

# What Credit Market Indicators Tell Us

John V. Duca

**T***his article reviews the economic ideas behind certain domestic interest rate spreads and Federal Reserve surveys of bank loan officers.*

Although the behavior of credit markets has long been recognized as revealing much about the U.S. business cycle, the economic meaning of credit market indicators has changed. In particular, the differences—or spreads—between interest rates on various private- and public-sector debt contain much valuable information, but the economic inferences we can draw from them have not always remained the same. Thus, it is important to interpret different credit market indicators carefully.

Such indicators drew much attention in fall 1998, when financial markets were affected by the global economic crisis and concerns that the United States could face a credit crunch, in which borrowers have trouble obtaining loans or must pay interest rates far above U.S. Treasury rates. At that time, world equity prices plunged, and many U.S. firms found it difficult to issue new credit instruments. And while Treasury rates fell as investors fled to these safe instruments, interest rates on private debt barely declined and in some cases rose. As a result, the spread between interest rates on ten-year Baa-rated corporate and Treasury bonds widened to levels typically seen in recessions (*Figure 1*). In the past, however, movements in this spread have not always been a reliable indicator of business cycle downturns. One reason is that interpreting credit market indicators can be complicated in periods of market turmoil.

This article provides an overview of several credit market indicators, showing that it is important to carefully interpret what they can tell us. The article reviews the economic ideas behind certain domestic interest rate spreads and Federal Reserve surveys of bank loan officers. The historical relationships of these indicators to the U.S. business cycle are briefly assessed and illustrated.<sup>1</sup> This article then interprets what these varied indicators have been telling us about credit market conditions since late summer 1998, when securities markets were very turbulent.

## WHAT DO INTEREST RATE SPREADS TELL US?

### Why It Is Important to Decompose Simple Interest Rate Spreads

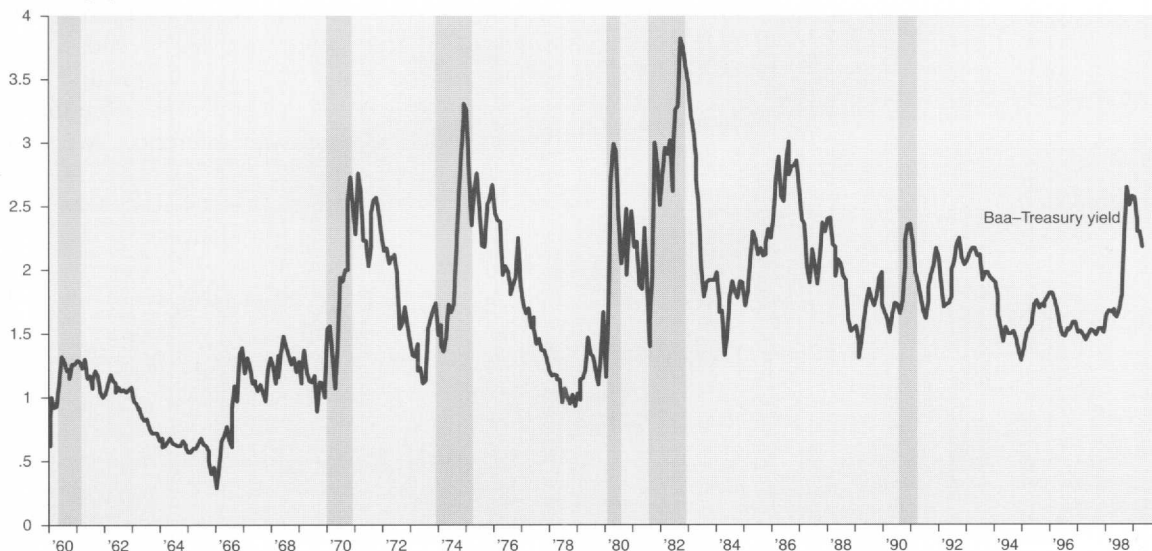
The Baa–Treasury spread has risen sharply during or before recessions and even when recessions have not occurred. This mixed record may result from this spread’s combination of three different types of risk, for which investors demand compensation and which have had different economic implications.<sup>2</sup>

One component of the Baa–Treasury

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Figure 1  
**Corporate–Treasury Bond Spreads Have Falsely Signaled Recession**

Percentage points



NOTE: Bars indicate recessions.

SOURCES: Moody's Investors Service; Federal Reserve Board.

spread is the prepayment premium to investors for the risk that if interest rates fall in the future, borrowers might retire old debt with new debt at lower rates. Because investors can lose in such cases, investors demand an extra return on a bond if the issuer can pay it before maturity. This extra return equals the perceived prepayment risk multiplied by the market price of that risk, both of which can vary.

Another component of the Baa–Treasury spread is a liquidity premium that compensates investors for the fact that private instruments are less desirable to hold relative to U.S. Treasuries when financial markets are turbulent and investors are very risk averse. The Baa–Treasury spread also contains a default risk premium to compensate lenders for the risk that borrowers may not repay, reflecting the amount of default risk posed and the price of risk.

These components of the Baa–Treasury spread have behaved differently and have different implications. For example, at first glance, the widening of the spread between yields on ten-year Baa-rated corporate and Treasury bonds in late 1998 might suggest the risk of an impending recession. However, a less alarming picture emerges from decomposing this spread into the yield spread between Aaa- and Baa-rated bonds, and the yield spread between the highest-grade corporate bond (Aaa) and Treasuries:

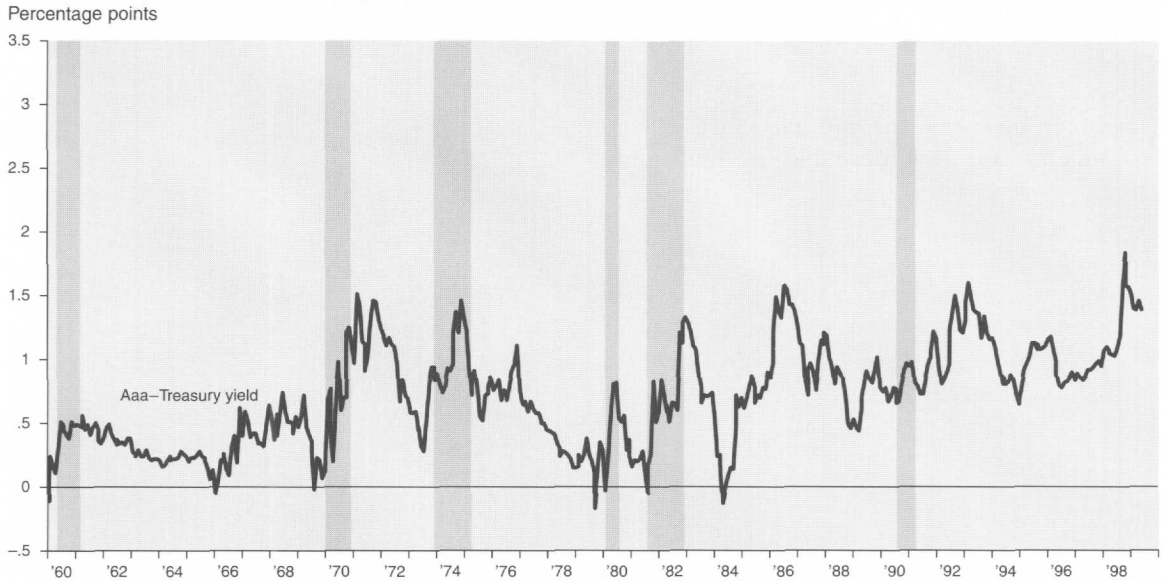
$$(Baa-Treasury) = (Baa-Aaa) + (Aaa-Treasury).$$

As shown below, the former component (which rose much less) is more reflective of default risk that is correlated with downturns, whereas the latter type of spread (which widened much) is more indicative of prepayment and liquidity risk that is not closely associated with recessions. For these reasons, it is important to interpret different types of interest rate spreads carefully.

### **Prepayment/Liquidity Premiums in Spreads Between High-Grade Corporate and Treasury Bonds**

Investors demand a prepayment risk premium for the possibility that borrowers will re-finance their debt if interest rates fall. Under normal conditions, this premium is often tracked by the gap between the average interest rate on callable bonds of the highest grade—Aaa-rated corporate bonds, which pose little default risk—and that on a Treasury bond. With little difference in default risk between such bonds, the primary distinction between Aaa-corporate and Treasury bonds is that when interest rates fall, private-sector bonds often are called and refinanced with new debt, whereas Treasuries are not. For this reason, the Aaa–Treasury spread contains a prepayment risk premium that reflects interest rate risk and the risk of refinancing. However, as noted below, this spread also contains a liquidity premium associated with a more stable demand for Treasury securities.

Figure 2  
**Higher Prepayment–Liquidity Premiums Often Not Linked to Recessions**



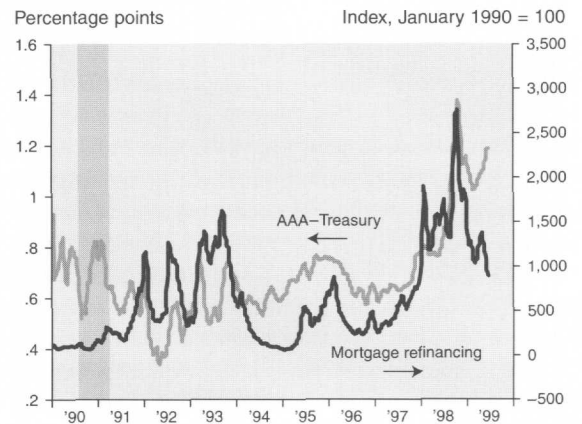
NOTE: Bars indicate recessions.  
 SOURCES: Moody's Investors Service; Federal Reserve Board.

Another complication with yield spreads between corporate and Treasury bonds is that the call provisions on corporate bonds vary within each grade of bond and also change over time. As a result, the prepayment risk premiums in corporate–Treasury yield spreads can vary across time not only due to changes in the risk that market interest rates will vary (henceforth, interest rate risk) but also due to changes in the practices regarding call provisions in bond issues, as emphasized by Duffee's (1998) research. This source of measurement error makes it difficult to separate the time-varying prepayment risk premium in corporate–Treasury yield spreads from other, more economically meaningful components.<sup>3</sup>

One interesting aspect of prepayment spreads is that they are not closely associated with recessions, as shown by the spread between Aaa-rated corporate and Treasury bond yields in Figure 2. This is also true for another measure of prepayment premiums, the interest rate spread between residential mortgage-backed securities and Treasuries. Since mortgage-backed securities are enhanced by collateral and are viewed as having an implicit guarantee from the federal government, these securities are seen as posing little default risk. But, if interest rates fall, many of the securities are retired as the mortgages backing them are refinanced by homeowners. Indeed, the Aaa–Treasury spread and mortgage refinancing activity have swung together since the recession

of 1990–91 (Figure 3). Nevertheless, it should be noted that changes in the costs and ease of refinancing have affected prepayment premiums over time, as have changes in the liquidity of these securities. This is true of the mortgage-backed securities market, which became deep and well-developed only in the mid- to late 1980s, well after the investment-grade corporate bond market did so.

Figure 3  
**AAA–Treasury Spread and Mortgage Refinancing Activity Have Swung Together Since the Last Recession**  
*(Four-week moving average)*



NOTE: Bar indicates recession.  
 SOURCES: Moody's Investors Service; Mortgage Bankers Association.

As mentioned above, the Aaa–Treasury spread normally includes not only a prepayment premium but also a liquidity premium that is usually small and less important. However, under unusual circumstances, this liquidity premium can become substantial, compensating investors for the fact that private instruments are less desirable to hold than Treasuries when financial markets are turbulent and investors are extremely risk averse.

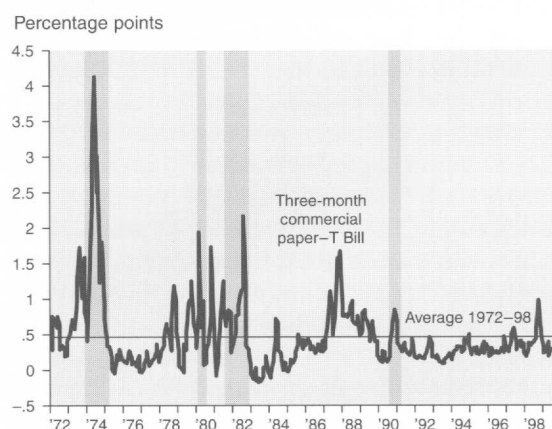
For example, some analysts argued that the big rises in common prepayment premium measures in fall 1998 reflected not so much an increase in prepayment risk as a flight to quality in which investors fled falling stock prices by shifting into the most liquid bond instruments, Treasuries. The flight to quality bid down Treasury yields more than private bond yields, thereby widening the gap between the two. From this point of view, last fall's run-up in the Aaa–Treasury spread is best interpreted as an increase in the so-called liquidity premium associated with a rise in nervousness among investors.

### Commercial Paper–Treasury Bill Spreads as Indicators of Liquidity Risk

A clearer gauge of the liquidity premium is the paper–bill spread, the gap between interest rates on top-grade commercial paper and Treasury bills. Since commercial paper is short-lived, it poses virtually no prepayment risk. In addition, because only the most creditworthy companies have enough market credibility to issue these short-term instruments, top-grade commercial paper normally poses little default risk.

At one time, the paper–bill spread was correlated with recessions, as emphasized by Friedman and Kuttner (1992) and Bernanke (1990). However, since the mid-1980s, this spread, like the prepayment spread, has not been closely related to recessions (*Figure 4*). The reasons for the earlier correlation are not completely clear, despite some attempts to explain them (most notably, Bernanke and Blinder 1992). One possibility is that the paper–bill spread spikes during periods of uncertainty, when even the strongest companies posed some default risk. Indeed, Hafer and Kutan (1992) and Emery (1996) found that most of the statistical significance of the paper–bill spread in samples from the 1960s–1980s was the result of an unusual spike in late 1973. This event coincided with the first OPEC crisis of 1973, when an oil embargo hurt the U.S. economy. The OPEC crisis of 1973–74 was the first major supply shock or stagflationary period in decades.

Figure 4  
**Paper–Bill Spread a Less Reliable Indicator After the Mid-1980s**



NOTE: Bars indicate recessions.

SOURCE: Federal Reserve Board.

Because of its unusual character, the jump in both inflation and unemployment confounded many analysts and created uncertainty that led investors to demand large risk premiums. On these grounds, some critics of the paper–bill spread believe that the spike of 1973 reflected the impact of a big supply shock and this coincidence makes the paper–bill spread appear to be a better leading indicator than it really is.

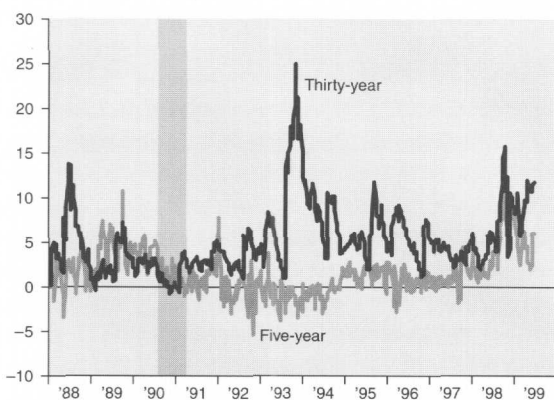
Explanations for the more recent decline in the information content of the paper–bill spread relate to asset substitutability, as stressed in the recent work of Friedman and Kuttner (1998). In practice, commercial paper is highly substitutable for uninsured large time deposits (often called certificates of deposit, or CDs) issued by banks or thrifts. During the thrift crisis of the late 1980s, investors demanded higher yields on many CDs, which because of market practices also drove up commercial paper rates. As a result, the paper–bill spread rose to high levels in 1987 and falsely signaled an impending recession in 1988–89.

### Liquidity Premiums and On-the-Run/Off-the-Run Treasury Spreads

Other indicators of liquidity premiums are on-the-run/off-the-run Treasury yield spreads. These spreads are based on the implied holding-period yields of Treasury securities whose remaining maturities do not precisely match up with those on more recently issued Treasuries. For example, an on-the-run Treasury at a three-year maturity could be the most recently issued three-year Treasury note, while a comparable off-the-run security could be a three-year Treasury

Figure 5  
**Treasury Liquidity Spreads Are Noisy**

Basis points,  
 on-the-run/off-the-run premiums



NOTE: Bar indicates recession.

SOURCE: Federal Reserve Board.

note issued just a few months earlier. Normally the implied yields on both securities over the next two and three-quarters years would be within a few basis points, with the on-the-run issue having a lower yield. The most recent issue is more liquid, partly because its maturity more closely tracks time in rounded units. In addition, new issues are more liquid with better known trading prices because they have recently been purchased by investors from primary dealers who bid on the bulk of government debt at Treasury auctions.

In turbulent markets, investors could prefer the more liquid on-the-run issue, causing a widening of the on-the-run/off-the-run spread. As shown in Figure 5, such spreads have sometimes surged in times of market uncertainty, such as in late 1989 and late 1998, when stock prices fell. These spreads are indicative of the liquidity of securities markets.

However, it is unclear what relationship these spreads have to the overall U.S. economy. One reason is the data needed to measure such spreads have been consistently saved only since 1987. Because the data span only one business cycle, there is not enough time series evidence to confidently estimate the economic significance of movements in this spread. Another drawback is that on-the-run/off-the-run spreads have been very noisy, sometimes widening during periods of strong GDP growth. Finally, the development of computer-driven trading may have altered the behavior of these spreads and their economic implications over time. For example, some risky investors, including some hedge funds, would bet these spreads would return to normal after widening. Under normal

conditions, such strategies would help stabilize these spreads. However, if investors become averse to liquidity risk and wide spreads persist, these strategies can lead to big losses, as happened to a prominent hedge fund in fall 1998.

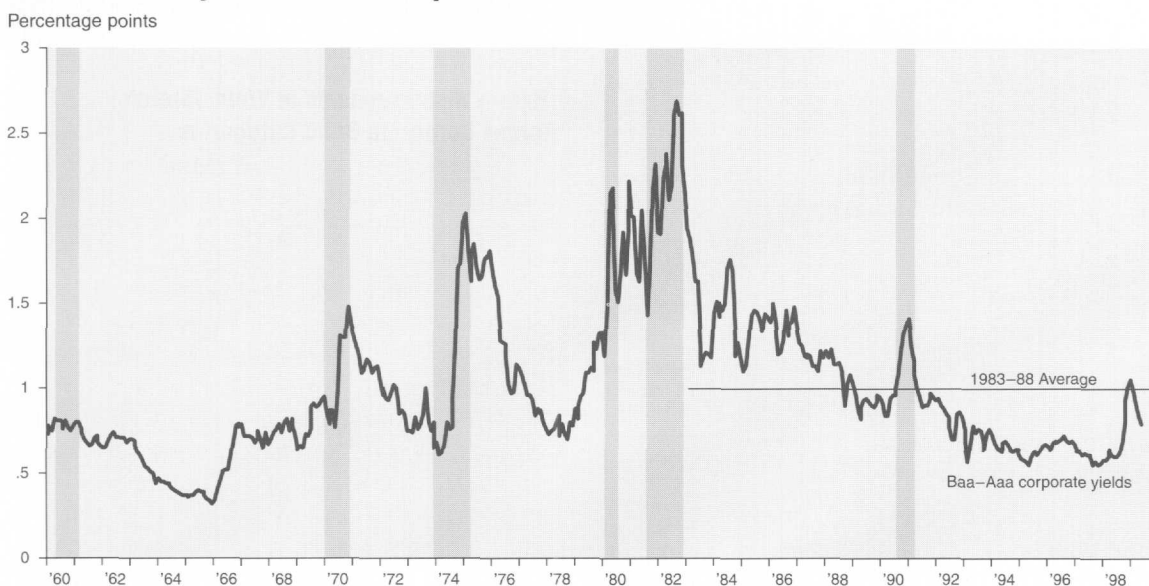
### **Default Risk Premiums in Yield Spreads Across Corporate Bond Categories**

Looking at spreads across different corporate bond categories is advantageous. These corporate spreads are subject to fewer complications posed by prepayment risk than are corporate–Treasury spreads because corporate bonds have similar callability provisions.<sup>4</sup> This implies that such spreads largely reflect default risk premiums. Such premiums, which compensate lenders for the risk that borrowers may not pay back their debt, reflect the market’s assessment of the magnitude of default risk posed and the market price of a given amount of risk. The latter depends on the supply of funds to that sector, which in turn depends on how risk-averse and liquid investors are.

Since the amount of default risk and its price reflect cyclical conditions, the spread between Baa and Aaa corporate yields has risen during recessions (*Figure 6*) and—relative to corporate–Treasury spreads—has a much lower tendency to falsely signal recessions. As Jaffee (1975) notes, corporate spreads are significantly related to macroeconomic conditions, both in a statistical and economically meaningful sense. In practice, increases in such premiums also have been associated with a tightening of credit standards, which makes it more likely that credit applicants get turned down by banks or get shut out of the bond market.

There are, however, two drawbacks to using these spreads. First, rather than giving advance warning of recessions, they tend to rise during recessions. This suggests they are better coincident indicators than leading indicators of economic activity. Second, the spreads have tended to decline since 1983, making it difficult to detect recession risk from the level of this spread. For example, the Baa–Aaa spread rose in the 1990–91 recession to a level near the average for the nonrecession months of the 1970s and 1980s. Another recent example is the run-up in this spread during the fourth quarter of 1998, when securities markets were turbulent. By itself, the increase in the spread suggests a rise in the default risk premium. However, because the level rose to the average of the post-1982 period, it is difficult to tell whether the recent run-up reflects a serious risk of recession or a return to more normal risk-

Figure 6  
**Default Premiums Tend to Rise During Recessions but  
 Their Levels May Have Different Implications Across Time**



NOTE: Bars indicate recessions.  
 SOURCE: Moody's Investors Service.

taking by investors after unusually low spreads during the mid-1990s.

The downtrend of investment-grade spreads since the early 1980s can be largely attributed to a more stable environment stemming from a low to stable inflation and a perception that the U.S. economy is less susceptible to large downturns (for example, see Dudley and McKelvey 1998). Also contributing to the downtrend in these spreads are several factors that deepened the corporate bond market, making it less subject to price volatility associated with thin trading or periods of rumor-driven trading. One factor is the improvement in information technology that has made it easier and cheaper for investors to monitor firms, thereby making investments less uncertain. Other factors have boosted the retirement demand for corporate bond investments, including the aging of the baby boom generation,<sup>5</sup> the post-World War II rise in the overall share of workers having some form of pension benefits, and legal changes fostering the growth of IRAs and 401K defined-contribution pension accounts.<sup>6</sup> Together these factors have made investors more willing to purchase lower rated investment-grade bonds, thereby pushing down spreads such as the Baa-Aaa yield spread.

It is important to note that the Baa-Aaa spread reflects credit market conditions for well-established, highly rated firms, whereas spreads

between investment-grade and below-investment-grade bonds (so-called junk spreads) are indicative of credit market conditions for mid-sized, less well established firms. The advantage to using investment-grade spreads is that their data extend far back in time, giving us a record spanning several business cycles. By contrast, junk bond indexes only extend to the mid-1980s, when the junk market developed. In addition, the greater liquidity of the investment-grade market implies that these spreads are more indicative of fundamental factors affecting default risk premiums and less indicative of temporary fluctuations due to market turbulence.<sup>7</sup>

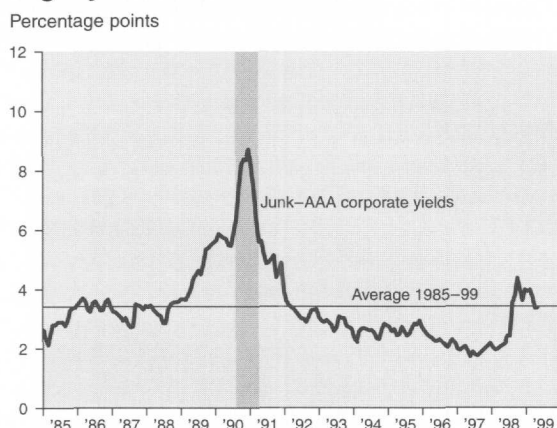
Indeed, as shown in Figure 7, junk bond spreads jumped much more during the 1990-91 recession than did the investment-grade spreads shown in Figure 6. The rise in junk spreads during the most recent recession strongly suggests that default risk affects junk spreads. However, variation in liquidity risk plausibly affects junk spreads more than it affects investment-grade spreads. For example, during the early 1990s, junk spreads were boosted by new regulations and the resolution of the thrift crisis, which forced the thrift institutions to sell their junk bond holdings.<sup>8</sup> Given that many important institutional investors could not readily purchase these securities, these sales greatly depressed the prices of junk bonds, thereby pushing up junk bond yields and spreads.

### What Are Brady Bond Spreads and What Do They Tell Us?

Brady bond interest rate spreads are helpful gauges of credit market conditions in emerging market economies. For reasons specified below, Brady bond spreads largely reflect default risk and are associated with the availability of international funds to emerging economies. What are Brady bonds? In exchange for forgiving many nonperforming loans in the 1980s, lenders were repaid by some emerging market countries with Brady bonds that the lenders could hold in portfolio or sell in credit markets. There are many types of Brady bonds, but all offer some guarantee on the interest payments or principal that removes much, but not all, of their risk. Many guarantees use Treasury bonds as collateral that investors can claim to cover missed interest or principal payments.

To allow better comparisons of Brady bonds with the bonds issued by other governments, the investment industry has created claims on these bonds that take into account these various kinds of partial guarantees. The spreads between the yields on these "stripped Brady bonds" and the yields on Treasury bonds reflect the extra default and liquidity risk that stripped Brady bonds pose relative to the debt of very creditworthy nations such as the United States. While in principle Latin American issuers of Brady bonds can call their debt, in contrast to the typical practice of the U.S. government, Brady bonds are viewed as posing little, if any, prepayment risk.<sup>9</sup>

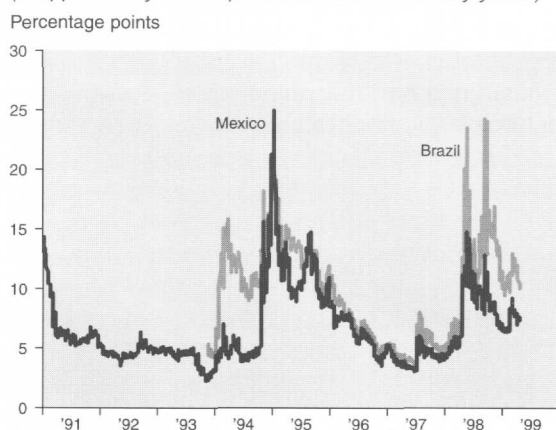
Figure 7  
**Junk Bond Spreads Jump to Slightly Above Normal in 1998**



NOTE: Bar indicates recession.

SOURCES: Moody's Investors Service; Merrill Lynch.

Figure 8  
**Latin Brady Bond Default Risk Erupts Again**  
(Stripped Brady Bond spreads relative to Treasury yields)



SOURCE: Federal Reserve Board.

The first example of how stripped Brady bond yield spreads behaved in a debt crisis occurred during the 1995 peso crisis, when Mexico devalued the peso after it could no longer defend its fixed exchange rate. The peso's fall made it more uncertain whether Mexican firms and the Mexican government could repay debt for two reasons. First, it implied that Mexican debtors would have to pay more pesos to repay their foreign-denominated debt. Second, the associated decline in the Mexican economy decreased the likelihood that Mexican debtors would have the revenue to repay debt.

As a result, the default risk on Mexican Brady bonds rose, and because the market for them was thin, their liquidity risk premiums also jumped. Compounding these problems was the maturing of short-term debt issued before the crisis. Investors either refused to buy any new debt issued by Mexican firms and the Mexican government to refinance the maturing debt or demanded high interest rates to do so.

Several other Brady bond issuers had followed policies similar to Mexico's, such as fixing exchange rates and borrowing much short-term debt denominated in foreign currencies. Given these similar risks, investors demanded higher yields on Brady bonds or any debt issued in such nations. As a result, stripped Brady bond yields surged as Latin America experienced an international credit crunch—credit inflows that had funded economic growth suddenly dried up while principal payments on old debt flowed out to foreign investors (Figure 8). This credit crunch created an economic slowdown in these countries following the peso crisis.

## WHAT DO FEDERAL RESERVE SURVEYS OF BANK LOAN OFFICERS TELL US?

Drawing economic inferences from interest rate spreads is complicated by noise in interest rates and the fact that many such spreads contain different risk premiums that have different economic implications. Therefore, it can be helpful to consider information from surveys of lenders to corroborate evidence on the availability of credit from interest rate spreads. Fortunately, the Federal Reserve has collected such information for three decades.

Specifically, the Federal Reserve has surveyed large U.S. banks quarterly since the late 1960s about their lending practices, conducting up to two extra surveys a year if conditions warrant. The questions have varied over the years, but two types of questions have focused on the degree to which loan applicants have been denied credit. Up until the early 1980s and since the early 1990s, banks have been asked if they have tightened credit standards on business loans and, since the early 1990s, on commercial real estate loans. The quarterly surveys have always asked banks whether they were more or less willing to make consumer installment loans than they were three months earlier. Responses to these two kinds of credit-rationing questions have been particularly informative during credit crunches.

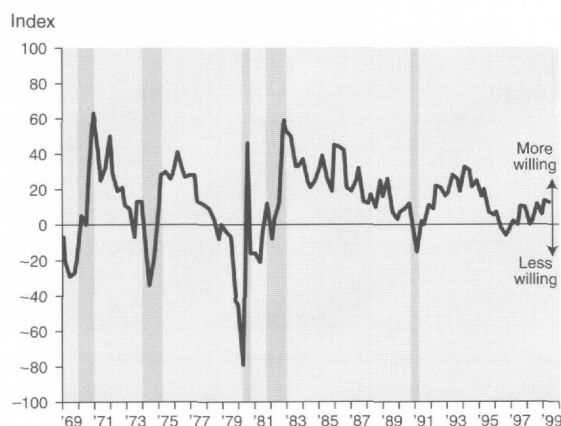
From both types of questions, analysts have created diffusion indexes of the percentage of respondents tightening minus those easing credit standards to see whether large banks had, on net, tightened or eased credit standards. Intuitively, if firms and households are more likely

to be denied credit, spending on demand for goods financed with credit would be restrained.

Schreft and Owens (1991) show that banks tightened their credit standards on business loans shortly before the recessions of 1970–71 and 1980 but tightened their standards during the recessions of 1974–75, 1981–1982, and 1990–91. These simple patterns suggest that tight credit conditions or credit crunches for businesses may have induced or propagated recessions, respectively. Unfortunately, changes in survey questions in the late 1970s and the absence of such credit-rationing questions during much of the 1980s make it nearly impossible to use this survey evidence to consistently estimate the economic effects of business credit availability over the last few decades.

However, since the late 1960s banks have been asked how their willingness to make consumer installment loans has changed from three months earlier. Using a diffusion index based on this question in econometric models, Duca (1987) and Duca and Garrett (1995) have found that banks' decreased willingness to lend to consumers has a statistically significant negative effect on consumer durable purchases. In addition, this index turned down before most recessions in the United States since the late 1960s, with the notable exception of the last recession, which was arguably prompted by an unexpected disruption of oil markets from the Iraqi occupation of Kuwait (*Figure 9*). The studies mentioned above find that bank willingness to make consumer loans falls as inflation-adjusted interest rates rise or as the economic outlook weakens. Both results support theoretical explanations for the nonprice rationing of credit (see the box titled "Why Loans Are Rationed With Price and Nonprice Terms of Credit"). A decreased willingness to lend to consumers is likely correlated with a tightening of bank credit standards on consumer loans, as implied by Schreft and Owens (1991), who find that movements in diffusion indexes of bank unwillingness to make business loans and tighter credit standards on business loans had a very high correlation (0.80). For these reasons, the index of bank willingness to make consumer installment loans provides an historically long and useful gauge of consumer credit markets.

Figure 9  
**Banks Still Slightly More Willing to Lend to Consumers in 1998–99**



NOTE: Bars indicate recessions.

SOURCE: Federal Reserve Board.

## WHAT HAVE CREDIT INDICATORS TOLD US ABOUT CREDIT CONDITIONS SINCE FALL 1998?

### Domestic Interest Rate Spreads

In early fall 1998, financial markets were wracked by turmoil as investors feared that an



## Why Loans Are Rationed with Price and Nonprice Terms of Credit

Loans are made using more than just the price of credit (the interest rate) because borrowers may not repay. Typically, lenders offer credit at different interest rates to borrowers posing different levels of default risk, with some applicants denied credit altogether. Assessments are often based on the borrower's credit history, wealth, income, proposed debt payments-to-income ratios, and, for mortgages, down payment ratios (see Duca and Rosenthal 1991; Rosenthal, Duca, and Gabriel 1991). Thus, credit is allocated or rationed using price (loan interest rates and fees) and nonprice terms of credit, both of which can vary.

What could cause such a tightening of nonprice terms of credit? One theoretical approach, typified by Jaffee and Russell (1976) and Stiglitz and Weiss (1981), stresses that lenders bear the downside risks of a loan and face asymmetric information because potential borrowers know more about whether they will repay a loan than do lenders. As interest rates rise, less risky and lower return projects drop out of the pool of loan applications, while riskier ones remain. In addition to this adverse selection effect, there is a moral-hazard problem in that borrowers have more incentive to take bigger risks once they have a loan if they believe they cannot otherwise repay. For some observably risky loan applicants, charging higher loan rates actually worsens loan quality so much that it is not profitable to lend to them. Thus, higher market interest rates or a deteriorating economic outlook makes it unprofitable to lend to what had been marginally creditworthy loan applicants and induces lenders to tighten credit standards used to approve loan applications.

Another approach to explaining the nonprice rationing of credit, typified by Williamson (1986), stresses that lenders bear deadweight costs of default that borrowers do not. These so-called agency costs of default include factors such as legal actions and the interest costs of delays in collection, as well as the time and expense incurred by lending staffs in monitoring delinquent loans and verifying defaults. As stressed by the theoretical work of Townsend (1979), Lacker and Weinberg (1989), and Lacker (1991), debt contracts may be superior to equity contracts for many types of financing. The intuition is that if good economic conditions prevail, borrowers usually meet preset debt payments, and lenders avoid agency costs of verifying how well a firm or household is doing. But, as argued by Bernanke and Gertler (1989), although collateral can reduce this type of agency-cost-induced credit-rationing, declines in asset values brought about by a deteriorating economic outlook or higher interest rates can destroy collateral and cause a tightening of credit standards. Higher interest rates also make it more likely that borrowers will not repay, boosting expected agency costs and prompting tighter credit standards.

economic slowdown would spread from some emerging market economies to the rest of the world. U.S. financial markets appeared to seize up and stop normal functioning. Stock prices were falling sharply and many firms could not issue bonds, commercial paper, or stock. This financial market distress was evident in spreads between corporate and U.S. Treasury bond yields, which jumped sharply. Close examination of the components of such spreads suggests the rises primarily reflected jumps in liquidity and prepayment premiums, as indicated by bigger increases in the Aaa–Treasury spread (*Figure 2*) than in the Aaa–Baa spread (*Figure 6*). Junk spreads widened much more than the Aaa–Baa spread did, but this may have reflected more liquidity than default risk, given the thinness of the junk bond market. Increased prepayment risk was manifested in record levels of mortgage refinancing and a fall in Treasury interest rates. But a flight to quality may have played a bigger role, as evidenced by investors' flight from equities and by a rise in the paper–

bill spread (*Figure 5*) and in on-the-run/off-the-run Treasury spreads.

When carefully interpreted, these spreads did not collectively point to recession but, rather, to a scenario of slow growth. Earlier in 1998, fears of slowing export growth from weakening foreign economies led to a decline in both Treasury and private bond rates. This, in turn, stimulated U.S. domestic demand and cushioned U.S. economic growth from a fall in exports (see Duca, Gould, and Taylor 1998). While fears of further global slowing in fall 1998 also sparked declines in U.S. Treasury rates, many private bond rates barely budged. In this sense, the widening of prepayment/liquidity premiums suggested that falling bond yields would not stimulate domestic demand enough to prevent falling net exports from slowing the U.S. economy too much. Against this backdrop and to help stabilize shaky international financial markets, the Federal Reserve cut the federal funds rate three times.

These actions helped restore financial market confidence, as did a natural bounceback in spending that followed a pause in consumption associated with the stock market correction in fall 1998. Since then, the run-up in the paper–bill spread has unwound, while most of the jumps in prepayment/liquidity risk measures have reversed. One interesting development was a further increase and then flattening of the Aaa–Baa spread. Together with other spreads, the rise in this default risk premium to its average level over 1983–98 suggests that while markets are more composed now than last fall, investors are returning to more normal levels of risk-taking in the bond market following the exceptionally easy period of 1996–97.

### Foreign Rate Spreads

Brady Bond spreads jumped in fall 1998 to levels not seen since the 1995 peso crisis (*Figure 8*), illustrating investor concerns that emerging market nations would have greater difficulty paying their debts because their economies would slow and currency declines would make it harder for them to pay back in dollars. Since then, spreads have subsided and by May 1999 had indicated that the severe credit crunch gripping Latin America may be lifting. Similar spreads between Asian issues of dollar-denominated bonds and U.S. Treasuries suggest the Asian credit crunch is subsiding.

### Loan Surveys

The Federal Reserve conducted an extra loan survey in September 1998 that focused on

credit standards. One key finding was that after years of easing credit standards, banks slightly tightened them for loans to large and medium-sized firms, as shown in Figure 10. By contrast, standards were little changed for small firms. Banks that tightened standards did so mainly based on a changing economic outlook. In addition, the larger banks in this sample tended to tighten more than the smaller ones. However, banks reported that they continued, on net, to be more willing to make consumer loans (Figure 9). Although the index was less positive, it remained above the negative levels of previous recessions and credit crunches. Other questions revealed slower loan demand by firms and households in September 1998.

The loan surveys have several implications. First, they suggest that credit standards had initially been tightened more for firms with higher global exposure in fall 1998, as such firms usually are bigger and also borrow from larger and more internationally oriented banks. Subsequently, credit standards for large and medium-sized firms have been tightened somewhat further. Second, the surveys imply that small firms experienced a mild tightening of credit standards, but by no means a credit crunch, as confirmed by survey evidence from the National Federation of Small Businesses showing that credit was widely available to the small firms surveyed. Third, while bank willingness to make consumer installment loans has not been increasing as rapidly, households have not been experiencing a credit crunch (Figure 9), consistent with strong growth in consumption and consumer credit in late 1998 and early 1999. Together, these three findings suggest that

after years of easing standards, lending practices may be returning toward more normal levels of risk-taking. Finally, businesses and household borrowers initially became more cautious, consistent with evidence of little hiring and little firing in early fall 1998. Since then, lending, confidence, spending, and hiring have rebounded, as the caution associated with financial market turmoil has subsided.

## CONCLUSION

This article shows that interest rate spreads and loan surveys should be interpreted carefully when assessing the availability of credit and its impact on the economy. This is especially true of interest rate spread indicators, some of which reflect prepayment, liquidity, or default risk premiums that have different relationships with economic activity. It can be helpful to decompose spreads before drawing economic inferences from the structure of interest rates. Spreads between yields on non-top-grade private-sector bonds and Treasury bonds, in particular, contain a large prepayment premium in addition to a time-varying default risk premium. With respect to recent developments, this distinction especially applies to the Baa–Treasury spread, which could be easily misread as pointing to a severe credit crunch in late 1998. In fact, a simple decomposition of this spread, consistent with other indicators, suggests the United States experienced more of a credit pinch than a credit crunch in late 1998 and early 1999.

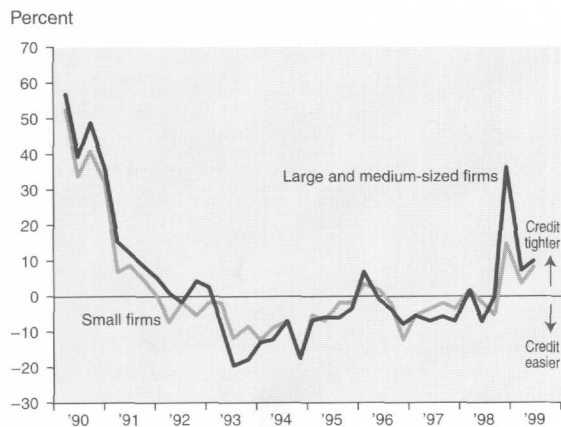
It is also important to recognize that even some decomposed spreads contain more than one type of risk premium. In this regard, a widening of some yield spreads that contain a small default risk component, such as the Aaa–Treasury spread, could arise from an increase in prepayment and/or liquidity risk premiums, whose magnitudes may be hard to identify separately. Such was the case in late 1998, when mortgage prepayment activity set records and the commercial paper–Treasury bill rate spread pointed to a jump in liquidity risk premiums.

## NOTES

I thank William Gruben and Robert Moore for helpful suggestions and Ricardo Laudes for excellent research assistance. Any errors are my own.

<sup>1</sup> This article does not review yield curve interest rate spreads, a subject that requires too much space and that has been covered in a host of articles, such as Bernanke (1990). In recent years, the yield curve has

Figure 10  
Net Percent of Banks Tightening Standards for Business Loans



SOURCE: Federal Reserve Board.

severely underestimated economic growth and has given false signals.

<sup>2</sup> Another component is tax treatment. In contrast to corporate bond interest payments, interest earned on U.S. Treasuries is not subject to state and local taxes. This effect is not likely to shift the spreads significantly because state income tax rates have not varied much over time and because residents in states with high state income taxes tend to buy municipal securities, whereas Treasuries are more likely to be owned by residents in low-state-income-tax states, retirees in low brackets, and institutional investors, who avoid most income taxation. An additional complication is that even if state income tax rates did not vary, the tax-induced spread between corporates and Treasuries could vary because the value of the tax exemption is proportional to the level of interest rates.

<sup>3</sup> There are other complications as well. For example, the Aaa-Treasury spread has even turned negative on rare occasions when the yield curve was inverted after steep rises in interest rates. During these episodes, markets may have anticipated such little prepayment risk that the expected lifetime of corporate bonds exceeded that of the noncallable ten-year Treasury note. (Many corporate bonds have stated maturities greater than ten years.) The implied negative term premium apparently outweighed the liquidity and default risk advantages of the ten-year Treasury note. This was so much the case that the ten-year Treasury yield exceeded the average yield on Aaa-rated corporate bonds, but the latter still exceeded the thirty-year Treasury bond yield in such yield-curve twists when the thirty-year Treasury bond was available.

<sup>4</sup> Nevertheless, yield spreads across corporate bond categories may reflect some differences in callability provisions across corporate bonds, as suggested by Duffee's (1998) study.

<sup>5</sup> Recent cross-section data on households indicate a general shift in household portfolios toward bond and equity mutual funds, for both IRA/401K assets and non-IRA/401K assets (see Kennickell and Starr-McCluer 1994).

<sup>6</sup> In general, pensions include traditional defined-benefit plans and IRA and 401K plans. Since the 1970s there has been a shift away from defined-benefit pension plans and toward defined-contribution pension plans. One advantage of the latter is that a greater share of the expected benefits is portable if employment at a particular firm ends.

Gustman and Steinmeier (1992) and Ippolito (1995) estimate that half the rise in the share of defined-contribution plans (401K and traditional defined-contribution plans as a share of primary pension plans) results from employment shifts away from firms that historically have favored defined-benefit plans—particularly unionized and larger firms. Ippolito (1995) concludes that the other half of this rise stems from tax law

changes that made 401K plans more attractive than pre-1980 defined-contribution plans.

<sup>7</sup> The investment-grade market is more liquid because many institutional investors (such as pension funds and life insurance companies) are explicitly or implicitly prohibited from investing in below-investment-grade bonds.

<sup>8</sup> I am indebted to Harvey Rosenblum for pointing this out to me.

<sup>9</sup> There are two primary reasons. First, most Brady bond issuers are unlikely to be in a position to run budget surpluses to pay down debt earlier than scheduled. Second, these nations are unlikely to refinance Brady bonds with new debt having lower interest rates because the original Brady bonds were issued at low rates with collateral backing from major industrialized nations.

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