

Is Bank Lending Important for the Transmission of Monetary Policy? An Overview

The importance of banks for the transmission of monetary policy has been a major topic in monetary economics for some time, and several factors have served to heighten that interest recently. One such factor has been the slower than expected U.S. recovery from the 1990–91 recession, which was accompanied by slow growth in bank lending. This spawned a substantial literature on regulatory-induced credit crunches, with a number of studies finding that bank lending behavior was a major contributing factor to the slow expansion.

A second factor has been the importance of banks in recent international economic crises. Japan, Latin America, and Scandinavia have each experienced major problems in their banking sectors that coincided with severe recessions. The role of banks in both the crises and the subsequent recoveries is likely to be the subject of research for some time.

A third factor is the recent (and ongoing) structural change in banking, which may significantly alter the role of banks in the transmission of monetary policy. As the banking industry and financial markets in general continue to evolve, it is not yet clear how useful historical data will be in understanding future business cycle fluctuations. Thus, a major concern of policymakers must be understanding the ways that changes in the banking industry and in the patterns of firm finance may alter our ability to control, or even predict, business cycle fluctuations.

To improve our understanding of the role of banks in the transmission of monetary policy, the Federal Reserve Bank of Boston convened a conference in June of 1995 to consider the question “Is Bank Lending Important for the Transmission of Monetary Policy?” That banks are an important element in the transmission process is not an issue, because monetary policy operates through the banking sector. However, the description of the exact role played by banks remains hotly disputed, with the debate focusing on the importance of the role for bank lending as a transmission channel (the lending view) distinct from the generally accepted channel operating through interest rates (the money view).

*Joe Peek and
Eric S. Rosengren*

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The conference was designed to explore the conditions necessary for bank lending to be an important channel for the transmission of monetary policy. The first three papers, focusing on banks and bank loans, examined the conditions necessary for a distinct bank lending channel to be operative. Charles P. Himmelberg and Donald P. Morgan documented that, for many firms, other debt instruments were not perfect substitutes for bank loans, providing a rationale for why bank lending might be especially important for monetary policy. The second paper, by Joe Peek and Eric S. Rosengren, showed that both regulatory and monetary policy could alter the amount of bank lending, so that the financial condition of banks is an important factor in determining the size and nature of the effects of monetary policy that are transmitted through the banking sector. The paper by Carl E. Walsh and James A. Wilcox showed that bank lending can affect output and may indeed have played an important role in the slow recovery from the most recent recession.

The final two papers focused on borrowing by firms, in order to explore the conditions necessary for a distinct bank lending channel. Simon G. Gilchrist and Egon Zakrajšek examined the distributive impact of the bank lending channel and found that small firms rather than large firms reacted the most to tighter policy. Fabio Schiantarelli assessed the methodological issues involved in empirical tests of the implications of capital market imperfections. He also reviewed the firm-level panel data evidence from other countries, finding that in most countries it is the small firms that bear the brunt of financial fluctuations.

No clear consensus was reached on the importance of a bank lending channel distinct from the more traditional effect operating through movements in interest rates, but several themes did permeate the conference. First, credit market imperfections remain important for banks and for those firms that depend on banks for financing. Thus, banks continue to play an important role in evaluating and monitoring smaller firms with relatively little publicly disclosed financial information. However, it was also generally agreed that this role was likely to diminish as credit markets became deeper and more liquid, especially for small firms.

Second, one should not expect the impact of monetary policy to remain constant over time. Because the financial condition of firms and banks will vary over a business cycle and from business cycle to business cycle, their responses to changes in monetary policy will also vary. Thus, the impact on the economy

of changes in monetary policy will be sensitive to the state of firms' balance sheets and the health of the banking sector.

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Third, significant financial innovation and regulatory changes may alter the future effectiveness of monetary policy, requiring policymakers to adapt their policy actions so as to incorporate the effect of these structural changes on the transmission of monetary policy. With the substantial change in financial markets and financial regulations in recent years, historical data on the transmission of monetary policy may not necessarily be a reliable guide for current or future policy. This presents a significant challenge to monetary policymakers to remain abreast of financial developments and to modify their policies accordingly.

I. The Role of Bank Lending

The first group of papers explores three conditions necessary for a distinct bank lending channel. First, to what extent is bank lending special for firms and, if it is critical for a subset of firms, is that subset large enough to have a macroeconomic impact? Second, if bank lending is special, can we influence bank lending with monetary or regulatory policy in a way that affects macroeconomic fluctuations? Finally, if policy can alter bank lending, will bank lending have a significant and predictable impact on GDP?

Is Bank Lending Special?

Charles P. Himmelberg and Donald P. Morgan contend that not only are bank loans special but a

surprisingly large percentage of firms continue to depend on banks for financing. They first examine whether banks' declining share of nonfinancial business credit has made banks "obsolete." Despite much previous work emphasizing the dwindling role of

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banks, they show that the reliance of manufacturers on banks has not declined over the past decade, and that small manufacturers remain especially dependent on banks. They also show that while commercial paper has been a major source of funding for large, creditworthy firms, 83 percent of firms included in the Compustat file borrow only from financial intermediaries rather than directly accessing credit markets. Himmelberg and Morgan attribute this dependence on intermediated debt to the fact that financial intermediaries are better able to monitor borrowers and enforce covenants. This is substantiated by evidence that issuers of public debt are generally limited to large, capital-intensive firms, while borrowers dependent on intermediaries are generally small, rapidly growing high-tech and inventory-intensive firms.

While a large percentage of firms depend on intermediated debt, they do not necessarily depend on bank debt. However, for borrowers, the substitutability of intermediated debt from alternative sources is limited by the fact that intermediated debt is to a large extent a segmented market. Insurance companies provide primarily long-term credit, to match the long-term liabilities generated by insurance products. Finance companies provide short-term credit that is collateralized by assets with high liquidation values. Banks, on the other hand, specialize in short-term credit that is collateralized by illiquid assets or is unsecured.

The authors conclude that bank lending remains an important source of funds for many businesses, and one that is not easily substituted for by funds obtained through other types of intermediaries or by debt directly placed in credit markets. Nonetheless, given the continuing evolution of credit markets and financial regulation, the degree of bank dependence of firms and the degree of substitutability among alternative sources of credit may be quite different in the future.

Robert R. Glauber agreed that both empirical and theoretical work support the view that a large group of firms is, and has been, dependent on banks. However, he was not convinced that this is likely to persist in the future. In particular, a maturity mismatch between assets and liabilities for insurance companies is not much of a barrier to entry into the shorter-term loan market favored by banks, given the ease of altering the maturity of loans with new financing techniques. And, finance companies are becoming more adept at making cash flow loans as well as asset-backed loans, which would allow them to make inroads into traditional bank lending markets.

Raghuram G. Rajan argued that bank-intermediated debt continues to be important. However, he shared Glauber's view that it was likely to be less important in the future. He emphasized that if monitoring hard-to-evaluate firms was banks' comparative advantage, this advantage would be eroded as more information and inexpensive computers made processing information easier and less costly. Nonetheless, even if banks continue to lose market share to other intermediaries, an operative lending channel is still possible, although it would not necessarily be limited to bank lending.

Do Monetary Policy and Regulatory Policy Affect Bank Loans?

Joe Peek and Eric S. Rosengren find evidence consistent with both monetary and bank regulatory policy altering the supply of bank loans. However, they emphasize that to the extent a distinct lending channel exists, its magnitude is likely to be dependent on the financial condition of banks. They provide a simple static model to illustrate that capital-constrained and unconstrained banks react very differently to changes in monetary policy. In particular, when capital requirements are binding, the lending channel is eliminated. Because an increase in the availability of reserves will not release a binding capital constraint and allow a bank to expand, the increase in transactions deposits associated with the

increase in reserves is exactly offset by a decrease in nontransactions deposits at capital-constrained banks. Using data for New England banks, Peek and Rosengren provide evidence that capital-constrained and unconstrained banks react differently to changes in the federal funds rate. Moreover, because so many banks in New England were capital constrained in the late 1980s and early 1990s, the total loans aggregate for all New England banks behaved in the same manner as that for the sample of constrained banks, failing to increase in response to lower federal funds rates.

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A major implication of their findings is that the capital requirement constraint faced by banks, as well as the bank reserve constraint, should be taken into account in determining the likely effect of monetary policy. Both the nature and the size of the effect of monetary policy transmitted through the banking sector will be affected by the financial condition of banks (especially with respect to their capital) and by regulatory policy. In particular, the size of the effect operating through the lending channel will be especially sensitive, differing from one episode to another as more or fewer banks come under a binding capital constraint. Thus, it is critical that, when setting monetary policy, policymakers understand and take into account the financial condition of banks and the regulatory environment in which banks are operating.

R. Glenn Hubbard emphasized that it was difficult to distinguish fully between the effects of changes in the federal funds rate on constrained banks and on unconstrained banks, using only a limited time series for one region of the country. The limited number of observations available for the constrained sample severely limits the power of the empirical test. Hubbard suggested that a more convincing test would require a national data set, allowing for more regional comparisons and providing a better benchmark for uncon-

strained institutions. With the current sample, the large standard errors make it difficult to draw strong conclusions from the evidence. Furthermore, the results face the common problem of isolating loan supply from loan demand. He cautioned further that examining bank reactions to monetary policy shocks was only a small part of the lending view, and that more complete tests would match borrowers, loans, and lender characteristics.

Christopher James suggested that a discussion of banks' reactions to monetary policy must carefully consider more than just the leverage ratio constraints. Two institutional elements that are potentially important, but not fully discussed in the paper, are deposit insurance and risk-based capital requirements. Deposit insurance is important because it affects the substitutability between implicitly or fully insured demand deposits and uninsured large CDs. Risk-based capital is important because it affects the substitutability between alternative assets in a bank's portfolio, for example, loans and Treasury securities. Because the degrees of substitutability among alternative bank assets and liabilities are critical for the effectiveness of the lending channel, it is important to understand fully how banking regulations alter those substitutabilities. Thus, while confirming that regulatory policies must be considered when examining the transmission of monetary policy, James emphasized that regulations other than the leverage capital constraint may be equally important.

How Is Bank Lending Related to Output?

James A. Wilcox presented a paper co-authored with Carl E. Walsh that examines whether bank lending is related to output, and whether that relationship has changed over time. They estimate a vector autoregression that includes the index of coincident indicators (their proxy for aggregate economic activity), the change in the consumer price index, the nominal federal funds rate, the prime rate, and real bank loans. They assume that shocks to bank loan supply are reflected in shocks to the prime rate and that shocks to loan demand are proxied by shocks to the quantity of real bank loans. They find this identification of supply and demand to be consistent with results of both a structural vector autoregression and the Choleski decomposition of their basic vector autoregression. Consistent with their use of shocks to the prime rate as a proxy for bank loan supply shocks, they find that upward shocks to the prime rate (which they interpret as a reduction in bank loan supply) are

correlated with increases in bank capital ratios, increases in required reserves, and the imposition of credit controls in 1980, while these same factors are not correlated with their proxy for loan demand shocks.

Decomposing the shocks from their vector autoregressions, Walsh and Wilcox find that the supply of bank loans had less effect on bank lending than output or the federal funds rate but that, nonetheless, shocks corresponding to changes in capital ratios, reserve requirements, and deposit insurance fees did affect bank lending. However, in the early 1990s, reduced bank loan supply aggravated declines in lending already under way as a result of tighter monetary policy.

Walsh and Wilcox also relate loan demand and supply shocks to output and find that these shocks are not the dominant force in output movements over the past 35 years. Nonetheless, they do find that output

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was more affected by changes in loan supply than by changes in loan demand, and that loan supply was a factor in the boom in the late 1980s and the recession in the early 1990s. Although loan supply shocks are not typically the primary determinant of recessions, Walsh and Wilcox show that they played an atypically large role in the 1990–91 recession. Still, over time the average response of both output and loan volume to loan supply shocks appears to have declined. While the bank lending channel may have been attenuated by greater substitutability of other forms of credit for bank loans, for now bank lending remains a determinant of aggregate output.

Stephen G. Cecchetti was not convinced that supply and demand had been appropriately identified. This is a problem for any empirical examination

of whether bank lending affects output. Because bank assets equal bank liabilities, distinguishing between the effects of money (bank liabilities) and loans (bank assets) is problematic. Looking at interest rates does not necessarily obviate this problem, because banks often drop low-quality borrowers rather than raise interest rates, so that the reported interest rate does not reflect the marginal cost of bank funds to a constant quality borrower. In addition, the prime rate used in this study has changed over the past 30 years in terms of both what it means and how it is set. Even without the data problems, Cecchetti was skeptical that vector autoregressions could be used to distinguish shifts of supply from those of demand. To really understand how monetary policy works through the banking system, disaggregated micro data, rather than aggregate time series data, are the most promising area for future research.

Alan H. Meltzer credited the authors with using a monthly output measure that appears to be an improvement over previous studies and with making a serious effort to show the validity of their measures of demand and supply shocks. However, he remained uncomfortable with the identification of supply and demand shocks. On the identification of supply shocks, he was particularly concerned with two characteristics not incorporated in the model, that borrowers can substitute nonbank sources of credit for bank lending and that banks can substitute nonreservable deposits for reservable deposits. In addition, the model is misspecified insofar as it omits both government securities and any measure of aggregate reserves or base money. Furthermore, Meltzer was not convinced that loan supply was a significant factor in the early 1990s. Instead, the drop in lending was a result of weak demand due to the recession and of the very slow rise in bank reserves due to restrictive monetary policy. His own view is that the effect of bank lending on output is close to zero: The supply of credit may have been important when Regulation Q was binding, but he is skeptical that bank lending has altered output at other times.

II. The Lending Channel: Evidence from Firms

For a bank lending channel to be operative, firms must be unable to easily substitute other sources of credit for bank loans. Individual firm panel data can provide evidence of whether financial constraints alter firms' investment, employment, and financing deci-

sions. The next two papers examined whether evidence of financial constraints was present in data for firms of different sizes, with the second paper providing an overview of the foreign evidence of the importance of financial constraints.

The Importance of Credit for Macroeconomic Activity: Identification through Heterogeneity

Simon G. Gilchrist and Egon Zakrajšek examine the role of credit in the transmission mechanism for monetary policy and as a propagation mechanism for business cycle shocks. They emphasize the financial accelerator, which, like the credit channel, relies on credit frictions. The financial accelerator emphasizes that the cost of external financing for a firm will depend on the condition of the firm's balance sheet. The premium on external finance should vary over the business cycle, across different-sized firms, and across firms with differing degrees of leverage, with these differences altering firms' investment financing decisions.

Gilchrist and Zakrajšek find that the ratio of the short-term debt of small firms relative to all short-term debt is a much better predictor of future economic activity than other debt mix variables, such as the mix between bank loans and commercial paper. They attribute these results to the effects of monetary tightening, which restricts the ability of small firms to raise external debt at the same time that large firms are expanding their debt in response to declining cash flows and rising inventories.

Gilchrist and Zakrajšek also examine firm-specific data and find that leverage as well as size alters firms' responsiveness to monetary policy shocks. They find that inventories of high-leverage firms are more responsive to a reduction of cash flow than those of low-leverage firms, and that this responsiveness increases during recessions. They conclude that monetary policy has distributional consequences, causing the effects of monetary policy to be altered by the financial condition of firms and the distribution of those firms in the economy. Thus, the impact of monetary policy will change as the composition of firms and their financial condition change, both over a business cycle and relative to similar stages of previous business cycles.

William C. Brainard emphasized that, to the extent that asymmetric information and moral hazard are still important credit market imperfections, their importance should continue to diminish as the costs of getting information and monitoring firms decrease. In

addition, such imperfections are likely to be generated by concerns with ownership and control and with bankruptcy, considerations frequently not stressed when discussing the costs of external financing. A useful line of research would be to better document the costs of external financing and whether these costs were likely to vary over the business cycle. If the responses do vary, implying nonlinear responses, they are unlikely to be captured accurately by vector autoregressions. If the effects of the financial accelerator vary over business conditions and across cycles, a movement to firm-level micro data will be necessary in order to address these issues.

Stephen D. Oliner concurred that monetary policy has a much stronger effect on small firms than on large firms, although we have probably only scratched the surface on understanding the role played by small firms in the monetary transmission process. The evidence provides a fairly strong indication that some form of a credit channel is at work, but it is not clear whether it operates through banks or is a more general

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balance-sheet effect. In fact, because the composition of debt between bank and nonbank debt changes little for small or for large firms following a monetary contraction, the underlying mechanism may be a more generalized flight to quality for all lenders, rather than a distinct bank lending channel. While the evidence that large firms increase their market share of credit relative to small firms as a result of monetary contractions may indicate distributional effects, it does not necessarily tell us much about the aggregate importance of the credit channel for real economic activity. Two areas that warrant further investigation are the nature of bank relationships with small firms and the role of trade credit.

Financial Constraints and Investment: A Critical Review

Fabio Schiantarelli examines the empirical evidence from abroad on the importance of financial constraints. He begins with an overview of the difficulties faced by any empirical investigation of financial constraints. The basic approach has been to assess whether firms likely to suffer from informational and agency problems show significant departures from standard models, which are derived under assumptions of perfect capital markets and convex adjustment costs. Such tests are problematic because adjustment costs are not convex, the absence of perfect capital markets makes modeling the investment behavior of constrained firms difficult, and correctly partitioning the set of firms into subgroups of constrained and unconstrained firms is not straightforward. While these difficulties are a problem in any study of financial constraints, they can be particularly troublesome when examining international evidence, where the industrial and institutional structure can be quite different across countries.

Schiantarelli suggests that future research attempt to identify the information and agency problems that cause external finance to be more expensive than internal finance, thus making financial constraints important for the transmission of monetary policy.

Despite the difficulties in estimation, Schiantarelli finds that a number of results appear consistently. First, information asymmetries and agency problems generate significant departures from standard models derived under the assumption of perfect capital markets. Second, even though financial structures differ substantially across countries, internal finance remains the dominant source of financing. Third, in many countries, firms create business groups that allow the formation of an internal capital market that supplements the capital allocation function of the external market and improves their access to external

funds, and this access affects the relative importance of banks. Banks are particularly important in countries with less developed capital markets, but remain important even in countries with very well-developed capital markets, such as the United States.

Finally, the nature of financial constraints can vary with macroeconomic conditions, the stance of monetary policy, and the financial condition of firms. Thus, financial constraints will be influenced by both the business cycle and structural changes in financial markets, so they should not be expected to be invariant over time. Schiantarelli suggests that future research should attempt to identify more specifically the information and agency problems that cause external finance to be more expensive than internal finance, thus making financial constraints important for the transmission of monetary policy.

Steven M. Fazzari emphasized that the financial accelerator mechanism tested in the literature was not limited to a bank lending channel. Financial constraints also could work through a collateral channel, with higher interest rates reducing the value of collateral, which in turn would limit a firm's access to credit and raise the cost of internal finance, lowering investment. Alternatively, tighter monetary policy could reduce firms' profits, decreasing their cash flow. With a reduced supply of low-cost, internally generated funds, firms would reduce investment. Thus, if a bank lending channel is operative, one should find evidence of financial constraints, but such evidence is not sufficient to establish the importance of a bank lending channel. While financial constraints are important, the source of the constraints has yet to be clearly identified. Another major challenge remaining for empirical research on this topic is to separate the role played by financial variables that influence investment as a signal for future profits from their role as a signal indicating whether firms are financially constrained.

Donald D. Hester also emphasized the difficulty in testing for financial constraints. To the extent that the constraint is attributed to the banking sector, we must recognize that much commercial and industrial lending is done offshore and presumably is little affected by changes in domestic monetary and regulatory policy. He also emphasized that evidence of financial constraints on firms cannot be taken as evidence of the importance of bank lending for the transmission of monetary policy. In particular, using a firm's net worth as a proxy for being constrained suffers from reliance on a measure of the difference between sums of arbitrarily valued assets and liabili-

ties that are to a large degree endogenously determined by the firm itself. The difference between two arbitrarily valued series is likely to contain serious measurement errors, even if it were the appropriate proxy for financial constraints.

In addition, Hester notes, if firms feel credit-constrained, the market has developed substitutes. Capital-starved firms increasingly can lease equipment and structures, and joint ventures and mergers with firms with access to credit provide an obvious way of removing firm-specific constraints that might otherwise have macroeconomic consequences. In any case, the serious problems with identifying supply and demand make it difficult to conclude that the evidence provides any substantial support for the proposition that the severity of financial constraints varies over the business cycle and with the stance of monetary policy.

III. Conclusion

The importance of understanding the monetary policy transmission mechanism has increased with financial innovations and changes in banking structure that have the potential to alter traditional chan-

nels of monetary policy. While most conference participants agreed that financial constraints on firms may have been important in the past, it was less clear how important they would be in the future. Recent changes can be expected to alter not only the distributional impact of monetary policy, but also the magnitude of monetary policy effects on the economy.

Financial constraints are likely to be ameliorated over time as information technology and financial innovation give even relatively small firms increased access to national credit markets, but the extent of changes in the degree of financial constraints faced by firms will be difficult to quantify. The intensity of financial constraints will vary both over time and over business cycles. Separating secular changes in financial constraints from changes over the business cycle will present a challenge to policymakers attempting to identify optimal monetary policy.

The pace of financial innovation is not independent of public policies. Regulatory policy, merger policy, and trade policy, as well as monetary policy, will affect the role of banks both in the monetary policy transmission mechanism and in the economy more generally. Understanding these changes, and adjusting policy accordingly, will remain a significant challenge for setting monetary policy in the future.

Is Bank Lending Important for the Transmission of Monetary Policy?

At the Federal Reserve Bank of Boston's economic conference on June 11, 12, and 13, 1995, bankers, economists, and other financial specialists met to discuss whether bank lending should be considered an important component of the transmission of monetary policy. Proponents argue that changes in bank assets as well as bank liabilities influence the future course of the economy. Many economists remain skeptical of the role of banks, however, believing that a focus on interest rates or money aggregates is sufficient for understanding the transmission of monetary policy. The conference agenda is outlined below.

Is Bank Lending Special?

Charles P. Himmelberg, Columbia University
Donald P. Morgan, Federal Reserve Bank of New York
Discussants: Robert R. Glauber, Harvard University
Raghuram G. Rajan, University of Chicago

Do Monetary Policy and Regulatory Policy Affect Bank Loans?

Joe Peek, Boston College and Federal Reserve Bank of Boston
Eric S. Rosengren, Federal Reserve Bank of Boston
Discussants: R. Glenn Hubbard, Columbia University
Christopher James, University of Florida

How Is Bank Lending Related to Output?

Carl E. Walsh, University of California, Santa Cruz
James A. Wilcox, University of California, Berkeley
Discussants: Stephen G. Cecchetti, Ohio State University
Allan H. Meltzer, Carnegie Mellon University

What Is the Distributive Impact of the Bank Lending Channel?

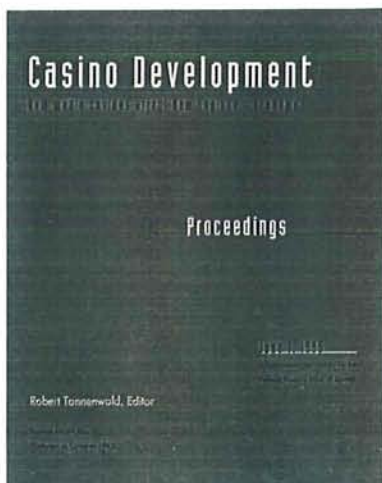
Simon G. Gilchrist, Boston University
Egon Zakrajšek, Federal Reserve Bank of New York
Discussants: William C. Brainard, Yale University
Stephen D. Oliner, Board of Governors of the Federal Reserve System

What Is the Experience from Abroad?

Fabio Schiantarelli, Boston College
Discussants: Steven M. Fazzari, Washington University
Donald D. Hester, University of Wisconsin, Madison

The proceedings, Conference Series No. 39, will be published early in 1996. Information about ordering will be included in a later issue of this *Review*.

*Casino Development:
How would casinos
affect New England's
economy?*



In 1992, Connecticut became the first New England state to allow casino gambling within its borders. Since then, the region's other states have seriously considered whether to follow Connecticut's example. One of the most controversial, unresolved issues in these debates has been the economic effects of casino development. While interest in this issue is intense, relevant empirical evidence is scant. For this reason, the Federal Reserve Bank of Boston held a one-day Symposium on Casino Development on June 1, 1995, bringing together experts from academia, government, Native American nations, and the gaming industry. This special report summarizes the participants' remarks.

Copies of *Casino Development: How would casinos affect New England's economy?* may be obtained without charge by writing to Research Library—D, Federal Reserve Bank of Boston, P.O. Box 2076, Boston, MA 02106-2076. Or telephone (617) 973-3397.