analysis reported in Tables 1-10: the higher the potency of monetary policy the higher the mark.

We note immediately that the analysis of the different channels does not deliver an unequivocal ranking: there are ample possibilities for compensation between different effects. France, Germany and Spain, show a relatively homogenous overall response to monetary policy. Italy features a definitely stronger lending channel, somewhat compensated by short-term bank credit and the balance sheet position of households, which work in the opposite direction. The UK is a rather special case in that the interest rate and asset price channels are particularly strong., but the lending channel is relatively weak. In Sweden the fast transmission of monetary policy to output could be related to the importance of bank credit, and thus of the credit channel, to the short maturity of

lending contracts, to the important role of collateral, and to the balance sheet position of households, whose financial liabilities exceed 100 percent of disposable income.

Table 11 **Summary of factors affecting monetary transmission in Europe**
Marks are attributed on the basis of the institutional analysis reported in Tables 1-9: the higher the potency of monetary policy the higher the mark.

		France	Germany	Italy	Spain	Sweden	UK
Interest rate	Balance sheet of households	2	4	1	3	5	6
	Credit at adj.rate	4	4	6	4	4	6
	adjustment of lending rates	2	1	5	5	n.a.	6
Credit	Importance of small banks	4	5	4	4	n.a	1
	Bank health	4	3	5	3	n.a.	1
	Importance of small firms	1	3	5	5	n.a.	1
	Availability of nonbank finance	4	4	5	4		1
Asset price	Exchange rate	3	4	4	2	5	6
	housing	3	4	1	2	5	6

3 The empirical evidence

In this section we turn to the empirical, econometric, evidence to see if the institutional differences we have documented translate into measurable asymmetries in the impact of monetary policy.

In general, the available information on the monetary transmission mechanism comes in two forms: there is evidence based on aggregate data, and evidence based on disaggregated data. For Europe, most of the evidence relies upon aggregated data: there is clear scope for improving our knowledge of the monetary transmission mechanism with studies based on disaggregated data.

3.1 The macro-econometric evidence

The available information here comes in two forms: there is evidence based on "large" econometric models, and evidence based on "small" econometric models. The first is available in compact form thanks to a project organised by Bank for International Settlements (BIS, 1995). The goal of the BIS exercise was to detect cross-country differences in the effectiveness of monetary policy, and ask whether they could be related to cross-country differences in financial structure. The tools used are the large econometric models developed by the national central banks and the multi-country macroeconometric model built by the staff of the Board of Governors of the Federal Reserve, which covers the G7 countries. All models considered use quarterly data, and are used to run the same

policy experiment: a temporary (8 quarters) one percent increase in the interest rate directly controlled by the local central bank. Two recent attempts at evaluating the impact of monetary policy shocks in different countries using small econometric models are the structural vector autoregression (VAR) estimated by Gerlach and Smets (1995),and by Barran, Coudert and Mojon(1997) and the Small Stylised Dynamic Model estimated by the staff of the Bank of England (Britton and Whitley, 1997). These studies differ in the identifying restrictions they impose on the data, but are based on a similar statistical structure --i.e. reduced form.

If these experiments are to be useful in evaluating the monetary mechanism in EMU, the simulations considered should reproduce conditions inside EMU as closely as possible. Three points are relevant. First, the direct effects on prices and output of a change in interest rates should be separated from the indirect effects working through the exchange rates movements induced by the change in interest rates. Exchange rate movements should then be separated into an intra-EMU channel and an extra-EMU (mostly a dollar) channel, as only the first will disappear inside EMU. This is an important point because in the EMS regime we could observe cross-country differences in the transmission mechanism that are simply the consequence of the movements in intra-European exchange rates induced by a change in monetary policy. Second, the exercise should consider the response to a simultaneous change in interest rates in all countries, as this will be the case inside EMU. Third, it should be possible to test the statistical significance of the cross-country differences that are observed in the response of prices and output to a change in interest rates – i.e., given point estimates of the parameters which characterise the monetary transmission mechanism in different countries, one should be able to construct a test of the null hypothesis of homogeneity across countries.

Unfortunately, simulations with these characteristics are not available. In the BIS exercise, only for France, Belgium, Italy and the Netherlands are the simulations run under the assumption of exogenous intra-European exchange rates. For other countries it is impossible to partial out the intra-European exchange rate channel – in particular for Spain, Austria and the UK. Most simulations also consider a change in interest rates occurring in one country at a time, and in none of them it is possible to test the hypothesis of homogeneity in the monetary mechanism. We shall review this evidence, ask how far it can bring us, and then attempt to overcome some of its limitations presenting some new evidence.

3.1.1 Evidence from large econometric models

Table 12 presents the response of output and inflation to a 1 percentage point increase in interest rates lasting two years, estimated using the national central bank models. In a first group of countries (Germany, Austria, the UK, Spain and the United States, that we report for comparison) the exchange rate is endogenous; in the second group (France, Holland, Belgium and Italy) intra-European exchange rates are maintained fixed. Thus the two sets of simulations are not directly comparable. Two facts emerge. The UK and Italy appear to be the countries where monetary policy has the strongest impact on output, Spain the country where the impact is smaller. In the UK the fall in output is twice as large as in Germany in the first year of the monetary contraction, three times as large in the second. In Spain the increase in interest rates has virtually no effect on output.

These results are comparable because are all derived under the assumption of an endogenous exchange rate, but provide little information on the way the monetary mechanism would work the day the intra-European exchange rate channel were closed. Comparisons among the countries in the second group are more informative, as these simulations assume constant intra-ERM exchange rates. The effect on output of the monetary contraction is smaller in Belgium and in Holland, largest in Italy. The Italian response is twice as large as that in Holland both on impact and three years after

the change in monetary policy. The impact on inflation is largest in Belgium and Italy, surprisingly small in Austria. The perverse response of UK inflation in the short run depends on the presence of housing mortgages in the CPI basket considered: it takes three years for the price of mortgages to work its way through the CPI; when the effect is over, the response of UK inflation is relatively strong – stronger than in Germany.

The data in Table 13 can be used to compute output-inflation tradeoffs. These are shown in the Table looking at the four countries for which results are available under the assumption of fixed intra-ERM exchange rates, the tradeoff appears to be relatively more favourable in the small open economies, Belgium and Holland, compared with France and Italy. The effects of a monetary tightening estimated using the Fed MCM model (reported in Table 14) are more similar across countries, suggesting that some of the differences observed when using the national models may be simply due the different specification of such models. The Fed simulation, however, leaves exchange rates endogenous, and is thus not very instructive in view of EMU. Finally, none of these experiments [1] provides a statistical criterion to judge the significance of the observed cross-country differences.

Table 12 The monetary mechanism in Europe according to the national central banks' models
Percent change in output and CPI inflation, following a 1 percent increase in S-T rates in years t and t+1: basis points deviation from baseline. Exchange rates assumption: Germany, Austria, UK and US: all exchange rates endogenous; other countries: fixed infra-ERM exchange rates

	output			inflation		
	year t	year t+1	year t+2	year t	year t+1	year t+2
Endogenous exchange rates						
USA	-7	-50	-121	-3	-21	-68
Germany	-15	-37	-30	-3	-14	-31
Austria	-8	-14	-2	-2	-4	-5
UK	-35	-89	-59	+89	+127	-46
Spain	-5	-1	+3	-5	-12	-22
Infra-ERM exch. Rates fixed						
France	-18	-36	-20	-5	-15	-25
Netherlands	-10	-18	-15	-13	-35	-35
Belgium	-3	-12	-23	-14	-48	-79
Italy	-18	-44	-34	-16	-43	-53

Table 13 Output-Inflation tradeoffs in the central banks' models
Output-Inflation tradeoffs: Ratio between the percentage fall in output and the percentage fall in CPI inflation following a 1 percent increase in S-T rates in years t and t+1.
Exchange rates: fixed infra-ERM exchange rates

	year t	year t+1	year t+2
France (*)	3.6	2.4	0.8
Netherl.	0.8	0.5	0.4
Belgium	0.2	0.3	0.3
Italy (**)	1.1	1.0	0.6

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(*) Exchange rate fixed only vis-a'-vis the 6 main ERM partners.
(**) Exchange rate fixed vis-a'-vis all ERM partners except the UK

[1] In principle such a test could be run in the Fed model which is a simulateneaous multi-country model.

Table 14 The monetary mechanism in Europe according to the Fed MCM model
Percent change in output and CPI inflation, following 1 percent increase in S-T rates in years t and t+1:
basis points deviation from baseline. Endogenous exchange rates.

	output			inflation		
	year t	year t+1	year t+2	year t	year t+1	Year t+2
USA	-46	-58	-17	-10	-23	-14
Germany	-72	-65	-3	-54	-44	-13
UK	-93	-120	-31	-15	-20	-26
France	-68	-70	-10	-48	-44	-17
Italy	-44	-30	-11	-39	-28	-2

Source: BIS (1995)

3.1.2 Evidence from small econometric models

Estimating the effects of a monetary contraction using small econometric models results in less pronounced cross-country differences. The model used by Gerlach and Smets (1995) is a trivariate VAR in prices, output and the short-term interest rate a similar model is estimated by Barran, Coudert and Mojon (1997) who augment the specification by including explicitly the exchange rate, without being very convincing in solving the identification problem[2]**.** The structure of the model is much richer in Britton and Whitley (1997), as it includes domestic demand, imports, exports, short and long rates, inflation, the nominal exchange rate and a few exogenous variables, including the oil price and tax rates. The GS paper uses quarterly data covering the period 1979-1993, while BW consider a longer period spanning from 1964 to 1994, also using quarterly data. GS include all the G7 countries, while BW consider a subset formed by France, Germany and the United Kingdom. Neither model allows for simultaneity across countries. Dornbusch, Favero and Giavazzi(1998) specify a small structural simultaneous model for output in different European Countries to assess the impact of monetary policy at given exchange rate within Europe

Identification is the crucial step in a VAR. This point is very well emphasized by Kieler and Saaranheimo (1998), who clearly show the dependence of the evidence on the identification structure. The GS paper assumes no contemporaneous and no-long run impact of monetary policy shocks on output. This is problematic: the imposition of long-run restrictions requires that all the dependent variables in the estimated system are stationary -- otherwise the long-run responses cannot be constrained because they are explosive-- a condition unlikely to be satisfied by the variables used. The imposition of long-restrictions in misspecified models can result in misrepresentations of the data-generating process (see Faust and Leeper,1997): the GS model describes the whole economy with only three variables, and is therefore likely to be under-parameterised. Moreover, monetary authorities in all countries are assumed to react to the same set of variables: this is an obvious potential source of misspecification, and one that could lead to misrepresentations of monetary policy shocks. The possibility of misspecification also raises an identification problem. Suppose the Bank of Italy reacted to changes in German monetary policy: omitting German rates from the specification of the Italian reaction function would lead to identifying as an exogenous Italian monetary policy innovation what is instead the endogenous response of the Bank of Italy to an innovation in German monetary policy. The reported response of

[2] Despite having the policy rates and the exchange rates in their model they keep a recursive identification scheme and justify it by stating that "…estimated path obtained with this assumption are plausible in the sense that they are consistent with our a-priori belief.."

the economy would thus be the response to a wrongly identified impulse. Finally, the very limited choice of variables does not allow to identify a domestic channel from the exchange rate channel, thus making the exercise of little use for our purposes. Finally ,the interesting simulation exercise, i.e. a co-ordinated change of interest rates for all countries in the EU area cannot be performed within this context.

In the small structural model estimated by BW, identification is instead achieved by imposing on the data the Dornbusch overshooting model. However, in the core European countries the spread between local interest rates and German interest rates has been strongly positively correlated with the Deutschemark exchange rate, in particular since the 1992 ERM crisis, and until the start of the convergence trade, in 1996. This evidence – a widening of the spread paired with depreciation of the weak currencies relative to the Deutschemark – is hardly compatible with the Dornbusch model, thus raising doubts about the identifying restrictions imposed on the data.[3]

Dornbusch et al. (1998) consider six countries that are representative of the EMU group: Germany, three "core" European countries (France, Italy and Spain) and two "non-core" countries, the United Kingdom and a Nordic country, Sweden.

The impact effect of a change in the short rate has a lag (before it becomes significant) of 8 months in Italy, Spain, Sweden and the UK, 9 months in Germany, and 12 months in France The impact effect on output is always significant, although to a different degree. They report very similar impacts in Germany, France, and UK in the region of 0.45-0.56, it is smaller in Spain,0.37, and it is higher in Sweden and Italy, 0.95 and 1.11 respectively. However the test for homogeneity of all these coefficient does not reject the null of equality at the ten per cent critical level. However, the impact after two years show more marked differences and the homogeneity restrictions are rejected at the one per cent critical level, pointing towards relevant but not dramatic differences in the effect of monetary policy on output the countries considered.

To sum up, the available empirical evidence points to an important difference between the results based on large econometric models and on small econometric models. In particular, the small econometric models do not detect cross-country differences in the monetary transmission mechanism, contrary to what seems to be the evidence from the estimation of large, country-specific econometric models. Dornbusch et al. is the only exception here. Estimates from large models are not statistically comparable across countries, and can only investigate the consequences of a local change in monetary policy. Still the simulations run by the individual central banks contain useful information because they are likely to incorporate the "local wisdom" on the monetary mechanism in a particular country.

Overall as clearly stated by Kieler and Saaranheimo (1998) the econometric jury is still out on detecting asymmetries in the monetary transmission mechanism based on macro data.

3.2 The microeconometric evidence

Favero, Flabbi and Giavazzi (1999) take a first stab at looking at the micro level the paper, by providing empirical evidence on the impact of a monetary policy tightening on the loans and deposits of European banks. They use balance sheet information on a sample of about 700 banks from 6 European countries (contained in the BankScope databank) to provide a case-study on the

[3] Another question regards the stability of money demand over the long sample (1964-1994) used in their estimation. An identical specification for money demand is adopted for the three countries, and no tests for structural stability are provided. An incorrect specification of the money demand equation would imply the confusion of money demand shocks with money supply shocks, a crucial issue for the analysis at hand.

response of the banking system to an episode of monetary tightening which occurred during 1992. The choice of 1992 as an episode of European-wide monetary tightening is based on the evidence that shows, during that year, a uniform squeeze in liquidity for all the banks in our sample. Given this measure of monetary policy, they look at the first link in the monetary transmission chain by analysing the response of loans and deposits for the banks in their sample.

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The paper finds two main results. First the different behaviour of European banks depending on their size. In those countries where a credit channel operates (Germany, Spain and Italy) the response of bank lending to a shift in monetary policy appears to be concentrated among the largest banks. The rapid consolidation of the banking industry in Spain and Italy could thus sharpen the credit channel. Second the apparent absence of a credit channel in France—a finding that is consistent with the evidence which suggests that the French financial market is the most "Anglo-saxon" among the continental European markets

4 Asymmetries in the monetary transmission mechanism: Are they going to disappear with EMU?

The obvious question that arises is whether EMU will eliminate the asymmetries across European financial structures, thus reducing the observed differences in transmission mechanisms. Two areas suggest themselves for urgent policy action. The banking industry and the rules governing financial markets in general and housing markets in particular.

The transmission mechanism and the on-going consolidation of the European banking industry

Danthine et al. (1999) discuss in great detail the future of European banking in EMU. Their point of departure is the sharp difference in the experience of banking consolidation in Europe and in the US. Despite the massive consolidation which has occurred in the United States during the past ten years, the concentration of banks at the local level has, if anything, decreased. Table 15 shows the Herfindahl index of the concentration of local markets for bank deposits: consolidation has been accompanied by no significant change in concentration.

Table 15 Measures of concentration in the US banking markets

	Per cent of total assets of domestic banks held by the top eight banks	Herfindahl concentration index	
		Metropolitan Statistical Areas (MSA) counties	non-MSA counties
1988	22.3	2,020	4,316
1997	35.5	1,949	4,414

The deposit Hiderfahl index is 10,000 times the sum of squared market shares based on deposits of banks operating in MSA and non-MSA counties

Source: Berger et al. (1998), reproduced in Danthine et al. (1999).

Table 16 documents the characteristics of the consolidation which has so far occurred in Europe. Contrary to the US, most European banking deals (one half of all mergers or acquisitions in 1997) have involved institutions based in the same country. Cross border activity has been limited to deals

involving a bank and a non-bank financial institution, mostly an investment bank, an insurance company or an asset manager. While cross-border deals are motivated by the search for experience in corporate finance and asset management—skills that are in scarce supply in continental European banks--domestic deals are mostly driven by the search for size

Table 16 Bank Acquisitions in Europe
(value of all deals, US$ billion)

		1993	1995	1997
Total		19	40	122
	of which:			
	- domestic bank/bank	9	24	60
	- cross-border bank/bank	1	8	7
	- bank/non-bank	9	8	55

Source: Goldman Sachs, reproduced in Danthine et al. (1999).

There are two reasons to be concerned. Competition is the first one. European banks have a natural tendency to consolidate within national boundaries leading to industry concentration ratios much above those observed in the US. This is because of potential cost cutting, culture and trust and, indeed, the quest for market power at a time of insecurity and change. Sheep get closer together when in danger. In commercial banking, diversification gains explain the success of interstate consolidation in the US. The anemia of the equivalent cross-border M&A's business in Europe is worrisome: while it can be explained by the fact that a good deal of the gains from diversification can be obtained within the borders of individual European states, it also generates the concern that European commercial banks will want to reach the higher minimum size in their business simply by acquiring or merging with their national competitors. The observed tendency to in-country consolidation is a challenge for competition authorities as it is likely to reinforce local monopoly power. This is particularly important for small firm lending, as large firms will access the euro capital markets directly, while consumers will have the option of turning to specialised asset managers and to direct banking.

Next are the consequences for the monetary transmission mechanism. Cross-country differences in the process of financial intermediation could be the result of varying national preferences and traditions. Consequently, a consolidated, cross-border, financial institution may wish to continue offering different products in different markets. Similarly, the respective roles of markets and intermediaries may be history-dependent in a way that will not allow for fast changes. Nevertheless, the creation of cross-border suppliers of financial services, at a time when European consumers and firms are likely to become more similar, would plausibly result in a homogenisation of financial practices across EMU.

One would expect, for instance, that the ability of medium-size Italian firms to make use of the opportunities offered by the emerging Euro-wide financial markets will be improved if Deustche Bank were to take over Banca Commerciale Italiana and the clients of Banca Commerciale could benefit from the universal banking experience of Deutsche Bank-Bankers Trust, as compared with the alternative of a local merger between Banca Commerciale and Unicredito. In the former case, there is reason to believe that traditional banking relationships will be reconsidered and aligned on

the best German and European practices in a way that would not be promoted by a pure domestic consolidation.

Both perspectives -- increased market power and the transmission mechanism -- suggest a similar conclusion: cross-border banking consolidations should be preferred to domestic consolidations. Cross-border mergers exploit economies of scale without posing any threat to competition. Mergers between banks with different financial expertise also facilitate the transmission of best practices across national boundaries, thus helping the convergence to a single model of different systems of financial intermediation.

Cross-border mergers among commercial banks, however, run against a deeply ingrained and widespread desire to foster national champions. In some country more than in others, but more often than not, cross-border mergers are frown upon, discouraged, or even prevented, all the more so in the case of a foreign acquisition. What often appears as a question of national pride is in our view a misplaced attitude and it should be fought against by politicians and authorities. The public, and in particular small and medium size firms, will be better served by a multinational bank, sufficiently large to be an efficient producer but with limited local market power, than by a national champion of similar size in an oligopolistic position on its local markets.

All in all, we conclude that national consolidations should be discouraged, and regulatory and political barriers to cross-border mergers should be dismantled. Cross-border mergers permit the emergence of efficient producers without prejudice for competitive conditions, and they help homogenise banking practices. In so doing such consolidations promote the desired convergence of the mechanisms by which a single monetary policy will be transmitted to the real side of European economies. It is time to favour the emergence of European competitors rather than national champions.

In this endeavour, the main players will be the national competition authorities. If domestic consolidation of the banking industry beyond a certain degree of concentration is made impossible by local competition authorities or by the European Commission--erring on the side of caution in case of doubt--national banks will be forced, and will progressively learn, to go against their natural tendencies and consolidate internationally if they need to. The intended economies of scale gains will be achieved without distorting the competitiveness of local markets and speeding the harmonization of the transmission of monetary policy.

Correcting the remaining asymmetries in financial and housing markets

McLennan et al. (1998) provide the following list of policy prescriptions to foster harmonisation, with the side effect of encouraging labour mobility:

1. *Encourage the use of fixed-rate mortgages and, more generally, of loans.*

2. *Place tougher prudential upper limits on loan-to-value ratios.*

3. *Retain a more significant pay-as-you go element in the public pension system*[4]

4. *Encourage the development of the private rented sector and encourage the move to market rents in as much of the social housing sector as possible.*

5. *As a substitute for increasing frictions in the housing market, which reduce labour mobility, use property taxes more flexibly to reduce house price volatility.*

[4] As Merton (1987) has argued, retaining a significant pay-as-you-go system can reduce one of the problems of incomplete markets, caused by the fact that human capital is largely uninsurable.

6. *Where relevant, encourage opening credit markets, the legal profession and estate agents to competition, reducing legal barriers to the use of housing collateral, and reducing transactions costs in those EMU countries of the opposite hue.*

Their analysis goes some way in the direction of Cecchetti (1999) who makes a strong argument for legal harmonization as a prerequisite for financial harmonization and symmetry in the monetary transmission mechanism

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