

Monetary Transmission and Bank Lending in Germany

By Jan Kakes, Amsterdam, Jan-Egbert Sturm, Munich, and
Philipp Maier, Groningen*

I. Introduction

Germany is widely considered one of the most typical examples of a bank-based economy. Over 70% of firms' external finance is provided by banks, which contrasts with market-based systems like the United States, where only 25% of the financing needs comes from banks.¹ As a result, one may expect that the German banking sector plays a key role in the transmission of monetary policy.

In this paper, we consider the relevance of a bank lending channel in Germany over the period 1970–1997. According to this transmission mechanism, banks respond to a monetary contraction by reducing the supply of bank loans which has, eventually, a negative impact on inflation and real activity. However, the implications of the German institutional setting for the effectiveness of monetary policy through bank lending are *a priori* ambiguous. On the one hand, the mere fact that banks play an important role suggests that the scope for an effective bank lending channel is potentially huge. On the other hand, banks may try to shield their loans portfolio from monetary disturbances which may weaken, rather than strengthen, the impact of monetary policy. This may be plausible for Germany, given the importance that is attached to long-term relationships between banks and their clients.

The importance of a bank lending channel is therefore an empirical matter. Empirical studies have come to different conclusions. On the basis of a number of qualitative indicators Kashyap and Stein (1997) conclude that a lending channel in Germany is more likely to be relevant

* We thank Peter van Bergeijk, Gabe de Bondt, Harry Garretsen, Jakob de Haan, Jan Jacobs and an anonymous referee for useful comments on earlier versions of this paper, and Peter Vlaar for providing his computer programs. The views expressed in this paper do not necessarily represent those of De Nederlandsche Bank.

¹ *The Economist*, November 21, 1998, pp. 75–76.

than in most other countries of the European Union. VAR studies by Barran *et al.* (1995, 1997), Guender and Moersch (1997) and Küppers (2000), however, suggest that a bank lending channel is not important in Germany. See also Worms (1998) for an overview of issues related to bank lending and monetary transmission in Germany.

We extend the existing VAR literature by considering several types of bank loans, distinguishing two sectors (firms and households) and different maturities (short-term, medium-term and long-term loans). As we will explain below, a disaggregated approach is one of the possible ways to deal with an important identification problem. Our results imply that a bank lending channel is not relevant for any of these lending categories. On the contrary, the responses of most credit aggregates following a monetary contraction are positive or insignificant. A significant negative response can be established for long-term corporate lending, but only after a significant lag, suggesting that this can be attributed to demand factors.

Because the start of EMU in 1999 marks the end of independent German monetary policy, one may question to what extent our findings are still relevant today. It should be noted, though, that the Bundesbank's monetary strategy has been an important ingredient of the monetary strategy of the Eurosystem (see Houben, 2000). In addition, the institutional setting underlying the monetary transmission mechanism is not likely to change immediately. Hence, analysing the transmission mechanism in individual EMU member states is still useful to investigate possible asymmetries in monetary transmission across countries.

The remainder of this paper is organized as follows. In Section II., we briefly discuss monetary transmission, particularly the theory underlying the bank lending channel. Subsequently, we present our empirical results in Section III. Section IV. concludes.

II. Monetary Transmission and Bank Lending

In recent years, a vast literature developed on the effectiveness of monetary policy and the channels through which this policy works. This renewed interest in monetary transmission must be seen within the context of a revival of theories that stress the impact of the financial system on aggregate economic activity.

In the first decades after the war, the role of credit market imperfections in the monetary transmission process was largely ignored in the

mainstream literature. This conventional approach is also known as the *money view*. Following *e.g.* the IS-LM model, only two financial assets are distinguished, money and bonds, of which the latter is supposed to be representative for the whole capital market. Since banks do not play an essential role in this world, there is no need to distinguish bank loans from other bank assets. According to this approach, monetary policy works primarily through its impact on the capital market interest rate.

By contrast, an important strand of the recent literature, gathered under the name *credit view*, focuses on financial phenomena that are likely to play a role in the transmission of monetary policy, such as financial intermediation and credit rationing. Starting from the assumptions that the capital market is characterized by imperfections and that bank assets – in particular bank loans and security holdings – are imperfect substitutes, various transmission channels may work on top of the standard interest rate channel.² One of these channels is the *bank lending channel*. The relevance of this mechanism follows directly from the fact that banks have a specific function as financial intermediaries, which contrasts with their role in the money view. Hence, the focus is on the specialness of the asset side of the banking sector's balance sheet. If part of the borrowers are bank dependent – *i.e.*, they cannot easily switch to alternative forms of external financing – and if banks consider bank loans as imperfect substitutes for other entries on the asset side of their balance sheets, monetary policy may operate through a bank lending channel (Bernanke and Blinder, 1988).³ These are in fact necessary conditions for a bank lending channel to be operative. Without them, banks could use their other assets as a liquidity buffer against monetary shocks which enables them to protect their loans portfolio, while borrowers could easily neutralize the impact of monetary policy by attracting alternative sources of funding, making a bank lending channel impotent.

² In the modern theoretical literature, these capital market imperfections are attributed to information asymmetries (see *e.g.*, Bernanke and Gertler, 1989; Greenwald and Stiglitz, 1993; Kiyotaki and Moore, 1997). The underlying ideas build upon early literature that can be traced back to prewar theories (see *e.g.*, Schumpeter, 1934 (1911); Hayek, 1933).

³ Another transmission mechanism that has received much attention in the credit view literature is the *balance sheet channel*, also denoted as 'financial accelerator' or 'broad' credit channel (Bernanke and Gertler, 1995). This mechanism emphasizes the role of borrowers' financial structure in the propagation of financial and real shocks. The balance sheet channel can be considered as more general than the bank lending channel: the latter, which is sometimes referred to as 'narrow' credit channel, focuses on the fact that financial market imperfections give rise to financial intermediation through banks.

It is important to note that the credit view does not preclude the mechanism underlying the money view, but rather provides a more general approach, allowing for various mechanisms that either exacerbate the effects of the interest rate channel, or can be considered as an additional monetary transmission channel. Obviously, if financial market imperfections do not play an important role in the transmission process – which is, in the end, an empirical issue – the transmission of monetary policy can be captured by the standard money view.

As yet, most empirical evidence for the existence of a bank lending channel has not been very conclusive. To a large extent, this is due to the fact that most studies based on aggregated data suffer from a severe identification problem: the inability to establish whether the decrease in credit that is observed after a monetary contraction is induced by bank supply or driven by a fall in borrowers' demand.⁴ In the latter case, a lending channel would be irrelevant. In this respect, recent studies based on disaggregated data are more informative. The advantage of disaggregated data is that the response of credit variables can be analysed in combination with other hypotheses that follow from the theoretical literature underlying the credit view. Information asymmetries, for instance, are presumably more relevant for specific categories of borrowers which suggests that banks may try to adjust their loans portfolio following a monetary contraction, substituting high-quality loans for low-quality loans, known as 'flight to quality.' Gertler and Gilchrist (1993b, 1994), Oliner and Rudebusch (1996), and Gilchrist and Zakrajšek (1998) use quarterly panel data of a large number of nonfinancial firms in the United States, taking into account heterogeneity among borrowers. It appears from this research that, following a monetary contraction, the amount of bank credit to small firms is reduced while large firms initially even attract more (mostly short-term) credit as a buffer to compensate for declining cash flows. Yet, although this is obviously consistent with the credit view in the sense that credit is 'special,' there still is no general agreement to what extent these findings should be interpreted as self-evident support for a bank lending channel.⁵

Unfortunately, detailed time series at the individual firm or bank level are not available for most countries. Studies at a sectoral level

⁴ See *e.g.* Barran *et al.* (1997) for an analysis of nine European countries, Guender and Moersch (1997) for Germany and Garretsen and Swank (1998) for the Netherlands.

⁵ See Oliner and Rudebusch (1996) and Kashyap *et al.* (1996) for a discussion.

may be a useful, albeit less rigorous, alternative. In most of these studies, bank lending is split into loans to the corporate sector and loans to the household sector.⁶ It seems plausible that information asymmetries between banks and households are greater than those between banks and firms.

III. Empirical Results

We analyse quarterly data over a sample that runs from 1970:1 up to 1997:4. In the next subsection we will give a more detailed description of the data (see also Appendix A). Then, we present our empirical findings, which consist of impulse-response simulations. Since cointegration can be established for all specifications, the appropriate model is a vector error-correction model (VECM). We consider several VECMs, starting with a specification based on aggregated data, *i.e.*, without making a distinction between sectors. Subsequently, we report the results using more disaggregated models which focus on the corporate sector and the household sector.

1. Data and Pre-Testing

The data we use can be divided into four categories:

Policy variable: Following Bernanke and Blinder (1992) and most of the subsequent VAR-based literature on monetary policy transmission, we include a short-term interbank interest rate as our policy variable in all specifications. The corresponding equation in the VECM can be interpreted as the Bundesbank's reaction function, while innovations of the short-term interest rate reflect unanticipated monetary policy shocks.⁷

Key macroeconomic variables: We include real activity and prices, since these are the main variables that reflect the eventual effects of monetary policy. We use real GDP and the GDP deflator in our aggregated VECM and corresponding alternatives in our sectoral specifications. In addition to bank balance sheet data (see below), we include two standard transmission variables: the long-term interest rate and, in order

⁶ See *Escrivá and Haldane* (1994) for Spain, *Dale and Haldane* (1995) for the United Kingdom, *Garretsen and Swank* (2000) and *Kakes* (2000) for the Netherlands. *Küppers* (2000) follows a sectoral approach for Germany by analysing different banking groups.

⁷ See *e.g. Clarida and Gertler* (1997).

to account for the openness of the economy, the US dollar exchange rate.⁸

Bank balance sheet data: The only bank liability we include is a broad money aggregate (M3). We include two bank assets: securities holdings and bank loans. We disaggregate bank lending in two ways. First, we take into account sectoral differences by distinguishing a corporate sector and a household sector. Second, bank loans are split into short-term, medium-term and long-term lending. Figures 1 and 2 show the developments of these bank assets over our sample. Looking at the magnitude of the lending categories, it appears that for all maturities corporate lending is larger than lending to households. Particularly for short-term credit, the bulk of loans is supplied to firms. Both for firms and households, most bank lending consists of long-term loans. Looking at the corresponding growth rates for each lending category, presented in Figure 2, it can be seen that the development in short-term and medium-term lending is relatively volatile.⁹ Presumably, this is because the demand for short-term and medium-term loans can more rapidly be adjusted to changes in interest rates and income. Long-term lending, by contrast, shows a more stable growth pattern. The proportion of banks' securities holdings, finally, has become more and more important. Like short-term and medium-term lending, the growth rate of securities is rather volatile.

Exogenous variables: To account for supply shocks, we include the oil price as an exogenous variable. We further add four seasonal dummies and a permanent dummy for the period from 1990:2 onwards in order to take into account structural changes due to German reunification.

Our results consist of innovation analysis which can be performed with an estimated VECM model, transformed into its moving average representation. According to Dickey-Fuller tests that we carried out, all series can be considered as I(1) variables. We employed likelihood ratio tests in a VAR in levels to determine the number of lags and the Johansen procedure to establish the cointegration rank, using the software package CATS (Hansen and Juselius, 1995). Our specification of the cointegration space allows for intercepts in the cointegration relationships and deterministic trends in the levels of the variables. Results are reported in

⁸ Instead of taking the DMark/Dollar exchange rate, we also experimented with the effective exchange rate (both real and nominal), which yields very similar results.

⁹ Presented are growth rates with respect to the corresponding quarter one year earlier.

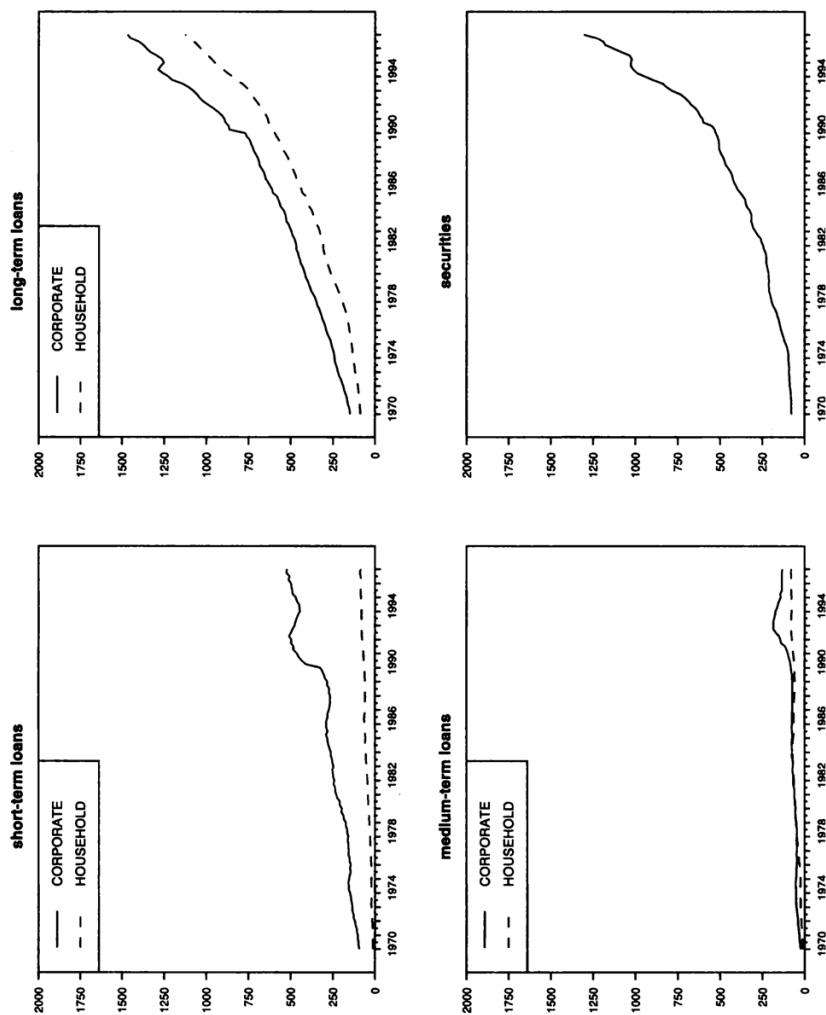
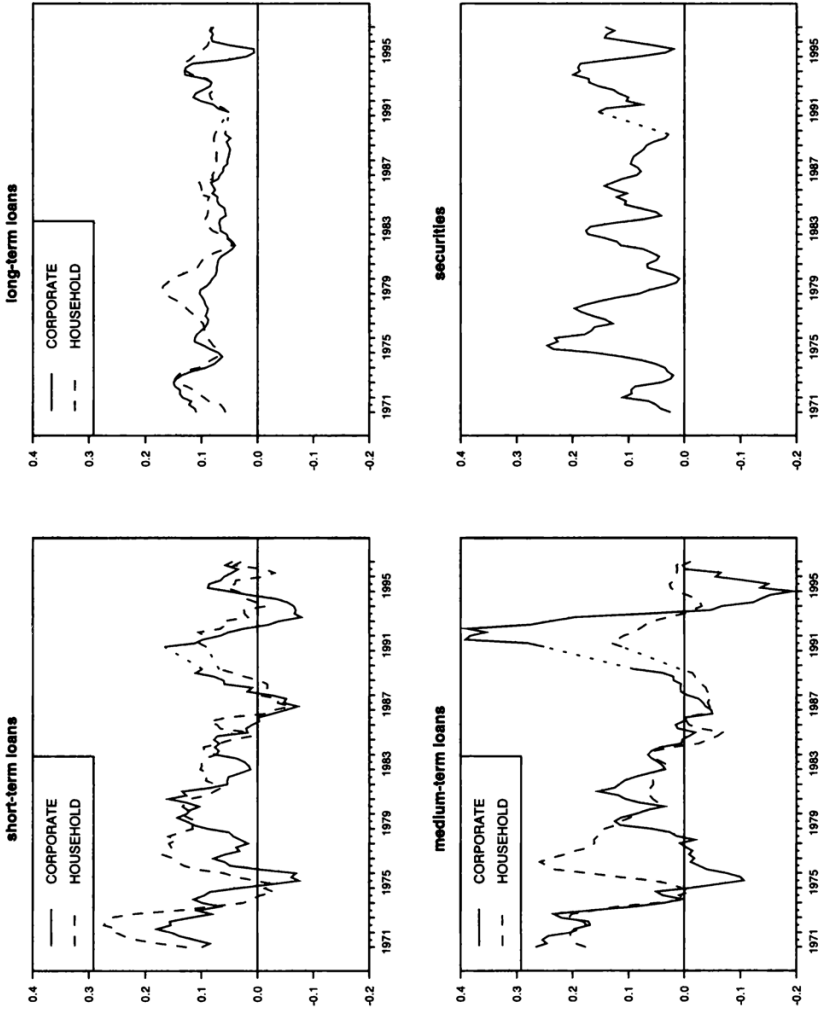


Figure 1: Bank balance sheet variables (in billions of Dmarks)



* We skip the observations in 1990 because these include a break that reflects German reunification.

Figure 2: Bank balance sheet variables (in growth rates)

Table 1 for all models that are discussed below. Impulse-response simulations are carried out with the MALCOLM package developed by Mosconi (1998) and modified by Vlaar (1998).¹⁰

Table 1
Main characteristics of each model

		# endog. var.	# lags	coint.rank
Model 1 (Fig. 3)	aggregated	8	5	5
Model 2 (Fig. 4)	corporate	8	5	6
Model 3 (Fig. 4)	household	8	4	4
Model 4 (Fig. 5)	maturity	10	6	7
Model 5 (Fig. 6)	corporate, maturity	10	5	8
Model 6 (Fig. 6)	household, maturity	10	4	8

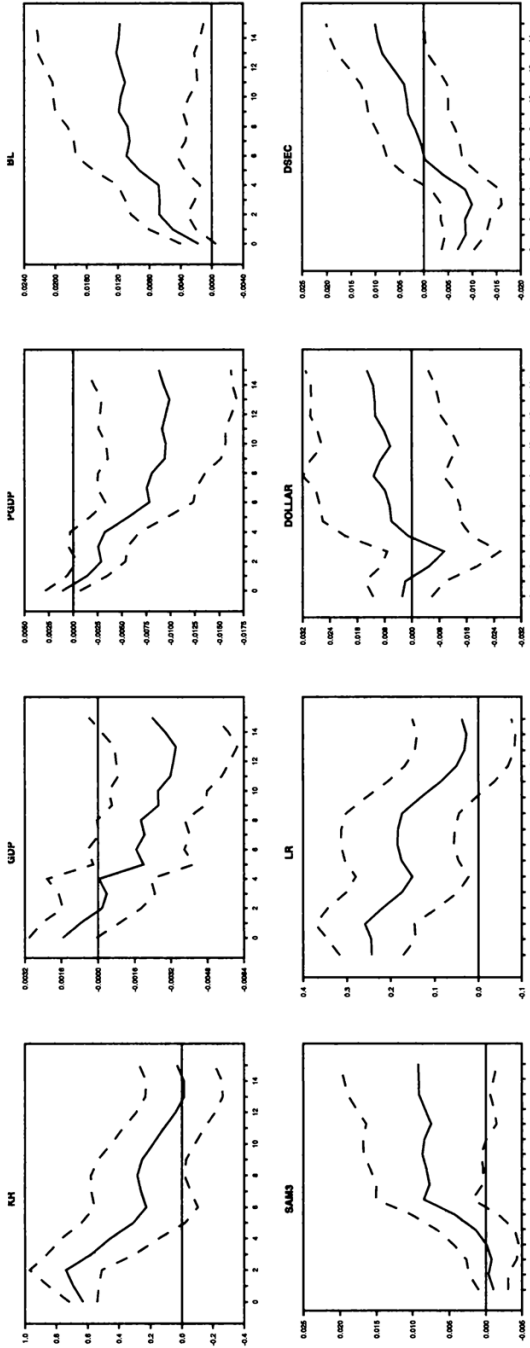
Innovations of the short-term interest rate are interpreted as unanticipated monetary policy shocks. These shocks are identified by imposing a Wold causal chain in which the policy variable is ordered first, and the other variables in the order presented in the impulse-response graphs. We also investigated alternative orderings, but these did not lead to very different outcomes. Each time, we use a simulation period of four years (16 quarters).

2. Innovation Analysis

Aggregated VECM: We first analyse a model that only includes aggregated data: the short-term interest rate, GDP, the GDP deflator, total bank loans, money (M3), the long-term interest rate, the exchange rate and banks' securities holdings. All variables included are in real terms (except both interest rates and the price level) and in logs (except both interest rates).

Figure 3 plots the dynamic response of each variable following an unanticipated monetary contraction, represented by a shock of about 60 basis points to the short-term interest rate. Within four quarters, the policy variable returns to a level not significantly different from zero.

¹⁰ We tested all VECMs for misspecification (serial correlation, normality). No serious problems were encountered.



*KR, GDP, PGDP, BL, SAM3, LR, DOLLAR and DSEC stand for respectively, short-term interbank interest rate, Gross Domestic Product, GDP deflator, seasonally-adjusted broad money aggregate M3, long-term interest rate, US dollar exchange rate, and banks' securities holdings. The dotted lines represent the 95% confidence bounds.

Figure 3: Aggregated impulse-responses following a monetary contraction

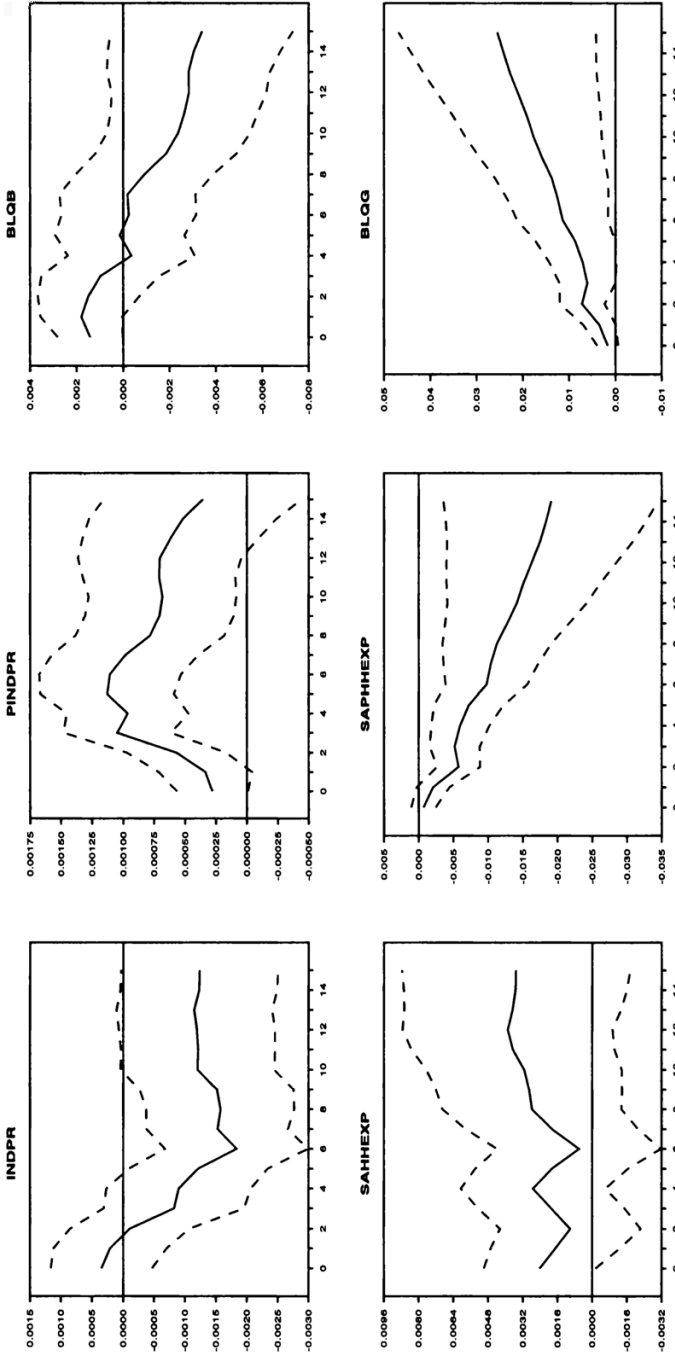
Both GDP and the price level show a negative response that becomes significant after about a year, which is a plausible reaction to a monetary contraction. The long-term interest rate rises about 25 basis points and returns to its initial level, following the same pattern as the short-term rate. The exchange rate does not show any significant response, which suggests that this is not an important transmission variable of monetary policy.

Banks' securities holdings fall immediately after the monetary contraction, but return to their baseline level within a year. This suggests that banks use their securities as a buffer stock to offset monetary disturbances. Bank lending shows a positive response, which is not consistent with the standard interpretation of a monetary contraction. Apparently, banks do not only shield their borrowers from monetary disturbances, but even extend their loans supply.

The response of M3 is also positive, albeit not very significant. This can be partly attributed to the fact that money and credit represent two sides of a bank's balance sheet and are therefore related. Furthermore, it is quite common to find a positive short-term interest rate elasticity of broad money demand (see Fase, 1994). Nevertheless, given the fact that M3 has served as an intermediate target of monetary policy since the early 1980s, one would expect that a monetary tightening has a negative impact on this broad money aggregate. Our findings are consistent with recent studies (Clarida and Gertler, 1997; Bernanke and Mihov, 1997) which conclude that, despite its monetary strategy of money targeting, in practice the Bundesbank's monetary policy has been much more pragmatic. In addition, it should be noted that the Bundesbank has actually missed its money growth target in about half of the years since it introduced money targeting.¹¹

Disaggregated VECMs: In separate specifications for the corporate sector and the household sector, we replace GDP by industrial production and household expenditures, respectively, and the GDP deflator by the producer price index and the household expenditures deflator. In addition, we include bank lending to firms and households, rather than

¹¹ We repeated the analysis with a VECM in which we replaced M3 by the narrow aggregate M1. This time, money shows an immediate negative response, which is a plausible reaction because a narrow aggregate contains fewer interest-bearing elements, making a positive relationship between money and interest rates unlikely. In addition, M1 represents a smaller part of the liability side of the banking sector's balance sheet than M3 and is therefore not as tightly related to developments in bank lending.



* INDPR, PINDPR, BLQB, SAHHEXP, SAPHHEXP and BLQG stand for respectively, industrial production, producer price index, bank loans to enterprises, seasonally-adjusted household expenditures, deflator of household expenditures, and banks' lending to households. The dotted lines represent the 95 % confidence bounds.

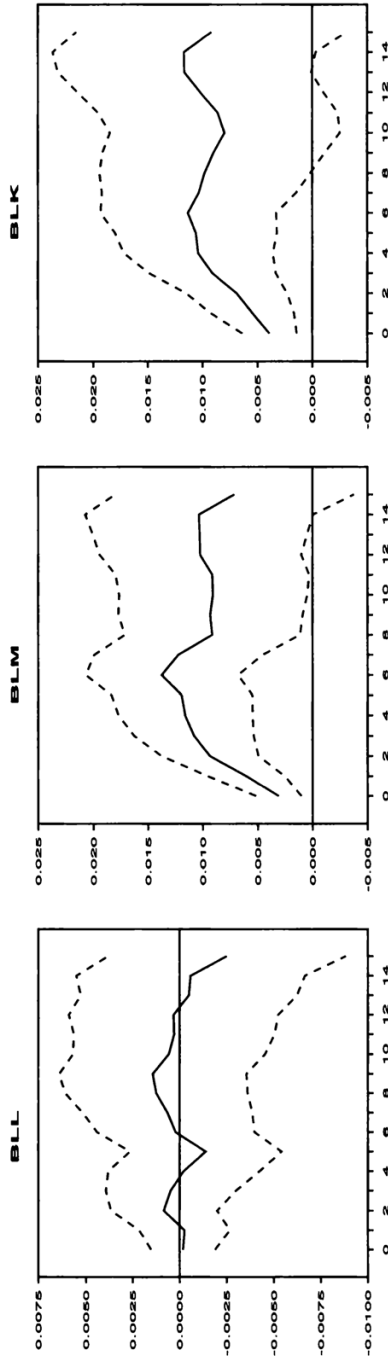
Figure 4: Sectoral disaggregated impulse-responses following a monetary contraction

aggregated credit. The responses of real activity, the price level and credit are reported in Figure 4.

Regarding the eventual effects of monetary policy on activity and prices, the sectoral differences are substantial. Industrial production shows a significant decrease, comparable with the response of GDP in Figure 3. Household expenditures, by contrast, do not seem to react at all, at least not significantly; the point estimate even shows a positive response. Apparently, monetary policy has more real impact on firms than on households. Looking at the response of prices, it is striking that the price index of household expenditures falls, whereas producer prices increase. The latter is obviously in contradiction with the expected result of a monetary contraction, and also with our aggregated VECM simulations. This perverse response of prices shows up in many VAR-based studies and may be an indication that an important variable is omitted. Including the oil price or a commodity price index, as Sims (1992) suggests, in order to take into account supply effects, does not resolve this price puzzle. Dale and Haldane (1995) suggest that the positive response of prices after a monetary tightening may be explained by increasing variable costs which initially translate into higher prices due to cost mark-up pricing. Finally, for both sectors bank credit increases immediately after the monetary tightening. This positive response persists for households, but is temporary for firms.

Figure 5 shows the results of simulations with a VECM in which bank lending has been disaggregated on the basis of debt maturity (instead of sectors), distinguishing short-term, medium-term and long-term lending (see Figures 1 and 2). It appears that long-term credit – which represents the bulk of total bank lending in Germany – hardly responds, whereas short-term and medium-term credit show a very significant increase. A positive response of short-term credit following a monetary contraction has been observed in many other studies.¹² This may be explained by the fact that borrowers try to shorten the maturity of their (new) debt as a response to increases – and in anticipation to future decreases – in the lending rate. Another explanation, which is perhaps more relevant here, since we observe a significant decline in GDP and industrial production, is that firms face declining cash flows due to a drop in sales which induces them to demand more short-term credit in order to build a liquidity buffer.

¹² See *e.g.*, Gertler and Gilchrist (1993a) for the United States and Kakes (2000) for the Netherlands.



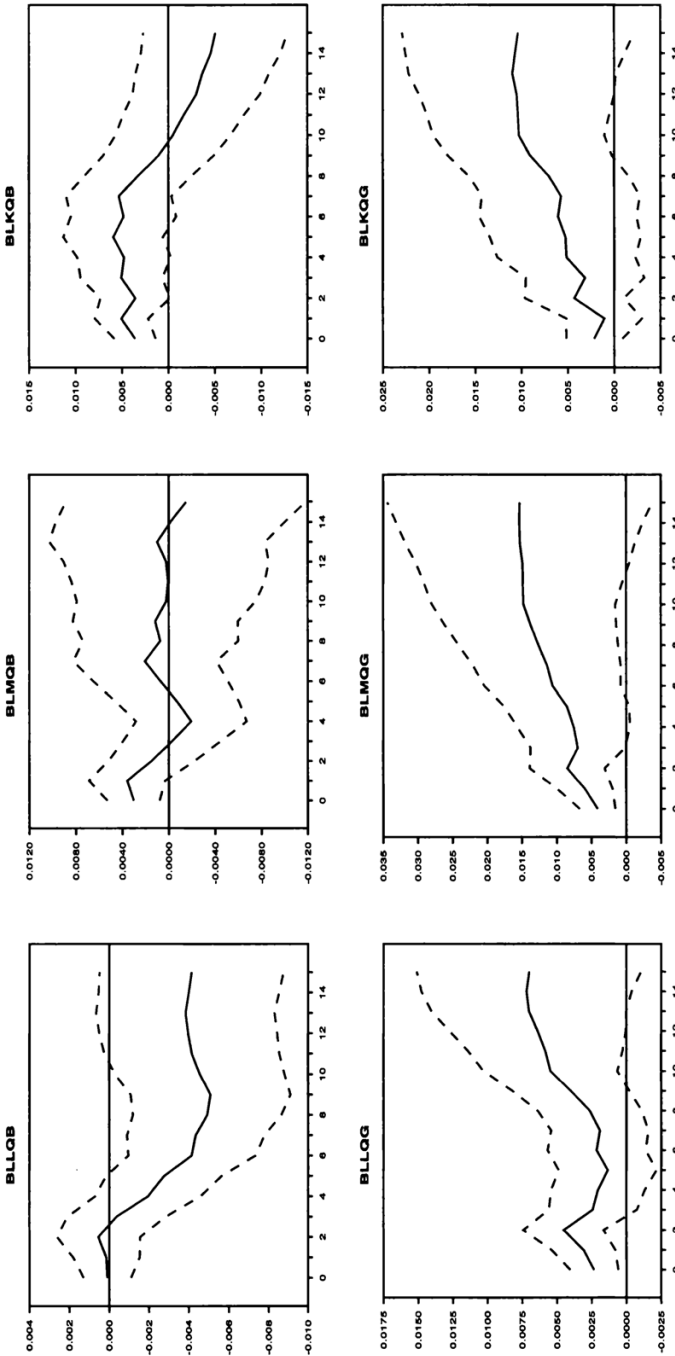
* BLL, BLM and BLK stand for respectively, long-term bank loans, medium-term bank loans and short-term bank loans. The dotted lines represent the 95% confidence bounds.

Figure 5: Maturity disaggregated impulse-responses following a monetary contraction

In Figure 6, finally, we present the responses of short, medium and long-term lending for each sector. Interestingly, the ‘non-response’ of total long-term credit that we just observed appears to be the net result of a decline in long-term lending to the corporate sector and an increase in long-term lending to the household sector. The slow response of long-term corporate lending – which coincides with the fall in GDP and industrial production, see Figures 3 and 4 – suggests that this is induced by demand, rather than supply. Presumably, monetary policy has a real impact on the corporate sector through other transmission channels (*e.g.*, the standard interest rate channel) while bank lending follows passively. The initial positive response of long-term household lending is somewhat puzzling. A possible explanation is that the mortgage lending rate is adjusted with a significant lag to changes in the policy-controlled short-term interest rate, which can be a reason to increase the demand for mortgages immediately after a monetary contraction, in order to still benefit from the lower mortgage rate. In addition, from the banks’ perspective the increase in long-term credit may partly represent a ‘flight to quality’ effect. This is because mortgage loans are a relatively safe investment, despite the fact that the information asymmetry is probably greater for households than for firms. For short-term and medium-term credit, sectoral differences are not substantial. As we already noted, the positive response of short-term and medium-term lending may be attributed to the fact that borrowers use this type of credit as a liquidity buffer.

Evaluation: In sum, we can conclude that bank lending does not seem to be an effective transmission channel of monetary policy in Germany. The results suggest that both banks and borrowers show buffer behaviour in order to offset the impact of monetary shocks. Banks respond to a monetary tightening by immediately decreasing their securities holdings, whereas they insulate their loans portfolio from monetary disturbances. For banks, securities holdings thus seem to serve as a liquidity buffer. Borrowers, in turn, respond to a monetary contraction by increasing their demand for short-term and medium-term loans, which is accommodated by the banks. Hence, rather than providing an effective transmission channel, banks are more likely to *weaken* the impact of monetary policy.

Presumably, monetary policy may have real effects via other transmission channels – *e.g.*, the long-term interest rate – which are more relevant for firms than for households. In this respect, it can be noted that, insofar as the real effects of monetary policy in both sectors are reflected



* BLLQB, BLMQB, BLKQB, BLLQG, BLMQG and BLKQG stand for respectively, long-term bank loans to enterprises, medium-term bank loans to enterprises, short-term bank loans to enterprises, long-term bank loans to households, medium-term bank loans to households and short-term bank loans to households. The dotted lines represent the 95% confidence bounds.

Figure 6: Sectoral and maturity disaggregated impulse-responses following a monetary contraction

by household expenditures and industrial production, only the latter falls significantly after a monetary contraction.

The interpretation of our results is consistent with the notion that long-term relationships between banks and their customers are important in Germany. It should be noted, though, that we have made a relatively crude disaggregation by distinguishing only two sectors, firms and households. Obviously, a further disaggregation of borrower types is needed to draw more rigorous conclusions. As we indicated, client relationships that may offset monetary policy shocks are presumably more relevant for large, creditworthy firms than for smaller borrowers. Panel data studies by Audretsch and Elston (1994), Elston (1998) and Bond et al. (1997) conclude that German firms' investments are sensitive to financial constraints. Especially small firms are vulnerable, which suggests that a further disaggregation of the corporate sector is useful. Note, though, that these micro-based studies do not explicitly consider monetary policy but are carried out in a more general setting.

Favero et al. (1999) study the response of individual banks' balance sheets following the monetary tightening in 1992. Although this study focuses on only one episode, their results are consistent with our conclusions: banks respond to the monetary contraction either by shielding their loans portfolio or by expanding their loans supply. Küppers (2000) finds that large banks' lending responds stronger to a monetary contraction than lending by small banks (savings banks and credit cooperatives). Again, this is in line with our conclusion that a bank lending channel is not important, as a lending channel would imply that smaller banks would show a stronger response.

We estimated all VECM specifications for various sub-samples. We let the sample start in 1973:1, the end of the Bretton Woods system, and in 1975:1, when the Bundesbank started its policy of monetary growth targeting. In addition, we checked what would happen if we end the sample in 1990:1 (German unification). Although these dates mark important shifts in the German economy, none of these alternatives had much impact on our results. Finally, we carried out simulations based on several alternative orderings. Again, this had only a limited impact on most of the results and does not materially change our conclusions.

IV. Concluding Remarks

In this study we have investigated the relevance of a bank lending channel of monetary policy transmission for the German economy. We performed impulse-response analysis to investigate the effects of unanticipated monetary policy shocks at the aggregate level as well as possible differences between the household sector and the corporate sector. An important conclusion is that banks seem to use their securities holdings as a buffer stock, which enables them to shield their loans portfolio from monetary disturbances. Whereas most other transmission variables show a plausible response following a monetary contraction, we observe that aggregate bank credit increases, which implies that a bank lending channel is not a relevant transmission mechanism of monetary policy. Rather, the opposite seems more likely, as borrowers appear to use their relationship with a bank to increase their lending, which may enable them to offset the effects of monetary policy through other channels such as the interest rate channel and the exchange rate channel.

It is interesting to note that, insofar as mortgages represent high quality, our results are consistent with a 'flight to quality' following a monetary contraction. In addition, this mechanism could be relevant among different classes of German firms. Hence, a natural extension of this study would be to make a further disaggregation of the corporate sector.

A. Data

For most series, we use seasonally unadjusted data. Seasonal effects are taken into account by including a dummy for each quarter. Most data are taken from the Bundesbank, the IMF's International Financial Statistics (IFS) and Datastream.

- *Bank balance sheet data.* Banks' securities holdings and credit aggregates are taken from the Bundesbank CD-ROM, which contains data reported in the Bundesbank's *Monatsberichte* (monthly reports). We corrected for a break in the credit aggregates in 1980Q3 by premultiplying the earlier observations by the ratio of the values at 1980Q3 under the new and old definition. M3 and M1 are taken from the IFS in seasonally adjusted form.
- *Real activity, prices.* For the aggregated model, we include real GDP as a measure of real activity, and the implicit GDP deflator as the price index. Both are taken from the IFS. For the corporate sector, we

use industrial production and the producer price index from the IFS. For the household sector, we use the volume of total household expenditures and the corresponding deflator, both taken from Datastream in seasonally adjusted form. In order to allow a direct comparison of the magnitudes of these variables among the models, we normalized all activity and price indices by dividing them by their 1980Q1 observation. In all models, we include the oil price, taken from the IFS.

Exchange rate, interest rates. In each model, we include the US dollar exchange rate, taken from the IFS database. An increase in this variable reflects an depreciation of the Dmark. The short-term interest rate is the three-month interbank rate, and the long-term interest rate is the government bond yield, both taken from the IFS.

References

- D. B. Audretsch and J. A. Elston: Does firm size matter? Evidence on the impacts of liquidity constraints on firm investment behaviour in Germany. CEPR Discussion Paper 1072, Centre for Economic Policy Research, London, 1994. – F. Barran, V. Coudert, and B. Mojon: Transmission de la politique monetaire et credit bancaire. Une application a trois pays de l'OCDE. *Revue Economique*, 46(2):393–413, 1995. – F. Barran, V. Coudert, and B. Mojon: The transmission of monetary shocks in the European countries. Published in: S. Collignon (ed), *European Monetary Policy*, London/Washington D.C., Pinter, 81–111, 1997. – B. Bernanke and A. Blinder: Credit, money and aggregate demand. *American Economic Review*, 78:435–439, 1988. – B. Bernanke and A. Blinder: The Federal Funds rate and the transmission of monetary policy. *American Economic Review*, 82(4):901–921, 1992. – B. Bernanke and M. Gertler: Agency costs, net worth, and business cycles. *American Economic Review*, 79:14–31, 1989. – B. Bernanke and M. Gertler: Inside the black box: The credit channel of monetary policy transmission. *Journal of Economic Perspectives*, 9(4):27–48, 1995. – B. Bernanke and I. Mihov: What does the Bundesbank target? *European Economic Review*, 41(6):1025–53, 1997. – S. Bond, J. Elston, J. Mairesse, and B. Mulkey: Financial factors and investment in Belgium, France, Germany and the UK. NBER Working Paper 5900, National Bureau of Economic Research, Cambridge, MA, 1997. – R. Clarida and M. Gertler: How the Bundesbank conducts monetary policy. Published in: C. D. Romer and D. H. Romer (eds.), *Reducing inflation: motivation and strategy*, NBER Studies in Business Cycles, Vol. 30, Chicago/London, University of Chicago Press, 363–406, 1997. – S. Dale and A. G. Haldane: Interest rates and the channels of monetary transmission: some sectorial estimates. *European Economic Review*, 39(9):1611–1626, 1995. – J. A. Elston: Investment, liquidity constraints and bank relationships: evidence from German manufacturing firms. Published in: S. W. Black and H. Moersch (eds.), *Competition and convergence in financial markets: the German and Anglo-American models*, *Advances in Finance, Investment and Banking*, Vol. 5, Amsterdam/New York/Tokyo/North-Holland, 135–150, 1998. – J. L. Escriva and A. G. Haldane: The interest rate transmission mechanism: sectorial estimates for

Spain. Documento de Trabajo 9414, Banco de Espana, Madrid, 1994. – M. M. G. *Fase*: In search for stability: an empirical appraisal of the demand for money in the G7 and EC economies. *De Economist*, 142(4):421–454, 1994. – C. A. *Favero*, F. *Giavazzi*, and L. *Flabbi*: The transmission mechanism of monetary policy in Europe: evidence from banks' balance sheets. NBER Working Paper 7231, National Bureau of Economic Research, Cambridge, MA, 1999. – H. *Garretsen* and J. *Swank*: The transmission of interest rate changes and the role of bank balance sheets: a VAR analysis for the Netherlands. *Journal of Macroeconomics*, 20:325–339, 1998. – H. *Garretsen* and J. *Swank*: The bank lending channel in the Netherlands: the impact of monetary policy on households and firms. mimeo, University of Nijmegen, 2000. – M. *Gertler* and S. *Gilchrist*: The cyclical behaviour of short-term business lending. *European Economic Review*, 37:623–631, 1993a. – M. *Gertler* and S. *Gilchrist*: The role of credit market imperfections in the monetary transmission mechanism: arguments and evidence. *Scandinavian Journal of Economics*, 95(1):43–64, 1993b. – M. *Gertler* and S. *Gilchrist*: Monetary policy, business cycles, and the behavior of small manufacturing firms. *Quarterly Journal of Economics*, 109(2):309–340, 1994. – S. *Gilchrist* and E. *Zakrajšek*: The importance of credit for macroeconomic activity: identification through heterogeneity. In *Market behaviour and macroeconomic modelling*, chapter 5, pages 129–157. MacMillan, London, 1998. – B. C. *Greenwald* and J. E. *Stiglitz*: Financial market imperfections and business cycles. *Quarterly Journal of Economics*, 108:77–114, 1993. – A. *Guender* and M. *Moersch*: On the existence of a credit channel of monetary policy in Germany. *Kredit und Kapital*, 30(2):173–185, 1997. – H. *Hansen* and K. *Juselius*: CATS in RATS: cointegration analysis in time series. *Estima*, Evanston, 1995. – F. A. *Hayek*: *Monetary Theory and the Trade Cycle*. Jonathan Cape, London, 1933. – A. *Houben*: The evolution of monetary policy strategies in Europe. Kluwer, Dordrecht, 2000. – J. *Kakes*: *Monetary transmission in Europe. The role of financial markets and credit*. Edward Elgar, Cheltenham, 2000. – A. K. *Kashyap* and J. C. *Stein*: The role of banks in monetary policy: a survey with implications for the European monetary union. *Federal Reserve Bank of Chicago Economic Perspectives*, Sept/Oct: 2–18, 1997. – A. K. *Kashyap*, J. C. *Stein*, and D. W. *Wilcox*: Monetary policy and credit constraints: evidence from the composition of external finance: reply. *American Economic Review*, 86:310–314, 1996. – N. *Kiyotaki* and J. *Moore*: Credit cycles. *Journal of Political Economy*, 105:211–248, 1997. – M. *Küppers*: *Banken in der geldpolitischen Transmission*. Mohr Siebeck, Tübingen, 2000. – R. *Mosconi*: MALCOLM (MAXimum Likelihood COintegration analysis of Linear Models) Venice, 1998. – S. D. *Oliner* and G. D. *Rudebusch*: Monetary policy and credit constraints: evidence from the composition of external finance: comment. *American Economic Review*, 86(1):300–309, 1996. – J. A. *Schumpeter*: *The theory of economic development*. Harvard University Press, Harvard, 1934. English translation of *Theorie der wirtschaftlichen Entwicklung* (1911). – C. A. *Sims*: Interpreting the macroeconomic time series facts: the effect of monetary policy. *European Economic Review*, 36(5):975–1000, 1992. – P. J. G. *Vlaar*: On the asymptotic distribution of impulse response functions with long run restrictions. DNB Staff Reports 22, De Nederlandsche Bank, Amsterdam, 1998. – A. *Worms*: *Bankkredite an Unternehmen und ihre Rolle in der geldpolitischen Transmission in Deutschland*. Peter Lang, Frankfurt am Main, 1998.

Summary

Monetary Transmission and Bank Lending in Germany

This paper analyses the role of bank lending in the monetary transmission process in Germany. We follow a sectoral approach by distinguishing corporate lending and household lending. We find that banks respond to a monetary contraction by adjusting their securities holdings, rather than reducing their loans portfolio. Most lending categories even show an *increase* following a monetary tightening. The main implication of our results is that a bank lending channel is not an important transmission mechanism. On the contrary, by insulating their loans portfolio from monetary shocks, banks are more likely to weaken than to strengthen the impact of monetary policy. (JEL E44, E51, E52)

Zusammenfassung

Monetäre Transmission und Bankdarlehen in Deutschland

In diesem Beitrag wird die Rolle von Bankdarlehen im monetären Transmissionsprozeß in Deutschland untersucht. Wir folgen einem sektoralen Ansatz, indem wir Kredite der Banken an Geschäfts- und Privatkunden unterscheiden. Wir haben festgestellt, daß die Banken auf eine monetäre Kontraktion eher durch Anpassung ihres Sicherheitenbestandes als durch Reduzierung ihres Wertpapierportfolios reagieren. Nach einer Periode des „knappen Geldes“ nehmen die meisten Darlehenskategorien zu (statt ab). Die wichtigste Folgerung aus unseren Ergebnissen besteht darin, daß der sogenannte „credit channel“ der Banken kein wichtiger Transmissionsmechanismus ist. Im Gegenteil, wenn man die Darlehensportfolios von Banken gegen monetäre Schocks abschirmt, besteht die Wahrscheinlichkeit, daß von Bankdarlehen eher eine Abschwächung als eine Verstärkung der geldpolitischen Auswirkungen ausgeht.

Résumé

Transmission monétaire et prêts bancaires en Allemagne

Dans cet article, les auteurs analysent le rôle du prêt bancaire dans le processus de transmission monétaire en Allemagne. Ils poursuivent une approche sectorielle, en distinguant entre prêts aux entreprises et prêts aux ménages. Selon eux, les banques répondent à une contraction monétaire en ajustant leurs avoirs en titres plutôt qu'en réduisant leur portefeuille de prêts. La plupart des catégories de prêts montre même un accroissement après un resserrement monétaire. La principale implication de leurs résultats est que le canal des prêts bancaires n'est pas un mécanisme de transmission important. Au contraire, en isolant leur portefeuille de prêts des chocs monétaires, les banques sont plus susceptibles d'affaiblir plutôt que de renforcer l'impact de la politique monétaire.