ARE LOAN SALES REALLY OFF-BALANCE SHEET?

by

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Abstract

A commercial loan sale or secondary loan participation is a contract under which a bank sells the cash stream from a loan to a third party, usually without recourse. In accordance with accepted accounting procedures, this no-recourse contract allows removal of the underlying loan from the balance sheet of the bank, so that the funding of the loan is not subject to capital or reserve requirements. Since commercial banks are thought to specialize in the origination of non-marketable claims on borrowing firms, the apparent ability of banks to sell these assets seems paradoxical. The paradox could be explained if loan sales contracts contained implicit guarantees in the form of options by loan buyers to sell the loans back to the bank if the underlying borrower performs worse than anticipated. If such guarantees exist, then loans which are sold represent contingent liabilities, and a rationale for increasing capital requirements may exist. As an indirect test of the existence of this guarantee, we investigate whether loan sales and commercial paper prices contain a risk premium for the default of the selling bank. The empirical evidence supports the hypothesis of implicit guarantees.

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I. Introduction

Many contingent contracts of banks are not recorded on their balance sheet and are referred to as "off-balance sheet items." A large number of important bank financial services fall into this category. Examples include loan commitments and lines of credit, standby and commercial letters of credit, financial futures and forward contracts, and interest rate and foreign currency swaps. Under these contracts the bank explicity creates a contingent asset or liability, usually in exchange for a fee. In the last fifteen years the volume of such off-balance sheet activity has grown enormously relative to the volume of "on-balance sheet" activity like loan creation.[1]

Another recent activity of banks which has increased rapidly appears to resemble these off-balance sheet activities. The new activity is the practice of selling loans. A commercial loan sale is a contract between a bank and a third party under which the bank sells the cash stream from a commercial loan to a third party, in most cases without explicit recourse, guarantees, insurance, or any other type of credit enhancement. Since the contract selling the cash stream from the loan explicity states that the sale is without recourse there appears to be no contingency under which the sale creates a liability for the bank. Unlike the traditional off-balance sheet activities in which the bank is at risk because a contingent liability is created, a loan sale appears to permanently and irrevocably remove the loan from the balance sheet. Thus, loan sales appear to be a unique form of off-balance sheet activity.

Actually, loan sales per se are not new. Banks have sold loans to other banks in the past. But three recent trends make this activity of singular importance to banking. First, the volume of loans sold has increased dramatically. According to FDIC Call Report data, the volume has increased

from $23 billion in 1983 to $111 billion in 1986, an increase of 382 percent. The first quarter of 1987 alone saw $85 billion of loans sold. Prior to 1983 the volume of loans sold was not reported to the FDIC because the amount of loan sales activity was so small. An increasing number of banks are becoming involved in loan sales as buyers and sellers. It is now commonplace for banks to have established asset sales groups. Secondly, unlike the traditional loan sales, an increasing amount of loans are now being sold to buyers who are not in the U.S. correspondent banking network; they are foreign banks, other intermediaries, and nonfinancial firms. (See Gorton and Haubrich (1987) for a review of the available data on loan sales.)

Finally, banks have actively sought to modify relationships with underlying borrowers in order to facilitate loan sales in such a way as to get the loans off the balance sheet, thereby avoiding funding costs associated with required reserves and capital.[2] Regulatory accounting procedures require that for the underlying loan to be removed from the balance sheet the loan sale must not only involve no recourse, but must also be sold on the same terms and conditions as the original, underlying, loan was made. In other words, the loan sale must be the same maturity and the same pricing mechanism, i.e., fixed or floating in the same way, as the underlying loan.[3] This has meant, in practice, alterations of contractual relations with borrowers.[4] Borrowers must be convinced, for example, to take shorter maturity loans with implicit promises of rollover instead of explicit longer maturity loans because the buyers of loans have shown a preference for shorter maturities. Hence, long term customer relationships and longer contract lengths are being modified, significantly altering the way in which banking is conducted.

The ability of banks to create loans and then resell them without [illegible] significant amounts appears to contradict the essence of

banking. Theoretical rationales for the existence of banks predict that loans will be nonmarketable securities. The basic argument runs as follows. In a world in which there are information asymmetries between borrowers and lenders, banks perform some service which market participants cannot produce. Examples of such services include bank production of information about borrowers' potential investment opportunities or monitoring of borrowers' investment activities by enforcing loan covenants.[5] Banks perform these services on behalf of market participants (e.g. depositors) who, in turn, can rely on banks because banks are at risk if they do not perform. Banks' incentive to perform these activities results from the disproportionate share of the loss suffered by bank equity holders from loan defaults caused by non-performance. Consequently, this theoretical rationale would imply that bank assets would be nonmarketable. If market participants were willing to buy, without recourse, the claims on borrowers originated by banks, then those same market participants could have purchased these claims directly from borrowers to start with and there would be no need for banks.

How then can these loans be sold without recourse? One possibility is that the loans sold are claims on borrowers who do not require the information production and monitoring services traditionally provided via bank lending. Loan selling may really amount to underwriting in the same sense that underwriting is done by other financial intermediaries. In other words, there are no incentive problems between banks and loan buyers because the loans being sold are loans to companies that are very well known. In fact, however, while this seems to have been true in the early 1980s when loans began to be sold in significant volume, in 1985 (the only year for which such data is available) about a third of the loans sold were to companies which did not [6] Consequently, this cannot be the

full explanation. This suggests that there may be an alternative mechanism which makes loan sales incentive compatible. This mechanism might take the form of an implicit guarantee by the bank to buy the loans back from loan purchasers if certain events occur.

If the loan sales contract is mutually beneficial for the borrower, the bank, and the loan buyer only if it can be removed from the balance sheet in order to avoid costs of required reserves and capital, then in order to accomplish the sale, the contract must explicity state that there is no recourse (to satisfy accounting regulations). However, in order for purchasers to be willing to buy loans, the bank may implicitly offer to guarantee the loans sold by agreeing to buy them back if there are unanticipated changes in the value of an underlying loan. Since the loans sold are not riskless, the guarantee must concern the difference between the buyer's perceived risk and subsequent realized risk. As a matter of course, banks buy loans back though there is no data on the extent or price of such repurchases.[7] However, if these repurchases represent loan purchasers' exercise of implicit guarantees, then loan sales involve the creation of contingent liabilities similar to other off-balance sheet contracts.

If banks are selling loans with this implicit guarantee, then they may be providing a service similar to a back-up line of credit (loan commitment) provided by commercial banks when firms issue commercial paper. Under this hypothesis, loan sales represent a substitute for commercial paper underwritten with a back-up credit line. Since banks have been restricted from underwriting, loan sales might be a way for them to jointly underwrite and issue a contingent liability similar to a credit line. Hence if proposals are implemented which seek to make a bank's required capital a function of its [illegible] of credit lines, consistency might imply that required capital also

depend on a bank's loan sales volume.

In this paper we empirically investigate whether loan sales contracts contain implicit guarantees of a magnitude similar to the more explicit guarantees represented by lines of credit backing commercial paper. If such guarantees exist, then loan and commercial paper purchasers would be concerned with the default risk of the bank providing the guarantee, because the bank's ability to make good on the guarantee depends on its solvency. For example, if an implicit guarantee exists when a loan is sold, the risk premium on the loan sold should, at least in part, reflect the bank's default risk. Variation in the spread of yields of loan sales over a risk free rate should reflect movements in the risk of default by the selling bank as well as the borrowing firm. We test for the presence of an implicit guarantee on loans sold by comparing the sensitivity to bank default risk of loan sales' risk premia relative to the risk premia on commercial paper.

The paper proceeds as follows. In Section II we briefly summarize the available information on loan sales as background and explain the data to be used for the empirical tests. In Section III the basis of the empirical tests is developed. The test results are reported and discussed in Section IV. Section V concludes.

II. Commercial Loan Sales Contracts and the Loan Sales Market

In this section commercial loan sales contracts are briefly reviewed and some stylized facts about the loan sales market are discussed. The loan sales price data, to be used subsequently, are introduced. Finally, the role of bank credit enhancements for commercial paper is discussed since we will be comparing these guarantees to possible guarantees on loan sales.

A loan sale is a contract which sells the cash stream from a loan contract to a third party. The loan contract, itself, is not transferred. Rather a new contract is created which commits the cash stream from a specified loan, for a specified period of time, to a third party. The commitment of this cash stream is sold to a "loan buyer" under a contract which states that the buyer has no recourse against the selling bank should the underlying bank borrower default, and since the loan sale contract is between the bank and the third party, the third party-buyer cannot directly negotiate with the underlying borrower, should the borrower default.

There are two kinds of commercial loan sales contracts: loan strips and loan participations.[8] A loan strip represents a short-term share of a longer-term loan commitment. When the strip comes due at the end of a given period, say 5, 30 ,60 or 90 days, the selling bank has a commitment to resell the strip over the subsequent period or provide funding for the loan itself. With a loan participation a bank sells a loan to maturity without recourse. The date at which the loan sale matures coincides with the maturity date of the underlying loan.

The issue of whether loan sales involve an implicit guarantee or not most clearly arises when loans are sold under the loan participation contract. Since this contract involves no recourse and sells the loan to maturity, clearly once the loan is sold the bank is no longer explicity at risk. Consequently, the incentives the bank faces may be different than if the loan was on the bank's books. The issue is more complicated, however, when loans are sold as strips. The reason is that strips expose the bank to the risk that it will have to fund the loan when the strip matures. Since the bank has made a commitment to resell the strip or provide funding itself, the bank is at risk when the strip matures. This means, for example, that a bank is less

likely to shirk in information production or covenant monitoring during the life of the strip. It also implies that the risk may be similar to that faced by a bank when it provides a back-up line of credit on commercial paper.

The fact that strips expose the bank to refunding risk has raised the question of whether banks should be allowed to take loans off their balance sheets when they are sold under strips. The Financial Accounting Standards Board offered a proposal in December 1987 that would require banks to account for risks assumed in selling loans. As a result, some banks are reported to have moved away from strips and concentrated on selling loans under the participation contract. In January 1988 the Financial Accounting Standards Board decided that loan strips could be recorded as sales if: (i) the buyer of the strip assumes the full risk of loss; and (ii), the lender has no contractual obligation to repurchase the loan strip.

Controversy has ensued over whether most loan strips satisfy these requirements. The banking committee of the American Institute of Certified Public Accountants has announced (January 1988) that it considers a strip to be a sale if, at the strip's maturity, the original lender refuses to lend for one of two reasons: (1) if the borrower violates a covenant included in the loan contract, or (2), if a material adverse change in the borrower's condition is discovered during a credit evaluation.[9] Condition (2) is similar to the condition frequently placed in loan commitment contracts which may be invoked to remove the bank's liability of providing the loan commitment. In practice, however, it seems that banks rarely utilize this condition to avoid funding a loan. Employing this condition may be at the expense of a loss in reputation as a reliable provider of loan commitments.

Similar to credit lines used to back-up commercial paper, the issue of an implicit guarantee on a loan strip arises when the contract explicity states

that the bank has no obligation to buy the strip back and when it has no binding obligation to refund the loan when covenants are violated or the borrower's credit condition deteriorates. In this case the strip buyer cannot rely on the fact that the bank has made a longer term (non-binding) commitment to refund the loan, so that the bank's incentive to maintain the value of the loan may be suspect. If the bank does not maintain the value of the loan, then it can always choose not to refund the loan. In this case the issue of the implicit guarantee arises exactly as before.

In either case the buyer of the loan has no rights against the underlying borrower. If the underlying borrower defaults, then the loan buyer must rely on the bank to represent them. To date there has been one known failure in the loan sales market. In this instance the bank invited the loan buyers along to the renegotiation sessions with the borrower, even though the loan buyers had no legal right to be there.[10] To some extent these incentive issues are mitigated if the bank does not sell the entire loan. Informally, banks say they keep about ten percent of each loan sold though there is no contractual obligation to do so.[11]

B) The Loan Sales Market

The commercial loan sales market is growing and changing so fast that it is difficult to adequately summarize recent developments. Gorton and Haubrich (1987) report the following stylized facts about the loan sales market:

(i) The volume of loan sales has grown enormously in the past five years. (The Lending Practices Survey of the Board of Governors of the Federal Reserve System reported that the volume of loan sales over the first half of the fourth quarter of 1984 was $5 billion. In June 1985 the survey reported sales of $23.5 billion during the first two thirds of

the second quarter of 1985. By the fourth quarter of 1987 the comparable FDIC measure of volume was $85 billion.)

(ii) The number of banks selling loans has also increased. (Pavel and Phillis (1987) report that 3,214 banks reported selling loans in each of the four quarters of 1985.)

iii) A significant portion of the loans sold are merger-related. (The Lending Practices Survey of the Federal Reserve system reported in March 1987 that "over one-third of all loans sold or participated in 1986 were merger-related.")

(iv) A significant portion of the loans sold are bought by foreign banks. (The Lending Practices Survey reported in June 1985 that foreign banks bought 60 percent of total loans sold.)

(v) A typical borrower profile for a loan sold would be a U.S. corporation which has publicly traded debt rated Baa or better, and has commercial paper rated A1/P1 or A2/P2. (The June 1985 Lending Practices Survey reported that 68 percent of loans sold were to firms with access to the commercial paper market.)

(vi) Loan maturities range from one day to two years, but tend to be of shorter maturity. (The Lending Practices Survey of June 1985 reported that 80 percent of loans sold had maturities of 90 days or less.)

Loans which are sold have most often been originated in the usual way, i.e., a bank customer borrows money. Then the loan is sold to the third party. But loan sales also seem to be increasingly arising from the "bid business" in which banks which are members of large syndicated revolving credit agreements bid for a share of the credit when the customer wants a loan. When the customer is ready to draw down a credit, a member bank can bid

the lowest bid and the winning bank then typically sells the loan. The bid business combined with loan sales most closely resembles underwriting behavior.

C) Loan Sales Data

Data on prices of loans sold are scarce. The data used in this study are from Asset Sales Report, a weekly industry publication which has been in existence since late July 1987. To our knowledge this is the only available data on prices of loans sold.[12]

Asset Sales Report collects "average yields on short-term loans offered to investors by Bankers Trust, Citibank, and Security Pacific." Yields on loan sales of three maturities are reported: five day, thirty day, and ninety day. Also, for each maturity the banks report yields for the loans to borrowers with commercial paper programs rated A1/P1 and A2/P2. Thus, there is no information on loans sold which were to underlying borrowers which do not issue commercial paper, i.e., are not publicly traded. Asset Sales Report informs us that there is little variation in yields across the reporting banks that they survey. Of the three banks in their survey, Citibank and Bankers Trust are the largest loan sellers. Citibank had loan sales of $23.142 billion in the first quarter of 1987 according the FDIC Call Report data; Bankers Trust sold over $20 billion. Security Pacific was the sixth largest seller of loans with $3.05 billion of loan sales. Citibank accounted for 27 percent of the volume reported by the top twenty five loan selling banks during this quarter.

D) Banks and Commercial Paper

Commercial paper issuance typically requires some kind of credit enhancement, usually from a bank. The credit enhancement may take the form of an explicit guarantee such as an irrevocable revolving credit, a standby letter of credit, an insurance company indemnity bond, or a direct pay commitment. Or the credit enhancement may be a less formal loan commitment.

Almost all commercial paper issuers maintain 100 percent backing for their paper in one of these forms. For example, Calomiris (no date) reports that: "Of the more than 1400 commercial paper issuers listed in the December 1986 Standard and Poor's Commercial Paper Rating Guide, only 59 reported backup lines of less than 100 percent." Rating agencies require that the back-up lines be confirmed in writing in order to be taken into consideration for rating the firm's paper. Oral commitments are not sufficient.[13]

While back-up lines must be confirmed in writing to the rating services, they can be fairly informal. The Federal Reserve System, in Statistical Release G-21 (discontinued since August 5,1987) reports data on four categories of loan commitments: "term," "revolving," and "other" formal arrangements; and informal "confirmed lines" which do not involve specific interest rates or advance fees. According to the Fed, confirmed lines of credit "represent general expressions of willingness to lend, other than for term loans or revolving credits, that are made known to the customer but are not charcterized by detailed formal agreements specifying the terms and conditions under which a loan is made."[14] Calomiris (no date) presents econometric evidence confirming the informal industry view that, among credit lines, confirmed lines are most closely linked to commercial paper.

There is little evidence on the extent to which commercial paper is

Lending Practices Survey reported that eleven percent of the outstanding standby letters of credit were issued to back taxable commercial paper. That amount, $13.6 billion represented approximately eighteen percent of the outstanding commercial paper of nonfinancial firms at that time. Thus, it seems that formal guarantees account for a significant amount of the backing.

Whether the backing is formal or not, it represents an option which matures at the date the commercial paper matures. The value of this option depends on the default risk of the bank providing the backing. It is not surprising, then, that Standard and Poor's, for example, requires the bank providing the credit enhancement to be rated A2 or better. However, these credit enhancements are European options. In the case of loan sales the informal or implicit offer to repurchase the loan at the demand of the loan buyer would be an American option. This distinction plays an important role later.

III. Investigating an Implicit Guarantee by the Loan Selling Bank

In this section, we propose a way to investigate the proposition that banks selling loans provide implicit recourse to the buyers of loans. An indirect test of this proposition can be carried out by estimating the magnitude of the implicit guarantee given on loan sales relative to the magnitude of the guarantee given by banks when providing back-up lines of credit on commercial paper.

A. Simple Model of the Yields on Loans Sold and Commercial Paper

The yields on loans sold and commercial paper are assumed to be a function of three factors: (1) the opportunity cost of funds to loan buyers and commercial paper holders; (2) the risk of the firm issuing the loan or

commercial paper; and (3) the quality of the guarantee given by the bank to buy back the loan sold or provide a back-up credit line in the case of commercial paper. The quality of this guarantee will depend on the default (failure) risk of the bank.

Consider the following model of the yield on a firm's debt security that may be partially guaranteed by a bank:

$$(1) \qquad y_{jt} - r_t = \alpha_{j0} + \alpha_{j1} f_t + \alpha_{j2} b_t + \varepsilon_{jt}, \qquad j = l,c$$

y_{jt} is the yield on a debt security of type j issued at time t, where j =l,c, indexes a loan (l) or an issue of commercial paper (c). r_t is the opportunity cost of an equivalent maturity riskless investment at time t. f_t is a measure of the default risk of the borrowing firm, and b_t is a measure of the default risk of the bank providing the guarantee on the security. The α_{ji}'s, i = 0,1,2, are constants while ε_{jt} is an independently distributed error term.

Merton (1974) derives the spread between a firm's risky (non-guaranteed) debt and a risk-free rate as a function of the borrowing firm's leverage and the variance of its asset returns. In our model, this spread is represented by the variable f_t. In the more general case where a bank may provide some partial guarantee on this debt, we would expect that the coefficient α_{j1} would be less than 1, and smaller the stronger is the guarantee made by the bank. In the limit, if the bank's guarantee is believed to be completely certain (and the bank, itself, is perceived to have a zero probability of failure), then the coefficient α_{j1} would be zero.

The bank's guarantee will be limited by the likelihood of the bank's failure, which will depend on the bank's leverage and its variance of asset returns. A risk premium corresponding to this probability of failure is measured by the variable b_t. Thus if a bank gives at least a partial option

to loan buyers to re-purchase loans sold, one would expect that α_{12} would be positive, while if a bank has some commitment to provide a back-up credit line on commercial paper, then α_{c2} should be positive. These coefficients will be larger the greater the belief by investors that the bank will choose to uphold its guarantee. In summary, a substantial bank guarantee would imply a small value of the coefficient multiplying f_t and a large value of the coefficient multiplying b_t, while the reverse would be true if the bank's guarantee was weak.

B. Empirical Method

Ideally we would like to estimate the model in equation (1) to test whether the guarantees given by banks on loans sold or commercial paper are substantial. Unfortunately, our time series data on yields on loans sold is not disaggregated at the individual borrowing firm level, but is an average of yields of loans to borrowers who also issue a given grade of commercial paper, A1/P1 or A2/P2. This makes obtaining a relevant direct measure of the borrowing firm's risk, f_t, quite difficult. However, since we know that these borrowers are issuers of commerical paper of a specific grade, we can jointly use the data on loan sales yields and commercial paper yields to test the relative strengths of guarantees given by banks selling loans versus providing back-up credit lines on commercial paper. In order to do this, we assume that the banks providing the loan sales guarantees are the same or very similar in terms of their default risk to the banks providing the back-up credit lines for the commercial paper. In that case the variable b_t in equation (1) can be assumed to be the same for both loan sales and commercial paper.

Under these assumptions, we can substitute out for the variable f_t in the loan sales equation using its value implied by the commercial paper equation

to obtain:

$$(2)\quad y_{1t} - r_t = \alpha_{10} - \alpha_{c0}\alpha_{11}/\alpha_{c1} + (\alpha_{11}/\alpha_{c1})(y_{ct} - r_t)$$

$$+ (\alpha_{12} - \alpha_{c2}\alpha_{11}/\alpha_{c1})b_t + \varepsilon_{1t} - (\alpha_{11}/\alpha_{c1})\varepsilon_{ct}$$

Equation (2) is the regression equation that forms the basis of our empirical tests. We now describe the method used to calculate the bank risk variable, b_t.

C. Calculation of a Premium for Bank Risk

The premium for bank risk that we choose is one that is proportional to the premium that an uninsured bank depositor would charge the bank. To see how this might proxy for a relevant risk measure, suppose that a loan purchased by a loan buyer has a probability equal to p of being paid in full by the borrowing firm, and thus a probability of (1-p) of the borrowing firm defaulting. If the bank had guaranteed the loan and the borrowing firm does indeed default, then the loan buyer might have a liability claim on the bank. If we assume that this claim is of equal claimant status to an uninsured bank depositor (i.e. a general creditor of the bank), then only partial payment of the loan buyer's promised claim would be made. This would suggest that (1-p) times the uninsured depositors' risk premium would be a relevant bank risk premium for the loan buyer. Employing the simplifying assumptions that the maturity date of the uninsured deposits and the auditing date of the FDIC coincide, and assuming that the FDIC's deposit insurance premium is fair, we can compute this risk premium in a manner similar to that of Merton (1974) and Merton (1977).

$$(3)\quad b = N(-d_-) - x\,N(-d_+)$$

where $d_1 = (\ln x_t + \sigma^2\tau/2)/\sigma\sqrt{\tau}$, $d_2 = d_1 - \sigma\sqrt{\tau}$. And where N(z) is the probability that a normally distributed random variable with mean zero and variance of unity will be less than or equal to z. x_t is the ratio of the market value of the bank's assets to the promised payment on its liabilities at time t, σ is the (assumed constant) standard deviation of the rate of return on the bank's assets, and τ is the time to maturity of the deposit. Note that in order to directly calculate this premium, one would need to observe values for x_t, the ratio of the market value of the bank's assets to its liabilities, and σ, the standard deviation of asset rates of return. Rather than attempt to directly calculate these variables, we choose to follow a procedure similar to Marcus and Shaked (1984) that calculates these variables using information contained in bank stock prices.

Note that the equilibrium value of the bank's equity per dollar liability, e_t, and the standard deviation of the return on bank equity, σ_{et}, are given by;

$$(4) \qquad e_t = x_t N(d_1) - N(d_2)$$

$$(5) \qquad \sigma_{et} = \sigma x_t N(d_1)/\left(x_t N(d_1) - N(d_2)\right)$$

If we can observe the market value of the bank's equity per dollar liability, e_t, and calculate its standard deviation of returns, σ_{et}, then equations (4) and (5) represent two equations in two unknowns, x_t and σ. A numerical minimization algorithm can be employed to solve for these two unknowns. Since we can observe a different market value of equity, e_t, at each point in time over our sample period, we can carry out this numerical procedure to obtain an (x_t, σ_t) pair for each point in time.[15] However, since our model is based on the Black-Scholes-Merton assumption that the standard deviation of asset

deviations to calculate a single implied standard deviation, σ. These values for x_t and σ can then be used to calculate a time series of premia for bank risk, b_t, given in equation (3).

IV. Empirical Investigation And Interpretation

Empirical tests of the model were carried out using weekly data over the period July 1987 to March 1988, a total of 32 observations. Since the reported weekly loan sales yields were an average of three different banks, Bankers Trust, Citibank, and Security Pacific, we calculated a time series of the bank risk variable, b_t, which was a weighted average of the bank risk premia for the individual banks. The weights used equaled the ratio of the bank's volume of loan sales to the total volume for the three banks, 0.437, 0.498, 0.066, for Bankers Trust, Citibank, and Security Pacific, respectively. Table 1 gives the means, standard deviations, and correlation matrix of the 90 days to maturity bank risk premium variable for each of the three banks. The means and standard deviations of the banks' implied asset value to liability ratios, x, and standard deviation of asset returns, σ, are also reported.

Since the loan sales and commercial paper yields used in the estimation had a 90 day maturity, we selected r_t to be the contemporaneous 90 day London Interbank Offered Rate (LIBOR) yield. Since the majority of loan purchasers are foreign and domestic banks, the LIBOR rate may be a good measure of loan buyers' opportunity cost of funds. Table 1 also presents summary statistics of the spread of loan sales yields and commercial paper over LIBOR, for both A1/P1 and A2/P2 rated borrowers.

A) Empirical Results

As a preliminary step in analyzing the data, we looked at the correlation between the spread on loan sales over LIBOR, $y_{lt} - r_t$, with the bank risk variable, b_t, and also the correlation between the spread on commercial paper over LIBOR, $y_{ct} - r_t$, with the bank risk variable. In other words, we ran the OLS regression given by equation (1) leaving out the (unobserved) firm default risk variable, f_t. Table 2 reports these results for both the A1/P1 rated and A2/P2 rated borrowers. In each of the four cases, the point estimates indicate positive correlation between the bank yield spreads on loans sold and the bank risk variable. However only for the case of the A2/P2 rated commercial paper spread is the point estimate significantly different from zero at the 5% confidence level. If firm risk and bank risk, f_t and b_t, were uncorrelated, then our point estimates would be unbiased estimates of α_{j2}, but the estimated standard errors would be upward biased, perhaps explaining the insignificant t statistics obtained, e.g., see Maddala (1977, p.156). However, it could well be that b_t and f_t are positively correlated, in which case our OLS estimates for α_{j2} would be upward biased as well.

Table 3 reports the OLS estimates of the coefficients in equation (2), first for A1/P1 borrowers, then for A2/P2 borrowers. The coefficient estimates are surprisingly similar for the two sets of borrowers. The estimates for α_{l1}/α_{c1}, for the two quality levels , are 0.807 and 0.819, respectively. Both numbers are significantly different from 1.0 at the 5% confidence level. This would suggest that investors place less weight on borrowers' default risk for the case of loans sold relative to commercial paper issued. This would be consistent with the hypothesis that the strength of the guarantee given by banks on loans sold exceeds that given on commercial

However, we obtain a seemingly conflicting set of negative estimates for $\alpha_{12} - \alpha_{c2}\alpha_{11}/\alpha_{c1}$, equal to -.0237 and -.0276 for the two quality levels, respectively. Both numbers are significantly different from zero at the 5% significance level. Since $\alpha_{11}/\alpha_{c1} < 1$ this result implies that $\alpha_{c2} > \alpha_{12}$, suggesting that investors are more concerned with the default risk of the bank when it gives a guarantee for commercial paper than when it gives a guarantee on a loan sold. This would seem to imply that a stronger guarantee is given on commercial paper than for a loan sold.

B) Interpretation of the Results

How can these apparently contradictory results be explained? Two nonmutually-exclusive explanations would lead to the above empirical estimates. The first explanation implies that the relevant measure of bank risk, b_t, is effectively smaller for the case of loans sold relative to the case of commercial paper underwriting, even though the guarantee on loans sold may be stronger. The second explanation implies that the relevant measure of the borrower's risk, f_t, is effectively smaller for the case of loans sold relative to commercial paper underwriting. Both of these explanations are consistent with loan sales having lower average spreads over LIBOR than do commercial paper issues (see Table 1).

The first explanation is based on the idea that the implicit guarantees on loan sales and commercial paper may be fundamentally different because the guarantee on a loan sold may be thought of as an American option while the guarantee on commercial paper is a European option. This distinction is especially important when combined with the fact that these options are options with default risk, referred to by Johnson and Stulz (1987) as "vulnerable" options. In other words, the banks writing these options may

voluntarily or involuntarily default. A bank may voluntarily default by possibly invoking the loan commitment conditions regarding the violation of a loan covenant by the borrower or a "materially adverse change" in the borrower's condition. An involuntary default would be triggered by the bank, itself, failing. Johnson and Stulz (1987) show that vulnerable options have comparative static results that can be quite different from those of standard exchange traded options not subject to default by the seller. In particular, an American option can be valued significantly higher than a European option because the right to early exercise increases in value when the liklihood of default by the writer increases. This implies that the European option will be highly dependent on the default probability (risk) of the writer, while the American option will not. A holder of an "in the money" American option can choose to exercise his option before the default risk of the writer becomes too great.

In the context of commercial paper guarantees and loan sale guarantees, note that the holder of commercial paper can call on the guarantor at the maturity date of the paper, but not before. Perhaps by the maturity date, the borrower has experienced a significant "material adverse change in condition" or violated a loan covenant enabling the bank to legally renege on its guarantee, or perhaps by maturity the bank, itself, is in financial difficulty. In contrast, with loan sales the loan buyer may have the right to sell the loan back to the bank at any time on or before maturity. For example, a loan purchaser may have the implicit option to sell the loan back to the bank at the first sign that the credit risk of the borrower or the credit risk of the bank has begun to deteriorate. This early exercise feature implies that the value of the guarantee given by the bank is greater in the case of loan sales than in the case of commercial paper, since it will be

little affected by the bank's risk. This implies that the effective premium that loan sales buyers will place on bank risk, $\alpha_{12}b_t$, will be quite small relative to that for commercial paper buyers. This would explain the negative coefficient obtained for $(\alpha_{12} - \alpha_{c2}\alpha_{11}/\alpha_{c1})$ even though α_{11}/α_{c1} was found to be greater than one (See Table 3).

Some casual evidence is consistent with the interpretation of the guarantee as an American put option. Because of securities laws, banks cannot allow a secondary market in loans sold to develop. All loan sales contracts prohibit resale of the loan. (See Gorton and Haubrich (1987).) Commercial paper, however, does have a secondary market albeit a thin one. In order to compete with commercial paper, banks may agree to buy back the loans so that buyers are not faced with possible illiquidity. Indeed, this is the reason bankers give for their loan repurchases. The repurchase price is subject to bargaining and is not simply adjusted for elapsed time. The possibility of an implicit guarantee enters when the repurchase price is agreed upon. Since, to provide liquidity, the bank must be willing to buy back the loan at any time, the implicit guarantee would take the form of the bank absorbing (at least part of) any possible credit deterioration that may have occurred by buying the loan back at a price favorable to the loan holder.

The second explanation is based on the hypothesis that banks may do a more efficient job of monitoring and verifying the credit of borrowers who sell loans relative to borrowers who issue commercial paper. This can result from banks having greater exposure to refunding risk in the case of loans sold relative to the case of commercial paper underwriting. Suppose, for the moment, that for the case of a loan sale, the underlying lending commitment between the bank and the borrowing firm was of a longer maturity than the loan

sale contract. Then, at the maturity of the loan sale contract, the bank would again be at risk, not only to re-fund the loan for the subsequent period, but perhaps for a number of periods into the future. Consequently, knowing this, the bank would continue to efficiently monitor the loan and enforce loan covenants during the time of the loan sale just as if a long term loan had been held by the bank, i.e., a loan with a maturity equal to the maturity of the lending commitment. As explained above, however, the bank would not be able to remove this loan from the balance sheet in this case. In order to remove the loan from the bank balance sheet, the longer maturity lending commitment must be shortened so that the loan sale and the explicit lending commitment by the bank mature at the same point in time.

If the underlying borrower can be convinced to take a shorter maturity loan with the implicit understanding that the loan is longer term then the loan could be sold and removed from the balance sheet. Moreover, the loan buyer may rely on the fact that the loan is implicity part of the longer term customer relationship in such a way that bank has an incentive to behave as if the loan were on its balance sheet. To minimize its refunding risk for all future periods of the lending commitment, the bank would have the incentive to more intensively verify the credit worthiness and/or monitor the borrower than in the case of providing a back-up line of credit on commercial paper, where the bank's refunding risk lasts for only the single period subsequent to the maturity of the paper. This implies that for an equal maturity loan strip and commercial paper issue, the effective premium charged by a loan buyer to cover the default risk of the borrower would be less than that charged by the commercial paper holder, i.e., $\alpha_{l1} f_t < \alpha_{c1} f_t$. This would explain the estimated value of α_{l1}/α_{c1} in Table 3 being less than one.

In fact, Table 1 shows that the above hypotheses are quite reasonable.

In Table 1 the means for ninety day loan sales are lower than for ninety day commercial paper for both qualities. The standard deviations for loan sales are also lower. The suggestion is that loan sales are less risky. Thus, loan sales must be safer because of some type of credit enhancement or borrowers happen to be safer or better monitored when they sell loans versus when they issue commercial paper.[16] The two interpretations suggested above are possible methods for banks to facilitate loan selling which make this activity significantly different from underwriting.

V. Conclusions

The fact that banks are selling loans under nonrecourse contracts in increasing amounts seems to contradict the unique role of banks as originators and holders of nonmarketable claims on firms. The ability of banks to sell loans could be explained if such sales involved implicit guarantees. We have investigated the existence of such guarantees relative to the better understood guarantees that banks provide for commercial paper.

The empirical evidence is ambiguous. While we can say that any guarantees which exist on loan sales are different from those backing commercial paper we cannot distinguish between two, nonmutually-exclusive, alternative ways for banks to guarantee the loans sold. The first explanation is that the bank offers a "vulnerable" American put option to the loan buyer. Since the bank, itself, is risky this option is more valuable than a vulnerable European option. Since the option allows the loan buyer to sell the loan back before maturity, the bank is taking more risk than it would with a guarantee on commercial paper. We have not investigated what mechanism insures loan buyers that this guarantee will, in fact, be adhered to, especially when the explicit contract definitively says that such guarantees

do not exist.

Alternatively, the loan buyer, instead of relying on an option to force the bank to repurchase the loan, may rely on an underlying long-term bank relationship with the borrower. If such a relationship exists, implicitly, then the bank has an incentive to maintain the value of the loan sold (through monitoring covenants, for example) because future loans are going to be made. This explanation suggests that loan sales do not create any additional risk for the selling bank.

It is difficult to discern any regulatory implications from these results. If loan sales are feasible because banks implicitly offer put options, then to be consistent (if for no other reason) loan sales should be treated like other off-balance sheet items, i.e., perhaps subject to capital requirements. But, under the second explanation, no contingent liability is created, and consequently, there would be no regulatory implications.

Footnotes

[1]The off-balance sheet activity which has attracted the most attention is the issuance of standby letters of credit. In June 1982 outstanding standby letters of credit amounted to $80.0 billion. In June 1985 the outstanding amount of standby letters of credit had grown to $153.2 billion, a 90 percent increase. See Bennett (1986). Also see Wolkowitz, et. al., (1982).

[2]Pennacchi (1988) analyzes banks' incentives for selling or buying loans based on regulatory costs and their degree of deposit market competition. Optimal contractual arrangements between loan buyers and sellers are also examined under the assumption that banks provide monitoring services. Flannery (1988), Greenbaum and Thakor (1987), and James (1987a) present additional motives for bank loan sales.

[3]See Melvin (1986) for a more detailed discussion.

[4]For example, the February 1986 Lending Practices Survey of the Federal Reserve System reported that 16.7 percent of all responding banks modified terms of revolving credit agreements to facilitate loan sales.

[5]See Boyd and Prescott (1986), Diamond (1984), and Gorton and Haubrich (1986) for discussions of these bank activities.

[6]See the Lending Practices Survey of the Federal Reserve System, June 1985.

[7]This statement summarizes impressions from conversations with asset sales bankers at money center banks.

[8]Loans may also be transferred under more stringent contracts. An assignment is a contract under which a share of a credit is sold with all rights, but without full responsibilities to the borrowing company. A novation is a share of a credit sold with all voting rights and responsibilities which are included in the original loan contract. See Gorton and Haubrich (1987) for a more complete discussion.

[9]Further details are provided in Asset Sales Report, January 25,1988.

[10]The one failure involved Republic Health Corporation. In August 1986 Republic Health borrowed $265 million from a syndicate with Security Pacific as lead bank, and eight other lenders. Security Pacific sold part of its share of the loan. In July 1986 Republic Health stopped interest payments on the loan. According to Asset Sales Report, October 5,1987: "Sources have reported that SecPac officials have been accompanied by representatives of a participating bank at several of Republic's workout meetings. The development was notable because investors in participations are considered non-voting members of the lending group, and therefore have virtual;ly no influence at workout meetings."

[11]This statement summarizes conversations with asset sales bankers at money center banks. Pennacchi (1988) solves for the optimal size of the claim that banks would choose to retain on a loan sold.

[12]No bank we contacted was willing to provide any data on loan sales.

[13]Thus, according to Bates(1986), writing in Standard and Poor's weekly: "To be viewed as eligible, back-up lines must be confirmed in writing. An oral commitment is not sufficient." (Quoted by Calomiris (no date).)

[14]Term loan commitments, according to the Federal Reserve System, are commitments for a term loan of original maturity greater than one year. Revolving credits are commitment agreements which allow repeated borrowing and repaying without penalty. The remaining category, "other," are those detailed, formal, agreements which do not fall into one of the above categories.

[15]Because of the relatively small sample size (32 weekly observations), each (x_t, σ_t) pair was calculated based on the same estimate of σ_e.

[16]This evidence is consistent with that found by James (1987b).

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Table 1

SUMMARY STATISTICS OF VARIABLES

90 Day Bank Default Risk Premium	Mean	Std. Deviation
Bankers Trust	3.32×10^{-7}	6.54×10^{-7}
Citicorp	1.04×10^{-6}	2.01×10^{-6}
Security Pacific	4.25×10^{-8}	9.39×10^{-8}

Correlation Matrix of Risk Premia

1	.408	.730	Bankers Trust
.408	1	.388	Citicorp
.730	.388	1	Security Pacific

Implied Ratios of Market Values of Bank Assets to Liabilities	Mean	Std. Deviation
Bankers Trust	1.052	.0094
Citicorp	1.038	.0052
Security Pacific	1.048	.0057

Implied Standard Deviations of the Returns of Bank Assets	Mean	Std. Deviation
Bankers Trust	.0239	.0041
Citicorp	.0200	.0026
Security Pacific	.0205	.0023

Yield Spread Over 90 Day LIBOR (Difference between Annualized Yields)	Mean	Std. Deviation
90 Day Loans Sold, A1/P1	-.0006	.2000
90 Day Commercial Paper, A1/P1	.2731	.2463
90 Day Loans Sold, A2/P2	.1302	.1930
90 Day Commercial Paper, A2/P2	.5308	.2390

Table 2

CORRELATIONS BETWEEN YIELD SPREADS AND BANK RISK

OLS Regressions
July 1987 to March 1988, 32 Observations
(Standard Errors in Parentheses)

Dependent Variable	Independent Variables		R^2
Yield Spread $(y_{jt}-r_t)$	Intercept	Bank Risk Premium $(f_t \times 10^6)$	
Loan Sold, A1/P1	-.0196 (.0411)	.0283 (.0312)	.027
Com. Paper, A1/P1	.2300 (.0489)	.0645 (.0371)	.091
Loan Sold, A2/P2	.1097 (.0395)	.0308 (.0300)	.034
Com. Paper, A2/P2	.4833 (.0467)	.0712 (.0355)	.118

Table 3

OLS REGRESSIONS RELATING LOAN SALES YIELD SPREAD TO COMMERCIAL PAPER YIELD SPREAD AND BANK RISK PREMIUM

July 1987 to March 1988, 32 Observations
(Standard Errors in Parentheses)

Dependent Variable	Independent Variables			R^2
Loan Sale Yield Spread $(y_{lt}-r_t)$	Intercept	Com. Paper Yield Spread $(y_{ct}-r_t)$	Bank Risk Premium $(f_t \times 10^6)$	
A1/P1 Borrowers	-.2053 (.0154)	.8070 (.0435)	-.0237 (.0093)	.924
A2/P2 Borrowers	-.2860 (.0215)	.8187 (.0394)	-.0276 (.0082)	.939