DOES BANK POWER RAISE LOAN PRICE?

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Abstract — We use U.S. syndicated loan data to investigate the effects of banking market concentration on credit interest. The results show that market concentration of banks in bothborrower's state and lender's state increases syndicated loan spread.

Index Terms ---Banking market; Competition; Syndicated loan; Market power

I. INTRODUCTION

As one of the most important elements in international financial market, syndicated loans provide borrowers a large sum and stable fund at a relatively lower interest rate than bilateral loans, bonds and equity do [1, 3]. Corporate borrowers can benefit from syndication process as to build and keep business relationship with multiple banks. While, lenderscan diversify loan risk through dispersing portfolio into multiple lenders and evade regulations of maximum size of single loan of banks equity capital[28].

Unlike a traditional bilateral loan, a syndicated loan usually contains one borrower and multiple lenders in which a lead arranger originates the loan and performs due diligence and monitoring, and participant banks fund parts of the loan[25]. Because of the distinct structure of syndicated loans, aside from agency problems between lender and borrower, there are two main problems existing in sucha lending process, adverse selection problem and moral hazard problem between lead arranger and participant investors. Lead arranger has information advantage and incentives to syndicate risky loans and is less likely to continue monitor the loan after selling parts of loan to participants[36]. Also because lead arranger owns no fiduciary duties to any participant banks, participant banks would like to let lead arranger to obtain a larger fraction of syndicated loan which not only reduce the moral hazard selection problem but also work a strong signal of less default risk of borrowers[40]. In reference [36], author also points out that the larger share obtained by lead arranger would increase risk of their loan portfolios, thus a higher price will be required by lead bank.

This distinctive research topic has been an area of interest of intense investigation, such as impact on syndicated loan structure by type of lenders [27, 34-35, 39], by type of borrower company[13, 20, 41, 46], by borrower-lender relationship[6-7, 9, 12], by macro culture and law [20, 26, 30, 38] and etc.

However, the mechanism driven by bank market structure has yet to be fully defined. As one of the most important sources providing external finance to firms, banks play an essential role in supplying credit, determining the cost of finance and maintaining bank-firm relationship. Changes of bank market structure would matter for cost of supplying fund, firm's innovation, economic growth and social welfare [11, 17-18].

There are two opposing hypotheses can potentially explain relation between syndicated loan prices and bank market structure, structure-performance hypothesis and structure-efficiency hypothesis. In literatures[15], [47] and [33] , authors insist high market power will lead to no-competitive prices. If in a less concentrated market, banks will charge lower spread from borrowers. While, structure-efficient hypothesis believes high market power which

resulting from efficient performance and management would generate competitive prices [2, 5, 29, 32].

To test which hypothesis determine syndicated loan price, we use a sample of 33,023 facilities of syndicated loans from DealScan database, each of which was originated between 1994 and 2012 to listed corporations located in U.S. We examine the impact of bank market structure, in the state where head quarter of lead arranger located, on the price of syndicated loan changes.

We estimate the difference in syndicated loan pricing among 51 states yearly changed bank market concentration. In doing so, we control for other variables that potentially or directly influence the loan pricing, such as loan facility-specific characteristics, firm's risks measured by profitability and tangibility, firm other characteristics, and we also control state macroeconomic information which may influence state economic. Our estimate suggests that higher bank market power is associated with higher syndicated loan pricing no matter from borrower market or lender market, which follow the basic Structure-Conduct-Performance (SCP) model.

The key contribution of this paper follows:

1. To our knowledge, it is the first paper to examine the relationship between bank market power and syndicated loan prices and fees.
2. This paper also sheds lights on policy, our findings are in favor of market competition. As that government would reduce concentration of bank market, thus syndicated loan borrowers, especially the home state borrowers would enjoy lower spread fund to sustain their production.
3. As a wise syndicated loan borrower, they would look for loan lead-arranger whose headquarter located in less concentrated market, because one standard deviation (0.12) decrease in lender bank market would generate around $102,000 (or $48,000) less in syndicated loan spread (or fees) with an average size of syndicated loan ($ 366 million). Inversely, lender institutions would like to invest borrowers located in higher concentrated bank market, because they can charge higher spread (or fees). For example, one standard deviation (0.12) increase in the borrower bank market concentration would raise spread (or fees) by around $100,000 (or $31,000).

The rest of paper proceeds as follows. Section 2 is literature review. Section 3 describe database and methodology. In Section 4, we report our result and conclude in Section 5.

II. LITERATURE REVIEW

There are two opposing theorems explaining the relation between bank market structure and loan price, structure-performance hypothesis and structure-efficient hypothesis. Based on traditional approaches to analysis the influence of bank market concentration, Structure-Performance (SP) model insists that monopolistic bank market will result in higher credit interest rates and lower credit aggregates, because banks with monopoly power will always tend to charge borrowers a higher interest rate while pay a relatively lower interest to depositors to maximize their profit and is more likely to lead strict credit rationing than in a competitive market[33, 43].

The Structure-Conduct-Performance(SCP) paradigm is inspired by economists Edward Mason [42] and Joseph Bain [48] researching in market structure based on basic monopolistic competition theory. Then in early 1990s, researchers began using traditional SCP paradigm to analyse bank market industry[31, 45, 49]. In the theory of SCP, it is believed that monopolistic bank market will always tend to charge borrowers a higher interest rate while pay a relatively lower interest to depositors to maximize their profit and is more likely to lead to strict credit rationing than in a competitive banking market[33, 43]. Therefore, from the bank credit supply orientation, there will be less accessible fund can be obtained by firms when paying a relatively lower interest rate to depositors. When there is a stringent banking screening

regulation,Guzman[33] shows that it will result in a lower rate of capital accumulation, furthermore, the increasing cost of excessive monitoring in monopoly banking market will cause a less attractive loan condition to borrower firms. Additionally, Black and Strahan[8] proves this argument using U.S. interstate and cross-industry data, and they found that there is less new business incorporationwith a higher bank concentration, and this evidence will be more significant with a strict bank regulation. At the same time, bank market concentration has been closely related with bank cost efficiency. Low cost efficiency may be another reason for bank to raise loan spread. Such asAriss[4] proved that market power decrease cost efficiency using Lerner Index in developing countries during 1999-2005. Delis and Tsionas[21], using European and U.S bank data from 2000 to 2007, find a negative relation between bank market power and efficiency. More recently,Chortareas, Kapetaios and Ventouri[16] suggest that open in banking deregulation and interstate banking could improve banking competition and efficiency.

While, some other researchers developed Structure-Efficient model (SE), it suggests that productive-technology and well-management will help banks to reduce cost and gain a higher profit, thus accelerate to take over a large market share[23-24, 44]. We have reasons to believe that U.S bank market become more efficient because deregulation of interstate banking and branching unblocks nationwide interstate banking and branching activities after Interstate Banking and Branching Efficiency Act of 1994[10]. The development of new technology and transport further eases the barriers to participant in new bank market and accelerates the merge activities between banks[19, 37]. If this is the case, ahigher bank market concentration would positively generate with more efficient performance and lower loan prices, because banks will price their service more competitively in a more efficient market.

Therefore, based on Structure-performance model (SP), banks will charge higher interest rate if they have monopoly power to control the market. If it is true, syndicate loan prices will increase with bank market concentration. However, if from Structure-Efficient model, syndicated loan prices will negatively relate with bank market concentration. Another issue we need to consider is that, unlike other countries which banking systems are dominated by few larger banks with a nationwide branch networks, United States consists of more geographically segment of banking market. Therefore, we cannot treat the whole U.S banking market system as one unit to test its impact as the unusual structure of U.S. banking market system. We improve on the existing literature by allowing concentration to influence syndicated loan prices in different market, such as considering different effects of concentration if borrower and lender are from different states. The traditional view of Structure-Performance (SP) model and Structure-Efficient model only considers the influence on their home markets, the loan prices increase (or decrease) with the changes of banking market concentration in home market. However, there is little evidence on prices changes if borrower from a distinct bank market after controlling culture and regulation factors.

III. DATA AND METHODOLOGY

A. Data

The empirical data used are collected from various sources. We collect syndicated loan samples from Dealscan at Reuters Loan Pricing Corporation (LPC) and bank information from Federal Deposit Insurance Corporation (FDIC). We also collect firm level information of the borrowers from Compustat and macroeconomic control variables from Federal Reserve Bank of St. Louis. Our syndicated loan samples cover the period of 1994 and 2012 so as we have full information set for borrowers, lenders, local (state level) banking information. To match borrower-lenders' location, we exclude sample loans issued to borrowers headquartering out of U.S. and those with missing location information. We followChava and Roberts[14]and use a

Compustat-Dealscan link file to match each syndicated loan to its borrower whose financial data are collected from Compustat. Therefore, we use 33,023 syndicated loan samples in total between 1994 and 2012 in the following empirical analysis.

B. Baseline model Specification

To examine the effects of banking market concentration on syndicated loan price, we have the baseline model specification (Eq.1) as follows:

$$Syndicated\ loan\ price = \partial + \beta \times banking\ market\ concentration + \gamma \times Controls + \varepsilon \quad \cdots\cdots\cdots (1)$$

where syndicated loan price is measured by *fees*, *spread* and*overlibor*, banking market concentration is measured by CR_n and HHI and control variables include the characteristics of loan facility, borrower and macroeconomic condition, where we match firm financial data from the fiscal year prior to the loan issue year. In addition, we also control for the aggregate trends in year, loan purpose and lender type fixed effects to eliminate the effects driven by time, loan type and lender type.

IV. BASELINE RESULT

We employ the baseline model (Eq. 1) to investigate the effects of banking market concentration on syndicated loan price where the results are reported in Table 1. In the first three columns we consider the effects of borrower's market and in the last three, we examine the effects of lead arranger's market. Overall, Table 1 shows that after controlling for a rich set of variables and fixed effects, syndicated loan borrowers would pay a higher cost, in terms of fees, spread and overlibor, in a more concentrated banking market with higher CR_{50}, supporting *market power hypothesis*. In addition, the economic effects of banking market concentration are significant. For example, a standard deviation (0.12) increase in $CR_{50}^{Borrower}$ (or CR_{50}^{Lender}) would raise the *overlibor* of a typical syndicated loan by 1.73 (or 4.24) base points, equivalent to around $63,000 (or $155,000) additional costs for a borrower with an average size of syndicated loan ($366 million). In particular, borrowers are also charged higher fees (commitment fee and annual fee) in a concentrated banking market and a standard deviation increase in $CR_{50}^{Borrower}$ (or CR_{50}^{Lender}) would increase *fees* by about 3% (or 4%).

While, it is still a problem to concern the reason that companies borrow expensive loan from concentrated bank market. One possible reason is that bank with power can effectively improve firm's performance after they issue the syndicated. Delis, Kokas and Ongena[22]have proved that there are at least five ways that bank can enhance borrower's performance, such as bank with market power have capacity to provide and screen investment idea for firms, providingsustaining fund during financing-constraint, increasing the debt payoff restructuring of a financially distressed borrower, providing more industry information for borrower, superior monitoring capacity also help borrowers' performance.

CONCLUSION

This paper investigates the impacts of state-level banking market concentration on facility-level loan deal. Our empirical evidence strongly supports market power hypotheses which firms would have better access to bank finance with lower cost in a competitive bank market.

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Table 1.

Baseline results: banking market concentration and syndicated loan price

Samples collected are between 1994 and 2012 with a total number of observations of 33,023. Dependent variable is syndicated loan price measured by *spread*, *fees* and *overlibor*. Banking market concentration is measured by concentration ratio (CR_{50}) in the borrower's market and lender's (lead arranger) market respectively. 'Performance pricing indicator' is defined as a dummy and coded as 1 if a sample loan has *overlibor*; therefore, we do not consider it in *overlibor*models (3 and 6). We also control for the fixed effects of loan type, lender type and year. Standard errors are clustered at lender-firm year level and reported in parentheses. ***, **,and * denotes statistical significant level of 1%, 5% and 10% respectively.

VARIABLES	Model 1 Spread	Model 2 Fees	Model 3 Overlibor	Model 4 Spread	Model 5 Fees	Model 6 Overlibor
Banking Market						
$CRK50^{Borrower}$	22.61***	7.197***	14.44*			
	(6.139)	(1.785)	(8.311)			
$CRK50^{Lender}$				23.31***	10.99***	35.35***
				(7.369)	(1.879)	(9.511)
Loan facility						
Log (Loan size)	-13.69***	-3.357***	-14.41***	-14.87***	-3.615***	-14.66***
	(0.688)	(0.245)	(1.013)	(0.779)	(0.280)	(1.082)
Loan maturity	0.292***	0.167***	0.647***	0.254***	0.148***	0.595***
	(0.0336)	(0.00974)	(0.0484)	(0.0383)	(0.0100)	(0.0517)
Total number of lenders	0.0445	0.0658**	0.0294	0.152*	0.105***	0.133
	(0.0737)	(0.0294)	(0.102)	(0.0819)	(0.0334)	(0.112)
Term loan dummy	53.37***	13.05***	34.97***	52.75***	11.92**	34.47***
	(1.338)	(4.048)	(1.835)	(1.547)	(5.198)	(2.010)
Covenants indicator	18.27***	3.819***	1.051	20.97***	3.462***	1.363
	(1.688)	(0.498)	(3.028)	(1.919)	(0.549)	(3.352)
Performance pricing	-35.60***	-3.333***		-36.48***	-3.141***	
	(1.484)	(0.492)		(1.689)	(0.549)	
Borrower's						
Log (Asset)	-13.25***	-1.387***	-22.12***	-12.89***	-1.433***	-22.46***
	(0.623)	(0.229)	(0.964)	(0.697)	(0.266)	(1.001)
Tangibility	3.407	4.173***	-3.301	1.900	3.052***	-6.189*
	(2.491)	(0.642)	(3.275)	(2.809)	(0.708)	(3.631)
Profitability	-8.538**	-2.907***	-5.029	-8.509**	-2.791***	-4.255
	(3.909)	(0.859)	(3.531)	(4.124)	(0.729)	(2.764)
State macroeconomics						
State personal income	-0.863***	-0.0993**	-1.322***	-0.804***	-0.0999**	-1.443***
	(0.144)	(0.0391)	(0.191)	(0.160)	(0.0456)	(0.209)
Log (GDP)	2.181***	0.593**	3.650***	1.759**	0.164	2.120**
	(0.780)	(0.246)	(1.029)	(0.807)	(0.247)	(1.072)
Constant	482.2***	64.78***	339.5***	719.9***	71.70***	423.5***
	(25.87)	(7.808)	(30.79)	(27.26)	(9.218)	(33.98)
Observations	28,198	18,225	14,470	21,963	14,563	11,320
R-squared	0.511	0.320	0.517	0.520	0.322	0.530
Year FE	YES	YES	YES	YES	YES	YES
Purpose FE	YES	YES	YES	YES	YES	YES
LenderType FE	YES	YES	YES	YES	YES	YES