On the Existence of a Credit Channel of Monetary Policy in Germany*

By Alfred Guender and Mathias Moersch,
Christchurch and Frankfurt/Main

I. Introduction

Since the mid 1980s, a new wave of research has explored the special role accorded to bank loans in the transmission of monetary policy from the financial to the real sector of the economy.[1] This credit view argues that a bank's choice to allocate assets away from loans as a reaction to tight monetary policy has potentially large effects on real output. While the theoretical arguments are well established, debate still continues about the empirical strength of the credit channel. In recent surveys both *Kashyap* and *Stein* (1994) and *Cecchetti* (1995) conclude, albeit tentatively, that the credit channel is responsible for significant movements in real output. *Neumann* (1995) and *Eichenbaum* (1994) on the other hand, doubt its empirical relevance.

While almost all studies focus on the U.S. experience, we argue in this paper that Germany, due to its institutional environment, is a particularly interesting case for the study of the credit channel. Relations between banks and firms, which lie at the core of the transmission mechanism of the credit view are particularly strong in Germany. These strong ties between German banks and firms have at least two important implications. First, German firms are more dependent on bank financing than their U.S. counterparts. Second, due to close and long-lasting relationships between banks and firms, the so-called *Hausbank* relationship, banks may be more reluctant to cut credit supply to firms.

Relying on a number of tests based on aggregate data, we find very little evidence for the existence of a separate credit channel of monetary

* We would like to thank seminar participants at the University of Birmingham and the Southern Economic Association meetings in New Orleans and an anonymous referee for valuable suggestions. The usual disclaimer applies.

[1] The lending view of monetary policy is not a new idea. For early expositions see for example *Rosa* (1951) and *Wojnilower* (1980).

policy in Germany. Our results are, however, consistent with the traditional money-view.

The remainder of the paper is organized as follows. In Section II we review the credit channel of monetary policy and in Section III the institutional background in Germany. In Section IV we conduct the empirical investigation. The main results are summarized and put in perspective in Section V.

II. The Credit Channel of Monetary Policy

The credit view of monetary policy complements the traditional money view by focusing on two channels of transmission of monetary policy that are not addressed in the money view. They are a balance sheet effect and a portfolio effect, which are discussed in detail below. Both effects tend to increase the potency of monetary policy and ultimately work through the availability of bank credit.

The credit view differs from the money view by incorporating a more detailed picture of the process of financial intermediation. In the money view there is neither a special role for banks as providers of assessments about the probability of repayment of an investment as stressed in the balance sheet effect, nor is there any modeling of the asset side of banks, as detailed in the portfolio effect. Instead, monetary policy has effects on the economy only by changing the money supply and interest rates. Changes in interest rates affect the profitability of the marginal investment project and thus output.

The balance sheet effect emphasizes the role that monetary policy has on the net-worth of borrowers. Due to informational asymmetries in evaluating an investment project, a firm's balance sheet is an important factor in determining its ability to obtain external funding. Changes in interest rates lead to a change in a firm's net worth by changing the value of debt and future sales. More specifically, contractionary policy will lead to a lower net worth, which makes firms less creditworthy. Hence some firms lose access to credit, because monetary policy tightens. Due to these worsening credit market conditions, the output decline at the aggregate level is much more pronounced than it would be in the absence of a balance sheet effect. This effect, where small changes in interest rates have large effects on output via credit market conditions has also been called the financial accelerator by *Bernanke, Gertler* and *Gilchrist* (1996).

The portfolio effect stresses the asset allocation of banks and the fact that some firms – especially small ones – depend on a particular bank asset, namely loans, for funding. In addition to the size of banks' balance sheets, asset allocation also matters. In particular loans are only one possible asset in banks' portfolios. Asset allocation away from loans will have a negative effect on output, whenever firms exist whose only source of finance are bank loans.

In sum, two institutional aspects must be in place for the credit channel to be operational. First, there must be firms that have no alternative to bank loans as a source of financing. Second, banks must reduce their supply of loans in reaction to a negative policy shock. If they were able to offset the policy shock by either increasing other liabilities or by reducing bond holdings disproportionately the credit channel would not be operational.

In the next section we turn to the institutional environment. We argue that the way financial intermediation is organized in Germany has, at least according to the traditional view, strong implications for these two conditions.

III. The Provision of External Finance in Germany

The German case is usually cited as a prime example of a bank-based system of financial intermediation. This contrasts with the market-based systems of the United States and the United Kingdom. In bank-based systems, as the name implies, banks play a much larger role both in the channelling of wealth from savers to investors and in the governance of corporations. Market-based systems leave both functions mostly to financial markets.

Empirically, one large difference between the two systems lies in the financial structure of non-financial enterprises. First, debt financing is more important in bank-based systems than in market-based systems. Second, among all debt, bank loans play a much larger role than commercial paper and corporate bonds in bank-based systems. Finally, market-based systems have better developed and more liquid money and capital markets than their bank-based counterparts.[2]

This strong dependence on bank financing implies that the credit channel of monetary policy ought to be particularly strong in a bank-based

[2] For surveys on the differences in national financial markets see *Bockelmann* (1996) and *Steinherr* and *Huveneers* (1994).

economy like Germany. Not only is debt more important than in market-based systems, but most debt is bank financed and alternative forms of financing are not as readily available. However, there are also a number of institutional features, subsumed under the notion of corporate governance, that may weaken the credit channel in Germany.

A notable aspect of the German system is the *Hausbank* relationship. This term characterizes the long-term relationship between a firm and a bank. One bank will serve as the main provider of financial services to a firm. This role is facilitated by the fact that in Germany universal banking allows for the provision of a large spectrum of financial services by one institution. The reliance on a *Hausbank,* through the reduction of competition, is seen as a way to promote commitment and a longer term focus of the bank.

The close ties between banks and firms in Germany are also manifest in German banks' representation on the supervisory board of firms. This representation provides banks with several advantages. First, they obtain confidential information, thus lowering information asymmetries and second, they can protect the suppliers of debt finance in times of financial distress.

Both the *Hausbank* relationship and supervisory board representation give German banks an incentive to provide firms with long-term financing. Put differently, they are probably more reluctant than their American counterparts to cut off the supply of loans to firms. Consequently, the particularities of the German banking systems may reduce or even eliminate the existence of a credit channel of monetary policy.

With respect to the two necessary conditions for the existence of the credit view of monetary policy mentioned above, the following implications arise. On the one hand, German firms rely on external finance, and in particular bank finance, to a larger extent than their counterparts in market-based systems. The absence of non-bank sources of funding would imply a particularly strong role for the credit view. On the other hand, the institutional features of the bank-based system make it likely that German banks provide more continuity with respect to long-term financing than banks in market-based systems. The strong relationship between banks and firms makes it less likely that financing will not be rolled over. As a result, the balance sheet effect may not be operational at all or its effect greatly diminished in Germany. Since the *Hausbank* relationship and board supervision reduce the problems associated with asymmetric information, net worth may lose its importance as a determinant of creditworthiness.[3]

IV. Empirical Method and Results

The empirical investigation relies on impulse response functions. First, monetary policy is identified and the transmission of policy from money market interest rates to the real economy is traced out. Second, the reaction to a monetary policy shock of the most important portfolio shares of banks, namely loans and bonds on the asset side and deposits on the liability side are analyzed. Neither test finds any evidence for the existence of a credit channel.

1. The Transmission of Monetary Policy

In this section we capture the interaction between monetary policy, money- and credit-aggregates, output and prices, and trace out the transmission mechanism of monetary policy. To do so, we employ a five variable vector autoregressive model (VAR) that contains the following variables: IIP (the log of the index of industrial production), Price (the log of the consumer price index), Spread (the difference between a bond rate, measured as the average maturity of long bonds and the money market rate), M1 (the log of real M1) and Crsht (the log of real short term credit to private enterprise and individuals). We estimate the system which contains 12 lags of all five variables and a constant, using monthly data from 69:1 until 94:12. It is identified via the following assumptions. First, the Cholesky decomposition is used to obtain orthogonalization. Second, it is assumed that innovations in the spread capture monetary policy surprises.[4] The spread, rather than the short term interest rate alone is used to identify monetary policy to avoid the price

[3] The importance of these institutional differences is a matter of some debate. *Edwards* and *Fischer* (1994) have recently argued that the differences between German and Anglo-Saxon banking systems are greatly exaggerated. Comparing the banking system in Germany and the United Kingdom, they find no support for the claim that external finance is more readily available in Germany than in the United Kingdom. They point out that supervisory board representation is limited to large firms and large banks. The majority of firms do not have boards and thus a large portion of bank lending is not connected to supervisory board representation. Similarly they doubt the importance of the *Hausbank*. If this view is right and the institutional differences are of little empirical importance when it comes to the availability of credit, the German case should not be very different from the Anglo-Saxon model.

[4] This assumption is based on the work of *Bernanke* and *Blinder* (1992). It does, of course, assume that the supply function for reserves is perfectly elastic. See *Gordon* and *Leeper* (1994) for a criticism of this approach and an attempt to estimate interest elasticities of reserve supply and demand.

puzzle.[5] Third, the ordering of the variables is IIP, Price, Spread, M1, Crsht. This implies that monetary policy does not affect output and prices contemporaneously, but does affect money and credit within the period.[6]

Figure 1 shows the set of 25 impulse responses and their two-standard-deviation error bands over a horizon of 24 months. The reactions to a positive shock in the spread, a monetary policy easing, are depicted in the third row. We find that the easing leads to an increase in real output. This effect becomes statistically significant after about one year. The monetary aggregate rises. This effect is significant on impact and remains so for the next 12 months. The volume of credit also rises after the policy shock, but the rise is never statistically different from zero.

As shown in the last panel of the first row, credit reacts positively and significantly during the entire 24 months to a positive output shock. When combined with the finding that the volume of credit does not react to a change in monetary policy, the observed positive comovement between real output and credit constitutes strong evidence against the credit view. Credit appears to be driven more by developments in the real economy than by monetary policy actions. A consistent explanation for these impulse responses is that credit demand goes up as the economy expands. However, the impulse responses are not consistent with the view that tight policy leads banks to cut the supply of credit.

---

[5] We use the spread, rather than a short term interest rate to identify monetary policy, because the price puzzle, which has been noted in previous research, for example *Sims* (1992), is also observed in our work. In the wake of a monetary tightening, measured by an increase in the short term interest rate, the price level is found to be increasing, a rather paradoxical result by conventional wisdom. *Sims* (1992) argues that the prize puzzle arises from the omission from the VAR of a variable measuring inflationary expectations. He shows that the inclusion of such a variable, commodity prices in his case, reduces the price puzzle. The spread measures monetary policy relative to the long bond, and therefore also incorporates inflationary expectations. This specification indeed makes the price puzzle disappear, while the results with respect to the other variables are similar to the case where the short term rate alone is used to identify policy. We therefore argue that our scheme of identifying monetary policy by innovations to the interest rate spread is sensible.

[6] The nature of VARs and their identification assumptions are discussed, for example, in *Sims* (1980).

2. *Bank Balance Sheets*

The main focus in this section is on analyzing the changes in the composition of the structure of assets and liabilities of the aggregate banking sector in response to a monetary policy tightening. Since the price puzzle is not an issue here, we identify monetary policy as innovations to the money market interest rate. Following the work of *Bernanke* and *Blinder* (1992), in addition to short term credit to non-banks, we also analyze bonds on the asset side and deposits from non-banks on the liability side.[7]

Figure 2 traces the responses of the balance sheet items to a monetary tightening. The impulse responses are derived from a VAR system with the following ordering: Short term interest rate (Rate), real short term credit (Crsht), real bonds (Rbond) and real deposits (Rdeposit). We find that bond holdings fall significantly on impact and remain below the base value for the entire 24 months. This effect is statistically significant for the first twelve months. Deposits also fall over the entire period and the fall becomes significant after about ten months. Short credit rises throughout, but the effect is never significantly different from zero.

In Figure 3 we enter all three balance sheet items as fractions of the balance sheet total. Scrsht refers to the share of short term credit as a percentage of the balance sheet total, similarly for bonds and deposits we use Sbond and Sdeposit. Here we see that the portion of loans actually increases significantly for about 5 months and then falls back towards the old value. Bonds are below the average for the entire 24 months, but the decline is not statistically significant. Deposit shares rise initially and then fall, but the effect is also never statistically significant.

Bernanke and *Blinder* (1992) and *Kashyap* and *Stein* (1994) have pointed out that the fact that loans do not immediately fall as a reaction to tight policy is in itself no evidence against the credit view. If loans are quasi-contractual arrangements that are hard to change in the short run, the necessary initial portfolio adjustment is instead undertaken by shedding the more liquid bonds. However, we find no decrease in loans, either in real terms or as shares over a two-year period, which seems sufficiently long to undertake portfolio adjustments. Loans as a percentage of the overall portfolio even rise significantly on impact and then

[7] On the asset side other important positions are loans to other banks and on the liability side these are deposits of other banks and securities issued.

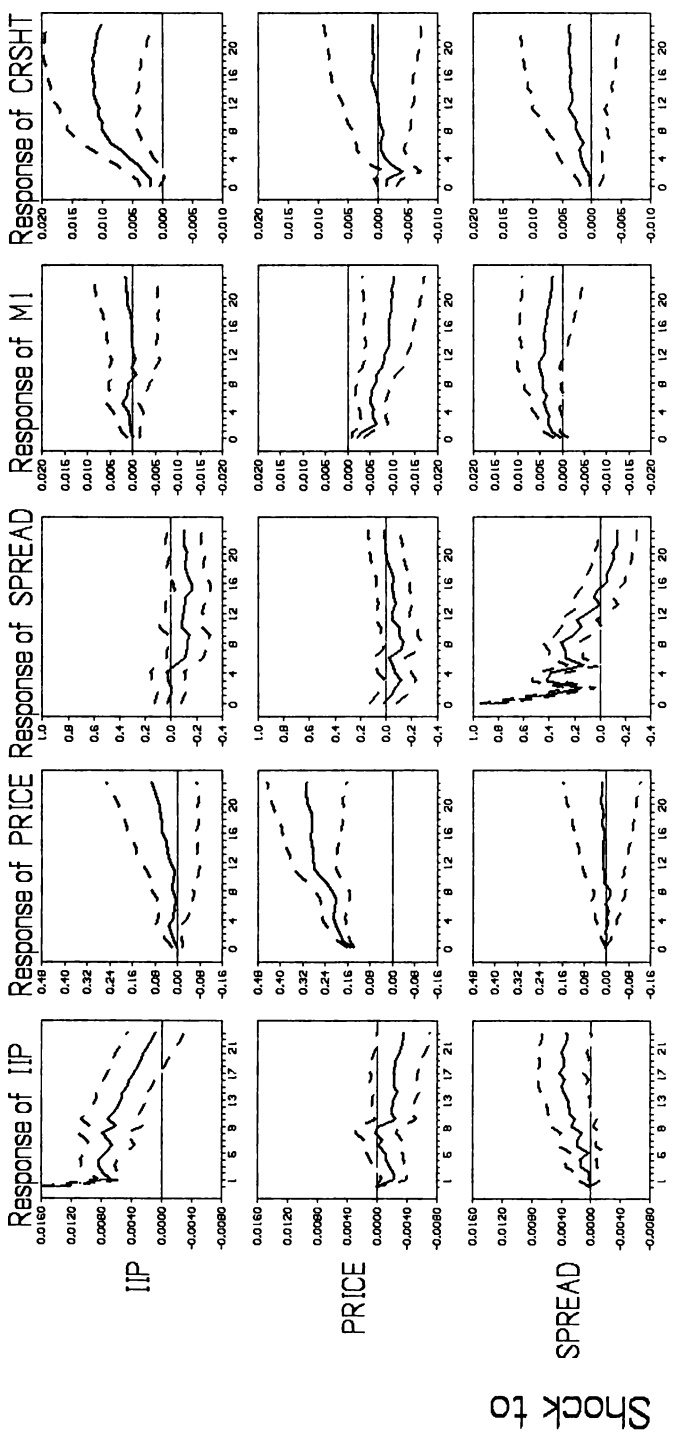

Figure 1: Impulse Responses

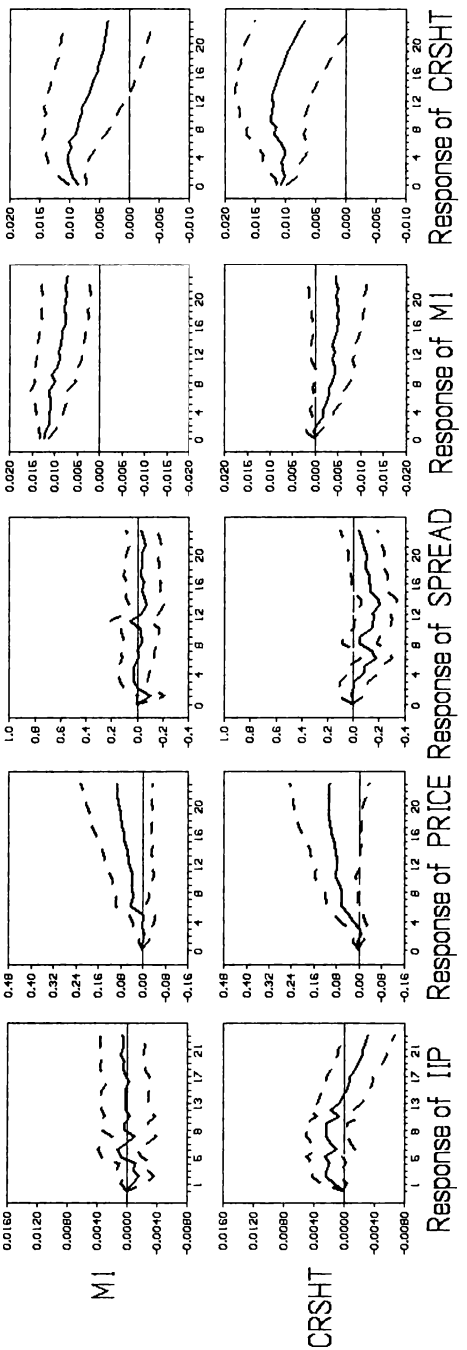

Figure 1: Continued

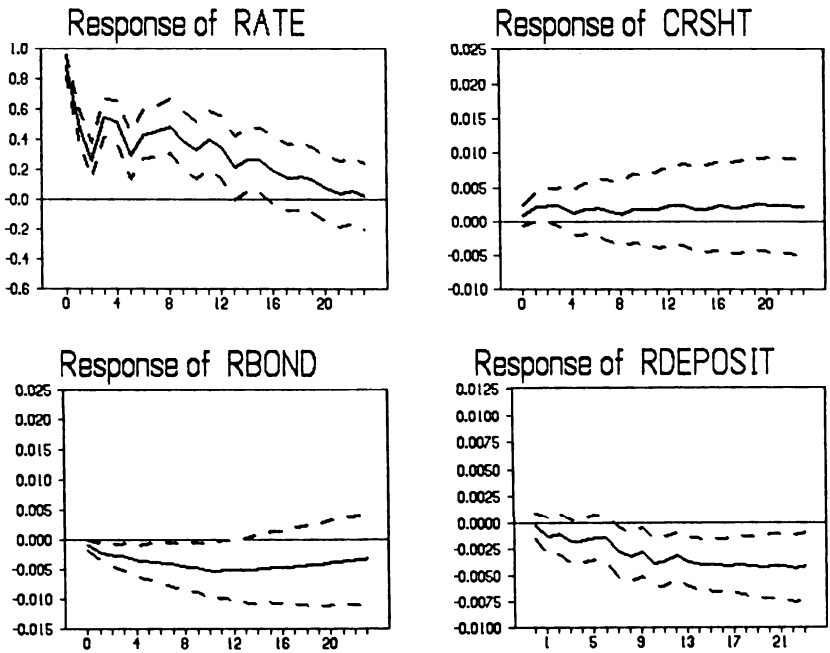

Figure 2: Impulse Responses to a Shock to Rate, Balance Sheet Items in Real Terms

merely return to the base value. Overall there is no evidence that banks reduce (short term) credit as a reaction to a policy tightening.

V. Comparisons with the Literature and Conclusions

This paper finds no evidence for a separate credit channel of monetary policy, while confirming the standard channel working through bank liabilities. *Tsatsaronis* (1993) also looks at the credit channel of monetary policy in Germany. His investigation differs from the above work in two important ways. First, he uses the historical record, following the work by *Romer* and *Romer* (1989) to identify monetary policy and second, his investigation ends in 1990. Nonetheless he also reaches the conclusion that the credit channel in Germany is not very important. The large institutional differences between Germany and the U.S. notwithstanding, it appears that the macro-based evidence concerning the credit channel of monetary policy is remarkably similar. For the U.S., *Ramey* (1992) also

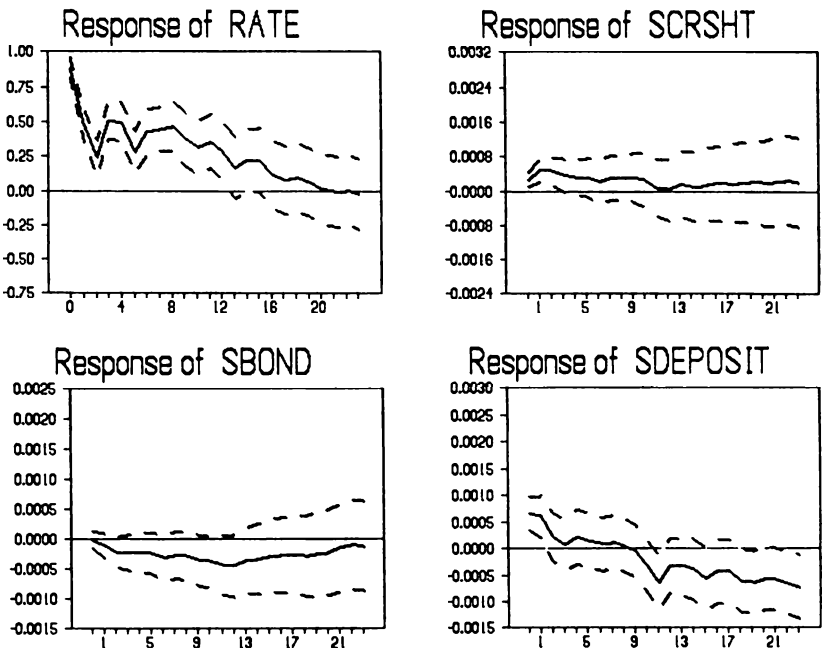

Figure 3: Impulse Responses to a Shock to Rate, Balance Sheet Items as Shares

finds a much stronger reaction of money compared to credit in reaction to a policy shock.

Certainly there is no support for the hypothesis that the dependence of German firms on bank debt makes the credit channel more potent. A possible explanation is that this dependency is compensated for by the *Hausbank* relationship, which shields loan customers from the possible effects of a monetary tightening. The reactions of the asset shares to a policy shock in particular are consistent with this interpretation.

Finally, it must be pointed out that all evidence presented here refers only to aggregate data. This leaves open the possibility that the credit channel is particularly strong for certain groups of firms (see *Gertler* and *Gilchrist,* 1994), groups of banks (see *Peek* and *Rosengren,* 1995), or sectors of the economy (see *Dale* and *Haldane,* 1995). These effects may be masked by the use of aggregate data. This is an investigation we plan to reserve for future research.

References

Bernanke, B. and A. *Blinder* (1992), "The Federal Funds Rate and the Channels of Monetary Transmission," American Economic Review, 901 - 922. – *Bernanke,* B., M. *Gertler* and S. *Gilchrist* (1996), "The Financial Accelerator and the Flight to Quality," Review of Economics and Statistics, 1 - 15. – *Bockelmann,* H. (1996), "Unterschiede in den nationalen Finanzstrukturen und ihre makroökonomische Bedeutung," in D. *Duwendag* (ed.) Finanzmärkte, Finanzinnovationen und Geldpolitik, Schriften des Vereins für Socialpolitik N.F. Bd. 242. Duncker & Humblot, 11 - 39. – *Cecchetti,* S. (1995), "Distinguishing Theories of the Monetary Transmission Mechanism," Federal Reserve Bank of St. Louis Review, May/June, 83 - 97. – *Dale,* S. and A. G. *Haldane* (1995), "Interest Rates and the Channels of Monetary Transmission: Some Sectoral Estimates," European Economic Review, 1611 - 1626. – *Edwards,* J. S. S. and K. *Fischer* (1994), Banks, Finance and Investments in Germany. Cambridge University Press. – *Eichenbaum,* M. (1994), "Comment on Monetary Policy and Bank Lending," in N. G. *Mankiw* (ed.) Monetary Policy. University of Chicago Press for the NBER, 256 - 261. – *Gertler,* M. and S. *Gilchrist* (1994), "Monetary Policy, Business Cycles, and the Behaviour of Small Manufacturing Firms," Quarterly Journal of Economics, 309 - 340. – *Gordon,* D. B. and E. M. *Leeper* (1994), "The Dynamic Impacts of Monetary Policy: An Exercise at Tentative Identification," Journal of Political Economy, 1228 - 1247. – *Kashyap,* A. and J. *Stein* (1994), "Monetary Policy and Bank Lending," in N. G. *Mankiw* (ed.) Monetary Policy. University of Chicago Press for the NBER, 221 - 256. – *Neumann,* M. J. M. (1995), "A Conference Panel Discussion: What Do We Know About How Monetary Policy Affects the Economy?" Federal Reserve Bank of St. Louis Review, May/June, 138 - 142. – *Peek,* J. and E. *Rosengren* (1995), "The Capital Crunch: Neither a Borrower Nor a Lender Be," Journal of Money, Credit and Banking, 625 - 638. – *Ramey,* V. (1993), How Important is the Credit Channel in the Transmission of Monetary Policy? Carnegie-Rochester Conference Series on Public Policy, 1 - 45. – *Romer,* C. and D. *Romer* (1989), "Does Monetary Policy Matter? A New Test in the Spirit of Friedman and Schwartz," NBER Macroeconomics Annual, 121 - 170. – *Rosa,* R. V. (1951), "Interest Rates and the Central Bank," Money, Trade and Economic Growth: In Honor of John Henry Williams. New York: Macmillan, 270 - 295. – *Sims,* Ch. A. (1980), "Macroeconomics and Reality," Econometrica, 1 - 48. – *Sims,* Ch. A. (1992), "Interpreting the Macroeconomic Time Series Facts," European Economic Review, 975 - 1011. – *Steinherr,* A. and C. *Huveneers* (1994), "On the Performance of Differently Regulated Financial Institutions: Some Empirical Evidence," Journal of Banking and Finance, 271 - 306. – *Tsatsaronis,* C. (1993), Bank Lending and the Monetary Transmission Mechanism: The Case of Germany. Manuscript, Dept. of Economics, University of California, Berkeley. – *Wojnilower,* A. (1980), "The Central Role of Credit Crunches in Recent Financial History," Brookings Papers on Economic Activity, 277 - 326.

Summary

On the Existence of a Credit Channel of Monetary Policy in Germany

This paper analyzes the credit channel of monetary policy in Germany. It finds little evidence for the existence of a credit channel, while confirming the standard channel of monetary transmission which works through bank liabilities. The findings suggest that, first, monetary policy shocks are largely transmitted through bank liabilities rather than assets. Second, after a policy tightening loans as a share of overall assets increase temporarily. The absence of a credit channel is consistent with a strong *Hausbank* relationship, in which banks insulate loan portfolios from monetary policy shocks.

Zusammenfassung

Zur Existenz eines Kreditkanals in der Geldpolitik in Deutschland

Diese Untersuchung befaßt sich mit dem Kreditkanal in der Geldpolitik in Deutschland. Sie findet kaum Anhaltspunkte für die Existenz des Kreditkanals und bestätigt gleichzeitig den bekannten Transmissionsweg der Geldpolitik über die Passiva der Banken. Die zwei Ergebnisse der Studie sind erstens, daß geldpolitische Impulse über die Passiva und nicht die Aktiva der Banken weitergeleitet werden, und zweitens, daß eine restriktivere Geldpolitik sogar zu einer kurzfristigen Erhöhung der Kreditvergabe relativ zum Bilanzvolumen führt. Die Unwirksamkeit des Kreditkanals kann mit einer starken Hausbankbeziehung erklärt werden, in welcher Banken Kreditportefeuilles gegen geldpolitische Schocks abschirmen.

Résumé

L'existence d'un circuit de crédit de la politique monétaire en Allemagne

Cet article analyse le circuit de crédit de la politique monétaire en Allemagne. Il y a peu d'évidence de l'existence d'un tel circuit; par contre, on confirme le circuit standard de la transmission monétaire à travers des passifs bancaires. Les résultats suggèrent que tout d'abord, les chocs de la politique monétaire sont avant tout transmis par les passifs bancaires plutôt que par les actifs. En second lieu, après une politique de restriction, les crédits comme part de tous les actifs augmentent. L'absence d'un circuit de crédit est compatible avec la forte relation avec la banque habituelle («Hausbank»), qui permet aux banques d'isoler les portefeuilles de crédits des chocs monétaires.