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BANK SIZE, RELATIONSHIP LENDING AND SME FINANCING: EVIDENCE FROM BANGLADESH

This paper examines the effect of bank size on relationship lending and how relationship lending can affect credit availability, interest rates and collateral to SMEs in the context of Bangladesh. Our empirical results suggest that SMEs with a long-term relationship with small banks have more access to finance than from large banks. However, we did not find any evidence that long-term relationship with small banks can reduce interest rates or collateral requirements for SMEs. We find evidence though that a stronger and much more exclusive relationship with a small bank can reduce the interest rates for SMEs. This mixed evidence suggests that small banks do not have full comparative advantage in processing soft information, but large banks in Bangladesh may have different lending techniques to extend loans to SMEs with similar interest rates and collateral requirements as like as small banks. Furthermore, we find evidence that small banks are giving priority to both long-term relationship and collateral requirement for SME credit risk than large banks.

Keywords: *small and medium enterprises; small banks; large banks; long-term relationship; collateral; Bangladesh.*

JEL classification: G21; L26; O16.

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ВЗАЄМОЗВ'ЯЗОК МІЖ РОЗМІРОМ БАНКУ, КРЕДИТУВАННЯМ НА ДОВІРІ ТА ФІНАНСУВАННЯМ МСБ: ЗА ДАНИМИ БАНГЛАДЕШ

У статті оцінено вплив розміру банку на кредитування на довірі, а також як саме довірчі взаємовідносини можуть вплинути на доступність кредиту, його відсоткову ставку та обсяг заставного майна малого та середнього бізнесу (МСБ) на прикладі Бангладеш. Емпіричні результати демонструють, що МСБ при тривалих відносинах з малими банками має кращий доступ до фінансових ресурсів, ніж у випадку з великими банками. Однак не знайдено підтвердження тому, що тривалі відносини з малими банками знижують процентні ставки або обсяг заставного майна при кредитуванні МСБ. У той же час знайдено підтвердження тому, що довірчі відносини з малим банком можуть знизити відсоткові ставки в бізнес-кредитуванні. Таким чином, отримано досить суперечливі дані і можна припустити, що малі банки мають деякі переваги щодо обробки неформальних якісних даних про клієнтів, в той час як великі банки в Бангладеш мають більше технічних можливостей адаптувати свої вимоги щодо відсоткових ставок та застави для конкурування з малими банками. Також доведено, що для малих банків в пріоритеті довготривалі відносини з клієнтами та вимоги щодо застави, які б мінімізували кредитні ризики.

Ключові слова: *малі та середні підприємства; малі банки; великі банки; довготривалі відносини; заставне майно; Бангладеш.*

Табл. 4. Літ. 49.

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ВЗАИМОСВЯЗЬ МЕЖДУ РАЗМЕРОМ БАНКА, КРЕДИТОВАНИЕМ НА ДОВЕРИИ И ФИНАНСИРОВАНИЕМ МСБ: ПО ДАННЫМ БАНГЛАДЕШ

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В статье оценено влияние размера банка на кредитование на доверии, а также как именно доверительные взаимоотношения могут повлиять на доступность кредита, его процентную ставку и объём залогового имущества малого и среднего бизнеса (МСБ) на примере Бангладеш. Эмпирические результаты показали, что МСБ при длительных отношениях с малыми банками имеют больший доступ к финансовым ресурсам, чем в случае с большими банками. Однако не найдено подтверждения тому, что длительные отношения с малыми банками снижают процентные ставки или объём залогового имущества при кредитовании МСБ. В то же время найдено доказательство тому, что доверительные отношения с малым банком могут снизить процентные ставки по бизнес-кредиту. Таким образом, получены довольно противоречивые данные и можно предположить, что малые банки имеют некоторые преимущества в плане обработки неформальных качественных данных о клиентах, а большие банки в Бангладеш имеют больше технических возможностей адаптировать свои требования по процентным ставкам и залогу для конкуренции с малыми банками. Также доказано, что для малых банков в приоритете долгосрочные отношения с клиентами и требования по залогу, минимизирующие кредитные риски.

Ключевые слова: *малые и средние предприятия; малые банки; большие банки; долгосрочные отношения; залоговое имущество; Бангладеш.*

Introduction. Lack of formal finance and credit constraints have become one of the main problems for small and medium-sized enterprises (SMEs) because it is argued that SMEs are more informationally opaque and their growth prospects are difficult to evaluate than that of large firms. Therefore, lending to small firms requires alternative lending techniques (Berger and Udell, 2002, 2005). It is also highlighted in literature that lending to SMEs needs special relationship building through a long-term banking process by which it will be possible for banks to know more private information and also future growth prospects of a firm (Berger et al., 2014; Berger and Udell, 2005). W. Mahmud (2006) revealed that SMEs in Bangladesh have only 10% access to credit from commercial banks and the rest of capital is contributed by either personal finance or via credits from microfinance institutions. Similarly, a recent study by M.Z. Hoque et al. (2016) find that 89% of the firms in their sample received loans from microfinance institutions and which suggests that formal commercial bank loans are still rigid in Bangladesh.

Relationship lending which is one of the most common techniques for lending to small firms is based on soft information received by maintaining a close relationship with a client. Alternatively, there are some other lending techniques known as transaction-based lending techniques. Those are mainly based on hard information, for example, financial statements based lending, asset based lending or credit scoring. It is argued that soft business information cannot be evaluated easily like hard information due to its qualitative nature and collection of soft information is more costly (Berger and Udell, 2006). It is suggested that the soft information generation and its careful investigation can increase lending efficiency of a bank, thereby reducing credit risk and ultimately increasing access to finance for business (Berger and Black, 2011; Belas et al., 2014a; Cole et al., 2004; D'Aurizio et al., 2015). It reveals that soft information generated from banking relationships cannot be analysed like hard information on a firm (Cipova and Belas, 2012). Nevertheless, relationship banking can increase trust between banks credit officers and SME clients and that can help credit officer analyse credit risks of the client.

The existing literature suggests that small banks are more efficient in processing soft information than large banks due to their simple organizational structure and also they devote more assets in relationship-based lending (Ongena and Smith, 2001; Berger and Black, 2011). R. DeYoung et al. (2004) argue that small banks extensively use soft information for evaluating credit to small firms and, as a result, they can provide special banking services to SMEs as compared to large banks. It is also recommended that small banks make more personal contact with their clients and by which they can exert private information for lending and also they can build trust between banks and clients (Berger et al., 2002). On the other hand, it is quite difficult for large banks to make personal or frequent contact with their clients due to large number of diversified customers. As a result, relationship lending is not an optimal choice for large banks due to difficulty in private information generation (Cole et al., 2004).

Banking structure and lending to SMEs has received huge attention of researchers because if small banks have a comparative advantage in lending to small firms than large banks, then SME borrowers should go to small banks to get finance otherwise they will be credit rationed and this will hinder their growth. In this context, the objective of the paper is to evaluate whether the size of the bank matters in relationship lending in Bangladesh, and if so which type of banks, large or small ones, are more efficient in relationship lending for SMEs. On the other hand, if small banks are in superior position in processing private information for lending to SMEs, then it could be the fact that small firms may have an easy access to finance in small banks. Moreover, we want to evaluate that if small banks have a comparative advantage in relationship lending then it is possible that SMEs borrowers will get loans with lower interest rates as well as with lower collateral requirements a result of information transparency.

On the basis of literature, we have also classified banks according to their total assets (Berger et al., 2005a; Shen et al., 2009; Uchida et al., 2008). The results of this study suggest that long-term banking relationship with small banks can increase credit availability for SMEs. Thus, we find evidence that small banks may have comparative advantage in processing small business loans and which is also documented in some other studies, for example A.N. Berger et al. (2001a), D.A. Carter et al. (2004), A.N. Berger et al. (2005a) and H. Uchida et al. (2008). We also find that stronger bank-borrower relationship can reduce interest rates for SMEs when getting loans from small banks. Therefore, it suggests that small banks do generate private information from their clients by relationship lending, which helps small banks screen their clients more cautiously and provide loans under lower interest rates. However, we did not find any significant difference between bank sizes with collateral requirement in relationship banking. Thus, it suggests that banking relationship will not reduce collateral requirement for SMEs regardless bank sizes and which suggests a rather conservative approach to banking practice in Bangladesh.

To the best of our knowledge, this is the first paper to document bank size and SME relationship lending phenomenon in the context of Bangladesh. This paper contributes to understanding the viability of investment in customer relationship banking by commercial banks and its impact on building long-term relationship for small business lending. More importantly, current research will also enable SME owners to select banks according to their business size and needs. If small banks are more efficient with SME loans then SMEs should go to small banks rather than to large ones. Therefore, this research provide valuable insights for small banks in the context of intermediation process.

Literature review. Empirical literature suggests that a long-term banking relationship offers some benefits to small business in the form of more credit availability and lower prices of loans. For example, interest rates and collateral and, therefore, small businesses benefit from banking relationships. M. Kano et al. (2006) show that long-term and stronger relationship helps reduce interest rates for small business, similar results are also found in A.N. Berger and G.F. Udell (2001) and more recently by P. Bolton et al. (2013). J. Comeig et al. (2015), V. Kysucky and L. Norden (2014). It is also documented that long-term relationship helps SMEs get more access to finance and also with reduced collateral requirements (Degryse and Cayseele, 2000; Uchida et al., 2012; Cenni et al., 2015; Ferri and Murro, 2015; Gama and Durate, 2015). Furthermore, SMEs are benefited from lending relationship with lower dependency on trade credit and increased protection from their main banks during their financial distressed situation (Uchida et al., 2008; Cenni et al., 2015).

Regardless of various benefits provided by bank-borrower relationship for SMEs, sometimes it is difficult to lend money to small business due to information asymmetry associated with small business loans. Most of the time small firms are credit rationed and suffer from less access to finance from financial institutions, especially from banks (Kozubikova et al., 2015). Since small business lending requires a careful investigation of soft qualitative information, it suggests that small banks are more efficient to do that due to their simple organizational structure and smaller number of customers (Canales and Nanda, 2012; Carter et al., 2004). In contrast, large banks have more difficult organizational diagram and most of them make centralized decisions on loans, as a result, transfer of soft information is difficult within large banking organizational structure as compared to hard information which is based on accounting numbers (Berger et al., 2001b; Berger and Udell, 2002). Therefore, relatively easy transferability of soft information through small banking structure gives small banks an advantage over large banks and that is why small banks should be more efficient in small business lending than large ones (Carter et al., 2004; DeYoung et al., 2004).

It is also argued that banking relationships and sharing insider business information may not always generate benefits for small business where the effect of bank size is irrelevant. J. Stein (2014) shows that excessive private information sharing with bank can be a suboptimal choice for small business. The result shows that firms with a substantial relationship with their main bank need to provide higher interest rates due to a hold-up problem. V. Kysucky and L. Norden (2014) stated that hold-up problem can increase the collateral requirement for small business and which is much more serious in bank-based economies than market-based economies. A. Ono and I. Uesugi (2009) find that a long-term banking relationship cannot be a suitable choice for firms if they want to ask for collateral free loans. Because collateral works as an incentive for banks to invest in relationship banking and banks want to create their seniority over the firm asset through relationship banking.

The existing literature also suggests that it is not always the bank size that affects the relationship lending or soft information generation, but bank-firm distance and banking competition also influence soft information generation. It is argued that if a firm is located far from a bank it is difficult for a credit officer to get access to information due to infrequent visit to business or less contact with firm owner (Agarwal and Hauswald, 2010; Berger et al., 2005b; Uchida et al., 2012). The above literature also states that small firms are mostly situated far from the city. However, most of large banks are situated in the main city, whereas small banks are situated in local areas. As a result, small banks have a comparative advantage to know more about local culture and business situation than large banks and thus small banks can make more efficient loans to small business than the large ones. In the context of market competition it is argued that when bank competition is high, relationship lending will have minimal impact on the benefits of long-term banking relationship (Berger et al., 2004; Degryse and Ongena, 2005; Kano et al., 2006). The reason is that at a competitive market borrower can switch easily from one bank to another and hence banks are reluctant to invest in this relationship.

A recent study by T. Beck et al. (2015) shows that under global economic crisis (2007–2009) relationship lending played a significant role for providing credits to small firms. The relationship developed through the banking process allowed banks provide credit to SMEs, since they had better information about the firm due to their past relationship. On the other hand, large and foreign banks reduced their credits to SMEs because of financial instability and this also reduced business turnover of SMEs. It is also highlighted that credits provided based on private business information which performed well and default rates were higher for large banks due to their excessive reliance on credit rating models which is mainly based on accounting information of firms. There are numerous studies which document that solely accounting information cannot fully comply with the credit risk of firms, however, the addition of personal characteristics and management skills of SMEs owners can significantly improve credit rating models (Altman and Sabato, 2007; Belas and Cipova, 2013; Grunert et al., 2005).

It can be also highlighted that not all firms benefit similarly from lending relationships. Depending on firms characteristics it could be so that bank-borrower relationships may fluctuate with access to credit and also with interest rates and collateral. E. Bracanti (2015) shows that microfirms at Italian market are much more credit constrained than small or medium firms. As a result, microfirms benefit more from relationship lending than small and medium firms. A study by W. Lee et al. (2015) at the UK market shows that micro and small firms rely more on relationship banking than medium firms. They also argued that as medium firms have more assets they can ask for loans from non-relationship banks or large banks as they can show their credit worthiness due to their comparatively larger asset base than micro and small firms. Other literature also highlighted the firm size effect on lending relationships and also that benefits from relationship banking differ by firm size (Lehman and Neuberger, 2001; Cole et al., 2004; Belas et al., 2014b; Blazy and Weill, 2013).

Hypotheses. We expect that there may be a significant difference between bank size and its impact on relationship lending and ultimately the outcome (credit availability, interest rates and collateral) of the relationship lending process. Hence, according to the expectation our hypotheses are as follows:

H1: There is a relationship between bank size and a long-term relationship on the approval of credits to SMEs.

H2: There is a relationship between bank size and a long long-term relationship on lending interest rates to SMEs.

H3: There is a relationship between bank size and a stronger relationship in reducing interest rates on future loans to SMEs.

H4: There is a relationship between bank size and a long-term relationship on collateral requirement for SMEs.

H5: There is a relationship between bank size and both long-term and collateral on reducing SME credit risk.

Data and methodology. This study uses the data collected by one of the authors during June-August 2015 via self-administered questionnaire survey of banks credit officers who are dealing only with SME finance. Purposively, we have selected only SME credit officers so that we can "tease out" the most essential information from them, what they consider for loan proposals. The initial target of the survey was to collect data at least from one credit officer from all the scheduled commercial banks operating in Bangladesh, which covers public (government-owned), private and foreign banks (total – 56). Finally, we have collected data from 110 credit officers from 44 commercial banks, mainly from their different branches operating in Dhaka (the capital of the country). Our data set is quite unique in a sense that most of the study performed within the bank-size and relationship lending arena were collected from SME owners or firm level data, see for example A.N. Berger et al. (2005a) and H. Uchida et al. (2008). However, our data set is directly from SME credit officers and we believe they are the main authority in relationship banking to process and transmit data to upper authority for further decision-making. Hence, credit officers' opinion can be more valuable in a relationship lending than what the SME owners thinks about their relationships with the bank.

Since the aim of the paper is to investigate the connection between bank size and SME relationship lending, this study measures the size of banks on the basis of total assets. Bank total assets is also used in different other papers to differentiate between small and large banks (Berger et al., 2005a; Uchida et al., 2008; Shen et al. (2009). Bank total assets and all other secondary data used in our analyses are collected from the annual reports and audited financial statements of the banks (published in 2014). We did not use the banks financial statements for the year 2015 because the statements for this year are yet to be audited. The study uses descriptive statistics such as mean to gain understanding about the banks size. In addition, this study applied Chi-square test to examine the hypotheses.

Summary statistics by bank size and bank types. Table 1 presents the summary statistics of the full sample of 44 banks as well as segmented analysis across bank size from the total number of banks. The mean "Bank age" is 22 years, thus the banks are not so old, neither very young. It is noticeable that on average "SME Advance to Total Advance Ratio" is about 15%. Although the ratio is not so high, A.D. De La Torre et al. (2010) found that banks' exposure to SME segment ranges from 6% to 37%.

In the context of bank size comparison, we have classified the sample according to total assets. To differentiate between small and large banks we calculated the mean value of total assets of our full sample and then bank's total assets is equal or more than the mean of the full sample is recognized as a large bank and rest of banks are classified as small banks. Table 1 clearly shows there is a significant difference between small and large banks with regards to various indicators. For example, the mean "Bank age" of the small banks is around 17 years whereas the mean "Bank age" of large banks is 29 years. Moreover, there is a significant difference in terms of the mean "Number of Total Branches" as well as in "Number of Total Employees" and all other variables. One interesting finding from Table 1 is that bank size and "SME Advance to Total Advance Ratio". The mean of "SME Advance to Total Advance Ratio" is higher for the large bank (16) than for small bank (14). Although the difference is only by 2%, nonetheless, it can be argued that large banks are investing in SMEs more than small ones. Therefore, it is a good sign for SMEs that they can ask for loans from large banks as well. This information also indicates that small banks are not only specialized in small loans, but large banks can also provide funds to SMEs may be with their diversified number of branches all over the country or may be with technology based lending beyond relationship lending.

We also run ANOVA tests to look at whether the mean differences are statistically significant. In particular, the results of F-tests indicate that mean bank age, mean assets, mean deposits are statistically significantly different across the bank size. However, the mean advance on SMEs are not statistically significantly different across the bank size.

Table 2 presents the segmented analysis across bank ownership types (public, private and foreign) based on our total sample of 44 banks out of 56 banks in Bangladesh. The aim of the segmentation is to find out the differences among each type of banks and more especially which types of banks are providing more loans to SMEs. It is noticeable that public banks are dominating private and foreign banks in terms of all the variables except for "SME Advance to Total Advance Ratio". In that case, private and foreign banks are higher than public banks. Especially with regards to SME loan portfolio, private banks are outperforming public banks by 10% and foreign banks – by 9%. This indicates that private banks are intensively investing in the SME sector and they are recognizing the diversification of their portfolio to SMEs. As we see in Table 1, "SME Advance to Total Advance Ratio" is higher for large banks than for small ones, after the segmented analysis it makes a clearer sense that it can be the result of large private banks which is a part of our large bank sample. This result is very similar to the result of (Beck et al., 2011), they found that private banks invest in SMEs more than public or foreign banks as a result of their better relationships with clients. However, the difference between public and foreign banks in terms of "SME Advance to Total Advance Ratio" is not so significant, it is also possible that pubic and foreign banks are more concerned about corporate clients rather than SME clients. Since A.N. Berger et al. (2001b) argue that foreign banks have difficulties in providing credits to SMEs due to less relationship lending. Furthermore, they also stated that foreign banks have a large asset base therefore, they can finance large corporate firms rather than SMEs because the cost of relationship lending is high. Moreover, T. Beck et al. (2011) claimed that foreign banks prefer providing loans to large asset base companies and they avoid risky relationship lending to minimize credit risks.

Table 3 presents the descriptions of the survey questions used to construct the relationship between bank size and SME relationship lending from 110 SME credit officers, representatives of 44 banks in Bangladesh. The respondents were given five-

Table 1. **Characteristics of the banks,** *authors' calculations from* (Bank's annual statements 2014)

Variable/Bank characteristics	Bank size			
	All Banks		Small	Large
	Mean	Mean equality F-tests	Mean	Mean
Bank age (years)	22 (12)	9.50 [0.0004]	17 (10)	29 (12)
Number of Total Branches	183 (268)		82 (67)	327 (370)
Number of Total Employees	3362 (4314)		1726 (2174)	5722 (5489)
Total Assets (mln BDT)	193140 (180981)	31.2 [0.000]	115350 (124384)	305502 (193584)
Total Deposits (mln BDT)	154068 (150892)	32.4 [0.000]	92507 (106711)	242989 (163330)
Total Advances (mln BDT)	111495 (92229)	17.5 [0.000]	72743 (88845)	167470 (65523)
SME Advances (mln BDT)	15612 (15694)	1.69 [0.196]	8236 (7097)	26267 (18588)
SME Advance to Total Advance Ratio (%)	15 (11)		14 (9)	16 (12)

Full sample: N = 44; Bank size classification (small bank = 26; large bank = 18). Standard deviations are in parenthesis.

Table 2. **Segmented analysis across banks' ownership structure,** *authors' calculations from* (Bank's annual statements 2014)

Variable/Bank characteristics	Public banks	Private banks	Foreign banks
	Mean	Mean	Mean
Bank age (years)	43 (.50)	19 (11)	23 (14)
Number of Total Branches	944 (290)	119 (80)	17 (10)
Number of Total Employees	13489 (7191)	2583 (2240)	703 (810)
Total Assets (mln BDT)	581748 (278514)	163673 (114386)	88523 (84559)
Total Deposits (mln BDT)	475033 (235255)	130689 (96226)	60947 (59916)
Total Advances (mln BDT)	252402 (98562)	105247 (79976)	42507 (45200)
SME Advances (mln BDT)	21401 (15646)	16576 (15965)	4236 (5503)
SME Advance to Total Advance Ratio (%)	7 (4)	17 (11)	8 (5)

Public banks = 4; private banks = 35; foreign banks= 5. Standard deviations are in parenthesis.

point Likert scale questions to disclose their opinions about relationship lending that are ranging from "strongly disagree" (1 point) to "strongly agree" (5 points). In line with the existing literature we recognise a relationship as a long-term relationship when the relationship between a bank and a borrower is minimum 5 or more than 5 years (Berger and Udell, 2002; Cheng et al., 2015).

In this paper we use 5 questions to measure 5 hypotheses. About 46% of the loan officers believe that long-term relationship with banks is very important in order to access credit. This result suggests that banking relationship is valued by credit officers for extending loans and relationship matters in SME lending. Second, with regards to borrowers with a long-term banking relationships and reduced interest rates on lending, this study finds mixed results. For example, about 38% of the officers believe that long-term relationship is not helpful to lower the interest rates and on the other hand, about 31% believe that long-term relationship can lower the interest rate. Third, however, this study finds that a stronger bank-borrower relationship can reduce interest rates. Hence, it could the fact that strong relationship may increase trust between banks and SME borrowers and therefore, loan officers are willing to provide loans under lower interest rate. Fourth, the survey result also suggests that a long lasting relationship not only helps get loans but also it facilitates lower collateral as a result of more information from borrowers during the course of relationship. Finally, with regards to both collateral and personal relationship on SME credit risk management, the results show that both long-term relationship and collateral are important for lowering SME credit risk. Thus, it reveals that a long-term relationship, as well as collateral, can act as an incentive for banks to reduce credit risk. Thus, information from relationship lending helps measure the credit risk to a certain extent. And, the collateral security makes it, even more, convenient for banks to secure their loans.

Empirical results and discussion. We test whether banks size matters in relationship lending with the availability of loans. According to the results, we accept the hypothesis (H1) which suggests that this a significant difference between small and large banks in SME credit availability through relationship lending. It indicates that small banks provide more credits through relationship banking than the large banks. Our result is consistent with the existing literature (Berger et al., 2005a; Uchida et al., 2008; Carter et al., 2004; Bracanti, 2015; Ferri and Murro, 2015). These studies claim that SMEs can benefit from small banks by having more credits due to long-term relationships. As discussed, this could be explained by the fact that small banks have an advantage in SME loan processing. Therefore, it could be argued that small banks could be a suitable choice for SMEs in Bangladesh to get funds if they have a long-lasting relationship. On the other hand, it could also be the fact that on the basis of banking relationships, SMEs owner may come to bank branches and discuss their loan requirements more personally with credit officer, and this may help credit officers analyse loan proposals beyond the accounting analysis. However, this sort of personal contact can be more challenging for a large institution due to a larger number of customers, and hence SMEs credit can be constrained.

We examine whether the banks size matters in providing loans to SMEs under lower interest rates due to long-lasting relationships. Surprisingly, with regards to long-term relationship and interest rate on lending, this study rejects H2 since we did not find any evidence on relationship lending and interest rate. However, several stu-

Table 3. **Descriptions of the survey questions,** *authors'*

Descriptions	Measurements/Categories				
	Strongly disagree	Disagree	Neither agree, nor disagree	Agree	Strongly agree
Borrowers with long-term banking relationship with us have much more chances to get loans	3 (2.7)	34 (30.9)	18 (16.4)	50 (45.5)	5 (4.5)
Borrowers with a long-term (more than 5 years) banking relationships with us pay lower interest rates on their loans	6 (5.5)	42 (38.2)	19 (17.3)	34 (30.9)	9 (8.2)
The stronger the bank-borrower relationship, the lower is the interest rate charged on the current and future loans	1 (.9)	39 (35.5)	17 (15.5)	46 (41.8)	7 (6.4)
Borrowers with a long-term banking relationships with us need to provide lower collateral on their loans	4 (3.6)	32 (29.1)	15 (13.6)	52 (47.3)	7 (6.4)
My bank value both long-term (more than 5 years) relationship and collateral as significant factor for SME credit risk management	0 (0.0)	4 (3.6)	10 (9.1)	58 (52.7)	38 (34.5)

Note: 5 = strongly agree; 4 = agree; 3 = neither agree, nor disagree; 2 = disagree, 1 = strongly disagree. Percentage values are in parenthesis; N = 110.

Table 4. **Hypotheses tests,** *authors'*

	Bank size	
	Chi-square value	P-value
H1: Long-term relationship and availability of loans	10.25	**0.036**
H2: Long-term relationship and interest rate on lending	4.19	0.38
H3: Stronger relationship helps to reduce interest rate on future loan	11.88	**0.018**
H4: Long-term relationship and collateral	3.09	0.54
H5: Long-term relationships and collateral security help to reduce SME credit risk	8.47	**0.037**

dies show that relationship lending, in particular in small banks, can reduce the interest rates of loans as a result of increased transparency (Comeig et al., 2015; Berger et al., 2005a; Uchida et al., 2008; Bracanti, 2015). On the other hand, as stated by P. Bolton et al. (2013) and L. Menkhoff et al. (2012) collateral along with a long-term relationship can reduce the interest rates for SME loans. Therefore, it may also be the case in the case of Bangladesh that only lending relationships will not be enough for loans with lower interest rates and, in that case, bank size is irrelevant. Although, we did not quantify the impact of collateral on the pricing of SME loans, it can be an interesting area for future research.

We also examined (H3) whether strong bank-borrower relationship matters in reducing interest rates on future loans. This study accepts H3 and it could be the fact that our sample does not provide any evidence of a hold-up problem due to data limitation. Since, there are some studies which suggest that when the relationship between banks and SMEs is more exclusive and when banks can extract more private information from firms, banks can ask for higher interest rates from the firm due to a holding-up problem (Gama and Durate, 2015; Stein, 2014). However, our results suggest that small banks can provide loans under lower interest rates to SMEs when they have more exclusive relationships and our result is opposite to the results of A.P.M. Gama and F.D. Durate (2015) and I. Stein (2014). Hence, with this evidence we can say that small banks' credit officers are willing to provide loans to SMEs with lower interest rates when they have a strong relationship. It may be the fact that despite a client having an account with a bank for a long time, if the client is not interacting with the bank frequently it may not be helpful for the client to get loans from the bank with lower interest rates.

If small banks have information superiority in terms of relationship lending and in processing of small loans, then we expect that small banks may also ask for lower collateral from SMEs. However, this study rejects H4 because we do not have enough evidence to state that SMEs can ask for loans from small banks with a lower collateral requirement. This result is consistent with that of H. Uchida et al. (2008), they have shown that relationship lending cannot reduce collateral requirement for firms and it is constant regardless the bank size. This result may be due to the inefficiency of loan officers to collect all the information required for a collateral free loan. Or, it may be so that small banks are very conservative to give loans without collateral, due to the ex-post moral hazard of clients. Since, it is argued that collateral can reduce the ex-post moral hazard of borrowers due to their personal asset is secured with banks (Hernandaz-Canovas and Martinez-Solano, 2010; Ono and Uesugi, 2009; Lehmann and Neuberger, 2001).

Finally, we examine whether the significance of a long-term relationship and collateral valued by small and large banks for lowering the SMEs credit risk. As discussed, soft information generated from relationship banking is highly used in the context of SME financing. Hence, if there is any small bank advantage in the banking sector of Bangladesh then we expect there will be a correlation between bank size, long-term relationship and collateral in SME credit risk. Our result is statistically significant and we claim that small banks give more priority to relationship lending and collateral in assessing credit risk than large banks. Explanation of the result can be two-fold. On one hand, loan managers may be satisfied with soft information that is acquired during the relationship period and hence ask for collateral to strengthen credit security. On the other hand, it can be a common practice among small banks to provide loans with collateral due to their small asset base. Despite all the efforts if a loan is default due to bad business conditions then banks can sell collateralized assets of borrowers and can get back their investments (Menkhoff et al., 2012; Hanedar et al., 2014). Thus, collateral can act as a safety net for small banks to recover loan in the default case.

Conclusion. This paper examines the relationship between bank size and banking relationships in the context of Bangladeshi SME loan market. Moreover, this is the first study which investigates bank size and lending relationships and its impact on credit availability, interest rates, collateral requirement and the interaction between relationship and collateral in reducing SME credit risk in the context of Bangladesh. As discussed earlier, small banks have an advantage in processing soft information due to organizational structure and, as a result, they can extend more loans to SMEs than large banks. We found evidence that SMEs can benefit from small banks by maintaining a long-term relationship, and information generated from the relationship banking helps small firms get more finance. In line with this finding, we can argue that if small banks provide more credits to SMEs due to a long-term relationship then it can be a suitable choice for SMEs to go to small banks rather than the large ones for loans. On the other hand, we did not find any evidence that small banks can provide loans to SMEs with lower interest rates or with lower collateral due to their long-term relationships with the client. Hence, this study suggests that collateral act as an incentive for small banks to invest in relationship banking. Nonetheless, we find evidence that a stronger and much exclusive relationship with small banks can reduce future interest rates for SMEs. This result also suggests that the hold-up problem is not available at least with small banks and sharing more private information is not a suboptimal choice for SMEs to get loans. We also find evidence that small banks give priority to both long-term relationship information and collateral in their SME credit risk management. However, we cannot rule out about large banks' credit risk management policy without further examination of their risk management characteristics.

From the policy perspective, our results suggest that if small banks have an advantage in processing small loans, in that case, small banks can be given more authority and also incentives from the government to promote more SME loans to develop the SME sector in Bangladesh. On the other hand, if SMEs are credit rationed by large banks due to centralized decision-making process than decentralization can be initiated to see the viability of decentralization on SMEs loans.

This paper has some limitations due to a small sample size. More importantly, our sample does not cover all commercial banks in Bangladesh. Similarly, we did not measure bank-borrower distance and market competition on relationship lending and its effect on credit availability, interest rates, collateral and credit risk management. Although, we have discussed their effect on relationship lending elsewhere in this paper we are leaving them for future research.

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