Security Loans at Banks and Nonbanks: Regulation U

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The Crash of 1929 was followed by a decade of legislation designed to prevent the securities markets abuses thought to contribute to the Great Depression. Among the perceived abuses was the liberal and destabilizing extension of credit for the purpose of purchasing and carrying securities ("security loans"). Loans by brokers and dealers to their customers, commonly referred to as "margin loans" or "debit balances," received the most attention in the public debate, although hypothecation loans by banks and loans by nonbanks (currently called "G-loans") also came under scrutiny.[1]

Broker-dealers finance margin loans in several ways. Internal funds from the broker-dealer's own account and, more important, from the credit balances of broker-dealer customers provide about 70 percent of the money required to finance margin loans.[2] Thus, customers with cash balances indirectly lend to customers who want to leverage their investments by borrowing to buy or hold securities. The remaining source of funds for margin loans is external financing from bank and nonbank lenders.

The Board of Governors adopted Regulation T, the first federal limit on margin loans, in 1934. These "margin requirements" were placed on loans made by brokers and dealers to their customers for the purpose of purchasing or carrying securities. Such loans are called "purpose loans" or "purpose credit." Extensive literature exists about the consequences of Regulation T for the performance of securities markets. This literature has been updated by recent studies in this *Review;* Fortune (2000) reviews the foundations and content of Regulation T; Fortune (2001) assesses the implications of margin lending for stock market volatility.

The present study focuses on security loans by banks and nonbanks and on the margin regulations adopted by the Board of Governors to limit purpose loans by banks and nonbanks to broker-dealers or other borrowers. Regulation U, adopted in 1936, imposes limits on commercial bank loans to purchase and carry margin stock. Regulation G, adopted in 1968 but merged into Regulation U in 1998, limited nonbank purpose lending on margin stock. Regulation X, adopted in 1971, limits the ability of U.S. persons or their agents to borrow abroad to circumvent Regulations T and U.

Along with the previous studies just cited, this study can be seen as a revisitation of the territory covered in earlier Federal Reserve System analyses of the topic. Parry (1949) provides an early history. Major Federal Reserve studies (Federal Reserve System, 1982, 1984) examine the technical details and economic effects of security credit regulation. In addition, a long list of academic studies, many cited in Fortune (2001), give extensive analysis and criticism.

The first part of this study looks at the history of security lending in the United States with special emphasis on lending by banks during the 1920s and 1930s. We show that security lending by banks and borrowing by broker-dealers often diverged—the popular notion that the two are tightly linked is not correct—and that during the 1928–29 episode, security loans by nonbank lenders became increasingly important. We also see that while both margin loans and security loans were high in the 1920s, both in absolute level and relative to stock market valuation, the level of lending fell in the 1930s and, since World War II, it has stayed at around 2 percent of stock market value.

The second section assesses the reasons for bank security loans. In particular, we look at the popular argument that margin loans (debit balances at broker-dealers) are a major driver of bank security loans. We contrast this with an alternative view, that debit balances play, at best, a mildly supportive role, and that bank security loans to brokers are driven primarily by the cash flows of broker-dealers. The evidence that we adduce does not support the first view. This weakens the argument, discussed in the fourth section, that margin loans absorb credit by diverting it from "legitimate" business uses to "speculation."

The third section reviews the securities market legislation of the 1930s and summarizes the contents of Regulations U, G, and X. Readers familiar with the salient features of these regulations can bypass this section. The fourth section looks at more recent experience with security credit. The increasingly important role of foreign banks is discussed, as is the role of nonbank security lending (G-lending). The merit of the credit absorption hypothesis—that bank security loans absorb credit that would otherwise be available for more productive business needs—is assessed by looking at the implications of security lending for the level of interest rates. We find no support for the credit absorption hypothesis: Shocks to bank security loans do not play a significant role in determining the commercial paper rate, and the effect, if any, appears to be in the wrong direction—a positive shock to security loans appears to reduce the rate on commercial paper. The paper concludes with a brief summary.

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I. A Brief History of Security Lending

The proliferation of development projects, such as railroads, turnpikes, bridges, and canals, following the War of 1812 created a need for large-scale external financing through new issues of debt and equity. Investors anticipating high returns often turned to brokers to finance their investments. Brokers, in turn, borrowed in the market for "call loans," loans by banks

[1] Bank loans to broker-dealers are called hypothecation loans because the broker-dealer hypothecates, or pledges, customer securities as collateral for the loan. Loans by nonbank entities are often called G-loans because they were once subject to Regulation G. In this paper we do not consider another form of "security loan," loans of securities by broker-dealers to other broker-dealers for short sale.

[2] According to the Federal Reserve System's Flow of Funds Accounts, at yearend 2001, broker-dealers had $619.4 billion of liabilities, of which $443.4 billion, over 70 percent, was from customer credit balances.

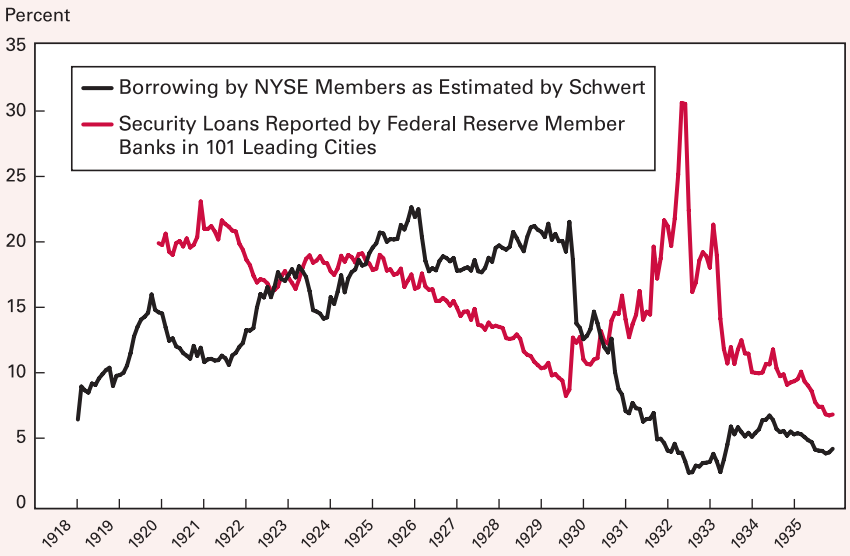
and others secured by marketable instruments and payable on demand.

By the late nineteenth century, call loans were an established part of the New York money market as banks sought highly liquid, interest-bearing, short-term securities to hold as secondary reserves. Call loans were fueled by deposits placed at New York City (NYC) banks, by correspondent banks in the interior, by call loans from outside banks using NYC banks as agents (a practice termed "loan arranging"), and by nonbank lenders through loan arrangements by banks both in and outside of New York City. Myers (1931) argues that the source of call loans was sensitive to the difference between the call loan rate and the commercial paper yield. When the call loan rate was relatively low, outside banks and other lenders made call loans indirectly by placing deposits with NYC banks, which then made the call loans. When the call loan rate was relatively high, outside banks withdrew deposits from NYC banks and made call loans directly, often using NYC banks as agents to place and service the loans.

Figure 1

Security Loans as Percent of NYSE Market Capitalization

January 1918 to December 1935



Source: Federal Reserve System (1943) and Schwert (1989).

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By the early twentieth century, an active market for common stocks was emerging. While debt issues were—and still remain—the predominant form of external finance, the liquidity provided by the stock market encouraged borrowing to either purchase or carry common stocks. The amount of credit extended in the call loan market was sensitive to the flows of funds into—and out of—NYC banks. During periods of slack agricultural activity, when deposits grew at NYC banks, call money was readily available, call loan volume increased, and, often, stock prices rose; during harvest seasons, when interior banks withdrew funds from New York correspondents, call loans were called, and, often, stock prices fell. The high correlation between the volume of call loans and stock prices created the impression that the former induced changes in the latter, and the stage was set for regulations limiting call loans.

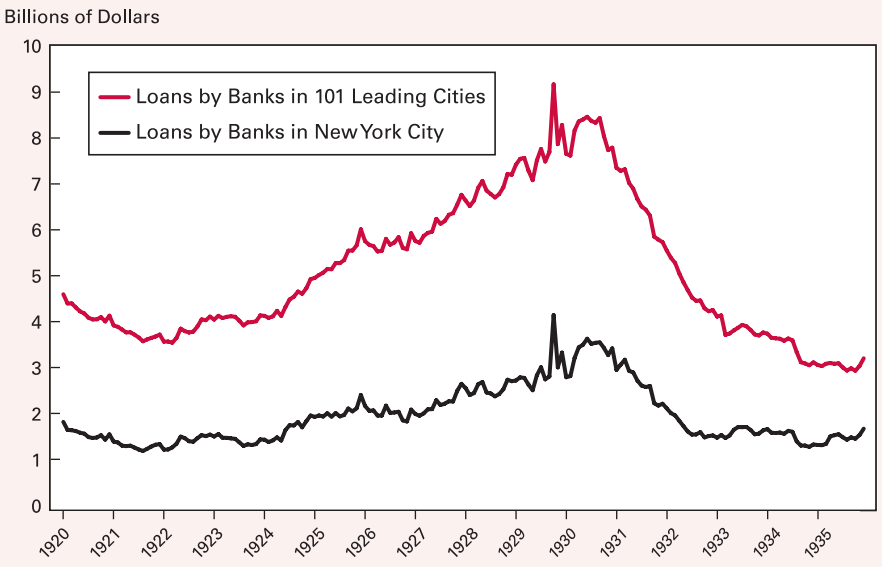
Following the 1929 Crash, the call loan market declined in significance. Lower expected stock returns trimmed the demand for security loans, and the supply of call loan money was tempered by structural and institutional changes. Important among these were sweeping new regulations of banks and securities markets, such as the Banking Act of 1933 and the Securities Exchange Act of 1934. These were supplemented by new regulations adopted by securities exchanges. A proliferation of alternative forms of liquidity for banks, including the creation of federal funds in 1921 and the introduction of U.S. Treasury bills in 1929, also affected the call loan market.

Figure 1 shows two measures of the volume of security loans in these early years. The first, reported by Schwert (1989), is the estimated amount of borrowing by New York Stock Exchange (NYSE) members per

Figure 2

Security Loans by Federal Reserve Member Banks in New York City and in 101 Leading Cities

January 1920 to December 1935



Source: Federal Reserve System (1943).

dollar of NYSE market capitalization. The second is loans on securities reported by Federal Reserve member banks in 101 leading cities, also per dollar of NYSE value. Schwert's measure shows that brokers' loans, about 20 percent to 25 percent of NYSE value in the 1920s, plunged sharply after 1929 to less than 5 percent of NYSE value in 1932. The member-bank data show a lower value of security loans in the 1920s, roughly 10 percent to 20 percent of NYSE value. The two series diverge sharply in the 1930s, especially during the banking crises of 1931–1933, when member-bank security loans rose sharply relative to NYSE value, while brokers' loans fell sharply. Note that the absolute levels of both fell in that period, but brokers' loans fell more sharply and bank loans fell less sharply than did the NYSE.

The above comparison provides an interesting insight into the roles of banks and brokers in the market for security loans. In the early 1920s, security loans by banks exceeded broker borrowing, suggesting that banks were directly lending to investors and that brokers were not the primary source of credit for security purchases. But during the boom of the later 1920s, bank security lending fell below broker borrowing, suggesting an increase in the role of nonbank lenders. At the same time, there was an increase in security loan issuance by nonbrokers. Roelse (1930) estimates that at the time of the 1929 Crash, about 55 percent of the $16.66 million of security loans were to broker-dealers, and the rest to customers other than broker-dealers. Thus, nonbanks had become more prominent lenders, and nonbrokers had become more prominent borrowers.

During the 1930s—and especially during the banking crises of 1931–1933—member bank security loans again exceeded brokers' borrowings. This reflected a withdrawal of nonbank lenders, a reduced demand for credit by brokers, and an increased reliance on banks by investors wanting credit to carry their security positions.[3]

The sources of security loans in these early years are varied. While attention has been focused on NYC banks, Figure 2 shows that Federal Reserve member banks in New York City provided only about half of the security loans made by all 101 leading-city member banks. The NYC bank share fell in the late 1920s as outside banks provided security loans at high rates, but throughout the period outside banks were the major sources of security credit.

Anecdotal evidence supports the important role of nonbank lenders in the security loan market, but little quantitative information about their role exists. The Federal Reserve System separated call report data on security loans by NYC banks into loans for their own account, loans for the account of outside banks, and loans for "others." Figure 3 shows these data. The share arranged for outside banks fell steadily throughout the 1920s, while the share for "others" rose. In

[3] This information is made more murky by difficulties in reconciling Schwert's data on borrowing by brokers and member-bank lending data. Part of the divergence is attributable to different data sources and different methods. Schwert's estimate of NYSE value is much lower than the values used in the member-bank calculation; the latter was reported by NYSE. Schwert's estimated broker loans are also much higher than security loans reported by member banks. But whatever the "true" value of security loans is, they were relatively high in the 1920s and fell sharply after the Crash of 1929.

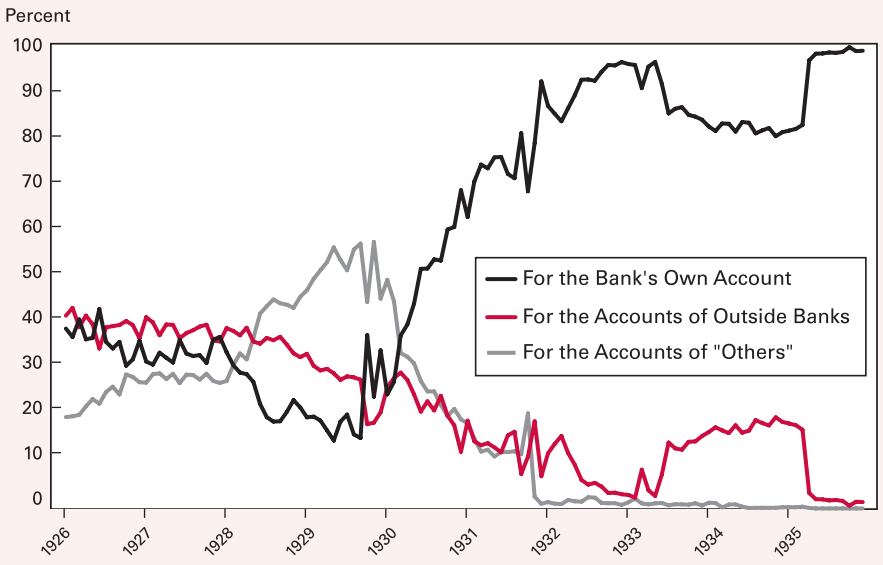
1928–29, NYC bank loans arranged for "others" rose sharply, reaching nearly 60 percent in late 1929.

While about 60 percent of NYC bank security loans were for "others," Roelse (1930) reports that about a third of all reported security loans were for "others." Thus, it appears that New York City was the locus of most of these loans. There are no firm data on who were the "other" lenders. The NYSE reported only that its members' borrowings from "others" were from "private banks, brokers, foreign banking agencies, etc." Bernheim et al. (1935) reports that just before the Crash the six largest NYC member banks reported that 56 percent of loans arranged for "others" were for corporations, 20 percent were for individuals, 14 percent were for investment trusts, and 10 percent were for foreign customers.[4] It is noteworthy that both corporations and investment trusts were simultaneously lending in the call money market and issuing new securities that were often bought with margin loans, leaving unmeasured the net lending attributable to them. Indeed, if one deducted all new shares issued on the assumption that the purchases were financed solely by margin loans, the remaining level of margin loans for purchase of existing securities would have been stable throughout 1928–29.

Figure 3

Security Loans by New York City Banks as Percent of All Security Loans by These Banks

January 1926 to December 1935



Source: Federal Reserve System (1943).

The state of the call loan market is reflected in the call money rate, the interest rate on call loans. Figure 4 shows the annualized interest rates on 4- to 6-month commercial paper and on call loans from January 1918 through December 1935. The call loan rate was typically below the commercial paper rate, reflecting the greater liquidity of call loans, their shorter duration, and their better collateral. However, during periods of stock market exuberance or financial crisis the call loan rate exceeded the commercial paper rate. This is particularly true in the financial crisis of 1920 and the financial exuberance of 1929. Myer's hypothesis, cited above, is consistent with these data: In 1929, when call money rates were high relative to the paper rate, loans arranged for "others" by NYC banks were also quite high (Figure 3).

Bank arrangements of call loans "for others" dropped sharply in late 1931. While the dismal state of stock-return expectations undoubtedly played a role, the New York Clearing House's late-1931 prohibition against members arranging call loans for nonbank customers was an important factor. By the mid-1930s, virtually all call loans by NYC banks were made for their own accounts.

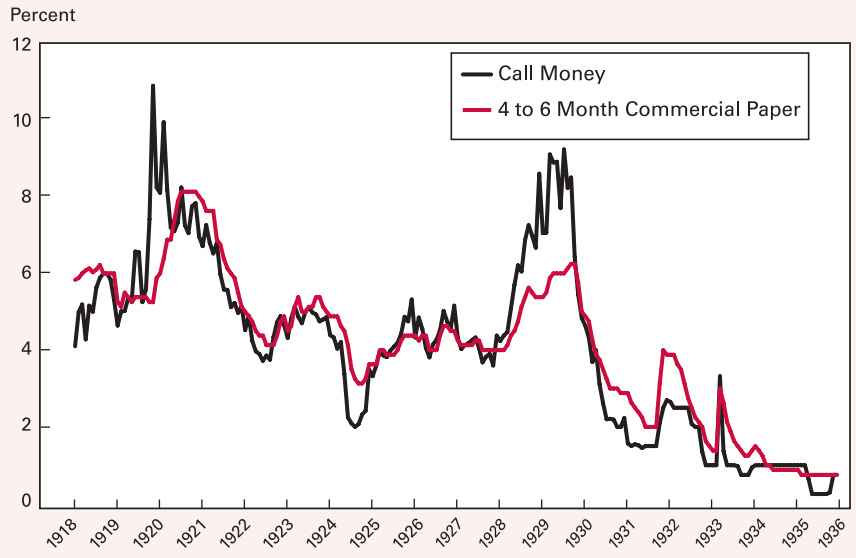
While the call money rate was generally below the commercial paper rate in the 1920s and 1930s, except in periods of strong excess demand for call loans, this pattern was reversed after World War II. Figure 5 shows the two interest rates for 1947 to 1970 and 1977 to 2001 (call loan rate data are not available for 1971 to 1976). The call money rate was below the commercial paper rate in very few months, and then only briefly. The reasons for this reversal are unclear, but the prolif-

[4] The NYC member-bank data on security loans for "others" understate the role of nonbank lenders because they show only loans to brokers arranged by NYC banks, they exclude loans channeled through other banks or made directly to brokers or investors, and they also exclude loans to nonbrokers arranged for outside banks.

Figure 4

Short-Term Interest Rates

January 1918 to December 1935



Source: Federal Reserve System (1943).

eration of short-term alternatives such as the federal funds market undoubtedly reduced the liquidity advantage that call money had provided. In addition, changes in the commercial paper market, such as the development of money market mutual funds that stimulated the demand for commercial paper, contributed to a decline in the commercial paper rate.

II. Why Do Brokers Borrow?

During the debates of the 1930s, at least two views of broker borrowing from banks emerged. The first, dubbed the "debit balance view," held that debit balances in margin accounts drove broker borrowing. The second, the "cash outflow view," placed debit balances in the background and held that brokers borrowed only when they needed to pay net cash withdrawals by customers. According to the former, the surge in margin loans in late 1929 was triggered by customer security purchases that were fueled by leverage. According to the latter, the 1929 margin debt surge was due to net cash withdrawals by customers, such as those arising from corporations issuing new shares and withdrawing the funds to make business investments.

According to the debit balance view, when a broker lends to finance a customer's purchase of securities, it was argued, the broker must turn to external sources, primarily banks, to finance the margin loan. Thus, if a broker's customer buys $1,000,000 of stocks and maintains only a $500,000 margin, the customer must borrow $500,000 from the broker, and the broker must obtain those funds from an external source. The margin loan (debit balance) directly increases bank loans to purchase and carry securities. The debit balance view was advocated by those concerned that margin loans absorbed credit that would otherwise have gone to more productive business uses.

However, this popular view is subject to several criticisms. First, it ignores the fact that the trade might have no effect on aggregate debit balances, or that it might even lead to a reduction in debit balances. The outcome depends on the margin-loan position of the seller as well as that of the buyer. If, for example, both the seller and the buyer decide to have a 40 percent margin (60 percent loan) at the time of purchase, but the seller has enjoyed a stock price increase so that he has a 50 percent margin (50 percent loan) at the time he sells, the net increase in debit balances is only 10 percent of the value traded. In this situation, the buyer's debit balances increase by 60 percent of the transaction, but the seller repays debt equal to 50 percent of the trade value. Indeed, if the seller has a lower margin (greater loan) than the buyer does, debit balances will actually fall.

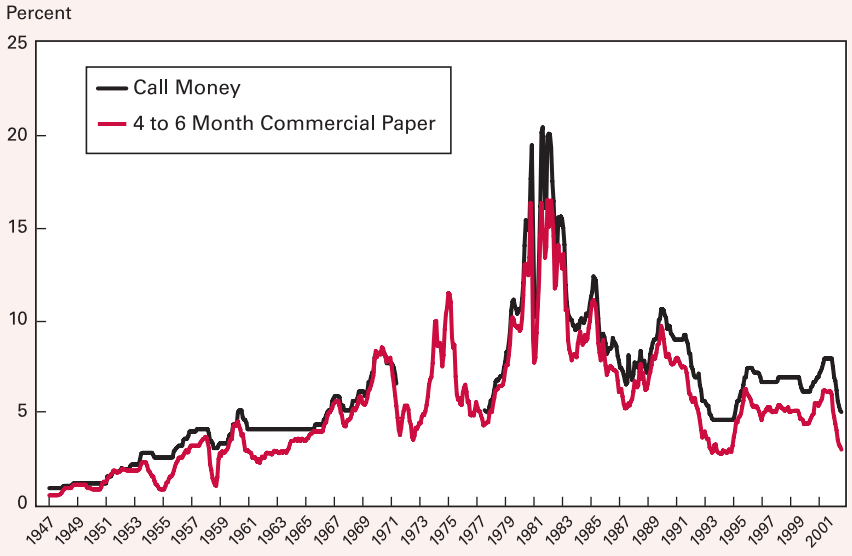
A second flaw is that the underlying analysis reflects a misunderstanding about the genesis of broker borrowing from banks and others. Eiteman (1932a, 1932b) points out that a broker needs external funds only when his cash outflows exceed his cash inflows. Thus, debit balances induce broker borrowing only when they require net cash outflows, as when a customer withdraws his credit balances to purchase consumer goods or to make business investments. We term this the "cash outflow hypothesis." Net cash out-

flows, in turn, occur when there are net cash withdrawals by customers or when, at settlement, a broker must make net payments to other brokers. Because the brokerage industry has no net payments for securities at settlement—one broker's payments to the clearinghouse are another broker's receipts—the brokerage industry experiences net cash outflows (inflows) only when there are net cash withdrawals by customers.

Figure 5

Short-Term Interest Rates

January 1947 to December 2001



Source: Federal Reserve System, Data Resources Inc.

Consider the following example. Broker A has a customer with a $500,000 credit balance. Broker A will have loaned that money to another broker or outside the brokerage industry, perhaps to a bank. Broker A receives interest on the loan and pays interest to the customer. Broker B has a customer with $1,000,000 in stocks and no debit balances. The initial position, therefore, is that the brokerage industry holds $1,000,000 in securities, and its customers have a $500,000 credit balance. Now suppose that Broker A's customer buys the stock of Broker B's customer, paying $500,000 from his credit balance at Broker A and financing the remaining $500,000 with a margin loan from Broker A. After settlement, Broker A's customer has $1,000,000 in stock and a $500,000 debit balance, while Broker B's customer has a $1,000,000 credit balance.

Has the $500,000 debit balance absorbed credit? Broker A must obtain the $500,000 to cover the margin loan because that cash must be paid to Broker B. But this requires no external borrowing from banks or others, for Broker B will not leave its customer's $1,000,000 credit balance idle—it will be loaned to another broker or outside the brokerage industry. Thus, the $500,000 debit balance can be financed by a $500,000 loan from Broker B to Broker A, leaving an additional $500,000 in credit balances at Broker B to be loaned outside the brokerage industry. The net effect is that the original $500,000 loaned by Broker A outside the industry is replaced by a $500,000 loan by Broker B outside the industry. The final consolidated position of the brokerage industry is unchanged: It has $1,000,000 in stock and $500,000 in customer credit balances, as before. There is no change in credit supply or demand, and, in this case, no increase in bank security loans.

Note that even if Broker A borrowed the $500,000 from a bank, there is no credit absorption because, while bank loans increase, the bank can obtain the funds from Broker B. Bank loans increase, but loans by brokers outside the industry also increase. In either case, there is no credit absorption in the popular sense of shifting credit from business purposes to stock market activity. Total credit available to businesses is unchanged but the form changes.

Eiteman's main point is that broker-borrowing from banks is not driven by debit balances unless those variables affect cash withdrawals from the brokerage industry, as when a customer withdraws sales proceeds or draws down his credit balance. Even then, credit absorption might be minimal. If Broker A's customer withdraws his $500,000 credit balance, Broker A will have to obtain the funds from a bank or elsewhere, but the customer might lend them in a related market so that no excess demand for credit appears, even though security loans increase.

To summarize, advocates of the debit balance view predicted that bank loans to broker-dealers

Table 1
Debit Balances and Security Loans at U.S. Banks
January 1984 to June 2002

	Equation 1	Equation 2	Equation 3	Equation 4
Constant	–.0180	–.0144	–.0235	–.0181
	(1.51)	(1.19)	(1.91)	(1.37)
CRASH87	–.0515	–.0600	–.0581	–.0542
	(2.09)	(2.39)	(2.35)	(2.28)
Δln(BANK CREDIT)	5.6121	5.7158	5.5253	5.4432
	(7.18)	(7.32)	(7.16)	(7.03)
Δln(DEBIT BALANCE)	.0806	.1360	.1596	.1451
	(.97)	(1.53)	(1.81)	(1.64)
Δln(FUND REDEMP)	.0795	.0656	.0462	.0426
	(3.67)	(2.83)	(1.94)	(1.77)
Δln(NYSE VALUE)		–.1472	–.1811	–.1529
		(–1.65)	(2.04)	(1.67)
Δln(NYSE VOLUME)			.0872	.0723
			(2.80)	(2.17)
Δln(FREE CREDITS)				.0749
				(1.22)
R^2	.24	.25	.27	.27
DW	1.95	1.93	1.92	1.94
Q	35.78	32.72	31.67	31.37
[p]	[.48]	[.62]	[.67]	[.69]

Note: The dependent variable is Δln(BANK CREDIT). Numbers in parentheses are absolute values of t-statistics. Q is the Box-Llung statistic for serial correlation and p is its probability level.
Source: BANK CREDIT: Loans and investments at U.S. banks, Federal Reserve System; DEBIT BALANCE: Debit balances at broker-dealers, NYSE; FUND REDEMP: Redemptions at U.S. equity funds, Investment Company Institute; NYSE VALUE: Market value of NYSE-listed securities, NYSE; NYSE VOLUME: Volume of NYSE-listed stocks, NYSE; FREE CREDITS: Free credit balances at broker-dealers, NYSE.

would depend largely on the debit balances of their customers. Other factors often mentioned were the level of stock prices and the volume of trades. Higher stock prices, it was argued, require additional margin loans and this increases the demand for bank security loans. Rising volume also increases security loans because if each trade requires more debits, more trades require even greater debits.

The cash outflow hypothesis, on the other hand, discounts debit balances as a determinant of bank security loans and focuses on cash payments and receipts by brokers as customers withdraw and deposit funds. An increase in debit balances will increase the demand for security loans only if it is directly associated with net cash withdrawals by customers. Should brokerage customers be adding to their free credit balances, security loans will fall even though debit balances might increase.

The cash outflow position suggests a different interpretation of the observed rise in brokers' loans during 1929. During that year there was a sharp rise in new issues of common stock by nonfinancial corporations and investment trusts. Since the likely motive for this was to obtain funds to finance investment or to change capital structure, the proceeds were probably not left with brokers. The cash withdrawals that resulted would have contributed to the rise in brokers' loans. Indeed, if all cash received by corporations as a result of new issues were deducted from total brokers' loans, the level of brokers' loans would have fallen in 1929 (Eiteman 1932a). This suggests that the Federal Reserve System's concern about rising bank loans to brokers in 1929 was misdirected: The issue was not the financing of speculation, but the financing of corporate activity that might well have been legitimate.

Table 1 reports the results of an attempt to determine the importance of debit balances in shaping security loans by banks. This effort is weakened by the facts that monthly data are not available for brokers' borrowings from banks, and that security loans to broker-dealers are only a subset of all bank security loans. Thus, our test assumes that bank security loans are

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highly correlated with broker borrowing. All variables are expressed as changes in logarithms, an approximation to the rate of growth. Data are available for all variables only since January 1984; the sample period is January 1984 to June 2002.

In equation 1 the rate of growth of security loans at all U.S. commercial banks is regressed on seasonal dummies (coefficients not reported), on a dummy variable (CRASH87) for the 1987 market break (equal to one in September through December, zero otherwise), and on the growth rates of U.S. bank credit, of debit balances at broker-dealers, and of redemptions from equity mutual funds. Debit balances reflect the credit absorption hypothesis, and equity fund redemptions are introduced as a proxy for cash withdrawals from broker-dealers. Bank credit is statistically significant in all equations, as should be expected because it is the constraint on security loans. Debit balances are not statistically significant, while equity fund redemptions are statistically significant and have the predicted sign (positive): Greater cash withdrawals are associated with higher security loans.

Equations 2 and 3 add additional variables that are often associated with the credit absorption view—NYSE market value and trading volume. The first has been a mainstay of the credit absorption view: When prices increase, buyers require more margin debt to finance their purchases, resulting in greater bank security loans. But our results indicate that bank security loans are inversely related to NYSE value, in contradiction to the credit absorption view. The credit absorption view predicts a direct relationship between trading volume and bank security loans because higher volume requires greater payments by buyers. Equation 3 reports a positive and statistically significant coefficient on volume, consistent with the absorption view. But this provides little comfort for the absorptionist because the two primary variables—debit balances and stock values—are not significant, and because the logical foundation of a volume-loan nexus is unclear. Equation 4 adds the growth rate of free credit balances at broker-dealers, a measure of net cash deposits by broker-dealer customers. The cash outflow view predicts a negative sign because net customer deposits provide lendable funds that substitute for bank loans. However, the growth rate of free credit balances is not significant.

In summary, it appears that there is little support for the debit balance view—both debit balances and NYSE value are either statistically insignificant or have the wrong sign, and the NYSE volume effect is consistent with absorption but the logic of its effect is unclear. There is some support for the cash outflow position, but the difficulty of measuring brokers' net cash withdrawals makes our regression a weak test of that proposition.

III. Security Loan Legislation and Regulation

The popular association of security lending with the stock market boom and crash, and with tight money in the late 1920s, contributed to important banking and security market regulations in the mid-1930s. As discomfort with the consequences of margin lending and security loans increased, securities exchanges initiated self-regulation. As noted above, in 1931, well after the Crash, the New York Clearing House changed its rules to prohibit members from making brokers' loans for nonbanking customers, and, in 1933, the New York Stock Exchange adopted minimum margin requirements for its member firms, a practice that has been formalized in the NYSE's Rule 431. But self-regulation was unable to address fundamental structural problems, and congressional action was pursued. Two major legislative responses to the perceived causes of the Crash were the Banking Act of 1933 and the Securities Exchange Act of 1934 (1934 Act).

The Banking Act prohibited payment of interest on demand deposits, thereby limiting the ability of money-center banks to attract funds from local banks and, not inadvertently, providing a competitive shield for the profitability of local banks. It also prohibited banks from arranging loans to brokers on behalf of nonbanking customers, extending the 1931 Clearing House rule to all banks.

The 1934 Act instituted margin requirements to be implemented and managed by the Federal Reserve System. This was immediately followed by the Fed's adoption of Regulation T ("Credit by Brokers and Dealers"), limiting broker-dealer loans to "public customers" secured by securities. Loans by broker-dealers to market makers (specialists, odd-lot brokers, block positioners, and so forth) and loans to other broker-dealers (except for proprietary purchases) were, and are, not limited by Regulation T. The 1934 Act also prohibited broker-dealers from arranging loans for others if the loans could not be made directly by the broker-dealer. Regulation T has been discussed at length in Fortune (2000) and its implications for stock market volatility have been addressed in Fortune (2001).

Regulation U

In 1936, recognizing that Regulation T's limits on margin loans by broker-dealers would be ineffective if security loans by commercial banks could be easily substituted, the Board of Governors adopted Regulation U (now titled "Credit by Banks and Persons Other Than Brokers or Dealers for the Purpose of Purchasing or Carrying Margin Stocks"). This prohibited commercial banks from making loans that would not be allowed by Regulation T if they were broker-dealers. While the Federal Reserve System can set maximum loan values for margin stock under Regulation U at any level, it has traditionally set maximum loan values at the level allowed by Regulation T, currently 50 percent.

While the Federal Reserve System can set maximum loan values for margin stock under Regulation U at any level, it has traditionally set maximum loan values at the level allowed by Regulation T, currently 50 percent.

Regulation U has a number of exemptions. First, nonbank lenders are exempted if they extend less than an aggregate of $200,000 in loans secured by margin stock in any quarter, or if they have less than $500,000 in such loans outstanding during the quarter. When these limits are exceeded, a nonbank lender must register with the Federal Reserve System by filing Form FR G-1; this one-time filing is kept by the regional Federal Reserve Bank and is valid until the entity's total margin stock-secured credit falls below $200,000 for six calendar months, at which time a deregistration statement (Form FR G-2) can be filed. In addition, the registered G-lender must file a purpose statement for each margin stock-secured loan (Form FR G-3).[5] Treatment of bank security loans is a bit different. All bank security loans are subject to the provisions of Regulation U, regardless of size. There is no specific registration requirement. The bank and the borrower must complete a purpose statement (From FR U-1) only if the loan exceeds $100,000.

Second, Regulation U does not apply to "exempted borrowers" or to "exempted loans." Amendments to Section 7(d) of the 1934 Act by the National Security Market Improvement Act (NSMIA) of 1996 defined an exempted borrower as a broker-dealer "a substantial portion of whose business consists of transactions with persons other than brokers or dealers." Thus, a bank loan to a broker dealing primarily with the general public is exempted from Regulation U, but a bank loan to a clearing broker doing its primary business with other brokers is not exempted.[6] The NSMIA also repealed Section 8(a) of the 1934 Act, thereby allowing broker-dealers to borrow from lenders other than member banks of the Federal Reserve System or nonmember banks approved by the Board of Governors. This allowed nonbank lenders to lend to broker-dealers and market makers, a previously prohibited activity. Regulation U defines "exempted loans" as loans by a bank to another bank, to any foreign banking institution, or to borrowers outside the United States not covered by Regulation X.

In addition, there is a long list of "special purpose" loans that are exempted from Regulation U. Loans by both banks and nonbanks are exempted if they are hypothecation loans to broker-dealers to finance their margin loans to customers. Other exempted special purpose loans are arbitrage loans, loans to underwriters and market makers,[7] loans to broker-dealers for emergencies or to finance capital contributions, and loans for certain short-duration purposes, such as clearing transactions, purchase or sale of securities for prompt delivery, financing securities in transit or transfer, and intraday credit. Loans by banks and nonbanks are also exempted if they are to Employee Stock Ownership Plans (ESOPs) or to "plan lenders" to exercise rights under eligible plans, such as stock purchase plans or stock option plans.

A loan falls under Regulation U if it meets all three of the following tests. The *collateral test* addresses

[5] The lender must keep Forms FR U-1 and FR G-3 in its files for three years.

[6] "Substantial portion" is defined in terms of number of broker-dealer accounts and revenues from them. Prior to this amendment, Section 7(d) had exempted specific loans, not borrowers.

[7] Market makers are specialists, odd-lot dealers, over-the-counter (OTC) market makers, third market makers, and block positioners. Loans to market makers are exempt if the purpose is to facilitate their transactions rather than to finance investments for their own accounts.

the type of collateral used. If a bank or nonbank loan is secured directly or indirectly by "margin stock," the loan is regulated under Regulation U.[8] Loans on nonmargin stock by bank and nonbank lenders are not regulated, however, in contrast with Regulation T, which prohibits loans by broker-dealers on nonmargin stocks. The *purpose test* focuses on the reason for the loan. If the loan proceeds are to be used to purchase or carry margin securities, the loan is regulated. To establish purpose, each regulated borrower is required to fill out a purpose form (Form FR U-1 for banks, Form FR G-3 for nonbank lenders). Finally, the *exemption test* places the loan under Regulation U if it is not explicitly exempted. If a loan is not regulated, bank and nonbank lenders can attach good faith loan value to the collateral, that is, they can require any margin a reasonable person might require so long as the loan does not exceed the security's value.

While Regulation U applies only to purpose loans secured by margin stock, it recognizes the possibility that both secured and unsecured loans might be made to the same borrower. This is done through the "single credit rule," which requires that any purpose loans to a borrower, whether secured or unsecured, and all collateral associated with those loans, must be consolidated as a single credit. The consolidated credit must satisfy the margin requirements of Regulation U. The effect, and the intent, is to prevent banks from making a purpose loan with the security as collateral, then making an additional unsecured loan relying on the equity in the secured loan. For example, with a 50 percent margin requirement a borrower can buy $100,000 of margin securities and borrow $50,000 from his bank, pledging the securities as collateral. If he then borrows $30,000 to buy additional margin securities, and the bank requires no additional security, the bank's customer would have an $80,000 liability and the bank's security would be only $100,000, leaving an 80 percent loan-to-value ratio, well above the 50 percent mandated by Regulation U for secured purpose loans. By requiring that the maximum loan be no greater than 50 percent of the security pledged, the single credit rule prevents this anomaly.

Note that the reverse sequence—an unsecured loan followed by a secured loan—is not prohibited by the single credit rule because the effect would be to require a margin in excess of the Regulation U requirement on the secured loan. For example, reversing the previous sequence, if a $30,000 unsecured purpose loan is followed by a $100,000 purpose loan secured by margin stock, the required margin of $50,000 would leave only 20 percent equity, as before. Although the two positions are identical, the secured loan is not prohibited even though the single credit equity is below Regulation U's required 50 percent. However, Regulation U contains a "withdrawal and substitution rule," stating that collateral cannot be withdrawn, as for sale, or substituted, if the effect is to cause the remaining credit to exceed the maximum loan value of the remaining collateral, or to cause the deficiency to increase. Thus, Regulation U limits the borrower's right to sell securities under these circumstances.[9]

Table 2 summarizes the borrowers and lenders affected by Federal margin regulations. As noted above, Regulation T applies to lending by brokers and dealers, limiting the amounts they can lend to public customers. Loans by broker-dealers to other broker-dealers are regulated only if the purpose is purchasing or carrying securities in the borrowing broker's own account; good faith loan value[10] is allowed if the borrowing broker uses the funds to make margin loans to its customers or for specified special purposes, such as broker-dealer loans to market makers. Regulation U's limits are as discussed above: Bank and nonbank loans on margin stock are regulated unless the loan is specifically exempted, and, with some exceptions, loans to broker-dealers or market makers are not regulated.

G-Lenders

In its 1963 *Special Study of Securities Markets,* the Securities and Exchange Commission (SEC) addressed the question of nonbank lending by nonbank financial institutions, such as life insurance companies, and by nonfinancial corporations. Many of the nonbank loans were by "plan lenders," such as companies lending to employees for the purpose of exercising subscription rights or stock options. The SEC expressed particular concern about "clearance lenders," which made security loans at low margins, as little as 10 percent of the market value of listed stocks and 20 percent of the value of OTC stocks, at a time when Regulation T required 70 percent margin.

[8] Regulation U defines margin stock as an equity security traded on a national exchange, an OTC security traded on the NMS section of Nasdaq, any debt security convertible into a margin stock or carrying rights to acquire a margin stock, any warrant or right to subscribe to a margin stock, and or a mutual fund security issued under the Investment Company Act of 1940 (excluding money market funds and funds invested in exempted securities).

[9] The maximum loan value is calculated on the day of the withdrawal or substitution.

[10] Good faith loan value is the loan value a reasonable person, in good faith, would attach to a security.

Table 2
Classification of Margin Requirements

Lender Type	Regulation that Applies	Permitted Loan Value, by Type of Borrower		
		Public Customers	Broker-Dealers	Specialists and Other Market Makers
Broker-Dealer	Formerly Regulation G, Now Regulation T	Regulation T Loan Value	For Proprietary Purchases, No Loan Value For Loans to Public Customers, Good Faith Loan Value For Special Purposes,[a] Good Faith Loan Value	Good Faith Loan Value
Commercial Bank	Regulation U	For Special Purposes,[b] Good Faith Loan Value For All Other Purposes, Regulation U Loan Value	For Proprietary Purchases, Regulation T Loan Value For Special Purposes,[c] Good Faith Loan Value For Hypothecation Loans, Good Faith Loan Value (limited)[d]	Good Faith Loan Value
Nonbank Nonbroker Lender	Formerly Regulation G, Now Regulation U	For Special Purposes,[b] Good Faith Loan Value For All Other Purposes, Regulation T Loan Value	Regulation U Loan Value	Regulation U Loan Value

[a] Loans for purchase of securities for customer accounts and loans to partners or stockholders for purchase of own stock, stock of another broker-dealer, or stock of an affiliated corporation.

[b] Loans to domestic and foreign banks, loans to customers outside the United States, loans to qualified ESOPs, loans to persons other than broker-dealers for temporary finance of security transactions, loans to any "plan-lender," and loans for emergency purposes.

[c] Arbitrage loans, intraday loans, loans for securities in transit or transfer, temporary advances in payment-against-delivery transactions, loans to underwriters, loans to clearing brokers and dealers, capital contribution loans, and emergency loans.

[d] Hypothecation loans are loans to broker-dealers to finance their loans to public customers. Total broker borrowing from banks cannot exceed aggregate debit balances, and securities pledged from any account cannot exceed 140 percent of the debit balances in that account.

Clearance loans were designed to circumvent regulations restricting "free-riding," the practice of buying securities and relying on the proceeds of a sale of that security to pay for the purchase. Free-riding allows a trader to buy an asset with no equity investment, and it can lead to an extension of credit when settlement of securities sold is delayed or the proceeds are insufficient to cover the purchase. Regulation T prohibits broker-dealer loans in margin accounts when secured by nonmargin equities, as well as credit for purchase of securities in cash accounts (except in special cases), and the NYSE's Rule 431 expressly prohibits purchases in a cash account that will be paid for by sales of the securities. Regulation U extended the similar prohibitions to commercial banks. But nonbank credit was not regulated, and traders borrowed from nonbank clearance lenders to bridge gaps between purchases and sales.

The SEC argued that, while the total volume of unregulated loans in general, and clearance loans in particular, was a small share of security credit, and

The SEC argued that low margins could potentially destabilize security markets by exacerbating margin calls in a downturn.

while much of it was legitimate, the low margins could potentially destabilize security markets by exacerbating margin calls in a downturn. Five years later, in

1968, the Board of Governors adopted Regulation G to bring nonbank lending under the federal margin umbrella; clearance lending dropped to less than 1 percent of all nonbank purpose lending. In 1998, Regulation G was eliminated, and its provisions were rolled into Regulation U, which then applied to all nonbroker-dealer lenders in the securities markets. While Regulation G no longer exists, its different treatment of nonbank lenders has survived its merger into Regulation U.

While bank and nonbank security loans are treated the same in most cases, some significant differences have carried over from the days when Regulation G existed. As noted above, banks do not have a registration requirement, and they must file a purpose statement for any loan secured by margin stock exceeding $100,000. Nonbank lenders must register by filing Form FR G-1 if the margin stock-secured credit extended in a quarter exceeds $200,000, or if they have more than $500,000 in such loans outstanding. Thereafter, a purpose statement (Form FR G-3) must be completed for each loan secured by margin stock, regardless of size. Furthermore, the "exempted loan" classification that applies to banks is not extended to nonbanks: G-loans to banks, foreign banks, or loans made outside the United States are regulated loans under Regulation U.

Regulation X

The SEC's *Special Study* also noted that foreign banks were used to bypass the intent of margin regulations. In one case, a U.S. bank made a loan to a foreign bank and the foreign bank made a purpose loan to a customer of the U.S. bank. Regulation X ("Borrowers of Securities Credit") was adopted in 1971 in response to the Board's concern that U.S. citizens were setting up offshore accounts with foreign brokers in a clear effort to violate Regulation T's restrictions on broker margin lending. Unlike Regulations T and U, Regulation X focuses on the borrower rather than the lender. It applies to "United States persons" or foreign persons acting as agents for U.S. persons who borrow outside the United States to purchase or carry U.S. securities or who borrow inside the United States for purchasing or carrying any nonexempt securities. Such persons cannot borrow purpose credit in violation of Regulations T and U. Three exemptions are allowed: borrowers of purpose credit within the United States, U.S. persons who are permanent residents abroad and who have obtained less than $100,000 in purpose credit outside the United States, and borrowers exempted by order of the Board of Governors.

IV. Recent Observations on the Security Loan Market

The Role of Foreign Banks

In the late 1920s, security loans by foreign lenders became increasingly important as stock prices rose. Roelse (1930) notes that loans to NYSE members by "private banks, brokers, foreign banking agencies, etc." rose to almost 10 percent of all reported security loans. The flow of foreign funds into security loans, while not precisely measured, was, to some, fuel on the speculative fire: Foreign money might be driving the stock market boom rather than simply responding to it. The same pattern was observed during the 1990s, when both stock prices and foreign lending on security collateral rose sharply.

Outstanding security credit at U.S. commercial banks continued to fall relative to NYSE value after the 1930s. Starting at about 5 percent in 1947, the ratio fell to around 2 percent by 1960, a level it maintained over the next 40 years (see Figure 6). While security loans by banks have become a small share of all U.S. bank loans and investments, the foreign sector has increased its participation. In the early 1970s, foreign-related U.S. banks[11] contributed very little to security loans in the United States. But beginning in 1990, these banks increased their security loans, both relative to security loans at all U.S. banks (Figure 6) and relative to bank credit at foreign-related banks (Figure 7). In 1994, security loans at foreign-related banks were about 10 percent of their loans and investments. In March 2000, when aggregate margin debt at broker-dealers reached a post-war peak amid a brief flurry of public concern about margin lending, foreign-related banks had over 17 percent of their credit invested in security loans, and these loans accounted for over 60 percent of all U.S. bank security loans.

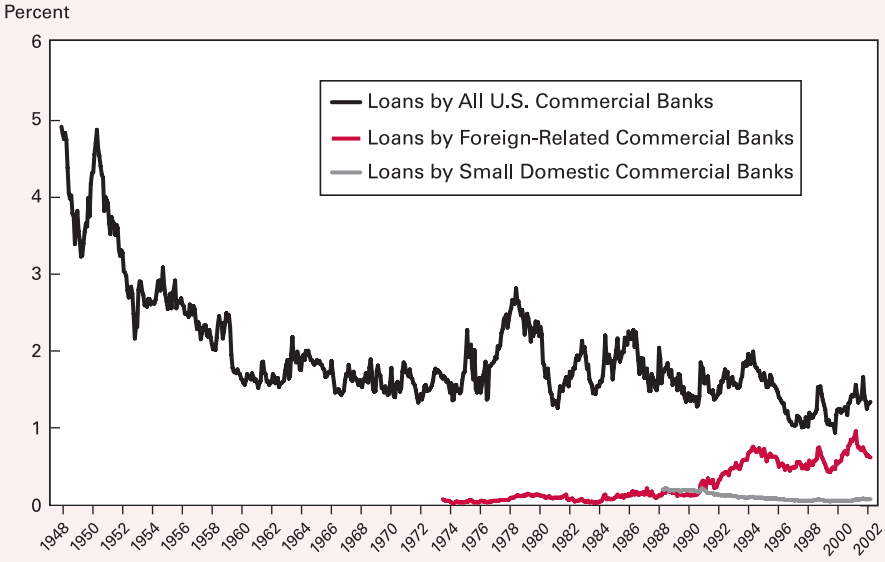
The reasons for the shift in bank security lending from domestic to foreign-related banks are unclear, but several possibilities exist. First, as Figure 8 shows, during the 1990s there was a significant increase in foreign net purchases of stocks and bonds issued in the United

[11] Foreign-related banks are branches and agencies of foreign banks, Edge Act, and Agreement corporations. International Banking Facilities are not included.

Figure 6

Security Loans as Percent of NYSE Market Capitalization

January 1947 to March 2002

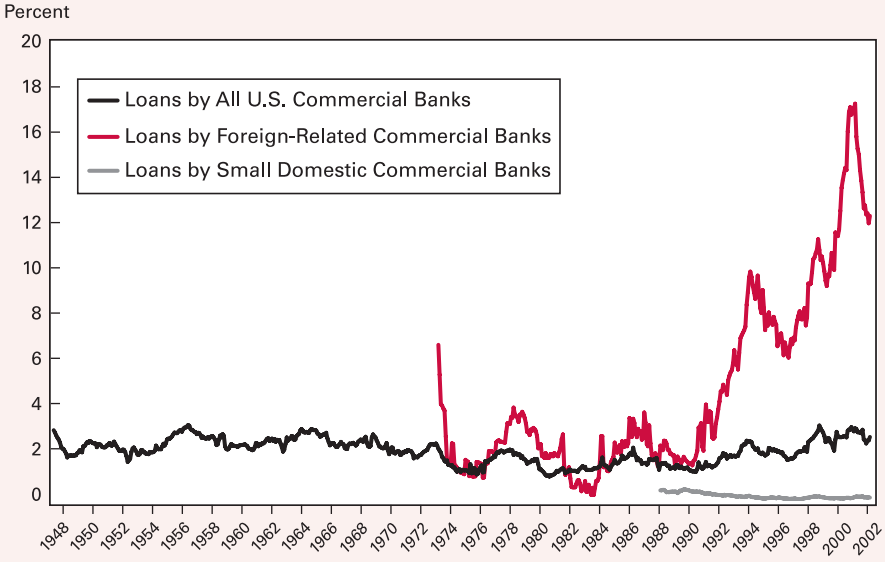


Source: Federal Reserve System.

Figure 7

Security Loans as Percent of All Loans Made by the Bank

January 1947 to March 2002



Source: Federal Reserve System.

States, both in absolute terms and as a share of total net issues. From 1995 to 2001, foreigners bought about half of all net issues of U.S. stocks and bonds. Important factors were the chronic U.S. trade deficit and the combination of a strong U.S. economy, rapid profit growth, and expectations of appreciation in the U.S. dollar, all encouraging foreigners to hold U.S. securities. On the assumption that foreign-related banks are more likely than domestic banks to have foreign customers with financial investments in the United States, foreign banks' share of security loans should increase.

Another possible contributing factor was the Basel framework for risk-based capital requirements at banks. These place light capital levies on low-risk investments, such as security loans. Foreign banks with limited capital that want to maintain a presence in the United States without weakening their capital further could do so by making security loans. Yet another factor might lie in the comparative advantage of domestic banks and of foreign-related banks. Banking research indicates that one reason banks are unique lenders is because they focus on small business loans requiring careful screening and monitoring. Banks have developed expertise in this area and earn a rent for that skill. U.S. domestic banks might be particularly good at business loan screening and supervision because of their longstanding relationships with borrowers and their

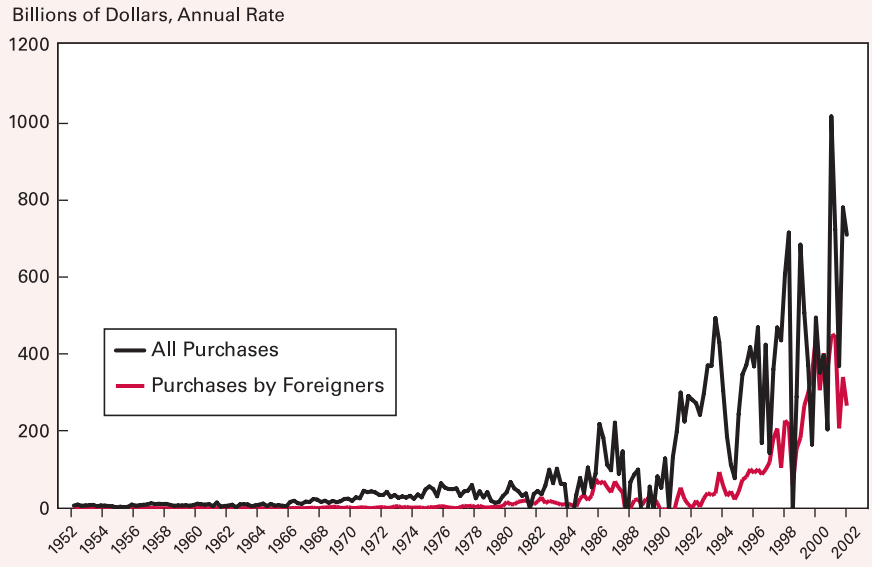
familiarity with local economic conditions. Foreign-related banks, on the other hand, might have less expertise in business lending in the United States and might focus more on lending to customers for the purpose of purchasing and carrying securities.

Was the role of foreign-related banks purely passive, with these banks entering the security loan market in response to rising stock prices, or did security lending at foreign-related banks play an active role in fueling the rise in stock prices? In order to answer this question, we assess the dynamic relationship between security lending and stock market capitalization using bivariate "Granger-causation" tests (see Box 1). These tests assess whether past movements in security loans by foreign-related banks are useful in explaining the current value of stocks traded on the NYSE. If so, a *prima facie* case can be made that foreign-related bank credit "Granger-causes" stock values, that is, that knowledge of security loan volume improves forecasts of stock prices. Similarly, one can test whether past information about stock prices is useful in explaining security lending; if so, stock prices "Granger-cause" security lending. Thus, the Granger-causation test rests on the assumption that leads and lags in bivariate relationships can allow inferences about the direction of influence. As noted in Box 1, this is a narrow definition of causality.

Figure 8

Net Purchases of U.S. Stocks and Bonds

Quarterly, 1952 to 2001



Source: Federal Reserve System Flow of Funds Accounts.

Using monthly data for both the levels and the first differences in the logarithm of NYSE market value and foreign-related bank security loans from January 1973 to March 2002, the vector autoregressions used in the Granger tests are estimated. The dependent variable is regressed on constant, linear, and quadratic trend terms; lagged values of the dependent variable; and lagged values of the other variable. This is done for lag lengths of four, eight, and twelve months. The results for four-month lags are reported in Table 3; other lag lengths gave the same answer. Our attention is focused on the F-statistic and its p-value. The F-statistic tests the null hypothesis that none of the lagged values of the other variables are statistically significant in explaining the dependent variable; if the F-statistic indicates significance, the other variable Granger-causes the dependent variable. The p-value is the probability that an F-statistic of the magnitude reported would occur by chance under the null hypothesis of no significance. A conventional rule is that statistical significance requires $p < 0.05$.

The F-statistics in Table 3 suggest that NYSE value and foreign-related bank security loans are not related in the short run: Lagged NYSE value provides no information about security loans, and lagged values of foreign-related bank security loans provides no information about NYSE value. Thus, the rise in security lending by foreign-related banks and in stock prices during the 1990s cannot be attributed to a causal relationship. Rather, the observed correlation is due to chance or, more likely, to the influence of a third variable, such as rising expectations of stock returns, operating on both stock prices and the supply of security loans at foreign-related banks.

G-Lending by Nonbank Institutions

Little is known about G-lending. Nonbank security lenders need not register if the loan is secured by non-

Box 1
Granger-Causation Test

The Granger-causation test rests on the assumption that leads and lags in bivariate relationships can allow inferences about the direction of causation. If movements in A are correlated with future movements in B, but movements in B are not correlated with future movements in A, it is said that A "Granger-causes" B. If A "Granger-causes" B and B "Granger-causes" A, then there is bidirectional causation.

Granger-causation is a very weak notion of causation. It conforms to the popular *post hoc ergo propter hoc* notion of causation—if something follows an event, the event causes the result. This is considered a fallacy in logic. One can easily think of reasons why Granger-causation fails as a meaningful definition of causation. For example, it is widely believed that expectations about price-earnings multiples for common stocks are determined (caused) by expected future earnings growth. But one might find that stock prices "Granger-cause" earnings. Stock prices today reflect expectations about future earnings, and if these expectations are rational, a Granger-causation test will find that changes in price-earnings ratios precede earnings growth changes but earnings growth changes will not precede multiple price-earnings changes. That is, even though earnings growth causes stock prices in a real sense, stock prices cause earnings growth in the Granger-causation sense.

In spite of the deficiencies of Granger-causation, it is the only game in town. Perhaps the best way to rescue the notion is to drop the word causation and simply refer to lead and lag relationships: If A occurs before B and there is no evidence that B's occurrence feeds back onto A, then we can think of A as leading B.

The Granger-causation test for foreign-related bank security loans and returns on common stocks requires several steps. First, each variable must be determined to be covariance-stationary. The Phillips-Perron test is commonly used. This assumes that a variable, y, is first-order autoregressive with a constant term, a linear trend, and serial correlation in the error term. The following regression is estimated:

$$y_t = \mathbf{a} + \mathbf{b}t + \mathbf{c}y_{t-1} + u_t \qquad (1)$$

where **a**, **b**, and **c** are coefficients and u_t is a random error with (possibly) serial correlation. If $\mathbf{c} < 1$ the variable y is covariance-stationary and its level can be used in the second stage. If $\mathbf{c} = 1$, it has a unit root and is not covariance-stationary. In this case, differencing of y_t is done and equation (1) is estimated using first differences, that is $\Delta y_t = y_t - y_{t-1}$. If there is a unit root ($\mathbf{c} = 1$) in first differences, second differences are used, that is, $\Delta^2 y_t = \Delta y_t - \Delta y_{t-1}$. This continues until the resulting differenced variable is covariance-stationary. The same process is done on the second variable, x_t. The result is two variables, $\Delta^w y_t$ and $\Delta^v x_t$, where w and v are the degrees of differencing required to achieve a covariance-stationary variable.

In the second stage, each variable, converted to covariance-stationary form, is regressed on lagged values of itself and the second variable, as follows:

$$\Delta^w y_t = \alpha_y + \sum_{i=1}^{I} \beta_{y,i} \Delta^w y_{t-i} + \sum_{j=1}^{J} \gamma_{y,j} \Delta^v x_{t-j} + u_t$$

and (2)

$$\Delta^v x_t = \alpha_x + \sum_{k=1}^{K} \gamma_{x,k} \Delta^w y_{t-k} + \sum_{m=1}^{M} \beta_{x,m} \Delta^v x_{t-m} + u_t$$

where $\Delta^w y_t$ and $\Delta^v x_t$ indicate differencing of y and x by w and v orders, respectively. The Granger test would conclude that x "causes" y if $\sum_j \gamma_{y,j} \neq 0$ and that y "causes" x if $\sum_m \gamma_{x,k}$.

margin stock or by nonequity securities, or if the total amount is below the registration requirements. The purpose statement, which contains credit amounts, is maintained in the lender's files and, while available to bank supervision agencies, is not filed with the Federal Reserve System. The registration form, which also contains information about amounts loaned, is filed only once so a historical record cannot be compiled.

G-lending appears to be small. Figure 9 shows the amounts of security credit extended by broker-dealers, U.S. banks, and others (G-lenders) on June 30 of each year from 1980 to 1998, when Regulation G terminated. In 1997, G-lending reached a peak of $12.3 billion, about 12 percent of security lending by banks and nonbanks. In 1998, lending by banks and nonbanks rose sharply to $135.3 billion, but G-lending fell to $7.2 billion.

Table 3
Granger-Causation Tests
NYSE Value and Security Lending at Foreign-Related Banks

	Dependent Variable			
	ln(NYSE)	**ln(LOANS)**	**Δln(NYSE)**	**Δln(LOANS)**
	Coefficient (t-statistic)	Coefficient (t-statistic)	Coefficient (t-statistic)	Coefficient (t-statistic)
Independent Variable (level or difference)				
Constant	.5158 (3.62)	–.0705 (0.32)	–.0042 (0.54)	–.0142 (0.55)
Time	.0006 (3.39)	.0012 (2.07)	.0002 (1.67)	.0000 (1.41)
$Time^2$	.0000 (1.21)	–.0000 (0.15)	–.0000 (1.49)	–.0000 (1.36)
$Ln(LOANS)_{t-1}$	.9578 (17.5)	.9377 (17.2)	–.0047 (0.28)	–.0403 (0.74)
$Ln(LOANS)_{t-2}$	–.0627 (0.83)	.1565 (0.25)	.0093 (0.57)	–.2279 (4.17)
$Ln(LOANS)_{t-3}$	.0279 (0.37)	–.1368 (0.54)	.0037 (0.23)	.1817 (0.33)
$Ln(LOANS)_{t-4}$	–.0042 (0.08)	.0346 (0.19)	–.0009 (0.05)	–.0176 (0.32)
$Ln(NYSE)_{t-1}$	–.0048 (0.29)	.9377 (17.2)	–.0052 (0.10)	–.0627 (0.34)
$Ln(NYSE)_{t-2}$	.0137 (0.62)	–.1901 (2.58)	–.0659 (1.21)	.0954 (0.53)
$Ln(NYSE)_{t-3}$	–.0053 (0.24)	.2362 (3.21)	–.0317 (0.58)	–.0406 (0.22)
$Ln(NYSE)_{t-4}$	–.0021 (0.13)	–.0403 (0.74)	–.0570 (1.05)	–.0448 (0.25)
F–statistic [p-value]	.11 [.98]	.13 [.97]	.13 [.97]	.13 [.97]

Note: ln(LOANS)=Security loans at foreign-related banks; ln(NYSE) = Total market capitalization at NYSE. The absolute value of the t-statistic is reported in parentheses. The F-statistic for the dependent variable ln(LOANS) [ln(NYSE)] is for the test that the coefficients for all four ln(NYSE) [ln(LOANS)] lags are zero, that is, that NYSE [LOANS] does not Granger-cause LOANS [NYSE]. The p-value in square brackets is the probability that the observed value of the F-statistic would be observed by chance if the true value were zero; p-values above 0.05 are generally interpreted as not statistically significant.

Source: LOANS, security loans at foreign-related banks, Federal Reserve System; NYSE, market value of NYSE-listed securities, NYSE.

Who are the G-lenders? The Federal Reserve System's National Information Center (NIC) database reports identifying characteristics of G-lending registrants, such as entity name, industry code, and whether the entity is registered to make purpose loans or nonpurpose loans. Unfortunately, NIC does not contain information on either the amount of security loans or the total assets of G-lenders. Table 4 lists the number of entities covered by Regulation U (including G-registrants) in the 12 Federal Reserve districts as of June 30, 2002. Entities are divided into "plan lenders," which extend credit for employee purchase of shares either outright or through option exercise, and nonplan lenders. Plan lenders are eligible to extend either purpose or nonpurpose credit, but nonplan lenders must choose to specify whether the credit extended is purpose or nonpurpose credit. For each sector, the table shows the total number of nonplan lending registrants as well as whether they intend to make purpose and or nonpurpose loans.

There were 762 registrants, of whom about 60 percent were plan lenders. About 70 percent of nonfinancial registrants were plan lenders, while 57 percent of financial sector registrants engaged in plan lending. Thrift institutions and insurance companies are the most prominent sectors among G-registrants, with the leasing, finance, and real estate sector coming in a strong third. However, among nonplan lenders, thrift institutions are particularly important.

Table 5 provides information on loans held by First Federal Reserve District G-registrants who filed annual reports for June 30, 2001. These data were collected by inspection of the Federal Reserve Bank of Boston's files of Form FR G-4 annual reports, which contain information about outstanding security loan amounts and total assets. On that date, the total assets of First District G-registrants was $517.6 billion, of which $374.9 billion, or 72.4 percent, was at financial firms and 27.6 percent was at nonfinancial firms. Financial firms held purpose loans of only 0.14 percent of assets; nonpurpose loans equaled 0.06 percent of assets. The sector with the largest share of assets in purpose loans was leasing, finance, and real estate, with 0.67 percent of assets in purpose loans. The second largest sector was banking, with 0.5 percent of assets in purpose loans. These were also the two smallest sectors in terms of total assets. Thus, at least in the First District, G-lenders play a very small role in the extension of purpose credit.

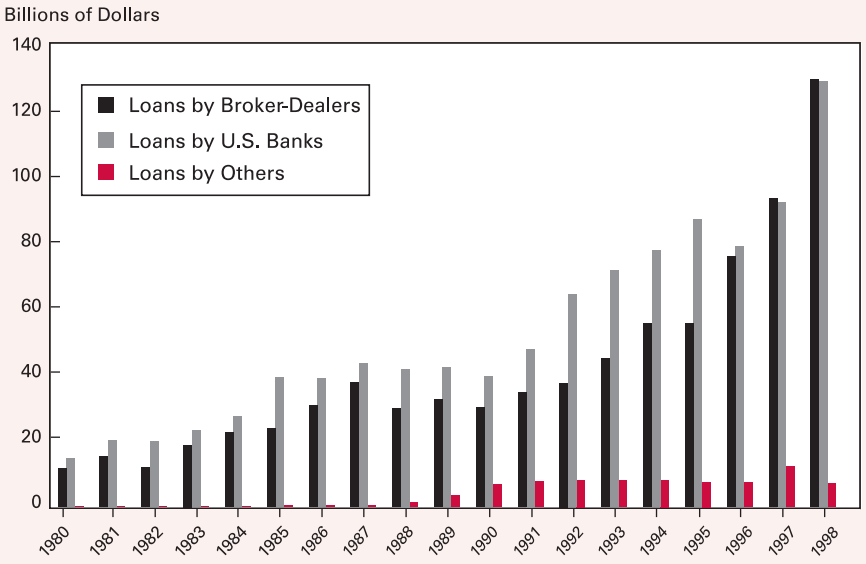
Credit Absorption Revisited

During the margin debt debates of the 1930s the potential for "credit absorption" was among the most hotly debated topics. In February 1929, the Board of Governors expressed its concern about "the extraordinary absorption of funds in speculative loans" and its "detrimental effects on business." In November 1929, President Hoover decried the "diversion of capital into the security market." In a well-known analysis of the 1929 Crash (Fisher 1930), Irving Fisher, perhaps the most prominent U.S. economist at the time, took the moral high road, claiming that "it [the use of funds for specula-

Figure 9

Security Credit Outstanding by Source of Credit

1980 to 1998



Note: Data are as of June 30 of each year.
Source: Federal Reserve System.

tion] might have been entirely proper had the speculators used their own money."[12]

Margin loans were said to absorb bank credit in two ways. First, as call money rates rose in New York, NYC banks raised rates paid on deposits to attract funds from interior (outside) banks. Hence, during times of high call money rates, bank deposits and bank reserves flowed to New York City. This was exacerbated by lending in the call money market by interior banks and others, either directly or through loans arranged by NYC banks. Because they had above-average reserve requirements,[13] the reallocation of deposits toward NYC banks meant that an unchanged aggregate deposit base required more bank reserves. This, it was argued, reduced excess reserves and, ultimately, bank credit.

Critics of this view pointed out that net effect of margin loans on required reserves depends on where the sales proceeds are deposited, as well as on which banks ultimately lend to brokers. If, for example, a Chicago investor buys $1,000 of stock on the NYSE using funds drawn on a Chicago bank, and the seller, located in St. Louis, deposits the proceeds in a local bank, there is a reduction in the banking system's required reserves, and more bank credit can be available.

A Twentieth Century Fund Report (Bernheim et al. 1935) pursued this issue by analyzing the geographic shift in bank reserves in 1928 and 1929, when margin loans were growing rapidly. It concluded that while NYC banks' share of bank reserves increased from April through September 1929, the change was small, about 6 percent, and was dwarfed by the increase in brokers' loans. Analysis of data from 1928 through 1929 found an even smaller effect. This suggests that while there was some reallocation of bank reserves in favor of NYC banks, it was small in comparison to the volume of security lending and could have had little effect on the banking system's credit availability.

We revisit the credit absorption theme by examining the relationship between bank security loans and short-term interest rates. The premise is that interest rates are the barometer of credit demand and supply. If security loans do lead to credit absorption we should expect that the short-term interest rates would be higher relative to other rates when security loans are high. Furthermore, the relationship between interest rates and margin loans should have some causal direction, with bank loans "causing" high interest rates. Thus, we adopt a multivariate form of Granger-causation analysis.

A three-variable vector autoregression, augmented by deterministic variables, is estimated using monthly data from February 1984 through June 2002. The three variables are the 4- to 6-month commercial

[12] All quotes are reported in Eiteman (1932a). Hoover's is cited as from the November 23, 1929 issue of the *Commercial and Financial Chronicle*, p. 3261; the Board of Governors' is from the February 1929 *Federal Reserve Bulletin;* and Fisher's is from *The Stock Market Crash and After*, 1930.

[13] In the late 1920s, NYC and Chicago banks were Central Reserve City banks having a 13 percent reserve requirement. Banks in other cities had reserve requirements ranging from 7 percent to 10 percent.

Table 4
Regulation U Registrations
All Federal Reserve Districts, June 30, 2002

Sector	Plan Lender	Nonplan Lender: Purpose	Nonplan Lender: Non-purpose	Total
Banking	26	5	4	35
Bank Holding Company	25	3	2	30
Other Banking	1	2	2	5
Nonbank Financial	114	47	90	251
Thrift Institution	68	38	68	174
Nonbank Holding Companies	32	5	2	39
Nondeposit Credit Intermediaries	14	4	20	38
Leasing, Finance, and Real Estate	31	3	4	38
Finance and Service Companies	25	2	3	30
Leasing Personal and Real Property	3	0	1	4
Real Estate Agency/Brokerage	3	1	0	4
Insurance	60	10	27	97
Agents and Brokers	7	0	1	8
Direct Insurance	53	10	26	89
Portfolio Management	7	3	4	14
Investment Advisory	0	0	4	4
Mutual Funds/Real Estate Trusts	7	3	0	10
Security Transactions	11	6	4	21
Brokerage	4	2	2	8
Trust and Custody Services	1	4	0	5
Securities and Commodities	6	0	2	8
Miscellaneous Financial	85	13	28	126
All Financial Sectors	345	93	165	603
Nonfinancial Sectors	112	28	19	159
Grand Total	457	121	184	762

Note: All active registrations are included.
Source: National Information Center (NIC) Database.

paper rate (R_{cp}); the logarithm of U.S. bank security loans, ln(SEC); and the logarithm of other loans and investments at U.S. banks, ln(OTH). After testing for lag lengths of three, six, and twelve months, a twelve-month lag length was chosen. The deterministic variables are seasonal dummies (results not reported); CRASH87, a dummy variable for the stock market Crash of 1987; and the interest rate on federal funds (R_{ff}). The last is included to control for the general level of short-term interest rates because the hypothesis being tested is that greater bank security loans will decrease the supply of business loans and increase the interest rate on short-term business loans relative to other short-term interest rates.

The results are reported in Table 6. Of particular interest is the sum of the coefficients on ln(SEC) in the autoregression explaining R_{cp} and the associated F-statistic. If the credit absorption hypothesis were valid, we would also expect that a positive shock to the volume of security loans would increase R_{cp} relative to R_{ff}. The sum of the coefficients should be both positive and statistically significant. However, the F-statistic for this sum does not indicate statistical significance. Furthermore, the sum of coefficients for ln(SEC), though not statistically significant, is negative in the R_{cp} equation.

Thus, at least in recent years, we find no support for the credit absorption hypothesis. The volume of bank loans appears to have no systematic relationship with our measure of short-term interest rates. There are several possible reasons why credit absorption is not valid today even if it had been in earlier periods. In the post–World War II period, the role played by commercial banks in short-term lending has dwindled as other sources of short-term business funds have emerged. The commercial paper market has evolved into a major source of funds for large businesses. The high-yield bond market has allowed smaller businesses to substitute long-term debt for short-term bank loans. The effect of these and other innovations is to increase the elasticity of supply for short-term loans, reducing the effect of changes in the supply of bank credit on the supply of aggregate short-term credit.

V. Summary

Regulation U, establishing margin requirements for certain security loans by commercial banks, was adopted in 1936, two years after the adoption of Regulation T. The goal of Regulation U was to limit the opportunity for investors to evade Regulation T's margin requirements by borrowing from banks instead of brokers. In addition, Regulation U was designed to limit the reallocation of credit from "legitimate" busi-

Table 5
Regulation U Annual Reports (FR G-4)
First Federal Reserve District, June 30, 2001

Sector	Number	Assets ($Billions)	Percent of Assets in Purpose Loans	Percent of Assets in Non-Purpose Loans
Banking	5	3.666	.50	.00
Bank Holding Companies	4	2.262	.42	.00
Other Banking	1	1.403	.63	.00
Nonbank Financial	30	17.394	.04	.50
Thrift Institution	25	14.477	.23	.34
Nondeposit Credit Intermediaries	5	2.916	.12	1.28
Leasing, Finance, and Real Estate	7	4.979	.67	.00
Finance and Service Companies	6	4.913	.66	.00
Real Estate Agency/Brokerage	1	.067	1.46	.00
Insurance	8	192.472	.22	.03
Security Transactions	7	156.426	.03	.06
Brokerage	6	156.304	.03	.06
Trust and Custody Services	1	.122	.00	1.23
All Financial Sectors	61	374.937	.14	.06
Nonfinancial Sectors	16	142.613	.07	.01
Grand Total	77	517.550	.12	.05

Source: National Information Center (NIC) Database.

ness uses to "speculation," a phenomenon called "credit absorption."

During the 1920s, the amount of credit extended to purchase or carry securities ("security loans") was high. Loans by broker-dealers ("margin loans") were 10 percent to 25 percent of the value of stocks listed on the New York Stock Exchange. Loans by banks ("bank security loans") were also high. Variations in the demand for credit created shifts of bank deposits and reserves between New York and interior banks, creating concerns about the supply of bank credit in local areas. During the late stages of the 1920s stock market boom, lending by others (nonbank and nonbroker-dealer entities) accelerated. Superimposed on the credit absorption and regional credit allocation issues was the popular view that loans to purchase or carry securities had contributed to the Crash of 1929 and to the Great Depression that followed. The first part of this study reviews the historical evidence on the sources and uses of margin and security loans.

The debate over the magnitude of credit absorption hinged, in part, on the role that margin loans were thought to play in driving broker-dealer borrowing from banks. One view held that there was a tight link between debit balances at brokers and bank loans to brokers—an increase in debit balances created an increase in bank loans, thereby absorbing bank credit. An alternative view held that debit balances played a passive role, and that brokers borrowed from banks only when they experienced net cash outflows. As we show in Section II, debit balances can be very loosely, even inversely, related to bank security loans. A simple regression test of the relationship between bank security loans and debit balances finds no significant association. Thus, one of the underpinnings of the credit absorption hypothesis is quite weak.

The third section reviews the key features of Regulations U and G, which apply to banks and nonbank lenders, respectively. Regulation G, adopted in 1968, was terminated in 1998, and its requirements were merged into the current Regulation U. Unlike Regulation T, which applies to broker-dealers, Regulation U applies only to margin stocks, allowing bank and nonbank nonbroker lenders to make loans against nonmargin stocks on a good faith basis; broker-dealers are prohibited from making loans against nonmargin stocks. While Regulation U treats bank and nonbank lenders the same in many respects, there are two important differences. First, the test for whether the lender is covered by Regulation U is different for banks and nonbanks, and, second, different criteria apply to exemption of loans from regulation.

The fourth section addresses some recent evidence about security loans. While bank security lending relative to total bank credit is far less today than it was in the 1920s, there has been a strong uptrend recently in security lending by foreign-related banks, a phenomenon also seen in the late 1920s. In March 2000, when debit balances at broker-dealers reached a peak, foreign-related banks held about 17 percent of their loans and investments in security loans. Since the mid-1990s, foreign-related banks have held more than 50 percent of all security loans. Several reasons for this are discussed.

Little hard evidence exists on the role of nonbank and nonbroker-dealer security lending (so-called "G-

lending"). The debate surrounding the introduction of Regulation G revealed that this lending was relatively small at the time, and that the primary concern was with "clearance lenders," who required much lower margins than either brokers or banks. This study finds that in 1998 G-lending was small, about 12 percent of all security lending, and that much of the G-lending was by "plan lenders" for the purpose of management acquisition of company stock or exercise of stock options, not for leveraged investments by broker-dealer customers.

In 2001, there were over 760 registered G-lenders, of whom 70 percent were plan lenders.

In 2001, there were over 760 registered G-lenders, of whom 70 percent were plan lenders. Lending by registered G-lenders in the First Federal Reserve District represented a very small proportion of assets on June 30, 2001. Thus, G-lending, particularly of purpose credit, appears to be minor.

The fourth section ends with a return to the theme of credit absorption. We test the credit absorption view using recent data for the interest rate on prime commercial paper, outstanding security loans at banks, and outstanding nonsecurity loans and investments at banks. The credit absorption view suggests that an increase (decrease) in bank security loans should result in higher (lower) business loan rates relative to other short-term interest rates. This is the consequence of the hypothesized reallocation of the supply of credit away from business loans and toward security loans. We find no such effect—lagged values of bank security loans are not a statistically significant determinant of short-term interest rates. We conclude that the recent evidence suggests no credit absorption from bank security loans.

Table 6
Vector Autoregression
Test of Credit Absorption Hypothesis[a]

	Dependent Variable		
	R_{cp}	ln(SEC)	ln(OTH)
Independent Variable	Coefficient (t-statistic) [F-statistic, p-value][b]	Coefficient (t-statistic) [F-statistic, p-value][b]	Coefficient (t-statistic) [F-statistic, p-value][b]
Constant	2.1376 (1.12) [n.a., n.a.]	–.7061 (1.38) [n.a., n.a.]	.1334 (4.13)* [n.a., n.a.]
CRASH87	.1743 (1.56) [n.a., n.a.]	–.0538 (1.79) [n.a., n.a.]	–.0010 (0.53) [n.a., n.a.]
R_{ff}	.4121 (7.20)* [n.a., n.a.]	–.0009 (.06) [n.a., n.a.]	.0028 (2.89)* [n.a., n.a.]
$\Sigma_i \ln(R_{cp,t-i})$, i=1,…,12	.5220 (n.a.) [23.77, .00]*	–.0013 (n.a.) [.26, .99]	–.0022 (n.a.) [1.27, .24]
$\Sigma_i \ln(SEC_{t-i})$, i=1,…,12	–.0615 (n.a.) [1.38, .18]	.9317 (n.a.) [52.21, .00]*	–.0109 (n.a.) [2.14, .02]*
$\Sigma_i \ln(OTH_{t-i})$, i=1,…,12	–.0780 (n.a.) [.74, .71]	.0999 (n.a.) [1.17, .31]	.9832 (n.a.) [8060.55, .00]*
R^2	.99	.99	.99
DW	1.65	1.99	1.95

Note: * indicates a p-level below 0.05; n.a. indicates "not applicable." The sum of all 12 coefficients is reported for the autoregressive terms, along with its F-statistic.

[a] Variables are: R_{cp}, 4–6-month commercial paper rate; R_{ff}, federal funds rate; CRASH87, Dummy variable = 1 in Sep–Dec 1987; SEC, security loans at U.S. banks; OTH, nonsecurity loans at U.S. banks. Seasonal dummies are included but not shown. Twelve-month lags are used after likelihood ratio testing for 6-month, 9-month, and 12-month lags. Data used are from January 1984 to June 2002.

[b] The F-statistics and p-values are for the null hypothesis that the indicated group of lagged variables is not statistically significant.

Source: Federal Reserve System, Haver Analytics.

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