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Bank-Firm Relationships in Emerging Markets: Evidence from India

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Abstract

Using data on bank-firm relationships for 2004, the study examines the factors influencing the relationships between bank and corporates. In particular, we examine the determinants of main bank relationship and the factors influencing multiple banking relationships. The findings suggest that state-owned banks have a comparative advantage in providing main relationships for informationally opaque firms. As regards the determinants of multiple banking relationships, it is found that firms without SBI-group banks as main bank are less likely to have multiple relationships. Finally, the results indicate that multiple banking relationships lowers borrowing costs for corporates: for a new bank granting credit, the interest rate charged by each bank declines by roughly 15-18 basis points.

Relationship banking plays an important role in overcoming credit constraints for business. In the presence of informational asymmetry, adverse selection and moral hazard can lead to credit rationing, a problem that can be overcome by banking relationships, which over time, enables the bank to obtain information on the borrowing firm's observable qualities and therefore, mitigate credit rationing. A growing body of theoretical literature examines the cost and benefits of banking relationships, suggesting that long-term exclusive banking relationships can relax the credit constraints of firms. On the other hand, such relationships potentially allow banks to extract rents by exploiting the informational monopoly power they possess over a firm if the quality of the firm is good but unobservable and the firm has good investment opportunities (Sharpe, 1990; Rajan, 1992; von Thadden, 1995). At the same time, informationally opaque firms with a single banking relationship are vulnerable to liquidity shocks to their first bank: unable to borrow from their preferred bank, such businesses may be unable to obtain financing from other non-relational banks, which fear they might be dealing with a 'lemon' (Detragiache *et al.*, 2000). Therefore, in order to ensure stable financing, firms of both good and bad quality typically often choose multiple sources.

The literature has also examined the comparative advantages of different bank ownership types – state-owned, private and foreign – in providing services to different categories of firms. Existing studies, however, do not directly address the potentially

important role of bank ownership on bank-firm relationships. In particular, the literature has not explored the effects of different ownership types in determining whether firms have multiple banking relationships. In addition, most studies on bank-firm relationships are confined to developed countries. It needs to be recognized that such relationships might be particularly important for developing countries, where owing to lack of adequate institutional infrastructure and informational asymmetries in the financial system, such relationships are likely to be quite pronounced.

The paper addresses this issue in a developing country context, focusing on India as a case study. The dataset includes information on over listed 1000 non-financial firms for the year 2004. The data includes measures of firm characteristics, ownership type and performance. The data are matched to information on the identities of banks with which these firms have relationships and comprise of state-owned (SBI group and nationalized), private (new and old) and foreign banks. In case a firm has multiple banking relationships, the data also provides the names of these banks listed in order of priority (main bank, second bank etc.).

The empirical analysis comprises of two models to test the hypotheses regarding bank ownership types and bank-firm relationships. The first model examines the determinants of the ownership type of the firm's main bank to test the factors which influence relationship banking for the firm's main bank. The findings indicate that state-owned banks have a comparative advantage in providing main relationships with informationally opaque firms. The findings also suggest that foreign- and state-owned banks may have advantages as main banks for foreign and state-owned listed firms, respectively. The second model analyzes the determinants of multiple banking relationships to test the hypotheses about the effects of bank ownership type on multiple relationships. The results suggest that firms with SBI-group banks as main bank are more likely to have multiple relationships. In terms of the number of relationships, it seems that banks with SBI-group bank as the main bank are less likely to forge multiple banking relationships. Additionally, firms with financially fragile main banks are more likely to exhibit multiple relationships.

The reminder of the paper is structured as follows. Section 2 reviews the literature on relationship banking, including multiple banking relationships. Section 3

provides an overview of the Indian banking sector. Section 4 discusses the empirical methodology. Section 5 describes the data set. The empirical results are discussed in Section 6, followed by the concluding remarks in the final section.

I
Literature Review

Relationships are commonly employed by banks to gather information about their customers. A closer and continuous relationship with customer often involves contact over a number of years and the supply of multiple services, including credit extension, provision of deposit services and other related facilities (Rajan, 1992). This forms the basis of *relationship lending* wherein banks develop multiple lender-customer interactions over time and across products which enables banks to obtain customer-specific information (often of proprietary nature) and the evaluation of the profitability of lending through multiple financial services. Using the 1993 National Survey of Small Business Finance data, Berger and Udell (1998) show that commercial banks in the US account for nearly 41% of small business credit.

In practice however, it is often observed that firms forge relationships with multiple banks. Such multiple banking relationships often have conflicting implications with regard to credit availability. In the presence of information asymmetry between lenders and borrowers, adverse selection and moral hazard can lead to credit rationing (Stiglitz and Weiss, 1981). Thus, firms are unable to obtain all the credit they demand at the going market interest rate. Adverse selection problems are particularly severe in the market for small business financing. In this case, exclusive and long-term banking relationships can mitigate credit rationing since relationship banks internalize the benefits of subsidizing firms over time. At the same time, firms with single banking relationships are more at risk of not being able to obtain additional credit if their bank refuses to provide it, because non-relational banks are likely to suspect that the firm is a lemon. Therefore, both good and bad quality firms may choose to engage in multiple banking relationships to ensure stable access to finance.

The empirical literature has produced mixed results regarding the effects of intensive banking relationships on the cost and availability of loans. Using US small firm data, Petersen and Rajan (1994, 1995) find that a higher concentration in banking

relationships leads to lower borrowing costs. Harhoff and Korting (1998), using survey data for small and medium-sized German firms with no more than 500 employees fin no correlation between the cost of debt and the number of relationship banks. These studies provide evidence to support the hypothesis that an exclusive banking relationship provides a good incentive for banks to supply loans to credit constrained firm since it enables banks to obtain rents in the future (von Thadden, 1995). In contrast to these results, D'Auria *et al*. (1999) using data on Italian firms find a negative relationship between the interest rate on loans and the number of banking relationships.

Some studies investigate the determinants of a firm's choice of number of banking relationships. Detragiache *et al*. (2000) address this question by developing an analytical framework in which a firm with good investment opportunity establishes multiple banking relationships from the start in order to avoid the risk of financing difficulties should it encounter liquidity problems. Using cross-section data for small and medium-sized manufacturing firms, the authors then test the model and find that the number of banking relationships is positively correlated with bank fragility. Berger *et al*. (2001) using data set on Argentine firms, find that small firms choose multiple banking relationships over single banking relationship as a reaction to bank distress, even though this increases their cost of credit. Cosci and Meliciani (2002) using data from a large Italian bank find that the number of banking relationships is positively related to a firm's leverage and the riskiness of the sector in which the firm operates.

An important facet of relationship lending is the tenure of the relationship. Earliest studies on this aspect found that the longer the duration of the relationship, the greater the availability of credit (Petersen and Rajan, 1994). A further significant factor in this context is the cross-subsidisation of loan rates over the monetary cycle as rates in bad times are reduced by charging marginally higher rates in good times (Berlin and Mester, 1999). Boot (2000) asserts that contract terms improve over the length of the relationship with interest rates and collateral requirements falling. An important aspect of the process is the existence of multiple relationships. Petersen and Rajan (1994) demonstrate that the existence of multiple lenders increases price and reduces the availability of credit. Detragiache *et al*. (1997) show that this may be a more serious problem in economies with high bankruptcy costs and where banks rarely have liquidity

problems so that withholding of credit is likely to be interpreted as a problem with the borrowing firm. Berger and Udell (1998), however, note that the use of multiple lenders may be desirable for borrowers because the removal of credit from the firm's only lender may provide a negative signal to the market. Employing survey data covering over 1000 firms across 20 European countries, Ongena and Smith (2000) document that the existence of multiple firm-bank relationships in most countries, with only 15% of firms maintaining single bank relationship; over 40% maintain relationships with 3 to 7 banks.

An aspect not adequately factored into earlier studies has been the issue of bank ownership and its effect on relationship lending. Several studies have explored the benefits of foreign bank presence in host country markets. Thus, Claessens *et al*. (2001) and Bonin *et al*. (2002) find that foreign ownership is associated with greater efficiency, greater credit availability (Clarke *et al.,* 2002; Berger *et al.,* 2002) and even more competitive banking systems (Claessens and Laeven, 2004). On the other hand, most cross-country studies are a pointer to the fact that state-owned banks are associated with reduced financial system development and lower economic growth (La Porta *et al.,* 2002; Barth *et al.,* 2004). In certain case, they have also been found to direct credit for political purposes (Sapienza, 2004).

In the Indian context, bank-firm relationship has, in recent years, witnessed several notable features include financing by multiple banks, through several instruments including investments, and access to a wider choice of sources of finance for corporates such as capital markets and external financing. Since such choices nudge towards transaction-based banker-customer relationship, these could impinge on the access to the information required by the bankers for financial assessment as also on the ability of corporates to get an assured and appropriately priced financial package (Reddy, 2005). However, limited research has been forthcoming in India on the factors influencing bank-corporate relationships, which is a major focus of this study.

II
A Brief Overview of Indian Banking

The Bank of Bengal, the first of the three Presidency banks, was established in 1806 by Palmer and Company, an agency house and subsequently renamed as Bank of Calcutta. The Banks of Bombay and Madras were founded in 1840 and 1843,

respectively, on the lines of the Bank of Bengal, with share capital of Rs.0.5 million and Rs.0.3 million. Both these banks were allowed to issue notes up to a certain amount and given the monopoly of Government banking. A comprehensive review of the functioning of the Presidency banks was effected following the failure of Bank of Bombay. This led to the enactment of the Presidency Banks Act of 1876, by which these banks came to be governed by very similar set of rules to safeguard interests of the Government and the public. Subsequently, over a period of time, after due legislative process, the three Presidency banks were amalgamated in 1921 to form the Imperial Bank of India. Subsequently, the Imperial Bank was taken over by the State Bank of India in July 1955. This was followed by another takeover of the major state-associated banks by the State Bank of India as its subsidiaries.[1]

The other category of Indian banks established was the Indian *joint stock banks*. The *Swadeshi* upsurge in 1906 was responsible for a number of banks to be established by Indian entities, with the twin motives of doing business with Indian interests as well as to extract a share of the profits earned by European banks. Salient among these included Bank of India (1906), Indian Bank (1907), Bank of Baroda (1908), Punjab and Sind Bank (1908), Central Bank of India (1911) and Bank of Mysore (1913). These were to subsequently become nationalized banks following bank nationalization.

Development of banking came into its own since the 1950s subsequent to the passage of the *Banking Regulation Act* in 1949. Bank deposits began to increase much faster than national income. Illustratively, the ratio of bank deposits to national income increased from around 15% in 1959 to nearly 17% in 1969. Over the same period, both aggregate deposits and credit of the 14 largest commercial banks grew at a compound rate of around 12%; the number of bank branches also witnessed a sharp rise.[2] These positive developments notwithstanding, a number of disquieting features began to surface in the banking sector.

First, over this period, there was a sharp growth in credit to industry. As proportion to total credit, industrial credit rose from about one-third in 1951 to over two thirds of an expanding total.

Second, the increasing share of industrial credit was also associated with the interlocking of directorships between industrial houses and banks. This was reflected in

the fact that bank advances to concerns in which of the banks are interested accounted for 1840 million (12.4% of advances by commercial banks) in 1962.

Third, the distribution of bank branches was highly skewed. Thus, on the eve of nationalization in 1969, nearly 38% of the bank branches were located in urban and metropolitan/port town locales.

Fourth, apart from industry, commerce (both trade and finance) accounted for a major chunk of total credit. This share however declined from 51.6% to 22.6% during the period. The bulk of trade credit was in respect of wholesale trade.

Fifth, in terms of dependence of the private corporate business on bank financing, over the period 1956-57 to 1960-61, banks accounted for 44% of the financial flows to corporates which rose to over 60% for the quinquiennum ending 1968-69.

Finally, credit to agriculture was scanty, both in absolute terms and in terms of proportions. Credit to agriculture comprised, on average, around 1.4% of bank credit over the period 1959-68, being less than 0.5% in several years, despite its share in net domestic product being over 50% during this period.

The inequitable distribution of bank credit, notwithstanding the existence of a branch licensing policy (where the central bank issued bank licences which emphasized the spread of branches to rural and semi-urban areas) raised misgivings about the ability of markets to efficiently allocate resources or exploit economies of scale associated with particular mixes of investment decisions. After several legislative procedures in the light of such disquieting developments, 14 major Indian scheduled commercial banks were nationalized in 1969. In April 1980, six more private sector bank with total deposits not les than Rs.2,000 million were nationalized.

The other category of bank with a somewhat long tradition has been the old private banks. These banks primarily originated in erstwhile provinces and were constituted by enterprising traders and businessmen to facilitate trade and exchange.

Banking sector deregulation was initiated in the early 1990s as part of an overall economic reforms process. This included permission to establish *de novo* banks and liberal entry of foreign banks. The period saw the introduction of prudential norms pertaining to capital adequacy, income recognition, loan classification and provisioning, exposure norms, etc. While these reforms were being implemented, the world economy

also witnessed significant changes, 'coinciding with the movement towards global integration of financial services' (Government of India, 1998). Against such backdrop, a second Government-appointed Committee on banking sector reforms provided the blueprint for the current reform process (Government of India, 1998).

Critical and noteworthy reforms in the financial system during the reform period included the following (Bhide *et al.,* 2001; Reddy, 2004):

(a) Lowering of statutory pre-emptions.
(b) Liberalizing the interest rate regime, allowing banks the freedom to choose their deposit and lending rates.
(c) Infusing competition by allowing more liberal entry of foreign banks and permitting functioning of new private banks.
(d) Introducing micro-prudential measures (capital adequacy requirements, income recognition, asset classification and provisioning norms for loans, exposure norms, accounting norms).
(e) Diversifying ownership of public sector banks. Several of the relevant acts were amended to enable the state-owned banks to raise capital up to 49 per cent from the public. Seventeen state-owned banks accessed the capital market and raised around Rs. 82 billion till end-March 2004.
(f) Mandating greater disclosures in balance sheets to ensure greater transparency.

Table 1: Summary of the Banking Industry: 1990-91 to 2003-04 (in Rs. billion)

Year /Bank Group	1990-91			1995-96			2003-04		
	PSB	Pvt.	Forgn.	PSB	Pvt.	Forgn.	PSB	Pvt.	Forgn.
No. of Banks	28	25	23	27	35 (8)	29	27	40 (10)	33
Listed	None	None	N.A.	2	9 (3)	N.A.	19	18 (8)	N.A.
Non-listed				25	26 (5)	N.A.	8	22 (2)	N.A.
Total Asset	2929	119	155	5058	455 (89)	475	14714	3673 (2466)	1363
Listed				1550	209 (37)		12309	3344 (2354)	N.A.
Non-listed	2929	119		3508	246 (52)		2405	329 (112)	
Total Deposit	2087	94	85	3908	362 (59)	306	12268	2685 (1632)	798
Listed				1051	165 (33)		10252	2415 (1543)	
Non-listed	2087	94	85	2857	197 (26)		2016	270 (89)	
Total credit	1306	50	51	2075	219 (48)	225	6327	1709 (1151)	605
Listed				645	103 (20)		5390	1575 (1106)	
Non-listed	1306	50	51	2430	116 (28)		937	134 (45)	
Credit-deposit ratio	0.63	0.52	0.60	0.53	0.61 (0.81)	0.75	0.52	0.64 (0.71)	0.76
Listed				0.61	0.62 (0.61)	--	0.53	0.65 (0.72)	--
Non-listed	0.63	0.52	0.60	0.85	0.59 (1.08)	--	0.46	0.49 (0.51)	--
Share (in %) of									
Total Asset	91.4	3.7	4.9	84.5	6.5 (1.5)	7.9	74.5	18.6 (12.5)	6.9
Listed				26	3 (1)	7.9	62.3	17.0 (12.0)	6.9
Non-listed	91.4	3.7	4.9	58.5	3.1 (0.5)	--	12.2	1.6 (0.5)	--
Total Deposits	92	4	4	85.4	6.6 (1.3)	6.7	77.9	17.1 (10.4)	5.0
Listed				23	4 (1)	6.7	65.0	15.3 (9.8)	5.0
Non-listed	92	4	4	62.4	2.6 (0.3)	--	12.9	1.8 (0.6)	--
Total Credit	93	4	3	82.4	6.8 (1.9)	8.9	73.2	19.8 (13.3)	7.0
Listed				26	4 (1)	--	62.4	18.2 (12.8)	7.0
Non-listed	93	4	3	56.4	2.8 (0.9)	8.9	10.8	1.6 (0.5)	--

Total Income	271	10	22	536	53	61	1376	547 (216)	130
Total Expenses	266	9.7	20	539	48	54	1211	493 (196)	108
Of which: P&C	*27*	*0.7*	*3.4*	*79*	*4.6*	*8.4*	*229*	*77.0 (29.8)*	*27.4*
Total Profit	5	0.3	2	-3	5	7	165	55.2 (20.4)	22.4
Memo									
Bank Asset/GDP (%)	56.3			50.4			71.2		
GDP growth	5.6			7.3			8.2		

N.A: not applicable
Figures for new private banks within brackets
PSB. Public sector banks; Pvt. Private Sector Banks; Forgn: Foreign Banks
GDP: GDP at market prices

In the empirical analysis, we explicitly distinguish between the two categories of state-owned banks, given the differences in their history and governance. We also make a distinction between the old private banks with an extended history of banking business and *de novo* private banks, which are relatively new entrants in the financial marketplace with greater technological sophistication and skilled manpower orientation. Over the decade of their operations, several of these *de novo* banks have outgrown their old private counterparts and in fact, have assets, comparable to mid-sized nationalized banks. Their share in total asset size of commercial banking segment has also increased at a remarkable rate (see table 1). Recent evidence by Banerjee *et al.* (2005) suggests that these *de novo* banks primarily lend to bigger firms in larger credit markets. This makes it all the more imperative to distinguish between these two bank categories. Finally, we include the foreign banks which were granted more liberal entry in the Indian financial market post initiation of reforms.

III
Data and Summary Statistics

We match data on non-financial firms and banks with which they have relationships. The source of the data is the publicly available *Prowess* database (Release 2.4), generated and maintained by Centre for Monitoring of Indian Economy (CMIE), a leading private think-tank in India. The dataset contains financial information on around 8,000 companies, which are either listed on the stock exchanges as well as major unlisted public limited companies having sales exceeding Rs.200 million. There is detailed information on the financial performance of these companies culled out from their profit and loss accounts, balance sheets and stock price data. The database also includes information on the ownership type of the firm as well as the banks with which a firm maintains relationships, listed in order of priority (main bank, second banks etc.).

The selection of the sample is guided by the availability of data. We followed a three-step process in the choice of sample firms. First, from the entire database, we initially chose the entire gamut of non-financial firms listed on the National Stock Exchange. This provided us with 1141 firms. In the next step, given the explicit focus on bank-firm relationships, we exclude all firms that do not report a main bank. In the third and final step, we exclude banks that report relationships with cooperative banks, since we do not have comparable bank data. Using this methodology, we finally arrived at a total of 1056 manufacturing firms.[3] Table 2 shows the number of bank relationships for the sample firms. Consistent with survey results reported by Ongena and Smith (2000), the data reveals that nearly 90% of the firms exhibit multiple banking relationships, suggesting that listed corporates prefer to be generally associated with multiple banks.[4]

Table 2: Number of Banking Relationships

Number of bank relationships	Number of firms	Per cent to total
1	131	12
2-5	620	59
Greater than 5	305	29
Total	1056	100

Table 3 reports the summary statistics of the firm characteristics based on the sample of 1056 manufacturing firms.[5] The first set of variables includes firm characteristics. These include firm size and age. Given that we consider only listed firms, this typically excludes small and medium-sized firms. We also include the natural logarithm of the number of years since incorporation (*Ln age*). The age of sample firms ranges from 2 to 141 years, with an average (*Ln*) age of 3.21 years.

Table 3: Variable Definitions and Summary Statistics

Panel A: Firm Characteristics			
Variable	Definition	Source	Mean
Firm characteristics			
Ln (asset)	Natural logarithm of total asset	CMIE	5.484
Ln (sales)	Natural logarithm of total asset	CMIE	5.198
Ln (age)	Natural logarithm of number of years since incorporation of the firm	CMIE	3.214
Business group	Dummy variable=1 if a firm belongs to an Indian business group, else zero	CMIE	0.501
Firm ownership			
Foreign	Dummy variable=1, if a firm is foreign-owned, else zero	CMIE	0.077
State	Dummy variable=1, if a firm is state-owned, else zero	CMIE	0.030
Indian private	Dummy variable=1, if a firm is Indian private, else zero	CMIE	0.392
Firm performance			
Return on asset	Operating profits/total asset	CMIE	0.031
Leverage	Total debt/total asset	CMIE	0.436
Panel B: Banking relationship and bank characteristics			
Banking relationships	Numerical variable equal to the number of banking relationships	CMIE	4.650

Bank characteristics			
Ln (main bank asset)	The natural logarithm of total asset at the main bank	RBI	10.541
CRAR (%)	Capital (tier-I *plus* tier-II)/total risk-weighted assets at the main bank	RBI	14.038
NPL (%)	Non-performing loans/total loans at the main bank	RBI	8.232
Bank ownership			
Foreign bank	Dummy variable=1 if the main bank is a foreign bank, else zero	RBI	0.187
SBI group	Dummy variable=1 if the main bank is a bank of the SBI group, else zero	RBI	0.077
Nationalised bank	Dummy variable=1 if the main bank is a nationalized bank, else zero	RBI	0.645
New private bank	Dummy variable=1 if the main bank is a new private bank, else zero	RBI	0.059
Old private bank	Dummy variable=1 if the main bank is a old private bank, else zero	RBI	0.029
Panel C: Local market characteristics			
Number of banks	Number of commercial banks operating in each state	RBI	66.569
Population density	Density of population per 1000 people per square kilometer	Economic Survey	1.326

We include one measure of non-bank external finance. Accordingly, we include a dummy for firms that belong to Indian business groups (*Business group)*, which comprise 50% of the sample firms. By virtue of their access to cheaper inter-company loans, these firms might be able to use other firms in their group as guarantors.

The third set of variables focus on dummies that classify firm ownership. We distinguish between state-owned, foreign-owned and Indian domestic private corporates. Foreign-owned firms may have access to cheaper financing *via* the parent firm and state-owned firms may secure financing by virtue of their implicit government guarantee. In the sample, 3% of the firms are state-owned, 8% are foreign-owned and 39% are domestic private entities.

The final group of variable measures firm performance. We include return on asset (*RoA*) and total debt to total asset (*Leverage*). The average *RoA* is 0.03 and the average leverage ratio was 0.44, respectively.

We also include controls for the firm's location and sector in all regressions, but these are not reported in the regressions. We employ dummies for 4 regions (North, South, East and West) and 11 industry sectors (food, textiles, chemicals, drugs and pharmaceuticals, cement, heavy industries, auto and auto ancillaries, diversified, electronics, electrical machinery and others), although we do not report them in the estimations.

Panel B reports the banking variables and the salient features of banking relationships. We include a dummy that equals one if a firm exhibits multiple (more than one) banking relationship and a separate variable that records the actual number of

banking relationships. About 12% of the firms in the sample display one-bank relationship, the remaining exhibits multiple banking relationships. The average number of relationships per bank is 4.65 with a high of 29.

Information on banks annual accounts is culled from two RBI reports: the *Statistical Tables Relating to Banks in India*, which reports bank-wise items of asset/liabilities as well as profit/loss figures as well as *Report on Trend and Progress of Banking in India*, a statutory report, which reports bank-wise prudential/financial ratios. We employ three measures of banking fragility. We include the natural logarithm of total assets (*Ln main bank asset)* of the main bank as a proxy for bank size. We also include the capital adequacy ratio (CRAR) and the non-performing loans (NPL) at the main bank. The average (*Ln*) asset at the main bank equals 10.54, the CRAR and NPL are 14.04% and 8.23%, respectively.

We also create dummies for the ownership type of the main bank. Nearly 65% of the corporates have nationalized bank as its main bank, 8% have a bank belonging to the SBI group, 3% have old private bank as the main bank, 6% have new private bank as the main bank, 198 corporates (18%) have foreign bank as the main bank.

Panel C shows the local market characteristics used to account for differences in the local economy. CMIE provides information on each firm's 'registered office', which identifies the main location of its operations. Sample firms are located in 21 states and 2 Union Territories. We also employ information on the total number of commercial banks, using the *Statistical Tables*. The average number of commercial banks (excluding RRBs and cooperative banks) in a state equals 66.6, with a high of 88 and a minimum of 11. We also use the *Economic Survey* to collect population density: the average population density is 1326 persons per square kilometer.

IV
Empirical Strategy

We first examine the determinants of main bank ownership type. Accordingly, we utilize the following specification:

Main bank ownership type=f1(firm characteristics, other characteristics, region/ industry dummies) **(1)**

The dependent variable (i.e., main bank ownership) is a dummy which equals one if the main bank is of a given ownership type, else zero. Among firm characteristics, we include various firm-level controls, including its ownership type and financial

performance. The estimations also include controls for the region in which the firm is located and industry type for the firm. Other characteristics include population density and index of law and order in the state.

We estimate (1) by Probit to ascertain the likelihood that the main bank belongs to the SBI group, nationalized, private (old and new) and foreign, each estimated relative to the other categories combined. The second model investigates the determinants of multiple banking relationships. Accordingly, we employ a dummy for the dependent variable which equals zero if the firm exhibits one banking relationship, one if the firm is associated with 2-5 banks (given that the average number of bank-firm relationship is 4.65) and 2, if the number of bank-firm relationships exceeds five. Given that the dummy dependent variable is ordered, we employ ordered logit regression to examine the likelihood that a firm exhibits multiple banking relationships as opposed to single banking relationship. In addition, to examine the robustness of the results, we also estimate the model by Poisson regression to ascertain the factors influencing the number of bank-firm relationships. We assume that multiple banking relationships is a function of firm characteristics, other characteristics and main bank characteristics as given by (2):

Multiple bank relationships (dummy or number) =f2(firm characteristics, other characteristics, main bank characteristics, Region/industry dummies) **(2)**

The included firm characteristics are the same as earlier. Among the main bank characteristics, we include measures of bank's soundness as captured by CRAR and fragility as measured by NPL ratio. Finally, among other characteristics, we include the number of banks in the market. More banks in the market may indicate less bank market power, reducing the incentive for multiple banking to avoid bank hold-up problems. These markets may encourage multiple banking, because additional banks are more conveniently located.

The final model studies the costs of relationship lending. We model the interest cost as a function of firm and other characteristics, including the main bank characteristics and the number of banking relationships. The dependent variable equals the interest cost faced by the firm. *Ceteris paribus*, firm profitability will be lower for firms that have to make higher interest payments, which makes this variable endogenous. To address this aspect, we perform a two-stage approach where in the first stage, we regress RoA on the exogenous variable and in the second stage, use the

predicted value of RoA and subsequently, estimate the model by weighted least squares (WLS) approach, where the weights are the inverse of the respective bank debt ratios. We test the following empirical specification as given by (3).

Interest cost =f4(firm characteristics, other characteristics, main bank characteristics, number of banking relationships, region/industry dummies) **(3)**

V
Empirical Results

The section elaborates the results of the regression analysis. We proceed in two steps: first, we discuss the determinants of main bank ownership type and subsequently, focus on the factors influencing multiple banking relationships.

Determinants of main bank ownership

Table 4 shows the results for the determinants of main bank ownership type. More specifically, we examine the first hypothesis of the comparative advantages and disadvantages of ownership types in providing relationship services to listed firms. The results indicate that across the first four bank groups (SBI group, nationalized, old and new private), the coefficient on *Ln asset* is negative and statistically significant, which suggest that these bank groups are the main bank for small firms, which are generally considered opaque. On the other hand, the variable exhibits a positive sign for the foreign bank group, suggesting that this category tends to choose established and large firms.

We next address the question whether foreign-owned and state-owned banks have comparative advantages in serving foreign-owned and state-owned listed corporates, respectively. The coefficient on the foreign-owned non-financial firm dummy is consistent with a comparative advantage for foreign bank, while the coefficient on the state-owned firm dummy is consistent with the fact that SBI group is less likely to act as the main bank for either Indian private of foreign firms. The results also suggest that old private banks do not have any comparative advantage in serving foreign-owned non-financial firms.

Regarding the differences between SBI group and nationalized banks, the estimates suggest that SBI group is less likely to serve as the main banks for highly leveraged firms. Additionally, the results also indicate that foreign banks are more likely to serve as the main banks for better-performing firms in terms of RoA. Finally, the

results indicate that nationalized banks are more likely to choose corporates with high asset tangibility, while SBI group is less likely to do so. Finally, the coefficient on population density is negative for SBI group and positive for new private and foreign banks. In other words, SBI tends to provide the main relationships in rural markets, while new private and foreign banks are more likely to provide main relationship in urban areas.

Table 4: Determinants of Main Bank Ownership Type

	Probit estimates				
	SBI group	Nationalised	OPvt	NPvt	Foreign
Firm characteristics					
Ln asset	-0.154 (0.063)***	-0.069 (0.037)**	-0.211 (0.072)***	-0.114 (0.056)**	0.283 (0.044)***
Ln age	-0.104 (0.099)	-0.001 (0.073)	-0.122 (0.141)	-0.046 (0.101)	0.096 (0.088)
Business group	-1.128 (0.304)***	0.103 (0.260)	-0.729 (0.528)	-0.335 (0.387)	1.415 (0.425)***
Firm ownership					
Foreign	-2.201 (0.484)***	-0.474 (0.301)	-1.067 (0.642)*	-0.382 (0.466)	2.410 (0.457)***
Indian Private	-1.181 (0.348)***	-0.006 (0.273)	-0.675 (0.555)	-0.393 (0.412)	1.537 (0.436)***
Firm performance					
RoA	0.203 (0.596)	-0.513 (0.446)	0.651 (0.581)	0.146 (0.646)	0.120 (0.055)**
Debt asset ratio	-0.435 (0.100)***	0.043 (0.159)	0.047 (0.079)	-0.315 (0.257)	0.032 (0.169)
Tangible	-0.402 (0.217)*	0.229 (0.134)*	0.073 (0.279)	-0.004 (0.222)	-0.135 (0.173)
Other characteristics					
Population density	-0.211 (0.121)*	-0.112 (0.083)	0.168 (0.126)	0.204 (0.099)**	0.231 (0.104)**
Constant	1.424 (0.789)*	0.503 (0.194)***	-0.667 (0.221)***	-0.854 (0.491)*	-4.100 (0.665)***
Diagnostics					
No. of observations	859	859	851	851	859
Pseudo R-squared	0.115	0.047	0.106	0.055	0.141

Region and industry dummies are included in all specifications
Robust standard errors within brackets
***, **and * indicate statistical significance at 1, 5 and 10%, respectively

Determinants of multiple banking relationships

Table 5 shows the regression results for the determinants of whether the firm exhibits multiple banking relationships and the number of such relationships. In both the ordered Logit and Poisson regression models, we run the model with and without the main bank ownership variables in order to enable us to ascertain if bank ownership affects bank fragility, since it is likely to differ across ownership types (e.g., state-owned banks are unlikely to terminate relationships due to bank distress). The results suggest that the coefficient on CRAR is negative when bank ownership is included, supporting the fact that multiple banking relationships are lower in case the bank is adequately capitalized. Additionally, the main bank ownership variable is statistically significant and the inclusion of these variables improves the preudo-R^2 significantly.

Table 5: Determinants of Multiple Banking Relationships

	Ordered Logit			Poisson		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Firm characteristics						
Ln asset	1.078		1.099	0.319		0.319
	(0.098)***		(0.095)***	(0.016)***		(0.014)***
Ln sales		0.738			0.263	
		(0.092)***			(0.019)***	
Ln age	0.030	0.109	0.004	-0.032	0.011	-0.026
	(0.132)	(0.126)	(0.137)	(0.030)	(0.029)	(0.027)
Business group	1.467	1.008	1.082	0.356	0.251	0.219
	(0.675)**	(0.607)*	(0.557)**	(0.130)	(0.140)*	(0.096)***
Firm ownership						
Foreign	1.316	0.407	0.858	0.308	0.072	0.186
	(0.695)**	(0.637)	(0.609)	(0.138)***	(0.147)	(0.110)*
Private	1.488	0.786	1.090	0.371	0.218	0.251
	(0.687)**	(0.621)	(0.584)*	(0.139)***	(0.147)	(0.105)***
Firm performance						
RoA	-0.458	-2.474	-0.230	-0.335	-0.926	-0.242
	(0.702)	(0.877)***	(0.732)	(0.151)***	(0.215)***	(0.145)*
Leverage	0.193	0.372	0.201	0.081	0.147	0.082
	(0.186)	(0.211)*	(0.171)	(0.034)**	(0.043)***	(0.033)***
Tangible	0.607	0.214	0.459	0.046	-0.037	0.026
	(0.229)***	(0.258)	(0.238)**	(0.061)	(0.073)	(0.054)
Main bank characteristics						
Ln total asset	-0.462	-0.481	-0.638	-0.104	-0.112	-0.158
	(0.068)***	(0.075)***	(0.108)***	(0.015)***	(0.095)***	(0.023)***
CRAR	-0.017	-0.024	-0.009	-0.005	-0.007	-0.004
	(0.014)	(0.023)	(0.003)***	(0.002)**	(0.004)*	(0.001)***
NPL	0.019	-0.012	0.021	0.004	0.0004	0.007
	(0.009)**	(0.018)	(0.010)**	(0.002)*	(0.0003)	(0.003)**
Main bank ownership						
SBI group			-1.406			-0.565
			(0.634)**			(0.150)***
Nationalised			1.764			0.421
			(0.502)***			(0.110)***
New Private			0.826			0.055
			(0.513)*			(0.116)
Foreign			0.652			0.109
			(0.481)			(0.104)
Other characteristics						
Number of banks	0.005	0.0007	0.004	0.002	0.001	0.003
	(0.006)	(0.005)	(0.005)	(0.001)*	(0.002)	(0.001)**
Population density	-0.106	-0.046	0.008	-0.028	-0.013	-0.005
	(0.146)	(0.134)	(0.141)	(0.031)	(0.029)	(0.029)
Constant				1.413	1.167	0.892
				(0.286)***	(0.327)***	(0.291)***
Diagnostics						
No. of observations	859	849	859	859	849	859
Pseudo R-square	0.223	0.192	0.291	0.197	0.171	0.231

Region and industry dummies are included in all specifications

Robust standard errors within brackets
***, **and * indicate statistical significance at 1, 5 and 10%, respectively

We first test whether multiple banking is more likely when the firm's main bank is state-owned. The coefficient on the main bank ownership dummy, when significant, is negative for SBI group and positive for nationalized banks, suggesting that SBI group is less likely to exhibit multiple banking relationships, whereas it is exactly the opposite for nationalized banks. This is true both in the logit as well as in the Poisson specification. This provides evidence to the fact that the two types of banks tend to have different relationships. Evidence also tends to suggest that the new private banks tend to exhibit multiple banking relationships.

Turning to the other hypotheses of multiple banking, we test the effects of firm characteristics. The results suggest that larger firms, defined in terms of either assets or sales, are more likely to have multiple relationships. This may reflect a greater need for multiple banks to provide additional services, and a lesser need for strong exclusive relationships to address information problems. Finally, the positive coefficient on the *business group* variable across both specifications suggests that business groups are likely to exhibit multiple banking relationships.

In the logit regressions, the coefficient on RoA is negative and significant. This indicates that better-performing corporates are less likely to have multiple banking relationships; even in the Poisson estimates, the negative coefficients on RoA indicates the number of bank relationships are lower for profitable corporates. In addition, the positive sign on *leverage* across most specifications is consistent with *a priori* expectations that firms with relatively high proportion of external debt are likely to exhibit multiple banking relationships. Finally, it seems that asset tangibility is an important consideration for firms to forge multiple banking relationships, since greater asset tangibility suggests that the firms is less informationally opaque, increasing the likelihood of multiple bank-firm relationships.

Second, we examine whether foreign-owned firms are more likely to have multiple relationships. The coefficient on both the Indian private as well as the foreign-owned dummy, when significant, bears a positive sign. In other words, both foreign-

owned as well as Indian private firms are more likely to have multiple banking ties, presumably in order to overcome the possible financial fragilities of the main bank.

Third, we test the net effect of the number of banks in the market to examine if the effect of mitigating market power *versus* convenience effect dominates. The coefficient is positive in the Poisson regressions. This suggests that in case of multiple banking relationships, it is convenience effect that is important for corporates.

Finally, we test whether firms with financially main banks are more likely to have multiple banking relationships. The complete specification that includes soundness and fragility indicators of main bank is consistent with this hypothesis. The coefficient on the main asset *ln asset* and *CRAR* are negative and significant, while that on *NPL* is positive, consistent with the use of multiple relationships as a hedge against the possible loss of services from fragile main banks.

Cost of banking relationships

The final aspect of the study explores the costs of banking relationships. Table 6 reports the results. We first examine whether the costs of banking relationships are higher for established firms with business group connections. The results support both hypotheses. The coefficient on *Ln age* is negative and statistically significant, even when bank ownership dummies are included, while that on *business group* is negative and significant across all specifications. In other words, the costs of bank-firm relationships are lower for older firms, belonging to business groups.

Second, we examine whether it is the foreign- or Indian private corporates which face lower borrowing costs. The results indicate that the costs of borrowing are lower for foreign corporates. By virtue of their ability to access to cheaper foreign currency resources from their host company, these firms are able to bargain for a lower price on bank debt.

Third, across all specifications, the coefficient on *RoA* is negative and statistically significant while the *leverage* variable is positive and statistically significant. In other words, profitable, low-leveraged corporates encounter low borrowing costs.

The full specification includes main bank ownership groups to ascertain the differential borrowing costs across corporates. The negative and significant coefficient

on the nationalized and new private bank suggests that the costs of banking relationships are lower for firms associated with these bank groups.

Fourth, we test whether main bank characteristics affect the cost of the banking relationships.[6] The results indicate that corporates with smaller main bank and low CRAR are likely to face higher borrowing costs. In the full specification however when bank ownership groups are included, both bank asset and CRAR lose their significance. Instead, it seems that banks' asset quality become dominant. In particular, higher the NPL of the main bank, higher is the cost of borrowing encountered by firms, suggesting that banks might be passing of some of these costs to firms.

Table 6: Determinants of Cost of Banking Relationships

	Weighted least squares		
Firm characteristics	Model 1	Model 2	Model 3
Ln asset	2.631 (0.866)***		0.235 (0.320)
Ln sales		0.289 (0.322)	
Ln age	-2.787 (1.399)**	-1.641 (0.588)***	-1.543 (0.568)***
Business group	-4.010 (2.250)*	-3.268 (0.997)***	-2.953 (0.952)***
Firm ownership			
Foreign	-4.224 (3.247)	-5.089 (1.398)***	-4.277 (1.397)***
Indian private	1.964 (3.682)	3.142 (2.023)	3.471 (2.895)
Firm performance			
RoA	-3.885 (1.271)***	-2.012 (0.873)***	-2.076 (0.785)***
Leverage	5.529 (2.562)**	1.835 (0.555)***	1.838 (0.546)***
Tangible	-1.105 (2.629)	-0.75 (1.145)	-0.638 (1.098)
Main bank characteristics			
Ln bank asset	-2.617 (0.808)**	0.479 (0.383)	0.745 (0.475)
CRAR	-0.701 (0.332)**	0.046 (0.142)	-0.020 (0.165)
NPL	0.356 (0.273)	0.063 (0.121)	0.282 (0.144)**
Main bank ownership			
SBI group			-2.645 (1.882)
Nationalized			-1.902 (1.095)*
New Private			-4.345 (1.648)***
Foreign			2.119 (1.905)
Other characteristics			
Population density	-3.503 (1.432)***	0.557 (0.529)	0.461 (0.563)
Number of bank firm relationships	0.103 (0.448)	-0.177 (0.089)**	-0.153 (0.092)*
Constant	2.938 (1.489)**	1.357 (4.809)	4.094 (4.881)
No. of observations	812	812	812
R-square	0.796	0.853	0.857

Region and industry dummies are included in all specifications
Robust standard errors within brackets
***, **and * indicate statistical significance at 1, 5 and 10%, respectively

Finally, the results indicate that the number of bank firm relationships influences the cost of banking relationships. The coefficient on this variable is negative and significant in 2 of the 3 specifications. In other words, when bank ownership

considerations are included, the multiple banking relationships lowers borrowing costs, suggesting a lowering of market power on part of banks. More specifically, for a new bank granting credit, the interest rate charged by each bank declines by roughly 15-18 basis points. This is supportive of D'Auria *et al.* (1999) who uncover a negative relationship between the interest rate on loans and the number of banking relationships for bank-firm relationship over the period 1987-94 in Italy.

VI
Concluding Remarks

Research suggests that in the face of informational asymmetries, banking relationships are an important tool for mitigating such problems. The literature on multiple banking relationships implies that such relations might arise because a single bank is unable to fulfill all of the firm's financial needs. Studies on bank ownership are consistent with the hypotheses that foreign-owned, state-owned and private banks may vary significantly in terms of performance, their ability to process information and their consequent effects on economic growth.

All of these issues are of considerable policy concern in developing nations, more so because financial markets in such countries are characterized by significant informational asymmetries. We address these research and policy concerns by formulating and testing a number of hypotheses about the links between bank ownership type and banking relationships using India as a case study.

In terms of research implications, the findings clearly suggest that more research is needed on the links between bank ownership type and bank firm relationships. With regard to policy implications, the results are a pointer to the fact that despite the differences in their history and governance structures, both categories of state-owned banks (SBI group and nationalized) have been playing a niche role in providing relationship banking to listed corporates.

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Notes

The views expressed and the approach pursued in the paper reflects the personal opinion of the author.

1. **In addition to bank established in India under the charters of the East India Company, a number of foreign banks with head offices abroad had been carrying on business in India. The most important of these originated from England, established under Royal Charters or English Acts.**

2. Between 1951 and 1965, the total number of branches of commercial banks increased from 4151 to 6133.
3. In case the main bank is a merged entity, we consider the financial variables of the bank with which the entity has been merged to be the main bank.
4. Survey results covering over 1000 firms across 20 European economies reported by Ongena and Smith (2000) suggest that the mean number of firm-bank relationships is 5.6, varying from an average (high) of 15.2 in Italy to a low of 2.3 in Norway. Less than 15% of the sample firms report single bank relationship.
5. Owing to missing data on several variables, in the regressions, the total number of observations varies around 800.
6. It is likely that firms with high interest payments are likely to exhibit lower RoA. To address this endogeniety, we employ the instrumental variable regression procedure where we first regress RoA on all exogenous variables and subsequently, employ the predicted value of RoA among the regressors.

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