School of Economics and Finance

Credit Markets in an Emerging Economy: Evidence from Pakistan

Inayat Hussain
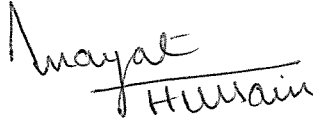
This thesis is presented for the Degree of
Doctor of Philosophy
of
Curtin University

April 2017

DECLARATION

To the best of my knowledge and belief this thesis contains no material previously published by any other person except where due acknowledgement has been made.

This thesis contains no material which has been accepted for the award of any other degree or diploma in any university.

Signature: --

Date: 4th April 2017

ACKNOWLEDGEMENTS

ABSTRACT

This thesis examines three important topics related to credit markets using a unique and exhaustive dataset of loans from an emerging economy – Pakistan. The first topic relates to loan default resolution and access to fresh credit after the firm's exit from default. This is the first study, to the best of my knowledge, which examines the role of collateral and interest rates in these two important events in the life of a firm. The second topic relates to the impact of "relationship lending" on collateral and interest rate levels. The previous empirical findings on this subject are mixed – some finding that the impact of relationship lending is beneficial to firms whilst others find it exploitative or negative. The results of the current study suggest that impact of relationship lending varies by types of financial institutions and firms and this in turn may be the cause of the tension in previous empirical findings. The third topic examines the impact of the relationship of a firm with the CEO of its bank on risk premium and collateral levels. This is the first study, to the best of my knowledge, which examines this relationship.

Chapter 1 presents the introduction of the thesis. It describes the motivation for the thesis, summary of main findings and contribution to literature. The second Chapter examines loan default by firms and identifies the factors that influence both the default resolution process and firms' access to fresh credit after firms exit default. The results suggest an important role for collateral. Collateral expedites both the default resolution process and access to fresh credit after exiting default. The findings of the Chapter also show that a higher interest rate increases the default duration. Relationships with multiple lenders as well as those with multiple branches of one lender are associated with obtaining fresh credit at the post default stage.

Chapter 3 examines the impact of relationship lending on risk premium and collateral requirements. The results suggest that, on average, a longer relationship length has a positive relationship with higher interest rates but lower collateral levels. However, further examination paints a far more complex picture. The impact of relationship length on interest rates and collateral varies substantially with the type of lender and borrower as well as across different relationship dimensions. The findings strongly suggest that conflicting previous empirical findings on the subject of

relationship lending are probably the result of using datasets limited to certain types of borrower or financial institutions.

The fourth Chapter further enriches the examination of relationship lending by examining the role of relationship between a firm and the CEO of its bank. The results suggest that, on an aggregate level, a stronger relationship results in lower risk premia for firms' loans; although there is no effect on collateral. However, the findings also show that the impact of these relationships vary by types of banks.

With explicit regard to publications, Chapter 2 forms the basis of the published journal article "Default Resolution and Access to Fresh Credit in an Emerging Market" in the Pacific-Basin Finance Journal (ABDC rank A). Another paper "Relationship Lending: A Source of Support or a Means of Exploitation? – Evidence from a Developing Economy" based on Chapter 3 has been presented at the Asian Finance Conference 2016 in Bangkok, the AFAANZ (Accounting and Finance Association in Australia and New Zealand) conference (2016, Gold Coast) and the Financial Markets and Corporate Governance conference (2016, Melbourne). The paper is currently under review at an A* journal. At the time of writing this thesis, Chapter 4 is being readied as an independent paper to be submitted to a suitable highly-ranked journal in the near future.

Whilst at Curtin university, I was fortunate to have the opportunity to work on two other projects not directly related to my thesis. The paper entitled "The Determinants of Digital Terrestrial Radio Aftermarket Coverage" co-authored with G. Madden and P. Kraipornsak was published in 2014 in the *Applied Economics Letters*. The second paper "Spectrum Auction Designs and Revenue Variations" was written with G. Madden and I. Saglam and was published in 2015 in the *Applied Economics*.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

AFAANZ   Accounting and Finance Association in Australia and New Zeeland

CIB   Credit Information Bureau

CEO   Chief Executive Officer

EAD   Exposure at Default

FMCG   Financial Markets and Corporate Governance

FSV   Forced sale value

GDP   Gross Domestic Product

GLS   Generalized least squares

IMF   International Monetary Fund

LGD   Loss Given Default

NBFI   Non-bank Financial Institution

NPLs   Non-performing Loans

OAEM   Other assets especially mentioned

PD   Probability of Default

PKR   Pakistan Rupees

SBP   State Bank of Pakistan

SECP   Securities and Exchange Commission of Pakistan

SMEs   Small and Medium Enterprises

WDI   World Development Indicators

CHAPTER 1

INTRODUCTION

1.1   Motivation

This dissertation examines two issues pertaining to loan defaults and relationship lending important to both academics and the professional community of bankers alike. The previous evidence on these issues is either limited or conflicting; furthermore, it predominantly relates to developed economies. We address these gaps in literature by using a unique dataset from Pakistan.

The contribution of this work is twofold. Firstly it addresses important topics either with limited coverage in literature or with mixed findings using this unique dataset. Secondly it brings emerging economy perspective to these studies. This is important since country differences may strongly impact the implications of economic and financial relationships.

The dataset used in this dissertation has been obtained from the Credit Information Bureau (CIB) of the State Bank of Pakistan (SBP). The SBP is the monetary authority as well as the bank regulator in Pakistan. All financial institutions in Pakistan are legally required to submit information about their credit transactions to the CIB at the end of each month. The dataset is thus exhaustive since it captures *each and every loan* generated in the economy of Pakistan. This incredibly rich dataset captures all of the relevant information about a loan such as the type of loan; sanctioned loan amount; interest rate; outstanding principal (loan amount withdrawn less any repayments); value and type of collateral; amounts overdue (amounts not paid by borrowers on due dates); any write-off availed by that borrower; amount under litigation; and so on. As of December 2013, the number of active borrowers in the CIB database was 34,470 for firms and about 3.9 million for individuals. An active status means that a borrower has an outstanding loan (not yet fully paid) from a financial institution. If a borrower has repaid all its loans, then it is no more active although its historical information is still retained in the database. The dataset consists of business loans to firms and covers the period from April 2006 to December 2013. April 2006 has been selected as starting point since the CIB started collecting data on interest rate from this date and information about this key variable

is not available for period prior to that. Further substantial changes in the definitions and codes of various variables were introduced by the CIB prior to April 2006 and hence data prior to April 2006 is not readily comparable with data after April 2006. The unit of analysis is lender-borrower-month and thus we aggregate the loans obtained by a borrower from a particular financial institution. The final dataset contains about 3.6 million observations.

1.2   Findings and Contribution

Chapter 2 examines loan default resolution and access to fresh credit for firms that exit default. Importantly, it is the first study that explores the role of collateral and interest rate in these two important events, which can have strong impacts both on the financial sector and overall economy of a country. An expeditious default resolution and access to fresh credit is beneficial both for the financial institutions and firms in an economy. Bonfim *et al*. (2012) is the only study that examines these relationships by using a dataset from Portugal. However, this study does not look into the role of collateral and interest rate in default resolution nor does it consider these variables while evaluating access to fresh credit.

The results suggest that collateral plays an important role both in an efficient default resolution process and a quick access to fresh credit after firms emerge from default. Higher interest rates make it difficult for firms to exit default. We also find that economic agents in Pakistan behave differently to those in Portugal. In contrast to Bonfim *et al*. (2012), who find that large firms exit default quickly, we observe that large firms in Pakistan spend more time in default resolution than small firms. We also find that firms in Pakistan need more time to access fresh credit after emerging from default than firms in Portugal.

Chapter 3 examines the impact of lender-borrower relationship on risk premium and collateral requirement for firms. The empirical evidence on this subject is mixed. Some studies suggest that a longer relationship with a financial institution is beneficial for firms in terms of lower risk premium and lower collateral requirements whereas other studies find that such relationship results in higher risk premium and higher collateral requirements. Kysucky and Norden (2015) analyse the results of 101 studies on this subject and suggest that the tension in empirical

findings is the result of country effects. Our findings, however, suggest that these differences may be a result of the particular dataset being used in these studies, which are invariably restricted to particular types of financial institutions and/or particular types of borrowers such as small firms or corporates.

The exhaustive dataset allows us to explore the impact of relationship length across a variety of financial institutions as well as borrowers. The results suggest that the impact of relationship length varies substantially across different types of financial institutions and different types of borrowers. The results also suggest that it is beneficial for small firms to cultivate relationships with non-bank financial institutions (NBFIs) since it results in lower risk premiums and lower collateral requirements. Their longer relationships with banks, on the other hand, results in greater collateral requirement. The relationship of listed firms with large financial institutions are welfare enhancing whereas small banks charge higher risk premium from them as length of their relationships increases. The impact of longer relationships for Government firms is either insignificant or exploitative across all types of lenders.

Chapter 4 continues the analysis of relationship lending. In addition to the impact of bank-borrower relationship, this Chapter examines the impact of relationship of a listed firm with the CEO of its bank on risk premium and collateral requirement. On an aggregate level (when we do not segregate data by type of banks), the results suggest that the longer the relationship of a listed firm with the CEO of its bank, the lower will be the risk premium, but with no effect on the collateral requirement. However, further analysis reveal that impact of this relationship varies by type of banks. A longer relationship with CEOs of banks results in lower risk premium across all types of banks except foreign banks and small banks.[1] Further, longer relationships with CEOs of small banks result in lower collateral whereas the same for large banks result in higher collateral requirements.

---

[1] We divide banks into Government banks, private banks, domestic banks, foreign banks, large banks and small banks.

1.3 Background Information about Pakistan

In addition to providing a unique dataset, Pakistan is an important and interesting emerging economy. It is the 6th largest country in terms of population with about 180 million people, and is ranked 35 in the world in terms of area and 45 in terms of GDP (at around US$233 billion for the year 2014).[2] In 2012, the Karachi Stock Exchange (KSE), the largest stock exchange in Pakistan, ranked at 50 in terms of market capitalization. However, Pakistan lags far behind in terms of other development indicators. Its per capita income for year 2014 at US$1,410 places it in the category of lower middle income countries. It stands at the 110th position for ease of doing business and at the 167th position in terms of enforcing a contract.[3] Corruption is a major issue in Pakistan as reflected in its ranking of 127th position in terms of corruption perception index by Transparency International.[4]

The total assets of the financial sector in Pakistan are around 57% of its GDP.[5] The financial sector consists of banks, development financial institutions (DFIs), microfinance banks, investment banks, leasing companies, housing finance companies, modarabas (an Islamic form of mutual funds) and insurance companies. Another important player in the financial sector is Central Directorate of National Savings (CDNS) which mobilizes savings on behalf of the Government of Pakistan through distributing various types of government securities to individuals as well as firms. In terms of number of various types of financial institutions, the financial sector in Pakistan is quite diversified, there are: 38 banks; 47 insurance companies; 8 DFIs; 7 investment banks; 9 leasing companies and 26 modarabas. However, in reality, the financial sector is dominated by commercial banks as they constitute 73% of the financial sector in terms of assets.

Comprehensive banking reforms in the 1990s and early 2000s transformed the banking system from a predominantly Government owned sector (more than 80% in terms of assets) to a privately owned and controlled banking system (more than

---

[2] IMF world economic outlook database accessed on 19th November 2015, available at https://www.imf.org/external/pubs/ft/weo/2015/01/weodata/weorept.aspx.
[3] Ease of business doing report by World Bank accessed on 19th November 2015, available athttp://www.doingbusiness.org/~/media/GIAWB/Doing%20Business/Documents/Annual-Reports/English/DB15-Chapters/DB15-Report-Overview.pdf
[4] Corruption perception index by Transparency International is available at http://www.transparency.org/cpi2013/results.
[5] The Financial Stability Review, June 2012 available at State Bank of Pakistan website www.sbp.org.pk.

78% of the banking assets are now under the private sector control). There are two regulators of the financial sector. The State Bank of Pakistan (SBP) regulates banks, DFIs and microfinance banks whereas Securities and Exchange Commission of Pakistan (SECP) regulates insurance companies, investment banks, leasing companies, discount houses and so on.

Note that although the subsequent research chapters are more-or-less self-contained, we do not repeat the above background in them for reasons of space and unnecessary repetition.

CHAPTER 2

DEFAULT RESOLUTION AND ACCESS TO FRESH CREDIT IN AN EMERGING MARKET

(This Chapter forms the basis of the published article "Default Resolution and Access to Fresh Credit in an Emerging Market" in the Pacific-Basin Finance Journal – Hussain et. al (2016))

2.1 Introduction

Failure to repay loans is at the core of banking crises (Reinhart and Rogoff, 2009). The net costs of resolving banking crises have been estimated at about 13.3% of GDP, with these costs much higher in emerging economies (Laeven and Valencia, 2008). An efficient default resolution mechanism is in the interest of every economic agent, be it banks, businesses or the economy as a whole. Tedious, time consuming and unsuccessful default negotiations are costly to both banks (in the form of loan losses) and firms (through higher risk of insolvency and reputational loss), as well as to the economy as a whole (Hart and Moore (1998) observe that post default lack of trust between lender and borrower causes the liquidation of many viable businesses). Since bank credit is a dominant source of funds for businesses in emerging economies (Fan *et al.*, 2012), access to fresh loans after default resolution is critical for the very survival of firms. Both default resolution and access to fresh credit after exiting default thus have strong linkages with financial stability and economic growth.

Despite the importance of default resolution and access to fresh credit for defaulting firms, these subjects have received only limited attention in the literature. While reorganizations under formal insolvencies regimes like Chapter 11 have been examined in detail, there have been few studies on corporate default resolution through private channels.[6] Two studies though have examined formal versus informal resolutions: Blazy *et al*. (2014) find that larger loans with long term maturities are restructured through private negotiations; whereas Hotchkiss *et al*. (2014) observe that firms backed by private equity also prefer informal channels for loan renegotiations. A few other studies have examined the role of particular variables of interest on default resolution: Bester (1994), in a theoretical paper,

---

[6] Chapter 11 is a component of the US bankruptcy code that governs reorganization of a firm

argues that collateral helps renegotiations; however, Karagozoglu *et al.* (2008) find that collateral increases the probability of liquidation in case of default; and Chan *et al.* (2014) examine mortgage loans and find that loans of borrowers with low credit scores are more likely to be restructured.

The topic of access to fresh credit after default resolution is reported in the literature even less than default resolution. To the best of our knowledge, Bonfim *et al.* (2012) present the only study on this topic. They find that most of the borrowers in Portugal are able to maintain access to credit even after default; however, few of them are able to get fresh loans. The large firms having multiple credit relationships are in a better position to access credit markets after clearing default. Further, access to credit becomes difficult if default is with the main bank of the borrower or if the duration of default is long. Bonfim *et al.* (2012) study, however, does not examine the role of collateral and interest rates in default resolution nor does it consider these variables while evaluating access to fresh credit: these variables are not available in the dataset. Our study, in contrast, is the first to examine the role of collateral and interest rate in default resolution and access to fresh credit. This study assesses the impact of a variety of variables on default resolution and access to fresh credit and find that size of borrowings, collateral, relationship with banks and severity of default affect both the period firms remain in default and their ability to access fresh credit.

We use a unique dataset of *all* loans in Pakistan, from April 2006 to December 2013.[7] Our dataset has been sourced from the Credit Information Bureau (CIB) of the State Bank of Pakistan (SBP).[8] All financial institutions in Pakistan are legally obligated to report complete information about their borrowers to CIB on a monthly basis and thus the database covers *every* firm which has availed itself of *any* financing facility from *any* financial institution in Pakistan.[9] The limited

---

[7] Pakistan is the 6th largest country in terms of population with around 180 million people. It stands at 35th position in terms of area and at 45th position in terms of GDP at around US$ 233 billion (IMF World Economic Outlook – April 2015). The Karachi Stock Exchange is the largest stock exchange in Pakistan, ranked at 50th position in terms of market capitalization (WDI report by World Bank available at http://databank.worldbank.org/data/download/WDI-2013-ebook.pdf accessed on November 29, 2014).

[8] The State Bank of Pakistan is the central bank of the country entrusted with dual responsibilities of conducting monetary policy as well as banking supervision in Pakistan.

[9] Financial institutions under the regulatory domain of the SBP are obliged to provide credit information under Section 25A of the Banking Companies Ordinance, 1962. Further, the Securities and Exchange Commission of Pakistan (SECP) has also advised financial institutions falling under its

research on bank-borrower post default relationships and subsequent access to credit after default resolution could be due to the nature of the required data. The number of defaults is generally a very small percentage of total credit transactions. As a result, even if one is able to gain access to the complete records of one or even a few banks, the small number of observations makes a meaningful analysis difficult. We overcome the limitations of data availability by examining *all* the credit transactions in an economy.

Bonfim *et al.* (2012) provides first evidence on the impact of severity of default and size of borrowings on ability of firms to access fresh credit. Collateral and interest rate may be considered most important features of a credit contract and we explore the impact of these variables on the ability of firms to obtain fresh credit after exiting default. Unfortunately, there is no theoretical literature underpinning this research. A logical argument can, however, be built that a borrower with the ability to offer higher collateral should be able to access fresh loan quickly.

Our contribution to the literature is three fold. First, to the best of our knowledge, this is the first study that examines the impact of collateral and interest rate on default resolution and access to fresh credit after clearing default. More importantly, in addition to examining the collateral per se, our dataset allows us to consider the role of different types of collateral in default resolution and access to fresh credit. Secondly, this study examines default resolution and access to credit from the perspective of a developing country. The design and enforcement of creditor rights in a country can have a material impact on economic relationships (la Porta *et al.*, 1998). As we explain in Section 2.6.1, the judicial system in Pakistan is inefficient and susceptible to pressure. Thirdly, we are able to examine the role of relationships in default resolution and access to fresh credit. Our dataset allows us to test the proposition of Bolton and Scharfstein (1996) that credit relationships with more banks are associated with inefficient reorganization because of coordination problems.

Our results suggest that defaulters in Pakistan behave differently to those in Portugal as studied by Bonfim *et al.* (2012). Indeed, in contrast to Bonfim *et al.* (2012), who observe that default duration is shorter for large firms, we find that

---

regulatory ambit to submit credit information to CIB. Thus all financial institutions are comprehensively covered.

larger borrowers take more time for default resolution. This is consistent with institutional differences in both countries.[10] The Pakistani dataset allows us to precisely determine when a borrower obtains fresh credit after clearing default. We consider a firm having accessed fresh credit after clearing default only when it obtains a new loan.[11] We find that borrowers in Pakistan need more time (10 months for first 25% firms) to access fresh loans after default resolution than the borrower in Portugal (6 months for first 25% firms).

The Pakistani dataset also provides information on collateral and interest rates (factors which could not be considered by Bonfim *et al*.). We find that the collateral is helpful in both expediting the default resolution process and in establishing access to fresh credit after exiting default. Regarding the effect of types of collateral, we observe that mortgages of both the residential and commercial property are helpful in resolving default. Higher interest rates increase the duration of default, suggesting that the higher credit pricing makes it difficult for a borrower in distress to service the loan and come out of default quickly. Interest rates do not play any significant role in accessing fresh credit after default resolution. Contrary to the notion that banks can lend to higher risk customers by charging greater risk premium, financial institutions in Pakistan perhaps decline the customers considered bad credit risk by them as observed by Stiglitz and Wejss (1983).

Default with more than one financial institution makes default resolution difficult perhaps owing to coordination problems among lenders (Brunner and Krahnen, 2008). We however, also observe a similar effect when a borrower in default has a credit relationship with a higher number of branches of the lender, or is availing multiple financing products from it. This shows that coordination can be a problem not only between lenders but also between branches of one financial institution. Quite understandably, however, the adverse impact of dealing with multiple branches is much milder as compared to dealing with many financial institutions (the hazard ratio of 'bank relationships in default' is 0.395 as against 0.828 for 'number of branches'). Higher numbers of credit relationships both with

---

[10] As we explain in Section 2.6.1, large borrowers can exploit the weak creditor rights regime and Pakistan's inefficient judicial system.
[11] This definition is stricter than Bonfim *et al*. (2012) who define access as availability of any sort of financing facility after clearing default "broad access" or an increase in the total credit outstanding "strict access". Total credit outstanding may simply increase because of accrual of interest and may not actually reflect the borrower's ability to access fresh credit.

financial institutions and their branches, however, are quite useful when it comes to obtaining new loans after resolving default. The findings of this paper shed light on two important facets of the bank-firm relationship and identify factors that facilitate or hamper the path to default resolution and access to fresh credit after the default episode is over. These findings can help both banks and firms in charting their course of action during this tumulus period of their journey. The results might also be used by policy makers, especially in emerging economies, to design appropriate frameworks for default resolution and rehabilitation of sick businesses.

2.2 Relevant Literature

Most of the studies on bank loan defaults have predominantly sought to identify determinants of default and estimate the probability of default (PD), loss given default (LGD) and exposure at default (EAD).[12] The primary aim of such studies is to assist banks in mitigating their credit risk or support them in adopting foundation and advanced internal rating based approaches for determining their credit risk under Basel Capital Accord II and III.[13]

Another stream of literature has dealt with businesses in distress especially insolvencies under Chapter 11.[14] There are, however, only a few studies that have looked into loan default resolution through private bilateral negotiations between banks and borrowers. Comparing formal versus informal distress resolution, Blazy *et al*. (2014) find that larger loans and long term maturities are associated with direct negotiations with lenders while Hotchkiss *et al*. (2014) observe that firms backed by private equity prefer informal channel and achieve resolution quickly as compared to other firms.

Examining the impact of defaults on firms in a theoretical model, Stiglitz and Wejss (1983), observe that banks will deny credit to defaulters rather than penalizing them through higher interest rates. Hart and Moore (1998) provide a theoretical

---

[12] PD – Probability of default is the likelihood that the borrower will not meet their debt obligations as they become due. EAD – Exposure at default is the borrower's total indebtedness at the time of default and LGD – loss given default is the net loss borne by the bank after netting off any recoveries made out of collateral.

[13] As a sample of such studies, please see Bastos (2010); Qi and Zhao (2011); Bellotti and Crook (2012) and Loterman *et al*. (2012).

[14] Chapter 11 is a component of US bankruptcy code that governs reorganization of a firm.

argument that lack of credibility between lenders and borrowers after a default results in an inefficient and premature liquidation of an otherwise viable project, exposing both the bank and the entrepreneur to losses. Brown *et al*. (2006) suggest that prospects of loan restructuring encourage borrowers to commit strategic default even when they are in a position to repay the loan.

Examining the role of write-offs in renegotiations, Gorton and Kahn (2000) observe that debt forgiveness reduces a borrower's incentive to take on more risk and thus is in the interest of the lenders. Franks and Sussman (2005) find that while banks extend the repayment period to help the borrowers in difficult situations, they do not offer any write off to reduce the burden on such borrowers. Examining distressed mortgage loans, Chan *et al*. (2014) find that borrowers with low credit scores at the time of origination of loans are better placed to get their loans restructured. The examination of the role of collateral in distress resolution has yielded mixed findings. Bester (1994) finds that collateral facilitates debt renegotiation and modification of the terms of the credit. However, Karagozoglu *et al*. (2008) find that collateral increases the threat of liquidation whereas high leverage leads to reorganization.

Examining the violations of debt contract by firms in an empirical study, Sufi (2009) find that such firms have lower access to credit. Roberts and Sufi (2009a) reveal that, in addition to a substantial negative impact on the future credit raising capacity of the borrower, violation of any provision of a debt contract also leads to higher interest rates. Roberts and Sufi (2009b) find that the majority (over 90%) of long term loans are renegotiated during their life because of macroeconomic changes and variations in borrowers' profiles. Default and financial distress were rarely the cause for renegotiation.

One aspect of loan defaults that has received limited academic attention is the access to fresh credit after resolving default. Analysing loans granted to countries after sovereign default, Sol (2009) observe that additional information acquired by lenders during the default helps them to extend fresh loans to such countries.[15] Bonfim *et al*. (2012) present the only study that examines corporate default resolution as well as access to fresh credit after the default is over. Bonfim *et al*. (2012) use an economy wide dataset of loans from Portugal and find that 50% of

---

[15] The study examines default by Governments and not by firms.

the firms are able to resolve their default within about one year. Default duration increases with time and resolution may take many years if the firm stays in default beyond one year. Larger borrowers are able to achieve default resolution quickly and higher overdue amounts at the start of default result in a longer duration of default. On the question of access to credit after clearing default, the study finds that most of the firms are able to maintain their access to bank loans, although only 25% of them are able to obtain fresh credit. Higher overdue amounts and a longer stay in default make access to fresh credit more difficult. Larger borrowers are able to regain access to the credit markets quickly.

Some of our findings match with those of Bonfim *et al*. (2012) while others differ. Access to fresh credit after clearing default appears to be more difficult in Pakistan. Further, we find that large borrowers in fact take more time for default resolution. Our results regarding the adverse impact of higher overdue amounts and smaller size of loans on access to fresh credit are consistent with their findings.

2.3. The Data

The dataset for this study has been sourced from the Credit Information Bureau (CIB) of the State Bank of Pakistan (SBP). The State Bank of Pakistan is the central bank of Pakistan and is entrusted with the dual responsibility of conducting monetary policy as well as supervising banking sector in Pakistan. This study uses the CIB dataset for firms from April 2006 to December 2013. April 2006 has been selected as the starting point since there have been relatively few and minor changes in the reporting formats since this date and thus the definitions and codes are consistent over the period April 2006 - December 2013. In addition, the CIB started collecting information about collateral and interest rates in April 2006: these being key variables for our study.

As of December 2013, the CIB database contained information concerning 34,470 active firms and about 3.9 million individual borrowers. An active status means that the borrower owes some money to a bank. If a borrower has fully repaid all its loans, it is no longer active, although its information is still retained in the system. Using the unique identifiers for each borrower and financial institution, we aggregate the loans extended by a particular financial institution to a particular

borrower. Our primary unit of analysis is thus bank-borrower-month and our final dataset contains about 3.6 million observations. Since we have a panel dataset where observations are repeated each month, we measure our variables at the end of each month. For example, for variable 'number of banks', we count the number of bank relationships each borrower has, at the end of each month. Note that the CIB does not collect accounting data and we are unable to augment our analysis with potentially important additional information relating to the firm, for example those related to the firm's financial statement(s). This is similar to Bonfim *et al*. (2012), the closest published study to the current paper, who also do not incorporate financial data. Our estimations, however, do exploit the panel nature of the data by employing a random effects specification, explicitly controlling for any such unobserved firm-specific heterogeneity.

Table 2.1 lists the research variables and their definitions while Table 2.2 presents summary statistics. We do not scale variables in this paper but rather we use variables capturing the size of the loan in our set of explanatory variables. Pearson (1896), Kronmal (1993), Barth and Kallapur (1996), Kim (1999), Zhu (2012), Bonaimé *et al*. (2014) and Dang *et al*. (2014) highlight the risk of spurious correlations associated with scaling. The size of the loan has been found to influence the type of renegotiation in cases of default (Blazy *et al*., 2014). In addition to the outstanding amount of the loan we also use the loan limit sanctioned for each firm and the number of loans made as our independent variables. The mean and standard deviation of all the three variables depict substantial dispersion while percentiles indicate the data is dominated by smaller borrowers. About 75% of firms borrow less than PKR 19.15 million (equivalent to about US$ 183,000).[16] Against this backdrop, a mean value of PKR 65 million (equivalent to US$ 617,000) also signals the presence of a small number of large borrowers.

---

[16] SBP PKR-US$ exchange rate on 31st December 2013 obtained from SBP websitehttp://www.sbp.org.pk/ecodata/rates/m2m/M2M-History.asp has been used for conversion of Pakistan Rupees into US Dollars. The same exchange rate has been used for conversion throughout the paper.

Table 2.1
Variables and their Descriptions

No.	Name of the variable	Description
	Dependent Variables	
1	Time to exit from default	The variable measures duration of default. In other words, the time it takes for a borrower to come out of default. It is measured in number of months, starting from the month a borrower is reported in default by a financial institution till the time it is reported as regular.
2	Time to access to fresh credit after exiting default	The time it takes, in months, for a borrower to obtain a new loan from a financial institution, after the default is cleared.
	Size of the Borrowings	
3	Principal	The outstanding amount of the loan owed by a borrower to a financial institution
4	Limit	The loan limit sanctioned by the financial institution to a borrower. This is the maximum amount that can be withdrawn by a borrower under a loan contract.
5	Number of loans	Number of loans availed of by the borrower from a particular financial institution
	Collateral	
6	Total collateral	Total value of collateral held by the financial institution as security against loans of a particular borrower
7	Liquid collateral	The best quality collateral that can be converted into cash without loss of substantial time and erosion in the value of security. It includes deposits under lien, precious metals, Government securities and shares of listed companies
8	Residential mortgage	The value of residential land and building mortgaged to the financial institution as security against loans

9	Commercial mortgage	The value of commercial land and property mortgaged to the financial institution as security against loans
10	Pledged stock	The value of stock (raw material, work in process, finished goods, merchandise, etc.) under the control of the financial institution, held as security against loans
11	Other collateral	All other types of collateral excluding the above categories
12	Types of collateral	Number of types of collateral offered by a borrower to a financial institution

Credit Relationships

13	Number of banks	Number of financial institutions with which a borrower has lending relationships at the end of a particular month
14	Number of branches	Number of branches of a particular financial institution with which a borrower has a credit relationship at the end of a particular month
15	Mainbank (dummy)	A dummy variable that identifies the main bank (the financial institution that has granted maximum aggregate loan limits to the borrower) if the borrower has lending relationship with more than one financial institutions
16	Number of products	Number of types of financing products (like term loans, running finance, TFC, bonds, etc.) availed of by a borrower from a financial institution

Other variables

| 17 | Rating (dummy) | A dummy variable with a value of 1 if the borrower is rated either externally or internally by its lender |
| 18 | Maturity of loan | It is tenure of the loan and is measured as the number of months when a loan becomes due. |

19	Islamic bank (dummy)	A dummy variable with the value of 1 if the bank extending the loan is an Islamic bank

Default variables

20	Total overdues	Total overdue amounts include principal, interest or any other amount owed to the bank and not paid by the due date
21	Write offs	Write offs include any amounts written off by the bank out of its claim on the borrower
22	Number of bank relationships in default	Number of financial institutions with which a borrower is in default at the end of the reporting month
23	FSV of collateral	Value of the collateral, assessed by an independent expert under the guidelines issued by SBP, which can be fetched in a forced sale
24	Amount in litigation	The amount claimed by the bank in recovery proceedings against a borrower in a court of law

Credit Pricing

25	Interest rate	The rate charged on the loan by a financial institution

Note: This Table presents definitions of the variables used in analyses. The explanatory variables have been grouped into five categories: size of the borrowings, collateral, credit relationships, other variables and default variables.

Table 2.2
Descriptive Statistics for Independent Variables Excluding Dummies

(Amounts are in Pakistan Rupees Millions)

Variables	Mean	Std. Dev.	Percentiles				
			p_10	p_25	p_50	p_75	p_90
Dependent Variables							
Time to exit from default (Number of months)	32.62	29.09	2	7	25	52	83
Time to access fresh credit (Number of months)	22.50	18.04	4	8	17	33	49
Size of the Borrowings							
Principal	65.00	485.00	0.03	0.32	2.61	19.15	100.07
Limit	98.80	703.00	0.18	0.90	5.03	33.56	167.50
Number of loans	2.27	4.42	1.00	1.00	1.00	2.00	4.00
Collateral							
Total collateral	168.00	1170.00	0.00	1.00	7.15	49.24	250.00
Liquid collateral	3.92	109.00	0.00	0.00	0.00	0.00	0.00
Residential mortgage	5.36	97.90	0.00	0.00	0.00	0.00	1.54
Commercial mortgage	14.70	301.00	0.00	0.00	0.00	0.00	6.00
Pledge	2.32	48.90	0.00	0.00	0.00	0.00	0.00
Other collateral	141.00	1100.00	0.00	0.00	2.03	25.00	190.40
Types of collateral	1.10	0.75	0.00	1.00	1.00	1.00	2.00
Credit Relationships							
Number of bank relationships	3.01	4.22	1.00	1.00	1.00	3.00	7.00
Number of branches	1.05	0.27	1.00	1.00	1.00	1.00	1.00
Number of products	1.54	1.10	1.00	1.00	1.00	2.00	3.00
Other Variables							
Maturity of loan	30.62	29.31	5	9	22	46	68

Default Variables

Overdue amounts	7.63	76.00	0.00	0.00	0.00	0.00	3.70
Write off amounts	0.02	2.73	0.00	0.00	0.00	0.00	0.00
Number of bank relationships in default	0.63	1.80	0.00	0.00	0.00	1.00	1.00
Forced sale value of collateral	12.90	232.00	0.00	0.00	0.00	0.00	1.00
Amount in litigation	8.14	1520.00	0.00	0.00	0.00	0.00	0.00

Credit Pricing

Interest rate	14.66	3.94	10.00	12.47	14.83	16.95	19.00

Note: This Table presents descriptive statistics for variables (excluding dummies) used in the analysis.

Collateral impacts the probability of default as well as the result of renegotiation in cases of default (Berger *et al*., 2016; Bester, 1994). There are 30 different types of collateral captured by the dataset. Given the lower number of observations for many categories and overlapping definitions, we have decided to broadly divide collateral into five categories, combining the types that have common characteristics from the perspective of quality of collateral.

Deposits under lien, certificate of deposits, precious metals and ornaments, listed debt securities and listed equities are categorized as *liquid collateral. Liquid collateral* can be readily converted into cash and is available to settle the bank's claim against the borrower without the need to go to a court of law. *Residential mortgages* include residential lands and buildings offered as security and likewise *commercial mortgages* include the mortgage of commercial land and buildings. *Pledged stocks* are raw material, work in process and finished goods offered as collateral, with the distinguishing feature that these stocks are under the control of the bank and are released to the borrower with the permission of the bank. Commercial mortgages are the second largest category at 8.8%, followed by residential mortgages, with its share at 3.2%. The most valuable and useful category, that is liquid collateral, constitutes only 2.3% of total collateral. The last category termed "*other collateral"* contains all the remaining 19 types of collateral, such as unrated debt securities, unlisted equities, mortgage of plant and machinery, guarantees, hypothecation, charge over assets, and lien on documents, which are relatively difficult to value, repossess and sell off in case of default. However, this

category is also the dominant type of collateral, constituting about 83.9% of the total collateral.

Multiple lending relationships of a firm are associated with better credit quality (Bolton and Scharfstein, 1996) although coordination problems among banks may reduce the probability of resolution in cases of default (Brunner and Krahnen, 2008). Further, the chances of resolution decrease if the main bank handles the negotiation in cases involving multiple lenders (Blazy *et al*., 2014). In addition to the number of bank relationships and the main bank, we also use the number of branches of a financial institution with which a firm conducts credit transactions as well as the number of different types of products it uses to raise financing. The dummy variable `Main bank' identifies the credit transaction in our dataset being carried out with the bank from which borrower is availing maximum credit limits. We have preferred to use sanctioned limits for determining the main bank of a borrower since loan limits are sanctioned for a fixed term and generally remain unchanged over a period of time, while the principal outstanding varies substantially. Summary statistics in Table 2.2 show that more than 50% of the observations in our dataset relate to borrowers dealing with only one bank, whereas the number of observations related to borrowers dealing with a single branch of a bank is even higher, at 90%. This indicates that, even when borrowers avail themselves of loans from more than one bank, they still prefer to deal with only one branch of a particular bank, perhaps because of familiarity with the branch officials or ease of access.

The length and severity of default makes it difficult for firms both to resolve default as well as access fresh credit after clearing default (Bonfim *et al*., 2012). We use five 'default variables' to capture the post default position of a borrower. The mean value of PKR 0.02 million for write off against the mean of PKR 7.63 million for overdue amounts shows that only a small number of overdue accounts actually result in a loss for the banks. A relatively high mean for the amount in litigation at PKR 12.9 million shows that banks generally take relatively larger defaulters to court. This phenomenon could be the result of a rational calculation on the part of the bank given the legal expenditure which makes legal proceedings against small borrowers unfeasible.

Pakistan also has Islamic commercial banks and the dataset contains information about loans extended by them.[17] The share of Islamic banks in the total credit of the economy, while growing, was still around 5% in year 2013. Although Islamic commercial banks extend loans in accordance with the principles of Islamic jurisprudence (Shariah), it has been found that risks and rewards for the customers of Islamic banks are similar to that of conventional banks (see for example, Khan (2010) and Chong and Liu (2009)). The Baele *et al.* (2014) study, however, reported a lower default rate for Islamic banks as compared to that for conventional banks in Pakistan. In order to control this aspect, we have added a dummy variable 'Islamic bank' in our estimations.

2.4 Characteristics of Default

We consider a loan in default when it has been reported by the bank in any one of four categories –other assets especially mentioned, substandard, doubtful or loss.[18] The State Bank of Pakistan has issued detailed regulations for the classification of loans and all banks are legally bound to follow these guidelines, ensuring uniformity of practices among financial institutions in Pakistan.[19] The original dataset obtained from CIB includes both fund based (various types of loans and investments like running finance, term loans, leases, Term Finance Certificates, Sukooks,[20] and so on) and non-fund based facilities (such as letters of credit and guarantees) extended to borrowers by the financial institutions. Since the default on a non-fund based facility may elicit a different type of response as compared to a loan default, this study only uses fund based facilities, that is, loans, for analysis.

The dataset contains month wise information of all loans from April 2006 to December 2013. The position of total loans, as well as corresponding NPLs, is given in Table 2.3.

---

[17] There were six Islamic banks in Pakistan as of 31st December 2013.
[18] We use the term loans in default or classified loans or NPLs (non-performing loans) interchangeably.
[19] For detail information, please see Prudential Regulations available at the SBP websitehttp://www.sbp.org.pk/publications/prudential/index.htm accessed on September 30, 2014.
[20] Sukook or Sukuk (کوسک) is an Islamic finance alternative for fixed income debt securities.

Table 2.3
Position of the Total Loans and Non-Performing Loans during April 2006 - December 2013

(Amounts are in Pakistan Rupees Billions)

Date	Borrowings by firms					Banking System Total Loans		
	Number of borrowers	Number of loans	Aggregate Principal Outstanding	Classified Principal	%age of total principal classified	Aggregate principal outstanding	Classified Principal	%age of total principal classified
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
30/04/2006	17,249	45,352	1,010.07	56.01	5.55%	2,174.02	176.71	8.13%
31/12/2006	22,441	60,072	1,477.62	100.80	6.82%	2,565.39	176.77	6.89%
31/12/2007	28,792	78,532	1,888.07	138.22	7.32%	2,875.69	218.00	7.58%
31/12/2008	29,063	81,552	2,328.41	229.79	9.87%	3,422.55	359.24	10.50%
31/12/2009	27,718	76,551	2,735.42	329.94	12.06%	3,551.33	446.01	12.56%
31/12/2010	26,944	75,361	2,990.89	375.36	12.55%	3,729.00	555.97	14.91%
31/12/2011	29,317	74,905	2,948.11	457.75	15.53%	3,759.24	591.58	15.74%
31/12/2012	28,591	73,446	3,295.29	462.96	14.05%	4,243.53	614.93	14.49%
31/12/2013	28,386	77,082	3,517.26	486.60	13.83%	4,505.49	585.12	12.99%

Note: This Table presents a comparative position of loans extended to firms and loans of the whole banking system. The banking system total loans include loans extended to firms as well as to individuals. Only the principal portion of the loans outstanding at a particular date has been shown here. The classified principal is the principal outstanding in respect of a loan reported as impaired by the bank in any category of classification (other assets especially mentioned, substandard, doubtful or loss).

Table 2.4
The Position of Regular vs. Defaulted Loans

(Amounts are in Pakistan Rupees Billions)

Date	Number of firms	Loans per firm	Total Loans			Loans in Regular Category			Loans in Default			%age loans in default		Collateral to Loan Amount ratio
			Number	Mean Amount	Median Amount	Number	Mean Amount	Median Amount	Number	Mean Amount	Median Amount	Number	Amount	
30/04/06	17,249	2.63	45,352	22.27	4.60	38,643	24.69	1.19	6,709	8.35	1.16	14.79%	5.55%	3.22
31/12/06	22,441	2.68	60,072	24.60	5.00	49,690	27.71	0.98	10,382	9.71	1.22	17.28%	6.81%	3.24
31/12/07	28,792	2.73	78,532	24.04	4.50	64,620	27.08	0.77	13,912	9.94	1.20	17.72%	7.31%	3.60
31/12/08	29,063	2.81	81,552	28.55	4.33	65,378	32.10	0.56	16,174	14.21	1.50	19.83%	9.86%	2.44
31/12/09	27,718	2.76	76,551	35.73	4.56	58,576	41.07	0.56	17,975	18.36	2.18	23.48%	12.04%	2.25
31/12/10	26,944	2.80	75,361	39.69	4.90	57,699	45.33	0.51	17,662	21.25	2.86	23.44%	12.55%	2.11
31/12/11	29,317	2.56	74,905	39.36	4.52	56,146	44.36	0.38	18,759	24.40	2.72	25.04%	15.52%	3.46
31/12/12	28,591	2.57	73,446	44.87	4.90	54,423	52.04	0.38	19,023	24.34	2.82	25.90%	14.03%	2.61
31/12/13	28,386	2.72	77,082	45.63	5.45	57,729	52.50	0.39	19,353	25.14	2.89	25.11%	13.82%	2.76

Note: This Table presents the comparative position of regular loans and loans in default on certain dates. The loans in default are the loans reported as classified by financial institution in any category of classification, namely other assets especially mentioned, substandard, doubtful or loss. The terms 'loans in default', 'defaulted loans' and 'classified loans' have been used interchangeably in this article.

The NPL to loan ratio of the entire banking system descended to its lowest level of 6.9% in December 2006 and then it gradually ascended to its peak at 15.7% in December 2011, after which it gradually levelled off to 13% in December 2013. Borrowings by firms also closely followed this trajectory, with NPLs peaking at 15.5% in December 2011 and then declining gradually. In terms of absolute numbers, the NPLs of the banking system attained their maximum level of PKR 615 billion in December 2012, after which they declined to PKR 585 billion in December 2013. The period under our examination, therefore, includes a variety of scenarios and should provide useful insight into the behaviour of banks and borrowers during a period of heightened concerns about the quality of loan portfolios.

The period covered in the study also coincides with the onset of the Global Financial Crisis in 2007-08, which had a substantial adverse effect on the economy of Pakistan (Jamali and Waseemuddin, 2011; Latif *et al.*, 2011).

In order to understand the dynamics of default, we provide in Table 2.4 some basic statistics and comparative information for loans in the regular category and the loans in default The average values in Table 2.4 calculated on the basis of mean and median narrate different stories. To start with, while the mean value of a loan almost doubled from PKR 22.27 million on 30th April 2006 to PKR 45.63 million at the end of 2013, the median value showed a negligible increase. This indicates that borrowing by larger borrowers increased while lending to small borrowers remained more or less at the same level during this period. The mean values of loans in default ranged from PKR 8.35 million to PKR 25.14 million as against a range of PKR 24.69 million to PKR 52.50 million for regular loans, thus suggesting that firms which succumb to default are small borrowers. However, the median values of loans in default (from PKR 1.16 million to PKR 2.89 million) are higher than those of regular loans (from PKR 1.19 million to PKR 0.39 million). These differences are unconditional and we will present a model of conditional default probabilities below which will help resolve the seemingly inconsistent picture that emerges from inspection of the summary statistics in Table 2.4.

The collateral to loan ratio ranged from 3.6 to 2.11 during the period under examination. Based on our discussions with regulators, we interpret this high level of collateral ratio an outcome of an inefficient judicial system (discussed in Section 2.6.1). During lengthy legal proceedings, the value of collateral may decline due to a number of reasons, for example, obsolescence, depreciation, theft and so on. In order

to compensate for this likely decline, financial institutions require higher levels of collateral from their borrowers.

We also observe that most of the default resolutions in Pakistan are achieved through private negotiations rather than judicial proceedings. Out of 17,040 cases of default resolutions in our dataset, only 940 cases (5.5%) were under litigation prior to resolution. However, we cannot state with certainty that even in these 940 cases, resolution was achieved through a court decision. Sometimes, lenders and borrowers reach out of court settlement while the legal proceedings are underway. Given the overwhelming majority of private resolutions in our dataset, we assume that our analysis and findings mainly pertain to private default resolutions.

2.5 Estimation Methodology

We utilize survival analysis technique for modelling data since our dependent variable(s) of interest are duration of default and time to access fresh credit after clearing default. It is also considered an appropriate choice for modelling longitudinal data, especially with censoring problems (Mills, 2011). In contrast to logistic regression that uses a binary output, survival analysis models use time to event of interest, which is more informative since it takes into account both the time to the event and probability of occurring of the event. A logistic regression model, in our case for example, would have treated a default that occurred after one month exactly the same as a default that occurred after one year. The proportional hazard model has been found to outperform logistic regression when occurrence of the event is not rare and the time to the event is long (Green and Symons, 1983).

The data are an unbalanced panel but the nature of the data introduces left and right censoring. Left censored observations are loans which had already experienced the event that we are trying to model, before the start of the observation period, i.e., April 2006. Right censoring occurs because we do not observe the subjects after a certain date. Following common practice in literature, we drop the left censored observations while right censoring is not considered a major problem in survival analysis and most of the econometric tools including the semi parametric Cox proportional hazard model we employ can take care of this issue (Guo, 2010). The Cox proportional hazard model estimates the hazard function using partial

likeliood method wihtout the need to make any assumption about baseline hazard (Cleves *et al., 2008).* The Cox proportional hazard model (Eq. 1) is estimated for the duration of the default and access to fresh credit after default:

$$h(t|x) = h_0(t)exp(x,\beta). \tag{1}$$

In the equation shown above, h_0 is the unspecified baseline hazard function, x is the vector of covariates and β is coefficient vector. One major advantage of using the Cox proportional hazard model is that it does not require any prior assumption about the shape of the baseline hazard.

Our first endogenous variable, duration of default, is the time that a borrower has been in default and is measured in number of months. It is the period when a borrower is reported in default by a financial institution till the time it is reported as regular. For example, if a borrower was reported in default for January 2008 and then reported as regular for August 2008, duration of default for this borrower would be 7 months. The second endogenous variable, time to access fresh credit after clearing default, measures the number of months it takes to obtain a new loan after a borrower has exited default. In the previous example, if the borrower having exited default in August 2008, obtains a new loan in June 2009, time to access fresh credit would be 10 months.

Our original dataset contains information for *each* loan obtained by a borrower. If a borrower has three loans from a bank, our dataset would have three observations for that borrower. However, a loan in itself is a transitory phenomenon since, in the normal course of the business, it is repaid and then a new loan is generated. As we are interested in observing the dynamics of a bank and borrower relationship, we collapse loan level data to the bank-borrower level by aggregating all the loans obtained from one bank by a particular borrower. Our primary unit of analysis is thus borrower-bank-month and the collapsed dataset contains about 3.6 million observations.

We proceed in the following manner for our analyses. Initially, we restrict our dataset to only the first default. All delinquents, by construction, must be in default a first time. Excluding subsequent defaults allows us to concentrate on this significant event for firms and also forestalls any confounding effects due to

recidivism. This analysis is thus confined to the duration of the first default and access to fresh credit after clearing the first default only. However, we later relax this restriction and include all subsequent defaults as well. This larger dataset allows us to consider if our decision to exclude subsequent defaults has a material effect on the inferences we draw. In these two analyses, we use nominal data. We present the results of these analyses in Panel A of Tables 2.5 and 2.6. We also re-estimate the samples after deflating monetary variables using the GDP deflator *and* converting nominal interest rates into real interest rates by use of the consumer price index.[21] We present these results in Panel B of Tables 2.5 and 2.6. Overall, our main findings are unaffected by these robustness checks.

We estimate several variants of the model, expanding the set of explanatory variables to develop a fuller picture of the influences on the dependent variable. We begin by estimating the Cox model with total collateral offered by a borrower to a bank to assess the impact of collateral per se. We then re-estimate the model using five different categories of collateral: – liquid collateral, residential mortgages, commercial mortgages, pledged stock and other collateral – in place of total collateral. This allows us to assess the efficacy and role played by different types of collateral in default resolution and access to fresh credit after clearing default. We then augment these models with the interest rate pertaining to the loan. Data on interest rates are available only for about 43% of observations but the data does not appear to be systematically missing (hence, a Heckman-like correction is not warranted). Both the performing and non-performing loans have more or less the same level of non-reporting of interest rates. There is neither any incentive or benefit nor any deterrence or threat to the bank related to reporting of interest rates: in Pakistan, banks are free to charge any interest rate considered appropriate by them.

2.6 Estimation Results

Our discussion of estimation results starts with the presentation of the Kaplan-Meier (KM) estimate, which is non-parametric tool and yields an unconditional probability of survival at time *t*. The Kaplan-Meier measures, at the end of each time interval,

---

[21] The consumer price index and the GDP deflator have been obtained from the website of the State Bank of Pakistan http://www.sbp.org.pk/ecodata on 30th September 2014.

the fraction of subjects surviving for a certain amount of time (Cleves *et al., 2008).*[22] For failure events defined as 'exit from default' and 'access to fresh credit after clearing default', KM estimate provides us an assessment of duration of default and time it takes for firms to access fresh credit after exiting default.[23]

We then follow up this discussion with the results of Cox Proportional Hazard Model, which are presented in Tables 2.5 and 2.6. As explained in Section 2.5, we run the estimations using both the nominal as well as real values of the variables. The Panel A of these tables present results for estimations with nominal values of the variables whereas Panel B lists results when we use real values of the variables. The first set of estimations (first four columns) in each panel contains results where analysis has been confined to the first default only. For example, for 'exit from default', we take into account only the first default of a firm and its resolution, ignoring subsequent defaults and any resolutions thereof. Likewise, for 'access to fresh credit', we use information about exit from first default and access to fresh credit after this default, ignoring subsequent defaults, exits and access to fresh loans after these events. This constraint is then removed in second set of estimations (last four columns), which uses first as well as all the subsequent defaults, exits from defaults and accesses to credit after all exits.

As explained in Section 2.5, we use numerous (16) different specifications of the model to estimate our variables of interest. The significance, sign and size of hazard ratios of almost all the variables, as shown in Tables 2.5 and 2.6, remain the same across all these specification, reflecting the robustness of our results.[24]

2.6.1 Exit from Default

The first aspect that we examine is when companies come out of default after committing default. A borrower may exit default by paying off the overdue amounts

---

[22] Unlike a simple graph of firms versus length of time in default, the Kaplan-Meier estimate takes into account right censoring, which occurs in our dataset as some of the firms exit without experiencing failure event.

[23] Failure event is the event of interest that we intend to examine and is the term commonly used in survival analysis.

[24] The reported standard errors in the paper have been calculated using conventional estimates for the variance-covariance matrix of the coefficients. However, the results with a range of standard errors (robust, clustered, bootstrapped, and so on) remain essentially unchanged (results available on request).

or through rescheduling or restructuring of its loan.[25] We consider a borrower having exited default once it is reported as regular after being in default by the lending institution. Figure 2.1 provides the Kaplan-Meier survival estimate for exit from default.

As we can see from Figure 2.1, the probability of exiting default drops with time. In the first five months, about 25% of defaults are cleared. However, it takes another 25 months to clear the next 25% of the defaults. Default duration thereafter increases with time. Our findings are close to those of Bonfim *et al*. (2012), who observe that 25% of the defaults are resolved in one or two quarters and 50% of the defaults are cleared within the first five quarters. They also observe that the defaults which are not cleared in one year take many years to resolve.

Figure 2.1: Exit from Default
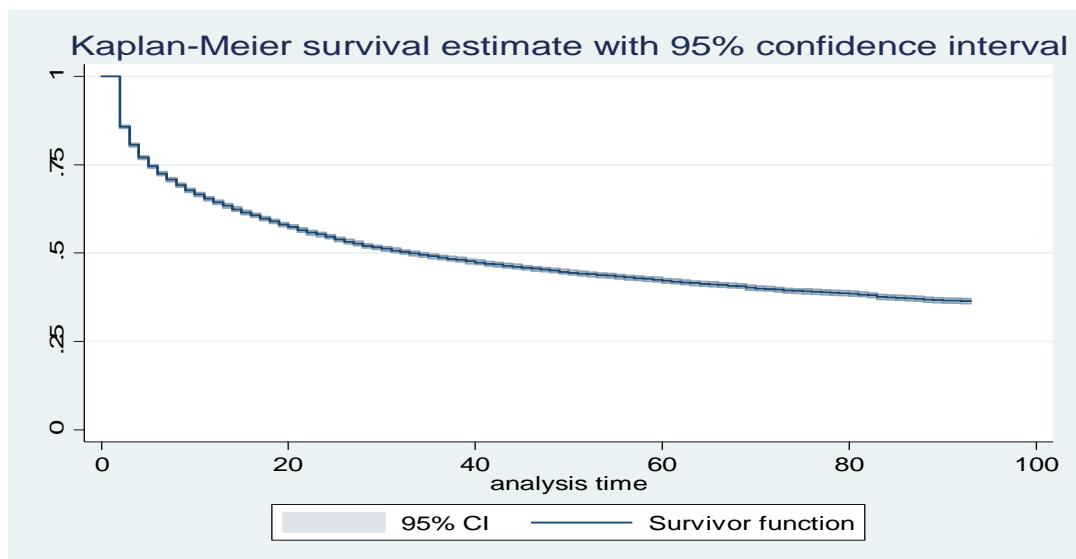
Note: Analysis time reflects number of months since default. The survival estimate yields the probability of surviving till time *t*. In the current scenario, the survival estimate is the probability of remaining in default till time *t*.

Table 2.5 summarizes the results of estimations for duration of default. This set of estimations assesses the impact of exogenous variables on time (*t*) for which a firm remains in default.

---

[25] Rescheduling refers to an extension in the repayment dates where restructuring is much more comprehensive and in addition to an extension in the maturity date of loans may include haircuts, waivers, reduction in interest rates, and so on.

Table 2.5: Panel A
Estimation Results with Exit from Default as Failure Event

Variables	First Default				Multiple Defaults			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Size of the Borrowing								
Ln (Principal)	0.965***	0.968***	0.970***	0.971***	0.976***	0.980***	0.979***	0.980***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)	(0.002)	(0.002)	(0.002)
Ln (Limit)	1.062***	1.076***	1.098***	1.106***	1.077***	1.092***	1.117***	1.123***
	(0.003)	(0.003)	(0.004)	(0.004)	(0.002)	(0.003)	(0.003)	(0.004)
Number of loans	0.997	0.998	0.999	0.998	0.999	0.999	0.999	0.999
	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)
Collateral								
Ln (Total collateral)	1.064***	-	1.030***	-	1.064***	-	1.024***	-
	(0.003)		(0.003)		(0.002)		(0.003)	
Ln (Liquid collateral)	-	0.992	-	0.981***	-	0.996	-	0.993
		(0.005)		(0.006)		(0.004)		(0.005)
Ln (Residential mortgage)	-	1.019***	-	1.003	-	1.021***	-	1.003
		(0.002)		(0.003)		(0.002)		(0.002)
Ln (Commercial mortgage)	-	1.015***	-	0.996	-	1.017***	-	0.996
		(0.002)		(0.003)		(0.002)		(0.002)
Ln (Pledged stock)	-	1.006	-	0.994	-	1.001	-	0.985***
		(0.005)		(0.006)		(0.004)		(0.005)
Ln (Other collateral)	-	1.033***	-	1.021***	-	1.036***	-	1.017***
		(0.002)		(0.003)		(0.002)		(0.002)
Types of collateral	1.022	1.033	0.943***	0.994	0.983	0.974	0.895***	0.930***
	(0.017)	(0.024)	(0.020)	(0.030)	(0.013)	(0.017)	(0.015)	(0.020)
Credit relationships								
Number of banks	1.075***	1.079***	1.058***	1.056***	1.077***	1.081***	1.060***	1.059***
	(0.002)	(0.002)	(0.003)	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)
Number of branches	0.828***	0.834***	0.832***	0.838***	0.856***	0.875***	0.844***	0.851***
	(0.031)	(0.031)	(0.036)	(0.036)	(0.025)	(0.025)	(0.027)	(0.027)
Main bank (dummy)	1.231***	1.260***	1.194***	1.184***	1.176***	1.206***	1.143***	1.135***
	(0.036)	(0.037)	(0.043)	(0.042)	(0.028)	(0.029)	(0.032)	(0.032)
Number of products	0.958***	0.941***	1.005	0.993	0.936***	0.924***	0.995	0.988
	(0.012)	(0.011)	(0.015)	(0.015)	(0.009)	(0.009)	(0.011)	(0.011)

Default variables

Ln (Total overdues)	0.832***	0.830***	0.824***	0.823***	0.813***	0.812***	0.799***	0.797***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)	(0.002)	(0.002)
Ln (Write offs)	1.056***	1.056***	1.055***	1.056***	1.041***	1.040***	1.030***	1.031***
	(0.004)	(0.004)	(0.005)	(0.005)	(0.003)	(0.003)	(0.004)	(0.004)
Number of bank relationships in default	0.395***	0.391***	0.410***	0.411***	0.458***	0.453***	0.479***	0.478***
	(0.007)	(0.007)	(0.008)	(0.008)	(0.006)	(0.006)	(0.007)	(0.007)
Ln (FSV of collateral)	0.963***	0.967***	0.978***	0.984***	0.962***	0.967***	0.983***	0.987***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Ln (Amount in litigation)	0.985***	0.985***	0.996	0.999	0.973***	0.972***	0.985***	0.987***
	(0.003)	(0.003)	(0.004)	(0.004)	(0.003)	(0.003)	(0.003)	(0.003)

Other variables

Rating (dummy)	1.132***	1.114***	1.099***	1.106***	1.253***	1.236***	1.273***	1.284***
	(0.030)	(0.029)	(0.034)	(0.034)	(0.027)	(0.027)	(0.032)	(0.032)
Maturity of loan	1.002***	1.001***	1.001***	1.000	1.002***	1.001***	1.001***	1.001**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Islamic bank (dummy)	1.658***	1.764***	1.257***	1.379***	1.935***	2.066***	1.489***	1.579***
	(0.108)	(0.115)	(0.161)	(0.177)	(0.100)	(0.107)	(0.151)	(0.161)

Credit Pricing

Interest rate	-	-	0.990***	0.990***	-	-	1.002	1.002
			(0.003)	(0.003)			(0.002)	(0.002)
Year dummies	Included	Included	Included	Included	Included	Included	Included	Included
No. of observations	776,997	776,997	439,764	439,764	931,677	931,677	550,188	550,188
Log Likelihood	-98,108	-98,311	-62,128	-62,099	-143,672	-143,933	-94,678	-94,647
Likelihood ratio chi-square (df)	29,988 (24)	29,583 (28)	20,321 (25)	20,377 (29)	46,922 (24)	46,399 (28)	34,417 (25)	34,480 (29)

Note: This Table presents the results of the Cox Proportional Hazard Model with exit from default defined as a 'failure event'. Panel A contains estimation results with nominal values of independent variables. In the first four models, the dataset is confined to first default (and exit) only and subsequent defaults are ignored. In the next four models, all the defaults as well as exits are taken into account. The first model contains the total value of collateral which is substituted with five different types of collateral in second model. The third model adds interest rate as another independent variable in the first model and the fourth model substitutes total collateral with types of collateral. This sequence is repeated in the next four models with multiple defaults. Standard errors are shown in parenthesis.
** significant at 5% level
*** significant at 1% level

Table 2.5: Panel B
Estimation Results with Exit from Default as Failure Event

Variables	First Default _ Deflated				Multiple Defaults _ Deflated			
	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Size of the Borrowing								
Ln (Principal)	0.958***	0.964***	0.959***	0.961***	0.973***	0.979***	0.972***	0.973***
	(0.002)	(0.003)	(0.003)	(0.003)	(0.002)	(0.002)	(0.003)	(0.003)
Ln (Limit)	1.077***	1.097***	1.124***	1.136***	1.095***	1.117***	1.148***	1.157***
	(0.003)	(0.004)	(0.005)	(0.005)	(0.003)	(0.003)	(0.005)	(0.004)
Number of loans	0.997	0.998	0.998	0.998	0.999	0.999	0.999	0.998
	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)
Collateral								
Ln (Total collateral)	1.066***		1.033***		1.065***		1.026***	
	(0.003)	-	(0.003)	-	(0.002)	-	(0.003)	-
Ln (Liquid collateral)		0.993		0.983***		0.997		0.995
	-	(0.005)	-	(0.006)	-	(0.004)	-	(0.005)
Ln (Residential mortgage)		1.019***		1.005		1.021***		1.005
	-	(0.002)	-	(0.003)	-	(0.002)	-	(0.002)
Ln (Commercial mortgage)		1.016***		0.998		1.017***		0.998
	-	(0.002)	-	(0.003)	-	(0.002)	-	(0.002)
Ln (Pledged stock)		1.006		0.996		1.001		0.987***
	-	(0.005)	-	(0.006)	-	(0.004)	-	(0.005)
Ln (Other collateral)		1.033***		1.022***		1.035***		1.018***
	-	(0.002)	-	(0.003)	-	(0.002)	-	(0.002)
Types of collateral	1.021	1.031	0.945***	0.986	0.982	0.970	0.898***	0.925***
	(0.017)	(0.024)	(0.020)	(0.030)	(0.013)	(0.017)	(0.015)	(0.020)
Credit Relationships								
Number of banks	1.075***	1.078***	1.058***	1.056***	1.077***	1.080***	1.059***	1.058***
	(0.002)	(0.002)	(0.003)	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)
Number of branches	0.820***	0.825***	0.825***	0.832***	0.854***	0.862***	0.834***	0.840***
	(0.031)	(0.031)	(0.035)	(0.036)	(0.025)	(0.025)	(0.027)	(0.027)
Main bank (dummy)	1.248***	1.263***	1.197***	1.184***	1.187***	1.202***	1.141***	1.130***
	(0.037)	(0.037)	(0.043)	(0.043)	(0.028)	(0.029)	(0.032)	(0.032)
Number of products	0.957***	0.935***	1.000	0.986	0.935***	0.920***	0.990	0.982
	(0.012)	(0.011)	(0.015)	(0.015)	(0.009)	(0.009)	(0.011)	(0.011)

Default variables

Ln (Total overdues)	0.759***	0.756***	0.750***	0.747***	0.734***	0.731***	0.714***	0.712***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)
Ln (Write offs)	1.096***	1.096***	1.089***	1.090***	1.072***	1.071***	1.052***	1.053***
	(0.006)	(0.006)	(0.008)	(0.007)	(0.005)	(0.005)	(0.006)	(0.006)
Number of bank relationships in default	0.383***	0.379***	0.390***	0.390***	0.445***	0.441***	0.458***	0.457***
	(0.007)	(0.007)	(0.008)	(0.008)	(0.006)	(0.006)	(0.007)	(0.007)
Ln (FSV of collateral)	0.950***	0.958***	0.972***	0.981***	0.952***	0.959***	0.979***	0.986***
	(0.003)	(0.003)	(0.003)	(0.004)	(0.002)	(0.002)	(0.003)	(0.003)
Ln (Amount in litigation)	0.982***	0.981***	1.000	1.004	0.966***	0.962***	0.985***	0.987***
	(0.005)	(0.005)	(0.006)	(0.006)	(0.004)	(0.003)	(0.005)	(0.005)
Other variables								
Rating (dummy)	1.137***	1.113***	1.101***	1.104***	1.257***	1.235***	1.274***	1.279***
	(0.030)	(0.029)	(0.034)	(0.034)	(0.027)	(0.027)	(0.032)	(0.032)
Maturity of loan	1.001***	1.001***	1.001***	1.001	1.001***	1.001***	1.001***	1.001
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Islamic bank (dummy)	1.676***	1.780***	1.273***	1.392***	1.944***	2.069***	1.512***	1.601***
	(0.109)	(0.116)	((0.163)	(0.179)	(0.100)	(0.107)	(0.153)	(0.163)
Credit pricing								
Interest rate			0.991***	0.991**			1.003	1.004
	-	-	(0.003)	(0.003)	-	-	(0.003)	(0.003)
Year dummies	Included	Included	Included	Included	Included	Included	Included	Included
No. of observations	776,997	776,997	439,764	439,764	931,677	931,677	550,188	550,188
Log likelihood	-98,406	-98,613	-62,377	-62,358	-144,237	-144,496	-95,228	-95,208
Likelihood ratio chi-square (df)	29,394 (24)	28,979 (28)	19,822 (25)	19,860 (29)	45,790 (24)	45,273 (28)	33,317 (25)	33,359 (29)

Note: This Table presents the results of the Cox Proportional Hazard Model with exit from default defined as 'failure event'. Panel B contains estimation results with deflated values of independent variables. In the first four models (9 to 12), the dataset is confined to first default (and exit) only and subsequent defaults are ignored. In the next four models (13 to 16), all the defaults as well as exits are taken into account. Model 9 contains the total value of collateral which is substituted with five different types of collateral in the model at column 10. Model 11 adds 'interest rate' as another independent variable in model 9 and the model at column 12 substitutes total collateral with types of collateral. This sequence is repeated in the next four models (13 to 16) with multiple defaults. Standard errors are shown in parenthesis.
** significant at 5% level
*** significant at 1% level

We first look at the variables representing the size of the borrowings. The firms having borrowed larger amounts take more time to exit from default. This is consistent with the notion that the resolution of large loans is more complicated and requires more time. However, the higher propensity of the firms borrowing larger sums of money to remain in default longer may also be construed as evidence of misuse of system inefficiencies by such borrowers. There have been consistent observations and findings regarding judicial system manipulations in Pakistan by persons with influence and power.[26] A weak judicial system deters the lenders from taking defaulting firms to courts and forces them to resolve defaults through private negotiations (Claessens *et al*., 2003). The inability of the lenders to efficiently foreclose collateral or liquidate defaulting firms would naturally strengthen the bargaining position of the borrower in a default resolution process.

Higher sanctioned limits, however, expedite the resolution of default. The sanctioned credit limits have been found to be associated with firms having higher cash flows (Sufi, 2009). In addition, the financial institutions in Pakistan generally reserve the right to cancel or revoke, at their own discretion, even a sanctioned limit.[27] This discretion helps them to contain their exposure in case of a default. The banks, however, generally keep the sanctioned limits intact if, in their judgement, the default is temporary or if they want the defaulting borrowers to utilize cushion in their limits to clear their default. In both scenarios, higher sanctioned limits help the borrowers to come out of default.

The optimal number of credit relationships is an important question for each firm. The higher number of creditors, being associated with inefficient reorganization in case of default, works as a deterrent against strategic default but also results in higher probability of liquidation in case of genuine default (Bolton and Scharfstein,

---

[26] For example, the Ex-Governor of the State Bank of Pakistan, Dr. Ishrat Husain, lamented the inefficiencies of the judicial system regarding loan recoveries in his essay "Judicial reforms and economic growth" published in the Express Tribute (Pakistan) on 17th March 2012. A working paper titled "Approaches to Legal and Judicial Reform in Pakistan" dated January 2011 by the Development Policy and Research Centre (DPRC) of Lahore University of Management Sciences and Law (LUMS) explains the misuse of the judicial system by powerful people (available at http://dprc.lums.edu.pk accessed on 25th February 2015).
[27] This assessment is based on our discussion with heads of credit of some of the large banks in Pakistan.

1996).[28] We estimate the impact of both the number of credit relationships as well as number of credit relationships in default on duration of default. Our estimation results show that having a higher number of credit relationships helps the firms in exiting default quickly. However, default with a higher number of credit relationships impedes the resolution process, most probably because of coordination problems. In fact, one additional bank relationship in default more than doubles the duration of default: this result holds across all models in Table 2.5. The credit relationship with multiple financial institution, we presume augment a borrower's ability to either payoff its overdue amounts to a bank by using financing from other banks or to use its credit relationships as a source of leverage in negotiation after default.

In addition to credit relationships, we also examined the role of number of branches and the number of financing products in the default resolution process. The variable 'number of branches' captures the number of branches of a bank with which a firm conducts credit transactions and represents breadth of a bank-borrower relationship. The variable 'number of products' represents the number of financing services utilized by a firm from a lender. Both the variables are significant and have hazard ratios of less than one across all specifications indicating their negative role in default resolution. This shows that coordination is not only an issue between different lenders in case of default, it is also a problem if a borrower is availing credit facilities from multiple branches of the same financial institution or utilizing various types of financing products. Having higher numbers of products utilized for financing makes the resolution of defaults complicated and thus such borrowers take more time in exiting default.

The variable 'main bank' identifies the credit transactions carried out with main bank if the borrower has credit relationships with more than one financial institution. The variable is significant with a hazard ratio of more than 1, reflecting an expeditious default resolution if the loan in default is from the main bank. Our results support the findings of Elsas and Krahnen (1998) that main banks are helpful for the borrowers in distress.

---

[28] A genuine default is because of cash flow problems of the firm where the firm is unable to honour its obligations. A strategic default, on the other hand, is committed to obtain better terms or seek partial write offs.

Collateral has a hazard ratio of more than one, which means that the firms offering higher collateral exit default quickly, ceteris paribus. There are mixed findings about the role of collateral in debt renegotiation. Bester (1994) reported that collateral facilitates debt restructuring while Neus and Stadler (2013) observe a diminishing role of collateral after the loan default. Our findings support the view that collateral facilitates default resolution. It implies that despite the issues related with foreclosure of collateral in Pakistan, discussed at the start of this section, banks still do rely on it to some extent. There is a possibility that, while it is difficult to foreclose on collateral because of the inefficient judicial system, collateral may still give some bargaining power to the banks in case of default.

While total collateral is significant across all models in Table 2.5, further consideration of the role of *types* rather than *total* collateral provides a more nuanced view. In our analyses of exit from default, not all types of collateral are statistically significant. Mortgages (both residential and commercial) and 'other collateral' tend to be statistically significant, with hazard ratios of 1.019, 1.015 and 1.033 respectively. Liquid collateral and pledged stock are not statistically significant: these types of collateral do not play any role during the default resolution process. Liquid collateral may become immaterial when firms are in default because it may have already been used or earmarked by the lender against its claim on the defaulting borrower and thus remains no more available at post default stage. The insignificance of pledged stock, however, is another matter. Pledged stock cannot be sold off by the bank without the help of the legal apparatus of the country. However, pledged stocks are moveable items and in many cases perishable as well. Being moveable and on the premises of the borrower, there is a high risk of pilferage once the borrower has defaulted. As a result, just like liquid collateral, pledged stock loses its importance at post default stage.

The hazard ratio of less than 1 for overdue amounts suggest that severity of default increases the duration of default as also observed by Bonfim *et al*. (2012). This is also intuitive since the borrowers will need more time to arrange for the repayment of the higher overdue amounts and banks will also take more time in processing the requests for rescheduling or restructuring of the large overdue amounts.

The existence of litigation between a lender and a borrower also makes the default resolution difficult. In fact, the higher the amount in litigation, the more time it takes for the borrower to exit default as suggested by a hazard ration of less than 1 for the variable 'amount in litigation'. Write-off is the only variable related to default that expedites renegotiation process. A decision to write-off is generally taken by a bank as a result of some sort of negotiated settlement. The results show that when the banks are ready to accept a write-off, resolution of the problem loans can be achieved quickly.

The interest rate, both nominal and real, is significant and increases the duration of default but only when we restrict the analysis to first default only. The higher interest rate adversely affects the debt servicing capacity of a borrower who is already in distress and as a result exit from default becomes more difficult. Thus a reduction in the interest rate may be an appropriate and effective strategy to pull such borrowers out of default. The interest rate, however, becomes insignificant when we take into account first, as well as, subsequent defaults. It means after the first episode of default and its resolution, interest rates no longer remain relevant for subsequent defaults. The repetition of default means that either the borrower is in serious trouble or is in default by choice. As a result, a reduction in the interest rate is not an effective strategy to help or deal with second and subsequent defaults.

The hazard ratios for 'Islamic banks', ranging from 1.257 to 2.069 as shown in Table 2.5, demonstrate that Islamic banks are much better than their conventional counterparts in resolving default. This could be attributed to borrowers' preference towards Islamic banks for regularization of their loan as Baele *et al*. (2014) found that likelihood of default by the same borrower on an Islamic finance loan is less than on a conventional loan. The efficient default resolution, however, may also be a result of better information that an Islamic bank acquires about its customers by virtue of peculiar characteristics of Islamic financing products that require a closer interaction between lender and borrower.[29]

---

[29] The bulk of financing by Islamic banks in Pakistan is done through Murabaha, which is basically a sale and purchase transaction between lender and borrower. The nature of transaction enables the Islamic banks to get much more information about their borrowers (like for example, their products, suppliers and inventory) than their conventional peers.

2.6.2 **Re-access to fresh credit**

Access to credit is a lifeline for subsistence as well as necessary precondition for the growth of business. It is, therefore, important to assess whether the borrowers who default are able to access fresh credit after exiting default and when are they able to do so. Further, it is important how the different variables affect the ability of such borrowers to access fresh credit. We define access as having obtained a new loan after exiting default. It is important to note that, as earlier pointed out in Section 2.1, our definition of access to fresh credit is quite strict and we only acknowledge access when the firm obtains a new loan. Thus renewal of an existing facility or drawdown under an existing facility would not count as access to fresh credit.

Figure 2.2 shows the Kaplan-Meier survival function for access to fresh credit after exiting default. In this case, the failure event (generic term used in the survival analysis) is access to fresh credit after exiting default. The graph shows that the majority of the firms are able to access fresh credit after default, although the probability declines with time. The first 25% of the firms gain access to fresh credit within ten months of the exit from default, whereas 50% of the firms get access to fresh credit in about 30 months.

Figure 2.2: Access to Fresh Credit after Exiting Default
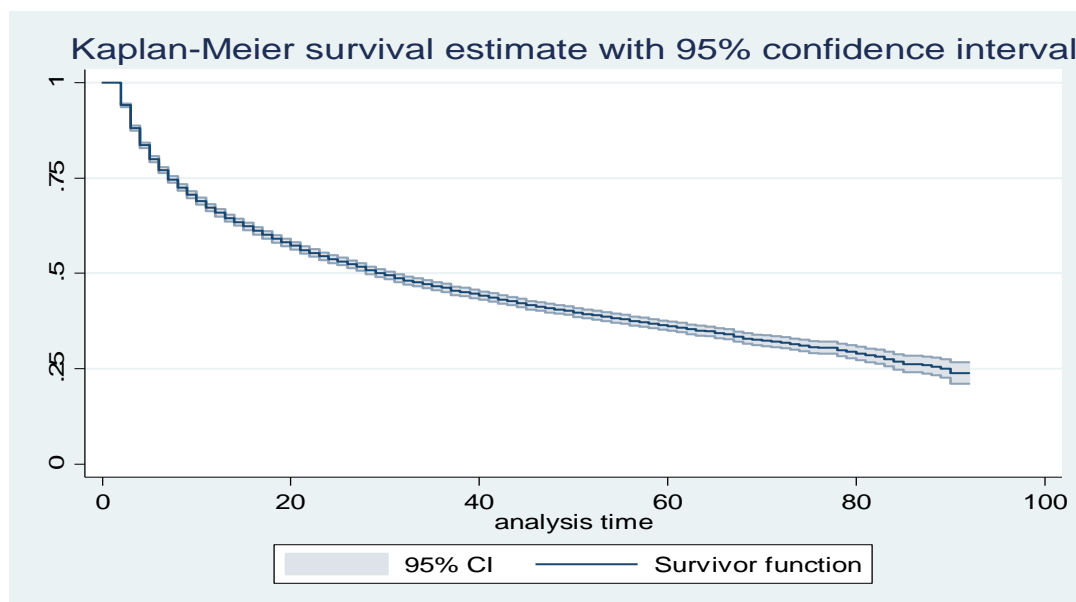
Note: Analysis time is the number of months after clearing default. The survival estimate yields the probability of subjects remaining in the same state till time t. In the current scenario, it is used to assess the probability of accessing fresh credit till time t. The access to fresh credit has been defined as obtaining a new loan after exiting default.

As described in Section 2.2, Bonfim *et al*. (2012) is the only study that has examined access to fresh credit after default. Our findings here are different from those of Bonfim *et al*. (2012) who observe that 25% of the firms increase their bank debt within two quarters of exiting default. They also observe that firms, which are not able to re-access credit within one year of exiting default, have less than 1% chance of getting credit afterwards. The differences, however, may be the result of different definitions of access to credit. Bonfim *et al*. (2012) use increase in total credit as evidence of obtaining a fresh loan whereas this study, having the benefit of a loan level dataset, identifies access to fresh credit only when a new loan has been obtained by the firm.

The results of estimations of time for access to fresh credit as a dependent variable are presented in Table 2.6. From Table 2.6, we see that firms with larger outstanding principal, higher sanctioned limits and greater number of loans are able to access fresh loans earlier after clearing default.[30] Bonfim *et al*. (2012) also observe a positive relationship between larger outstanding amounts and access to fresh credit after clearing default. Our results suggest that sanctioned loan limits and number of loans have the same effect on access to fresh credit as that of the outstanding loan amount.

In the previous section, we discussed that multiple credit relationships help the borrower in exiting default. We now observe that this variable is also helpful in obtaining fresh loans after default resolution. In fact, firms conducting credit transactions with greater number of branches and using multiple financing products are also at an advantageous position in accessing fresh credit as implied by the hazard ratios of more than one for both these variables in Table 2.6. These results suggest that generally larger firms are able to access the loan market faster than smaller firms, after resolving default. Our assessment is based on the notion that generally large firms would obtain bigger loans, would have relationships with more banks and branches, and would use greater number of financing products as compared to small firms.

---

[30] Variable 'number of loans' has a hazard ratio of 1.001 (which is very close to one, indicating the low impact of the variable on dependent variable) and is not significant when we confine the dataset to access to fresh credit after first default only, that is, we ignore subsequent defaults and re-access after such defaults. However, the variable becomes significant when re-access to fresh credit after subsequent defaults is also taken into account and its hazard ratio also improves to 1.004.

Table 2.6: Panel A
Estimation Results with Failure Event as Access to Fresh Credit after Exiting Default

Variables	First Default				Multiple Default			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Size of the Borrowing								
Ln (Principal)	1.041***	1.041***	1.055***	1.057***	1.035***	1.036***	1.046***	1.047***
	(0.004)	(0.004)	(0.006)	(0.006)	(0.004)	(0.004)	(0.005)	(0.005)
Ln (Limit)	1.027***	1.025***	1.022**	1.024**	1.020***	1.020***	1.021**	1.023***
	(0.007)	(0.006)	(0.010)	(0.010)	(0.006)	(0.006)	(0.009)	(0.009)
Number of loans	1.001	1.000	1.001	1.001	1.004***	1.004***	1.004***	1.004***
	(0.001)	(0.001)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)
Collateral								
Ln (Total collateral)	1.019***		1.016***		1.014***		1.010	
	(0.005)		(0.006)		(0.005)		(0.005)	
Ln (Liquid collateral)		1.006		0.998		1.009		1.006
		(0.006)		(0.008)		(0.005)		(0.006)
Ln (Residential mortgage)		1.004		0.996		1.001		0.997
		(0.004)		(0.005)		(0.003)		(0.004)
Ln (Commercial mortgage)		1.011***		1.005		1.005		1.003
		(0.003)		(0.004)		(0.003)		(0.004)
Ln (Pledged stock)		0.997		0.987		0.996		0.994
		(0.006)		(0.007)		(0.005)		(0.006)
Ln (Other collateral)		1.027***		1.012***		1.015***		1.006
		(0.004)		(0.005)		(0.003)		(0.004)
Types of collateral	0.929***	0.892***	0.942**	0.954	1.005	0.988	1.016	1.018
	(0.019)	(0.025)	(0.025)	(0.035)	(0.016)	(0.022)	(0.019)	(0.025)
Credit Relationships								
Number of banks	1.090***	1.089***	1.093***	1.093***	1.048***	1.047***	1.050***	1.050***
	(0.003)	(0.003)	(0.004)	(0.004)	(0.003)	(0.003)	(0.003)	(0.003)
Number of branches	1.225***	1.222***	1.228***	1.227***	1.055**	1.050**	1.052**	1.048**
	(0.047)	(0.046)	(0.050)	(0.050)	(0.024)	(0.025)	(0.025)	(0.026)
Main bank (dummy)	1.319***	1.300***	1.270***	1.263***	1.217***	1.213***	1.185***	1.184***
	(0.055)	(0.055)	(0.066)	(0.066)	(0.044)	(0.044)	(0.052)	(0.052)
Number of products	1.174***	1.171***	1.140***	1.138***	1.084***	1.081***	1.064***	1.063***
	(0.016)	(0.016)	(0.019)	(0.019)	(0.012)	(0.012)	(0.014)	(0.014)

Default variables

Ln (Total overdues)	0.946***	0.946***	0.939***	0.939***	0.950***	0.950***	0.944***	0.944***
	(0.004)	(0.004)	(0.005)	(0.005)	(0.003)	(0.004)	(0.005)	(0.005)
Ln (Write offs)	0.946***	0.944***	0.949***	0.949***	0.951***	0.951***	0.951***	0.950***
	(0.012)	(0.012)	(0.015)	(0.015)	(0.012)	(0.012)	(0.014)	(0.014)
Number of bank relationships in default	0.940***	0.937***	0.939***	0.938***	0.999	0.998	1.004	1.004
	(0.006)	(0.006)	(0.008)	(0.008)	(0.005)	(0.005)	(0.007)	(0.007)
Ln (FSV of collateral)	0.980***	0.983***	0.976***	0.979***	0.985***	0.987***	0.983***	0.985***
	(0.004)	(0.004)	(0.004)	(0.005)	(0.003)	(0.003)	(0.004)	(0.004)
Ln (Amount in litigation)	0.962***	0.963***	0.959***	0.960***	0.971***	0.972***	0.967***	0.967***
	(0.009)	(0.009)	(0.011)	(0.011)	(0.009)	(0.009)	(0.010)	(0.010)

Other variables

Rating (dummy)	1.058	1.054	0.935	0.941	0.966	0.964	0.853***	0.857***
	(0.044)	(0.044)	(0.046)	(0.046)	(0.036)	(0.036)	(0.037)	(0.037)
Maturity of loan	1.000	1.000	0.998***	0.998***	1.000	1.000	0.999	0.999
	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)	(0.001)	(0.001)
Islamic bank (dummy)	1.619***	1,589***	1.466***	1.482***	1.261***	1.248***	1.037	1.037
	(0.144)	(0.141)	(0.264)	(0.267)	(0.100)	(0.099)	(0.166)	(0.166)

Credit pricing

Interest rate			0.998	0.998			1.000	1.001
	-	-	(0.006)	(0.006)	-	-	(0.005)	(0.005)
Year dummies	Included	Included	Included	Included	Included	Included	Included	Included
No. of observations	88,454	88,454	59,821	59,821	166,453	166,453	114,524	114,524
Log likelihood	-33,780	-33,750	-22,062	-22,055	-46,000	-45,986	-30,657	-30,654
Likelihood ratio chi-square (df)	3,240 (24)	3,300 (28)	2,235 (25)	2,249 (29)	2,342 (24)	2,370 (28)	1,691 (25)	1,696 (29)

Note: This Table presents the results of the Cox Proportional Hazard Model with access to credit after clearing default defined as 'failure event'. Panel A contains estimation results with nominal values of independent variables. In the first four models, the dataset is confined to first default (exit and subsequent access to credit) only and subsequent defaults are ignored. In the next four models, all the defaults (as well as exits and access to credit) are taken into account. The first model contains the total value of collateral which is substituted with five different types of collateral in the second model. The model at column 3 adds 'interest rate' as another independent variable in model 1 and the model at column 4 substitutes total collateral with types of collateral. This sequence is repeated in the next four models (5 to 8) with multiple defaults. Standard errors are shown in parenthesis.

** significant at 5% level

*** significant at 1% level

Table 2.6: Panel B
Estimation Results with Failure Event as Access to Fresh Credit after Exiting Default

Variables	First Default _ Deflated				Multiple Defaults _ Deflated			
	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Size of the Borrowing								
Ln (Principal)	1.056***	1.056***	1.075***	1.077***	1.049***	1.049***	1.062***	1.063***
	(0.006)	(0.006)	(0.008)	(0.008)	(0.005)	(0.005)	(0.007)	(0.007)
Ln (Limit)	1.036***	1.031***	1.027**	1.027**	1.026***	1.024***	1.025**	1.026***
	(0.008)	(0.008)	(0.012)	(0.012)	(0.007)	(0.007)	(0.011)	(0.010)
Number of loans	1.001	1.001	1.001	1.001	1.004***	1.004***	1.004***	1.004***
	(0.001)	(0.001)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)
Collateral								
Ln (Total collateral)	1.014***		1.012		1.010**		1.006	
	(0.005)		(0.006)		(0.005)		(0.005)	
Ln (Liquid collateral)		1.005		0.997		1.009		1.006
		(0.006)		(0.008)		(0.005)		(0.006)
Ln (Residential mortgage)		1.003		0.995		1.000		0.996
		(0.004)		(0.005)		(0.003)		(0.004)
Ln (Commercial mortgage)		1.010***		1.003		1.004		1.002
		(0.003)		(0.004)		(0.003)		(0.004)
Ln (Pledged stock)		0.996		0.986		0.996		0.993
		(0.006)		(0.007)		(0.005)		(0.006)
Ln (Other collateral)		1.025***		1.010**		1.014***		1.005
		(0.004)		(0.005)		(0.003)		(0.004)
Types of collateral	0.930***	0.896***	0.944**	0.959	1.006	0.993	1.017	1.021
	(0.019)	(0.025)	(0.025)	(0.035)	(0.016)	(0.022)	(0.019)	(0.025)
Credit Relationships								
Number of banks	1.087***	1.086***	1.091***	1.090***	1.047***	1.045***	1.049***	1.048***
	(0.003)	(0.003)	(0.004)	(0.004)	(0.003)	(0.003)	(0.003)	(0.004)
Number of branches	1.219***	1.216***	1.223***	1.222***	1.052**	1.048**	1.049**	1.046
	(0.046)	(0.046)	(0.049)	(0.050)	(0.024)	(0.025)	(0.025)	(0.025)
Main bank (dummy)	1.292***	1.274***	1.247***	1.239***	1.200***	1.195***	1.169***	1.167***
	(0.054)	(0.054)	(0.065)	(0.065)	(0.044)	(0.043)	(0.052)	(0.052)
Number of products	1.165***	1.162***	1.129***	1.127***	1.078***	1.074***	1.056***	1.056***
	(0.016)	(0.016)	(0.019)	(0.019)	(0.012)	(0.012)	(0.014)	(0.014)

Default variables

	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Ln (Total overdues)	0.921***	0.922***	0.910***	0.910***	0.928***	0.928***	0.917***	0.917***
	(0.006)	(0.006)	(0.008)	(0.008)	(0.006)	(0.006)	(0.007)	(0.007)
Ln (Write offs)	0.916***	0.914***	0.918***	0.918***	0.925***	0.924***	0.921***	0.921***
	(0.018)	(0.018)	(0.022)	(0.022)	(0.017)	(0.017)	(0.021)	(0.021)
Number of bank relationships in default	0.940***	0.937***	0.940***	0.938***	0.999	0.998	1.005	1.005
	(0.006)	(0.006)	(0.008)	(0.008)	(0.005)	(0.005)	(0.007)	(0.007)
Ln (FSV of collateral)	0.974***	0.979***	0.968***	0.973***	0.981***	0.983***	0.978***	0.980***
	(0.005)	(0.005)	(0.006)	(0.006)	(0.004)	(0.004)	(0.005)	(0.0005)
Ln (Amount in litigation)	0.946***	0.948***	0.943***	0.943***	0.959***	0.961***	0.953***	0.953***
	(0.013)	(0.013)	(0.015)	(0.015)	(0.012)	(0.012)	(0.015)	(0.015)
Other variables								
Rating (dummy)	1.057	1.053	0.937	0.942	0.963	0.961	0.855***	0.859***
	(0.044)	(0.044)	(0.046)	(0.047)	(0.036)	(0.036)	(0.037)	(0.037)
Maturity of loan	1.000	1.000	0.998***	0.998***	1.000	1.000	0.999	0.999
	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)	(0.001)	(0.001)
Islamic bank (dummy)	1.617***	1.582***	1.465**	1.474**	1.258***	1.243***	1.036	1.034
	(0.143)	(0.140)	(0.264)	(0.265)	(0.100)	(0.098)	(0.166)	(0.166)
Credit pricing								
Interest rate			0.999	0.999			1.003	1.003
	-	-	(0.006)	(0.006)	-	-	(0.005)	(0.005)
Year dummy	Included	Included	Included	Included	Included	Included	Included	Included
No. of observations	88,454	88,454	59,821	59,821	166,453	166,453	114,524	114,524
Log likelihood	-33,780	-33,751	-22,066	-22,058	-46,000	-45,986	-30,658	-30,655
Likelihood ratio chi-square (df)	3,239 (24)	3,299 (28)	2,228 (25)	2,243 (29)	2,343 (24)	2,371 (28)	1,689 (25)	1,695 (29)

Note: This Table presents the results of the Cox Proportional Hazard Model with access to credit after clearing default defined as 'failure event'. Panel B contains estimation results with deflated values of independent variables. In the first four models (at columns 9 to 12), the dataset is confined to first default (exit and subsequent access to credit) only and subsequent defaults are ignored. In the next four models (at columns 13 to 16), all the defaults (as well as exits and access to credit) are taken into account. The first model at column 9 contains the total value of collateral which is substituted with five different types of collateral in the next model at column 10. The model at column 11 adds 'interest rate' as another independent variable in model 9 and the next model at column 12 substitutes total collateral with types of collateral. This sequence is repeated in the next four models (13 to 16) with multiple defaults. Standard errors are shown in parenthesis.
** significant at 5% level
*** significant at 1% level

The variable 'main bank' is significant across all models in Table 2.6, with hazard ratios ranging from 1.167 to 1.319. This variable identifies the credit transaction of a firm with its main bank in the dataset. The results show that the firms clearing default with their main bank are able to access credit markets faster. Our results in the previous section show an efficient default resolution if the loan has been obtained from the main bank of the borrowers. These findings suggest that relationship with main bank is welfare enhancing both in terms of efficient default resolution and access to credit markets after clearing default.

The value of collateral also plays a positive role as suggested by its hazard ratios of more than one in Table 2.6 across all specification. Thus higher the collateral a borrower has, the quicker it will be able to access the fresh credit. While there is a plausible economic justification for this phenomenon (banks would be more willing to lend if borrower can offer suitable collateral), this relationship may also be the manifestation of influence of the large firms. Generally large firms would have access to higher levels of collateral. However, given the issues related with foreclosure of collateral because of an inefficient judicial system, financial institutions are generally not expected to assign substantial weightage to collateral especially when they are lending to a firm with bad credit history. A positive relationship between collateral and access to fresh credit after default, therefore, may actually be driven by the influence wielded by large firms in Pakistan.

Bonfim *et al.* (2012) observe that overdue amounts increase the time to access fresh credit. We also find that larger overdue amounts make access to fresh credit difficult even after the resolution of default. The larger overdue amounts may be a reflection of deterioration in the financial condition of the firm. In such a case, lenders would generally be unwilling to take fresh stake in the company because of higher credit risk. The greater forced sale value of collateral and amount in litigation also stretches the timeframe to obtain fresh loans, presumably because of the same reasons discussed in Section 2.6.1 in detail.

The 'write off', which facilitates the borrowers in exiting default quickly, has an adverse impact on access to credit as shown by its hazard ratios of less than one across all specification in Table 2.6. It means that even when the banks support the borrowers in exiting default through write offs, such write offs create a hindrance for borrowers in re-accessing fresh credit. This creates a major dilemma. The absence of

fresh credit, post default, may not only constrain the growth prospects of a company but may endanger its very existence, thus compromising the very objective for which write off was offered by the bank.

The borrowers of the Islamic banks are able to access fresh credit faster as compared to borrowers of conventional financial institutions. This may be attributable to a more accommodative stance that Islamic banks can take because of their access to higher information about the borrower as Sol (2009) find that more information about the borrowers during default plays an important role in lenders' decision to extend fresh loans to defaulters.[31]

The interest rate is insignificant across all model specifications in Table 2.6, suggesting that it does not play any role in access to fresh credit after default resolution. A borrower with a poor credit history will be considered a higher risk by the lenders. One may suggest that lenders could compensate for this risk through charging higher interest rates to such borrowers. In such a scenario, interest rate should be significant with an hazard ratio of more than one. However, our results support the argument of Stiglitz and Wejss (1983) who suggest that lenders would not extend fresh credit to defaulters even at the higher interest rates to avoid adverse selection.

2.6.3 Joint dynamics of default resolution and access to fresh credit after exiting default

Table 2.7 summarizes the estimation results (reported in Tables 2.5 and 2.6) of default resolution and access to credit taking into account the whole credit history of the borrowers for comparison purposes.

---

[31] We have earlier explained, in Section 2.6.1, that peculiar characteristics of Islamic financing products entail acquisition of richer information by Islamic banks about their borrowers.

Table 2.7:
Summary of the Results

Failure Event	Exit from Default		Access to Credit after Exiting Default	
	Table 2.5, panel A, column 5	Table 2.5, panel A, column 7	Table 2.6, panel A, column 5	Table 2.6, panel A, column 7
Size of the Borrower				
Ln (Principal)	-	-	+	+
Ln (Limit)	+	+	+	+
Number of loans	n/s	n/s	+	+
Collateral				
Ln (Total collateral)	+	+	+	n/s
Types of collateral	n/s	-	n/s	n/s
Credit Relationships				
Number of banks	+	+	+	+
Number of branches	-	-	+	+
Main bank (dummy)	+	+	+	+
Number of products	-	n/s	+	+

Other Variables

Rating (dummy)	+	+	n/s	-
Maturity of loan	+	+	n/s	n/s
Islamic bank (dummy)	+	+	+	+

Default Variables

Ln (Total overdues)	-	-	-	-
Ln (Write offs)	+	+	-	-
Number of bank relationships in default	-	-	n/s	n/s
Ln (FSV of collateral)	-	-	-	-
Ln (Amount in litigation)	-	-	-	-

Credit Pricing

Interest rate	n/a	n/s	n/a	n/s

Year dummies	Included	Included	Included	Included

Note: This Table presents a comparison of the estimation results with the two failure events examined in the paper i.e., exit from default and access to credit after clearing default. The Table shows the estimation results of the column 5, which take into account all defaults (that is first default as well as subsequent defaults) and the column 7 which adds 'interest rate' as another independent variable in column 5. The sign (+) denotes a positive and significant association at 1% and 5% level and (-) denotes a negative and significant association at 1% and 5% level. The term (n/s) denotes insignificant association whereas (n/a) denotes the variables not included in the regression.

We find that the firms with smaller loan size are able to resolve default quickly. Despite this, such firms take more time in accessing fresh credit after clearing default. Further, the access becomes more challenging if these firms do not have sanctioned loan limits or the limits are small. Assuming a strong correlation between the firm size and size of its borrowing and sanctioned loan limit, our interpretation of the results suggests that defaults are especially costly for smaller firms in terms of their access to credit markets. Given the fact that small businesses play a pivotal role in economic development and generation of employment, policy makers may need to extend some handholding to small businesses at the post default stage.

Firms with higher overdue amounts face difficulties both in exiting default and in accessing fresh credit after default resolution. The overdue amount would generally increase with time in default as firms increasingly do not make payments on due dates. Litigation is also a time consuming process and delays both the default resolution as well as access to fresh credit. It is, therefore, in the interest of both the lender and the borrower to resolve defaults quickly without involving courts.

Surprisingly, write offs expedite the default resolution process, however, borrowers with a write off history face problems in getting fresh credit after exiting default. Firms accepting write offs should, therefore, be cautious that this temporary relief may compromise their fund raising ability in future.

2.7 Conclusion

In this paper, we use a unique and exhaustive dataset of loans from Pakistan to examine the factors that facilitate or hamper loan default resolution and access to fresh credit by firms after exiting default. The findings of the study have important implications for banks, firms, policy makers and especially bank supervisors.

We offer the first study that examines the role of collateral and credit pricing on default resolution and access to fresh credit. We find that collateral facilitates the borrowers in both exiting default and accessing fresh credit after default resolution. Firms with access to real assets that can be offered as collateral are, therefore, at

advantageous position. The firms paying higher interest rates find it difficult to exit from default. This suggests that banks should carefully weigh the pros and cons of charging high penalty interest rates to their borrowers in default since it can actually delay the resolution and hurt both banks and their borrowers.

We also examine the impact of relationships on default resolution and access to fresh credit. Having multiple credit relationships is helpful in resolving default and in accessing the credit markets for fresh loans after clearing default. However, in the event of default involving more than one credit relationship, both resolution and access to credit in the future becomes problematic. We believe that this could be because of coordination issues between lenders. Since the delays in default resolution and access to credit markets can result in suboptimal utilization of productive resources, these findings highlight the need for a suitable mechanism to facilitate coordination between lenders at the post default stage. Such a mechanism would be useful, not only in resolving defaults involving multiple lenders, but also in arranging the necessary funding to keep such borrowers afloat.

Our findings also suggest that effective coordination is also an issue even when a firm borrows from multiple branches of the same financial institution. It may be necessary for a firm, especially if it is geographically dispersed, to build credit relationships with many branches. However, utilizing facilities from a higher number of bank branches, and use of multiple financing products, make the default resolution process complicated and time consuming. A centralized default resolution mechanism at the banks could iron out these complications and accelerate the process, benefitting both the banks and their borrowers. Both of these variables (number of both branches and financing products) are, however, helpful to firms at the post default stage of accessing fresh credit since accessibility to a higher number of bank branches and multiple financing products increase the number of options that a borrower can tap into to arrange fresh loans.

Our results suggest that Islamic banks are able to resolve loan defaults quickly as compared to conventional financial institutions. Further, firms dealing with Islamic banks are also able to access fresh credit more easily. This shows that the relationships with Islamic banks are welfare enhancing for firms. Owing to a lack

of information, we cannot say at this stage with certainty whether these findings are the results of characteristics of the borrowers of Islamic banks or the business model of such financial institutions that requires closer interaction between lender and borrower as explained in previous sections.

RELATION LENDING: A SOURCE OF SUPPORT OR A MEANS OF EXPLOITATION? – EVIDENCE FROM A DEVELOPING ECONOMY [*]

3.1 Introduction

Relationship lending is characterized by a long term bilateral relationship between a lender and borrower. Over this time, the lender collects private information about the borrower affording it a competitive advantage over other financial institutions (Haubrich, 1989). Relationship lending plays a vital role for financial intermediation in opaque environments such as developing economies. Acute information asymmetry and poor collateral enforcement are well known features of these economies (Hainz, 2003). In contrast, relationship lending has declined in developed economies because of greater availability of good quality hard information about firms, well developed capital markets and prevalence of alternative financing products (Allen and Santomero, 2001; Boot and Thakor, 2000).

We utilize a unique dataset of *each and every* loan extended by financial institutions to firms in Pakistan during April 2006 to December 2013 to study relationship lending. Previous studies of relationship lending have been hampered by data limitations; they have been limited to either certain types of financial institutions or borrowers, or both. Our first contribution to the literature on relationship lending is that consideration of the type of the lender and the borrower has a material influence on the inferences which may be drawn regarding relationship lending. To be precise, we explore variations between banks and non-bank financial institutions (NBFI), foreign banks and domestic financial institutions, government financial institutions and private lenders and lastly large banks and small and medium size financial institutions. The literature, as we explain in section 3.2, has so far only examined the variation between small and large banks regarding relationship lending. These potentially limited examinations have resulted in conflicting empirical results. Kysucky and Norden (2015) analyse 101 studies on relationship lending and propose that differences in empirical findings are caused by

---

[*] This Chapter of the Thesis was presented at the Asian Finance Conference 2016 in Bangkok, AFAANZ conference 2016 in Gold Coast and Financial Markets and Corporate Governance conference 2016 in Melbourne.

country effects. Our findings, however, suggest that the conflicting empirical evidence presented in previous studies may be the result of limited datasets.

Our detailed results demonstrate that consideration of lender and borrower types result in different inferences regarding relationship lending. For example, longer lending relationships with NBFIs are better for small and medium enterprises (SMEs) than longer relationships with banks: NBFIs charge lower risk premiums and require less collateral as relationship lengths increase.[33] Public sector financial institutions reduce their credit pricing for SMEs as relationships become longer without any impact on collateral.[34] SMEs, however, have to post higher collateral to obtain loans from private financial institutions and large banks as relationship length increases. SMEs are able to obtain loans with less collateral if they concentrate their borrowings with one lender but banks exploit this reliance by charging higher interest rate in this situation.

Listed companies dealing with large banks benefit from both lower interest rates and less collateral as length of their relationships increase. Public sector banks and domestic financial institutions reduce the collateral they require from listed companies as relationships lengthen without any effect on credit pricing. In contrast, private sector financial institutions and foreign banks reduce interest rates as the relationship length increases but do not lower collateral requirements. Small and medium financial institutions are only financial institutions that charge higher risk premium on loans to listed firms as the length of their relationship increases. Listed firms are able to get relief both in credit pricing and collateral if they concentrate their borrowings with one lender.

Longer lending relationships are generally exploitative for Government firms: small and medium financial institutions charge higher risk premium and require more collateral as relationship length increases whereas private banks and domestic financial institutions increase their credit pricing without any impact on collateral. While concentration of credit with one lender helps the Government firms to obtain

---

[33] NBFIs are non-bank financial institutions and include investment banks, leasing companies, housing finance companies, development finance institutions and asset management companies.
[34] An SME has been defined in Prudential Regulations issued by the SBP as an entity with annual sales turnover of less than Pak Rupees 400 million and with employees less than 50 (for trading business) and less than 250 (for manufacturing and services industries). The definition can be accessed at http://www.sbp.org.pk/publications/prudential/PRs-SMEs.pdf"

loan with lower collateral across all type of banks, public sector financial institutions exploit this reliance and charge higher interest rates from Government firms in this situation.

The results of our estimations using random coefficient model, when we allow the coefficient of *relationship length* change between firms, show substantial influence of heterogeneity between firms on the way the *relationship length* impacts both the collateral levels and risk premiums. The coefficients of relationship length between firms vary substantially implying that firm characteristics play a critical role on the impact of relationship between firm and its lender.

The primary contribution of the study is to provide a rationale for conflicting empirical findings related to relationship lending. Our analysis suggests that the impact of relationship lending varies by type of lender and borrower. In addition to demonstrating the sensitivity of inferences regarding relationship lending to lender and borrower type, we also make two further contributions to the literature on relationship lending. Our second contribution is to be the first study, to our knowledge, to examine the impact of relationship lending on credit pricing and collateral in a developing country context. Finally, we also supplement our analysis with separate estimations for SMEs, listed companies and Government firms. This is the first study, to the best of our knowledge, which examines lending relationship impact for Government firms. The structure of the remainder of this paper is as follows. In section 3.2, we discuss the differences in findings of extant literature on relationship lending. In section 3.3, we describe the dataset. Our estimation methodology is discussed in section 3.4. We present our results in section 3.5 and section 3.6 concludes the discussion.

3.2 Literature

Theoretical and empirical research on relationship lending present diverse and, at times, conflicting results. One strand of literature posits that a durable relationship with a financial institution is welfare enhancing for borrowers and results in lower interest rates and reduced collateral requirements as the bank shares its informational

advantage with the borrower. The other strand of literature asserts that lenders exploit their informational advantage and extract rents from their borrowers by imposing higher credit pricing and collateral requirements. Boot (2000) and Elyasiani and Goldberg (2004) provide reviews of relevant literature and Kysucky and Nordon (2015) discuss the tensions in empirical findings on the subject.

The strength of any bank-borrower lending relationship(s) is multidimensional and can be assessed in a number of ways. The most common measure used in the literature is duration or length of the lending relationship followed by scope (use of multiple products of lender) and reliance of the firm on a particular lender in terms of its share in total financing of the firm.

In an early empirical study, Petersen and Rajan (1994) found that length of the bank-borrower relationship does not have any impact on interest rate. Similar conclusions have been reached in a number of other studies (Elsas and Krahnen, 1998; Lehmann and Neuberger, 2001; Machauer and Weber,1998) discarding any linkage between length of relationship and credit pricing. However, Blackwell and Winters (1997), Brick and Palia (2007) and Peltoniemi (2007) find that firms with longer relationships are charged lower interest rates.

Harhoff and Körting (1998) find no relationship between relation length and the interest rate, but observe lower collateral with the increase in relationship length. Chakraborty and Hu (2006) also observe that collateral requirements decline with the increase in duration of bank-borrower relationship. Degryse and Van Cayseele (2000) and Hernández-Cánovas and Martínez-Solano (2010) find that firms with longer relationships with banks pay higher interest rates, however, length of relationship does not affect collateral requirements. This is also found by Steijvers *et al*. (2010). Ono and Uesugi (2009), however, observe higher collateral requirements for customers with longer relationships with banks. Berger and Udell (1995), Bodenhorn (2003) and Bharath *et al*. (2011) observe that both interest rate and collateral requirements drop as duration of bank-borrower relationship increases.

Relying on one lender to meet the bulk of its credit needs reduces a firm's cost of funds (Blackwell and Winters, 1997). Obtaining multiple banking products

from a bank also results in lower interest rates (Degryse and Van Cayseele, 2000). Multiple lending relationships reduce the value of the private information collected by a particular bank (Cole, 1998) and borrowing from multiple lenders results in higher interest rates (Petersen and Rajan, 1994) and heavier collateral requirements (Harhoff and Körting, 1998). However, Hernández-Cánovas and Martínez-Solano (2010) find that firms maintaining more than one banking relationship get cheaper credit

Regarding the impact of the type of lender, research has mainly concentrated on the differences between small and large banks. Small banks are found to be in a better position to use soft information collected through relationship lending and also to make effective use of it (Berger and Black, 2011; Berger *et al*., 2005). Uchida *et al*. (2012) find that small banks focus on relationship lending whereas large banks concentrate on transaction lending.[35] While Shimizu (2012) and Mudd (2013) find that small banks concentrate on small firms for relationship lending. Stanton (2002) observes, however, that relationship lending is more suitable for large loans since it requires substantial time and effort from lending officers. Berger and Black (2011) also observe that comparative advantage of small banks in relationship lending is optimum when lending to large firms. Longer relationships with small banks result in lower interest rates while having an opposite effect of higher interest rates in case of relationships with large banks (Kano *et al*., 2011). Bharath *et al*. (2011) observe that relationship loans and transaction loans, in terms of cost of credit, becomes indistinguishable for large firms.

A few studies have examined the impact of relationship length on the quality of the lender's portfolio and probability of default. Jiménez and Saurina (2004) find that close bank-borrower relationships induce banks to assume more credit risk whereas Kang *et al*. (2013) find that relationship lenders increase banks' commitments to bad loans exposing themselves to higher credit losses. Fiordelisi *et al*. (2014) observe that long bank-borrower relationship reduces the probability that a firm would become distressed.

---

[35] Transaction lending is the form of lending based on the use of publicly available hard information like financial statements data.

3.3 The Data

We use an exhaustive dataset of business loans from Pakistan covering the period April 2006 to December 2013. The dataset has been obtained from the Credit Information Bureau (CIB) of the Central Bank of Pakistan.[36] All financial institutions in Pakistan are legally obliged to report all credit transaction to CIB and thus the dataset covers *every* loan granted by a financial institution to a firm in Pakistan. April 2006 was chosen as the starting point because major changes were introduced in reporting formats by the CIB from this date. Incorporation of data prior to this period is problematic because of changes in codes and definitions.

The original dataset is a month-wise loan-level dataset containing information about loans as well as non-fund based facilities (such as bank guarantees and letters of credit) obtained by a firm.[37] A loan in itself is, however, a transitory phenomenon as it is obtained and then repaid and a new loan is generated. We, therefore, collapse the loan data to the level of bank-borrower and thus our unit of observation becomes bank-borrower-month. Our final dataset contains about 1.66 million observations pertaining to nearly 41,000 firms.[38]

Table 3.1 contains the list of variables used in the analysis. We measure strength of the bank-borrower relationship in multiple dimensions. Kysucky and Norden (2015) identify four key dimensions to assess the strength of bank-borrower relationship in literature: length or duration of the relationship, concentration of

---

[36] The State Bank of Pakistan (SBP) is the central bank of Pakistan as well as the banking sector regulator. It operates a credit information bureau (CIB) under section 25A of the Banking Companies Ordinance, 1962. All financial institutions in Pakistan are mandated to submit information about their credit transaction to CIB on a monthly basis. The CIB's database, therefore, covers all credit transactions taking place in the whole economy of Pakistan.

[37] The dataset has been obtained from the Credit Information Bureau (CIB) of the State Bank of Pakistan. The SBP checks the accuracy of data submitted by financial institutions during their periodical inspections and imposes penalties for misreporting. Further, financial institutions also use this data for credit decisions and hence it is in their own interest to ensure the quality of data. A number of published studies (see for example Khwaja and Mian (2005), Khwaja et al. (2010) and Baele et al. (2014)) have used this data and assessed the quality of data being quite good.

[38] The firms that pay off their entire financing facilities drop off from the dataset although their historical records are still maintained. Since the study assesses the impact of relationship lending on firms that are borrowing from the financial sector, this aspect should not affect the analysis. The CIB assigns a unique borrower code to each borrower and this borrower code remains the same irrespective of change of name. The dataset does not contain information whether a firm is member of a group of companies or not. Resultantly subsidiaries of firms are also treated separately. I, however, acknowledge that this information (if available) would have enriched the analysis immensely.

borrowings by a firm from a lender, distance between firm and bank and range of financial services obtained by the firm from its lender. Most studies, as we have noted above, have used length of the lending relationship to represent bank-borrower relationship strength. In addition to the *relationship length*, we use four other variables. The *lender's share in financing* of the firm is used to assess borrower reliance on one lender or degree of its concentration of borrowings. *Number of loans, number of financing products* obtained from the bank and existence of *non-fund based facility* like bank guarantees, letters of credit, etc. capture the scope of bank-borrower relationship or cross-product synergies.

The study examines the impact of the bank-borrower relationship on collateral requirement and interest rate. There is clearly a positive relationship between the size of the collateral and the size of the loan. We, however, are interested in assessing whether the same size of loan would elicit differential collateral requirements dependent on the relationship length. We, therefore, scaled collateral by the sanctioned loan limit to neutralize this impact.

In addition to relationship aspect, the bank's decision to grant a loan also depends upon financial position of the borrower and collateral on offer (Uchida, 2011). While we do not have access to information on firms' balance sheets, we capture the risk of the firm through its detailed credit history using four variables. *Overdues* show the overdue amounts not paid within due dates by the firm. *Default* is a dummy variable that captures the quality of the credit as reported by the financial institution.[39] If the loan is not overdue and the bank is satisfied with the repayment capacity of the borrower, it is reported as 'regular' by the lender. If it is a problem loan, it is reported in one of four categories of classification: OAEM (other assets especially mentioned); substandard; doubtful and loss. A dummy variable, *default*, assigns a value of one if a borrower has been reported in any category of classification by the bank.

---

[39] The SBP has issued detailed instructions on how to classify loans in its prudential regulations. The instructions are largely objective and a business loan is required to be classified if it becomes overdue by 90 days or more. The category of classification further deteriorates as the number of days overdue increases. Given that all financial institutions under the SBP regulatory domain are required to follow these prudential regulations, we can safely assume uniformity of practice for classification of loans in Pakistan. These prudential regulations can be accessed on the SBP website http://www.sbp.org.pk/publications/prudential/index.htm.

Table 3.1:
Variables and their Descriptions

No.	Name of the variable	Description
	Relationship Strength Variables	
1.	Relationship length (years)	Number of years a lender and borrower have been in lending relationship
2.	Number of loans	Number of loans availed by the borrower from a particular financial institution
3.	Number of financing products	Number of types of financing products (like term loan, running finance, TFC, bonds, etc.) availed by a borrower from a particular lender
4.	Lender's share in financing	A particular lender's share in total financing of a borrower from the financial sector. It is worked out by dividing financing availed from a lender by total financing availed by a borrower from all its lenders.
5.	Non-fund based facility	A dummy variable with a value of 1 if a financial institution has granted non-fund based facilities like letter of credit, bank guaranty, etc. to a borrower in addition to loans
	Dependent Variables	
6.	Collateral	The value of the total collateral divided by the loan limit sanctioned by a lender to the borrower
7.	Risk Premium	Risk premium (interest rate less risk free rate) being charged by the financial institution on its loans to a particular borrower
	Loan Characteristics	
8.	Maturity	Maturity of loan extended to borrower by the financial institution
9.	Principal	Principal outstanding amount of the loan payable by the borrower
	Borrower Characteristics	
10.	Number of bank relationships	Number of financial institutions with which a borrower has lending relationships
11.	Rating	A dummy variable with a value of 1 if the

Page 57

		borrower is rated either externally or internally by the lender
12.	SME firm	A dummy variable with a value of 1 if the firm is an SME, 0 otherwise
13.	Listed firm	A dummy variable with a value of 1 if the firm is a listed company, 0 otherwise
14.	Govt. firm	A dummy variable if a firm is majority owned and controlled by Government, 0 otherwise
	Credit History of Borrower	
15.	Overdues	Total overdue amount including principal, interest or any other amount owed to the lender and not paid by the due date
16	Default	A dummy variable with a value of 1 if the firm has defaulted on its loan to any of its lender, 0 otherwise
17.	Litigation	A dummy variable with a value of 1 if the firm is in litigation regarding recovery of loan with its lender, 0 otherwise
18.	Write-off	A dummy variable with a value of 1 if the firm has availed any sort of write off from its lender
	Type of Financial Institution	
19.	NBFI	A dummy variable with a value of 1 if the financial institution is a non-bank financial institution like investment bank, leasing company, housing finance company, etc.
20.	Foreign bank	A dummy variable with a value of 1 if the financial institution is a foreign bank
21.	Large bank	A dummy variable with a value of 1 if the financial institution is large bank
22.	Government financial institution	A dummy variable with a value of 1 if financial institution is Government owned and controlled

Note: This Table presents definitions of the variables used in analyses. The independent variables have been grouped into four categories: relationship strength variables, borrower characteristics, credit history of the borrower and type of financial institution. In addition, the Table contains definitions of dependent variables.

Two other dummy variables, *litigation* and *write off*, identify the borrower if it has entered into litigation with its lender or has benefitted from any write off on its loans. We use various borrower characteristics as well as types of financial institutions as control variables. Three dummy variables, *SME firm*, *Listed firm* and *Govt. firm*, are used to identify if a borrower is an SME, listed company or a government owned (majority shareholding) and controlled firm. We identify a firm as *Govt. firm* if the Government is the majority shareholder (more than 51% of the shares) and the Government has the right to appoint the Chief Executive Officer of the firm and majority of the board members. The size of the loan (*principal*) and *number of bank relationships* represent the size of the borrowings and firm's access to the financial sector. The *rating* of the borrower is used as a dummy variable to assess the impact of information asymmetry.

The type of financial institution is captured by identifying if a lending institution is an *NBFI* (Non-bank financial institution), a *foreign bank*, a *large bank* or a *Government financial institution*. Large banks represent five largest banks in Pakistan in terms of size of assets and branch network. *Government financial institutions* have been identified using the same criteria of ownership and control as we used for Government firms.

Table 3.2 provides summary descriptive statistics of variables (excluding dummies) examined in this study. The average relationship length of a firm with a financial institution is about 5.45 years with a median of 4.11 years. Since relationship length is the most important variable to capture the relationship strength, we examine this aspect in more detail.

Table 3.3 details the relationship length across different types of lenders and firms. The customers of NBFIs have relatively shorter average relationship length at 4.53 years as compared to those of banks at 5.75 years. The longest average relationship period of 6.83 years pertains to Government financial institutions while the foreign banks offer the shortest average relationship period of 4.41 years, even shorter than NBFIs.

The relationship length in a particular type of financial institution, however, cannot solely be ascribed to the lender. There is a possibility, for example, that the firms prize their relationship with Government banks and maintain it at the expense of their relationship with other banks, perhaps owing to the perception that this will result in better loan terms and conditions. Ongena and Smith (2001) find that firms in Norway maintain the longest relationships with two largest banks of the country. Regarding type of borrower, listed firms have substantially longer relationships, averaging 6.32 years compared to 4.77 years for SMEs. Government firms lag slightly behind listed firms with average relationship length of 5.9 years.

Table 3.2:
Descriptive Statistics for Variables Excluding Dummies

			(Amounts are in Pakistan Rupees Millions)				
Name of Variables	Mean	Std. Dev.			Percentiles		
			p_10*	p_25*	p_50*	p_75*	p_90*
Relationship Strength Variables							
Relationship length (years)	5.45	4.91	1.13	2.22	4.11	6.93	11.04
Number of loans	2.38	3.62	1.00	1.00	1.00	2.00	5.00
Number of financing products	1.56	1.14	1.00	1.00	1.00	2.00	3.00
Lender's share in financing	0.76	0.36	0.10	0.46	1.00	1.00	1.00
Dependent Variables							
Collateral	1.68	1.58	0.42	0.99	1.00	2.00	3.72
Interest rate	14.74	3.84	10.19	12.63	14.98	17.00	19.13
Loan characteristics							
Maturity	3.14	2.79	0.58	1.00	2.91	4.33	6.25
Principal	47.00	150.00	0.11	0.69	3.50	20.00	100.00
Borrower Characteristics							
Number of bank relationships	3.26	4.47	1.00	1.00	1.00	3.00	8.00
Credit history of the borrower							
Overdues	6.20	40.00	0.00	0.00	0.00	0.00	4.30

Note: This Table presents descriptive statistics for variables (excluding dummies) used in estimations in the paper
* The terms p_10, p_25, p_50, p_75 and p_90 represent values at 10th percentile, 25th percentile, 50th percentile, 75th percentile and 90th percentile respectively

Table 3.3:
Relationship Length (in years) Segmented by Types of Financial Institution and Borrower

	No. of observations	Mean	St. dev.	Percentiles				
				p_10*	p_25*	p_50*	p_75*	p_90*
Financial Institution Type								
NBFIs[a]	403,216	4.53	4.10	0.94	1.93	3.43	5.77	8.87
Banks	1,257,909	5.75	5.11	1.19	2.34	4.36	7.28	11.84
Govt. financial institutions	275,046	6.83	6.45	1.11	2.38	4.76	8.25	17.64
Private financial institutions	1,386,079	5.18	4.50	1.13	2.19	4.00	6.72	10.18
Foreign banks	107,211	4.41	3.40	1.13	2.12	3.61	5.70	8.41
Domestic financial institution	1,553,914	5.52	4.99	1.13	2.23	4.16	7.02	11.28
Large banks	556,593	6.40	6.01	1.20	2.33	4.59	7.89	14.53
Small and medium financial institutions	1,104,532	4.97	4.17	1.09	2.17	3.92	6.45	9.76
Borrower type								
SMEs	355,945	4.77	4.12	1.06	2.01	3.70	6.33	9.10
Listed firms	121,396	6.32	5.06	1.41	2.76	5.05	8.19	13.09
Govt. firms	12,636	5.90	6.01	0.92	1.99	4.05	7.09	14.01

Note: This Table provides relationship length statistics by different type of financial institutions and borrowers.

[a] NBFIs are non-bank financial institutions and include investment banks, leasing companies, housing finance companies, development finance institutions and asset management companies

* The terms p_10, p_25, p_50, p_75 and p_90 represent values at 10th percentile, 25th percentile, 50th percentile, 75th percentile and 90th percentile respectively.

The average number of loans availed by a firm from a lender is 2.38. However, about 56% of the observations in the dataset pertain to bank-borrower relationships with only one loan. Average number of products used by firms to raise financing is 1.56 while a lender's share in a firm total financing is averaged at about 76%. However, in about 63% of the observations, one lender is sole provider of the funds of a firm. These figures show a general trend of reliance of firms on one lender for their financing needs.

The average collateral ratio (collateral value/sanctioned loan limit) in our dataset is 1.68. However, there is substantial variation with lowest 10 percentile of the observations falling below 0.42 and largest 10 percentile of the observations with collateral ratio higher than 3.72. Interest rate has a mean of 14.74 and maturity of the loans averages at about 3.14 years.

The mean overdue amount is PKR 6.2 million. About 23% of the observations in our dataset have overdue status, which is a substantial number. However, this perhaps reflects that financial sector of Pakistan was under stress during the period under our examination. NPLs of the banking system started increasing after December 2006 from 6.89% and rose to 15.74% by December 2011 after which they gradually declined to 12.99% by December 2013.[40]

3.4 Estimation Methodology

The dataset is an unbalanced panel and our dependent variables are collateral ratio and risk premium. The collateral ratio has been obtained by dividing the amount of the collateral by the sanctioned loan limit and risk premium has been obtained by subtracting risk free rate from interest rate.[41] In addition, we use GDP deflator to convert nominal value of principal and overdue amounts into real value.

One of the dependent variables – *collateral* - is bounded by zero as the lower limit. Wooldridge (2011) terms such variables as "corner solution response(s)" and argues that standard censored regression model is suitable for such distributions.

---

[40] Financial sector reviews (BSRs) of the SBP for the relative periods are available at http://www.sbp.org.pk/FSR/index.htm.
[41] For risk free rate, we use rate of return on Government 3 months treasury bills obtained from website of the State Bank of Pakistan

Accordingly, we, employ maximum likelihood to estimate the following random effects panel Tobit model.

$$Y^*_{it} = X_{it}\,\beta + \varepsilon_{it} + \mu_i$$

Y^* is a latent variable, observable for values greater than zero and censored otherwise and X is a vector of independent variables. μ_i is the unit specific error term and for a specific unit, its value is constant. ε_{it} is the observations specific error term.

The second dependent variable, risk premium has both the negative and positive values. We use a multivariate GLS regression with setting to fit the following random effects panel model.

$$Y^*_{it} = \alpha + X_{it}\,\beta + \varepsilon_{it} + v_i$$

We use random effects for both types of estimations since differences across borrowers can influence our dependent variables and random effects enables us to assess the impact of type of borrowers on collateral and risk premium. This approach, however, assumes that observed variables are not correlated with the unobserved variables – a strong assumption that may not be valid. The key assumption that independent variables are uncorrelated with unobserved effects is critical to establish consistency. The violation of this assumption will imply that one or more of the explanatory variables is correlated with error term and may result in estimators being both biased and inconsistent. This bias does not disappear even in large sample, as is the case in this study. The direction of the bias would depend on the sign of correlation between explanatory variables included in the regression and omitted variables, which is not known thus making interpretation of the results inconclusive in the presence of this bias. In order to address this issue, we employ a Mundlak correction that enables us to relax this assumption by adding group means of exogenous variables in our models (Mundlak, 1978).

Since the amount of the loan and its terms and conditions (interest rate, collateral and maturity) are generally decided upon simultaneously, endogeneity may be an issue. We use the following approach to address this issue. For each dependent

variable, take collateral, we first estimate the model without including the other three main variables with which we have, a priori, the potential issue of simultaneity: principal, interest rate and maturity in this case. We then gradually introduce them into the model one by one. As we will show in section 3.5, the sign and magnitude of the coefficients of independent variables remain almost the same across all these estimations giving us comfort that the estimates are robust.

A large variety of econometric techniques have been used in relevant key papers starting from ordinary least square regression by Petersen and Rajan (1994) and Blackwell and Winters (1997), logit regression by Berger and Udell (1995), multivariate logistic regression by Cole (1998) to multivariate regression with difference in differences specification by Dewally and Shao (2014) and bivariate probit model by Cenni et al. (2015). We use the practice of gradually introducing exogenous variables which, a priori, may have potential issue of simultaneity followed by Degryse and Van Cayseele (2000).

We start by addressing two research questions relating to the impact of relationship strength variables on the risk premium and collateral levels. First we examine the impact of relationship strength, credit history of the borrower, characteristics of the firm and lender types on the risk premium. Secondly we estimate the impact of aforementioned variables on the collateral. We use our whole dataset for these estimations.

In our next set of estimations, we examine how different types of financial institutions respond to lending relationships. We split the dataset using eight different financial institution types – banks, NBFIs, Government financial institutions, private financial institutions, foreign bank, domestic financial institutions, large banks and small and medium financial institutions. It is important to note that these categories are not mutually exclusive. For example, banks include both foreign banks and domestic banks. Our primary aim is to understand the influence of a particular characteristic on the impact of relationship length at interest rate and collateral requirement. Thus large banks versus small and medium size financial institutions will help us to understand the impact of size and other dynamics that accompany it.

Government financial institutions versus private ones will help us to understand the impact of ownership and control by the Government.

The last set of estimations finally uses sub-samples divided both along borrower type and lender type, providing us an insight as to how a particular type of lender interacts with a particular type of borrower.

3.5 Results

We start by presenting results of estimations that use the whole dataset. We then follow up this discussion with results obtained by running estimations on subsamples selected on the basis of type of financial institutions and borrowers.

3.5.1   Lending relationships, risk premiums and collateral requirements

The results of our first set of estimations relating to impact of bank-borrower relationship and other control variables on risk premium and collateral are shown in Tables 3.4 and 3.5.

Table 3.4
Impact of Relationship Length and Other Variables on the Risk Premium

Name of Variable	Equation 1	Equation 2	Equation 3	Equation 4
Loan Characteristics				
Maturity of Loan				0.020***
				(0.003)
Collateral			0.111***	0.111***
			(0.002)	(0.002)
Ln (Principal)		0.007***	0.007***	0.007***
		(0.001)	(0.001)	(0.001)
Relationship strength variables				
Relationship length (years)	-0.060***	-0.056***	-0.057***	-0.059***
	(0.005)	(0.005)	(0.005)	(0.005)
Number of loans	0.000	-0.000	-0.001	-0.001
	(0.001)	(0.001)	(0.001)	(0.001)
Number of financing products	-0.048***	-0.051***	-0.054***	-0.057***
	(0.004)	(0.004)	(0.004)	(0.004)
Lender share in financing	0.016	0.013	0.038***	0.038***
	(0.011)	(0.011)	(0.011)	(0.011)

Page 65

Non fund based facility	-0.042***	-0.039***	-0.035***	-0.032***
	(0.010)	(0.010)	(0.010)	(0.010)
Credit history of the borrower				
Ln (Overdues)	0.019***	0.019***	0.019***	0.019***
	(0.001)	(0.001)	(0.001)	(0.001)
Default	0.227***	0.232***	0.226***	0.226***
	(0.008)	(0.008)	(0.008)	(0.008)
Litigation	0.000	-0.001	0.007	0.008
	(0.011)	(0.011)	(0.011)	(0.011)
Write off	-0.801***	-0.789***	-0.785***	-0.784***
	(0.022)	(0.022)	(0.022)	(0.022)
Borrower characteristics				
Number of lending relationships	-0.022***	-0.023***	-0.021***	-0.022***
	(0.002)	(0.002)	(0.002)	(0.002)
Rating	-0.427***	-0.427***	-0.428***	-0.429***
	(0.006)	(0.006)	(0.006)	(0.006)
SME firm	0.717***	0.701***	0.589***	0.585***
	(0.034)	(0.034)	(0.034)	(0.034)
Listed firm	-0.118**	-0.121**	-0.113**	-0.113**
	(0.051)	(0.051)	(0.050)	(0.050)
Government firm	-0.596***	-0.553***	-0.516***	-0.515***
	(0.140)	(0.140)	(0.139)	(0.139)
Type of Financial Institution				
NBFI	2.345***	2.343***	2.516***	2.333***
	(0.039)	(0.039)	(0.039)	(0.042)
Foreign bank	0.227***	0.190***	0.215***	0.128**
	(0.054)	(0.054)	(0.054)	(0.054)
Large bank	-0.421***	-0.438***	-0.492***	-0.525***
	(0.034)	(0.034)	(0.033)	(0.034)
Public sector financial institution	-0.318***	-0.305***	-0.402***	-0.425***
	(0.038)	(0.038)	(0.038)	(0.038)
Constant	4.616***	4.954***	4.658***	4.697***
	(0.094)	(0.099)	(0.099)	(0.099)
Year dummies	Included	Included	Included	Included
Observations	1,661,125	1,661,125	1,661,125	1,661,097
R-square	0.21	0.21	0.22	0.22
Wald chi2	362,431	362,779	367,542	367,794
Degree of freedom	43	45	47	49

Note: This Table provides results of estimations for risk premium with relationship strength variables and other control variables. Equation 1 is the basic model and then 'principal', 'collateral' and 'maturity' are introduced one by one in the subsequent equations.

Standard errors in parentheses

** significant at 5% level

*** significant at 1% level

Table 3.5
Impact of Relationship Length and Other Variables on the Collateral

Name of Variable	Equation 1[@]	Equation 2[@]	Equation 3	Equation 4
Loan Characteristics				
Maturity of Loan				0.004***
				(0.001)
Risk Premium			0.019***	0.019***
			(0.000)	(0.000)
Ln (Principal)		-0.003***	-0.003***	-0.003***
Relationship strength variables		(0.000)	(0.000)	(0.000)
Relationship length (years)	0.009***	0.008***	0.009***	0.008***
	(0.002)	(0.002)	(0.002)	(0.002)
Number of loans	0.004***	0.004***	0.004***	0.004***
	(0.000)	(0.000)	(0.000)	(0.000)
Number of financing products	0.030***	0.031***	0.032***	0.032***
	(0.002)	(0.002)	(0.002)	(0.002)
Lender share in financing	-0.227***	-0.226***	-0.226***	-0.226***
	(0.005)	(0.005)	(0.005)	(0.005)
Non fund based facility	-0.031***	-0.032***	-0.031***	-0.031***
	(0.004)	(0.004)	(0.004)	(0.004)
Credit history of the borrower				
Ln (Overdues)	0.001***	0.001***	0.001***	0.001***
	(0.000)	(0.000)	(0.000)	(0.000)
Default	0.060***	0.057***	0.053***	0.053***
	(0.003)	(0.003)	(0.003)	(0.003)
Litigation	-0.071***	-0.071***	-0.071***	-0.070***
	(0.005)	(0.005)	(0.005)	(0.005)
Write off	-0.027***	-0.033***	-0.018**	-0.018**
	(0.009)	(0.009)	(0.009)	(0.009)
Borrower characteristics				
Number of lending relationships	-0.016***	-0.015***	-0.015***	-0.015***
	(0.001)	(0.001)	(0.001)	(0.001)
Rating	0.012***	0.012***	0.020***	0.020***
	(0.003)	(0.003)	(0.003)	(0.003)
SME firm	0.505***	0.503***	0.472***	0.472***
	(0.015)	(0.015)	(0.015)	(0.015)
Listed firm	-0.020	-0.019	-0.014	-0.014
	(0.022)	(0.022)	(0.022)	(0.022)
Government firm	-0.169***	-0.166***	-0.141**	-0.141**
	(0.063)	(0.063)	(0.063)	(0.063)

Type of Financial Institution

NBFI	-0.777***	-0.778***	-0.884***	-0.901***
	(0.018)	(0.018)	(0.018)	(0.019)
Foreign bank	-0.110***	-0.113***	-0.121***	-0.129***
	(0.025)	(0.025)	(0.024)	(0.025)
Large bank	0.242***	0.240***	0.260***	0.257***
	(0.015)	(0.015)	(0.015)	(0.015)
Public sector financial institution	0.436***	0.437***	0.451***	0.448***
	(0.017)	(0.017)	(0.017)	(0.017)
Constant	1.308***	1.334***	1.112***	1.117***
	(0.043)	(0.045)	(0.045)	(0.045)
Year dummies				
Observations	1,661,125	1,661,125	1,661,125	1,661,097
Log likelihood /R square	0.15	0.15	-2,016,650	-2,016,610
Wald chi2	14,975	15,200	19,293	19,314
Degree of freedom	43	45	47	49

This Table provides results for first set of estimation – with collateral as dependent variable. The first equation does not include risk premium, principal and maturity – the variables which are considered to have simultaneity issue with collateral. These variables are introduced one by one in estimation in next equations. As can be observed from the results, the size, sign and significance of almost all the variables remain the same indicating robustness of the estimates.

Standard errors in parentheses

** significant at 5% level

*** significant at 1% level

@ These results have been obtained using multivariate GLS regression since Tobit estimation could not converge on a solution for these models. The comparison of Tobit and multivariate GLS regressions results for equations 3 and 4 (multivariate GLS regression results for these equations are not included in table, however, are available on request) shows almost the same results for both estimation techniques. This gives us confidence that results obtained from multivariate regression are reasonably reliable.

The size and sign of most of the variables used in the estimations remains almost the same as we gradually introduce potentially endogenous variables, giving us confidence about the robustness of the estimates. Endogeneity, if present, would lead to specification bias and noticeably different coefficient estimates. While empirical evidence on the relationship between collateral and risk premium is mixed (Berger *et al.*, 2016), our results suggest a positive relationship between these variables supporting the findings of Berger and Udell (1990), Godlewski and Weill (2011), John *et al.* (2003) and Godlewski and Weill (2011).

Table 3.4 shows that coefficients of three of our relationship strength variables are significant and negative (coefficients of *relationship length, number of financing products* and *non-fund based facility* are -0.059, -0.057 and -0.032 respectively). This implies that strong relationships with financial institutions are largely welfare enhancing as relationships which are longer and benefit from cross product synergies – evidenced by the use of different types of financing products and non-fund based facilities from a lender - result in lower credit pricing for firms. However, firms that become dependent on a particular lender to meet their financing requirements are exploited to pay higher interest rates as shown by positive and significant coefficient of *lender share in financing*.

In terms of collateral, strong lender-borrower relationships are generally exploitative: more collateral is required from firms with longer relationships with a lender, with more loans from that lender and if multiple financing products are obtained from a lender as evidenced by significant and positive coefficients of *relationship length, number of loans* and *number of financing products* in Table 3.5. However, coefficient of *lender share in financing* is significant and negative showing that lenders lower collateral requirements if they are the dominant financier of a firm. The exclusivity of relationship has thus two dimensions. It results in high interest rate but low collateral and may be a balancing act on part of the lenders to create a win-win situation both for them and their customers so that firms do not seek new credit relationships to ward off their hold-up positions entirely.

Non-fund based facility is our only relationship strength variable that is significant and has negative coefficients both for risk premium and collateral estimations in Tables 3.4 and 3.5. Thus the borrowers obtaining non-fund based facilities from their lenders benefit both in terms of interest rate and collateral. It makes sense since non-fund based facilities allow financial institutions to earn commission and fee based income. It thus enables them to diversify the sources of their income, which in turn may improve their credit rating.

The above results provide *prima facie* support the findings of Cornee *et al.* (2012) who observe that long term relationships mitigate default risk thus reducing the collateral requirement but also enable the lenders to increase interest rate. Tables 3.4 and 3.5, however, also show that relationship strength variables are overshadowed by type of lender and kind of borrower. For example, the coefficient of *NBFI* (a dummy variable with the value of 1 if the lender is an NBFI) in Table 3.4 is 2.333 as compared to the coefficient of -0.059 for *relationship length.* Likewise coefficient of *SME firm* (a dummy variable with the value of 1 if the borrower is an SME) in Table 3.5 is 0.472 as compared to 0.004 for *number of loans*. The dominance of these variables reflects the need to examine the lender-borrower relationship by fully taking into account their types. We, therefore, proceed to divide our sample on the basis of type of financial institution in the next sub-section.

3.5.2   Lending relationships, types of lender and terms of credit

The above results, however, are preliminary since they do not fully take into account the type of lender. To the best of my knowledge, the empirical research on the subject has not examined the impact of type of lender on association between relationship lending and terms of credit. The study intends to assess the impact of type of lender on this important relationship. The type of financial institution has important bearing on the choice of lending technology and how the financial institutions treat their customers. For example, Berger *et al.* (2005) observe that small banks make more extensive and better use of relationship lending whereas large banks prefer "short and less exclusive relationships". Likewise Berger and

Black (2011) find that small banks are better placed for relationship lending. In order to understand that interplay between type of lender, relationship lending and terms of credit, we divide our sample on the basis of ownership (Government financial institutions versus private lenders), size (large banks versus small and medium size financial institutions), place of incorporation (foreign versus domestic financial institutions) and most importantly constitution (commercial banks versus NBFIs).

Table 3.6 provides estimation results of different sub-samples split on the basis of type of financial institution for risk premium while Table 3.7 provides that for collateral. We observe substantial variation in most of the variables across different types of financial institution, substantiating our belief that the type of financial institution has an important bearing for the implications of lender-borrower relationship.

While all types of financial institutions reduce interest rates as relationship length increases, small and medium financial institutions actually do the opposite and increase their interest rates (the coefficient of relationship length in Table 3.6 is significant and negative for all types of financial institutions except for small and medium financial institutions where it is significant but positive). It has been observed that small financial institutions are better able to produce soft information as compared to their larger counterparts (Uchida *et al.*, 2012). This competitive advantage may enable these institutions to charge higher risk premium from their customers.

The variable '*number of loans*' has no impact (insignificant) on credit pricing as per estimation results of our whole sample shown in Table 3.4. The results in Table 3.6, however, narrate a different story. The *number of loans* is significant and positively associated with interest rate in case of public sector financial institutions, foreign banks and small and medium financial institutions whereas it is significant and negatively associated with interest rate in case of domestic financial institutions, large banks and NBFIs. We observe similar sort of variation in the impact of other relationship strength variables on risk premium.

Table 3.6
The Influence of Type of Financial Institution on Risk Premium
Estimation with different types of financial institutions – Dependent variable *Risk Premium*

| | Type of Financial Institution | | | | | | | |
Name of variable	Public (1)	Private (2)	Foreign (3)	Domestic (4)	Large (5)	S&M[a] (6)	NBFIs (7)	Banks (8)
Loan Characteristics								
Maturity of Loan	-0.184***	0.042***	-0.013	0.019***	0.122***	-0.031***	-0.308***	0.042***
	(0.007)	(0.003)	(0.013)	(0.003)	(0.006)	(0.003)	(0.013)	(0.003)
Collateral	0.059***	0.121***	0.172***	0.105***	0.141***	0.091***	0.384***	0.103***
	(0.004)	(0.002)	(0.007)	(0.002)	(0.004)	(0.002)	(0.009)	(0.002)
Ln (Principal)	-0.003***	0.008***	0.007***	0.006***	-0.002***	0.018***	0.076***	-0.001**
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Relationship strength variables								
Relationship length (years)	-0.053***	-0.053***	-0.600***	-0.025***	-0.198***	0.050***	-0.047***	-0.058***
	(0.010)	(0.006)	(0.019)	(0.005)	(0.011)	(0.006)	(0.009)	(0.006)
Number of loans	0.022***	-0.001	0.028***	-0.002***	-0.013***	0.004***	-0.067***	0.005***
	(0.003)	(0.001)	(0.008)	(0.001)	(0.002)	(0.001)	(0.002)	(0.001)
Number of financing products	0.001	-0.059***	-0.524***	-0.002	-0.011	-0.090***	0.197***	-0.071***
	(0.010)	(0.004)	(0.015)	(0.004)	(0.008)	(0.004)	(0.019)	(0.004)
Lender share in financing	-0.129***	0.059***	-0.323***	0.071***	0.145***	-0.007	0.057***	0.003
	(0.032)	(0.012)	(0.038)	(0.012)	(0.032)	(0.011)	(0.015)	(0.015)
Non fund based facility	0.050**	-0.039***	0.310***	-0.057***	-0.116***	0.014	0.048	-0.009
	(0.024)	(0.012)	(0.034)	(0.011)	(0.021)	(0.011)	(0.052)	(0.011)
Credit history of the borrower								
Ln (Overdues)	0.005***	0.023***	0.062***	0.015***	0.039***	0.004***	-0.017***	0.029***
	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Default	0.067***	0.236***	0.741***	0.195***	0.588***	0.044***	0.040***	0.308***
	(0.016)	(0.009)	(0.026)	(0.008)	(0.018)	(0.008)	(0.012)	(0.010)

Litigation	-0.236***	0.097***	1.391***	-0.069***	0.270***	-0.164***	-0.670***	0.269***
	(0.020)	(0.013)	(0.048)	(0.012)	(0.022)	(0.013)	(0.018)	(0.014)
Write off	-0.655***	-0.749***	-0.821***	-0.775***	-1.182***	-0.520***	-0.696***	-0.859***
	(0.032)	(0.027)	(0.095)	(0.023)	(0.044)	(0.024)	(0.028)	(0.030)
Borrower characteristics								
Number of lending relationships	-0.021***	-0.020***	-0.087***	-0.014***	-0.008	-0.024***	-0.009***	-0.020***
	(0.003)	(0.002)	(0.006)	(0.002)	(0.004)	(0.002)	(0.003)	(0.002)
Rating	0.264***	-0.625***	-0.602***	-0.418***	-0.549***	-0.395***	-0.460***	-0.501***
	(0.011)	(0.008)	(0.027)	(0.007)	(0.012)	(0.007)	(0.017)	(0.008)
SME firm	0.426***	0.326***	0.418***	0.398***	0.837***	0.342***	0.249***	0.561***
	(0.082)	(0.038)	(0.157)	(0.035)	(0.047)	(0.050)	(0.089)	(0.035)
Listed firm	-0.417***	-0.156***	-0.610***	-0.176***	0.013	-0.258***	0.120	-0.232***
	(0.087)	(0.060)	(0.159)	(0.054)	(0.096)	(0.058)	(0.091)	(0.059)
Government firm	-0.462	-0.866***	-0.151	-0.784***	-0.231	-0.915***	-1.089**	-0.498***
	(0.280)	(0.164)	(0.482)	(0.150)	(0.216)	(0.183)	(0.454)	(0.143)
Constant	4.395***	5.959***	4.472***	5.802***	3.326***	6.310***	8.573***	4.411***
	(0.240)	(0.111)	(0.402)	(0.104)	(0.184)	(0.122)	(0.262)	(0.112)
Year dummies	Included	Included	Included	Included	Included	Included	Included	Included
Observations	275,029	1,386,068	107,211	1,553,886	556,576	1,104,521	403,206	1,257,891
R-square	0.28	0.17	0.27	0.18	0.16	0.22	0.31	0.16
Wald chi2	106,146	287,437	40,959	334,730	105,183	308,505	182,635	238,288
Degree of freedom	45	45	45	45	45	45	45	45

Note: This Table provides estimations for risk premium for sub-samples split on the basis of type of financial institutions.

Standard errors in parentheses

** significant at 5% level

*** significant at 1% level

[a] Small and medium size financial institutions

Table 3.7
The Influence of Type of Financial Institution on Levels of Collateral
Estimation with different types of financial institutions – Dependent variable *collateral*

VARIABLES	Type of Financial Institutions							
	Public	**Private**[@]	**Foreign**	**Domestic**	**Large**	**S&M**[@ a]	**NBFIs**[@]	**Banks**
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
Loan Characteristics								
Maturity of Loan	0.001	0.004***	0.088***	-0.004***	-0.044***	0.029***	-0.046***	0.002
	(0.003)	(0.001)	(0.006)	(0.001)	(0.002)	(0.001)	(0.002)	(0.001)
Risk Premium	0.014***	0.020***	0.031***	0.018***	0.018***	0.019***	0.013***	0.020***
	(0.001)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Ln (Principal)	-0.008***	-0.003***	-0.000	-0.004***	-0.001***	-0.005***	0.002***	-0.004***
	(0.001)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Relationship strength variables								
Relationship length (years)	-0.005	0.011***	0.066***	0.005**	0.019***	0.005**	-0.015***	0.021***
	(0.005)	(0.002)	(0.008)	(0.002)	(0.004)	(0.003)	(0.002)	(0.003)
Number of loans	0.033***	0.003***	0.012***	0.004***	0.002***	0.004***	0.011***	0.003***
	(0.002)	(0.000)	(0.003)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)
Number of financing products	0.055***	0.026***	-0.038***	0.044***	-0.006**	0.052***	0.076***	0.036***
	(0.005)	(0.002)	(0.006)	(0.002)	(0.003)	(0.002)	(0.004)	(0.002)
Lender share in financing	-0.256***	-0.224***	-0.349***	-0.213***	-0.286***	-0.212***	-0.026***	-0.362***
	(0.015)	(0.005)	(0.016)	(0.005)	(0.012)	(0.005)	(0.003)	(0.007)
Non fund based facility	-0.020	-0.035***	0.028**	-0.032***	0.032***	-0.061***	0.045***	-0.034***
	(0.011)	(0.005)	(0.015)	(0.005)	(0.008)	(0.005)	(0.010)	(0.005)
Credit history of the borrower								
Ln (Overdues)	0.002***	0.000	-0.002***	0.001***	-0.001***	0.001***	0.001***	0.000
	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Default	0.048***	0.053***	0.109***	0.047***	0.061***	0.058***	0.006***	0.079***
	(0.008)	(0.004)	(0.011)	(0.003)	(0.006)	(0.004)	(0.002)	(0.004)

Page 74

Litigation	-0.131***	-0.054***	0.077***	-0.079***	-0.154***	-0.021***	0.035***	-0.110***
	(0.010)	(0.005)	(0.020)	(0.005)	(0.008)	(0.006)	(0.003)	(0.006)
Write off	-0.101***	0.001	0.002	-0.021**	-0.122***	0.035***	0.026***	-0.040***
	(0.015)	(0.011)	(0.041)	(0.009)	(0.016)	(0.011)	(0.005)	(0.013)
Borrower characteristics								
Number of lending relationships	-0.018***	-0.014***	-0.012***	-0.017***	-0.017***	-0.014***	-0.009***	-0.020***
	(0.002)	(0.001)	(0.002)	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)
Rating	0.058***	0.024***	-0.100***	0.031***	0.003	0.026***	0.093***	-0.023***
	(0.005)	(0.003)	(0.011)	(0.003)	(0.005)	(0.003)	(0.003)	(0.004)
SME firm	0.231***	0.694***	0.331***	0.597***	0.554***	0.256***	0.077***	0.568***
	(0.042)	(0.016)	(0.059)	(0.016)	(0.026)	(0.020)	(0.021)	(0.017)
Listed firm	-0.064	0.035	0.068	0.020	0.047	-0.012	0.033	0.017
	(0.043)	(0.026)	(0.062)	(0.024)	(0.043)	(0.024)	(0.019)	(0.028)
Government firm	-0.108	-0.060	0.054	-0.062	-0.060	-0.033	0.340***	-0.122
	(0.143)	(0.072)	(0.181)	(0.069)	(0.119)	(0.072)	(0.107)	(0.071)
Constant	1.464***	0.942***	1.210***	1.018***	0.249**	1.585***	0.910***	0.690***
	(0.124)	(0.050)	(0.152)	(0.049)	(0.102)	(0.049)	(0.064)	(0.057)
Year dummies	Included	Included	Included	Included	Included	Included	Included	Included
Observations	275,029	1,386,068	107,211	1,553,886	556,576	1,104,521	403,206	1,257,891
Log likelihood / R-square	-315,052	0.10	-124,361	-1,892,079	-708,917	0.06	0.26	-1,681,340
Wald chi2	3475.61	14109.84	5423.68	13162.33	8737.84	10260.06	13000.02	13927.74
Degree of freedom	45	45	45	45	45	45	45	45

Note: This Table provides estimations for collateral for sub-samples split on the basis of type of financial institutions.

[@] Estimation at columns 2, 6 & 7 used multivariate GLS regression since Tobit regression is not able to converge on a solution for these sub-samples estimation. As earlier explained, however, the results of estimations using multivariate GLS regression (these results are not included in the tables but available on request) and Tobit are almost the same for other equations. This gives us confidence on the reliability of these results.

Standard errors in parentheses

** significant at 5% level

*** significant at 1% level

[a]: Small and medium size financial institutions

We observe relatively less variation in Table 3.7. The *number of loans* is significant and positively associated with collateral (results in higher collateral) across all types of financial institutions and *lender's share* is significant and negatively associated with collateral for every type of financial institution. The *length of relationship*, although significant and positive for all other types of institutions, is insignificant for public sector financial institutions and negatively associated with collateral for NBFIs. This shows that NBFIs are the only institutions that reduce collateral requirements for their customers with longer relationships. NBFIs are constrained both by their small size and limitations on their operations (for example NBFIs cannot attract demand deposits and cannot undertake a number of other banking activities) and lower collateral requirements may be an effort on their part to retain their customer base. In the remaining two relationship strength variables, *number of products* and *non-fund based facility*, we observe even higher level of variation between different types of lenders.

The response of a particular type of financial institution towards different relationship dimensions is also not uniform. For example, for public sector financial institutions, the coefficients of *relationship length* and *lender share in financing* are significant and negative in Table 3.6 while those of *number of loans* and *non-fund based facility* are significant and positive. This shows that public sector financial institutions charge lower risk premium from firms as length of their relationship increases or they become dominant financier of a firm. However, they charge higher interest rates when firms obtain larger number of loans or non-fund based facilities from them. Large banks, on the other hand, reduce credit pricing in these situations but charge higher interest rates as a borrower becomes more reliant on them.

It seems that financial institutions respond to different relationship strength variables according to their peculiar circumstances. For example, foreign banks and public sector financial institutions charge higher interest rates from firms that obtain non-fund based facilities (like letters of credit and guarantees) from them unlike private and domestic financial institutions, which reduce interest rates for such borrowers. The credit rating of domestic financial institutions in Pakistan is constrained by the sovereign rating of the country (Which was below investment grade during larger period of 2006-13). In many cases, an investment grade or better rating of the issuer is required for acceptance of letters of credit or guarantees. In

such circumstances, firms may be constrained to approach foreign banks to obtain these facilities, enabling such foreign banks to exploit this position. In Government related transactions, a guarantee from a public sector institutions may be required or preferred, forcing the firms to foster and maintain relationships with these institutions.

As observed in Tables 3.4 and 3.5, the variables related to type of firm still dominate the relationship strength variables in terms of magnitude of coefficients both in Tables 3.6 and 3.7. For example, the coefficients of *Government firm* (a dummy variable for control identifying Government firms in our dataset) in Table 3.6 ranges between -0.498 to -1.089 as compared to -0.025 to -0.600 for relationship length. This reflects the need to go a step further in bifurcation of our dataset and examine the relationship both by type of the borrower and the lender. We, therefore, delve deeper and partition our dataset both by type of financial institution and type of firm in the next section.

3.5.3 Lending relationships, type of firm-lender and terms of credit

Firm's characteristics significantly affect the bank-borrower lending relationship and its implications. Bharath *et al.* (2007) and Mudd (2013) observe that smaller firms are more inclined to use a relationship lender for their loans. Larger firms are found to experience no significant difference in interest rates for loans from a relationship lender or other lenders (Bharath *et al.*, 2011).

Tables 3.8, 3.9 and 3.10 provide the results of estimations run on sub-samples split both by type of the borrower and the lender. We start with the results for SMEs followed by listed companies and Government firms.

Table 3.8 Panel A
Estimations for Risk Premium for SMEs by Different types of Financial Institutions

	Type of Financial Institution							
	Public	private	Foreign	Domestic	Large	S&M[a]	NBFIs	Banks
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Loan Characteristics								
Maturity of Loan	-0.374***	0.180***	0.134***	0.160***	0.262***	0.039***	-0.558***	0.187***
	(0.024)	(0.008)	(0.035)	(0.008)	(0.011)	(0.009)	(0.041)	(0.008)
Collateral	0.095***	0.134***	0.040	0.130***	0.148***	0.080***	0.847***	0.123***
	(0.010)	(0.005)	(0.021)	(0.004)	(0.006)	(0.006)	(0.025)	(0.005)
Ln (Principal)	0.011***	-0.001	-0.001	-0.001	-0.008***	0.028***	0.096***	-0.006***
	(0.003)	(0.001)	(0.005)	(0.001)	(0.002)	(0.002)	(0.003)	(0.001)
Relationship strength variables								
Relationship length (years)	-0.256***	-0.001	-0.191***	-0.033**	0.012	-0.011	-0.077***	-0.007
	(0.026)	(0.014)	(0.046)	(0.013)	(0.019)	(0.015)	(0.022)	(0.015)
Number of loans	0.116***	-0.067***	0.064**	-0.072***	-0.160***	-0.060***	-0.181***	-0.050***
	(0.031)	(0.007)	(0.031)	(0.006)	(0.021)	(0.005)	(0.012)	(0.007)
Number of financing products	0.063	0.180***	-0.127	0.179***	0.345***	0.056**	0.246***	0.124***
	(0.052)	(0.022)	(0.070)	(0.021)	(0.038)	(0.022)	(0.068)	(0.022)
Lender share in financing	0.279	0.078	-0.231	0.107**	0.319***	-0.011	-0.006	0.181***
	(0.150)	(0.048)	(0.129)	(0.047)	(0.115)	(0.039)	(0.043)	(0.066)
Non fund based facility	-0.301***	-0.133***	-0.358***	-0.137***	-0.361***	0.063	0.236	-0.121***
	(0.076)	(0.041)	(0.131)	(0.038)	(0.060)	(0.040)	(0.164)	(0.039)
Credit history of the borrower								
Ln (Overdues)	-0.022***	0.037***	0.003	0.028***	0.039***	-0.009***	-0.037***	0.036***
	(0.003)	(0.002)	(0.004)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Default	0.602***	0.412***	0.318***	0.514***	0.826***	0.028	-0.269***	0.658***
	(0.040)	(0.024)	(0.063)	(0.022)	(0.034)	(0.023)	(0.030)	(0.025)
Litigation	-0.133**	0.352***	0.617***	0.322***	0.441***	-0.237***	-1.128***	0.472***
	(0.066)	(0.030)	(0.129)	(0.028)	(0.036)	(0.043)	(0.062)	(0.030)

Write off	-0.905***	-0.678***	-1.379***	-0.733***	-0.732***	-0.813***	-2.158***	-0.441***
	(0.203)	(0.108)	(0.324)	(0.101)	(0.136)	(0.128)	(0.144)	(0.114)
Borrower characteristics								
Number of lending relationships	0.142***	-0.076***	0.126**	-0.056***	-0.150***	0.019	0.099***	-0.117***
	(0.044)	(0.018)	(0.052)	(0.017)	(0.037)	(0.015)	(0.017)	(0.023)
Rating	-0.028	-0.037**	-0.588***	-0.034**	0.169***	-0.587***	-0.300***	-0.147***
	(0.031)	(0.017)	(0.079)	(0.015)	(0.021)	(0.021)	(0.062)	(0.018)
Constant	5.977***	7.266***	-0.266	7.128***	6.974***	9.041***	12.586***	5.944***
	(1.241)	(0.356)	(3.777)	(0.345)	(0.639)	(0.498)	(0.849)	(0.408)
Year dummies	Included	Included	Included	Included	Included	Included	Included	Included
Observations	47,106	308,838	12,837	343,107	206,528	149,416	53,911	302,033
R-square	0.14	0.13	0.24	0.13	0.15	0.18	0.26	0.13
Wald Chi2	14,294	51,571	7,437	56,572	34,409	43,199	31,756	47,991
Degree of freedom	42	42	42	42	42	42	42	42

Note: This Table shows the estimation results of risk premium models for SME firms across different types of financial institutions

Standard errors in parentheses

** significant at 5% level

*** significant at 1% level

[a]. Small and medium size financial institutions

Table 3.8 Panel B
Estimations for Collateral for SMEs by Different types of Financial Institutions

| | Type of Financial Institutions | | | | | | | |
Name of Variable	Public (1)	Private (2)	Foreign (3)	Domestic (4)	Large (5)	S&M[a] (6)	NBFIs[@] (7)	Banks (8)
Loan Characteristics								
Maturity of Loan	-0.008	-0.044***	0.026	-0.044***	-0.086***	0.017***	-0.017**	-0.050***
	(0.012)	(0.003)	(0.015)	(0.003)	(0.004)	(0.004)	(0.007)	(0.003)
Risk Premium	0.023***	0.019***	0.007	0.020***	0.020***	0.016***	0.025***	0.020***
	(0.002)	(0.001)	(0.004)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Ln (Principal)	-0.007***	-0.003***	-0.003	-0.004***	-0.002***	-0.006***	0.002***	-0.004***
	(0.001)	(0.001)	(0.002)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)
Relationship strength variables								
Relationship length (years)	0.008	0.051***	0.056***	0.044***	0.078***	0.003	-0.039***	0.063***
	(0.013)	(0.005)	(0.020)	(0.005)	(0.007)	(0.007)	(0.004)	(0.006)
Number of loans	0.043***	0.008***	0.022	0.009***	0.030***	0.002	0.017***	0.005
	(0.015)	(0.002)	(0.013)	(0.002)	(0.008)	(0.002)	(0.002)	(0.003)
Number of financing products	0.023	0.099***	-0.067**	0.101***	-0.060***	0.225***	0.214***	0.106***
	(0.025)	(0.008)	(0.030)	(0.008)	(0.014)	(0.010)	(0.012)	(0.009)
Lender share in financing	-0.382***	-0.143***	-0.516***	-0.128***	-0.218***	-0.151***	-0.003	-0.315***
	(0.073)	(0.018)	(0.055)	(0.018)	(0.042)	(0.018)	(0.007)	(0.027)
Non fund based facility	-0.334***	-0.062***	0.517***	-0.123***	0.094***	-0.281***	-0.347***	-0.102***
	(0.037)	(0.016)	(0.056)	(0.015)	(0.022)	(0.018)	(0.028)	(0.016)
Credit history of the borrower								
Ln (Overdues)	-0.008***	-0.004***	-0.003	-0.005***	-0.012***	-0.000	0.000	-0.008***
	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)	(0.000)	(0.001)
Default	0.184***	0.076***	0.024	0.100***	0.146***	0.077***	0.016***	0.140***
	(0.019)	(0.009)	(0.027)	(0.008)	(0.013)	(0.010)	(0.005)	(0.010)

Litigation	-0.453***	-0.207***	0.149***	-0.240***	-0.302***	-0.120***	0.158***	-0.277***
	(0.032)	(0.011)	(0.055)	(0.011)	(0.013)	(0.019)	(0.011)	(0.012)
Write off	-0.308***	0.131***	0.850***	0.038	-0.112**	0.380***	0.396***	0.000
	(0.099)	(0.041)	(0.139)	(0.039)	(0.050)	(0.057)	(0.024)	(0.046)
Borrower characteristics								
Number of lending relationships	-0.125***	-0.015**	-0.032	-0.023***	-0.046***	-0.020***	0.001	-0.057***
	(0.022)	(0.007)	(0.022)	(0.007)	(0.014)	(0.007)	(0.003)	(0.009)
Rating	0.083***	0.122***	-0.036	0.116***	0.118***	0.093***	0.035***	0.081***
	(0.015)	(0.006)	(0.034)	(0.006)	(0.008)	(0.009)	(0.011)	(0.007)
Constant	2.595***	0.662***	1.965	0.837***	0.785	1.896***	1.215***	0.725***
	(0.727)	(0.221)	(1.732)	(0.219)	(0.442)	(0.240)	(0.225)	(0.259)
Year dummies	Included	Included	Included	Included	Included	Included	Included	Included
Observations	47,106	308,838	12,837	343,107	206,528	149,416	53,911	302,033
Log Likelihood/R-square	-57,164	-396,946	-12,412	-441,132	-276,746	-173,634	0.48	-407,800
Wald Chi2	1,391	6,115	448	6,381	6,996	1,943	5,858	6,851
Degree of freedom	42	42	42	42	42	42	42	42

Note: This Table shows the estimation results of interest rate model for listed firms across different types of financial institutions

Standard errors in parentheses

** significant at 5% level

*** significant at 1% level

[@] These results have been obtained using multivariate GLS regression analysis since Tobit estimation could not converge on a solution for sub-sample relating to NBFIs' loans to SMEs. The comparison of Tobit and multivariate GLS regressions for other sub-samples (multivariate results for other sub-samples are not included in table, however, are available on request) shows almost the same results for both estimation techniques. This gives us confidence that results obtained from multivariate regression are reasonably reliable.

[a] Small and medium size financial institutions

Table 3.9 Panel A
Estimations for Risk Premium for Listed Firms by Different Types of Financial Institutions

Name of Variable	Type of Financial Institution							
	Public	Private	Foreign	Domestic	Large	S&M[a]	NBFIs	Banks
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Loan Characteristics								
Maturity of Loan	-0.267***	-0.003	-0.330***	0.012	0.037**	-0.035***	-0.148***	-0.025***
	(0.023)	(0.009)	(0.034)	(0.009)	(0.017)	(0.010)	(0.035)	(0.009)
Collateral	0.065***	0.074***	0.136***	0.067***	0.060***	0.075***	0.285***	0.060***
	(0.016)	(0.008)	(0.018)	(0.008)	(0.014)	(0.008)	(0.024)	(0.008)
Ln (Principal)	-0.002	-0.017***	-0.017***	-0.011***	-0.025***	-0.008***	0.014***	-0.018***
	(0.004)	(0.002)	(0.003)	(0.002)	(0.003)	(0.002)	(0.004)	(0.002)
Relationship strength variables								
Relationship length (years)	-0.034	-0.046**	-0.107**	-0.021	-0.247***	0.049**	-0.149***	0.000
	(0.035)	(0.022)	(0.055)	(0.020)	(0.042)	(0.021)	(0.032)	(0.023)
Number of loans	0.029***	0.006***	0.013	0.006***	-0.012***	0.020***	-0.017***	0.008***
	(0.007)	(0.002)	(0.029)	(0.002)	(0.003)	(0.002)	(0.007)	(0.002)
Number of financing products	0.054**	-0.040***	-0.238***	-0.009	0.028	-0.068***	-0.153***	-0.021**
	(0.024)	(0.010)	(0.041)	(0.010)	(0.016)	(0.011)	(0.048)	(0.010)
Lender share in financing	-0.440***	-0.022	-0.416***	-0.045	0.132	-0.106**	0.126	-0.144***
	(0.078)	(0.046)	(0.135)	(0.042)	(0.075)	(0.048)	(0.068)	(0.048)
Non fund based facility	-0.118**	-0.048	0.244***	-0.101***	-0.339***	0.088***	0.114	-0.041
	(0.059)	(0.030)	(0.080)	(0.028)	(0.053)	(0.031)	(0.129)	(0.029)

Credit history of the borrower

Ln (Overdues)	0.019***	0.029***	0.028***	0.023***	0.048***	0.018***	0.016***	0.028***
	(0.002)	(0.002)	(0.007)	(0.002)	(0.003)	(0.002)	(0.002)	(0.002)
Default	0.091	-0.067**	-0.268***	-0.026	-0.001	-0.044	0.396***	-0.198***
	(0.051)	(0.031)	(0.080)	(0.029)	(0.057)	(0.030)	(0.042)	(0.033)
Litigation	0.104**	0.202***	0.216	0.112***	0.665***	0.046	-0.351***	0.476***
	(0.054)	(0.042)	(0.160)	(0.035)	(0.079)	(0.037)	(0.048)	(0.045)
Write off	-0.499***	0.154**	-2.896***	-0.047	-0.680***	0.166***	0.267***	-0.308***
	(0.077)	(0.066)	(0.385)	(0.053)	(0.113)	(0.058)	(0.069)	(0.071)
Borrower characteristics								
Number of lending relationships	0.003	0.006	-0.042***	0.013***	0.025***	-0.005	-0.000	0.004
	(0.005)	(0.003)	(0.009)	(0.003)	(0.006)	(0.003)	(0.005)	(0.003)
Rating	-0.062	-0.446***	0.107	-0.487***	-0.827***	-0.184***	-0.244***	-0.559***
	(0.044)	(0.030)	(0.092)	(0.027)	(0.048)	(0.030)	(0.045)	(0.032)
Constant	3.707***	4.730***	4.411***	4.337***	1.991***	4.750***	4.926***	4.047***
	(0.581)	(0.359)	(0.797)	(0.346)	(0.762)	(0.343)	(0.746)	(0.360)
Year dummies	Included	Included	Included	Included	Included	Included	Included	Included
Observations	23,854	97,542	15,106	106,290	32,641	88,755	29,136	92,260
R-square	0.13	0.20	0.24	0.16	0.19	0.21	0.21	0.14
Wald Chi2	5,857	13,623	2,136	16,739	7,296	12,098	8,177	12,114
Degree of freedom	42	42	42	42	42	42	42	42

Note: This Table shows the estimation results for risk premium charged by different types of financial institutions on loans to listed firms.

Standard errors in parentheses

** significant at 5% level

*** significant at 1% level

[a] Small and medium size financial institutions

Table 3.9 Panel B
Estimations for Collateral Requirements for Loans to Listed Firms by Different Types of Financial Institutions

Name of variable	Public[a] (1)	Private (2)	Foreign (3)	Domestic (4)	Large (5)	S&M[a] (6)	NBFIs[@] (7)	Banks (8)
				Type of Financial Institution				
Loan Characteristics								
Maturity of Loan	0.011	0.020***	0.102***	0.005	0.020***	0.019***	-0.024***	0.021***
	(0.010)	(0.004)	(0.016)	(0.004)	(0.007)	(0.004)	(0.009)	(0.004)
Risk Premium	0.011***	0.013***	0.029***	0.011***	0.009***	0.014***	0.017***	0.012***
	(0.003)	(0.001)	(0.004)	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)
Ln (Principal)	-0.005***	0.000	0.001	-0.001	0.002	-0.002	-0.001	-0.000
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Relationship strength variables								
Relationship length (years)	-0.033**	-0.018	-0.018	-0.025***	-0.056***	-0.005	-0.002	-0.023**
	(0.015)	(0.009)	(0.025)	(0.008)	(0.016)	(0.009)	(0.008)	(0.010)
Number of loans	0.037***	0.008***	-0.016	0.010***	0.010***	0.010***	0.008***	0.010***
	(0.003)	(0.001)	(0.014)	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)
Number of financing products	0.091***	0.023***	-0.087***	0.053***	0.071***	0.004	-0.077***	0.038***
	(0.010)	(0.004)	(0.019)	(0.004)	(0.006)	(0.005)	(0.012)	(0.004)
Lender share in financing	-0.200***	-0.664***	-0.857***	-0.564***	-0.554***	-0.595***	-0.104***	-0.722***
	(0.032)	(0.019)	(0.062)	(0.017)	(0.029)	(0.021)	(0.017)	(0.021)
Non fund based facility	-0.174***	-0.042***	0.151***	-0.077***	-0.097***	-0.029**	0.231***	-0.064***
	(0.024)	(0.013)	(0.037)	(0.012)	(0.021)	(0.013)	(0.032)	(0.013)

Credit history of the borrower

Ln (Overdues)	-0.004***	0.007***	0.022***	0.003***	0.007***	0.003***	-0.001	0.005***
	(0.001)	(0.001)	(0.003)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Default	0.067***	0.090***	0.294***	0.054***	0.119***	0.071***	0.083***	0.089***
	(0.021)	(0.013)	(0.037)	(0.012)	(0.022)	(0.013)	(0.010)	(0.015)
Litigation	0.006	0.159***	0.103	0.113***	0.299***	0.059***	-0.039***	0.196***
	(0.022)	(0.018)	(0.074)	(0.014)	(0.031)	(0.016)	(0.012)	(0.020)
Write off	0.068**	0.001	-0.400**	0.036	0.003	0.031	-0.015	0.074**
	(0.032)	(0.028)	(0.177)	(0.022)	(0.044)	(0.025)	(0.017)	(0.031)
Borrower characteristics								
Number of lending relationships	-0.015***	-0.011***	0.029***	-0.019***	-0.019***	-0.009***	-0.012***	-0.013***
	(0.002)	(0.001)	(0.004)	(0.001)	(0.002)	(0.001)	(0.001)	(0.002)
Rating	-0.084***	-0.017	0.020	-0.011	-0.022	-0.084***	0.034***	-0.062***
	(0.018)	(0.013)	(0.042)	(0.011)	(0.019)	(0.013)	(0.011)	(0.014)
Constant	1.268***	0.951***	1.030***	1.101***	0.531	1.121***	0.970***	0.947***
	(0.307)	(0.127)	(0.288)	(0.133)	(0.307)	(0.128)	(0.249)	(0.141)
Year dummies	Included	Included	Included	Included	Included	Included	Included	Included
Observations	23,854	97,542	15,106	106,290	32,641	88,755	29,136	92,260
Log likelihood/R-square	0.07	-120,402	-19,703	-125,180	-40,760	-104,523	0.17	-120,372
Wald Chi2	881	1,990	993	2,053	1,119	1,367	852	1,937
Degree of freedom	42	42	42	42	42	42	42	42

Note: This Table shows the estimation results of interest rate model for listed firms across different types of financial institutions

Standard errors in parentheses

** significant at 5% level

*** significant at 1% level

[@] These results have been obtained using multivariate GLS regression analysis since Tobit estimation could not converge on a solution for sub-sample relating to NBFIs' loans to SMEs. The comparison of Tobit and multivariate GLS regressions for other sub-samples (multivariate results for other sub-samples are not included in table, however, are available on request) shows almost the same results for both estimation techniques. This gives us confidence that results obtained from multivariate regression are reasonably reliable.

[a] Small and medium size financial institutions

Table 3.10 Panel A
Estimations for Risk Premium for Government Firms by Different Types of Financial Institutions

VARIABLES	Types of Financial Institutions							
	Public (1)	Private (2)	Foreign (3)	Domestic (4)	Large (5)	S&M[a] (6)	NBFIs (7)	Banks (8)
Loan Characteristics								
Maturity of Loan	-0.023	-0.157***	0.204**	-0.138***	-0.192***	-0.048	-0.652***	-0.121***
	(0.041)	(0.025)	(0.083)	(0.023)	(0.033)	(0.029)	(0.166)	(0.022)
Collateral	-0.069**	-0.073***	-0.108	-0.079***	-0.019	-0.133***	0.110	-0.080***
	(0.029)	(0.027)	(0.072)	(0.022)	(0.032)	(0.028)	(0.081)	(0.021)
Ln (Principal)	0.018**	-0.004	-0.037***	0.004	-0.002	-0.010	0.038**	-0.003
	(0.008)	(0.005)	(0.008)	(0.005)	(0.006)	(0.005)	(0.016)	(0.004)
Relationship strength variables								
Relationship length (years)	-0.010	0.263***	-0.198	0.203***	0.144	0.197***	0.123	0.180***
	(0.080)	(0.059)	(0.124)	(0.052)	(0.080)	(0.061)	(0.143)	(0.052)
Number of loans	-0.043	-0.041***	-0.193	-0.049***	-0.031***	-0.140***	-0.951***	-0.036***
	(0.027)	(0.007)	(0.109)	(0.007)	(0.008)	(0.016)	(0.068)	(0.007)
Number of financing products	-0.489***	0.381***	-0.044	0.334***	0.329***	0.470***	0.884	0.304***
	(0.119)	(0.044)	(0.197)	(0.042)	(0.057)	(0.061)	(0.630)	(0.040)
Lender share in financing	0.691**	-0.041	0.408	-0.117	-0.304	0.075	-0.092	-0.024
	(0.293)	(0.124)	(0.284)	(0.119)	(0.226)	(0.127)	(0.278)	(0.121)
Non fund based facility	0.917***	-0.262**	2.347***	-0.378***	-0.629***	-0.073		-0.181
	(0.253)	(0.116)	(0.342)	(0.110)	(0.186)	(0.129)		(0.104)

Credit history of the borrower

Ln (Overdues)	-0.058***	-0.010	0.003	-0.024***	-0.023**	-0.012**	-0.035***	-0.017***
	(0.009)	(0.006)	(0.019)	(0.005)	(0.009)	(0.006)	(0.011)	(0.006)
Default	0.742***	0.259***	-0.678***	0.538***	0.801***	0.058	0.628***	0.376***
	(0.129)	(0.099)	(0.258)	(0.085)	(0.133)	(0.103)	(0.193)	(0.090)
Litigation	-0.179	-0.926***	-	-0.600***	-1.118***	-0.302	-0.627**	-0.378**
	(0.173)	(0.215)	-	(0.142)	(0.201)	(0.198)	(0.252)	(0.173)
Write off	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-
Borrower characteristics								
Number of lending relationships	-0.079***	0.015	0.091***	-0.009	-0.016	-0.005	-0.110**	0.016
	(0.024)	(0.015)	(0.033)	(0.014)	(0.022)	(0.017)	(0.043)	(0.014)
Rating	0.609***	-0.628***	-0.562**	-0.028	0.189**	-0.442***	-0.317	-0.064
	(0.083)	(0.090)	(0.231)	(0.066)	(0.090)	(0.092)	(0.382)	(0.066)
Constant	2.249	5.356***	2.339	4.407***	3.994**	6.731***	4.825	3.631***
	(1.698)	(1.078)	(5.692)	(0.945)	(1.606)	(1.041)	(5.216)	(0.914)
Year dummies	Included	Included	Included	Included	Included	Included	Included	Included
Observations	3,019	9,617	1,174	11,462	4,995	7,641	1,411	11,225
R-square	0.43	0.18	0.40	0.20	0.29	0.26	0.49	0.20
Wald Chi2	.	.	.	.	.	.	.	.
Degree of freedom	40	40	38	40	40	40	38	40

Note: This Table shows the estimation results of collateral model for listed firms across different types of financial institutions.

Standard errors in parentheses

** significant at 5% level

*** significant at 1% level

[a] Small and medium size financial institutions

Table 3.10 Panel B
Estimations for Collateral for Loans to Government Firms by Different Types of Financial Institutions

Name of Variables	Type of Financial Institutions							
	Public (1)	Private (2)	Foreign (3)	Domestic (4)	Large (5)	S&M[a] (6)	NBFIs (7)	Banks (8)
Loan Characteristics								
Maturity of Loan	-0.224***	0.022**	0.053	-0.030***	0.003	-0.038***	-0.229***	-0.015
	(0.026)	(0.010)	(0.034)	(0.010)	(0.015)	(0.012)	(0.055)	(0.010)
Risk Premium	-0.027**	-0.011***	-0.019	-0.015***	-0.004	-0.024***	0.012	-0.016***
	(0.012)	(0.004)	(0.012)	(0.004)	(0.007)	(0.005)	(0.009)	(0.004)
Ln (Principal)	-0.005	-0.005***	-0.008**	-0.005**	0.002	-0.011***	-0.002	-0.006***
	(0.005)	(0.002)	(0.003)	(0.002)	(0.003)	(0.002)	(0.005)	(0.002)
Relationship strength variables								
Relationship length (years)	-0.007	0.037	-0.002	0.030	-0.008	0.060**	-0.073	0.038
	(0.050)	(0.023)	(0.051)	(0.023)	(0.037)	(0.026)	(0.048)	(0.023)
Number of loans	-0.003	0.011***	0.034	0.010***	0.007	0.029***	0.209***	0.008**
	(0.017)	(0.003)	(0.045)	(0.003)	(0.004)	(0.007)	(0.024)	(0.003)
Number of financing products	0.437***	0.061***	0.172**	0.093***	0.059**	0.092***	-0.206	0.095***
	(0.075)	(0.017)	(0.081)	(0.018)	(0.026)	(0.026)	(0.210)	(0.018)
Lender share in financing	-0.528***	-0.575***	-0.722***	-0.570***	-0.532***	-0.627***	-0.113	-0.697***
	(0.183)	(0.048)	(0.115)	(0.052)	(0.103)	(0.053)	(0.093)	(0.054)
Non fund based facility	-0.020	-0.009	-0.092	0.019	0.145	-0.076		-0.018
	(0.159)	(0.045)	(0.144)	(0.049)	(0.085)	(0.054)		(0.047)

Credit history of the borrower

Ln (Overdues)	0.035***	-0.006**	0.003	0.003	0.009**	-0.002	0.025***	-0.009***
	(0.006)	(0.002)	(0.008)	(0.002)	(0.004)	(0.003)	(0.003)	(0.003)
Default	-0.439***	0.034	0.067	-0.124***	-0.052	-0.146***	0.205***	-0.140***
	(0.081)	(0.039)	(0.106)	(0.038)	(0.061)	(0.044)	(0.064)	(0.040)
Litigation	-0.610***	0.017	-	-0.265***	0.496***	-1.141***	-0.045	-0.310***
	(0.108)	(0.084)	-	(0.062)	(0.092)	(0.082)	(0.084)	(0.077)
Write off	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-
Borrower characteristics								
Number of lending relationships	-0.064***	-0.008	-0.004	-0.019***	-0.030***	-0.012	-0.009	-0.015**
	(0.015)	(0.006)	(0.014)	(0.006)	(0.010)	(0.007)	(0.014)	(0.006)
Rating	0.207***	-0.039	0.446***	-0.020	0.052	-0.152***	0.949***	-0.007
	(0.052)	(0.035)	(0.094)	(0.029)	(0.041)	(0.039)	(0.125)	(0.030)
Constant	0.850	1.620***	4.589***	1.007**	-0.108	2.596***	-0.169	1.201***
	(0.971)	(0.442)	(0.914)	(0.416)	(0.623)	(0.543)	(1.454)	(0.435)
Year dummies	Included	Included	Included	Included	Included	Included	Included	Included
Observations	3,019	9,617	1,174	11,462	4,995	7,641	1,411	11,225
Log likelihood/R-square	-3,691	-,691	-832	-12,675	-5,709	-7,766	-1,100	-12,337
Wald Chi2	332	347	484	343	193	570	441	441
Degree of freedom	40	40	38	40	40	40	38	40

This Table shows the estimation results of collateral model for Government firms across different types of financial institutions

Standard errors in parentheses

** significant at 5% level

*** significant at 1% level

[a] small and medium size financial institutions

3.5.3.1 SMEs, lending relationships and terms of credit

Panels A and B of Table 3.8 provide the estimation results for SMEs across different types of financial institutions for the risk premium and collateral, respectively. While interpreting the results, we need to take into account that SMEs by their very nature are constrained in terms of availability of collateral. Thus higher collateral requirements are perhaps a bigger deterrent for them compared to higher interest rates. NBFIs are, however, the only financial institutions, which require less collateral from SMEs as the duration of their relationship increases (the coefficient of relationship length for NBFIs in Panel B of Table 3.8 is significant and negative whereas it is either significant and positive or insignificant for all other types of financial institutions). SMEs can, however, economize on collateral by concentrating their borrowings from one lender as it reduces the collateral requirements across almost all types of financial institutions as reflected by negative coefficient of *lender share in financing* in Panel B of Table 3.8.

One rationale of keeping the financial institutions in the public sector is that they support small businesses. Public sector financial institutions in Pakistan do reduce risk premium for their SME borrowers as relationship length increases (the *relationship length* is significant with coefficient of -0.256) although NBFIs and even foreign banks also follow the same practice (but the coefficient of relationship length is much smaller at -0.077 and -0.191 respectively). Public sector financial institutions further also reduce credit pricing as well as collateral if SMEs obtain non-fund based facilities from them. Larger number of loans from such institutions, however, exposes SMEs to both higher risk premium as well as larger collateral requirements.

Foreign banks and large banks are considered unsuitable for small firms (Berger *et al*., 2005; Pennathur and Vishwasrao, 2014). We, however, observe a mixed pattern in the Pakistani dataset. As relationship length increases, both foreign banks and large banks require SMEs to post larger collateral as shown by positive coefficients of *relationship length* in Panel B of Table 3.8. These are also the only type of financial institutions that require more collateral if SMEs obtain non-fund based facilities from them (the coefficients of *non-fund based facility* are significant

and positive for foreign banks and large banks while they are significant and negative for all other types of financial institutions). The *number of financing products* and *lender share in financing* are significant and negatively associated with collateral both for foreign and large banks showing that use of multiple financing products and concentration of borrowings by SMEs with such banks result in lower collateral levels. Foreign banks also charge lower risk premium from SMEs with longer relationships with them.

SMEs are clearly confronted with a choice. If they want to pay lower interest rate, relationship with public financial institutions, foreign banks and NBFIs is more useful. Alternatively if they are constrained by the availability of collateral, they should either maintain relationship with NBFIs or concentrate their borrowings with one lender since the coefficient of *lender's share* in Table 3.8 panel B is negative for all types of financial institutions except NBFIs. Another option for SMEs to save on interest rate is to use the same lender for obtaining loans as well as non-fund based facilities as reflected by a negative coefficient of *non-fund based facility*.

3.5.3.2 Listed companies, lending relationships and terms of credit

Table 3.9 panels A and B present results of estimations for listed companies with different types of financial institutions for interest rate and collateral. The prior research has found the lending relationships for listed firms to be less useful because of lower degree of information asymmetry as compared to small businesses (Bharath *et al.*, 2007; Bharath *et al.*, 2011). We, however, find significant impact on both interest rate and collateral across almost all types of financial institutions in various relationship dimensions that we examine. The results show that *relationship length* is significant with negative coefficients both in Panels A and B of Table 3.9 for large banks showing that the longer relationships with large banks benefit listed companies both through low risk premium as well as reduced collateral. Private financial institutions, foreign banks and NBFIs reduce interest rate only (without any impact on collateral) while public sector financial institutions and domestic banks lower the collateral requirements with longer relationships.

The exclusivity of relationship through concentrated borrowing with one lender results in low collateral across all types of financial institutions and also delivers low risk premium if the lender is a public sector financial institution, a foreign bank or a small and medium financial institution as shown by negative coefficients of *lender share in financing* in Panels A and B of Table 3.9. Listed companies using multiple financing products of a lender are generally able to get financing at cheaper rate although it results in higher collateral requirement in case of certain types of lenders.

3.5.3.3 Government firms, lending relationships and terms of credit

While the Government firms in Pakistan do default on their bank loans, there is not a single instance of any write off relating to Government firms in our dataset. Government firms enjoy the implicit backing of the Government and many of them obtain regular budgetary support to meet their operational and financing needs (Syed *et al.*, 2012). This advantageous position helps them to obtain loans from the financial sector on preferential terms and conditions as evidenced by negative coefficients of variable '*Government firm*' in Tables 3.4 and 3.5. The strength of their relationships with financial institutions, however, leads to different kinds of results. Table 3.10 panel A and panel B show the estimation results for Government firms with different types of financial institutions. The *relationship length* is either positively associated with higher risk premium and larger collateral or is insignificant across various types of financial institutions showing that longer lending relationships for Government firms are generally exploitative. The private and domestic financial institutions increase the risk premium as relationship length increases while small and medium size financial institutions increase both the risk premium and collateral.

One would generally expect that Government firms would be facilitated by public sector financial institutions since both are owned and controlled by the Government. However, public sector financial institutions actually are the only institutions that charge higher risk premium from Government firms as these firms

become more reliant on them to meet their financing needs (the coefficient of *lender's share* in Panel A of Table 3.10 for public sector financial institutions is 0.691 while it is insignificant for all other types of lenders). Likewise, these institutions also charge higher interest rates from Government firms when they obtain non-fund based facilities from them. Other types of financial institutions, with the exception of foreign banks, in fact, reduce their credit pricing on loans to Government firms in such situation. In addition, all types of lenders, again with the exception of public sector financial institutions and foreign banks, reduce interest rates when Government firms obtain more loans from them.

The only way for Government firm to economize on collateral is by concentrating their borrowings since it reduces collateral across all types of banks. The concentration of credit at one bank does not have any impact on interest rate except as earlier mentioned, public sector financial institutions increase interest rates in this situation. Higher number of loans and financing products result in larger collateral across almost all types of financial institutions. The inefficient utilization of collateral in this manner may be the result of poor collateral management on behalf of Government firms since allocation of collateral across different loans and products requires certain level of professional expertise.

3.5.4 Influence of heterogeneity between firms on the impact of *relationship length*

In sections 3.5.2 and 3.5.3, we observed that as we dissected the dataset, first by type of financial institutions and then by both the types of firms and financial institutions, our estimates changed. This provided us useful insights about the influence of type of firm and type of financial institution on our results. As a final step, we assess the impact of heterogeneity between individual firms by allowing the coefficient of our most important relationship variable, relationship length, vary across firms. Our previous estimation techniques implicitly assume that estimated coefficients of independent variables are constant across firms in a sample. The following random

coefficient model allows the coefficient of independent variables to change between firms and also enables us to predict the coefficient for each firm in our sample.[42]

$$Y^*_{it} = \alpha + X_{it}\,\beta + Z_{it}\,\mu_i + \varepsilon_{it}$$

Where X_{it} is the set of independent variables with fixed coefficients whereas Z_{it} is the variable with random coefficient. The μ_i is the random coefficient that varies across firms and in turn may be considered as a combination of fixed component and a random component.

Figure 3.1 presents the frequency distribution graph for predicted coefficients of relationship length when the dependent variable is risk premium.

Figure 3.1

---
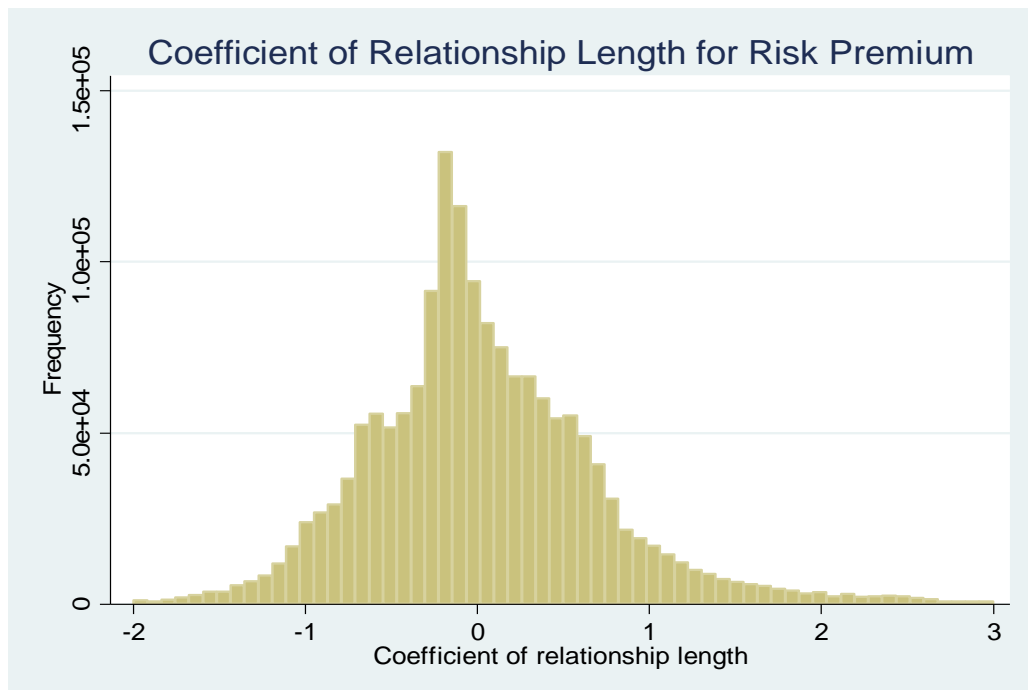
[42] We only use coefficient of relationship length as a random parameter since it is the most extensively used variable in research on relationship lending. Further, when we use other relationship variables as random parameters, the model does not converge on a solution.

Figure 3.2 presents this graph for the dependent variable collateral.

Figure 3.2

Coefficient of Relationship Length for Collateral
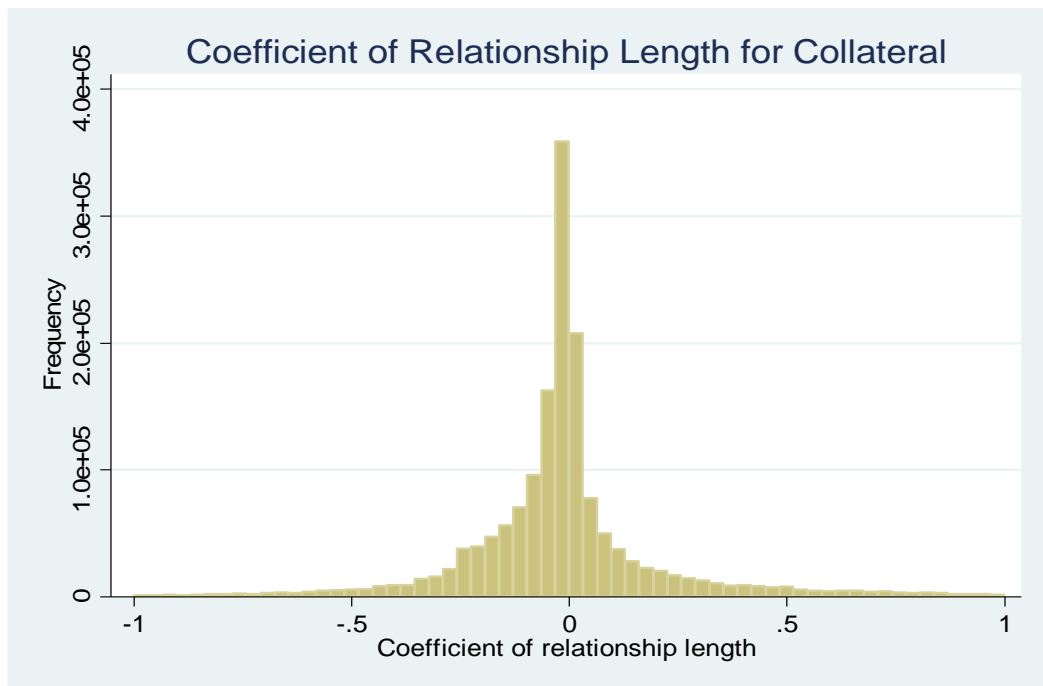
The substantial dispersion in the estimated coefficient of relationship length for both the dependent variables shows the impact of heterogeneity between firms and substantiates our argument that the individual firm characteristics play an important role in deciding the way firms are treated by their lenders as duration of relationship increases. The comparison of the graphs also show that dispersion in the coefficient of relationship length is wider for dependent variable risk premium that that for collateral, implying that discriminant treatment on the basis of relationship length is more pronounced for risk premium than for collateral.

Table 3.11

Comparison of Earlier Estimation Results with Random Coefficient Model for Risk Premium

Name of Variable	Results Table 3.4	Random Coefficient	Random Effects (Std. Deviation)
Loan Characteristics			
Maturity of Loan	0.020***	0.034***	
	(0.003)	(0.003)	
Collateral	0.111***	0.080***	
	(0.002)	(0.002)	
Ln (Principal)	0.007***	0.005***	
	(0.001)	(0.001)	
Relationship strength variables			
Relationship length (years)	-0.059***	-0.143***	0.897
	(0.005)	(0.006)	(0.004)
Number of loans	-0.001	0.004***	
	(0.001)	(0.001)	
Number of financing products	-0.057***	-0.020***	
	(0.004)	(0.004)	
Lender share in financing	0.038***	-0.003	
	(0.011)	(0.012)	
Non fund based facility	-0.032***	-0.050***	
	(0.010)	(0.010)	
Credit history of the borrower			
Ln (Overdues)	0.019***	0.010***	
	(0.001)	(0.001)	
Default	0.226***	0.112***	
	(0.008)	(0.009)	
Litigation	0.008	0.153***	
	(0.011)	(0.014)	
Write off	-0.784***	-0.183***	
	(0.022)	(0.025)	
Borrower characteristics			
Number of lending relationships	-0.022***	-0.017***	
	(0.002)	(0.002)	
Rating	-0.429***	-0.224***	
	(0.006)	(0.007)	
SME firm	0.585***	0.663***	
	(0.034)	(0.043)	
Listed firm	-0.113**	-0.395***	
	(0.050)	(0.061)	
Government firm	-0.515***	-0.334	
	(0.139)	(0.182)	

Type of Financial Institution

NBFI	2.333***	2.357***	
	(0.042)	(0.053)	
Foreign bank	0.128**	0.077	
	(0.054)	(0.070)	
Large bank	-0.525***	-0.483***	
	(0.034)	(0.043)	
Public sector financial institution	-0.425***	-0.411***	
	(0.038)	(0.049)	
Constant	4.697***	4.509***	4.819
	(0.099)	(0.133)	(0.019)
Year dummies	Included	Included	
Observations	1,661,097	1,661,097	
R-square/ Log likelihood	0.22	-3,235,032	
Wald chi2	367,794	289,650	
Degree of freedom	49	49	

LR test vs. linear regression

chi2(3) = 2.3e+06   Prob. > chi2 = 0.0000

Note: This Table presents comparison of results in Table 3.4 with results of random coefficient model

** significant at 5% level

*** significant at 1% level

Table 3.12
Comparison of Earlier Estimation Results with Random Coefficient Model for Collateral

Name of Variable	Results from Table 3.5	Random Coefficient	Random Effects (Std. Deviation)
Loan Characteristics			
Maturity of Loan	0.004***	0.002	
	(0.001)	(0.001)	
Risk Premium	0.019***	0.013***	
	(0.000)	(0.000)	
Ln (Principal)	-0.003***	-0.000	
	(0.000)	(0.000)	
Relationship strength variables			
Relationship length (years)	0.008***	0.011***	0.383
	(0.002)	(0.003)	(0.002)
Number of loans	0.004***	0.005***	
	(0.000)	(0.000)	
Number of financing products	0.032***	0.033***	
	(0.002)	(0.002)	
Lender share in financing	-0.226***	-0.260***	
	(0.005)	(0.005)	
Non fund based facility	-0.031***	-0.019***	
	(0.004)	(0.004)	
Credit history of the borrower			
Ln (Overdues)	0.001***	0.001***	
	(0.000)	(0.000)	
Default	0.053***	0.044***	
	(0.003)	(0.003)	
Litigation	-0.070***	0.033***	
	(0.005)	(0.005)	
Write off	-0.018**	-0.020**	
	(0.009)	(0.010)	
Borrower characteristics			
Number of lending relationships	-0.015***	-0.011***	
	(0.001)	(0.001)	
Rating	0.020***	-0.018***	
	(0.003)	(0.003)	
SME firm	0.472***	0.512***	
	(0.015)	(0.019)	
Listed firm	-0.014	-0.097***	
	(0.022)	(0.026)	
Government firm	-0.141**	-0.104	
	(0.063)	(0.081)	

Type of Financial Institution

NBFI	-0.901***	-0.964***	
	(0.019)	(0.024)	
Foreign bank	-0.129***	-0.202***	
	(0.025)	(0.031)	
Large bank	0.257***	0.282***	
	(0.015)	(0.019)	
Public sector financial institution	0.448***	0.375***	
	(0.017)	(0.022)	
Constant	1.117***	1.074***	1.476
	(0.045)	(0.057)	(0.006)
Year dummies	Included	Included	
Observations	1,661,097	1,661,097	
Log likelihood	-2,016,610	- 1,663,697	
Wald chi2	19,314	154,556	
Degree of freedom	49	49	

LR test vs. linear regression:

chi2(3) = 4.3e+05   Prob. > chi2 = 0.0000

Note: This Table presents comparison of results in Table 3.5 with results of random coefficient model
** significant at 5% level
*** significant at 1% level

We present the comparisons of our earlier results with the estimates of random coefficient model for risk premium and collateral in Tables 3.11 and 3.12. Likelihood ratio (LR) test statistics provided at the bottom of these tables compare the fitted model (random coefficient) with standard regression and reject the null hypothesis that random effect in the coefficient is zero. The comparison of results in Tables 3.11 and 3.12 shows that the sign and significance of *relationship length* both for collateral and risk premium remain the same albeit size of the coefficient becomes larger. Importantly, however, dispersion of the coefficient reflected by its standard deviation (0.383 versus 0.011 for collateral and 0.897 versus 0.143 for risk premium) substantiates our earlier evidence that the impact of *relationship length* across different firms varies very substantially. This shows that firm level characteristics play an important role in determining the impact of relationship length on collateral and credit pricing.

3.6 Conclusion

We examine the impact of relationship on the interest rate and collateral levels across various types of lenders and borrowers by using a unique dataset, which covers *each and every* commercial loan generated during April 2006 to December 2013 in Pakistan. On an aggregate basis, we find that increase in relationship length results in higher interest rates but lower collateral levels. However, further examination paints a far more complex picture. We observe that impact of relationship on interest rate and collateral varies substantially with type of lender and borrower as well as across different relationship dimensions. We find it particularly noteworthy that firm level heterogeneity has an important role in determining the impact of relationship length on collateral and credit pricing.

Different types of financial institutions respond differently towards different relationship dimensions perhaps because of their peculiar circumstances. For example, NBFIs are the only institutions that reduce both the collateral and interest rate as relationship length increases. NBFIs have smaller branch network and

outreach as compared to banks and this facilitation towards their customers may be an effort to retain their customer base.

Our results suggest that SMEs face a trade off in terms of effects of relationship length. Their relationship with certain types of financial institutions reduces interest rates on one hand, while it results in higher collateral on the other. Likewise financial institutions which reduce collateral as their relationship length with SMEs increases, actually also charge higher interest rates in this situation.

Listed companies generally pay lower interest rates and provide less collateral as their relationship length with various types of lenders increases. With respect to the impact of relationship length on risk premium and collateral, listed companies are better off than SMEs and even Government firms. Relatively less information asymmetry in case of listed firms may reduce the hold-up problem and enable them to bargain a better deal with their lenders.

The impact of relationship for Government firms is either insignificant or exploitative as it results in higher credit pricing and collateral in case of certain types of lenders. Importantly even the public sector financial institutions do not share informational advantage with Government firms. On the contrary, public sector financial institutions are the only type of lender that exploit Government firms by charging higher risk premium when these firms become dependent upon them for meeting their financing requirements. Government firms do not have any instance of write off in our dataset and further their obligations are implicitly guaranteed by Government. Given their better credit risk, these firms should have been able to demand better treatment from their lenders.

The results imply that firms have to carefully choose the type of financial institution with which they want to build a long term relationship. For a particular firm, the type of financial institution substantially influences the outcome that whether a relationship will be welfare enhancing or exploitative. In addition to relationship length, other relationship strength variables like *lender's share* and *non-fund based facility* also play a significant role in determining the terms of credit. The complex interplay of various variables demonstrates that development of an optimal

strategy by a firm to achieve favourable outcomes in terms of low interest rate and less collateral requirement is not an easy task.

Our findings strongly suggest that conflicting empirical findings on the subject of relationship lending are the result of dataset limited to certain types of borrowers or financial institutions. By using an economy wide exhaustive dataset that enables us to exploit variation across various types of financial institutions and firms, we show the key role of types of the lender and the borrower in determining the impact of relationship length on interest rates and collateral levels. In addition we contribute to the literature by examining the role of NBFIs, public sector financial institutions and Government owned firms in relationship lending that hitherto has not been evaluated. Lastly we add to the literature by examining a developing economy where a traditional financial intermediation model still dominates the financial market and relationship lending remains relevant owing to the opaque environment and weak institutional arrangements for contract enforcement.

CHAPTER 4

IT's NOT WHAT YOU KNOW. IT's WHO YOU KNOW. BANK CEOs AND RELATIONSHIP LENDING IN AN EMERGING ECONOMY

4.1   Introduction

Studies of relationship lending have focussed on the relationship between financial institutions and borrowers (Kysucky and Norden, 2015). Although Berger and Udell (2002) argue that the primary relationship in a bank-borrower association is that of loan officer and entrepreneur rather than that of bank and firm, the extant literature on the subject has so far largely ignored the role played by individuals' relationships in this association. Especially in emerging economies, due to institutional weaknesses, relationships between individuals may be as important as relationships between institutions. This paper bridges the gap in literature by examining the impact of relationship between a firm and CEO of its bank on terms of credit for the firm – specifically risk premium and collateral requirement. On average, we find that relationships of firms with CEOs of their banks result in lower risk premia (without any impact on collateral) while relationships with banks result in lower collateral requirements (without any impact on risk premia). Thus relationship of a firm with the CEO of its bank is welfare enhancing in terms of credit pricing while its relationship with its bank is welfare enhancing regarding collateral requirement. As we found in Chapter 3, our examination by type of bank suggests that the impact of the firm-CEO relationship varies from one type of bank to other. These findings confirm and extend the results in Chapter 3 that show that the impact of relationships varies by types of financial institutions and types of firms.

The defining feature of relationship lending is the capture of private soft information about a borrower that puts the relationship lender at a competitive advantage versus other arms-length creditors (Agarwal and Hauswald, 2010).[43] This information is collected through direct and repeated interactions between firm and bank officials. The utility of such soft information depends upon a specific bank

---

[43] Soft information refers to the knowledge that is difficult to transmit in numbers, for example, quality of management of a firm, a firm's relationship with its suppliers or customers, its reputation, etc.

official who collects and utilizes this information (Liberti and Mian, 2009). In fact, Uchida *et al*. (2012) find that loan officer turnover adversely affects the accumulation of soft information about the borrower. Smaller and medium size firms are generally expected to interact at the level of branch while large firms will be, directly or indirectly, dealt at a more senior level. Listed firms, such as those examined in this chapter, generally have larger asset base than unlisted firms.[44] These firms must be audited and make their audited financial statement publicly available. While credit decision making apparatus vary from bank to bank in Pakistan, our discussion with regulators and CEOs of some banks affirm our understanding that CEOs play an important role in credit decisions for large size borrowers such as listed firms. The longer the CEO of a bank knows a firm, the more private information he will have about this firm.[45] We, therefore, posit that length of relationship between a listed firm and a particular CEO of a bank is an important determinant of credit pricing and collateral requirements for the firm.

The second channel through which relationship of a firm with CEO of its lending bank can influence the terms of credit is the importance of personal relationships. These personal relationships may be beneficial both for the CEO of the bank and firm. The business networks in emerging economies have been found to be positively associated with greater credit availability and lower probability of financial distress (Khwaja *et al*., 2011). Empirical research has also found strong positive impact of a CEO network, especially his/her connections with CEOs of large firms, on their compensation (Engelberg *et al*., 2013). CEOs of banks may claim superior knowledge about the firms they personally know leading to better credit decisions and greater opportunities for their banks to generate business. The firms may expect preferential treatment from such banks due to their links with CEOs. Strong personal relationships are thus potentially beneficial both for CEOs of banks as well as firms. The evidence on the impact of private information channel is mixed as it can be either exploitative or welfare enhancing (Boot, 2000). Private

---

[44] Listing conditions on a stock exchange generally include a requirement for minimum asset size. Further, in our dataset, average loan size of listed firms is much larger than unlisted firms.
[45] This assumption that CEOs of banks personally know large borrowers of their banks is based on our discussion with bank regulators and a number of market participants. We cannot, however, affirm with certainty that each CEO has personal relationship with every large borrower of his/her bank.

information about the borrower delivers a competitive advantage to a relationship lender enabling it to make economic gains through better credit decisions. This competitive advantage can be shared with the borrower in the form of lower credit pricing and collateral and thus can be welfare enhancing for the borrower. However, lenders may also use store of this private information as a capturing tool and exploit the borrower through higher interest rates and collateral. The personal relationship channel between a firm and CEO of its bank should, however, result in better credit terms for firms owing to its utility both for the CEOs and firms.

We use a unique dataset of loans to examine the impact of relationship of a firm with the CEO of its bank on credit pricing and collateral requirement for the firm. Our dataset of loans has been sourced from Credit Information Bureau (CIB) of the State Bank of Pakistan (SBP).[46] It includes *each and every loan* obtained by a listed firm from banking system in Pakistan during the period of April 2006 to December 2013. In addition, we have obtained from the SBP data about the appointment dates of CEOs of all banks in Pakistan. This enables us to identify the length of relationship between a particular CEO and a certain firm in addition to other relationship variables used in literature. In Chapter 2 and Chapter 3, we could not include accounting data (balance sheet, income statement and cash flow information) in our estimations since majority of the firms are private. However, in this chapter, our examination is confined to listed firms for which annual accounting data is available from the SBP. Our estimations in this chapter, therefore, include accounting information of the firms as well.

Our results show the importance of relationship of a listed firm with the CEO of its bank. The relationship of a listed firm with CEO of its bank enables it to obtain loans at lower risk premium. The relationship with CEO, however, does not have any impact on the collateral requirement although collateral requirement declines as duration of relationship of a firm with its bank increases. We, however, observe that the impact of relationship with CEO differs across different types of banks. The relationship of a firm with CEOs of all types of banks is advantageous in terms of

---

[46] The State Bank of Pakistan (SBP) is central bank of Pakistan as well supervisory authority of its banking system.

lower credit pricing with the exception of CEOs at foreign banks and small banks.[47] The impact of *relationship with CEO* on *collateral* is insignificant except for CEOs at large banks and small banks. However, relationship with CEOs of large banks results in higher collateral requirements while relationship with CEOs of small banks is associated with lower collateral.

Our results in this Chapter confirm and extend our findings in Chapter 3 that type of institution has an important bearing on the impact of relationship lending. It is, however, important to note that both results are not directly comparable. In Chapter 3, we examine the impact of relationship lending across different types of financial institutions that include banks as well as Non-bank financial institutions (NBFIs). For example, Government financial institutions in Chapter 3 include Government banks as well as NBFIs owned and controlled by Government. However, in this chapter, we have confined our analysis to Government banks only since the information about appointment of CEOs of NBFIs is not available.

We contribute to the literature of relationship lending by presenting the first study on the impact of relationship of firms with CEOs of their banks. The study also provides important insights in the role of personal relationships in credit markets in an emerging economy. The findings of the study can be helpful to the banks, firms and supervisors of the financial sector especially in emerging markets to understand the role of personal relationships in credit markets.

4.2 The Data

Our final dataset is a combination of data from three sources. Our primary data pertaining to information about loans to listed firms has been obtained from credit information bureau (CIB) of the State Bank of Pakistan (SBP). The CIB obtains information from all financial institutions in Pakistan about their credit transactions on monthly basis. The dataset is thus exhaustive since *each and every loan* made by every financial institution in Pakistanis is covered by it. This is the same dataset that

---

[47] We divide banks in Government banks, private banks, domestic banks, foreign banks, large banks and small banks.

was used for analysis in Chapter 2 and Chapter 3. In this Chapter, however, we have included loans extended by banks only since information about CEO appointments is available for banks only while in Chapter 2 and Chapter 3, we used loans extended by all financial institutions in Pakistan (that is banks as well as non-bank financial institutions).

The information regarding appointment dates of CEOs of banks has been obtained from the SBP. The SBP approves the appointment of CEO of each bank and hence this information is available with the central bank. This information has been added to the loan level dataset, which also includes names of banks as well as their specific codes. The change in CEO of a bank is marked in the dataset as and when a new CEO is appointed. The information reported to the CIB contains all the relevant information about a credit transaction like loan limit, outstanding amount or amount withdrawn from this loan limit by the borrower, type and amount of collateral, overdue amount if any, status of the loan and so on. Since the information is submitted on regular periodical basis (at end of each month) to the CIB, we can track the status of each loan throughout its life. We supplement this loan dataset with yearly financial accounts data of the listed firms, which has also been obtained from State Bank of Pakistan.[48] The analysis in Chapter 2 and Chapter 3 could not take this information into account as it is not available for firms other than listed companies.[49] The share price information of listed firms has been obtained from Bloomberg.

The dataset covers the period from April 2006 to December 2013. We have selected April 2006 as starting point since the CIB started collecting information about interest rate and collateral – our dependent variables from this date. Our unit of analysis is bank-borrower-month, which allows us to track the relationship between a bank and a borrower over period of their relationship. After dropping observations with missing values, our final dataset contains 70,879 observations pertaining to 395 listed firms, 38 banks and 78 CEOs of banks.[50]

---

[48] We use data from yearly financial accounts of listed firms since these accounts are audited and are more reliable than quarterly financial statements.

[49] The dataset for analysis in Chapter 2 and Chapter 3 relates to about 41,000 firms, most of which are private and hence their accounting information is not available.

[50] The number of bank-borrower-month observations in our main dataset is about 3.6 million. Out of these observations, information on both collateral and interest rate is available for 1.6 million

Table 4.1 lists the research variables and their definitions and Table 4.2 contains the descriptive statistics for these variables.

The variable *relationship length with CEO* is primary variable of our interest and measures the duration for which a particular CEO and a firm have been related (that is the firm has been borrowing from the bank during the tenure of a particular CEO). We measure the duration of this relationship at the end of each month. Further the relationship continuous when CEO moves form one bank to another and the firm stars borrowing from the other bank. For example, a firm A started borrowing from a bank X in January 2011 (the loan is reported in our dataset on 31st January 2011) when a person M was CEO of the bank X. In June 2011, Mr. M resigned from the bank X and moved to bank Y. The length of relationship between firm A and Mr. X at this point in time is 5 months. In January 2012, the firm A obtains a loan from the bank Y. We measure the length of relationship between firm A and Mr. X in February 2012 as 6 months (i.e., 5 months previous relationship and 1 month existing relationship).

Relationship length has been widely used in literature to measure the strength of relationship (Kysucky and Norden, 2015). Our second key variable is *relationship length with bank* that measure the duration of bank-borrower relationship of a firm. As shown in Table 4.2, *relationship length with bank* is, on average, much longer than *relationship length with CEO*. This may imply that firms value their relationship with bank more than their relationship with its CEO. So even when a particular CEO leaves a bank, firms continue their relationship with their bank instead of ceasing the relationship and following the CEO to other bank. This argument is further supported by relatively higher *number of bank relationships* maintained by listed firms.[51]

---

observations. The number of observations related to loans from commercial banks to listed firms is 92,260. We lose 21,381 observations because of missing data.

[51] The average number of bank relationships maintained by listed firms is 6.57 as compared to 3.26 for all types of firms in the larger dataset supplied by the CIB.

Table 4.1
Variables and their Definitions

No.	Name of variable	Description
	Relationship with CEO	
1	Relationship length with CEO	Number of years a particular CEO and a firm have relationship
	Relationship with Bank	
2	Relationship length (years)	Number of years a bank and a firm have been in lending relationship
3	Number of loans	Number of loans obtained by a firm from a particular bank
4	Number of financing products	Number of types of financing products (like term loan, running finance, TFC, bonds, etc.) availed by a firm from a particular bank
5	Lender's share in financing	A particular bank's share in total financing of a borrower from the financial sector
6	Non-fund based facility	A dummy variable with a value of 1 if a bank has granted non-fund based facilities like letter of credit, bank guaranty, etc. to a firm in addition to loans.
	Dependent variables	
7	Collateral	The value of the total collateral divided by the loan limit sanctioned by a bank to a firm
8	Risk premium	Risk premium (interest rate less risk free rate) being charged by a bank on its loans to a particular borrower
	Loan characteristics	
9	Maturity	Maturity of loan extended to a firm by a bank
10	Principal	Principal outstanding amount of the loan payable by a firm on the date of the reporting to the CIB
	Credit history of borrower	
11	Overdues	Total overdue amount including principal, interest or any other amount owed by a firm to its bank and not paid by the due date
12	Default	A dummy variable with a value of 1 if the firm has defaulted on its loan to any of its banks, 0 otherwise
13	Litigation	A dummy variable with a value of 1 if a firm is in litigation regarding recovery of loan with its bank, 0 otherwise

Page 109

14	Write-off	A dummy variable with a value of 1 if the firm has availed any sort of write off from any of its lenders
	Type of bank	
15	Foreign bank	A dummy variable with a value of 1 if a bank is not incorporated in Pakistan, 0 otherwise
16	Large bank	A dummy variable with a value of 1 if a bank is large in terms of assets and branch network, 0 otherwise
17	Government bank	A dummy variable with a value of 1 if a bank is owned and controlled by Government, 0 otherwise
	Borrower characteristics	
18	Number of bank relationships	Number of banks with which a borrower has lending relationships
19	Rating	A dummy variable with a value of 1 if the firm is rated either externally or internally by its bank
20	Total assets	The total assets of the firm
21	Net profit margin	Net profit margin of the firm
22	Current ratio	Current ratio of the firm
23	Debt equity ratio	Debt equity ratio of the firm
24	Intangible assets	Intangible assets to total assets ratio
25	Share price to book	The ratio of share price to its book value
26	PPE	The ratio of property, plant and equipment to total assets

Note: This Table presents definitions of the variables used in analyses. The explanatory variables have been grouped into various categories: relationship with CEO, relationship with bank, borrower characteristics, credit history of the borrower and type of bank. In addition, the Table contains definitions of dependent variables.

Table 4.2
Descriptive Statistics for Variables Excluding Dummies

(Amounts are in Pakistan Rupees Millions)

Name of variable	Mean	St.Dev	Percentiles				
			p-10*	p-25*	p-50*	p-75*	p-90*
Relationship with CEO							
Relationship length	2.92	2.69	0.33	1.00	2.17	4.00	6.67
Relationship with Bank							
Relationship length	6.83	5.30	1.50	3.00	5.59	8.94	14.09
Number of loans	4.95	6.31	1.00	2.00	3.00	6.00	10.00
Number of financing products	2.98	1.86	1.00	1.00	3.00	4.00	6.00
Lender's share in financing	0.29	0.30	0.03	0.07	0.17	0.41	0.89
Dependent variables							
Collateral ratio	1.51	1.28	0.62	1.00	1.10	1.54	2.71
Interest rate	12.59	3.21	9.00	10.54	12.88	14.79	16.13
Loan characteristics							
Maturity	4.58	6.70	0.58	1.00	3.00	5.67	8.50
Principal	280	370	0.84	34.00	140	370	740
Credit history of the borrower							
Overdues	22.00	96.00	-	-	-	-	18.00
Borrower characteristics							
Number of banks	6.57	4.42	2.00	3.00	6.00	9.00	13.00
Total assets	15.00	31.00	0.74	1.70	4.50	14.00	34.00
Net profit margin	0.11	0.24	-0.13	-0.01	-0.03	0.08	0.13
Current ratio	1.37	1.28	0.47	0.74	0.97	1.24	1.79
Debt ratio equity	0.02	0.41	0.00	0.01	0.02	0.03	0.05
Intangible assets	0.01	0.03	-	-	-	0.00	0.00
Price to book ratio	1.34	5.77	0.14	0.26	0.56	1.22	2.22
PPE to assets	0.51	0.20	0.25	0.36	0.51	0.66	0.78

Note: This Table presents descriptive statistics for variables (excluding dummies) used in analysis.
* P_10, p_25, p_50, p_75 & p_90 are values at 10th, 25th, 50th, 75th and 90th percentiles respectively.

The manner in which both of our variables: *relationship length with CEO* and *relationship length with bank* are being measured, may give the impression of an overlap. However, number of CEOs in our dataset is more than double the number of banks. This reflects reasonable degree of turnover and provides assurance that both of our variables are estimating distinct dimensions.[52]

The literature has used number of loans, range of products and reliance on a particular lender as other measures of bank-borrower relationship (Kysucky and Norden, 2015). We have used *number of loans, number of financing products, lender's share in financing* and *non-fund based facility* as other measures of strength of bank-borrower relationship in Chapter 3. The results of our analysis in Chapter 3 show that these variables have significant impact on terms of credit. We have accordingly included these variables in our estimations in this Chapter as well.

We intend to estimate the impact of our relationship variables on *collateral* and risk premium. We scale collateral by sanctioned loan limit to neutralize the size of the loan.[53] We also subtract risk free rate from interest rate to obtain *risk premium* since it is a better measure of risk that a lender associates with a borrower.[54]

Loan characteristics and credit history of a borrower are important determinants of collateral and interest rate and we have, therefore, added them as explanatory variables. Type of a financial institution has been found to play an important role in the dynamics of bank-borrower relationships (Berger and Black, 2011; Kano *et al.*, 2011). We use three dummy variables to characterize the type of a bank. We treat a bank as a *foreign bank* if it is not incorporated in Pakistan. The

---

[52] The number of CEOs in our dataset is more than double the number of banks. The number of observations where relationship length with CEO is equal to relationship length with bank is only 191 out of the sample size of 70,879 observations. Further the correlation between relationship length with CEO and relationship length with bank is 0.39, which we feel is not problematic. We also control for relationship length with bank while estimating the impact of relationship length with CEO in a multivariate regression setting. Moreover, the regression coefficient values of both the variables, relationship length with CEO and relationship length with bank, range from -0.145 to 0.237 and -0.239 to 0.122 respectively as shown in Tables 4.3, 4.4, 4.5 and 4.6. In case of an issue of collinearity, the coefficient values would have shown an abnormal behaviour.

[53] The greater size of a loan would essentially require higher level of collateral.

[54] We use rate of return on Government 3 months treasury bills as risk free rate, which was obtained from the SBP website

banks owned and controlled by Government are treated as *Government banks*.[55] There are five large banks in Pakistan in terms of assets and branch network and these have been identified as *large banks* in our estimations (we accordingly term the other banks as small banks). In terms of the range of financial institutions, there is an important difference between our analysis in Chapter 3 and this Chapter. The analysis in Chapter 3 uses data related to all types of financial institutions - banks as well as NBFIs. Thus domestic financial institutions include domestic banks as well as domestic NBFIs. However, in this chapter, our data set is restricted to banks only because of lack of CEO appointment information about NBFIs.

The number of banking relationships is an important determinant of credit supply (Detragiache *et al.*, 2000) and especially firms in economies with weak judicial system and creditors rights regime have been found to have more bank relationships (Ongena and Smith, 2000). In addition to *number of bank relationships*, we include *rating* and a number of variables representing financial position of the borrower as control variables in our models.

4.3 Estimation Methodology

As discussed in section 4.2, we use a subsample (related to loans from banks to listed firms only) of the dataset used in Chapter 3. Further we examine the impact of relationship length (with banks as well as CEOs of banks) on collateral and risk premium as we did in Chapter 3. Given the similarities in data, we use the same estimation methodology, which we adopted in Chapter 3. For estimating *risk premium*, we use the following multivariate GLS regression panel model with random effects (Greene, 2000):

$$Y^*_{it} = \alpha + X_{it}\,\beta + \varepsilon_{it} + v_i$$

---

[55] There are a number of banks where Government has a shareholding but these banks are controlled (through their board of directors) and managed by private sector. We have included only those banks as Government banks in which Government has both the majority shareholding and has the power to appoint at least 51% directors on their boards.

X is our vector of independent variables while ε_{it} is observation specific error term and v_i is unit specific error term. We use the following Tobit panel model that employs maximum likelihood approach for estimating collateral:

$$Y^*_{it} = X_{it}\,\beta + \varepsilon_{it} + \mu_i$$

Y^* is a latent variable, observable for values greater than zero and censored otherwise. X, as in previous model, is a vector of independent variables. μ_i is the unit specific error term. Unit specific error term differs between units but for a specific unit like a particular firm in our case, its value is constant. ε_{it} is the observations specific error term.

We use the same approach adopted in Chapter 3 (described at page 62 in detail) to deal with the potential issue of endogeneity.[56]For each dependent variable, take risk premium, we run the model without including the other three variables with which we have, a priori, the potential issue of endogeneity: principal, risk premium and maturity. We then introduce these variables one by one in the next estimations. As we show in section 4.4, our results remain the same across those variations providing evidence that the results we present in this Chapter are robust to considerations of endogeneity.

We start our estimations, using whole of our dataset, to assess the impact of our relationship variables on collateral and risk premium. In the next stage, however, we split our dataset by type of banks to examine how a certain type of bank affects this relationship. We split the dataset using six different types of banks – Government banks, private banks, foreign banks, domestic banks, large banks and small banks. These categories, however, are not mutually exclusive. For example, domestic banks include Government banks and likewise private banks include foreign banks. The objective of this exercise is to understand the impact of a particular type of bank on relationship under examination since our results in Chapter

---

[56] It can be argued that *collateral, risk premium* (our dependent variables), loan amount (*principal*) and *maturity* are agreed upon between lenders and borrowers simultaneously.

3 show that type of financial institutions substantially impacts the direction and size of the impact of relationship on collateral and risk premium.

4.4   Results

We first discuss the impact of relationships with CEO and banks on risk premium and credit pricing for listed firms. We then follow up this discussion with the impact that type of bank has on these results.

4.4.1 The Impact of relationship with CEO and bank on credit pricing

The results of our first set of estimations relating to impact of relationship length and other variables on risk premium of a listed firm are presented in Table 4.3.

The sign and size of the coefficients of all the variables remain almost the same across all the four estimations as we gradually introduce potentially endogenous variables. The consistency in results provides reasonable assurance of the robustness of the estimates. In case, if endogeneity was present, it would have led to specification bias and different coefficient estimates.

The results show that *relationship length with CEO* is significantly and negatively associated with risk premium whereas *relationship length with bank* is insignificant. This shows that relationship with CEO is welfare enhancing whereas relationship with bank does not have any impact on risk premium. The risk premia on loans to firms decreases by 4 basis point with each year of its relationship with CEO of its bank. This suggests that for a listed firm, it is better to cultivate relationship with a particular CEO instead of maintaining relationship with a particular bank if its wants to reduce its credit pricing.

Table 4.3
Impact of Relationship Length and other variables on Risk Premium

Name of variable	(1)	(2)	(3)	(4)
Collateral				0.046***
				(0.009)
Loan characteristics				
Maturity			-0.367***	-0.380***
			(0.106)	(0.106)
Principal		-0.029***	-0.029***	-0.029***
		(0.003)	(0.003)	(0.003)
Relationship with CEO				
Relationship length with CEO	-0.040***	-0.040***	-0.040***	-0.040***
	(0.004)	(0.004)	(0.004)	(0.004)
Relationship with bank				
Relationship length with bank	0.001	-0.013	-0.009	-0.007
	(0.026)	(0.026)	(0.026)	(0.026)
Number of loans	0.013***	0.014***	0.013***	0.013***
	(0.002)	(0.002)	(0.002)	(0.002)
Number of financing products	-0.014	-0.004	-0.001	-0.002
	(0.010)	(0.010)	(0.010)	(0.010)
Lender's share in financing	-0.099	-0.081	-0.075	-0.039
	(0.058)	(0.058)	(0.058)	(0.058)
Non-fund based facility	-0.035	-0.044	-0.049	-0.047
	(0.032)	(0.032)	(0.032)	(0.032)
Credit history of the borrower				
Overdues	0.048***	0.049***	0.049***	0.049***
	(0.003)	(0.003)	(0.003)	(0.003)
Default	0.056	0.052	0.050	0.047
	(0.040)	(0.040)	(0.040)	(0.040)
Litigation	0.786***	0.794***	0.792***	0.784***
	(0.059)	(0.059)	(0.059)	(0.059)
Write-off	-0.201**	-0.215**	-0.215**	-0.220**
	(0.095)	(0.095)	(0.095)	(0.095)
Type of bank				
Foreign bank	-0.149	-0.357	-0.464	-0.463
	(0.582)	(0.589)	(0.592)	(0.592)
Large bank	-1.028**	-1.022**	-1.076**	-1.074**
	(0.453)	(0.452)	(0.453)	(0.453)
Government bank	1.819	1.821	1.786	1.788
	(1.174)	(1.172)	(1.172)	(1.177)
Borrower characteristics				
Number of bank relationships	-0.005	-0.003	-0.003	-0.002
	(0.004)	(0.004)	(0.004)	(0.004)
Rating	-0.580***	-0.580***	-0.587***	-0.585***
	(0.039)	(0.039)	(0.039)	(0.039)

Total assets	0.290***	0.295***	0.296***	0.297***
	(0.037)	(0.037)	(0.037)	(0.037)
Net profit margin	-0.052	-0.054	-0.056**	-0.054
	(0.028)	(0.028)	(0.028)	(0.028)
Current ratio	0.016	0.012	0.012	0.013
	(0.013)	(0.013)	(0.013)	(0.013)
Debt equity ratio	-0.077	-0.075	-0.075	-0.074
	(0.060)	(0.060)	(0.060)	(0.060)
Intangible assets	2.334***	2.181***	2.186***	2.205***
	(0.816)	(0.815)	(0.815)	(0.815)
Share price to book	-0.006**	-0.006**	-0.006**	-0.006**
	(0.003)	(0.003)	(0.003)	(0.003)
Property, plant and equipment	-0.094	-0.080	-0.084	-0.085
	(0.108)	(0.108)	(0.108)	(0.108)
Constant	6.156***	6.228***	6.403***	6.404***
	(0.911)	(0.910)	(0.915)	(0.924)
Year dummies	Included	Included	Included	Included
Bank dummies	Included	Included	Included	Included
Observations	70,879	70,879	70,879	70,879
R square	0.21	0.21	0.21	0.21

Note: This Table provides results of estimations for risk premium with relationship length variables and other control variables. Equation 1 is basic model and then variables with potential endogeneity problem 'principal', 'collateral' and 'maturity' are introduced one by one in the subsequent equations.
Standard errors in parentheses
** significant at 5% level
*** significant at 1% level

The only other significant relationship variable is *number of loans*. It is significant with coefficient of 0.013. Thus as a firm increases its number of loans from a particular bank, the bank starts charging higher risk premium. The *number of bank relationships* does not have any effect on risk premium.

The coefficients related to the variables under the category of credit history of the borrower show that both the overdues and litigation results in higher risk premium on loans of a firm. The coefficient of *write-off* (-0.220), however, seem counter intuitive since it shows that borrowers availing themselves of write-off are charged lower risk premium by banks. It may, however, also indicate the presence of a supporting stance by banks towards their distressed borrowers.

In terms of type of banks, borrowers obtaining loans from large banks are charged lower risk premia. Borrowers, which are rated and have higher price to book ratio are able to obtain loans at lower rates. Borrowers with a higher proportion of intangible assets in their balance sheet have to pay higher risk premium. This result may relate to the issues of valuation of intangible assets with potential adverse impact on financial position of such firms. The borrowers with greater total assets are also charged higher risk premia. While this result may seem counter intuitive, it makes sense in the light of our results in Chapter 2, which shows that large borrowers take more time in default resolution.

4.4.2   The Impact of relationship with CEO and bank on collateral

Table 4.4 contains results of estimations examining the impact of relationship length and other variables on collateral.

As in Table 4.3, the size and sign of all the coefficients remain largely the same across all four estimations, supporting the robustness of the results. While the *relationship length with CEO* is insignificant, the *relationship length with bank* is significant with negative coefficient (-0.040). Thus a longer relationship with a bank helps in reducing the collateral requirements for listed firms. The *number of loans* and *number of financing products are both significant and positive*. This shows that as a firm increases the number of loans and acquires different types of financing products, its collateral requirements increase. The banks, however, require less collateral if they are the dominant financier of a firm. This might be expected given that these firms maintain multiple banking relationships (the average number of bank relationships in our dataset is 6.57), which shows that banks compete for business from listed firms. The variable *number of banks* itself is also significant and negative, which shows that firms with higher number of bank relationships post lower collateral.

Table 4.4:
Impact of Relationship Length and other variables on Collateral

Name of variable	(1)	(2)	(3)	(4)
Risk premium				0.009***
				(0.002)
Loan characteristics				
Maturity			0.300***	0.303***
			(0.046)	(0.046)
Principal		0.001	0.001	0.001
		(0.001)	(0.001)	(0.001)
Relationship with CEO				
Relationship length with CEO	-0.001	-0.001	-0.001	-0.001
	(0.002)	(0.002)	(0.002)	(0.002)
Relationship with bank				
Relationship length with bank	-0.036***	-0.036***	-0.040***	-0.040***
	(0.011)	(0.011)	(0.011)	(0.011)
Number of loans	0.011***	0.011***	0.011***	0.011***
	(0.001)	(0.001)	(0.001)	(0.001)
Number of financing products	0.033***	0.033***	0.030***	0.030***
	(0.004)	(0.004)	(0.005)	(0.005)
Lender's share in financing	-0.784***	-0.784***	-0.788***	-0.788***
	(0.025)	(0.025)	(0.025)	(0.025)
Non-fund based facility	-0.053***	-0.053***	-0.048***	-0.048***
	(0.014)	(0.014)	(0.014)	(0.014)
Credit history of the borrower				
Overdues	0.002	0.002	0.002	0.002
	(0.001)	(0.001)	(0.001)	(0.001)
Default	0.082***	0.082***	0.083***	0.083***
	(0.017)	(0.017)	(0.017)	(0.017)
Litigation	0.173***	0.173***	0.174***	0.168***
	(0.025)	(0.025)	(0.025)	(0.025)
Write-off	0.100**	0.100**	0.100**	0.102**
	(0.041)	(0.041)	(0.041)	(0.041)
Type of bank				
Foreign bank	-0.327	-0.260	-0.351	-0.352
	(0.234)	(0.237)	(0.238)	(0.238)
Large bank	0.277	0.276	0.230	0.230
	(0.182)	(0.182)	(0.181)	(0.182)
Government bank	1.883***	1.883***	1.852***	1.851***
	(0.474)	(0.474)	(0.473)	(0.473)
Borrower characteristics				
Number of bank relationships	-0.012***	-0.012***	-0.012***	-0.012***
	(0.002)	(0.002)	(0.002)	(0.002)
Rating	-0.061***	-0.061***	-0.055***	-0.050***
	(0.017)	(0.017)	(0.017)	(0.017)

Total assets	-0.035**	-0.035**	-0.036**	-0.039**
	(0.016)	(0.016)	(0.016)	(0.016)
Net profit margin	-0.037***	-0.037***	-0.035***	-0.035***
	(0.012)	(0.012)	(0.012)	(0.012)
Current ratio	-0.022***	-0.022***	-0.022***	-0.023***
	(0.006)	(0.006)	(0.006)	(0.006)
Debt equity ratio	-0.029	-0.030	-0.029	-0.028
	(0.026)	(0.026)	(0.026)	(0.026)
Intangible assets	-0.336	-0.337	-0.344	-0.362
	(0.353)	(0.353)	(0.353)	(0.353)
Share price to book	0.002**	0.002**	0.003**	0.003**
	(0.001)	(0.001)	(0.001)	(0.001)
Property, plant and equipment	0.005	0.005	0.009	0.009
	(0.047)	(0.047)	(0.047)	(0.047)
Constant	2.063***	2.040***	2.193***	2.201***
	(0.366)	(0.366)	(0.367)	(0.372)
Year dummies	Included	Included	Included	Included
Bank dummies	Included	Included	Included	Included
Observations	70,879	70,879	70,879	70,879
Log likelihood	-91,193	-91,191	-91,162	-91,149

Note: This Table provides results of estimations for risk premium with relationship length variables and other control variables. Equation 1 is basic model and then variables with potential endogeneity problem 'principal', 'collateral' and 'maturity' are introduced one by one in the subsequent equations. Standard errors in parentheses
** significant at 5% level
*** significant at 1% level

Banks reduce collateral requirements if firms obtain non-fund based facilities (letters of credit, guarantees and so on) from them. Non-funding business generates fee based income and is important for banks from the perspective of diversification of sources of revenue. Since a diversified revenue base helps in obtaining a better credit rating, this incentive may be the reason for this accommodative stance by the banks. In terms of type of banks, only variable that is significant is *Government bank*. Government banks require greater collateral as compared to their private counterparts. Government banks generally lag behind private banks in adopting sophisticated risk management systems. This, in turn, may increase their reliance on collateral for mitigating credit risk. The firms with rating, larger assets base, higher profitability and better current ratio are able to obtain loans with lower collateral requirements.

4.4.3 Role of type of banks in the interplay between relationship variables and terms of credit

Our results in Chapter 3 suggest that type of financial institutions play an important role in determining the impact of bank-borrower relationship on collateral and risk premium. Accordingly, in order to examine the impact of type of bank on interrelationship between relationship variables and terms of credit, we split our dataset by different types of banks. We present the results of estimations for risk premium and collateral using sub-samples split on the basis of types of bank in Tables 4.5 and 4.6.

Table 4.5
Estimations with different types of banks – Risk Premium as dependent variable

| Name of variable | Type of bank | | | | | |
| | Govt. | Private | Domestic | Foreign | Large | S&M [@] |
	(1)	(2)	(3)	(4)	(5)	(6)
Collateral	-0.003	0.056***	0.050***	0.078***	0.029	0.059***
	(0.022)	(0.010)	(0.010)	(0.022)	(0.017)	(0.010)
Loan characteristics						
Maturity	-0.898***	-0.332***	0.208	-4.586***	0.377	-0.372***
	(0.328)	(0.112)	(0.110)	(0.391)	(0.201)	(0.122)
Principal	-0.004	-0.032***	-0.021***	-0.044***	-0.030***	-0.026***
	(0.008)	(0.003)	(0.003)	(0.005)	(0.005)	(0.003)
Relationship with CEO						
Relationship length with CEO	-0.145***	-0.026***	-0.053***	0.237***	-0.126***	0.018***
	(0.011)	(0.004)	(0.004)	(0.018)	(0.007)	(0.005)
Relationship with bank						
Relationship length with bank	0.077	-0.001	0.061**	-0.175***	-0.239***	0.122***
	(0.063)	(0.029)	(0.029)	(0.061)	(0.050)	(0.030)
Number of loans	0.039***	0.012***	0.012***	-0.004	0.009***	0.023***
	(0.010)	(0.002)	(0.002)	(0.031)	(0.003)	(0.003)
Number of financing products	-0.008	0.000	0.005	-0.115***	0.003	-0.034***
	(0.030)	(0.011)	(0.011)	(0.044)	(0.018)	(0.013)
Lender's share in financing	-0.668***	0.032	0.052	-0.404***	0.035	-0.038
	(0.133)	(0.064)	(0.063)	(0.153)	(0.093)	(0.075)
Non-fund based facility	-0.001	-0.074**	-0.116***	0.072	-0.256***	0.021
	(0.075)	(0.035)	(0.035)	(0.087)	(0.061)	(0.037)
Credit history of the borrower						
Overdues	0.032***	0.059***	0.047***	0.041***	0.078***	0.030***
	(0.006)	(0.004)	(0.003)	(0.012)	(0.006)	(0.004)

Default	-0.169	0.088**	0.036	0.131	0.170**	-0.058
	(0.099)	(0.044)	(0.044)	(0.096)	(0.071)	(0.048)
Litigation	1.112***	0.682***	0.839***	-0.310	1.168***	0.575***
	(0.118)	(0.066)	(0.061)	(0.203)	(0.110)	(0.068)
Write-off	-1.220***	0.363***	-0.297***	9.985***	-1.274***	0.334***
	(0.146)	(0.119)	(0.096)	(1.505)	(0.158)	(0.119)
Borrower characteristics						
Number of bank relationships	0.024**	-0.008	0.005	-0.044***	-0.000	-0.002
	(0.010)	(0.005)	(0.005)	(0.012)	(0.007)	(0.005)
Rating	-0.074	-0.769***	-1.073***	0.240**	-1.064***	-0.103**
	(0.088)	(0.043)	(0.045)	(0.118)	(0.064)	(0.049)
Total assets	0.112	0.349***	0.386***	-0.212**	0.251***	0.291***
	(0.088)	(0.040)	(0.040)	(0.088)	(0.069)	(0.042)
Net profit margin	-0.080	-0.050	-0.084***	0.111	-0.118**	-0.008
	(0.088)	(0.030)	(0.031)	(0.060)	(0.047)	(0.034)
Current ratio	0.074	0.010	0.010	-0.048	0.000	0.016
	(0.049)	(0.014)	(0.014)	(0.046)	(0.031)	(0.014)
Debt equity ratio	0.205	-0.131**	-0.108	0.106	-0.120	-0.156**
	(0.140)	(0.066)	(0.069)	(0.120)	(0.095)	(0.079)
Intangible assets	10.781***	1.662	1.168	8.982***	-3.434	3.852***
	(3.054)	(0.853)	(0.908)	(1.790)	(1.916)	(0.871)
Share price to book	-0.010	-0.006	-0.009**	-0.012***	-0.010	-0.005
	(0.007)	(0.003)	(0.004)	(0.004)	(0.006)	(0.003)
Property, plant and equipment	-1.170***	0.043	-0.327***	0.717***	-0.222	-0.010
	(0.276)	(0.117)	(0.117)	(0.268)	(0.197)	(0.126)
Constant	7.790***	5.953***	7.610***	4.620**	-0.510	9.505***
	(2.370)	(1.711)	(1.421)	(1.950)	(1.675)	(1.437)
Year dummies	Included	Included	Included	Included	Included	Included
Bank dummies	Included	Included	Included	Included	Included	Included
Observations	8,575	62,304	58,507	12,372	23,463	47,416
R square	0.18	0.22	0.21	0.20	0.22	0.24

Note: This Table provides results for risk premium estimated on sub-samples split by type of bank.
Standard errors in parentheses
** significant at 5% level
*** significant at 1% level
@ Small and medium banks, which are termed small banks in the body of the Chapter

Table 4.6

Estimations with different types of banks – Collateral as dependent variable

	Type of bank					
	Govt.	**Private**	**Domestic**	**Foreign**	**Large**	**S&M** [@]
Name of variable	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Risk premium	-0.001	0.010***	0.010***	0.014***	0.005	0.013***
	(0.006)	(0.002)	(0.002)	(0.004)	(0.003)	(0.002)
Loan characteristics						
Maturity	0.680***	0.234***	0.146***	1.263***	0.153	0.350***
	(0.165)	(0.048)	(0.048)	(0.166)	(0.080)	(0.056)
Principal	-0.014***	0.002	-0.001	0.002	0.003	-0.001
	(0.004)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)
Relationship with CEO						
Relationship length with CEO	0.004	-0.002	0.001	-0.014	0.012***	-0.011***
	(0.006)	(0.002)	(0.002)	(0.008)	(0.003)	(0.002)
Relationship with bank						
Relationship length with bank	-0.118***	-0.032***	-0.047***	-0.058**	-0.084***	-0.021
	(0.032)	(0.012)	(0.013)	(0.026)	(0.020)	(0.014)
Number of loans	0.047***	0.009***	0.011***	-0.007	0.010***	0.011***
	(0.005)	(0.001)	(0.001)	(0.013)	(0.001)	(0.001)
Number of financing products	0.071***	0.024***	0.052***	-0.092***	0.062***	0.012**
	(0.015)	(0.005)	(0.005)	(0.019)	(0.007)	(0.006)
Lender's share in financing	-0.485***	-0.837***	-0.803***	-0.745***	-0.664***	-0.903***
	(0.067)	(0.027)	(0.027)	(0.064)	(0.037)	(0.034)
Non-fund based facility	-0.215***	-0.030**	-0.057***	0.136***	-0.038	-0.045***
	(0.038)	(0.015)	(0.015)	(0.037)	(0.024)	(0.017)
Credit history of the borrower						
Overdues	-0.014***	0.006***	0.002	0.005	0.004	-0.000
	(0.003)	(0.002)	(0.002)	(0.005)	(0.002)	(0.002)
Default	0.320***	0.047**	0.048**	0.214***	0.117***	0.069***
	(0.050)	(0.019)	(0.019)	(0.040)	(0.028)	(0.022)
Litigation	0.296***	0.146***	0.164***	0.213**	0.166***	0.185***
	(0.060)	(0.028)	(0.027)	(0.086)	(0.044)	(0.031)
Write-off	0.208***	0.079	0.111***	-0.700	0.194***	0.070
	(0.074)	(0.051)	(0.042)	(0.634)	(0.063)	(0.055)
Borrower characteristics						
Number of bank relationships	-0.029***	-0.010***	-0.022***	0.038***	-0.022***	-0.003
	(0.005)	(0.002)	(0.002)	(0.005)	(0.003)	(0.003)
Rating	-0.177***	-0.030	0.013	0.109**	-0.040	-0.086***
	(0.044)	(0.018)	(0.020)	(0.050)	(0.025)	(0.023)
Total assets	0.219***	-0.082***	-0.049***	0.027	-0.078***	-0.017
	(0.045)	(0.017)	(0.018)	(0.037)	(0.027)	(0.020)

Net profit margin	-0.122***	-0.031**	-0.053***	0.066***	-0.009	-0.058***
	(0.045)	(0.013)	(0.014)	(0.025)	(0.019)	(0.016)
Current ratio	0.206***	-0.034***	-0.012**	-0.088***	-0.025**	-0.025***
	(0.024)	(0.006)	(0.006)	(0.020)	(0.012)	(0.006)
Debt equity ratio	0.153**	-0.066**	0.001	-0.124**	-0.080**	0.008
	(0.070)	(0.028)	(0.030)	(0.050)	(0.038)	(0.036)
Intangible assets	-6.245***	-0.246	0.056	-1.306	0.353	-0.634
	(1.540)	(0.362)	(0.396)	(0.756)	(0.764)	(0.401)
Share price to book	0.000	0.003**	0.000	0.006***	0.004	0.002
	(0.004)	(0.001)	(0.002)	(0.002)	(0.002)	(0.001)
Property, plant and equipment	0.100	0.013	0.068	-0.208	-0.147	0.084
	(0.139)	(0.050)	(0.051)	(0.113)	(0.079)	(0.058)
Constant	2.921**	1.804	4.165***	0.957***	1.479***	3.593***
	(1.411)	(1.100)	(0.590)	(0.343)	(0.435)	(0.582)
Year dummies	Included	Included	Included	Included	Included	Included
Bank dummies	Included	Included	Included	Included	Included	Included
Observations	8,575	62,304	58,507	12,372	23,463	47,416
Log likelihood	-10,774	-80,012	-75,660	-15,074	-29,962	-60,998

Note: This Table provides results for risk premium estimated on sub-samples split by type of bank.
Standard errors in parentheses
** significant at 5% level
*** significant at 1% level
@ Small and medium banks, which are termed small banks in the body of the Chapter

The comparison of results across estimations in Table 4.5 alludes to important insights regarding the role of type of bank plays in the subject matter under consideration. Firstly, the sign of the coefficient of *relationship length with CEO* changes as the type of bank changes. The results show that relationship with a CEO of a domestic bank or of a large bank results in lower risk premium. In contrast, relationship with CEOs of foreign bank or small banks results in a higher risk premium.

Importantly the sign of the *relationship length with bank* is opposite to that of the *relationship length with CEO* for domestic as well as foreign banks. Thus, while relationships of borrowers with CEOs of domestic banks are welfare enhancing, the relationships with a domestic banks, when we do not consider any relationship with the CEO, are exploitative. Conversely, relationships with CEOs of foreign bank are

exploitative but the relationship with foreign banks are welfare enhancing. The relationships with large banks and CEOs of large banks are both welfare enhancing whereas relationships with small banks and CEOs of such banks are both exploitative.

The impact of *relationship with CEO* on the collateral required was insignificant when we examined it using whole of our dataset in Table 4.4 (discussed in section 4.4.2). As we split our dataset across different types of banks in Table 4.6, the relationship remains insignificant for four types of banks – Government, private, domestic and foreign banks. The relationship, however, becomes significant, and the coefficient of *relationship length with CEO* is positive for large banks and significant and negative for small banks. This shows that relationship with CEOs at large banks is exploitative (that is, it results in higher collateral requirements) whereas relationships with CEOs at small banks is welfare enhancing for firms (results in lower collateral requirements). The relationship length with banks, however, are associated with lower collateral requirements across all types of banks with the exception of small banks.

4.5 Conclusion

We offer first study on the impact of relationship between a firm and CEO of its bank on credit pricing and collateral requirements. We find that, on average, relationships with CEOs of banks result in lower risk premia for listed firms whereas relationships of firms with banks result in lesser collateral requirements. The relationship length with banks does not impact credit pricing whereas relationship with CEOs of banks does not influence collateral. We also find that the effects of relationship length with banks as well as CEOs of banks vary across different types of banks. Our findings in this Chapter regarding impact of bank-borrower relationship on risk premia and collateral are identical to our results in Chapter 3 and provide further evidence of robustness of our results.

The findings of extant literature on relationship lending support both the arguments for exploitative relationship and welfare enhancing relationship (Boot, 2000; Elyasiani and Goldberg, 2004). While we find that all types of banks, except small banks, lower collateral requirements as length of their relationship with a firm increases, the impact on risk premium varies. Foreign banks and large banks reduce risk premium as relationship length increases while domestic banks and small banks charge higher risk premium.

One area of further research on this topic could be to examine the impact of relationship with bank and its CEO by splitting dataset into different subsamples based on length of relationship with bank versus length of relationship with the CEO of the bank. The results would be helpful in understanding the interplay between these two relationships.

The findings in this Chapter provide evidence of the importance of personal relationships in credit markets in emerging economies. Personal relationships have been found to influence a broad range of decisions - from corporate policies of a firm (Fracassi, 2016) to merger and acquisitions (Cai and Sevilir, 2012) and higher CEOs compensation (Hwang and Kim, 2009). We present the first study on the impact of relationship between a firm and CEO of its bank across different types of banks. In addition to being the first study on firm-CEOs of banks relationship, we add to the literature of personal relationships especially in the context of a developing economy. The findings of the study are important for firms, banks and policy makers.

CHAPTER 5

CONCLUSION

5.1 Summary of Major Findings

This dissertation contains three papers that examine important issues, both from an academic and a professional perspective, using a unique dataset from Pakistan. The comprehensiveness of the dataset allows us to examine these issues from a completely different perspective than previous literature.

The first paper in Chapter 2 examines loan default resolution and access to fresh credit by firms after exiting default with particular emphasis on the role of collateral and interest rate in these two events. The study finds that collateral expedites both the default resolution and access to fresh credit. Higher interest rates impede the default resolution process. Small firms resolve default quickly but take more time in accessing fresh credit after exiting default. The firms that default with more than one lender or have relationships with a greater number of branches of the same lender, face difficulty in resolving default. The main bank, largest lender to a firm, is helpful both in default resolution and access to fresh credit.

The second paper in Chapter 3 analyses the impact of lender-borrower relationship on risk premium and collateral requirements. The study finds that the types of lender and borrower have important roles in determining the impact of lender-borrower relationship on terms of credit. The results suggest that tension in empirical findings on this subject is possibly due to data limitations – previous studies used datasets that were limited to either certain type of financial institutions or certain types of firms. However, one limitation of the current study is a lack of firm accounting data. Most of the firms in the dataset are private for which accounting information is not available.

Third paper in Chapter 4 extends the examination carried out in Chapter 3 by looking into the role of relationship of a firm with CEO of its bank and its impact on risk premium and collateral requirements. The dataset in this study consists of listed firms for which we have accounting information. The results regarding the role of

length of bank-borrower relationship on risk premium and collateral requirement remain the same as in Chapter 3, providing evidence of the robustness of these findings. An important role of the CEO relationship on risk premium was also found. The impact of relationship of a firm with the CEO of its bank, however, varies by type of bank. We have six types of banks in the dataset – Government banks, private banks, domestic banks, foreign banks, large banks and small banks. The length of relationship of a firm with the CEO of its bank reduces risk premium across all types of banks with the exception of foreign banks and small banks. The longer relationships with CEO of small banks, however, reduce collateral requirements for a firm.

5.2 Policy Implication and Directions for Future Research

The findings of this dissertation are extremely useful for banks, firms and bank regulators alike. An efficient default resolution mechanism is beneficial both for financial institutions as well as for firms. The findings in Chapter 2 can assist banks in formulating appropriate policies to achieve this end. For example, higher interest rates hamper the default resolution process, so that banks may therefore, consider easing debt servicing burden for firms that are in trouble. Write-offs reduce the duration of default for a firm but are detrimental in accessing fresh credit after firm exits default. Firms should therefore, take into consideration problems that they may face in raising future debts while requesting their banks for write-offs.

The results in Chapter 2 suggest that default with more than one lender stretches the period firms remain in default. This may be the result of coordination problems between lenders. Previous studies have also found that coordination problems between lenders delay default resolution process. Bank regulators may therefore, consider putting in place a regulatory framework that facilitates this coordination especially during periods of economic stress. The results also suggest that small firms face difficulty in accessing fresh credit after exiting default. Lack of credit can result in the demise of such firms or at a minimum can seriously repress their growth prospects. This is extremely important as small firms are a beacon for

growth, especially in emerging economies. Therefore, financial sector supervisors or economic policy makers could consider facilitating small firms that emerge from default in accessing fresh credit. The regulatory frameworks for financial institutions should also take into cognizance the role of bank-borrower relationships and the importance of personal relationships in determining the outcomes of financial transactions.

The results in Chapter 3 emphasize the importance of the type of firm and financial institution in a bank-borrower relationship. The results help in distinguishing the lending relationships which are beneficial to firms, from the ones which are exploitative. The results suggest that a firm should carefully select the type of financial institution while cultivating relationships in order to get optimal benefit. The results in Chapter 4 explain the role of personal relationships of a firm with CEO of its bank. These results suggest that personal relationships are as important as institutional relationships in a developing country. The findings of these Chapters are informative and useful for banks, firms and policy makers in emerging economies.

The findings of the thesis help us in understanding the dynamics of loan default resolution and access to fresh credit in emerging economies. More research is needed to understand how the institutional weaknesses (weak creditors regime, inefficient judicial system and so on) in emerging economies play out in these dynamics. The results of the thesis provide a rationale for tension in empirical findings related to relationship lending. Further research can be carried out to understand why the impact of relationship lending varies across different dimensions of relationship (that is length of relationship, scope of relationship and its exclusivity). The results of the thesis suggest an important role of relationship between firm and CEO of its bank. Another dimension that can be examined is the role of relationship between CEO and owners of a firm with CEO of bank.

References

Agarwal, S., Hauswald, R., 2010. Distance and private information in lending. Review of Financial Studies 23, 2757-2788.

Allen, F., Santomero, A.M., 2001. What do financial intermediaries do? Journal of Banking & Finance 25, 271-294.

Baele, L., Farooq, M., Ongena, S., 2014. Of religion and redemption: Evidence from default on Islamic loans. Journal of Banking and Finance 44, 141-159.

Barth, M.E., Kallapur, S., 1996. The effects of cross-sectional scale differences on regression results in empirical accounting research. Contemporary Accounting Research 13(2), 527-567.

Bastos, J.A., 2010. Forecasting bank loans loss-given-default. Journal of Banking and Finance 34 (10), 2510-2517.

Bellotti, T., Crook, J., 2012. Loss given default models incorporating macroeconomic variables for credit cards. International Journal of Forecasting 28(1), 171-182.

Berger, A.N., Black, L.K., 2011. Bank size, lending technologies, and small business finance. Journal of Banking & Finance 35, 724-735.

Berger, A.N., Frame, W.S., Ioannidou, V., 2016. Reexamining the empirical relation between loan risk and collateral: The roles of collateral liquidity and types. Journal of Financial Intermediation 26, 28-46.

Berger, A.N., Miller, N.H., Petersen, M.A., Rajan, R.G., Stein, J.C., 2005. Does function follow organizational form? Evidence from the lending practices of large and small banks. Journal of Financial Economics 76, 237-269.

Berger, A.N., Udell, G.F., 1990. Collateral, loan quality and bank risk. Journal of Monetary Economics 25, 21-42.

Berger, A.N., Udell, G.F., 1995. Relationship lending and lines of credit in small firm finance. Journal of Business 68, 351.

Berger, A.N., Udell, G.F., 2002. Small business credit availability and relationship lending: The importance of bank organisational structure. Economic Journal 112, 32-48.

Bester, H., 1994. The role of collateral in a model of debt renegotiation. Journal of Money, Credit and Banking (Ohio State University Press) 26(1), 72-86.

Bharath, S., Dahiya, S., Saunders, A., Srinivasan, A., 2007. So what do I get? The bank's view of lending relationships. Journal of Financial Economics 85, 368-419.

Bharath, S.T., Dahiya, S., Saunders, A., Srinivasan, A., 2011. Lending relationships and loan contract terms. Review of Financial Studies 24, 1141-1203.

Blackwell, D.W., Winters, D.B., 1997. Banking relationships and the effect of monitoring on loan pricing. Journal of Financial Research 20, 275.

Blazy, R., Martel, J., Nigam, N., 2014. The choice between informal and formal restructuring: The case of French banks facing distressed SMEs. Journal of Banking and Finance 44, 248-263.

Bodenhorn, H., 2003. Short-term loans and long-term relationships: Relationship lending in early America. Journal of Money, Credit & Banking (Ohio State University Press) 35, 485-505.

Bolton, P., Scharfstein, D.S., 1996. Optimal debt structure and the number of creditors. Journal of Political Economy 104(1), 1-26.

Bonaimé, A.A., Öztekin, Ö., Warr, R.S., 2014. Capital structure, equity mispricing, and stock repurchases. Journal of Corporate Finance 26, 182-200.

Bonfim, D., Dias, D.A., Richmond, C., 2012. What happens after corporate default? Stylized facts on access to credit. Journal of Banking and Finance 36(7), 2007-2025.

Boot, A.W.A., 2000. Relationship banking: What do we know? Journal of Financial Intermediation 9, 7-25.

Boot, A.W.A., Thakor, A.V., 2000. Can relationship banking survive competition? Journal of Finance 55, 679-713.

Brick, I.E., Palia, D., 2007. Evidence of jointness in the terms of relationship lending. Journal of Financial Intermediation 16, 452-476.

Brown, D.T., Ciochetti, B.A., Riddiongh, T.J., 2006. Theory and evidence on the resolution of financial distress. Review of Financial Studies 19(4), 1357-1397.

Brunner, A., Krahnen, J.P., 2008. Multiple lenders and corporate distress: Evidence on debt restructuring. Review of Economic Studies 75(2), 415-442.

Cai, Y., Sevilir, M., 2012. Board connections and M&A transactions. Journal of Financial Economics 103, 327-349.

Cenni, S., Monferrà, S., Salotti, V., Sangiorgi, M., Torluccio, G., 2015. Credit rationing and relationship lending. Does firm size matter? Journal of Banking & Finance 53, 249-265.

Chakraborty, A., Hu, C.X., 2006. Lending relationships in line-of-credit and nonline-of-credit loans: Evidence from collateral use in small business. Journal of Financial Intermediation 15, 86-107.

Chan, S., Sharygin, C., Been, V., Haughwout, A., 2014. Pathways after default: What happens to distressed mortgage borrowers and their homes? Journal of Real Estate Finance and Economics 48(2), 342-379.

Chong, B.S., Liu, M.-H., 2009. Islamic banking: Interest-free or interest-based? Pacific-Basin Finance Journal 17(1), 125-144.

Claessens, S., Djankov, S., Klapper, L., 2003. Resolution of corporate distress in East Asia. Journal of Empirical Finance 10(1), 199-216.

Cleves, W., Gould, W., Gutierrez, R., Marchenko, Y., 2008. Introduction to survival analysis using State, Stata Press.

Cole, R.A., 1998. The importance of relationships to the availability of credit. Journal of Banking & Finance 22, 959-977.

Comeig, I., Fernández-Blanco, M.O., Ramírez, F., 2015. Information acquisition in SME's relationship lending and the cost of loans. Journal of Business Research 68, 1650-1652.

Cornee, S., Masclet, D., Thenet, G., 2012. Credit relationships: Evidence from experiments with real bankers. Journal of Money, Credit & Banking (Wiley-Blackwell) 44, 957-980.

Dang, V.A., Kim, M., Shin, Y., 2014. Asymmetric adjustment toward optimal capital structure: Evidence from a crisis. International Review of Financial Analysis 33, 226-242.

Degryse, H., Van Cayseele, P., 2000. Relationship Lending within a bank-based system: Evidence from European small business data. Journal of Financial Intermediation 9, 90-109.

Detragiache, E., Garella, P., Guiso, L., 2000. Multiple versus single banking relationships: Theory and Evidence. Journal of Finance 55, 1133-1161.

Dewally, M., Shao, Y., 2014. Liquidity crisis, relationship lending and corporate finance. Journal of Banking & Finance 39, 223-239.

Elsas, R., Krahnen, J.P., 1998. Is relationship lending special? Evidence from credit-file data in Germany. Journal of Banking and Finance 22(10), 1283-1316.

Elyasiani, E., Goldberg, L.G., 2004. Relationship lending: a survey of the literature. Journal of Economics and Business 56, 315-330.

Engelberg, J., Gao, P., Parsons, C.A., 2013. The Price of a CEO's rolodex. Review of Financial Studies 26, 79-114.

Fan, J.P.H., Titman, S., Twite, G., 2012. An international comparison of capital structure and debt maturity choices. Journal of Financial and Quantitative Analysis 47(1), 23-56.

Fiordelisi, F., Monferrà, S., Sampagnaro, G., 2014. Relationship lending and credit quality. Journal of Financial Services Research 46, 295-315.

Fracassi, C., 2016. Corporate finance policies and social networks. Management Sciences. (published online). http://dx.doi.org/10.1287/mnsc.2016.2433

Franks, J., Sussman, O., 2005. Financial distress and bank restructuring of small to medium size UK companies. Review of Finance 9(1), 65-96.

Godlewski, C.J., Weill, L., 2011. Does collateral help mitigate adverse selection? A cross-country analysis. Journal of Financial Services Research 40, 49-78.

Gorton, G., Kahn, J., 2000. The design of bank loan contracts. Review of Financial Studies 13(2), 331-364.

Green, M.S., Symons, M.J., 1983. A comparison of the logistic risk function and the proportional hazards model in prospective epidemiologic studies. Journal of Chronic Diseases 36(10), 715-723.

Greene, W.H., 2000. Econometric analysis (International edition).

Guo, S., 2010. Survival analysis / by Shenyang Guo. Oxford University Press, New York.

Hainz, C., 2003. Bank competition and credit markets in transition economies. Journal of Comparative Economics 31, 223-245.

Harhoff, D., Körting, T., 1998. Lending relationships in Germany – Empirical evidence from survey data. Journal of Banking & Finance 22, 1317-1353.

Hart, O., Moore, J., 1998. Default and renegotiation: A dynamic model of debt. The Quarterly Journal of Economics 113(1), 1-41.

Haubrich, J.G., 1989. Financial intermediation: Delegated monitoring and long-term relationships. Journal of Banking & Finance 13, 9-20.

Hernández-Cánovas, G., Martínez-Solano, P., 2010. Relationship lending and SME financing in the continental European bank-based system. Small Business Economics 34, 465-482.

Hotchkiss, Edith S., Strömberg, P., Smith, David C., 2014. Private equity and the resolution of financial distress. AFA 2012 Chicago Meetings Paper; ECGI - Finance Working Paper No. 331/2012

Hussain, I., Durand, R.B., Harris, M.N., 2016. Default resolution and access to fresh credit in an emerging market. Pacific-Basin Finance Journal 39, 256-274.

Hwang, B.-H., Kim, S., 2009. It pays to have friends. Journal of Financial Economics 93, 138-158.

Jamali, M.B., Waseemuddin, 2011. Global financial crisis and its impact on textile industry in Pakistan. Journal of Business Strategies 5(2), 20-35.

Jiménez, G., Saurina, J., 2004. Collateral, type of lender and relationship banking as determinants of credit risk. Journal of Banking & Finance 28, 2191-2212.

John, K., Lynch, A., xa, W, Puri, M., 2003. Credit ratings, collateral, and loan characteristics: Implications for yield. The Journal of Business 76, 371-409.

Kang, E., Zardkoohi, A., Paetzold, R., Fraser, D., 2013. Relationship banking and escalating commitments to bad loans. Small Business Economics 40, 899-910.

Kano, M., Uchida, H., Udell, G.F., Watanabe, W., 2011. Information verifiability, bank organization, bank competition and bank–borrower relationships. Journal of Banking & Finance 35, 935-954.

Karagozoglu, Ahmet K., Layish, Dina N., Jacobs, Michael Jr. (2008). Understanding and predicting the resolution of financial distress. Available at SSRN: http://ssrn.com/abstract=1149406

Khan, F., 2010. How 'Islamic' is Islamic Banking? Journal of Economic Behavior and Organization 76(3), 805-820.

Khwaja, A.I., Mian, A., 2005. Do Lenders Favor Politically Connected Firms? Rent Provision in an Emerging Financial Market. Quarterly Journal of Economics 120, 1371-1411.

Khwaja, A.I., Mian, A., Zia, B., 2010. Dollars Dollars Everywhere, Nor Any Dime to Lend: Credit Limit Constraints on Financial Sector Absorptive Capacity. Review of Financial Studies 23, 4281-4323.

Khwaja, A.I., Mian, A., Qamar, A., 2011. Bank credit and business networks. Federal Reserve Bank of St Louis, St. Louis.

Kim, J.-H., 1999. Spurious correlation between ratios with a common divisor. Statistics & Probability Letters 44, 383-386.

Kronmal, R.A., 1993. Spurious correlation and the fallacy of the ratio standard revisited. Journal of the Royal Statistical Society. Series A (Statistics in Society) 156, 379-392.

Kysucky, V., Norden, L., 2015. The Benefits of relationship lending in a cross-country context: A meta-analysis. Management Science. (Published online) http://dx.doi.org/10.1287/mnsc.2014.2088

la Porta, R., Lopez-de-Silanes, F., Shleifer, A., Vishny, R.W., 1998. Law and finance. Journal of Political Economy 106(6), 1113-1155.

Laeven, L. Valencia, f\F., 2008. Systemic banking crisis: A new database. IMF working paper WP/08/224. International Monetary Fund, Washington, D.C. http://www.imf.org/external/pubs/ft/wp/2008/wp08224.pdf.

Latif, A., Nazar, M.S., Shah, M.Z., Shaikh, F.M., 2011. Global financial crisis: Macroeconomic linkage to Pakistan's agriculture. Asian Social Science 7(7), 90-93.

Lehmann, E., Neuberger, D., 2001. Do lending relationships matter?: Evidence from bank survey data in Germany. Journal of Economic Behavior & Organization 45, 339-359.

Liberti, J.M., Mian, A.R., 2009. Estimating the effect of hierarchies on information use. Review of Financial Studies 22, 4057-4090.

Loterman, G., Brown, I., Martens, D., Mues, C., Baesens, B., 2012. Benchmarking regression algorithms for loss given default modeling. International Journal of Forecasting 28(1), 161-170.

Machauer, A., Weber, M., 1998. Bank behavior based on internal credit ratings of borrowers. Journal of Banking & Finance 22, 1355-1383.

Mills, M., 2011. Introducing survival and event history analysis. SAGE Publications Ltd. SAGE Publications Ltd, London.

Mudd, S., 2013. Bank structure, relationship lending and small firm access to finance: A cross-country investigation. Journal of Financial Services Research 44, 149-174.

Mundlak, Y., 1978. On the pooling of time series and cross section data. econometrica 46, 69-85.

Neus, W., Stadler, M., 2013. Risk and the role of collateral in debt renegotiation. Economic Notes 42(3), 273-284.

Ongena, S., Smith, D.C., 2000. What determines the number of bank relationships? cross-country evidence. Journal of Financial Intermediation 9, 26-56.

Ongena, S., Smith, D.C., 2001. The duration of bank relationships. Journal of Financial Economics 61, 449-475.

Ono, A., Uesugi, I., 2009. Role of collateral and personal guarantees in relationship lending: Evidence from Japan's SME loan market. Journal of Money, Credit & Banking (Wiley-Blackwell) 41, 935-960.

Pearson, K., 1896. Mathematical contributions to the theory of evolution. III. Regression, heredity, and panmixia. Philosophical transactions of the royal society of London A: Mathematical, Physical and Engineering Sciences 187, 253-318.

Peltoniemi, J., 2007. The benefits of relationship banking: Evidence from Small business financing in Finland. Journal of Financial Services Research 31, 153-171.

Pennathur, A., Vishwasrao, S., 2014. The financial crisis and bank–client relationships: Foreign ownership, transparency, and portfolio selection. Journal of Banking & Finance 42, 232-246.

Petersen, M.A., Rajan, R.G., 1994. The benefits of lending relationships: Evidence from small business data. Journal of Finance 49, 3-37.

Qi, M., Zhao, X., 2011. Comparison of modeling methods for Loss Given Default. Journal of Banking and Finance 35(11), 2842-2855.

Reinhart, C.M., Rogoff, K.S., 2009. This Time is different: Eight centuries of financial folly. Princeton University Press, Princeton

Roberts, M.R., Sufi, A., 2009a. Control rights and capital structure: An empirical investigation. The Journal of Finance 64(4), 1657-1695.

Roberts, M.R., Sufi, A., 2009b. Renegotiation of financial contracts: Evidence from private credit agreements. Journal of Financial Economics 93(2), 159-184.

Shimizu, K., 2012. Bankruptcies of small firms and lending relationship. Journal of Banking & Finance 36, 857-870.

Sol, J., 2009. A Model of lending resumption after default: Lessons from capital markets during the nineteenth century. Economica 76(303), 557-573.

Stanton, K.R., 2002. Trends in relationship lending and factors affecting relationship lending efficiency. Journal of Banking & Finance 26, 127-152.

Steijvers, T., Voordeckers, W., Vanhoof, K., 2010. Collateral, relationship lending and family firms. Small Business Economics 34, 243-259.

Stiglitz, J.E., Wejss, A., 1983. Incentive effects of terminations: Applications to the credit and labor markets. American Economic Review 73(5), 912-927.

Sufi, A., 2009. Bank lines of credit in corporate finance: An empirical analysis. The Review of Financial Studies 22(3), 1057-1088.

Syed, A.A.S.G., Anka, L.M., Abidi, S.A.R., Shaikh, F., 2012. Privatisation and reform programme of public sector enterprises in Pakistan 1960-2004. Asian Social Science 8, 171-79.

Uchida, H., 2011. What do banks evaluate when they screen borrowers? Soft information, hard Information and collateral. Journal of Financial Services Research 40, 29-48.

Uchida, H., Udell, G.F., Yamori, N., 2012. Loan officers and relationship lending to SMEs. Journal of Financial Intermediation 21, 97-122.

Wooldridge, J.M., 2011. Econometric analysis of cross section and panel data (2nd Edition). MIT Press, Cambridge, MA, USA.

Zhu, Y., 2012. Capital structure: The case of firms issuing debt. Australian Journal of Management 37, 283-295

RIGHTS & ACCESS

Elsevier B.V.

Article:	Default resolution and access to fresh credit in an emerging market
Corresponding author:	Mr. Inayat Hussain
E-mail address:	inayat.hussain@postgrad.curtin.edu.au
Journal:	Pacific-Basin Finance Journal
Our reference	PACFIN862
PII:	S0927-538X(16)30086-5
DOI:	10.1016/j.pacfin.2016.06.009

YOUR STATUS

» I am one author signing on behalf of all co-authors of the manuscript
» I am signing on behalf of the corresponding author.
   Name/Job title/Company: Inayat Hussain
   E-mail address: inayat.hussain@postgrad.curtin.edu.au

DATA PROTECTION & PRIVACY

» I do not wish to receive news, promotions and special offers about products and services from Elsevier B.V. and its affiliates w

ASSIGNMENT OF COPYRIGHT

I hereby assign to Elsevier B.V. the copyright in the manuscript identified above (where Crown Copyright is asserted, authors agree to grant an exclusive publishing and distribution license) and any tables, illustrations or other material submitted for publication as part of the manuscript (the "Article"). This assignment of rights means that I have granted to Elsevier B.V. , the exclusive right to publish and reproduce the Article, or any part of the Article, in print, electronic and all other media (whether now known or later developed), in any form, in all languages, throughout the world, for the full term of copyright, and the right to license others to do the same, effective when the Article is accepted for publication. This includes the right to enforce the rights granted hereunder against third parties.

SUPPLEMENTAL MATERIALS

With respect to Supplemental Materials that I wish to make accessible through a link in the Article or on a site or through a service of Elsevier B.V., Elsevier B.V. shall be entitled to publish, post, reformat, index, archive, make available and link to such Supplemental Materials on a non-exclusive basis in all forms and media (whether now known or later developed) and to permit others to do so. "Supplemental Materials" shall mean additional materials that are not an intrinsic part of the Article, including but not limited to experimental data, e-components, encodings and software, and enhanced graphical, illustrative, video and audio material.

REVERSION OF RIGHTS

Articles may sometimes be accepted for publication but later rejected in the publication process, even in some cases after public posting in "Articles in Press" form, in which case all rights will revert to the author (see http://www.elsevier.com/locate/withdrawalpolicy).).

REVISIONS AND ADDENDA

I understand that no revisions, additional terms or addenda to this Journal Publishing Agreement can be accepted without Elsevier B.V.'s express written consent. I understand that this Journal Publishing Agreement supersedes any previous agreements I have entered into with Elsevier B.V. in relation to the Article from the date hereof.

AUTHOR RIGHTS FOR SCHOLARLY PURPOSES

I understand that I retain or am hereby granted (without the need to obtain further permission) the Author Rights (see description below), and that no rights in patents, trademarks or other intellectual property rights are transferred to Elsevier B.V..

The Author Rights include the right to use the Preprint, Accepted Manuscript and the Published Journal Article for Personal Use, Internal Institutional Use and for Scholarly Sharing.

In the case of the Accepted Manuscript and the Published Journal Article the Author Rights exclude Commercial Use (unless expressly agreed in writing by Elsevier B.V.), other than use by the author in a subsequent compilation of the author's works or to extend the Article to book length form or re-use by the author of portions or excerpts in other works (with full acknowledgment of the original publication of the Article).

AUTHOR REPRESENTATIONS / ETHICS AND DISCLOSURE / SANCTIONS

I affirm the Author Representations noted below, and confirm that I have reviewed and complied with the relevant Instructions to Authors, Ethics in Publishing policy, Declarations of Interest disclosure and information for authors from countries affected by sanctions (Iran, Cuba, Sudan, Burma, Syria, or Crimea). Please note that some journals may require that all co-authors sign and submit Declarations of Interest disclosure forms. I am also aware of the publisher's policies with respect to retractions and withdrawal (http://www.elsevier.com/locate/withdrawalpolicy).
For further information see the publishing ethics page at http://www.elsevier.com/publishingethics and the journal home page. For further information on sanctions, see https://www.elsevier.com/trade-sanctions

Author representations

» The Article I have submitted to the journal for review is original, has been written by the stated authors and has not been prev

» The Article was not submitted for review to another journal while under review by this journal and will not be submitted to any

» The Article and the Supplemental Materials do not infringe any copyright, violate any other intellectual property, privacy or oth person or entity, or contain any libellous or other unlawful matter.

» I have obtained written permission from copyright owners for any excerpts from copyrighted works that are included and have in the Article or the Supplemental Materials.

» Except as expressly set out in this Journal Publishing Agreement, the Article is not subject to any prior rights or licenses and, i authors' institution has a policy that might restrict my ability to grant the rights required by this Journal Publishing Agreement the Author Rights permitted hereunder, including Internal Institutional Use), a written waiver of that policy has been obtained.

» If I and/or any of my co-authors reside in Iran, Cuba, Sudan, Burma, Syria, or Crimea, the Article has been prepared in a per research capacity and not as an official representative or otherwise on behalf of the relevant government.

» If I am using any personal details or images of patients, research subjects or other individuals, I have obtained all consents re law and complied with the publisher's policies relating to the use of such images or personal information. See http://www.elsevier.com/patientphotographs for further information.

» Any software contained in the Supplemental Materials is free from viruses, contaminants or worms.

» If the Article or any of the Supplemental Materials were prepared jointly with other authors, I have informed the co-author(s) Journal Publishing Agreement and that I am signing on their behalf as their agent, and I am authorized to do so.

For information on the publisher's copyright and access policies, please see http://www.elsevier.com/copyright. For more information about the definitions relating to this agreement click here.

✓ **I have read and agree to the terms of the Journal Publishing Agreement.**

1st July 2016   T-copyright-v21/2016

Definitions

Help

Accepted Manuscript

The manuscript of an Article that has been accepted for publication and which typically includes author-incorporated changes suggested during submission, peer review, and editor-author communications. The Accepted Manuscript should not be added to or enhanced in any way to appear more like, or to substitute for, the Published Journal Article. The Accepted Manuscript should include a link to the formal publication through the relevant DOI and should bear a Creative Commons CC BY NC ND license.

Commercial Use

The use or posting of Articles:

- for commercial gain - for example by associating advertising with the full-text of the Article, by providing hosting services to other repositories or to other organisations, or charging fees for document delivery or access;
- to substitute for the services provided directly by the publisher - for example article aggregation, systematic distribution via e-mail lists or share buttons, posting, indexing or linking by commercial companies for use by customers of such companies (e.g. pharmaceutical companies and physician-prescribers).

Internal Institutional Use

Use by the author's institution for classroom teaching at the institution and for internal training purposes (including distribution of copies, paper or electronic, and use in coursepacks and courseware programs, but not in MOOCs -Massive Open Online Courses) and inclusion of the Article in applications for grant funding. For authors employed by companies, the use by that company for internal training purposes.

Personal Use

Use by an author in the author's classroom teaching (including distribution of copies, paper or electronic) or presentation by an author at a meeting or conference (including distribution of copies to the delegates attending such meeting), distribution of copies (including through e-mail) to known research colleagues for their personal use, use in a subsequent compilation of the author's works, inclusion in a thesis or dissertation, preparation of other derivative works such as extending the Article to book-length form, or otherwise using or re-using portions or excerpts in other works (with full acknowledgment of the original publication of the Article).

Preprint

Author's own write-up of research results and analysis that has not been peer reviewed, nor had any other value added to it by a publisher (such as formatting, copy-editing, technical enhancements, and the like). Preprints should not be added to or enhanced in any way in order to appear more like, or to

substitute for, the Published Journal Article.

Published Journal Article

The definitive final record of published research that appears or will appear in the journal and embodies all value-adding publisher activities including peer review co-ordination, copy-editing, formatting, (if relevant) pagination, and online enrichment.

SCHOLARLY SHARING

Preprints:

Sharing of Preprints by an author on any website or repository at any time. When the Article is accepted, the author is encouraged to include a link to the formal publication through the relevant DOI. The author can also update the Preprint on arXiv or RePEc with the Accepted Manuscript.

Accepted Manuscripts:

1. immediately on acceptance: sharing of the Accepted Manuscript by an author:
   - via the author's non-commercial personal homepage or blog
   - via the author's research institute or institutional repository for Internal Institutional Use or as part of an invitation-only research collaboration work-group
   - directly by providing copies to the author's students or to research collaborators for their personal use
   - for private scholarly sharing as part of an invitation-only work group on commercial sites with which the publisher has a hosting agreement

2. after the embargo period: an author may share the Accepted Manuscript via non-commercial hosting platforms (such as the author's institutional repository) and via commercial sites with which the publisher has a hosting agreement.

To check the embargo period for the journal, go to http://www.elsevier.com/embargoperiodlist.

The publisher has agreements with certain funding agencies that may permit shorter embargo periods and/or different sharing guidelines. To learn more about the publisher's policies and agreements with such agencies or institutions go to http://www.elsevier.com/fundingbodyagreements.

Published Journal Article:

The author may share a link to the formal publication through the relevant DOI. Additionally theses and dissertations which contain embedded Published Journal Articles as part of the formal submission may be hosted publicly by the awarding institution with a link to the formal publication through the relevant DOI. Any other sharing of Published Journal Articles is by agreement with the publisher only.