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Loan Syndication and Credit Cycles

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Cyclicality in the supply of business credit has been the focus of a considerable amount of research. This cyclicality can stem from shocks to borrowers' collateral, which affect firms' ability to raise capital if agency and information problems are significant (Ben S. Bernanke and Mark Gertler 1989). Or it can stem from shocks to bank capital, which affect the supply of bank loans if agency and information problems limit the ability of banks to raise additional capital (Bernanke 1983). Both of these channels may have been at work during the financial crisis that started in 2007. Ran Duchin, Oguzhan Ozbas, and Berk A. Sensoy (2010) show that firms with more collateral were better able to withstand the contraction in credit, and Victoria Ivashina and David Scharfstein (2010) show that reductions in bank capital had an adverse effect on lending.

In this paper, we examine cyclicality in the supply of credit in the context of modern forms of banking, often referred to as the "originate-to-distribute" model. In particular, we are interested in the role of syndicated lending. In traditional bank lending—the focus of most models of banking—banks originate and hold loans on their balance sheets. This exposes banks to risk but provides them with strong incentives to screen and monitor borrowers (Douglas W. Diamond 1984). Over the last 20 years, however, the development and growth of the syndicated loan market has enabled a bank to originate a loan but retain only a fraction of it. On average, the originating bank (or "lead bank") retains about a third of each syndicated loan and sells the remaining share to a syndicate of investors, which includes banks and institutional investors such as pension funds, mutual funds, hedge funds, and sponsors of structured products.[1] In addition to receiving interest on its share of the loan, the lead bank also receives a fee for arranging the syndication.

The advantage of syndicated lending is that it enables originating banks to share risk across the syndicate. Such risk sharing is valuable if banks are themselves financed in an imperfect capital market and adverse shocks require them to raise costly external capital (Kenneth A. Froot and Jeremy C. Stein 1998). As shown by Ivashina (2009), banks weigh this diversification benefit against the reduced incentive they have to screen credit risk and monitor borrower behavior.

The process of syndication leads to an expansion of credit because it enables banks to share risk, which lowers their risk threshold for originating a loan. It also expands credit by making it possible for institutional investors to participate directly in funding the types of loans that banks originate, rather than indirectly by funding the bank. The value of this sort of financing is consistent with the model of financial intermediation developed by Bengt Holmstrom and Jean Tirole (1998).

While loan syndication arguably expands credit supply, the question we address here is whether it increases the cyclicality of credit supply. Loan syndication can amplify credit cycles if, in response to an economic downturn, lead banks are required to hold larger shares of the loans they originate. If banks are financially constrained, then this larger share reduces the amount of loans they are willing to originate during a downturn. By contrast, if the lead share falls during a downturn, then this increase in risk sharing could actually dampen credit cyclicality.

While this is ultimately an empirical question, one might expect the lead share to rise during a downturn because of (i) shocks to borrowers, (ii) shocks to bank capital, and (iii) variation in investor sentiment.

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[1] These collateralized loan obligations typically pool and tranche speculative grade debt. They started being used around 2003 and at their peak in 2007 accounted for 60 percent of syndicated loan purchases.

Shocks to borrowers.—Bernanke and Gertler (1989) suggest that during a downturn borrower collateral values are impaired and risk increases, which exacerbates asymmetric information and incentive problems. This, in turn, increases screening and monitoring costs, and thus the share the lead bank has to hold in order to have the incentive to monitor and screen. This is also consistent with the model of financial intermediation developed by Holmstrom and Tirole (1997).

Shocks to bank capital.—A downturn may be associated with an adverse shock to bank capital. If participant banks are more adversely affected, this will result in an increase in the lead share. Even if participants are no more likely to be adversely affected than leads, there could be an increase in the cross-sectional variation of bank capital during downturns. The more adversely affected banks will require higher returns for using their capital to participate in the loan syndication. This would take the form of higher interest spreads on the loan, and lower fees to the lead bank. Rather than offer higher spreads to syndicate participants and take a lower fee, the lead bank may prefer to hold a larger share of the loan.

Shocks to investor sentiment.—Andrei Shleifer and Robert W. Vishny (2010) argue that there may be periods in which investors overvalue the loans that banks originate for distribution, whether through securitizations or loan participations. In their model, banks are willing to originate loans during episodes of overvaluation as long as they can collect large enough upfront fees and do not need to retain too large a share of the loans. It follows from their framework, though they do not model it, that the lead bank in a loan syndication will sell as much of the loan as possible to limit how much it retains of the overvalued loan. Indeed, Ivashina and Zheng Sun (2008) show that during the 2004–2007 credit boom the fall in loan spreads was at least partially caused by the institutional investors' positive sentiment. When this positive sentiment ends, as it arguably does during a downturn, the lead share should rise as banks no longer sell overvalued loans.

I. The Cyclicality of Lead Share

To examine the cyclicality of the lead share, we analyze a sample of US corporate syndicated loans from the Reuters DealScan database covering the period January 1990–June 2009. We exclude financials and constrain the sample to loans for which the lead bank's share is available.[2] The lead share is reported in roughly a third of the cases; potential reporting biases are extensively discussed in Ivashina (2009) and are unlikely to affect our analysis.

The unit of observation in our sample is the syndicated loan (as opposed to a loan facility).[3] There are 5,436 such syndicated loans with information available on the lead share. The average loan size is $408 million (deflated to 2009). The average lead share across the sample is 29 percent, and there are an average 9 participants in a syndicate.

We first document a strong negative relationship between aggregate syndicated loan volume and lead share. This is depicted in Figure 1. The lead share is the average fraction of syndicated loans retained on the lead bank's balance sheet. The lead share is the average fraction of syndicated loans retained on the lead banks balance sheet. The correlation between lead share and lending volume is -0.67; as lending volume falls, the lead share rises. After seasonally adjusting lending volume, the correlation is -0.64. The correlation is -0.50 even if one excludes 1990–1994, the early period of the syndicated loan market during which the market grew rapidly as the lead share fell. While one cannot claim that the increase in lead share reduces lending volume, there is a clear association between the two.

Figure 2 reveals a connection between the lead share and credit conditions. The figure plots lead share and a measure of credit availability based on the Federal Reserve Senior Loan Officer Opinion Survey on Bank Lending Practices. This survey measure is the net percentage of domestic bank respondents who report tightening

[2] There are several roles that can be assigned to lenders in the syndicate. We define the lead bank as the member of the syndicate that is designated as the administrative agent, since this is the bank that is responsible for traditional bank duties including due diligence, payment management, and monitoring of the loan. If the database does not designate an administrative agent, then a lender that is designated as agent, arranger, bookrunner, lead arranger, lead bank, or lead manager is defined as a lead bank.

[3] Large loans are typically structured in multiple facilities. All facilities are covered by the same loan agreement; however, they may have different maturity or drawdown terms.

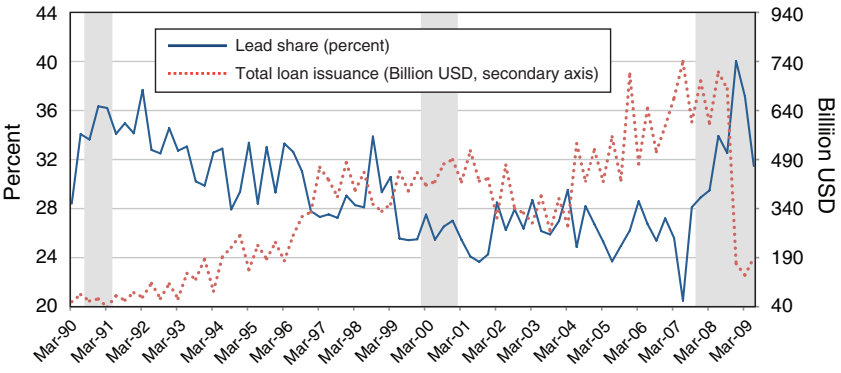

FIGURE 1—LOAN SHARE RETAINED BY THE ORIGINATING BANK AND LOAN ISSUANCE VOLUME

Notes: The graph is compiled from DealScan database of loan originations and corresponds to US, nonfinancial syndicated loans. Lead share is a three-month rolling window average (equally weighted). Loan issuance is the total issuance in a given quarter. Shaded areas indicate US economic recessions as defined by NBER.

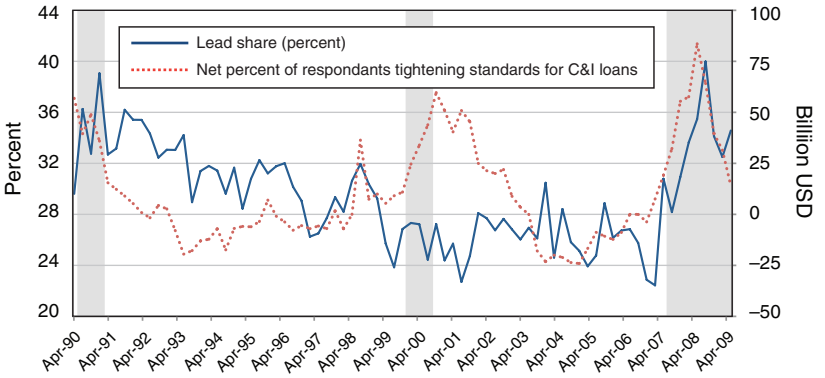

FIGURE 2—LOAN SHARE RETAINED BY THE ORIGINATING BANK AND CREDIT CYCLE

Notes: The graph is compiled from DealScan database of loan originations and corresponds to US, nonfinancial syndicated loans. Data on credit standard tightening comes from the Federal Reserve Senior Loan Officer Opinion Survey on Bank Lending Practices. The series corresponds to the net percentage of domestic respondents tightening standard for commercial and industrial (C&I) loans to large and medium sized firms. Lead share is a three-month rolling window average (equally weighted). Horizontal axis is modified to match the timing of the survey. Shaded areas indicate US economic recessions as defined by NBER.

standards for all commercial and industrial (C&I) loans to large and medium-sized firms (including both syndicated and nonsyndicated loans). The figure indicates that there is a positive relationship between the credit tightening and lead share. This is particularly true as credit tightened during the banking crisis of 1990–91, the credit tightening brought on by the failure of Long-Term Capital Management, and the most recent financial crisis. The same cannot be said of the credit tightening that occurred in the recession of 2001.

The basic patterns in Figure 2 are also apparent in the loan level regressions reported in Table 1. Since lead share has been shown to be related to firm and loan characteristics, we include controls for firm size, credit rating, loan size, and loan maturity (Ivashina 2009). These controls all have the predicted sign. The coefficient of the credit tightening variable is positive and statistically significant at the ten percent level. One can see that the coefficients are much larger and more statistically significant if we exclude the period around the 2001 recession.

Table 1—Loan Share Retained by the Originating Bank and Credit Cycle

Lead share	Full sample	1990–1999	2004–2009
Credit tightening	0.01*	0.06**	0.03***
	[0.01]	[0.02]	[0.01]
log (loan amount)	−6.26***	−7.48***	−5.24***
	[0.24]	[0.37]	[0.48]
log (sales)	−1.12***	−0.85***	−1.92***
	[0.18]	[0.32]	[0.34]
Loan maturity	−0.64***	−0.59***	−1.38***
	[0.11]	[0.17]	[0.25]
Observations	5,436	1,933	1,778
R^2	0.47	0.48	0.51

Notes: The dependent variable is share of the loan retained by the originating banks in percent. Each regression includes two-digit SIC industry, and credit ratings fixed effects. Robust standard errors are reported in brackets.

***Significant at the 1 percent level.

**Significant at the 5 percent level.

*Significant at the 10 percent level.

An alternative explanation of the countercyclicality of the lead share is based on the countercyclicality of loan demand. Since loan demand falls during a recession, lead banks may have enough capital to fund larger shares of their originations. In this view, we should have observed an increase in the lead share in all three recessions in the sample. The fact that we do not see an increase in the lead share during the 2001 recession suggests that there is another factor at work. Indeed, a key distinction between the 2001 recession and the other recessions in the sample is that the others were both associated with (or perhaps caused by) significant negative shocks to bank capital. By contrast, the 2001 recession was associated with the bursting of the tech bubble, which had little or no effect on bank capital.[4] This suggests that shocks to financial capital underlie the relationship between lead share and credit conditions. In other words, shocks to borrower collateral and risk are less important in explaining variation in the lead share.

[4] Nonperforming loans as a fraction of tangible common equity and allowances for loan losses was 0.12 in 2001 recession (0.10 in 1999) and 0.20 in 2007–2009 (0.5 in 2006). Numbers correspond to the 15 largest US syndicated loan originators with Call Reports available. The average Center for Research in Security Prices market beta excess return for the top four US originators (Bank of America, JPMorgan Chase, Citibank, Goldman Sachs) was five percent in annualized terms between March 2001 and November 2001 (NBER recession) and −21 percent between December 2007 and December 2008.

If shocks to capital primarily affect lead banks, one would expect lead share to have fallen in financial crises. The fact that lead share increased during periods of reduced bank capital suggests that the shocks may have had a larger effect on the capital of syndicate participants. If these investors lacked capital to hold new loan originations, it would have forced the lead bank to hold a larger share of the loan. As suggested above, it is also possible that the shocks did not have a greater effect on the capital of syndicate participants but did increase the variation in bank capital, leading more capital constrained participants to demand higher returns for their participation. Rather than offer higher returns to all participants, the lead bank may choose instead to offer lower returns to the syndicate and retain a larger share of the loan. This explanation would suggest that during periods when the average lead share is high, the average number of participants in the syndicate should be low. Figure 3 plots these two series, which have a correlation of −0.93. This negative correlation may also be consistent with the existence of variation in investor sentiment over the cycle, as there are fewer investors who overvalue the loan participation during a downturn and perhaps more who undervalue such participations.

II. Final Remarks

We have argued that cyclical variation in the demand for loan participations—whether

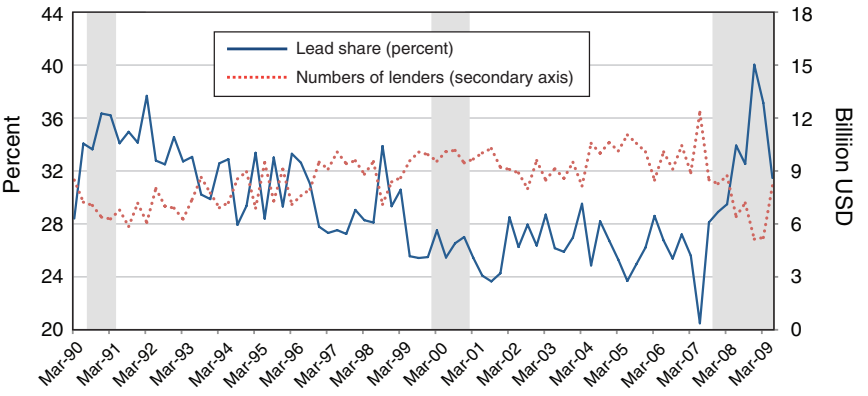

FIGURE 3. LOAN SHARE RETAINED BY THE ORIGINATING BANK AND NUMBER OF SYNDICATE PARTICIPANTS

Notes: The graph is compiled from DealScan database of loan originations and corresponds to US, nonfinancial syndicated loans. Lead share and number of lenders is a three-month rolling window average (equally weighted). Shaded areas indicate US economic recessions as defined by NBER.

through shocks to bank capital or variation in investor sentiment—can help to explain variation in the lead share and thus also increase the cyclicality of credit. One limitation of this analysis is that we have ignored the role of securitization in the syndication process. Beginning in 2004, sponsors of collateralized loan obligations (CLOs) became large buyers of speculative grade syndicated loans. This increase in loan demand was associated with an expansion of credit, particularly for leveraged buyouts, and a reduction in the share held by lead banks. As CLO demand evaporated in mid-2007 due to concerns about all types of securitization, lead share increased. Although this is not the explanation we have emphasized, it is consistent with our general perspective since CLOs can be thought of as special purpose financial institutions that experienced large increases and then decreases in their supply of capital. This would then have an effect on lead share and the supply of credit. This suggests that there are important linkages between securities markets and loan syndication. Further study of these interactions is likely to be a fruitful area of research.

REFERENCES

Bernanke, Ben, and Mark Gertler. 1989. "Agency Costs, Net Worth, and Business Fluctuations." *American Economic Review*, 79(1): 14–31.

Diamond, Douglas W. 1984. "Financial Intermediation and Delegated Monitoring." *Review of Economic Studies*, 51(3): 393–414.

Duchin, Ran, Oguzhan Ozbas, and Berk Sensoy. Forthcoming. "Costly External Finance, Corporate Investment, and the Subprime Mortgage Credit Crisis." *Journal of Financial Economics.*

Froot, Kenneth A., and Jeremy C. Stein. 1998. "Risk Management, Capital Budgeting, and Capital Structure Policy for Financial Institutions: An Integrated Approach." *Journal of Financial Economics*, 47(1): 55–82.

Holmstrom, Bengt, and Jean Tirole. 1997. "Financial Intermediation, Loanable Funds, and the Real Sector." *Quarterly Journal of Economics*, 112(3): 663–91.

Ivashina, Victoria. 2009. "Asymmetric Information Effects on Loan Spreads." *Journal of Financial Economics*, 92(2): 300–19.

Ivashina, Victoria, and David Scharfstein. Forthcoming. "Bank Lending During the Financial Crisis of 2008." *Journal of Financial Economics.*

Ivashina, Victoria, and Zheng Sun. 2008. "Institutional Demand Pressure and the Cost of Leveraged Loans." Unpublished.

Shleifer, Andrei, and Robert Vishny. Forthcoming. "Unstable Banking." *Journal of Financial Economics.*