Bank Capital Ratios, Competition and Loan Spreads

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Abstract

This paper uses a dataset of all syndicated loans issued by U.S. borrowers during the 1993 to 2007 period and empirically investigates whether or not bank banks charge higher loan spreads for maintaining high capital ratios. We find convincing evidence that this is indeed the case. We further investigate whether this result can be explained by banks holding-up their borrowers. using various proxies for information asymmetry and competition, we cannot reject the hypotheses that all borrowers pay for banks having high capital ratios. In other words, this premium is not competed away even for the most transparent firms. Our findings have implications why borrowing costs are higher in the U.S. than in Europe.

JEL-Classification: G14, G21, G30

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1 Introduction

This paper examines whether or not bank banks charge higher loan spreads for maintaining high capital ratios. This is an important question as, since the mid-1990s, capital ratios in U.S. banking organizations have substantially exceeded even the highest supervisory standards (so-called "capital buffer"). Berger et al. (2008) document that "as of June 2007, the 67 BHCs with assets exceeding 10 billion had a mean Tier 1 leverage ratio of 7.63%, a Tier 1 risk-based ratio of 9.38%, and a total risk-based capital ratio of 11.97%". Yet, only few studies shed light on the role of bank capital on the costs of corporate debt[1].

If banks price high capital ratios into loan spreads, as we find, it is an interesting question to ask whether loans are priced differently for transparent versus opaque firm with respect to this loan spread component. As argued in Rajan (1992), banks might be able to charge higher loan spreads to informationally opaque firms which lack alternative outside funding options and thereby 'hold-up' the borrower. If higher loan costs induced by high capital ratios are simply an artifact of hold-up, this higher spread can be competed away at least for informationally transparent firms. However, if loans are not priced differently for opaque versus transparent firms and also competition among banks does not lower the costs of corporate borrowing, then the effect identified in this paper might well explain why loan costs are higher in the U.S. relative to Europe (Carey and Nini, 2007).

We use a dataset of all syndicated loans issued by U.S. borrowers during the 1993 to 2007 period and empirically investigate whether banks charge higher loan spreads for maintaining a 'capital buffer'. Specifically, our paper contributes in two important ways. First, by focusing on a period during which banks continuously increased their capital ratios, we find contradicting evidence to a widely cited argument in the literature, that "weak banks charge higher loan spreads" (Hubbard et al., 2002). Second, we provide evidence for a loan spread component which is not competed away and might explain at least in part why loan spreads are higher in the U.S. than in Europe (the 'loan spread puzzle' according to Carey and Nini (2007)).

This paper proceeds as follows. Section 2 gives an overview over related literature resulting in the formulation of hypotheses. Section 3 describes our dataset and provides some descriptive statistics. In section 3, we set out our methodology, discuss our results and provide evidence for their robustness. Section 5 concludes.

2 Related Literature and Presentation of Hypotheses

2.1 Theoretical and Empirical Background

Carey and Nini (2007) find convincing evidence that syndicated corporate loan spreads differ significantly between Europe and the United States. The authors conclude that their findings

[1] Hubbard et al. (2002)) is the notable exception.

weakens traditional explanations for price differences, such as legal regime (La Porta et al., 1997) as well as asymmetric information and moral hazard (e.g James, 1987; Berlin and Mester, 1992). Furthermore, Carey and Nini (2007) mention that many borrower and loan characteristics are important for the determination of the loan rate, but nevertheless " the difference in average loan spreads across markets persists, suggesting that the market effect is not due to well-understood differences in the composition of borrower or loan characteristics". However, despite extensively controlling for borrower as well loan characteristics, the authors focus on lender characteristics less detailed[2]. Therefore there seems to be room to further explore lender characteristics and their impact on loan spreads.

Nevertheless, there exists vastly research how reputation might influence the pricing of a loan. For example, Allen (1984) develops a model which shows that reputable firms can charge more for their products. Comparable research was conducted by Klein and Leffler (1981) and Shapiro (1983). Additionally, Fang (2005), focusing on securities' underwriting of investment banks, argues that "economic rents are earned on reputation, and thereby provide continued incentives for underwriters to maintain reputation". Billett et al. (1995) find empirical evidence that choosing lenders with higher reputation, as defined by credit ratings, lead to larger abnormal stock-market returns for the borrower. A recent study by Coleman et al. (2006) approximate reputation with lender monitoring skills resulting in the evidence that banks with greater monitoring capabilities can ceteris paribus charge higher loan spreads. Beside commonly used risk measures, the authors also incorporate proxies for monitoring effort and monitoring quality based upon salary expenses[3].

Overall, Coleman et al. (2006)'s finding suggest that banks are able to charge a higher loan spread if they have 'superior' monitoring abilities because they are better able to attenuate moral hazard problems. In conjunction with this, a recent work by Allen et al. (2008) provides a theoretical explanation why a bank's equity capital is a credible commitment to dutifully monitor a borrower and thereby reducing moral hazard. The authors develop a one-period model of bank lending where firms need external financing to make investments. After the loan was granted, the bank should monitor the borrower closely which helps to improve the borrower's performance. However, since monitoring is costly and banks have limited liability, banks are subject to a moral hazard problem in the choice of monitoring effort and therefore need to be provided with incentives to exert more monitoring effort which on the other way increases the probability that a borrower's investment is successful. The authors mention that the moral hazard problem can be overcome or at least attenuated through the amount of equity capital a bank has at stake. More accurately, Allen et al. (2008) state that "capital forces banks to internalize the costs of their default, thus ameliorating the limited liability problem banks face due to their extensive reliance on deposit-based financing." However, as it is argued by

[2]For example, regarding asymmetric information they test if the lender's nationality is different from the one of the borrower.

[3]Interestingly, these monitoring proxies are rather ex-ante measures compared to traditional monitoring proxies, such as loan charge-offs.

the authors, a higher capital amount is also beneficial to the bank since it increases a bank's attractiveness to borrowers and thereby improves the bank's 'product-market' opportunities.

If the theoretical model of Allen et al. (2008) is valid then banks should hold more equity capital than required by supervisory standards and making these capital requirement rather meaningless. Regarding this, Berger et al. (2008) show that U.S. bank holding companies hold equity capital far above the required Basel I minimums. Beside the circumstance that the Tier-1 and Total Capital risk-based ratios vary across the years, the authors state that "the annual averages exceed minimum capital standards by material amounts in every year of the data". On average the Total Capital risk-based ratio exceeds the Federal Reserve's definition of 'well-capitalized' by at least 200 basis points for every observation year[4]. Similar findings are observed by Flannery and Rangan (2008) who find that banks capital ratios have increased substantially since the beginnings of the 1990s, with banks in the United States holding capital in 2001 that is 75% in excess of the regulatory minimum. One might argue that the increase in banks capital ratios in the last decade might be just a result of high profitability in the banking sector since the 1990s[5]. However, Flannery and Rangan (2008) mention that their findings suggest that the capital growth of banks at the beginning of the 1990s has been a deliberate and rational response to regulatory and market changes[6]. In accordance with this, Berger et al. (2008) find evidence that U.S. bank holding companies actively manage their capital ratios by freely using share repurchases to offset other additions to equity capital. The authors infer that banks like to keep capital ratios high due to "the benefits of maintaining a specific standing in credit markets".

This insight suggests that banks actively keep capital ratios high and contradicts "the widely accepted view that equity capital is more costly for banks than other forms of funds, the common result in many analyses of bank regulation is that capital adequacy standards are binding as banks attempt to economize on the use of this costly input", as it is pointed out by Allen et al. (2008). Further, Allen et al. (2008) state that a "common justification for capital regulation for banks is the reduction of bank moral hazard". In other words, a low level of equity capital, is an incentive for a bank to take on excessive risk. However, as it is concluded by Berger et al. (2008) the empirical results of equity capital show that "minimum supervisory standards are largely irrelevant" and thereby backing the theoretical model of Allen et al. (2008) that borrower prefer to deal with banks having more capital at risk, i.e. having higher capital ratios. Overall, after combining the theoretical arguments and the empirical evidence, it seems

[4]The Basel I minimum of the Total risk-based capital ratio is defined by 8% and the Federal Reserve using this threshold futher defines a 'well-capitalized' bank as one having a Total risk-based capital ratio of at least 10%.

[5]Since dividends are assumed to be rather sticky not all generated profits were distributed to shareholders and therefore retained earnings led to a steep increase in capital ratios.

[6]Regarding this Flannery and Rangan (2008) state that "large banking firms conjectured government guarantees weakened during the 1990s as the Federal Deposit Insurance Corporation Improvement Act (FDICIA) changed failed bank resolution methods and curtailed supervisors ability to ignore banks operating with low capital ratios".

that banks' capital ratios play an important role in the loan market in the United States.

Further, noting that Carey and Nini (2007) state "that a full explanation of the loan pricing puzzle must explain not only why price differences are not competed away by lenders and borrowers, but also what causes the differences to open up", it seems worthwhile to look at capital ratios in Europe. Here a recent study by Bikker and Metzemakers (2007) suggests that the Total risk-based capital ratios in Europe are not as high as in the United States. While, comparable to Berger et al. (2008), they find an average Total risk-based capital ratio above 12% for U.S. banks during the observation period from 1990 to 2001, the Total risk-based capital ratios of banks in European countries are around 10%[7]. Their finding is broadly in line with Barth et al. (2005) who provide a snap-shot cross-country comparison of banks' capital ratios for 131 countries. Carey and Nini (2007) concluded that "loans made in the European and U.S. markets may differ materially along some dimension that is relevant to price but that has received little attention." Interestingly, research on the influence of a bank's capital on the charged loan spread is surprisingly neglected beside a recent study of Hubbard et al. (2002). So following the lines of our reasoning, differences in the capital ratios across Europe and the U.S. might play a vital role in explaining at least a part of the 'loan prizing puzzle'.

Before presenting the hypotheses in the next section, a policy implication might evolve if there is a systematic relation between charged spreads and a bank's capitalization. Regarding this, Morgan and Ashcraft (2003) mention that "supervisors might consider using interest rates in the off-site surveillance of banks." However, if well-capitalized peers can ceteris paribus charge higher loan spreads compared to their not so well-capitalized peers then it seems quite arguable if supervisors should "consider basing capital requirements on loan interest", as proposed by Morgan and Ashcraft (2003).

2.2 Emerged Hypotheses

From the line of reasoning evolved in section 2.1 testable hypotheses emerge quickly. The first hypothesis introduces the main question of interest whereby the consequent hypotheses reflect extensions that are quite common in the financial intermediation literature.

Since Allen et al. (2008) argue that corporate borrowers may prefer to deal with banks having higher capital ratios which increases banks incentives to monitor. In addition, Berger et al. (2008) argue additionally that firms prefer well-capitalized lenders because borrower-lender relationships are costly to replace in the event that the lender fails. This leads to our first hypothesis:

> **Hypothesis 1 (H1):** *Well-capitalized banks charge higher spreads for loans compared to their not so well-capitalized peers.*

[7]For example, the average Total risk-based capital ratio of German banks is 10.3%. For French banks it is 10.2% and for Spanish and Italian banks it is 10.6% and 9.8%, respectively. This difference between European and U.S. banks is even more pronounced for the Equity capital ratio which, however, is less common used in Europe as a reference measure.

If banks price high capital ratios into loan spreads, it is an interesting question to ask whether loans are priced differently for transparent versus opaque firm with respect to this loan spread component. As argued in Rajan (1992), banks might be able to charge higher loan spreads to informational opaque firms which lack alternative outside funding options and thereby "hold-up" the borrower. If higher loan costs induced by high capital ratios are simply an artifact of hold-up, this higher spread can be competed away at least for informational transparent firms. However, if loans are not priced differently for opaque versus transparent firms, information transparency does not lower the costs of corporate borrowing. This gives us our second hypothesis:

> **Hypothesis 2 (H2):** *The higher loan spreads charged by well-capitalized banks cannot be fully explained by information opacity of the borrower.*

Petersen and Rajan (1994) argue that competition reduce bank's lending fees. Further, Hubbard et al. (2002) mention that "absent informational frictions, in a competitive loan market, the loan interest rate charged by a bank to a borrower should reflect the banks cost of funds and the risk characteristics of the borrower". Regarding competition in the syndicated loan market Rhodes (2004) notes that "the number of banks participating in the market and capable of arranging syndicated transactions continues to decline but competition remains fierce nonetheless. We approximate competition with concentration as it is commonly done in the financial intermediation literature. For example, Bikker and Haaf (2002) conclude that their findings are "providing support for the conventional view that concentration impairs competitiveness". However, according to Allen et al. (2008), reputable banks might be able to charge higher spreads independent of the competition environment. We transform this into the third hypothesis:

> **Hypothesis 3 (H3):** *Competition does not alter the market power of well-capitalized bank and therefore the spread charged by it.*

We now introduce the dataset which is the source for the subsequent testing of the hypotheses in section 4.

3 Data and Sample Selection

3.1 Data

To gain insights into the question whether or not strong banks charge higher spreads, we construct a dataset using three different data sources, namely the Loan Pricing Corporation Dealscan (henceforth LPC) database, the CRSP/Compustat database and Call Reports from the Bank Regulatory Database.

We create the universe of our sample by first merging loan transaction data from LPC with borrowing firms' financial statement data from CRSP/Compustat. LPC contains detailed information on worldwide syndicated loan originations, e.g. contract terms, lender identities and their roles within the syndicate, as well as borrower identity information (i.e. name, region, country, and SIC industry classification)[8]. Since LPC focuses primarily on information of the loan contract we use the merged CRSP/Compustat database to extract accounting and capital markets information on publicly-listed borrower, such as size of assets or the share price. Unfortunately, LPC does not offer an unique identifier, so we had to hand-match the LPC's borrower names with the one of CRSP/Compustat where we used a rather conservative approach comparable to Santos and Winton (2008). To guarantee that we use only accounting information that was publicly available at the time of the loan, we used the accounting data from the year before the loan was syndicated[9]. Since CRSP/Compustat data is only available for publicly listed firms, we label all other firms as privately held firms. After appending the accounting information we excluded all financial service firms (SIC codes between 6000 and 6799) and turned to the LPC's bank names, i.e. lead arranger names, and compared them with the Call Reports' bank names from the Bank Regulatory Database. Finally, we were able to retrieve the RSSD number for the majority of banks and used this unique identifier to obtain all the financial information on banks. It is important to point out that we the match is done on the bank level and not on the holding company level. A major advantage is that the bank level name obtained from the LPC database does not change as a consequence of a merger. Thus, we do not need to control for mergers that could have affected the change in ownership for which we would have to control for when analyzing on a parent level. However, only in a small number of cases we obtained exactly the same names for both LPC and Call Reports. For example, referring to the LPC lender parent name for Citigroup Inc., we found various lender subsidiary names such as Citi, Citibank and Citibank NA, whereas in the Call Reports this subsidiary is labeled Citibank NA[10]. For those banks that we still could not match due to a lack of appropriate names in the Call Reports, we checked the banks' websites if there were identities present matching the ones in the Call Reports files. However, we explicitly accounted for mergers between financial institution, so that we also matched banks that are now extinct. So accounting information of banks such as Chemical Bank NA and Bankers Trust Company. The bank's data is from the quarter prior to the issuance of the loan to explicitly incorporate,

[8]LPC is commonly used in the literature on syndicated loans and lending relationships (see e.g. Bharath et al. (2007), Drucker and Puri (2005) and the references cited therein). A good description of LPC is provided in Strahan (1999).

[9]We are aware that this approach has advantages as well as disadvantages. Some researchers, for example, Bharath et al. (2008) use the following approach: "For those loans made in calendar year t, if the loan activation date is 6 months or later than the fiscal year ending month in calendar year t, we use the data of that fiscal year. If the loan activation date is less than 6 months after the fiscal year ending month, we use the data from the fiscal year ending in calendar year t-1." However, from our point of view our approach is the one that can ensure the public availability of the borrower's information at the time of the beginning of the loan syndication.

[10]To cancel out differences in names, we used total assets and the location and compared them with the individual financial institutions using the banks' websites.

for example, increases in loan loss provisions due to recent detoriations in the loan portfolio quality.

3.2 Descriptive Statistics

Our main dataset includes all syndicated loans from the beginning of 1993 till the end of 2007 done by public U.S. non-financial firms[11] After matching the sample with our borrower and bank data, we end up with 21,053 loan agreements with an average facility amount of USD 380 million[12].

[Figure I]

The analysis of the changes over time allows for very interesting observations concerning changes in the financial services sector involved in granting syndicated loans (cf. Figure I). Especially the increase in terms of total assets from USD 83 billion in 1993 to USD 804 billion in 2007 and in terms of deposits from USD 57 billion to USD 491 billion for the same time period are enormous. Both the growth rate of both assets and deposits reach an increase of approximately 60 percent only for the years 1999 to 2000.

Table I offers a summary statistics of used variables as well as informative ratios such as Noncurrent Loan rate which is the percentage of noncurrent loans to total loans.

The mean Total Risk Based Capital ratio is 11.6 percent and therefore way above the minimum requirement of 8% as demanded by the Federal Deposit Insurance Corporation (FDIC) and the Bank for International Settlements (BIS). The mean of the Tier-1 Risk Based Capital ratio (8.4%) is also above the requirement of 4%. This observation is consistent with Flannery and Rangan (2008) who found that a majority of banks hold more capital than the required regulatory minimum.

Furthermore, the descriptive statistics of Loan Loss Allowance rate, the Noncurrent Loan rate as well as the Loan Charge-offs rate are broadly in-line with the descriptive statistics published in Quarterly Banking Profile by the FDIC. Interestingly, is the huge kurtosis of bank characteristics measured in absolute values (in constant 2000 USD), such as deposits and especially total assets. Huge swings in variables are also visible if the bank characteristics are subdivided into the observation years of the sample period.

[Table I]

[11]Excluding the private companies may understate our results because weaker borrowers experience higher lock-in effects (cf. Hubbard et al. (2002) and Steffen and Wahrenburg (2007)). We have to exclude all private companies that are not listed due to the lack of borrower information.

[12]Most of the lost observations are due to a lack of information about the borrower or the bank.

Table II.A segregates the matched sample after years and thereby clearly shows that there have been major changes in loan as well as borrower characteristics and especially in bank characteristics. While assets grew by as much as ten times over our sample period, the loans to assets ratio decreased over our time period from 60% to 50%. The mean of the bank's coverage ratio which is defined as loan loss allowance to noncurrent loans varies -as expected- with the business cycle. The ratio decreases with the recession and increases with the upswing.

The opposite is true for the all-in-spread-drawn (AISD). It increases with the recession and decreases with the upswing. However, as best pictured in Figure II, this incident is observed with a certain time lag.

[Figure II]

[Table II.A]

Most strikingly is the observation that the Total capital ratio stayed nearly constant over time and varied only by less than one percent in total. This is nearly also true for the Tier-1 Capital ratio. This interesting finding suggest that banks actively manage their Total Capital and Tier-1 Capital ratios which is in line with Berger et al. (2008) who argue that the optimal pecking order[13] and the need to adjust to market conditions lead to an active management of capital ratios and thus to a higher level of capitalization.

[Table II.B]

In Table II.B we divided the matched sample into borrower sales categories showing that even we are dealing with publicly listed firms there are huge differences in firm sizes. More than 50 percent of the companies have sales larger than USD one billion (in constant 2000 USD), and on the other side nearly 20 percent of the companies have sales below USD 250 million a year. The fraction of the secured loans decreases with the borrower sales size. The mean of the AISD decreases heavily with the borrower sales size

On the one side, the bank's Total Capital and Tier-1 Capital ratios do not vary across the different sales size. On the other side, it is interesting to see that loans to assets ratio decreases with the borrower sales size but the Noncurrent Loans rate increases with the borrower sales size. From just looking at the descriptive statistics this might suggest that banks lending to small borrowers do the borrowers' credit analysis more thoroughly. The in the credit analyses

[13]Pecking order is used to develop a financing hierarchy for long term finance. Following this approach, internal generated funds are superior to debt and equity is only 'the last resort' of financing to use. (cf. Myers (1984) Myers and Majluf (1984)).

important Z-Score decreases with the size of the company but does not show measurable default risk, since all Z-Scores stay above the value of three.

Overall, the descriptive statistics clearly indicated the change over time in the loan, bank and borrower characteristics. Especially, an increase in the bank and borrower balance sheet data is notable. And the separation by year table indicates a bank's active management of capital ratios.

4 Multivariate Analysis

For our multivariate analysis, we precede as follows. Firstly, we do a basic analysis testing whether there is evidence that low capitalized banks, as measured by total capital to risk-weighted assets, charge higher spreads during 1993 to 2007. Based on our basic results, we introduce a new variable for high total capitalization for all further regressions.

4.1 Methodology

In order to test the influence of the capital structure on the pricing of syndicated loans, we use this basic regression:

$$\begin{aligned} AISD_i &= \beta_0 + \beta_1 Capital.Ratio.Dummy_i + \sum_{k=1}^{n} \beta_{Lk}(Loan.Characteristics_i) \\ &\quad + \sum_{k=1}^{n} \beta_{Ck}(Company.Characteristics_i) + \sum_{k=1}^{n} \beta_{Bk}(Bank.Characteristics_i) + \epsilon \end{aligned}$$

AISD is the abbreviation of the dependent variable all-in-spread-drawn as reported in the LPC database, equaling to the standardized measure of the overall costs of a loan which translates into the spread in basis points over LIBOR also including one-time and recurring fees[14]. The β_0 variable indicates the constant. β_1 , β_{Lk} , β_{Ck} , and β_{Bk} are the coefficients for the capital ratio, loan, company (borrower), and bank characteristics. ϵ is the remaining error term. To account for influences of lenders, borrowers and the syndicated loan terms we control for multiple variables reflecting certain characteristics. These characteristics are presented in more detail in the appendix.

4.2 Do Banks Charge for Maintaining High Capital Ratios?

We first analyze if the equity capitalization of a bank influences the charged spread on a syndicated loan. We control for loan, borrower and bank characteristics .

[14]Loans that are not reported in terms of LIBOR are recalculated in LIBOR terms by LPC.

[Table III]

Table III provides the regression results for our basic set-up on the individual bank level for the period 1993 to 2007 with the all-in-spread-drawn being the dependent variable. Included loan, borrower and bank characteristics are discussed in detail below. Column (A) to (F) differ only with respect to the included bank characteristics but all regressions incorporate year, one-digit SIC, prime dependency and borrower credit rating. Borrower data is from the year and bank data is from the quarter prior to the loan issuance. Standard errors are heteroscedasticity robust and clustered at the bank level. In short, across all six specifications our results indicate that the all-in-spread-drawn (AISD) is positive correlated to the total capital to risk-weighted assets ratio (hence: Total capital ratio) with an effect that ranges from 248 to 331 bps (basis points), suggesting that a high capitalized bank charges higher spreads than their low-capitalized peers. In all specification the capital ratio variable is significant to the one percent level.

We included various bank characteristics in our analyses to point out that the capital ratio effect does not depend on the included bank characteristics and loan portfolio risk measures. In column (A) we just include the Total capital ratio without any other bank coefficients. The Total capital ratio coefficient is positive (+249 bps) and significant at the one percent level. We extend this regression by including the natural logarithm of a bank's total assets (Log of Bank Assets) which exhibits a positive coefficient and significance to the five percent level. This result seems to suggest that larger banks are able to benefit from their stronger balance sheet power in the syndicated loan market. The Total capital ratio is still positive and significant at the one percent level. In order to incorporate risk measures in our analysis we add in the next four regressions each time a risk measure. The risk measures are taken from the "Quarterly Banking Profile" published by the Federal Deposit Insurance Corporation (FDIC). Therefore all incorporated risk measures are good proxies for measuring a bank's loan portfolio risk. We start in column (C) by including the so-called coverage ratio which is defined as the ratio of loan loss allowance to non-current loans. We expect a negative sign since a higher ratio implies a higher 'risk-buffer'. This is confirmed by looking at the regression which shows a negative coefficient (-10 bps) significant at the five percent level. Further incorporating the ratio of loan loss provision to loan charge-offs. Once again a negative coefficient is expected and obtained (significance at the five percent level). In column (E) the ratio of a bank's total loans to a bank's total assets is added. We find a negative sign which is significant at the ten percent level when also the ratio of a bank's total net loans to a bank's deposits (negative sign, significant at the then percent level) is included in column (E). However, most importantly, the positive Total capital ratio coefficient stays significant at the one percent level across all six specifications.

For borrower characteristics we find the expected signs, namely negative, for Market Capitalization, Tangibility, Coverage and the Current Ratio. All these borrower characteristics are

significant at least to the ten percent level. Positive coefficients are present for the Leverage ratio (+17 bps) and Prime Dependency. The coefficients for Log of Market Capitalization, Log of Coverage and the Current Ratio are -18 bps, -12 bps and -2 bps, respectively, across all six columns. The coefficient of Tangibility varies slightly between -12 bps and -14 bps. The dummy variable indicating Prime Dependency is highly positive with a coefficient of 187 bps across columns (A) to (F).

Regarding loan characteristics we find for Log of Maturity of the loan a positive coefficient which is significant at the one percent level. This positive relation is consistent also with Coleman et al. (2006), suggesting that a longer maturity tends to be more expansive in terms of spread. Yi and Mullineaux (2005) and Coleman et al. (2006) also find a negative relation between the AISD and the maturity of a loan. For Log of Facility Size we find nearly no effect on the all-in-spread-drawn.

For the various loan purposes included as dummy variables in our analysis, we obtain higher spreads for recapitalization, acquisition and leverage buyouts at the 1 percent significance level. However, the increase in the spread ranges from 11 bps (Recapitalization) to 95 bps (Leveraged Buy Out). A syndicated loan used for bridge financing (Bridge Loan) increases its spread by approximately 68 bps (significant at the one percent level). In contrast to revolver with a maturity of above one year (+20 bps), revolver with a maturity of less than one year carry a higher AISD of approximately 22 bps. The coefficients for both revolver types are significant at the one percent level. The obtained results for loan purposes, revolving and bridge facilities are consistent with those by Hubbard et al. (2002).

Nevertheless, the most striking observation in table III is the strongly positive relation between the all-in-spread-drawn of syndicated loan and the capitalization (as measured by the Total capital ratio) of a bank. Also already visible and significant, our results may even understate the true high capital effect by two reasons. Firstly, we use only publicly listed companies and thus have a sample which is likely to be biased towards large companies[15]. Thus, additionally including smaller companies would probably increase the high capital effect. Secondly, although we control for loan, borrower, and bank characteristics, other loan terms such as covenants[16] could also affect the spread by a notable level.

However, our obtained positive impact on the capitalization of a bank on spread of a syndicated loan, is contrary to Hubbard et al. (2002) who find a negative relation between the AISD and the capital ratio for their observation period. A reason for this might stem from the different capital ratio measures we incorporate. Hubbard et al. (2002) use equity capital to total assets and we use total capital (which consists of Tier-1 and Tier-2 capital) to risk-weighted assets. The Total capital ratio as defined by the Bank for International Settlements (BIS) has

[15]Cf. for example Petersen and Rajan (1994), Berger and Udell (1995), and Steffen and Wahrenburg (2007) who use either a sample of small companies or a mixed sample of large and small companies.

[16]Covenants are restrictions made in a loan contract to limit the borrowers' possibilities to misuse the capital provided. They can be affirmative and create incentives for borrowers to fulfill certain criteria, or negative and prohibit the borrowers to commit certain actions. (cf. Taylor and Sansone, 2006).

to be honored by banks in the USA since the beginning of 1993. Furthermore, the Total capital ratio measure is superior since it takes explicitly off-balance sheet risk into account.

Nevertheless, we run robustness checks by using Equity Capital Ratio, as it is done by Hubbard et al. (2002), for our time period from 1993 to 2007. We find also a positive relation between the Equity Capital ratio and the charged all-in-spread-drawn. In all three specifications the coefficient is significant to the five percent level. Because of this contradiction we decided to further check our set-up and therefore we rerun our regression model for the years 1987 to 1992 with the Equity Capital Ratio and thereby resembling the time period used by Hubbard et al. (2002). Interestingly, the results tabulated in appendix B are consistent with the ones of Hubbard et al. (2002) because we also find the same effect they do, namely, that low-capitalized banks charge higher spreads (significant at least at the ten percent level).

This changing effect of the bank's capital ratio on the charged all-in-spread-drawn of a syndicated loan seems to indicate that there were significant changes present in the syndicated loan market over the last twenty years. Therefore we try to reconcile and explain these two different outcomes. Coleman et al. (2006) argue, it is hard to understand why only low capitalized banks would charge a premium on their loan spreads, while their well capitalized peers do not intend to do so. We find evidence in the longer time period (1993 to 2007) of our analysis that this is exactly not the case. Higher capitalized banks charge higher spreads and hence seem to exploit their stronger market position. This interpretation is consistent with Klein and Leffler (1981), Shapiro (1983) and Allen (1984), all of whom argue that higher reputation has a positive impact on the level of prices and the quality of issues. It is also in line with Booth and Smith (1986), Chemmanur and Fulghieri (1994) and Fang (2005) that reputable banks charge higher spreads.

But the results of Hubbard et al. (2002) and the ones for our early observation period (1987 to 1992) are still evident and imply that low-capitalized bank, as measured by equity capital to total assets, charged a higher spreads on syndicated loans than their high-capitalized peers at the end of the 1980s and the beginning of the 1990s. Therefore, we need to further investigate this issue and start with it by looking if there were major changes in the banking industry in the first half of the 1990s. Our research concludes that first of all, major regulatory changes for the banking industry were introduced and enforced by the SEC at the beginning of the 1990s. Secondly, the S&L crisis (savings and loan association crisis) in the 1990s influenced the sensitivity of the banks' counterparts to control for bank capital structure. Thirdly, banks were allowed to get involved into riskier businesses since the beginning of the 1990s (Stiroh, 2004). This point is also made by Flannery and Rangan (2008) who point out that in the 1990s, not only regulatory requirements were imposed to increase capital ratios but additionally at the same time banks were allowed to get involved into riskier businesses. Thus, in the 1990s, higher capital levels also led to higher risk-taking and consequently banks with riskier portfolios ended up holding more equity. Hence, discipline became more relevant for banks and their counterparts, and even if not absolutely reliable, capital ratios are a measure of risk and quality.

All in all, these culminating circumstances strongly influenced the perspective towards the level of the capital ratio upwards.

Overall, we clearly find evidence for a correlation between banks' capital ratios and the pricing of syndicated loans. This relation suggests that banks with a high capitalization charge higher prices. Since banks have started to actively manage their capital ratio and the banks' counterparts paid attention towards the equity/asset relation, the pricing of syndicated loans changed. The impact the capital ratio has on the pricing of loans since 1993 can be interpreted as two effects: One is that the capital ratio represents a kind of certification that borrowers are willing to pay for. Hence, lower default risk due to higher capitalization attracts higher prices. The other explanation is that higher capitalized banks exploit and use their information monopoly to extract higher prices from borrowers. To verify these suggestions we expand our analysis in the following section by controlling for switching costs. Resulting from the circumstance that loan, borrower and bank characteristics' coefficients and signs do not change significantly in the following regressions, we will not further discuss the variables in great detail if not necessary.

4.3 Discussion

Table IV extends our analysis in table III by replacing the capital ratio level variable with a dummy variable indicating a high capital ratio. The results are provided in Table IV. Here we first include a dummy variable indicating a high Total capital ratio if the bank's Total capital ratio is above the median in columns (A) to (C) and if it is in the upper 20 percentile for columns (D) to (F). The Total capital ratio dummy cut-off points are 11.2 percent and 12.2 percent, respectively.

[Table IV]

The set-up in columns (A) and (D) is comparable to the one in column (B) of table III with the exception that the aforementioned capital ratio dummies replace the capital ratio level variable. Both dummies are significant at the one percent level. Other included variables have coefficients and signs closely comparable to the ones in column (B) of table III. The set-up of second and third columns of the high Total capital ratio are comparable to columns (E) and (F) of table III, respectively. The high Total capital ratios of these four columns have a positive sign and a coefficient that is significant at the one percent level. The included known portfolio risk measures exhibit the same signs as in table III and are significant at least at the ten percent level.

All in all, the introduction of a high capital ratio dummy did not alter our results visible in table III. Actually, the magnitude and the significance of the borrower, loan and bank

characteristics are nearly unaltered. The high capital ratio dummies are positive and significant at the one percent level. After controlling for our additional loan portfolio risk characteristics our capital ratio dummies stayed positive and significant at the one percent level. Consequently, our findings still suggest that borrowers seem pay a certification bonus to those banks with higher capital ratios.

4.4 Bank Capital Ratios and Information Asymmetries

Another interesting question to ask is whether borrowers are priced differentially with respect to this additional loan premium. In other words, are informational opaque firms more likely to pay for banks' higher capital ratios? If switching costs exist, they are supposed to be strongest for companies that are small and/or weak borrowers.

We use four proxies for information asymmetry: (i) not rated (column A), (ii) low asset size (column B), (iii) low market capitalization (column C) and low sales size (column D). Each of the last three dummies is one if the specific variable is in the lowest tercile. In the last column (E) we include a competition proxy among banks in a Metropolitan Statistical Area (MSA)[17]. This so-called High HHI dummy captures the loan syndication competition with the Herfindahl-Hirschman index (HHI) in a MSA.

It is one if the MSA's HHI is in the upper tercile[18], suggesting that loan syndication market is dominated by a single bank (or a few banks) in a MSA. All four dummies are than interacted with high Total Capital Ratio ($\geq 11.2\%$).

[Table V]

The results of column (A) exhibit a positive high Total capital ratio dummy (+10 bps) as well as a positive Unrated dummy (+41 bps). Both dummies are significant at the one percent level. However, the interaction term is not significant at all. If the interaction term between high Total capital ratio and Unrated is positive and significant, this would suggest that high-capitalized banks use their monopoly power particularly over prime dependent borrowers. In other words, a 'lock-in' effect would be present. We find a negative interaction term which however, is not significant at all. Therefore we find no measurable effect of a hold-up problem. Nearly 40% of all firms included in our sample have no credit rating by S&P and therefore we extend our analysis by looking at balance sheet, income statement and capital market

[17]To obtain the variable MSA, we use the Metropolitan statistical areas and metropolitan divisions as defined by the Office of Management and Budget. We match this information with the banks we used in our data set received from the Call Reports.

[18]To receive the HHI proxy, we add up the facility size of all lenders in one MSA. We use the total amount of loans in USD granted by each bank and each year in one single MSA. Then, we calculate the HHI dividing the sum of the squared amount of loans in USD by the squared sum of the amount of loans in USD. We find values for HHI ranging between 0.12 and 1.

information and incorporate each in a dummy.

Therefore, column (B) includes a low assets dummy which is one if the asset size is in the lowest tercile. Both the high Total Capitalratio dummy (significant at the one percent level) and the Low Assets Dummy (significant at the 5 percent level) are positive. The interaction term between these two variables is not significant with a value of -5 bps, also implying that the 'hold-up' problem is not present. The results of column (C) (low market cap) and column (D) (low sales size) confirm the findings of column (B). The high Total capital ratio dummy is in both cases positive and significant at the one percent level. The income statement dummy is positive and significant at the five percent level and the low market is significant even at the one percent level with a positive coefficient of 21. Both interaction terms are not significant.

Once again, all coefficients of other loan, bank and borrower characteristics of columns (A) to (D) are comparable to the ones of our basic set-up in column (F) in table III and are therefore not depicted in table V. Overall, our results indicate that high-capitalized banks do not use their monopoly power particularly over weak borrowers and even if bank competition is not fierce. This shows that companies are not subject to 'lock-in' effects by high-capitalized banks.

4.5 Bank Capital Ratios and Competition

Petersen and Rajan (1994)argue that competition reduce bank's lending fees. Therefore we investigate if competition impacts the market power of a well-capitalized bank, we have encountered so far. We approximate competition with concentration as it is commonly done in the financial intermediation literature. For example, Bikker and Haaf (2002) conclude that their findings are "providing support for the conventional view that concentration impairs competitiveness". In the first three columns we use three different competition proxies based on metropolitan statistical areas (MSA),more specifically, the Herfindahl-Hirschman Index (HHI) (column A), top-3 lender market share (column B), top-5 lender market share (column C). Technically, we separate the borrowers according to their MSAs and then calculate the lenders' market shares of each single MSA for three different five year periods to capture dynamic changes in the lender environment. All three proxies measure competition, however, in different ways. The top-3 (top-5) measures if the MSA is dominated by few (several) banks and the HHI is broader since it measures the whole concentration of a MSA. The HHI dummy is one if the HHI value of the specific MSA is in the top third of all MSA's HHIs. The top-3 (top-5) market share dummy is one, if the summed market share of the top-3 (top-5) banks in a MSA is also in the top third of all MSAs. In columns (D) and (E) we incorporate, broadly comparable to Carey and Nini (2007), dummies for the activity of foreign banks. Column (D) includes a dummy that is one if (at least) a foreign bank is among the lead arrangers. Foreign banks acting as lead arranger should increase competition by possibly driving down spreads in order to enter the market. Column (E) is a dummy which is one if in a deal is an active foreign participant. In contrast to a U.S. bank only acting as an active participant, an active foreign

bank participating (top third of all foreign participants) in the US syndicated loan market, might seek an entrance to be a lead arranger and thereby could possibly drive down spreads. Then each competition proxy is also interacted with the high total capital ratio dummy ($\geq$ 11.2%).

[Table VI]

The competition dummies in column (A) to (C) show the expected positive coefficient and are at least significant to the ten percent level. Nevertheless, the high Total risk-based capital ratio dummies stays positive and significant at the one percent level. Comparable to the case of information opacity, the interaction terms are not significant and thereby do not suggest additional rent extraction if the MSA does not show a dispersed concentration. In other words, banks acting in a MSA facing there low competition, charge significantly higher spreads. However, the interaction term between these two dummies is not significant at all suggesting that high capitalized banks do not additionally 'lock-in' borrowers if they have a dominating position in their neighborhood. The coefficients of other loan, bank and borrower characteristics of columns (A) to (C) are comparable to the ones of our basic set-up in column (F) in table III and are therefore not depicted in table VI.

The Total capital ratio dummies in columns (D) and (E) stay positive significant at the one percent level, even both competition dummies are not significant. Neither a foreign lead arranger nor an active foreign participant seems to have no effect on the charged spread by a well-capitalized lead arranger and thereby amplifying the market power of a well-capitalized bank. Therefore we might conclude that competition does not have am additional influence on the loan spreads charged by a well-capitalized bank which is line with hypothesis 3.

5 Conclusion

We explore a unique dataset of US syndicated loans from 1993 to 2007 and analyze whether the bank's capital structure influences costs of corporate borrowing. We provide evidence that well capitalized banks impose significantly higher spreads. We further ask whether well-capitalized banks "lock-in" their borrowers. Using various measures for information asymmetry and lending relationships, we cannot find evidence that opaque firm pay higher spreads to well-capitalized banks than transparent firms. Taken together, our results suggest a loan spread premium to well-capitalized banks, which is not competed away even for the most transparent firms. Our findings might therefore (at least partially) explain why loan costs are higher in the U.S. than in Europe.

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Appendix

A Variable Definition

Variable	Description	Source
Bank Capital Ratios		
Total Capital Ratio	Ratio of bank's total capital, consisting of Tier-1 and Tier-2 capital, to total risk-weighted assets. Definition according to BIS and FDIC.	Call Reports
High Total Capital Ratio Dummy ($< 11.2\%$)	Dummy variable equal to one, if the bank's total capital to total risk-weighted assets ratio is greater than 11.2 percent, which corresponds to the 50 percent quantile for the time period from 1993 to 2007.	Call Reports
High Total Capital Ratio Dummy ($< 12.2\%$)	Dummy variable equal to one, if the bank's total capital ratio to total risk-weighted assets is greater than 12.2 percent, which corresponds to the 80 percent percentile for the time period from 1993 to 2007.	Call Reports
Tier-1 Capital Ratio	Ratio of tier-1 capital to total risk-weighted assets. Definition according to BIS and FDIC.	Call Reports
Tier-1 Leverage Ratio	Ratio of tier-1 capital to average total assets. Definition according to BIS and FDIC.	Call Reports
Equity Capital Ratio	Ratio of equity capital to total assets. Definition according to FDIC.	Call Reports
Bank Characteristics		
Bank Assets	Total assets in terms of constant 2000 USD.	Call Reports
Bank Total Loans	Total loans provided by a bank in terms of constant 2000 USD.	Call Reports
Bank Total Net Loans	Total loans net of unearned income and allowance of a bank in terms of constant 2000 USD.	Call Reports
Bank Deposits	A bank's deposits in terms of constant 2000 USD.	Call Reports
Bank Coverage Ratio	Ratio of loan loss allowance to non-current loans.	Call Reports
Bank Loan Loss Provision to Charge-offs	Ratio of loan loss provision to charge-offs. Henceforth LLP to CHO.	Call Reports
Bank Loan Loss Allowance Rate	Loan loss allowance to total loans. Henceforth LLA Rate.	Call Reports
Bank Loan Loss Provision Rate	Loan loss provision to total loans. Henceforth LLP Rate.	Call Reports
Bank Non-current Loan Rate	Non-current loans to total loans. Henceforth NCL Rate.	Call Reports
Bank Charge-offs Rate	Loan charge-offs to total loans. Henceforth CHO Rate.	Call Reports
Bank Total Loans to Assets	Total loans to total assets.	Call Reports
Bank Total Net Loans to Deposits	Total net loans to total deposits.	Call Reports
Loan Characteristics		
AISD	AISD (all-in-spread-drawn) is measured in basis points and is the the coupon spread over LIBOR on the drawn amount plus the annual fee.	LPC Dealscan
Secured	Dummy variable equal to one, if the loan is "Secured".	LPC Dealscan
Maturity (month)	Natural logarithm of the maturity in month.	LPC Dealscan
Log of Facility Size	Natural logarithm of the facility amount (in constant 2000 USD).	LPC Dealscan
Revolver <1 Year	Dummy variable equal to one, if the loan type equals to "Revolver <1 Year".	LPC Dealscan
Revolver $\geq$ 1 Year	Dummy variable equal to one, if the loan type equals to "Revolver $\geq$ 1 Year".	LPC Dealscan
Bridge Loan	Dummy variable equal to one, if the loan type equals to "Bridge Loan".	LPC Dealscan

LPC Dealscan is Reuter's Loan Pricing Corporation Dealscan database, Compustat/CRSP is the datasource for the borrower information and Call Reports is the information provided in the Bank Regulatory Database.

A Variable Definition (Cont'd)

Variable	Description	Source
Credit Rating		
AA- or above	Dummy variable equal to one, if the loan is rated AA- or above by S&P.	LPC Dealscan
A+ to A-	Dummy variable equal to one, if the loan is rated A+ to A- by S&P.	LPC Dealscan
BBB+ to BBB-	Dummy variable equal to one, if the loan is rated BBB+ to BBB- by S&P.	LPC Dealscan
BB+ through BB-	Dummy variable equal to one, if the loan is rated BB+ to BB- by S&P.	LPC Dealscan
B+ or below	Dummy variable equal to one, if the loan is rated B+ or below by S&P.	LPC Dealscan
Not Rated	Dummy variable equal to one, if the loan is not rated by S&P.	LPC Dealscan
Loan Purposes		
General Purpose	Dummy variable equal to one, if the loan issuance purpose equals to "General".	LPC Dealscan
Recapitalization Purpose	Dummy variable equal to one, if the loan issuance purpose equals to "Recapitalization".	LPC Dealscan
Acquisition Purpose	Dummy variable equal to one, if the loan issuance purpose equals to "Acquisition".	LPC Dealscan
LBO Purpose	Dummy variable equal to one, if the loan issuance purpose equals to "Leveraged Buy Out".	LPC Dealscan
Miscellaneous Purpose	Dummy variable equal to one, if the loan issuance purpose equals to "Miscellaneous" and "Other".	LPC Dealscan
Borrower Characteristics		
Market Capitalization	Natural log of market capitalization of the borrower in terms of constant 2000 USD.	COMPUSTAT
Log of Assets	Natural log of book value of assets of the borrower in terms of constant 2000 USD.	COMPUSTAT
Leverage	Ratio of book value of total debt to book value of assets.	COMPUSTAT
Coverage	Ratio of EBITDA to interest expenses.	COMPUSTAT
Tangibility Ratio	Ratio of net value of property, plant and equipment (PP&E) to total assets.	COMPUSTAT
Current Ratio	Ratio of current assets to current liabilities.	COMPUSTAT
Information Proxies		
Borrower Not Rated	Dummy variable equal to one, if the borrower is not rated by S&P.	LPC Dealscan
Low Borrower Market Cap	Dummy that is one if borrower's market capitalization in the bottom third of the sample.	COMPUSTAT
Low Borrower Sales	Dummy is one if sales is in the bottom third.	COMPUSTAT
Low Borrower Assets	Dummy is one if the asset size is in the bottom third.	COMPUSTAT
Competition Proxies		
High HHI in MSA	A dummy that is one if the HHI value of the specific MSA is in the top third of all MSA's HHIs.	LPC Dealscan
High Top3 Market Share	Dummy is one if the summed market share of the top-3 banks in a MSA is also in the top third of all MSAs.	LPC Dealscan
High Top5 Market Share	Dummy is one if the summed market share of the top-5 banks in a MSA is also in the top third of all MSAs.	LPC Dealscan
Foreign Lead Existing	Dummy that is one if (at least) a foreign (non-U.S.) bank is among the lead arrangers.	LPC Dealscan
Active Foreign Participants	Dummy which is one if an active foreign participant, defined as top third of all foreign participants, is among the participants in a deal.	LPC Dealscan

LPC Dealscan is Reuter's Loan Pricing Corporation Dealscan database, COMPUSTAT is the datasource for the borrower information and Call Reports is the information provided in the Bank Regulatory Database.

B Relation of Equity Capital Ratio and AISD

The dependent variable is All-In-Spread-Drawn and the explaining variable is now the Equity Capital ratio instead of the Total Capital ratio. All regressions are on basis of the individual bank level. The regressions in columns A to C cover the time period from 1993 to 2007 and columns D to F the years 1987 to 1992. The set-ups are comparable to the ones in table IV. All regressions include specific year (1987-1992 or 1993-2007), one-digit SIC dummies, prime dependency and firm credit rating dummies. Standard errors are heteroscedasticity robust and clustered at the bank level.

	Period 1993 to 2007			**Period 1987 to 1992**		
	(A)	**(B)**	**(C)**	**(D)**	**(E)**	**(F)**
Log of (1+Equity Capital Ratio)	118.98**	123.10**	116.68**	-351.75**	-246.87*	-257.63**
	(59.74)	(59.23)	(58.57)	(175.07)	(150.14)	(116.81)
Log of Bank Assets	2.55*	1.50	1.69	-0.42	0.85	2.56
	(1.34)	(1.35)	(1.54)	(3.73)	(3.98)	(3.07)
Log of (1 + LLA to NCL)		-13.61***	-13.09***		-6.74	-18.30*
		(4.35)	(4.63)		(9.91)	(10.72)
Log of (1 + LLP to CHO)		-0.08**	-0.08**		4.76	1.13
		(0.03)	(0.03)		(5.78)	(5.37)
Total Loans to Total Assets		-10.14*	-10.86*		5.41	-19.32
		(5.9)	(6.26)		(28.59)	(26)
Log of Total Net Loans to Deposits			1.24			23.46***
			(2.2)			(6.96)
Log of Maturity (month)	13.10***	12.89***	12.89***	6.38	7.40	7.34
	(1.65)	(1.61)	(1.61)	(4.83)	(4.74)	(4.7)
Log of Facility Size	-0.32	-0.77	-0.83	-0.59	-1.05	-1.89
	(1.53)	(1.56)	(1.58)	(5.28)	(5.15)	(5.24)
Recapitalization Purpose	10.90***	10.89***	10.89***	32.26***	32.19***	30.75***
	(2.71)	(2.7)	(2.7)	(7.68)	(7.85)	(7.92)
Acquisition Purpose	30.92***	30.85***	30.82***	61.45***	61.93***	62.60***
	(3.52)	(3.53)	(3.51)	(12.94)	(12.83)	(12.83)
LBO Purpose	95.74***	96.08***	96.07***	157.90***	156.51***	153.75***
	(10.35)	(10.54)	(10.54)	(16.1)	(15.04)	(14.67)
Miscellaneous Purpose	4.27	4.59	4.47	13.20	10.76	8.67
	(5.06)	(4.8)	(4.73)	(20.77)	(21.67)	(22.85)
Revolver $<$ 1 Year	22.28***	22.47***	22.47***	78.33***	82.45***	78.11***
	(4.83)	(4.84)	(4.83)	(21.6)	(21.18)	(20.67)
Revolver $\geq$ 1 Year	-20.31***	-19.49***	-19.50***	5.78	5.98	5.70
	(1.73)	(1.68)	(1.68)	(7.34)	(7.54)	(7.73)
Bridge Loan	41.98***	42.22***	42.19***	41.39	45.00	45.75
	(5.75)	(5.72)	(5.74)	(31.55)	(31.47)	(30.06)
Market Capitalization	-18.20***	-18.44***	-18.44***	-15.57***	-14.94***	-15.20***
	(0.9)	(0.9)	(0.9)	(4.29)	(4.24)	(4.19)
Leverage Ratio	16.46	16.72	16.71	-60.10**	-58.78**	-56.95**
	(14.5)	(14.71)	(14.71)	(29.75)	(29.32)	(27.84)
Current Ratio	-2.41**	-2.09*	-2.08*	-1.30	-0.67	0.70
	(1.1)	(1.14)	(1.15)	(3.89)	(3.66)	(3.9)
Tangibility Ratio	-12.84**	-12.69**	-12.60**	-1.83	-0.84	10.10
	(6.21)	(6.14)	(6.09)	(19.83)	(20.13)	(18.62)
Log of Coverage	-12.07***	-11.92***	-11.91***	-17.04***	-16.10***	-16.62***
	(1.39)	(1.45)	(1.46)	(4.52)	(4.73)	(4.54)
Const.	181.46***	203.30***	201.02***	195.70***	174.56***	164.26***
	(33.39)	(33.25)	(35.45)	(50.18)	(55.52)	(43.61)
Number of observations	20,511	20,373	20,373	1,017	1,009	1,009
Adjusted R^2	0.5643	0.5674	0.5674	0.6476	0.6476	0.6533

*,**, *** denotes significance at the 10%, 5% and 1% level

Table I

Descriptive Summary Statistics

This Table shows descriptive data for loan, borrower and bank characteristics for loans granted to public non-financial firms between 1993 and 2007 in the USA. Lender and bank data is from the quarter prior to the issuance of the loan and all figures shown in terms of USD or logarithm are denominated to the constant 2000 USD. The sample includes all loans granted between 1993 and 2007 where loan, borrower and bank data is available, resulting in 21,053 observations. Some facilities can be included more than once, based on the fact that they are granted by several lead arrangers. Results are winsorized at the 1 percent and 99 percent level. Further details about the definition of all variables can be found in the appendix.

	Mean	StDev	P5	Median	P95
Bank Characteristics					
Total Risk Based Capital Ratio	11.64%	1.76%	10.27%	11.26%	13.45%
Tier-1 Risk Based Capital Ratio	8.38%	1.97%	6.78%	8.11%	10.03%
Equity Capital to Assets Ratio	7.99%	1.96%	5.68%	7.89%	10.56%
Tier-1 Leverage Ratio	6.77%	1.42%	5.40%	6.52%	8.72%
Assets (USD mm)	364,277	311,118	11,619	306,526	1,013,439
Total Loans (USD mm)	180,196	148,878	7,201	148,442	483,399
Total Net Loans (USD mm)	177,408	147,147	7,035	145,200	479,022
Deposits (USD mm)	223,141	188,030	8,436	186,841	607,922
Loan Loss Provision to Charge-offs	0.60	0.57	-0.46	0.67	1.32
Coverage Ratio	2.28	2.29	1.01	1.82	4.59
Loan Loss Allowance Rate	1.73%	0.73%	0.76%	1.68%	2.91%
Loan Loss Provision Rate	0.28%	0.38%	-0.07%	0.17%	0.98%
Noncurrent Loan Rate	1.03%	0.81%	0.25%	0.83%	2.22%
Loan Charge-offs Rate	0.42%	0.40%	0.06%	0.29%	1.27%
Total Loans to Total Assets	0.54	0.15	0.29	0.56	0.76
Bank Total Net Loans to Deposits	1.43	4.84	0.55	0.83	1.22
Bank Return on Assets	0.61%	0.38%	0.13%	0.57%	1.30%
Bank Return on Equity	7.89%	4.70%	1.82%	7.48%	16.24%
Loan Characteristics					
All-In Spread Drawn (AISD)	141	118	5	113	350
Maturity (month)	45	24	12	49	85
Facility Size (USD mm)	380	531	13	195	1436
Secured	63%	48%			
Loan Purpose					
General Purpose	46%	50%	-	-	-
Recapitalization Purpose	18%	39%	-	-	-
Acquisition Purpose	16%	37%	-	-	-
LBO Purpose	2%	15%	-	-	-
Miscellaneous Purpose	16%	36%	-	-	-
Revolver $<$ 1 Year	2%	14%	-	-	-
Revolver $\geq$ 1 Year	55%	50%	-	-	-
Bridge Loan	2%	13%	-	-	-
Prime Dependency	3%	16%	-	-	-
Credit Rating					
Rating AA- or above	3%	17%	-	-	-
A+ to A-	12%	32%	-	-	-
BBB+ to BBB-	20%	40%	-	-	-
BB+ through BB-	16%	36%	-	-	-
B+ or below	11%	31%	-	-	-
Unrated	39%	49%	-	-	-
Borrower Characteristics					
Market Capitalization (USD mm)	5,170	11,461	38	1,101	24,276
Firm Assets (USD mm)	5,505	10,089	75	1,349	26,397
Current Ratio	1.72	1.04	0.59	1.48	3.62
Tangibility Ratio	0.36	0.23	0.06	0.30	0.81
Coverage Ratio	20.69	55.96	1.05	6.52	78.17
Leverage Ratio	0.31	0.17	0.02	0.30	0.61

Table II.A

Loan, Borrower and Bank Descriptive Statistics by Year

This Table extends the descriptive analysis of table I and shows mean values for loan, borrower and bank characteristics for loans granted between 1993 and 2007 in the USA classified according to years.

	Loan Characteristics				**Firm Characteristics**		**Bank Characteristics**						
Years	Number of Facilities	Maturity (Months)	AISD (bp)	Fraction Secured	Leverage Ratio	Altman Z-Score	Assets ($mm)	Loans to Assets	Noncurrent Loans Rate	Loss Allowance Rate	Coverage	Tier-1 Cap. Ratio (%)	Total Cap. Ratio (%)
1993	562	40	111	0.67	0.31	7.25	75,388	0.61	2.60%	2.71%	1.52	7.80%	11.93%
1994	866	46	105	0.61	0.29	7.16	78,554	0.58	1.38%	2.30%	2.21	8.61%	12.27%
1995	1,003	51	114	0.64	0.30	7.43	83,186	0.59	1.06%	2.02%	2.56	8.51%	11.93%
1996	1,178	49	125	0.59	0.31	8.43	97,311	0.58	0.90%	2.10%	3.19	8.04%	11.30%
1997	1,255	50	119	0.61	0.30	9.59	125,033	0.56	0.71%	1.97%	3.40	7.99%	11.18%
1998	1,572	46	136	0.69	0.31	9.02	194,036	0.54	0.67%	1.79%	3.15	7.68%	11.20%
1999	1,373	42	161	0.67	0.34	7.96	245,350	0.54	0.85%	1.71%	2.34	7.91%	11.24%
2000	1,628	37	151	0.61	0.32	7.63	330,087	0.58	1.00%	1.70%	1.91	8.13%	11.52%
2001	1,705	33	148	0.58	0.32	7.20	339,351	0.57	1.27%	1.73%	1.48	8.17%	11.57%
2002	1,702	31	168	0.64	0.33	6.70	361,443	0.54	1.62%	1.97%	1.35	8.76%	12.12%
2003	1,775	35	175	0.70	0.32	6.77	396,647	0.52	1.59%	1.99%	1.41	8.76%	11.92%
2004	1,819	48	151	0.61	0.29	7.36	455,089	0.49	0.99%	1.57%	1.88	8.78%	11.76%
2005	1,830	54	137	0.60	0.29	7.31	635,997	0.50	0.62%	1.30%	2.45	8.65%	11.64%
2006	1,466	55	120	0.60	0.27	7.89	717,737	0.51	0.48%	1.09%	2.79	8.67%	11.57%
2007	1,319	57	135	0.69	0.27	8.70	820,895	0.51	0.55%	0.97%	2.08	8.63%	11.70%
Total	21,053	45	141	0.63	0.31	7.72	364,277	0.54	1.03%	1.73%	2.22	8.38%	11.64%

Table II.B

Loan, Borrower and Bank Descriptive Statistics by Borrower Sales

This Table extends the descriptive analysis of table I and shows mean values for loan, borrower and bank characteristics for loans granted between 1993 and 2007 in the USA classified according to borrower's sales size.

	Loan Characteristics				**Firm Characteristics**		**Bank Characteristics**						
Sales	Number of Facilities	Maturity (Months)	AISD (bp)	Fraction Secured	Leverage Ratio	Firm Z-Score	Assets ($mm)	Loans to Assets	Noncurrent Loans Rate	Loss Allowance Rate	Coverage	Tier-1 Cap. Ratio (%)	Total Cap. Ratio (%)
< $250m	3703	47	217	0.90	0.28	11.58	237,259	0.59	0.88%	1.71%	2.50	8.49%	11.58%
$250m-$500m	2630	50	180	0.79	0.30	9.20	298,697	0.57	0.98%	1.70%	2.29	8.45%	11.61%
$500m-$1.0bn	3,181	51	162	0.70	0.32	7.79	344,246	0.56	0.99%	1.68%	2.30	8.48%	11.69%
$1.0bn-$2.0bn	2,988	47	135	0.59	0.32	6.91	395,202	0.54	1.06%	1.72%	2.16	8.31%	11.62%
$2.0bn-$5.0bn	3,684	42	112	0.44	0.31	6.32	438,308	0.51	1.06%	1.71%	2.09	8.25%	11.59%
> $5.0bn	4,867	36	75	0.27	0.30	5.61	434,422	0.49	1.14%	1.81%	2.05	8.31%	11.71%
Total	21,053	45	141	0.63	0.31	7.72	364,277	0.54	1.03%	1.73%	2.22	8.38%	11.64%

Table II.C

Loan, Borrower and Bank Descriptive Statistics by Borrower Market Capitalization

This Table extends the descriptive analysis of table I and shows mean values for loan, borrower and bank characteristics for loans granted between 1993 and 2007 in the USA classified according to borrower's market capitalization.

	Loan Characteristics				**Firm Characteristics**		**Bank Characteristics**						
Market Capitalization	Number of Facilities	Maturity (Months)	AISD (bp)	Fraction Secured	Leverage Ratio	Firm Z-Score	Assets ($mm)	Loans to Assets	Noncurrent Loans Rate	Loss Allowance Rate	Coverage	Tier-1 Cap. Ratio (%)	Total Cap. Ratio (%)
< $100m	2,556	42	252	0.94	0.33	6.33	222,193	0.61	1.00%	1.80%	2.36	8.56%	11.76%
$100m-$500m	4,809	49	190	0.83	0.30	8.86	252,568	0.58	1.00%	1.77%	2.41	8.37%	11.57%
$500m-$1.0bn	2,925	51	157	0.72	0.32	8.73	350,391	0.55	1.00%	1.70%	2.29	8.38%	11.60%
$1.0bn-$2.5bn	3,859	47	129	0.54	0.31	7.36	404,083	0.53	1.00%	1.68%	2.20	8.42%	11.65%
$2.5bn-$10.0bn	4,330	40	82	0.29	0.31	6.85	449,140	0.50	1.08%	1.73%	2.08	8.32%	11.67%
> $10.0bn	2,774	35	46	0.12	0.27	8.14	494,828	0.49	1.08%	1.71%	1.99	8.25%	11.61%
Total	21,253	45	141	0.63	0.30	7.76	361,559	0.54	1.02%	1.73%	2.23	8.38%	11.64%

Table III

Do Banks Charge for Maintaining High Capital Ratios?

The dependent variable is All-In-Spread-Drawn. All regressions are on basis of the individual bank level and all regressions include year, one-digit SIC dummies, prime dependancy and firm credit rating dummies. Variables are winsorized at the 1 percent and 99 percent level. Standard errors are heteroscedasticity robust and clustered at the bank level.

	(A)	(B)	(C)	(D)	(E)	(F)
Log of (1+ Total Capital Ratio)	248.97***	331.61***	315.90***	324.51***	301.83***	317.55***
	(62.49)	(67.23)	(72.07)	(72.56)	(82.17)	(81.09)
Log of Bank Assets		3.47**	2.82**	2.84**	2.29*	2.98**
		(1.43)	(1.32)	(1.32)	(1.34)	(1.46)
Log of (1 + LLA to NCL)			-10.50**	-10.64**	-11.48***	-9.65**
			(4.79)	(4.83)	(4.06)	(4.03)
Log of (1 + LLP to CHO)				-0.08**	-0.09**	-0.08**
				(0.03)	(0.03)	(0.03)
Total Loans to Total Assets					-6.13	-8.34*
					(4.57)	(4.68)
Log of Total Net Loans to Deposits						3.53*
						(1.93)
Log of Maturity (month)	13.15***	12.95***	13.02***	12.89***	12.85***	12.81***
	(1.63)	(1.63	(1.63)	(1.63)	(1.62)	(1.61)
Log of Facility Size	-0.16	-0.57	-0.72	-0.70	-0.85	-1.02
	(1.53)	(1.54)	(1.57)	(1.57)	(1.55)	(1.56)
Recapitalization Purpose	10.56***	10.77***	10.73***	10.77***	10.81***	10.80***
	(2.69)	(2.67)	(2.66)	(2.67)	(2.69)	(2.68)
Acquisition Purpose	30.71***	31.06***	31.01***	31.07***	31.07***	30.95***
	(3.49)	(3.53)	(3.53)	(3.54)	(3.55)	(3.53)
LBO Purpose	94.31***	93.73***	95.26***	95.21***	95.13***	94.94***
	(10.09)	(9.91	(10.35)	(10.35)	(10.35)	(10.33)
Miscellaneous Purpose	3.96	4.12	4.77	4.79	4.53	4.15
	(4.97)	(4.93	(4.94)	(4.94)	(4.80)	(4.71)
Revolver $<$ 1 Year	22.67***	22.18***	22.67***	22.53***	22.47***	22.41***
	(4.82)	(4.72)	(4.74)	(4.76)	(4.73)	(4.70)
Revolver $\geq$ 1 Year	-20.04***	-19.79***	-19.50***	-19.40***	-19.24***	-19.26***
	(1.64)	(1.62)	(1.65)	(1.66)	(1.65)	(1.65)
Bridge Loan	41.62***	41.13***	42.24***	42.10***	41.80***	41.70***
	(5.76	(5.84)	(5.63)	(5.65)	(5.73)	(5.75)
Market Capitalization	-18.04***	-18.37***	-18.41***	-18.43***	-18.51***	-18.50***
	(0.90)	(0.89)	(0.90)	(0.90)	(0.89)	(0.90)
Leverage Ratio	17.31	16.81	16.80	17.00	16.95	16.95
	(14.84)	(14.65)	(14.74)	(14.76)	(14.80)	(14.81)
Current Ratio	-2.54**	-2.36**	-2.22**	-2.19*	-2.10*	-2.08*
	(1.12)	(1.10)	(1.11)	(1.12)	(1.13)	(1.14)
Tangibility Ratio	-14.05**	-13.13**	-13.13**	-13.18**	-13.07**	-12.83**
	(6.38)	(6.10)	(6.02)	(6.04)	(6.03)	(5.98)
Log of Coverage	-11.91***	-11.83***	-11.83***	-11.81***	-11.76***	-11.73***
	(1.39)	(1.39)	(1.40)	(1.40)	(1.43)	(1.43)
Const.	182.32***	142.15***	162.82***	162.04***	168.56***	156.98***
	(24.59)	(30.81)	(29.96)	(29.90)	(29.80)	(31.50)
Number of observations	20,511	20,511	20,385	20,373	20,373	20,373
Adjusted R^2	0.5647	0.5656	0.5673	0.5679	0.5681	0.5683

*,**, *** denotes significance at the 10%, 5% and 1% level

Table IV

Do Banks Charge for Maintaining High Capital Ratios? - High Capital Ratio Dummy

The dependent variable is All-In-Spread-Drawn. All regressions are on basis of the individual bank level. The regressions in columns A to C have a total capital ratio dummy which is 1 if the total capital ratio is above the median (11.2 percent). The regressions in column D to F are comparable to the ones in A to C except that the capital ratio dummy is 1 if the total capital ratio is above 12.2 percent (top 20 percentile). All regressions include year (1993-2007), one-digit SIC and firm credit rating dummies. Standard errors are heteroscedasticity robust and clustered at the bank level.

	P50 Capital Ratio Dummy			**P80 Capital Ratio Dummy**		
	(A)	**(B)**	**(C)**	**(D)**	**(E)**	**(F)**
High Total Capital Ratio ($\geq$ 11.2%)	7.67***	7.04***	7.13***			
	(2.00)	(1.88)	(1.87)			
High Total Capital Ratio ($\geq$ 12.2%)				10.38***	8.79***	8.96***
				(3.42)	(2.96)	(2.97)
Log of Bank Assets	2.29	1.28	1.73	2.48*	1.39	1.86
	(1.43)	(1.52)	(1.76	(1.33)	(1.42)	(1.62)
Log of (1 + LLA to NCL)		-14.33***	-13.14***		-13.50***	-12.24***
		(4.28)	(4.50)		(4.15)	(4.30)
Log of (1 + LLP to CHO)		-0.10***	-0.10**		-0.09**	-0.09**
		(0.03)	(0.03)		(0.04)	(0.04)
Total Loans to Total Assets		-8.00	-9.64**		-8.45*	-10.19**
		(5.11)	(4.91).		(4.73)	(4.89)
Log of Total Net Loans to Deposits			2.51			2.63
			(2.13)			(2.02)
Log of Maturity (month)	13.28***	13.08***	13.06***	13.21***	13.03***	13.00***
	(1.65)	(1.62)	(1.61)	(1.64)	(1.62)	(1.61)
Log of Facility Size	-0.37	-0.76	-0.88	-0.44	-0.82	-0.94
	(1.52)	(1.53)	(1.55)	(1.53)	(1.52)	(1.54)
Recapitalization Purpose	11.20***	11.16***	11.16***	11.00***	10.99***	10.99***
	(2.73)	(2.72)	(2.71)	(2.70)	(2.70)	(2.70)
Acquisition Purpose	31.24***	31.20***	31.12***	30.96***	30.96***	30.86***
	(3.56)	(3.55)	(3.54)	(3.54)	(3.54)	(3.53)
LBO Purpose	96.30***	96.71***	96.63***	95.54***	96.12***	96.02***
	(10.34)	(10.49)	(10.49)	(10.32)	(10.58)	(10.5)
Miscellaneous Purpose	4.32	4.81	4.55	4.20	4.61	4.34
	(4.99)	(4.83)	(4.76)	(4.99)	(4.85)	(4.78)
Revolver $<$ 1 Year	22.31***	22.54***	22.51***	22.06***	22.35***	22.31***
	(4.73)	(4.75)	(4.72)	(4.74)	(4.72)	(4.70)
Revolver $\geq$ 1 Year	-20.12***	-19.36***	-19.38***	-19.98***	-19.27***	-19.29***
	(1.71)	(1.65)	(1.65)	(1.69)	(1.65)	(1.65)
Bridge Loan	41.45***	41.84***	41.77***	41.43***	41.82***	41.75***
	(5.76)	(5.74)	(5.76)	(5.76)	(5.74)	(5.76)
Market Capitalization	-18.36***	-18.57***	-18.57***	-18.43***	-18.63***	-18.62***
	(0.88)	(0.89)	(0.90)	(0.89)	(0.90)	(0.91)
Leverage Ratio	16.84	17.08	17.08	16.47	16.73	16.73
	(14.44)	(14.59)	(14.59)	(14.55)	(14.75)	(14.75)
Current Ratio	-2.34**	-2.05*	-2.04*	-2.36**	-2.07*	-2.05*
	(1.10)	(1.14)	(1.14)	(1.11)	(1.13)	(1.14)
Tangibility Ratio	-12.95**	-12.82**	-12.64**	-12.75**	-12.68**	-12.48**
	(6.18)	(6.12)	(6.05)	(6.23).	(6.19)	(6.12)
Log of Coverage	-11.87***	-11.74***	-11.72***	-11.86***	-11.75***	-11.72***
	(1.39)	(1.42)	(1.43)	(1.38)	(1.41)	(1.42)
Const.	186.02***	209.84***	203.39***	185.68***	210.44***	203.62***
	(34.46)	(34.62)	(37.81)	(33.71)	(33.84)	(36.82)
Number of observations	20,511	20,373	20,373	20,511	20,373	20,373
Adjusted R^2	0.5650	0.5680	0.5680	0.5651	0.5680	0.5680

*,**, *** denotes significance at the 10%, 5% and 1% level

Table VI

Bank Capital Ratios and Information Proxies

The dependent variable is All-In-Spread-Drawn. All regressions are on basis of the individual bank level. Each column incorporates an information proxy, namely, Unrated (column A), Low Assets Size (column B), Low Market Cap (column C), Low Sales Size (column D) and High HHI (column E). The borrower information dummies is one if the specific variable, namely assets, market cap and sales, is in the bottom (in 2000 USD). Each proxy is interacted with the high total capital ratio dummy ($\geq$ 11.2%). The regression set-up is similar to the one of column (C) in table IV and include year (1993-2007), one-digit SIC, prime dependancy and firm credit rating dummies. Standard errors are heteroscedasticity robust and clustered at the firm level.

For better depiction all other coefficients except the interaction term related coefficients are omitted. The omitted coefficients are in magnitude and significance comparable to the ones in column (C) of table IV.

	(A)	**(B)**	**(C)**	**(D)**
High Total Capital Ratio ($\geq$ 11.2%)	10.06***	8.77***	6.57***	8.05***
	(1.93)	(2.01)	(2.07)	(2.26)
Unrated Dummy	41.14***			
	(3.18)			
Capital Ratio Dummy $\times$ Unrated Dummy	-7.71			
	(4.66)			
Low Assets Dummy		6.71**		
		(3.08)		
Capital Ratio Dummy $\times$ Low Assets Dummy		-4.78		
		(5.07)		
Low Market Cap Dummy			21.73***	
			(2.67)	
Capital Ratio Dummy $\times$ Low Market Cap Dummy			1.79	
			(5.27)	
Low Sales Dummy				6.72**
				(3.17)
Capital Ratio Dummy $\times$ Low Sales Dummy				-2.66
				(4.81)
...				
Number of observations	20,373	20,373	20,373	20,373
Adjusted R^2	0.5683	0.5683	0.5710	0.5683

*,**, *** denotes significance at the 10%, 5% and 1% level

Table VI

Bank Capital Ratios and Competition Proxies

The dependent variable is All-In-Spread-Drawn. All regressions are on basis of the individual bank level. The regressions in columns A to C have a total capital ratio dummy which is 1 if the total capital ratio is above the median (11.2 percent). We incorporate different competition measures across MSAs (metropolitan statistical area) as dummy variables for three 5 year periods. Competition is approximated through concentration as it is commonly done in the financial intermediation literature.More specifically, we use the Herfindahl-Hirschman Index (HHI) (column A), top-3 lender market share (column B), top-5 lender market share (column C). The HHI dummy is one if the HHI value of the specific MSA is in the top third of all MSA's HHIs. The top-3 (top-5) market share dummy is one, if the summed market share of the top-3 (top-5) banks in a MSA is also in the top third of all MSAs. In columns (D) and (E) we incorporated dummies for the activity of foreign banks. Column (D) includes a dummy that is one if (at least) a foreign bank is among the lead arrangers. Foreign banks acting as lead arranger should increase competition by possibly driving down spreads in order to enter the market. Column (E) is a dummy which is one if in a deal is an active foreign participant (defined as top third of all foreign participants). The regression set-up is similar to the one of column (C) in table IV and include year (1993-2007), one-digit SIC, prime dependancy and firm credit rating dummies. Standard errors are heteroscedasticity robust and clustered at the bank level.

For better depiction all other coefficients except the interaction term related coefficients are omitted. The omitted coefficients are in magnitude and significance comparable to the ones in column (C) of table IV.

	(A)	**(B)**	**(C)**	**(D)**	**(E)**
High Total Capital Ratio ($\geq$ 12.2%)	8.87***	7.95***	8.19***	7.60***	7.49***
	(2)	(1.9)	(1.74)	(1.92)	(2.90)
High HHI in MSA	3.76***				
	(1.4)				
High Total Capital Ratio $\times$ High HHI in MSA	-2.76				
	(2.12)				
High Top3 Market Share		5.36*			
		(2.9)			
High Total Capital Ratio $\times$ High Top3 Market Share		-1.28			
		(3.7)			
High Top5 Market Share			4.96**		
			(2.12)		
High Total Capital Ratio $\times$ High Top5 Market Share			0.71		
			(4.02)		
Foreign Lead Existing				-4.02	
				(6.3)	
High Total Capital Ratio $\times$ Foreign Lead Existing				7.80	
				(7.08)	
Active Foreign Participants					1.94
					(2.01)
...					
Number of observations	16,005	14,805	13,497	16,005	16,005
Adjusted R^2	0.5610	0.5618	0.5598	0.5609	0.5608

*,**, *** denotes significance at the 10%, 5% and 1% level

Figures

Figure I

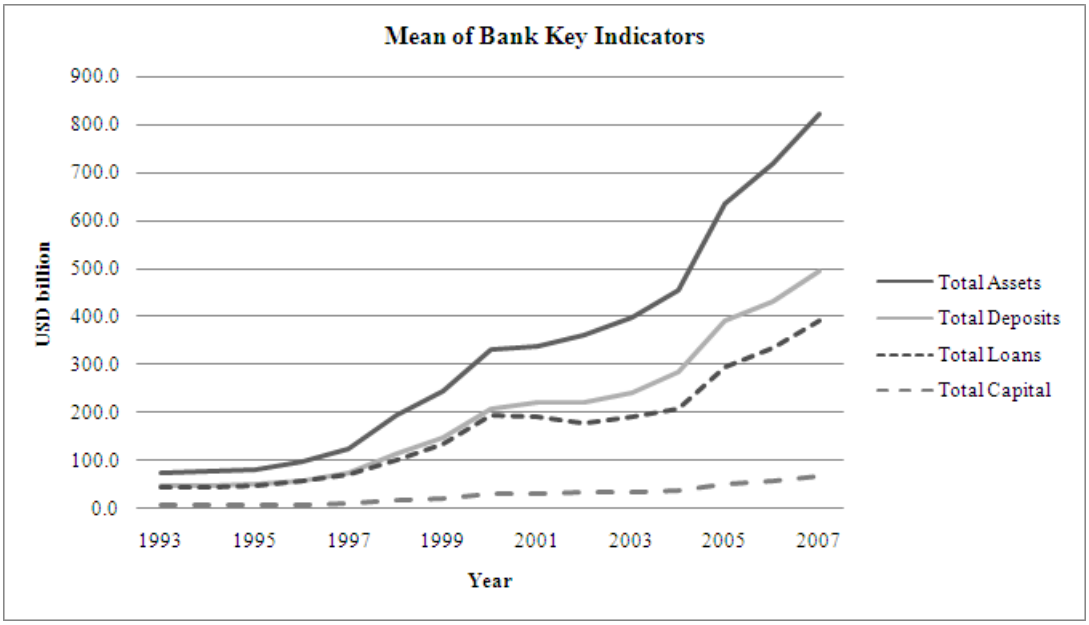

Figure II