

Commentary: Credit Channel or Credit Actions? An Interpretation of the Postwar Transmission Mechanism

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In recent years we have seen the development of a new literature on credit, based largely on the asymmetry of the information available to lenders and borrowers and drawing out various implications of this asymmetric information hypothesis. The primary emphasis of the earlier part of this new literature was on microeconomic phenomena and it contributed importantly to our understanding of the behavior of lenders and borrowers and the nature of the credit-granting process by financial intermediaries. More recently, there has been an increased tendency to focus on the macroeconomic implications of the credit-granting decision and a long debate has been waged over the relative importance in the transmission mechanism of the so-called credit channel and the so-called money channel, although the latter should be more appropriately called the monetary conditions channel. Romer and Romer have been important contributors to this debate, as has Mark Gertler, the other discussant this morning.

As an interested central bank observer of this debate, I have been struck by the quasi-theological nature of the dispute about what is meant by the credit view or the credit channel. In fact, there are a number of hypotheses that could be subsumed under the rubric of the credit view and part of the difficulty in tracking the debate lies in the necessity of distinguishing among the various elements of the credit view, especially in assessing the empirical results provided by the protagonists in the debate.

One can usefully distinguish between what might be called stronger versions of the credit view and weaker versions. Among the stronger versions would be the joint hypothesis, first, that there is a direct link between the decline of reserves following tightening actions by the central bank and the supply of credit by banks (and perhaps other financial institutions) and, second, that the shifts in the supply of loans by financial institutions will have a significant effect on overall spending, over and above the demand-side effects of the rise in the level of market interest rates. Among weaker versions of the credit view would be the hypothesis that, because of informational asymmetries, interest rate increases are accompanied by a rise in default risk and result in a reduction in the availability or an increase in the cost of credit to small firms relative to large firms. (I would note, however, that whether or not such a change leads to an overall decline in spending will depend, among other things, on the ability of large firms to increase their share of the economy at the expense of that of small firms under such conditions.) Both stronger and weaker versions of the credit view have a market-clearing variant in which the reduction in loans (overall or to small firms) occurs via the rise in loan rates in relation to market interest rates, a non-market-clearing variant with rationing by banks, and an intermediate variant in which banks adjust their non-price terms and conditions of lending to clear the market. Not only do the various versions of the credit view have different macroeconomic implications, but the ways of testing the associated hypotheses can be very different.

The most direct way of testing for the broad macroeconomic significance of credit would be to assess the marginal contribution of credit measures (whether bank credit or total credit) to the explanation of output or demand growth in the context of reduced-form or VAR-type models.¹ However, since such tests are rarely conclusive and, in any case, throw little light on the details of the transmission mechanisms involved, a number of less direct tests have been used to evaluate various implications of the credit view, such as movements in the mix of loans and commercial paper and movements in the "risky spread" (the differential between the interest rates on private obligations and government obligations) in response to policy tightening and easing.

Most of the Romer and Romer paper takes this latter, less direct approach to testing the credit view. The first half of the paper, which I found very interesting, examines the various postwar episodes of credit restraint and argues that these typically developed not as part of the ordinary transmission mechanism but as a result of Fed actions that impinged more or less directly on credit. The latter part of the paper, which I found less convincing, argues that these credit actions explain much of the movement in the spread between loan rates and market rates as well as the mix between loans and commercial paper over the postwar period.

As just noted, I found the Romers' discussion of the episodes of tightening in the postwar period to be both interesting and insightful. I would like to recast their argument somewhat, focusing more directly on the changing capacity of banks to adjust to central bank actions, and comparing U.S. and Canadian developments over the period. These comments are intended to complement the analysis in Romer and Romer.

The simple textbook story of money and credit multipliers in which banks reduce loans in direct response to a shortage of reserves may be a useful teaching device but it is far removed from reality, where there is no such direct link between reserve changes and bank loans. Banks finding themselves short of reserves (or of settlement balances in countries where reserves have been eliminated) initially respond by borrowing from the central bank (where that is acceptable) or by selling liquid assets or by bidding more aggressively for wholesale deposits.² Typically, only at a later stage in the process is bank lending affected. Of course, some of these adjustment mechanisms were not available in the early postwar period and that is an important part of the story of the various episodes told by the Romers.

Borrowing from the Fed has traditionally been the first response of the banking system as a whole in the United States to a reduction in non-borrowed reserves. However, because banks were not supposed to use borrowed reserves as a continuing source of funds and because large, sophisticated banks were not supposed to use them at all, the initial response by many banks in the early postwar period to a shortfall of reserves was to sell liquid assets. In Canada, since bor-

rowing from the central bank was infrequent and very small in amount through most of the postwar period,³ liquid asset adjustment always played a key role in the response by banks to central bank actions. Since the banks in both countries came out of the wartime period with large stocks of such assets, their provision of loans could be insulated from the effects of central bank actions for quite some period of time. Of course, if the central bank continued to put reserve pressure on the banks, their declining liquid asset ratios would have made them increasingly less comfortable with their evolving portfolio mix and they would eventually have cut back on loans.⁴

Since central banks at that time focused on "credit conditions" (a term that included both the cost and availability of loans) as a key element in the transmission of policy, there was concern that the lags in the response of loans to the reduction in the supply of reserves could be excessively long and, therefore, supplementary techniques were used from time to time to speed up the response. Thus, in both Canada and the United States, moral suasion was used to slow down lending more directly and more predictably than reliance solely on bank responses to liquid asset declines would have done. In Canada, the moral suasion was directed not only to slowing down overall credit but also to ensuring that certain types of borrowers (for example, small business, residential mortgage borrowers, farmers) were not unduly affected, particularly given their lack of access to other credit markets. In Canada, moreover, the authorities introduced a minimum liquid asset ratio (subsequently formalized as a secondary reserve requirement), which required the banks to hold specified amounts of certain liquid assets. This was intended to tighten up the link between the central bank actions and bank lending by limiting the capacity of the banks to sell off liquid assets and hence speeding up the lending response of the banks to a deteriorating liquidity situation.⁵

In the 1960s, the raising of funds in deposit markets, especially wholesale markets, became the preferred adjustment mechanism of banks to a shortfall of reserves, although liquid asset reduction continued to be an alternative avenue of response. The ability to raise funds by adjusting deposit rates also had the effect of slowing markedly the need for banks to respond to central bank tightening by cutting back on the provision of loans.⁶ Rather than rely only on the

effect of interest rate changes on the demand for credit, the Fed was able to make use of deposit rate ceilings (Regulation Q), which had been introduced for other reasons, to limit bank access to funds and this became an important part of the transmission mechanism for a number of years. In practice, a considerable part of the impact of Regulation Q ceilings seems to have fallen on residential construction? which was financed to an important extent in those years by locally based banks and savings and loan associations without good access to wholesale deposit markets.

Another method used by the Fed to tighten the link between its actions and the extension of loans by financial institutions was the imposition of marginal reserve requirements on wholesale deposits. The purpose of these marginal reserve requirements was not to drain reserves from the system, since open market operations were a much more efficient means of reserve management, but rather to influence the desire of banks to extend loans by reducing the profit margin on lending or to cause a rise in loan rates relative to market rates. For example, with interest rates at 10 percent the imposition of a marginal reserve requirement of 10 percentage points would reduce the net spread between loan rates and deposit rates by 100 basis points, or would force banks to raise the gross spread by 100 basis points by some combination of loan rate rise and deposit rate decline,⁸ or would result in some intermediate outcome. In the first case, the banks would act to reduce the supply of loans (by tightening non-price terms and conditions). In the second case the quantity of loans demanded would decline and those potential borrowers with less access to other types of credit would revise downward their desired expenditure plans as a result of the higher cost of bank loans.

The Bank of Canada abandoned the use of moral suasion to curtail bank lending in the early 1970s. And, with the exception of a short period in the early 1970s in which there were rate ceilings on short-term wholesale deposits, there were no restrictions on interest rates following the elimination of the interest rate ceiling on bank loans in 1967. Nor did the Bank ever make use of discretionary changes in reserve requirements on wholesale deposits. Thus, from the early 1970s, increases in interest rates in response to a surge of spending and rapid money and credit growth typically led to a divergence in

the movements of **M1** and those of the broader monetary aggregates. **M1**, which was very interest-elastic, slowed in response to the rising level of short-term interest rates, while the broader aggregates continued to expand for quite some time as banks accessed time deposits and wholesale deposit markets to maintain a rapid growth of **lending**.⁹ Of course, over time, spending and credit slowed but this primarily reflected the response of demanders of credit to the higher level of interest rates.

Thus, somewhat earlier in Canada and somewhat later in the United States, central banks abandoned the use of moral suasion and other mechanisms aimed at tightening the link between the actions of the central bank and the extension of loans by banks. There were a **number** of reasons for this change in approach. First, there was an increasing tendency philosophically to rely on the markets and interest rates to allocate credit. Second, academic and central bank research on the importance of money and the stability of money demand led to an increased focus on monetary aggregates and monetary conditions, with correspondingly reduced focus on credit conditions and the relatively less stable credit aggregates. Third, and most pertinent to the analysis of how the extension of credit changed through the postwar period, was the growing ability of many borrowers to access **nonbank** sources of credit. Thus, even if the central bank actions caused banks to reduce their supply of credit, many other lenders and markets stood ready to fill the gap. In the United States, for example, the widespread securitization of mortgages significantly weakened the link between the capacity of financial institutions to lend and that of homeowners to **borrow**.¹⁰ And nonregulated intermediaries as well as commercial paper markets started to play a much larger role in making credit available to firms. In similar fashion, in Canada the bankers' acceptance market took an increasing share of short-term lending to business from the mid-1970s.

It was thus increasingly recognized that any direct influence on bank lending behavior by the central bank would have less effect on total credit and on spending because of the increase in substitutability on the part of many borrowers across different credit **sources**.¹¹ Moreover, those whose spending would be directly affected by such actions would be borrowers without access or with limited access to other

types of credit, such as small businesses, households, and farmers. These were the very groups that the authorities had tried to protect from credit rationing in the earlier postwar episodes, in part perhaps for political reasons, in part for fairness and efficiency reasons. In any case it was deemed inappropriate to impose controls on bank lending that would force these groups to take the brunt of monetary policy actions while others could access nonbank sources of credit.

In these circumstances, central banks around the world (and not just in North America) have come increasingly to rely on changes in monetary conditions¹² operating through market processes to influence spending, with less and less use of direct or indirect controls on lending. In analyzing the transmission mechanism, there is still the need, however, for a careful analysis and interpretation of responses of markets and financial institutions to policy actions by the central bank, whether or not one labels them as the credit channel. This would include such matters as the response to changes in market rates of "administered" rates such as the prime loan rate and certain mortgage rates, movements in non-price terms and conditions of lending over the cycle, and the differential effect, if any, of monetary actions on different classes of borrowers, notably small versus large borrowers.

In Canada we appear to have the same pattern of differential movements of loans to small businesses and large businesses in a slowdown as in the United States. It is far from clear, however, whether this is a demand-side phenomenon or a supply-side phenomenon. Do banks reduce the supply of loans to small businesses in response to such factors as the decline in the value of collateral during a slowdown? Or do small businesses reduce their demand for loans more than large businesses at times of weakening economic conditions? A relatively larger response to interest rate rises by small businesses than by large businesses might be attributable to a number of factors. For example, small firms might typically engage in different lines of business than large firms, or their greater flexibility might enable them to reduce their inventories more quickly, or their lower capital might force them to reduce their inventories more quickly, or they might be more able to substitute accounts payable for bank loans. In any case, these phenomena clearly deserve more study.

As noted earlier, I found the econometric analysis in the latter part of the paper less convincing than the discussion of the credit restraint episodes. I had some concerns about the specification of the equations as well as the interpretation offered.

In the basic spread equation the change in the differential between the prime rate and the six-month commercial paper rate is regressed on eight lags of the dependent variable and eight lags of the explanatory variable or variables. The latter include the federal funds rate, the Romer dummies, and the credit action dummies. One of my concerns with even the simplest version of this equation is that I find some of its implications very peculiar. In the regression of the change in the spread on the lagged changes in the federal funds rate, the initial response (after the one quarter lag) of the spread to a 1 percentage-point increase in the federal funds rate was 20 basis points and this jumped to its long-run increase of **30** basis points after about six quarters. It is not clear to me why there should be a large steady state effect on the spread following a rise in the level of interest rates. Rather, I would have expected a temporary downward movement in the spread followed by subsequent reversal, perhaps with some overshoot on the way to equilibrium. The expectation that the initial effect would be negative follows from the observation that movements in prime rates tend to lag somewhat behind movements in market rates. And, in fact, when the contemporaneous change in the federal funds rate is included in the equation, the initial response of the spread to a change in the federal funds rate is negative and very significant, the responses over the intermediate periods then become **positive**,¹³ and the long-run response is about 16 basis points.

Similar results were found using Canadian data, both on a quarterly basis and a monthly basis.¹⁴ Adding the contemporaneous variable to the equations leads to the expected negative (and very significant) initial response, a gradual reversal of this initial effect over time, and a very small and insignificant steady state response. A very similar path is found in the simulation of a more complex weekly model which is based on the error-correction **framework**.¹⁵ Addition of dummies for periods of credit restraint in Canada left the coefficients on the interest rate changes unchanged, although the dummies themselves were significant.

Since the basic equation for the spread is problematic, one should be somewhat cautious about any inferences drawn from adding the credit action dummies to the basic equation. Indeed, adding the contemporaneous interest rate change variable results in smaller and less significant coefficients on the credit dummies.¹⁶ Moreover, as the Romers themselves point out, the spread between the loan rate and market rates may be adjusting to perceived changes in riskiness of bank loans over the cycle and not just in response to central bank actions. I wondered whether changes in the risky spread (between commercial paper rates and Treasury bill rates) could be used to proxy for changes in default risk and remove that source of variation in the spread between the loan rate and market rates. I also wondered whether one was not picking up a term structure movement in analyzing the rise in the differential between the prime rate (effectively a very short-term rate) and a six-month rate in response to Fed actions. As well, the meaning of the spread may be changing over time since the prime rate has come to be applied to riskier borrowers and banks have extended below-prime lending to the strongest borrowers. Thus, in the United States the spread increased from an average of 30 basis points in the second half of the 1960s to 92 basis points in the 1970s and to 228 basis points in the period since 1980. Canadian spreads, in contrast, remained at about 100 basis points in these same sub-periods.

In equations for the mix variable for Canada (where the mix is defined as the ratio of loans to total short-term credit), credit restraint dummies were not significant. And the regressions indicated that an increase in interest rates led to an initial *increase* in loans, the opposite of the U.S. results, followed by a reversal. These results are consistent with the spread equations for Canada inasmuch as a rise in interest rates leads to an initial *decline* in the prime rate relative to market rates.¹⁷

One final issue on which I would like to comment is the role of reserve requirements in permitting the central bank to influence short-term interest rates. There is a widespread view that reserve requirements are necessary for the central bank to maintain its influence over short-term interest rates. In fact, as the Romers correctly point out, even the disappearance of liabilities subject to reserve

requirements would not eliminate the Federal Reserve's control over interest rates.

Canadian developments provide a useful perspective with regard to this issue. Legislation has been passed in Canada which will eliminate reserve requirements by mid-1994. There will, however, be no diminution in the ability of the Bank of Canada to implement monetary policy or to influence short-term interest rates.¹⁸ What will give the **Bank** of Canada its leverage in a world without reserve requirements is the requirement that financial institutions continue to settle payments on the books of the Bank. This creates a demand for settlement balances on the part of clearing institutions and the Bank of Canada, as the monopoly supplier of such balances, is able to control the quantity of settlement balances available to financial institutions.¹⁹ Maintaining such a structure for the settlement of payments is sufficient to enable the Bank to have the same degree of influence on short-term interest rates as it currently possesses.

Author's Note: The views expressed are those of the author and are not attributable to the Bank of Canada. I would like to thank Peter Thurlow, Kevin Clinton, Pierre Duguay, and David Longworth for their assistance in the preparation of these comments

Endnotes

¹See, for example, King (1986), Bemanke and Blinder (1992), Romer and Romer (1990), and Ramey (1993). In the case of Canada, equations including both monetary and credit aggregates have been used to explain the rates of increase in nominal spending, output, and inflation. On balance, monetary aggregates are more important than credit aggregates in explaining the main macroeconomic variables. See Muller (1992).

²Of course, from the point of view of the banking system as a whole, borrowing reserves does relieve the shortfall in reserves (provided the central bank does not offset the borrowing by reducing nonborrowed reserves further) while selling liquid assets or issuing wholesale deposits does not. From the point of view of the individual bank, however, all three kinds of actions will lead to an increase in its reserves relative to not taking any action. All three types of adjustment actions will be accompanied by upward pressure on interest rates but only the sale of liquid assets leads to a decline in deposits and hence in the "money supply."

³Recent changes to the system of implementation of monetary policy in Canada in anticipation of the elimination of reserve requirements in mid-1994 have resulted in an increase in borrowing from the central bank.

⁴In early Bank of Canada econometric models, the loan equations incorporated a term for the liquid asset ratio relative to its "desired" value in order to capture these effects. See Helliwell and others (1971).

⁵The Bank of Canada (1962) dealt with these issues in its submission to the Porter commission. "In a period in which the demand for bank loans is strong, banks may allow their holdings of liquid assets to decline as a means of accommodating part or all of this demand . . . The absence of any agreed minimum ratio of liquid assets would introduce another element of uncertainty concerning the response of the banking system to central bank action; it might be impossible to predict even within quite wide limits the point at which banks as a group would feel they could no longer go on reducing their holdings of liquid assets. A minimum liquid asset ratio, therefore, makes the response of banks somewhat more predictable and in addition, it is likely to produce smoother reactions on their part."

⁶In this context, one should note that in both Canada and the United States, total reserves were adjusted passively to the growth in M3-type deposits.

⁷See, for example, de Leeuw and Gramlich (1969).

⁸The relative effect on deposit and loan rates of the rise in the reserve requirement "tax" would depend on the relative substitutability of deposits and market instruments on the one hand, and of loans and other forms of credit on the other. In the case of marginal reserve requirements on wholesale deposits, most of the tax would probably have fallen on loan rates.

⁹Given the very high degree of substitutability between interest-bearing bank deposits and market instruments, banks could attract sizable amounts of funds by raising term deposit rates slightly relative to market rates.

¹⁰Indeed, the use of Regulation Q ceilings was an important cause of the development of the securitized mortgage market as a way of bypassing the restrictions. This is part of the explanation for the far more rapid growth of these markets in the United States than in Canada.

¹¹**Indeed**, the credit restrictions imposed by the Fed in 1980 were aimed at all forms of consumer credit, not just the bank loans, for precisely this reason.

¹²**The** term monetary conditions encompasses changes in both interest rates and exchange rates, as monetary policy actions work through both channels.

¹³**The** Romers' basic equation seems to be picking up mainly the reversal and overshoot of the spread following its initial negative response to interest rate changes.

¹⁴**The** Canadian spread used in the regressions is the differential between the prime rate and the three-month commercial paper rate. The monetary policy variable is the rate on three-month Treasury bills.

¹⁵**See** Hendry (1992).

¹⁶ Moreover, I did not **find** the reduction in the size and significance of the coefficients on the federal funds rate in the equations once the credit action dummies were introduced to be as important as did the authors.

¹⁷**This** cost effect appears to outweigh the expectations effect whereby a rise in the level of rates would induce borrowers to lock in current rates by issuing commercial paper or bankers' acceptances in anticipation of further increases in rates.

¹⁸**Other** countries, such as the United Kingdom and New Zealand, also no longer rely upon reserve requirements in the implementation of monetary policy.

¹⁹**Longworth** and Muller (1991) note that the requirement that settlement occurs on the books of the Bank is a form of "legal restriction" and that the demand by clearing institutions for clearing balances will be a function of the pricing schedule for borrowing at the Bank, which is under the control of the Bank.

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