Bank Lending and Monetary Policy: Evidence on a Credit Channel

By Charles S. Morris and Gordon H. Sellon, Jr.

While there is widespread agreement that banks play a key part in the transmission of monetary policy actions to the economy, there is considerable controversy over the precise role that banks play. The focus of this debate is whether bank *lending* plays a special part in the monetary transmission mechanism. If a special lending or credit channel exists, changes in the willingness and ability of banks to extend credit may have implications for aggregate economic activity. Moreover, ongoing changes in the role banks play in financial markets may affect this credit channel and so alter the monetary transmission mechanism.

Recent research on a bank credit channel has focused on two questions. Are certain borrowers so dependent on bank lending that any change in banks' willingness to lend immediately affects investment and spending decisions? And, do monetary policy changes directly constrain bank lending? Both conditions are necessary for bank lending to play a special role in the monetary transmission mechanism. Thus far, research on a credit channel has yielded mixed results. Some recent research provides support for the view that certain borrowers, such as small businesses, are very dependent on banks for financing. This finding suggests that disruptions in bank credit could affect economic activity. At the same time, there is conflicting evidence that bank lending is directly constrained by monetary policy actions.

This article provides additional insight into the second question—whether bank lending is constrained by monetary policy. The article does so by analyzing how banks adjust the amount and terms of business lending when monetary policy is tightened. The analysis differs from previous research by using a more precise measure of monetary policy actions, which allows a more accurate identification of episodes of monetary tightening. Evidence presented in the article suggests that bank business lending is not constrained by restrictive monetary policy. The article concludes that monetary policy does not appear to operate through a special credit channel.

The first section of the article examines the rationale for a credit channel and the implications of this channel for monetary policy. The second section reviews recent research on the key features of a credit channel: bank dependent borrowers and the ability of monetary policy to directly restrict bank lending. The final section presents new empirical evidence on whether monetary policy constrains bank business lending.

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BANK LENDING AND THE MONETARY TRANSMISSION MECHANISM

The view that bank lending plays a special role in monetary policy has been part of policy debates for over 40 years. The existence of a lending or credit channel implies that ongoing structural changes in the banking industry may alter the monetary transmission mechanism and make it harder to implement monetary policy.

The special nature of bank lending

There is general agreement among economists and policymakers that monetary policy works mainly through interest rates. When policy is tightened through a decrease in reserve provision, for example, interest rates rise. A rise in interest rates leads to a reduction in spending by interest-sensitive sectors of the economy, such as housing and consumer purchases of durable goods. Banks play a part in this interest rate mechanism since a reduction in the money supply—which consists mainly of deposit liabilities of banks—is one of the principal factors pushing up interest rates. In this standard view of the monetary transmission mechanism, however, there is nothing unique about bank lending. Indeed, the interest rate mechanism does not depend on what assets banks hold; the same response would occur regardless of the proportions of a bank's assets that are held as loans or securities (Bernanke and Blinder 1988).

In contrast to this description of the transmission mechanism, some economists and policymakers have argued that an additional policy channel works through bank credit. In this view, monetary policy directly constrains the ability of banks to make new loans, making credit less available to borrowers who are dependent on bank financing. Thus, in the credit channel, restrictive monetary policy works not only by raising interest rates, but also by directly restricting bank credit.

The view that bank lending plays a special role in the transmission mechanism is not a new idea. Indeed, it has been part of monetary policy debates for over 40 years. During the 1950s, for example, proponents of the "availability doctrine" argued that a bank credit channel provided the Federal Reserve with additional leverage in conducting monetary policy.[1] According to this view, the existence of a direct channel from monetary policy to bank lending made it possible to carry out monetary policy without large changes in interest rates. Restrictive monetary policy would cause banks to directly reduce the supply of loans, forcing businesses to cut back their spending.

In recent years, debate over the existence of a bank credit channel has focused on two distinct but related lines of research. One approach examined whether banks ration credit to borrowers (Jaffee; Keeton; Stiglitz and Weiss). To the extent that "credit rationing" exists, it may provide a direct channel for monetary policy. More recently, a second line of research termed the "credit view," or "lending view," has explored how credit market imperfections may not only create a credit channel for monetary policy, but also may make disruptions in credit availability a source of fluctuations in economic activity (Bernanke and Blinder 1988). As in the availability doctrine, this approach emphasizes that changes in monetary policy may work partly by directly affecting the supply of bank loans.

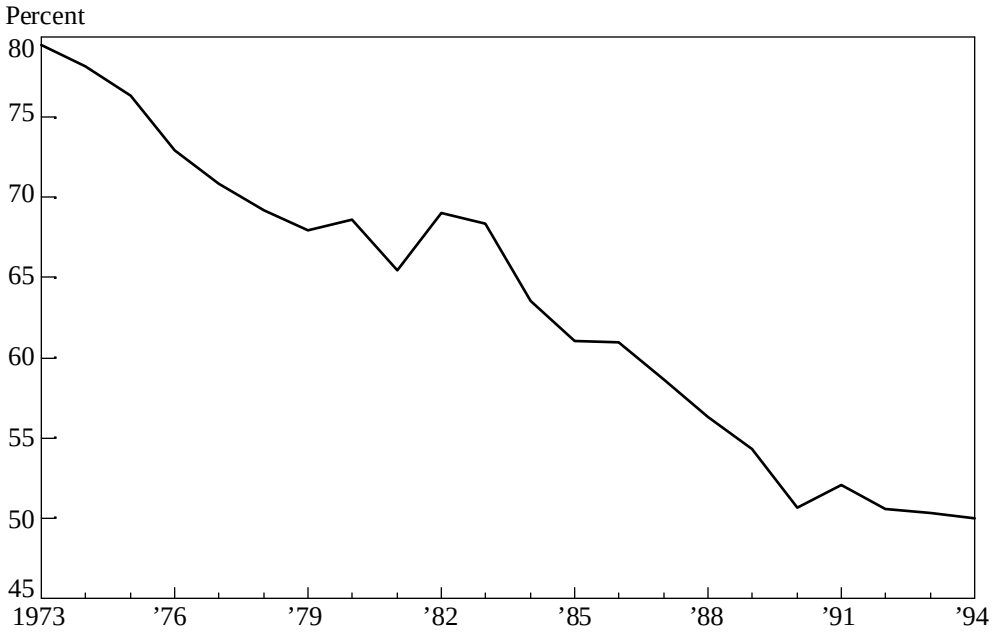
Bank credit and monetary policy

If bank lending plays a central role in the monetary transmission mechanism, changes in bank lending practices or in the role that banks play in financial markets can alter the transmission mechanism and have important policy implications. Two institutional changes that may have affected the transmission mechanism are the secular decline in bank lending to business and the growing use of bank loan commitments.

Banks have traditionally been a primary source

Chart 1

Banks' Share of Short-term Business Credit



Note: Bank loans are the sum of the categories "bank loans not elsewhere classified" and "acceptance liabilities to banks" as a percentage of short-term business credit to nonfarm nonfinancial corporate business.
Source: Authors' calculations are from Flow of Funds, Board of Governors of the Federal Reserve System.

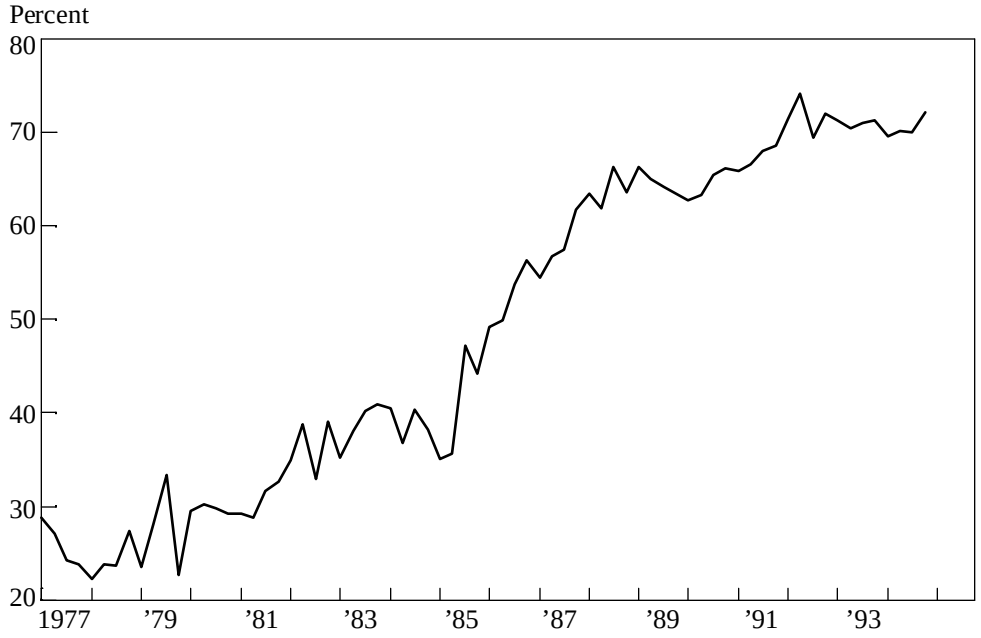
of short-term credit for business. Businesses borrow from banks to finance inventories and working capital, to obtain short-term construction and land-development loans, and to provide bridge financing for mergers and acquisitions. Over time, however, business dependence on bank loans has diminished as alternatives such as the commercial paper market and nonbank intermediaries have allowed businesses to bypass banks. Thus, the proportion of short-term business finance provided by banks has dropped dramatically over the past 20 years (Chart 1). Where businesses obtained 80 percent of their short-term funding from banks in the early 1970s, they currently get only 50 percent from banks. In contrast, reliance on the commercial paper market and finance companies has increased.

The decline in bank lending to businesses suggests that if a credit channel exists, its importance may have changed over time. If so, the monetary transmission mechanism also may have changed, with less of the impact of policy occurring through bank lending and more occurring through interest rates. Such a change could complicate monetary policy. Without an accurate measure of the impact of these changes, for example, the Federal Reserve could underestimate the change in interest rates needed to achieve a slowing in economic activity, resulting in an inflationary bias to policy.[2]

A second institutional change in banking with policy implications is the growing use of loan commitments. A loan commitment is an agreement between a borrower and lender that allows the

Chart 2

Growth in Loan Commitments



Note: Percent of the total number of loans made that are made under commitment. Loans are loans with maturity between one month and one year plus demand loans.
Source: Authors' calculations are from the Survey of Terms of Bank Lending, Board of Governors of the Federal Reserve System.

borrower to draw down a line of credit at his discretion. In effect, a loan commitment provides guaranteed funding up to a credit limit, protecting the borrower from being denied credit. Over the past two decades, the use of bank loan commitments has increased dramatically (Chart 2). In the late 1970s, only 20 percent of bank loans to business were made under the terms of a commitment. In recent years, however, 75 percent of all bank loans to business have been made under commitment.

The growing use of commitments also has implications for the transmission mechanism. If a credit channel exists, the increased use of loan commitments may tend to lengthen monetary policy lags because firms can borrow under a commitment and delay the impact of a policy tightening. This introduces an additional complication to the implementation of monetary policy. Without an accurate estimate of the effect of loan commitments on the transmission mechanism, the Federal Reserve may have difficulty judging the timing of policy actions.

RECENT RESEARCH ON A CREDIT CHANNEL

Recent research on whether a credit channel plays an important part in the monetary transmission mechanism has focused on two issues: whether certain borrowers are dependent on bank loans and whether bank lending is constrained by monetary

policy. While there is some evidence that small firms may be especially dependent on banks for financing, there are conflicting opinions on whether bank lending is directly affected by monetary policy actions.

Are borrowers dependent on banks?

The view that some borrowers are dependent on banks for financing stems from economic models of asymmetric information that help explain credit market imperfections. The central idea is that the costs of obtaining information about a firm's condition, as well as liquidation or bankruptcy costs, are differentially greater for smaller firms. Thus, small firms find it more difficult and more costly to obtain credit. In addition, a special feature of banks is that they may have a comparative advantage over other intermediaries in information processing and monitoring that enables banks to lend to smaller firms at lower cost.[3]

These theories provide a rationale for observed differences in large-firm and small-firm financing. Generally speaking, larger firms have a greater array of financing options, including equity, long-term debt, and short-term debt, in addition to bank loans and internal cash flow. In contrast, smaller firms appear to have much less access to capital markets and depend more on bank loans, trade credit, and internal funds for financing. The greater dependence of smaller firms on bank financing, in turn, suggests they may be more vulnerable than larger firms to disruptions in credit availability.

A number of studies have provided evidence that these credit market imperfections may explain differences in behavior of small and large firms during periods of tight credit. For example, small firms appear to account for a larger share of the decline in manufacturing activity and reduced inventory demand that follow a monetary tightening (Gertler and Gilchrist 1994). Similarly, small firms appear to have less access to bank and nonbank external finance in periods of monetary tightening (Oliner and Rudebusch). This behavior is consistent with the view that restrictions in the availability of bank credit could have macroeconomic consequences by affecting the investment and spending decisions of bank-dependent borrowers.

Does monetary policy constrain bank lending?

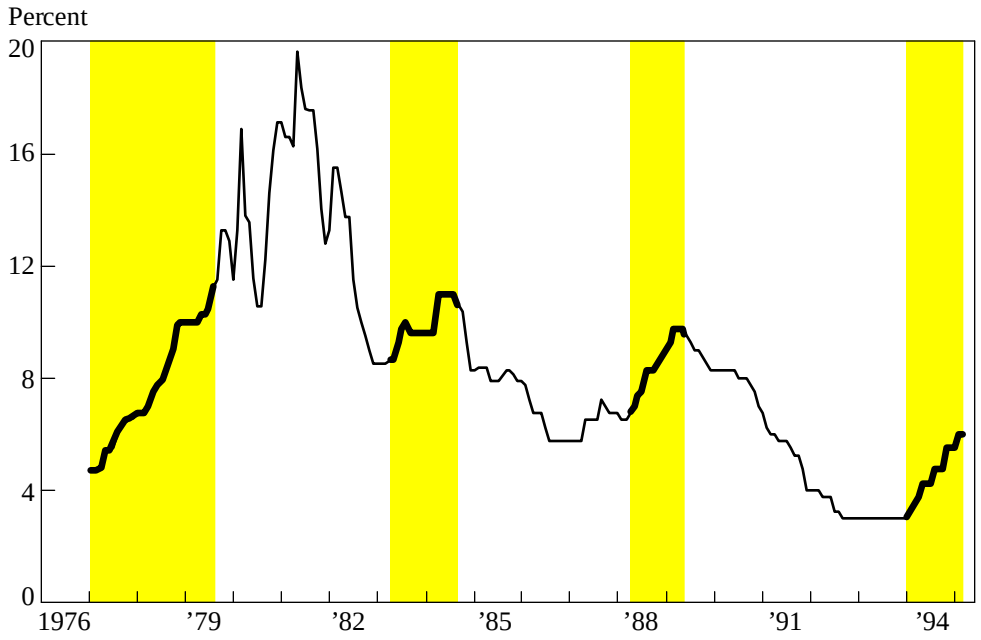
For monetary policy to operate through a credit channel, not only must there be bank dependent borrowers, but monetary policy must also directly affect banks' willingness to lend. To determine whether monetary policy affects bank lending, some studies have examined how banks adjust their portfolios in periods of monetary tightening, while other studies have looked at changes in the price and nonprice terms of lending.

Bank portfolio behavior. One approach to identifying a bank lending channel is to see how banks alter their assets and liabilities during periods of monetary restraint. Accordingly, a number of studies have examined how banks adjust loans, securities, and deposit and nondeposit liabilities to changes in monetary policy. Several stylized facts about bank portfolio behavior have emerged from this line of research (Bernanke and Blinder 1992; Romer and Romer 1990). First, in response to a tightening of policy, bank transactions deposits or core deposits fall immediately. Second, total bank loans decline, but only after a significant lag of two to three quarters. Third, banks are able to maintain lending in the face of a decline in core deposits by selling securities and by issuing managed liabilities such as time deposits and Eurodollar borrowings. Fourth, the eventual decline in bank lending is roughly contemporaneous with a decline in economic activity as measured by industrial production or GDP.

Taken as a whole, these results do not resolve the debate over the existence of a credit channel. While there is some evidence that bank lending declines when policy is tightened, the time lags

Chart 3

Effective Funds Rate Target



Source: Authors' calculations; Sellon (1994).

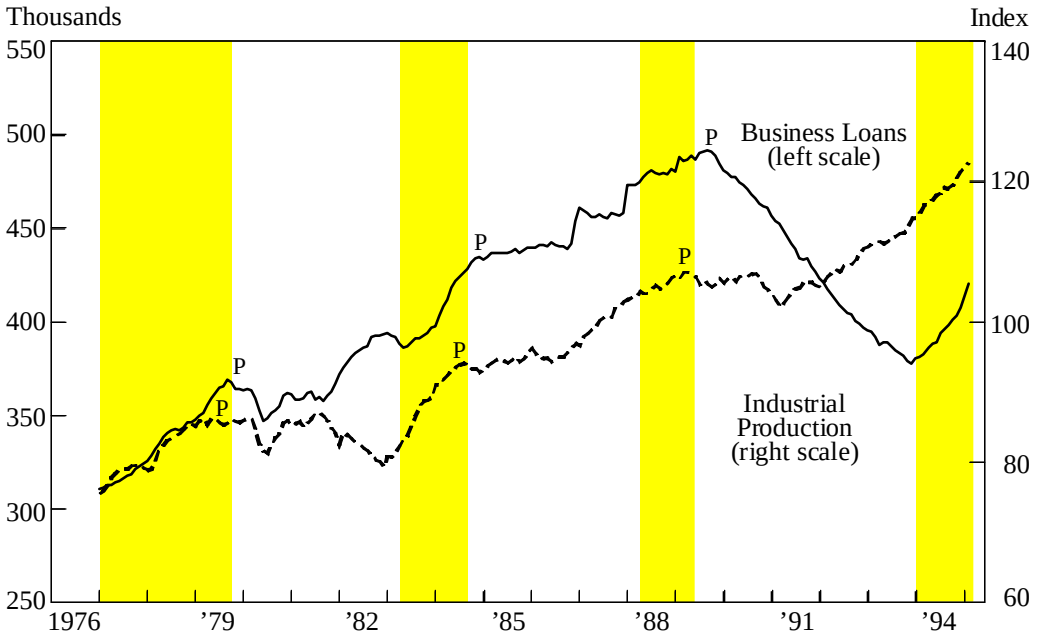
appear quite long. Moreover, although the contemporaneous decline in loans and output is consistent with a reduction in lending causing output to fall, it is equally consistent with a decline in output causing a fall in loan demand.

An additional problem with many of these studies is that they use total bank loans, which includes consumer and real estate lending, rather than business loans. Based on the discussion of credit market imperfections above, business lending would appear to be the more appropriate measure in testing for a credit channel. Indeed, given the large number of nonbank credit sources for consumer and real estate lending and the extensive securitization of these loans, it is difficult to believe the informational problems that make small businesses dependent on bank credit would apply to other types of lending.

Unfortunately, focusing on business lending still does not resolve the debate. One recent study that specifically looks at how bank business lending responds to policy tightening finds business lending does not decline when policy is tightened (Gertler and Gilchrist 1993). All of the decline in total lending comes from a reduction in consumer and real estate loans. Moreover, when the analysis is narrowed further to loans to manufacturing firms, bank lending actually shows a significant increase in response to tighter policy. Indeed, for manufacturing firms, most of the increased lending appears to go to large firms; while loans to small manufacturing firms are largely unaffected by policy

Chart 4

Business Loans and Economic Activity



Note: Business loans are commercial and industrial loans deflated by the consumer price index excluding food and energy.
Source: Business loans are from the H.8 release, and industrial production is from the G.17 release. Board of Governors of the Federal Reserve System.

tightening. Thus, there is little evidence banks actually reduce lending to small firms when monetary policy is tightened.

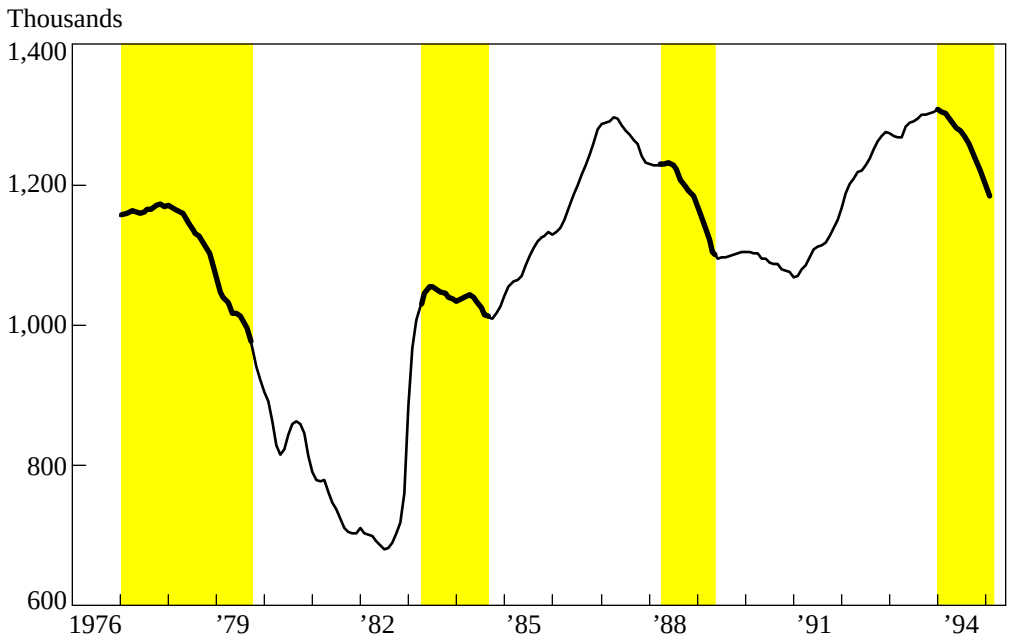
In contrast to this study, Kashyap and Stein find evidence that business lending may respond to a tightening of monetary policy. They examine the lending behavior of small and large banks, rather than loans received by small and large firms. Kashyap and Stein find that when policy is tightened, both total loans and business loans at small banks fall, while loans at large banks are unaffected. The differential response of small banks may indicate they have less access to alternative funding sources than large banks and so are less able to avoid the loss of core deposits when policy is tightened. Since small banks lend primarily to smaller firms, this research is consistent with the view that monetary policy may work, in part, through a credit channel.

Another line of research consistent with Kashyap and Stein examines the behavior of business loans not made under terms of a loan commitment (Sofianos, Wachtel, and Melnik; Morgan). These loans would appear to be most vulnerable to monetary tightening. This line of research provides evidence that uncommitted loans fall in periods of monetary tightening, while loans made under the terms of an existing commitment are unaffected. Thus, restrictive policy may work primarily by reducing the availability of bank credit to business borrowers without a loan commitment.

Terms of bank lending. Given these conflicting

Chart 5

Bank Core Deposits



Note: Core deposits are transactions deposits plus small savings deposits deflated by the consumer price index excluding food and energy.
Source: Authors' calculations are from the H.6 release, Board of Governors of the Federal Reserve System.

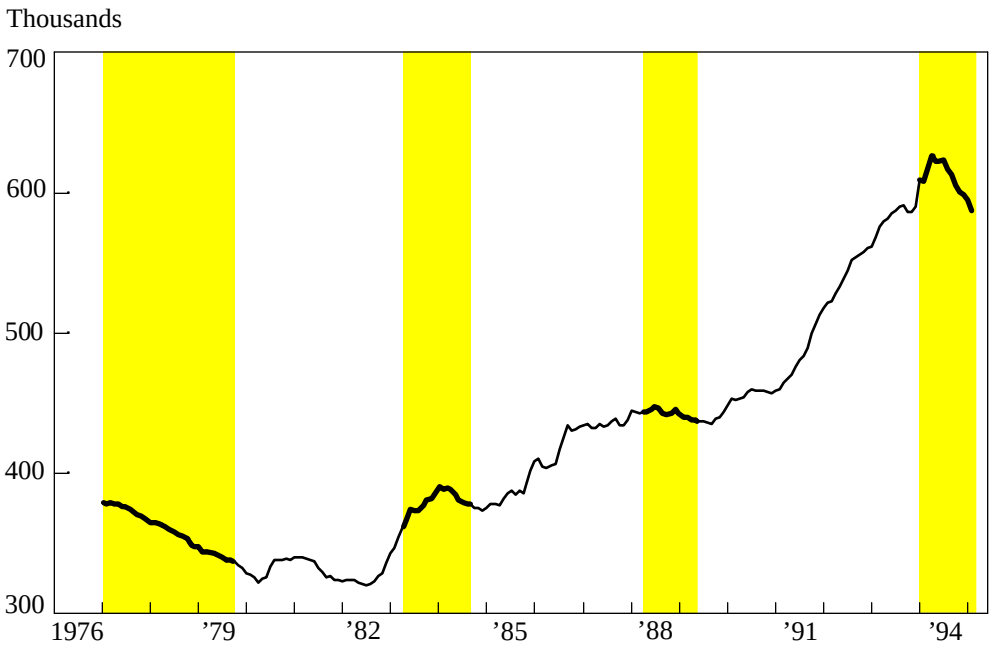
results, most researchers agree that analyses of aggregate bank balance sheets need to be supplemented with more detailed information on bank lending behavior. One limitation of balance sheet data is that they contain no information on the rates banks charge on new loans or on other terms of loan contracts. In addition, the value of loans on banks' balance sheets may change for a variety of reasons having little to do with monetary policy. For example, while loans on balance sheets could decline as a consequence of restrictive monetary policy, they could also fall as a result of increases in nonperforming loans or because banks sell loans to other financial institutions.

Information on the terms of bank lending may also be useful in distinguishing between the "lending view" and the "credit rationing" explanations of a bank credit channel. In particular, Kashyap and Stein note that the lending view is a statement about the relative magnitude of shifts in the demand for and supply of loans when policy is tightened. According to the lending view, the volume of new loans should decline and loan rates should rise relative to market rates when policy is tightened. This behavior would indicate loan supply shifts are relatively larger than loan demand shifts. In contrast, most theories of credit rationing suggest that, while the volume of new loans should decline when policy is tightened, bank loan rates should actually increase less than market rates.

Recent studies on bank lending using survey data on the terms of lending have found little evidence

Chart 6

Bank Security Holdings



Note: Securities deflated by the consumer price index excluding food and energy.
Source: H.8 release, Board of Governors of the Federal Reserve System.

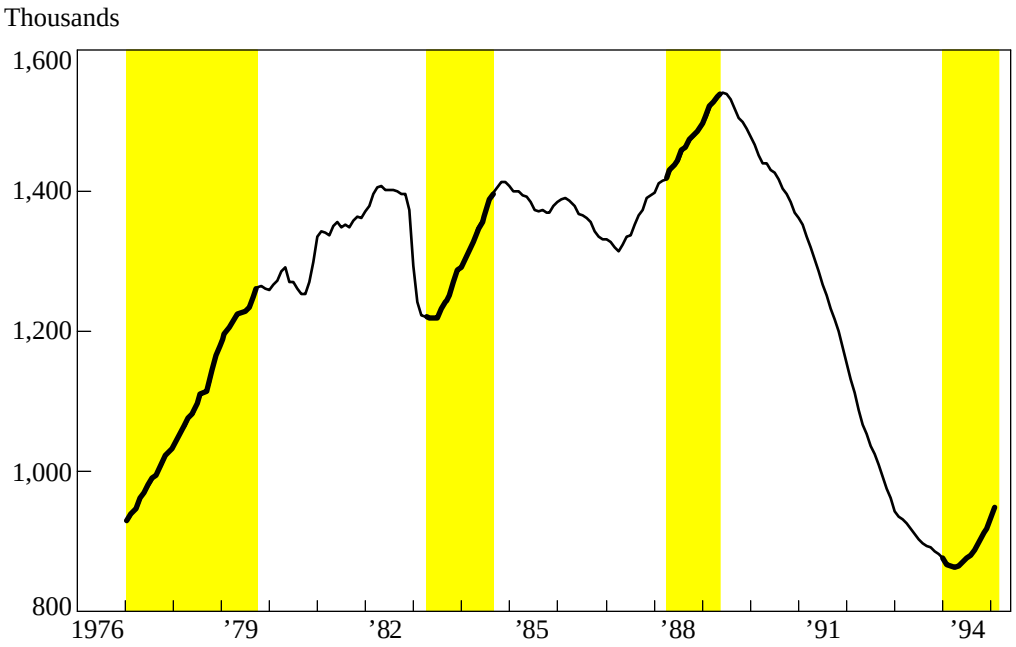
in favor of either credit rationing or the lending view. For example, in work specifically designed to investigate credit rationing, Berger and Udell find little supporting evidence. While they do find a key element of rationing, a sluggish response of bank loan rates to market rates, other characteristics of rationing are not present. In particular, Berger and Udell note that interest rates on loans made under commitment are as sluggish as rates on uncommitted loans. Since loans made under commitment are presumably not subject to credit rationing, this suggests the slow response of loan rates is not due to rationing. In addition, they find that the volume of new bank loans, both uncommitted and committed, rises in periods of tight credit, while credit rationing would imply a reduction in loans made without a commitment. While Berger and Udell do not directly examine the lending view, the stickiness of bank loan rates found in their study suggests banks do not reduce the supply of new loans when monetary policy is tightened.

DOES MONETARY POLICY CONSTRAIN BANK LENDING?

While recent research provides support for the view that some borrowers may be dependent on bank credit, the evidence is conflicting on whether restrictive monetary policy actually forces banks to reduce their lending. One important limitation of previous research on the reaction of bank lending to restrictive

Chart 7

Managed Liabilities of Banks



Note: Managed liabilities are small and large time deposits, Eurodollar deposits, and repurchase agreements deflated by the consumer price index excluding food and energy.
Source: Authors' calculations are from the H.6 release, Board of Governors of the Federal Reserve System.

monetary policy is the lack of a direct measure of monetary policy actions. Using a new measure of the timing of policy actions, a reexamination of bank behavior suggests that bank business lending is not constrained by restrictive monetary policy.

Measuring monetary policy

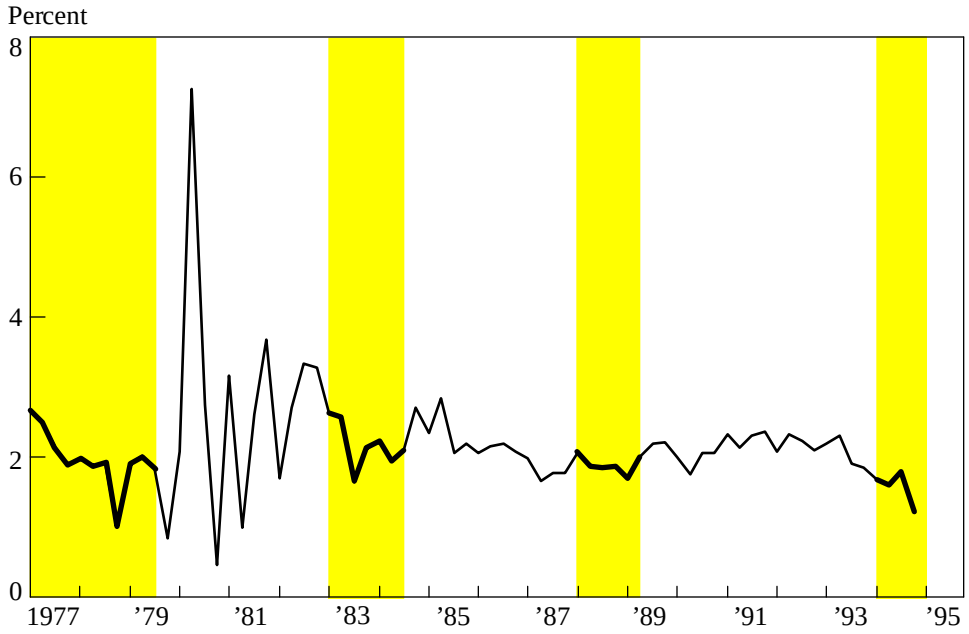
Previous research on the credit channel has used two types of monetary policy measures. Most studies use a short-term market interest rate, such as the federal funds rate or Treasury bill rate, to measure policy actions. Some also use a record of dates of significant monetary policy actions developed by Romer and Romer (1989). Both approaches have a number of limitations (Cecchetti).

One difficulty with the use of short-term market interest rates to measure policy actions is that large changes in interest rates can occur for reasons other than a change in monetary policy. Thus, the response of bank lending to interest rate changes found in some studies may not be caused by monetary policy. Similarly, the failure to find a response of lending to interest rate changes may be due to factors other than monetary policy.

A second difficulty with the use of market interest rates is that these rates may incorporate both the effects of normal policy actions and special policy actions. For example, the Federal Reserve

Chart 8

Spread Between Bank Loan and Commercial Paper Rates



Note: he spread is the difference between the bank loan rate and the 3-month commercial paper rate. The bank loan rate is the weighted average stated rate on new demand loans and loans with a maturity between one month and one year. Demand loans are loans with no stated maturity.
Source: Authors' calculations are from the Survey of Terms of Bank Lending, Board of Governors of the Federal Reserve

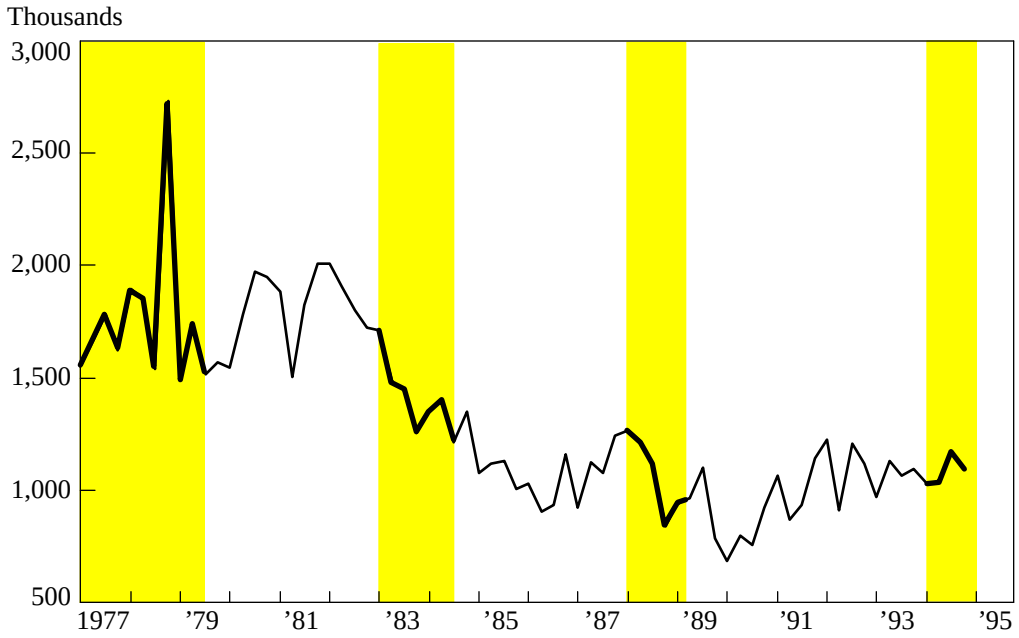
imposed direct credit controls on banks and raised interest rates in the second quarter of 1980. During this period, it is difficult to untangle the effect of changes in interest rates on bank lending from the effect of the credit controls.[4]

The use of the Romer and Romer dating procedure to measure policy actions also has problems. Romer and Romer have chosen to measure only significant anti-inflationary actions taken by the Federal Reserve. Post-1975, there are only three Romer dates and most of the studies cited above incorporate only the two dates reported in 1978 and 1979. Thus, use of these dates to measure policy actions omits considerable information about monetary policy. The Romer dates have also been criticized as reflecting factors other than monetary policy actions, such as oil price shocks, and for their accuracy in identifying significant policy actions (Hoover and Perez; Dotsey and Reid; Sellon).

To attempt to overcome some of these difficulties, this article uses a new measure of monetary policy actions to identify periods in which the Federal Reserve was tightening monetary policy (Sellon). This measure, termed the "effective funds target," includes all changes in the Federal Reserve's short-run operating targets from September 1974 to the present (Chart 3). With this measure of policy actions it is possible to isolate four separate periods since the mid-1970s in which the Federal Reserve pursued a sustained policy of reducing

Chart 9

Ratio of Uncommitted Loans to GDP



Note: The ratio of nominal loans that are not made under a commitment to nominal GDP, where loans are measured as the sum of demand loans and loans with a maturity between one month and one year not under commitment. Demand loans are loans with no stated maturity.
Source: Authors' calculations are from the Survey of Terms of Bank Lending, Board of Governors of the Federal Reserve

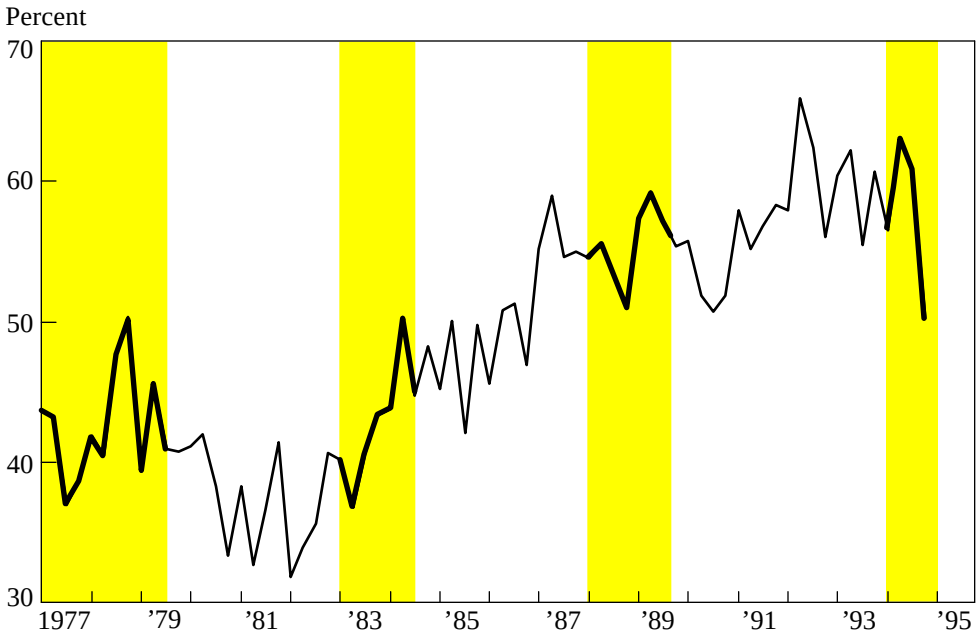
bank reserves to raise the federal funds rate and in which there were no special policy actions implemented through reserve requirement changes or direct credit controls. The four periods, identified by shaded areas in Chart 3, are: January 1977 to September 1979, April 1983 to August 1984, April 1988 to May 1989, and February 1994 to February 1995.[5] For each episode, the beginning of the shaded area identifies the month before tightening began. The ending of the shaded area identifies the last month before policy was eased. Thus, within each "policy window" the Federal Reserve was taking a series of restrictive policy actions designed to slow the pace of economic activity and reduce inflationary pressures.[6]

Bank lending during policy tightening

These "policy windows" provide a more precise way of viewing bank lending behavior during periods of policy tightening. Looking first at balance sheet data, the behavior of bank business lending during each tightening period is shown in Chart 4. In each period, real commercial and industrial (C&I) lending rises throughout the period and shows no tendency to weaken until well after the Federal Reserve has reversed course and has begun to ease policy. In addition, it is clear that in each episode, business lending tends to lag economic activity as measured by industrial production. That is, the peak in lending occurs a few months after the

Chart 10

Collateral Requirements on New Loans



Note: Collateral requirements are measured by the percentage of the amount of nominal loans backed by collateral, where loans are measured by the sum of demand loans and loans with a maturity between one month and one year backed by collateral. Demand loans are loans with no stated maturity.
Source: Authors' calculations are from the Survey of Terms of Bank Lending, Board of Governors of the Federal Reserve System.

peak in industrial activity.

Taken together, these results lend little support to the view that restrictive monetary policy constrains business lending. Indeed, the results are more in line with the view that business lending is driven by the demand for loans rather than supply. For example, the strength in business lending after the decline in industrial production may be caused by an increased demand for loans to finance an unanticipated rise in unsold inventories. If so, banks would appear to be providing an additional source of liquidity rather than restricting liquidity.

Other aspects of bank portfolio behavior are consistent with previous research. For example, core deposits decline in each episode of policy tightening as interest rates increase (Chart 5).[7] Banks also tend to sell off security holdings and increase their use of managed liabilities when policy is tightened (Chart 6, Chart 7).[8] Thus, while banks are faced with a decline in core deposits when policy is tightened, they appear to be able to offset the loss of deposits by selling securities and obtaining additional funding in order to continue to meet loan demand.

A similar picture of bank behavior emerges from a more detailed look at the terms of bank lending during the four episodes of monetary policy tightening. Indeed, an analysis of information from the Federal Reserve's *Survey of the Terms of Bank Lending* (STBL) provides little evidence of

constraints on bank lending during periods of tightening.[9] As noted by Berger and Udell, interest rates on new loans in the STBL data tend to adjust only slowly to market rates during a period of tightening. Thus, as shown in Chart 8, the spread of bank loan rates over the commercial paper rate actually declines in each episode of tightening rather than increasing as required by the lending view.[10] While the stickiness of loan rates is not consistent with the lending view, it may reflect credit rationing. However, a more detailed analysis of the volume of new lending and the nonprice terms of lending provides little support for the view that restrictive policy constrains bank credit.

According to both the lending view and credit rationing, new loans should decline when policy is tightened. As discussed earlier, this effect is most likely to be found in uncommitted loans since loans made under commitment are presumably not subject to restrictions. Chart 9 shows the ratio of uncommitted loans to nominal GDP over the 1977-94 period. Uncommitted loans are deflated by nominal GDP as a rough method of controlling for business cycle induced changes in loan demand. This ratio shows little change during the 1977-79 and 1994 tightening episodes. In contrast, it declines during the 1983-84 and 1988-89 episodes, suggesting that lending may have been constrained in these two periods.

A more detailed analysis of these two periods, however, indicates the decline in lending may not have been caused by monetary tightening. Because both episodes occur in the middle of a long downward trend in the number of uncommitted loans, it is important to remove this trend when examining the effect of policy tightening on lending.[11] After detrending, the ratio of uncommitted loans to GDP in the 1983-84 and 1988-89 periods tends to decline, but the declines are not statistically significant.[12] Thus, the decline in the ratio of uncommitted loans to GDP in the 1983-84 and 1988-89 periods is apparently due more to long-run factors affecting this ratio rather than to a cyclical tightening of monetary policy.

Another indication of possible credit rationing by banks is an increase in the nonprice terms of lending such as collateral requirements. Chart 10 shows how collateral requirements on new business loans changed over the 1977-94 period.[13] Casual observation suggests that banks may have increased collateral requirements in the 1977-79, 1983-84, and 1988-89 periods, consistent with credit rationing. As in the case of uncommitted loans, however, there is a strong trend in collateral requirements that may have nothing to do with monetary policy.[14]

When the long-run trend is removed, it appears collateral requirements rose during the 1983-84 and 1988-89 tightening episodes and may have declined in the most recent 1994 period. None of these effects is statistically significant, though, suggesting collateral requirements on business loans are not raised in response to a tightening of monetary policy.[15]

Taken as a whole, this reexamination of balance sheet and survey information finds little support for either the lending view or credit rationing. Indeed, there is no evidence bank business lending is constrained by restrictive monetary policy in any of the four episodes of monetary tightening examined in this article. Thus, in spite of other information suggesting some borrowers are dependent on bank credit, there is little indication monetary policy works through a separate credit channel.

SUMMARY AND CONCLUSIONS

Ongoing changes in the banking industry have brought renewed attention to the role banks play in the monetary transmission mechanism. To the extent certain borrowers are dependent on bank credit and bank lending is constrained by monetary policy, restrictive policy may affect the economy through a bank credit channel. Structural changes in the role banks play in the financial system may then affect monetary policy by altering this credit channel.

The analysis presented in this article finds little evidence that bank lending is constrained by monetary policy. In four periods of restrictive monetary policy over the past 20 years, banks have been able

to offset a decline in core deposits by selling securities and issuing managed liabilities so as to maintain their business lending. In addition, an analysis of the terms of bank business lending finds little support for the view banks reduce loan supply or ration credit in periods of monetary tightening.

Because a direct bank credit channel does not appear to be part of the monetary transmission mechanism, concern that structural changes in the banking system may affect the transmission mechanism does not appear to be warranted. At the same time, it is important to recognize that the evidence presented in this article does not imply that bank credit is unimportant. Indeed, to the extent that some borrowers are dependent on bank credit, sudden disruptions in bank lending could alter their spending decisions and affect the level of economic activity.

ENDNOTES

[1] See Mayer, pp. 125-46, for a detailed discussion on the "availability doctrine."

[2] An additional implication of the declining importance of bank lending concerns the use of credit market indicators as guides to future economic activity. To the extent that bank lending or credit growth is tied closely to business spending decisions, it may provide important information about current or future economic activity. If large firms have developed alternatives to bank lending, however, measures of bank credit flows to these firms may provide an inaccurate gauge of future spending. Thus, if the ability of firms to substitute other methods of financing for bank loans has changed over time, measures of bank credit may have become less reliable as barometers of future economic activity.

[3] See Hubbard for references to this literature.

[4] Another problem is that some discussions of a credit channel contain an implicit assumption that monetary policy has asymmetrical effects on lending. That is, while restrictive policy may curtail lending, there is no presumption that easier policy causes an acceleration in lending. Yet, use of a market interest rate without an attempt to distinguish periods of tightening and easing implies a symmetrical effect of policy actions that may lead to biased estimates of the effect of policy actions on bank lending.

[5] These periods were generally selected to include the month in which the first of a sustained set of increases in reserve pressure occurred and to end in the month before the Federal Reserve began to ease policy. The first period is somewhat different, however, in that it includes only the tightening up to the October 1979 change in Federal Reserve operating procedures. While the Federal Reserve continued to tighten policy after September 1979, monetary policy was implemented under a different set of operating procedures, changes in market interest rates were unusually large, and policy actions were supplemented in both October 1979 and March 1980 with additional measures such as reserve requirement changes and credit controls. Thus, after September 1979, it becomes difficult to separate ordinary policy changes from these special actions. In addition, the late-1980s period omits the tightening that occurred in 1987 as well as the easing of policy that happened after the October 1987 stock market crash as, again, representing unusual factors in financial markets. Finally, the 1994 period ends with currently available data in February 1995 and does not represent a complete policy cycle.

[6] In the 1977-79 period, this policy measure includes 22 actions taken by the Federal Reserve to restrict reserve availability and put upward pressure on the federal funds rate. Over this period, the effective funds target increased from 4 5/8 to 11 1/2 percent. In the 1983-84 period, there were five actions that increased the effective funds target from 8 1/2 to 11 percent. In 1988-89, there were ten actions increasing the effective funds target from 6 1/2 to 9 3/4 percent. In 1994-95, so far there have been seven actions raising the effective funds target from 3 to 6 percent.

[7] Core deposits are defined in this article as transactions accounts plus savings deposits. The decline in core deposits in the 1983-84 period is less pronounced because of the introduction of money market deposit accounts in early 1983, a factor that boosted bank core deposits. Similarly, the decline in security holdings during this period, shown in Chart 6, is less pronounced because banks temporarily invested the increased flow of deposits in securities.

[8] Managed liabilities in this article are defined as small and large time deposits, repurchase agreements, and Eurodollar borrowings.

[9] The Survey of Terms of Bank Lending is a quarterly survey of approximately 350 banks taken during the first full business

week in the second month of each quarter. Respondent banks report the amount and terms, such as the interest rate, maturity, whether the loan is backed by collateral, and whether the loan is made under a commitment, for all new commercial and industrial loans made during the survey week. The data are adjusted so that they reflect the terms of lending by all commercial banks. The data are currently available from February 1977 to November 1994, and aggregated data are reported in the Federal Reserve's E.2 release. This article only uses demand loans, which are loans with no stated maturity, and loans with a maturity between one month and one year. Together, these represent about 40 percent of total business lending. Loans that mature in less than a month are excluded because they typically are not the type of loans that are relevant for a credit channel. Specifically, such loans appear to be used primarily for cash management purposes and to finance short-term security purchases rather than for financing inventories and short-term capital investment. Loans with maturities greater than a year are excluded because they also are not typically used for financing inventories and short-term capital investment.

[10] The spread of bank loan rates over market rates is the weighted average stated rate on new demand loans and loans with a maturity between one month and one year less the three-month commercial paper rate.

[11] Augmented Dickey-Fuller and Phillips-Perron tests for the null hypothesis that the log of the ratio of loans not under commitment to GDP has a unit root cannot be rejected at conventional levels of significance. The loan-to-GDP ratio was detrended by taking the difference between the log of its value and its trend, where the trend was calculated by applying the Hodrick-Prescott filter (λ equal to 1600) to the log of the loan-to-GDP ratio. Detrending the data with λ equal to 1200, 800, 400, and 200 does not change any of the conclusions reached in the empirical analysis. A value of 1600 was chosen because that is the value recommended by Hodrick and Prescott and most commonly used for quarterly data. Because the detrended value is the difference between the logs of the actual and trend values, it is approximately equal to the percentage deviation of the loan-to-GDP ratio from its trend.

[12] Specifically, the average change in the detrended ratio of uncommitted loans to GDP is not statistically different from zero during tightening episodes.

[13] Collateral requirements are measured as the percentage of the amount of nominal loans backed by collateral.

[14] Augmented Dickey-Fuller and Phillips-Perron tests for the null hypothesis that the percent of loans backed by collateral has a unit root cannot be rejected at conventional levels of significance. The percent of loans backed by collateral was detrended by taking its difference from its trend, where the trend was calculated using the Hodrick-Prescott filter (λ equal to 1600). Detrending the data with λ equal to 1200, 800, 400, and 200 does not change any of the conclusions reached in the empirical analysis. A value of 1600 was chosen because that is the value recommended by Hodrick and Prescott and most commonly used for quarterly data.

[15] Specifically, the average change in the detrended percentage of collateralized loans is not statistically different from zero during tightening episodes.

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