The Effects of Bank Ownership Type on Banking Relationships and Multiple Banking in Developing Economies Detailed Evidence from India

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Abstract

There is extensive research on banking relationships, multiple banking, and bank ownership types – foreign-owned, state-owned, and private, domestically-owned banks. However, no prior studies to our knowledge have directly tested the abilities of these ownership types to provide the main banking relationship or second banking relationship with firms, or investigated the effects of these ownership types in determining whether firms have multiple banking relationships. There are also very few studies of banking relationships and multiple banking issues in developing nations. We address these issues using data on Indian firms, banks, and their relationships. India is an important developing economy and our findings may be representative of other developing economies, where banking relationships tend to play key roles in mitigating financial market imperfections. Our hypothesis tests yield a number of interesting findings that suggest that the different bank ownership types have important effects on bank-firm relationships with several research and policy implications.

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1. Introduction

A number of important policy and research issues concern the relationships of banks with nonfinancial firms. Theory suggests that such relationships may play key roles in resolving information problems and mitigating financial market imperfections more generally, and empirical analysis has shown important benefits from strong banking relationships. Much of the research focus is on the comparative advantages of banks of different sizes in relationship banking, with a typical finding that large banks are better at transactions lending technologies based on "hard" quantitative information and small banks are superior at relationship lending based on "soft" qualitative information.

A significant research agenda has also emerged on multiple banking relationships. Multiple relationships may be an efficient outcome when one bank cannot serve all of a firm's needs. Firms may also add relationships as defense mechanisms to protect themselves against the potential exercise of market power by a single bank with proprietary information or when the fragility of their main bank threatens a premature withdrawal of services. In these cases, multiple relationships may be inefficient because the banks are essentially providing the same service and potentially duplicating costs, and may underinvest in due diligence because the benefits are shared.

The literature has also evaluated the comparative advantages of different bank ownership types – foreign-owned, state-owned, and private, domestically-owned banks – in providing services to different categories of firms. To our knowledge, however, existing studies have not directly addressed the potentially important role of bank ownership type on bank-firm relationships. In particular, the literature has not specifically tested the abilities of different ownership types in providing the main or second banking relationship with firms, or investigated the effects of these ownership types in determining whether firms have multiple banking relationships. In addition, very few of the studies of bank-firm relationships and multiple banking issues are applied to data on developing nations, where relationships may be particularly important because of financial system inadequacies and fragility.

This paper directly addresses these previously unexplored issues. We estimate models of the determinants of the bank ownership type of the main and second relationship of firms and of whether they have multiple banking relationships. We use these models to test hypotheses about the impact of bank ownership type on relationships in an important developing nation.

We use an unusually informative data set on Indian firms, banks, and their relationships. India is one of the largest and fastest growing developing countries and our findings may be representative of the role of bank ownership type in other developing economies. Banking relationships are generally more important in developing nations because public capital markets are typically underdeveloped, legal and regulatory infrastructures to protect creditors are frequently lacking, and banks and financial systems are often financially fragile. Research on banking relationships has generally focused on the effects on small and medium enterprises (SMEs), but firms of all sizes in developing nations often need strong banking relationships or multiple banking relationships to protect their access to financial services. The effects of different bank ownership types are also likely to be of particular significance in developing nations because of large shares of foreign-owned and state-owned in these nations.

The hypotheses tested regarding main bank relationships include which ownership type has a comparative advantage in serving as the main bank for opaque firms with limited access to nonbank external funding sources. We also examine whether foreign-owned and state-owned banks have comparative advantages in serving as the main bank for foreign-owned and state-owned nonfinancial firms, respectively. In addition, we test whether two types of state-owned banks in India tend to act as the main bank for the same or different types of firms and whether these relationships are consistent with their mandates to serve rural and small firms.

The hypotheses tested regarding multiple banking relationships include whether multiple banking occurs more often when the firm's main bank is foreign. This may come about because of the weak ties to the developing nation that cause firms to add relationships to defend against potential withdrawal of services. Foreign banks may also be associated with multiple banking because of disadvantages in processing local soft information – they may use established relationships with other banks as indicators of firm quality. Another hypothesis tested is that firms with state-owned main banks may be relatively unlikely to have multiple relationships. Bank fragility and withdrawal of services may be of less concern with these institutions, and state-owned banks often provide subsidized services and provide credit to firms that would not qualify using private-sector standards. Thus, it may be less likely that firms with a state-owned main bank would seek a second relationship or that other banks would provide it.

Finally, we test hypotheses regarding the bank ownership type for the second relationship, given

that a firm has multiple relationships. We investigate whether firms tend to have the same bank type for the second relationship as for their main relationship versus diversifying to a different type. Use of the same bank type may reflect inefficient duplication of services to thwart the exercise of market power or premature withdrawal of services. Firms might also use the same bank type for their second relationship because banking markets may be partially segmented – e.g., firms that are state-owned and/or poor performers may not qualify for relationships with privately-owned banks. If firms instead diversify to a different bank type, it may reflect a complementarity in which different bank ownership types tend to provide different services – e.g., foreign-owned banks may supply international services, one of the three domestic ownership types may deliver domestic services. We also examine whether any one bank ownership type tends to act as second bank to offset problems of main bank fragility.

In addition to these hypotheses on bank ownership and relationships, we test several secondary hypotheses regarding the determinants of main and second bank relationships and multiple banking. For example, we investigate whether the conventional motives for multiple banking given in the literature hold when main bank ownership type is included in the regression models.

Our Indian data set provides an excellent opportunity to test the different hypotheses, as it matches information on firms, banks, and their relationships with the data on local market conditions. It has a mix of bank ownership types, foreign-owned, state-owned, and private, domestically-owned banks. The data also provide an interesting natural experiment in terms of comparing the relationship behavior of state-owned banks with different governance and history. Specifically, we compare the State Bank of India (SBI) and its associates, established in the 1950s with a substantial rural footprint versus more recently nationalized large banks that are managed as corporate entities with private-sector board representation that retained some prior management, staff, and relationships with large firms after nationalization.

The data set includes information for 3,423 nonfinancial firms for the year 2001 from the Centre for Monitoring Indian Economy (CMIE). The firms are either listed on a national exchange or have sales or assets exceeding the equivalent of about US $4 million. The data include measures of firm opacity, access to external finance, ownership type, performance, and sector; and the identities of the banks with which these firms have relationships. These data are matched to information from the central bank on

almost all commercial banks in the country, including 46 foreign-owned banks, 8 SBI and its associated state-owned regional banks, 20 formerly large private banks that were later nationalized, and 36 private, domestically-owned banks.[1] For convenience, we simply refer to these types as foreign, SBI, nationalized, and private, respectively. The bank data includes both ownership type and measures of financial fragility.

The main empirical analysis consists of three models to test hypotheses regarding bank ownership types and firm-bank relationships. In particular, we model the determinants of the ownership type of the firm's main and second bank, and we examine the factors explaining whether the firm has multiple banking relationships and the number of them. These are reduced form models that embody the preferences and needs of the firms, the comparative advantages of the different types of banks in meeting these needs/preferences, and the local market characteristics.

The first model examines the determinants of the ownership type of the firm's main bank among the four types, foreign, SBI, nationalized, and private, to test the hypotheses given above regarding the comparative advantages of these ownership types in acting as the main bank for different kinds of firms. The exogenous variables include the measures of firm opacity and access to external finance, firm ownership type, performance, sector, and the characteristics of the local market. The results suggest that private banks may have a comparative advantage in providing the main relationship for opaque firms; that foreign- and state-owned banks have comparative advantages as the main bank for foreign- and state-owned firms, respectively; and that SBI and nationalized banks act as the main bank for somewhat different firms. The findings also suggest that the relationships for both types of state-owned banks may not be consistent with their mandates to serve rural and small firms, although an important caveat to this last finding is that our data set does not have information on the smallest firms.

The second model analyzes the determinants of whether the firm has multiple banking relationships and the number of relationships to test the hypotheses about the effects of bank ownership type on multiple relationships. In addition to the other firm and market characteristics, we include measures of the number of banks in the local market – which may proxy for either market power or

[1] Our sample excludes regional rural development banks (RRBs) – state-owned development finance vehicles that make microloans to the rural poor – that do not have relationships with the firms in our sample.

convenience – and measures of the fragility and ownership type of the main bank. The results are consistent with the hypotheses that firms with foreign-owned main banks are more likely than other firms to have multiple banking relationships; and those with state-owned SBI banks as their main banks are relatively unlikely to have more than one bank. However, the findings for firms with state-owned nationalized banks are mixed, again suggesting that the two types of state-owned banks tend to have different bank-firm relationships. The results also provide limited support for two of the conventional motives given for multiple banking – providing different services to large, complex firms and insurance against the fragility of a firm's main bank.

The third model investigates the determinants of the ownership type of the firm's second bank – corrected for having multiple relationships – to test the hypotheses regarding the role of ownership type for the second bank. We again include firm and market characteristics, and measures of the fragility and ownership type of the main bank. The findings suggest that most firms tend to have the same bank ownership type for the main and second relationships. However, firms with foreign main banks often have nationalized second banks, consistent with some complementarity between these two ownership types. We also find that no particular bank type is used to offset main bank fragility.

The remainder of the paper is organized as follows. Section 2 reviews the literature on banking relationships, multiple banking, and bank ownership types. Section 3 provides an overview of the Indian banking sector. Section 4 presents the empirical methodology. Section 5 discusses the data set and provides summary statistics. Section 6 presents the empirical results and Section 7 concludes.

2. Literature review on banking relationships, multiple banking, and bank ownership type

Banking relationships

Relationships are among the most powerful tools banks employ to gather information from their customers. A strong relationship with a business customer often involves continuous contact over a number of years, and the supply of multiple services, including the extension of credit, the provision of deposit services, and other financial services. In some cases, the bank may also gather information through relationships with the firm's owners, managers, clients, suppliers, and others in the firm's local community. The information may be acquired from the history of monitoring, repayment, and

renegotiation on credit products, the balances and transactions activity on deposit accounts, the observation of the character and reliability of the owners and managers, and the communication of local demand and supply conditions from the firm's clients, suppliers, and community members. Over the course of the relationship, the bank uses the information from these sources in deciding whether, when, and how much credit and other services to extend; choosing the best combinations of interest rates, collateral, covenants, and other contract terms; and determining the most advantageous monitoring and renegotiation strategies.[2]

Although banking relationships is a general topic, much of the literature focuses on the issue of relationship lending to informationally opaque SMEs and almost all of the empirical evidence is based on data from developed nations. Relationship lending to these firms is based significantly on soft qualitative information – including assessments of owner and manager character/reliability, and loan officer judgment about future prospects for the firm – gathered through personal contact over time by the loan officer with the SME, and the relevant individuals noted above. The relationship information is generally proprietary to the bank – no other institutions have access to the information. To a significant degree, the information may be proprietary within the bank to the loan officer because the qualitative nature of the soft information means that it may not be easily observed by, verified by, or transmitted to bank managers. In contrast, transactions lending technologies – such as financial services lending, small business credit scoring, and asset-based lending – are based primarily on hard quantitative information gathered from sources such as audited financial statements, credit scores from external vendors, and data collected on accounts receivable or other collateral, respectively. This hard information may be relatively easily observed by, verified by, and transmitted to others in the bank, and in most cases can be replicated by other banks if the borrower applies for credit elsewhere.[3]

The literature has often keyed in on the comparative advantages of banks of different sizes in lending to SMEs, with both the theory and empirical evidence pointing to an advantage for large banks in transactions lending technologies, while small banks tend to excel in relationship lending. These

[2] For more complete reviews of the banking relationship literature, see Berger and Udell (1998) and Boot (2000).
[3] While transactions technologies are often considered to be superior for dealing with transparent borrowers, in some cases, these technologies may also be as good as or better than relationship lending at dealing with opacity problems, particularly small business credit scoring and asset-based lending (Berger and Udell 2005).

comparative advantages may stem from economies (diseconomies) of scale in the processing and transmission of hard (soft) information (e.g., Stein 2002), managerial agency problems caused by some of the soft information being proprietary to the loan officer that require a closely-held organizational structure (e.g., Berger and Udell 2002), and Williamson-type (Williamson 1988) organizational diseconomies in large banks with using transactions technologies for large businesses along with relationship lending to SMEs. The empirical research supporting these comparative advantages includes findings that large banks base lending decisions more on financial ratios than on prior relationships (e.g., Cole, Goldberg, and White 2004) and that large banks tend to have temporally shorter, less exclusive, less personal, and longer-distance associations with SMEs (e.g., Berger, Miller, Petersen, Rajan, and Stein 2005).[4]

Because the soft relationship information is generally proprietary to the relationship bank, an exclusive banking relationship for a firm may give rise to a "hold-up" problem and the extraction of rents from the firm (e.g., Sharpe 1990, Rajan 1992). Several key issues arise from this potential effect of market power concerning the extent to which borrowers gain from relationships in terms of improved credit availability or contract terms and the actions that firms take to offset some of the potential extraction of rents.

Some theories suggest that marginally creditworthy borrowers may have improved credit availability from this exploitation of market power, since it allows the bank to enforce long-term implicit contracts in which the borrower receives a subsidized interest rate in the short term, and then compensates the bank by paying a higher-than-competitive rate in a later period (Sharpe 1990). As the market power of the bank increases, firms with progressively lower credit quality may be able to obtain funding (Petersen and Rajan 1995). A number of empirical papers test this theory by measuring the association between credit availability and measures of market power, such as banking market concentration or other restrictions on bank competition (e.g., barriers to entry). The empirical results are mixed, with some finding more credit availability (e.g., Petersen and Rajan 1995, Cetorelli and Gambera 2001) and some finding less availability (e.g., Black and Strahan 2002, Berger, Hasan, and Klapper 2004) when measured

[4] A significant caveat to this literature is that the lending technology is usually not observed, but is inferred from the loan contract terms or the characteristics of the SME receiving the credit (Berger and Udell 2005).

market power is relatively high.

Some have also examined the issue of whether firms with stronger banking relationships generally have more credit availability or more favorable credit contract terms. Relationship strength is usually measured by its length, breadth, or whether the lending bank is the firm's main relationship bank (e.g., its "hausbank" in Germany). Some of the theories predict that contract terms such as interest rate and collateral requirements become easier for firms as a relationship matures (e.g., Boot and Thakor 1994, Petersen and Rajan 1995), whereas others predict that terms become tougher over the course of the relationship (e.g., Greenbaum, Kanatas, and Venezia 1989, Sharpe 1990).

The empirical literature fairly consistently has found more favorable treatment of firms with stronger banking relationships. Studies of measures of credit availability, such as higher loan application acceptance or less dependence on expensive trade credit are consistent with the notion that banking relationships facilitate access to financing (e.g., Petersen and Rajan 1994,1995, Cole 1998, Elsas and Krahnen 1998, Harhoff and Körting 1998, Machauer and Weber 2000). The empirical research is also consistent with improved loan contract terms, such as lower interest rates and collateral requirements when relationships are stronger (e.g., Berger and Udell 1995, Harhoff and Körting 1998, Scott and Dunkelberg 1999, Degryse and van Cayseele 2000).[5]

Multiple banking relationships

The existing research refers to three main motivations for multiple banking relationships. First, multiple relationships may arise when one bank cannot provide all the needs of a firm. This may be expected to occur when the firm is large, complex, and geographically dispersed, requiring more types of services in more locations. Multiple relationships may arise, for example, when the firm's main bank is too small or concentrated to diversify the firm's risks; when the firm needs domestic and international services and the main bank has sufficient expertise in only one of these categories; or when the firm's main bank does not have offices in all the localities where the firm needs services..

Second, firms may seek multiple banking relationships to mitigate the hold-up problem of a

[5] Studies of large, traded firms also find that banking relationships add value by showing that the announcement of bank loan agreements have a positive effect on firm stock prices (e.g., James 1987, Lummer and McConnell 1989, James and Wier 1990, Billet, Flannery, and Garfinkel 1995) A related literature also finds that announcements on the health of the main bank have a significant effect on firm stock prices (e.g., Slovin, Sushka, and Polonchek 1993, Djankov, Jindra, and Klapper 2005).

single relationship bank discussed above (e.g., Von Thadden 1995, Boot 2000). This incentive may be greater when banking markets are less competitive, offering fewer potential alternatives in the future event that their main bank tightens contract terms dramatically.

Third, firms may engage in multiple relationships to insure themselves against a premature withdrawal of credit or other services due to the distress of their bank, rather than any deterioration in their own creditworthiness (e.g., Detragiache, Garella, and Guiso 2000). This incentive is greater, the more financially fragile is the firm's main bank. By maintaining additional relationships, the firm can increase the likelihood that at least one informed bank would be able to continue providing services, reducing the costs of bankruptcy or financial distress for the firm.

All three motives may create strong incentives for multiple relationships in developing economies. Banks in these nations often have limited abilities to provide services; there may be significant market power because bank competition is frequently restricted; the banks are commonly financially fragile and the firms may often be in poor condition and cannot bear the costs of losing access to their main source of external finance. As discussed, multiple banking may be an efficient solution to providing the full range of services needed by the firm, but may alternatively result in inefficient duplication of costs and underinvestment in due diligence when it is used for mitigating problems of market power or bank fragility. Notably, all of the motives may also be blunted for small, opaque firms because these firms more often require the informational benefits of an exclusive banking relationship and because these firms may not be able to bear the duplicative costs of multiple relationships.

There is a growing empirical literature on the determinants of multiple banking (e.g., Houston and James 1996, Detragiache, Garella, and Guiso 2000, Machauer and Weber 2000, Ongena and Smith 2000, Berger, Klapper, and Udell 2001, Farinha and Santos 2002, Berger, Miller, Petersen, Rajan, and Stein 2005). Most of these studies focus on developed nations, such as the U.S., Italy, and Germany. These studies generally find that likelihood of multiple banking relationships or the number of these relationships increases with firm size.[6] This is consistent with the first motive discussed above that their main bank cannot fulfill all their needs, given that large firms more often are in many localities, require

[6] In some cases, these studies measure the number of lending relationships, rather than the more inclusive concept of banking relationships employed here.

domestic and international services, are complex, and may impose more risk than their main bank is willing to bear.[7] However, the firm size result is also consistent with possibility noted above that small firms more have exclusive relationships to resolve information problems and/or avoid duplicative costs of multiple relationships.

Regarding the second motive, there is evidence that large U.S. firms not only engage in multiple banking relationships in order to offset the hold-up problem, but they also reduce the control of their main banks by issuing public debt at higher costs (Houston and James 1996). A cross-country study finds that firms maintain a higher number of banking relationships in countries with unconcentrated banking sectors, contrary to the theoretical predictions (Ongena and Smith 2000).

Regarding the third motive, there is information on the effects of bank fragility and the costs to firms of losing their main banking relationship, but some of the evidence is also conflicting. One study using German data finds that borrower quality – which should be a proxy for the ability of the firm to recover in the event of the cutoff of bank funds – has no impact on the number of banking relationships (Machauer and Weber 2000). However, a study using Italian data finds that the number of banking relationships is higher for firms with more leverage, suggesting lower quality, consistent with the third motive (Detragiache, Garella, and Guiso 2000). Regarding the financial fragility of the bank, the Italian study also finds that those borrowing from banks that are prone to financial distress – measured in terms of the bank's size, volatility of liquidity, and nonperforming loans – are likely to maintain a larger number of banking relationships, consistent with the motive for multiple banking as insurance against the premature termination of services. A study of Argentine banks similarly finds that bank fragility has a positive impact on the likelihood that a firm will borrow from multiple banks (Berger, Klapper, and Udell 2001). However, the cross-country study finds mixed support in this regard. It finds that firms maintain a higher number of banking relationships in countries with inefficient judicial systems and poor enforcement of property rights, consistent with the theory, but also finds more banking relationships in nations with more stable banking systems (i.e., with better bank credit ratings), contrary to the predictions

[7] Also consistent with the first cause, one study finds that firms that are foreign affiliates of multinational corporations often choose a domestically-owned bank for their cash management services (Berger, Dai, Ongena, and Smith 2003). Presumably, these firms are often using their home nation bank for some other services, although that study did not have data on the firm's use of other banks.

(Ongena and Smith 2000).

Comparative advantages of bank ownership type

As noted, we are not aware of any studies that directly examine the effects of bank ownership type of the bank on our relationship questions and hypotheses. However, there are a number of studies on the comparative advantages of foreign-owned and state-owned banks relative to private domestically-owned banks. These are relevant to what the abilities of these banks may be in main or second banking relationships and whether firms with main relationships at these types of banks may engage in multiple banking relationships.

Foreign banks may have comparative advantages in serving the local affiliates of home-country-based multinational firms or other firms needing expertise in international markets. These institutions may also have superior abilities to diversify risks, and may have better access to transactions technologies for handling hard information. However, foreign banks may also have disadvantages due to weak ties to an individual developing nation, reducing confidence that these institutions will provide services in times of national distress. In addition, these banks may have relatively poor knowledge of local conditions, and have difficulty processing local soft information. These potential problems may be particularly acute when the home nation of the bank is geographically distant, and has a very different culture, market system, regulatory environment, and/or language, creating additional filters that make it difficult to observe, verify, and transmit soft information.

The extant research generally suggests that the advantages of foreign banks often outweigh the disadvantages in developing nations in terms of bank performance. Foreign ownership is often associated with greater efficiency (e.g., Claessens, Demirguc-Kunt, and Huizinga 2001, Bonin, Hasan, and Wachtel 2004); more competitive national banking systems (e.g., Claessens and Laeven 2004, Martinez Peria and Mody 2004); and more business credit availability (e.g., Clarke, Cull, and Martinez Peria 2002, Berger, Hasan, and Klapper 2004, Bhaumik and Piesse 2004). Other literature shows that foreign banks provide a greater share of total funds in countries with stronger creditor rights and legal enforcement and less government ownership of banking assets (Esty 2004) and in countries with smaller cultural and geographical "distances" between the foreign bank headquarters and local branches (Mian forthcoming).

State-owned institutions typically operate with government subsidies, which yields an operational

advantage over privately-owned banks. However, the lack of market discipline could more than offset the advantage and result in inefficient management. State-owned banks generally have mandates to engage in directed lending at subsidized prices or pursue objectives such as developing specific industries or regions. These mandates require caution in evaluating performance, given that these banks are not trying to maximize value or profits as privately-owned banks do.

The empirical research literature on state ownership in developing nations generally finds unfavorable effects. Individual state-owned institutions have relatively low efficiency and high nonperforming loans, and large market shares for state-owned banks are associated with reduced access to credit, diminished financial system development, and slow economic growth (e.g., La Porta, Lopez-de-Silanes, and Shleifer 2002, Barth, Caprio, and Levine 2004, Beck, Demirguc-Kunt, and Maksimovic 2004, Berger, Hasan, and Klapper 2004, Berger, Clarke, Cull, Klapper, and Udell 2005). In some cases, they have also been found to subsidize or direct credit for political purposes (e.g., Cole 2004, Sapienza 2004) or lend mostly to large firms (e.g., Francisco and Kumar 2004). The low efficiency and high nonperforming loans are not necessarily contrary to the objectives of state-owned banks that are mandated to subsidize some negative net present value projects. However, the generally reduced access to credit, diminished development, slow economic growth, and focus on large firms do not appear to be consistent with their mandates.

3. The Indian banking sector

We distinguish among four categories of banking institutions identified by the Reserve Bank of India (RBI): *Foreign-owned banks* that entered after 1990 and operate local branches, the state-owned *State Bank of India* (*SBI*) formed in 1955 and its associates; *nationalized banks* that were formerly private large banks and became state-owned in two waves, 1969 and 1980, and *private Indian banks* mostly created after 1990.

Following independence in 1945, the RBI was formed as the central bank and the government set out to increase credit to rural areas and small businesses. In 1955, the government took over the largest bank, the Imperial Bank of India, to form the state-owned State Bank of India (SBI). The State Bank of India Act in 1959 directed SBI to take over regional banks that were associated with local governments

and make them subsidiaries of SBI, which were later named "associates." SBI is now the largest commercial banking organization in the country – and one of the largest in the world. SBI and its seven regional associates have a substantial rural branching footprint – of about 14,000 branches of these banks, 74% are located in rural and semi-urban areas (India Banking Yearbook 2003).

The government continued to face pressure to extend bank lending to agricultural and small business sectors, which led to the decision to nationalize 14 large banks in 1969 and another 6 banks in 1980 to redirect credit to "underserved" sectors and populations. Unlike SBI, nationalized banks remained corporate entities and retained most of their management and staff. Although their boards of directors were replaced by the state, appointees included representatives from both the government and private industry (Banerjee, Cole, and Dufflo 2004). RBI continued to fix interest rates on loans, and a significant portion of nationalized banks' deposit bases were redirected to support government expenditures through statutory measures that required banks to maintain specified fractions of their total deposits as cash balances with RBI and additional fractions in government and quasi-government securities. However, the nationalized banks continue to the present day to maintain relationships with large firms begun prior to nationalization.

In our empirical analysis, we distinguish between the two state-owned bank categories to test the effects of their differences in governance and history on their relationship behavior. That is, we test the effects of SBI's larger size, rural footprint, and long tenure of government ownership versus nationalized banks' corporate organization, private-sector board representation, retention of management and staff, and maintenance of prior relationships with large firms. We test the combined effects of these differences on whether SBI and nationalized banks tend to have similar or different bank-firm relationships, and whether these relationships are consistent with their mandates to serve small and rural firms.

Banking sector liberalization and deregulation started in the early 1990s as part of a comprehensive reform agenda. This included permission to establish de novo banks and the entry of foreign banks, the deregulation of the expansion of branching networks, and the privatization of some state-owned banks. Between 1994 and 2000, 25 new private banks and 21 foreign banks began operations. Interest rates were also liberalized and banks were permitted to invest in equity. However, all commercial banks are currently still required to make loans to "priority sectors" at below-market rates.

These sectors consist largely of agriculture, exporters, and small businesses. Domestic banks are required to allocate 40% of lending (net bank credit), while foreign banks are required to make 32% of lending to these priority sectors. However, while private banks are required to open branches in rural areas and extend loans to the agricultural sector, foreign banks are exempt (Hanson 2004).

Foreign banks began operating in 1994 under a license to open branches and are permitted to take deposits and provide credit in accordance with local banking laws and RBI regulations. Foreign banks have generally not purchased shares of local Indian banks, since foreign banks were restricted to a ceiling of 10% of voting rights, even though foreign banks could legally own up to 74% of equity. However, planned revised regulations will allow foreign banks to open 100% capitalized wholly-owned subsidiaries in India. Foreign banks have typically focused their operations in the top 25 cities in the country, likely due in part to restrictions on branch expansion.[8] The foreign banks generally use more modern equipment, pay higher salaries, and attract better-trained employees (IndiaMart 2004).

Private banks are primarily de novo entrants that were granted banking licenses during the financial liberalization in the early 1990s, plus a small number of incumbent private banks that existed before 1990 and some state-owned institutions that have been successfully privatized. An example of the latter is ICICI, which was formed in 1955 as a state-owned institution at the initiative of the Government of India and the World Bank to create a development financial institution for providing medium-term and long-term project financing to Indian businesses. During the 1990s, ICICI was privatized and evolved into a private, full-service bank and is now India's second largest bank offering a wide range of financial services to retail and corporate customers.

As shown in Table 1, the foreign banks are most numerous, but they have relatively few branches and accounts and also have fewer deposits and assets than the other types. Nationalized banks are the largest type as measured by number of branches, accounts, deposits, and assets. The state-owned banks combined – SBI plus the nationalized banks – dominate the banking sector with about 80% of deposits

[8] Foreign banks currently operate only on a branch license basis under which they are required to keep locally $25 million in capital for the first three branches set up. Further expansion does not require additional capital, but requires RBI approval, which is often difficult to receive.

and assets.

4. Data and Summary Statistics

We match data from nonfinancial firms, the banks with which they have relationships, and information on their local market. The firm data are from *Prowess*, an electronic database produced by the Centre for Monitoring Indian Economy (CMIE). This database includes firms that are required to file annual accounting reports and have submitted reports for at least three years. This comprises: (i) firms that are listed on a national exchange (National Stock Exchange or Bombay Stock Exchange), and (ii) all non-listed public limited companies that have sales or assets more than Rs. 200,000,000 or about U.S. $4.15 million. Prowess includes balance sheet, income statement, and other financial information for over 7,000 firms over time. However, many of these firms are not considered in our analysis either because they are financial institutions or do not report banking relationship information. Prowess also includes information on the ownership type of the firm and the names of the banks with which the firm maintains relationships. The data include up to 26 banks with which the firm has relationships of all types – including lending, deposit, or other types of relationships – listed in order of priority.

We exclude a number of firms from the sample. First, we drop financial firms and firms with missing key financial information, reducing the sample to 4,382 firms. We also exclude 628 firms that do not list a main bank and 313 firms that list a main or second bank with financial institutions that are not regulated by the RBI and hence do not submit audited financial statements to RBI. Thus, we drop firms with relationships with development and co-operative banks, as well as offshore foreign banks, since we do not have comparable bank data (we use only domestic assets and capital of foreign bank branches). Finally, we exclude 18 firms for which the ownership of the firm is either cooperative or undisclosed. These exclusions reduce our sample of firms to 3,423.

Table 2, Panel A shows definitions and summary statistics of all firm characteristics based on the final sample of 3,423 nonfinancial firms with all of the data needed for the regression analyses. The first set of firm variables includes measures of firm size and age to capture firm opacity. We use the firm size classification of the Indian Ministry of Industry (2003): Small and medium sized firms (*SME*) are identified as firms with gross fixed assets less than Rs. 100 million (about US $5.5 million). The SMEs

in our sample generally do not include the smallest firms in India due to the requirements for firms to be included in Prowess. Thus, the sample is significantly skewed towards large Indian firms (excluded from the regression equations as the base case), which comprise 64% of the sample. We also include the natural log of the number of years since incorporation (*Log Age*), but we report the actual average firm age in Table 2. The ages of firms in our sample range from 2 to 178 years, with an average age of 26.57 years. Although we label only these two variables as opacity measures, the other firm characteristics described below for access to external finance and firm ownership may also proxy for opacity.

We include two measures of access to nonbank external finance. We use a dummy for firms that are listed on one of the two national exchanges (*Listed*), 25% of the sample. These firms have access to public equity financing, which may reduce their dependence on banks. Listed firms may also have greater transparency because of exchange disclosure requirements. We also include a dummy for firms that belong to Indian business groups (*Business Groups*), 36% of the sample. These firms may have access to cheaper inter-company loans or be able to use other firms in their group as guarantors.[9]

Our third set of firm variables includes dummies that classify firm ownership, as identified by CMIE. In particular, we distinguish between foreign-, state-, and private, domestically-owned firms (the omitted category). A firm's ownership may affect its access to and need for bank finance. Foreign-owned firms may have cheaper financing overseas or via their parent firm and state-owned firms may secure financing from government agencies (including banks) directly or gain access indirectly by virtue of an implicit government guarantee. In our sample, 89% of firms are privately-owned, 7% are foreign-owned, and 4% are state-owned.

The fourth group of variables measure firm performance. We include return on assets (*ROA*) and the ratio of total debt to total assets (*Leverage*) to control for profitability and indebtedness, respectively. The average ROA is 0.04 and The average leverage ratio is 0.39.[10]

We also include controls for the firm's location and sector in all regressions, but do not display these in the tables. We use dummies for 4 Indian regions (North, East, South, and West) and 7 industry

[9] Prior research finds that firms belonging to diversified Indian business groups outperform unaffiliated firms (Khanna and Palepu 2001).

[10] In some estimations, we also included sales growth but since this variable was never significant and reduced the sample of firms, these estimations are not shown.

sectors (food, textile, chemicals, electronics, machinery and tools and others).[11]

Panel B shows our variables for banking relationships, and the characteristics of the banks in these relationships. To measure banking relationships, we include a dummy that equals one if the firm has multiple (i.e., more than one) banking relationship (*Multiple Banks Dummy*) and a separate variable that records the actual number of banking relationships up to 26 (*Number of Banking Relationships*). About 61% of firms have multiple banking relationships, and the average firm has 2.76 relationships.

Balance sheet information on all regulated commercial banks is from the Accounts of Scheduled Commercial Banks, published by the RBI. We calculate two measures of main bank fragility using this data. We include the log of total assets of the main bank as a measure of size (*Log Assets*). We also compute the capital asset ratio for the main bank, equal to its ratio of equity to total assets (*Capital Asset Ratio*). The average assets and capital ratio of main banks are Rs. 331,042 million **(**US$ 7 billion) and 5.14, respectively.[12]

We also create dummies for the ownership type of the main and second bank, foreign, SBI, nationalized, or private. A majority of firms, 61%, have a nationalized bank as its main bank, 16% have an SBI bank, 12% have a private bank, and 11% a foreign bank. Firms are also more likely to use a nationalized bank as their second bank – 27% of firms have their second relationship at a nationalized bank, 13% each at SBI or a private bank, and 7% at a foreign bank.

Panel C shows the local market characteristics used to account for differences in the local economy and supply of banking services, using the Indian state as the local market. CMIE provides information on each firm's "registered office district," which identifies the main location of firm operations. Sample firms are located in 25 different states. We also use information on the total number of bank branches and the number of foreign branches in the market from the RBI Branch Banking

[11]Approximately 40% of firms in the sample are located in Western India, 30% are in the South, 19% are located in the North and 14% are in Eastern India. In terms of sectors, 22% of firms are in the chemicals and pharmaceutical sectors, 30% are in the electronics and machinery sectors, 15% are in the service industry, 10% are in textiles, and 9% are in the foods sector. The remaining 14% are in the "others" category, which includes glass and ceramics, paper and printing, construction, mining and quarrying; extraction of crude petroleum and natural gas; manufacture of coke; refined petroleum products and nuclear fuel; electricity, gas, stream and hot water supply; manufacture of furniture and manufacturing N.E.C.; hotels and restaurants; diversified; etc.

[12] These averages are for all firm-bank observations in our sample and reflect the frequency with which the banks are reported as the main bank by firms in the sample. The average size of all the commercial banks in our sample (independent of how often they serve as a main bank) is considerably lower, approximately US$ 2 billion.

Statistics (2002). We find that the average local market has 60 banks, ranging from a minimum of 6 for one very small state to a maximum of 68 (*Number of Banks*). In the model for main bank ownership type below, we include a dummy for the presence of at least one foreign bank in the state to proxy for whether the firm has a convenient choice of a foreign main bank. Similarly, in the second bank ownership model, we include a dummy for the presence of at least one 2 foreign banks in the state to proxy for whether the firm has convenient choices of foreign banks for both the main and second relationships. All but one of the 25 states in our sample has at least one foreign bank branch (*At Least 1 Foreign Bank Present*), and all but two states have at least two foreign bank branches (*At Least 2 Foreign Banks Present*). We also use Census India 2001 to collect population density to proxy for rural versus urban areas (*Population Density*). The average population density is 1,250 people per square kilometer, and ranges widely from 100 to 9,290 people per square kilometer in our sample. All data are for 2001.

5. Empirical Methodology

Determinants of main bank ownership type

Our first model tests the effects of firm and local market characteristics in determining the ownership type of the firm's main bank:

Main bank ownership type = f{Firm characteristics, Local market characteristics} *(1)*

The dependent variables are dummies which equal 1 if the main bank is the given ownership type (foreign, SBI, nationalized, or private) and 0 otherwise. Among the firm characteristics, we include measures of firm opacity, access to external finance, ownership type, and financial performance. The estimations also incorporate controls for the location and industry type for each firm. Among the local market characteristics, we include a dummy for the presence of at least one foreign bank in the state (so the main bank may be foreign) and population density. All of these variables are described in Section 4 and shown in Table 2.

We estimate equation (1) two different ways. First, we use separate probit models to estimate the likelihood that the main bank is foreign, SBI, nationalized, or private, each estimated relative to the other

three categories combined. Second, we use a multinomial logit model to determine the likelihood that the main bank is foreign, SBI, or nationalized relative to the private bank category, which is omitted.

We use equation (1) to test hypotheses regarding the comparative advantages of the different bank types in providing relationship services to different types of firms. First, we test which bank ownership types have a comparative advantage in main relationships with opaque firms. Second, we check whether foreign-owned and state-owned banks have comparative advantages in main relationships with foreign-owned and state-owned nonfinancial firms, respectively. Third, we test whether the two types of state-owned banks (SBI and nationalized) tend to have main relationships with the similar or different kinds of firms, and whether these relationships are consistent with their mandates to serve small firms and those in rural areas. As noted above, we distinguish between the two state-owned bank categories to test the effects of their differences in governance and history on their relationship behavior.

Determinants of multiple banking relationships

Our second model investigates the determinants of multiple banking relationships in two ways. First, we use probit estimations to study the probability that a firm has multiple banking relationships as opposed to a single relationship using a dummy for the dependent variable for whether the firm has more than one banking relationship (Multiple Banks). Second, we study the actual number of banking relationships (Number of Banking Relationships) using Poisson equations. In both cases, we assume that multiple banking relationships is a function of firm, local market, and main bank characteristics as illustrated in equation (2):

Multiple Banking (Dummy or Number) = g{Firm characteristics, Local market characteristics, Main bank characteristics} *(2)*

The firm characteristics in equation (2) are identical to those in equation (1). The local market characteristics differ in two ways. First, we exclude the dummy for the presence of at least one foreign bank, which is not necessary for multiple banking – all states have at least two banks of some types

available. Second, 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. Alternatively, these markets may encourage multiple banking because additional banks are more conveniently located.

Among the main bank characteristics, we include measures of financial fragility and ownership type of the main bank. Importantly, while the literature has included firm and market characteristics and measures of bank fragility, no prior study of multiple banking has included bank ownership type to our knowledge.

We use equation (2) to test whether multiple relationships are more likely when the firm's main bank is foreign-owned and less likely when its main bank is state-owned. As discussed, multiple banking may be more likely when the main bank is foreign-owned because of the weak ties to the developing nation that cause firms to guard against withdrawal or disadvantages in processing local soft information that result in foreign banks choosing firms that already have established relationships. Multiple banking may be less likely for firms with state-owned main banks because bank fragility and withdrawal of services is less likely, or because state-owned banks may provide services at subsidized prices or allow greater credit availability (including for negative net present value projects) or other services that other banks would not match.

We also test several other hypotheses regarding the kinds of firms that are likely to have multiple relationships, and the effects of bank market power and fragility. It important in our view to control for these factors when testing for bank ownership effects, and we are also interested in examining whether these other hypotheses continue to hold when bank ownership type is included in the model.

First, we test the effects of firm opacity and access to nonbank external finance. Large, transparent firms with strong external ties may be more likely to have relationships both because they are likely to have needs that cannot be fulfilled by a single bank and because they are in less need of exclusive relationships to address opacity problems or to minimize duplicative costs. Second, we examine if foreign-owned and state-owned nonfinancial firms are more likely to have multiple

relationships. These firms may have implicit or explicit backing by foreign parent companies and the government, respectively. Foreign-owned firms may also have a greater likelihood of needing more services than one bank can efficiently supply (e.g., domestic and international services). Third, we investigate whether the effects of mitigating market power versus convenience dominates the net impact of the number of banks in the local market. As discussed, more local banks may reduce the probability of multiple banking to mitigate market power or may increase the likelihood of multiple banking by making it more convenient. We can only measure the net of these two effects. Finally, we analyze whether main bank fragility causes firms to have additional relationships to avoid premature withdrawal of services as found by other studies.

Determinants of second bank ownership type

Our third model investigates the determinants of the ownership type of the bank with which the firm has its second relationship, given that the firm has at least two banking relationships. We conduct maximum likelihood Heckman probit estimations, taking into account that those with a second bank all have multiple banking relationships.[13] To identify this model, we assume that the number of banks in the firm's market affects the probability of multiple banking relationships, but not the ownership of the second bank type. Thus, we model the second bank ownership type as a function of firm, local market, and main bank characteristics, but the local market characteristics differ from those in the multiple banking equation:

Second bank ownership type = h{Firm characteristics, Local market characteristics,

Main bank characteristics }, *(3)*

where the local market characteristics exclude the number of banks in the market, but include a dummy for the presence of 2 or more foreign banks to allow the possibility that the second bank is a foreign bank

[13] This is roughly equivalent to, but more efficient than, the more familiar two-step method in which we would first estimate the likelihood that a bank maintains multiple banking relationships (following model (2) above), and then include the inverse Mills ratio in the second-stage probit estimations for the second bank ownership type.

when the main bank is also foreign. The dependent variables are dummies which equal 1 if the second bank is the given ownership type (foreign, SBI, nationalized or private) and 0 otherwise.

We use the third model to test three main hypotheses. First, we test whether the firm's characteristics affect the second bank ownership type in similar ways to their effects on the main bank type. That is, we investigate whether the ownership types are associated with the same or different comparative advantages in serving as a firm's second bank as they have in providing the firm's main banking relationship. Second, we examine whether a particular ownership type is used for the second bank when the main bank is financially fragile. It is possible that one ownership type may be considered most reliable in times of distress and be best able to offset main bank fragility problems. Third, we test whether firms tend to have the same bank type for their second relationship as for their main relationship versus diversifying to a different type. As discussed, this may help determine the extent to which multiple banking may reflect inefficient duplication of services or partial market segmentation versus a complementarity in which ownership types provide different services.

6. Empirical results

Results for determinants of main bank ownership type

Table 3 shows the results for the determinants of the main bank ownership type. As noted, the four probit estimations are for the probability of each ownership type relative to the other three, and each multinomial logit estimation uses the private category as the omitted alternative. The two methods yield consistent results for all of our hypothesis tests.

We first test hypotheses regarding comparative advantages and disadvantages of ownership types in providing relationship services to informationally opaque firms. The data clearly suggest a comparative advantage for private banks in this regard. In the probit equation for private banks, the coefficient on SME is positive and statistically significant, and the coefficient on log age is negative and significant, suggesting that private banks tend to be the main bank for small and young firms, which are generally considered to be opaque. The coefficients on these variables are also significant with opposite signs in all cases in the multinomial logit equations in which private banks is the omitted category, again consistent with a comparative advantage for private banks. On the associated question of relationships

with firms that have limited access to nonbank external sources of funding, foreign banks appear to be a clear disadvantage relative to the other ownership types. Foreign banks tend to be the main bank for large, well-connected firms that are listed and part of business groups, and are also good performers located in more densely populated or urbanized markets. This is consistent with the discussion and literature above that suggested a comparative advantage for these banks in processing hard information to serve large, financially sophisticated firms in urban markets, and a disadvantage in processing local soft information about opaque firms in rural markets.

We next address hypotheses about whether foreign-owned and state-owned banks have comparative advantages in serving foreign-owned and state-owned nonfinancial firms, respectively. The findings support both hypotheses. The coefficients on the foreign-owned nonfinancial firm dummy are consistent with a comparative advantage for foreign banks and the coefficients on the state-owned firm dummy are consistent with a comparative advantage for both SBI and nationalized banks. In the one case of the coefficient on the state-owned firm dummy in the nationalized bank probit equation is not statistically significant, but the multinomial logit results make it clear that this is because the findings for nationalized banks are simply weaker than those for SBI. Both SBI and nationalized banks are more likely to be the main bank for state-owned firms than both foreign and private banks.

Finally, we use the results in Table 3 to examine whether the two types of state-owned banks – SBI and nationalized – tend to have relationships with the same or different types of firms and whether these relationships are consistent with their mandates. The data suggest that there are some notable differences in the firms with main relationships with SBI versus with the nationalized banks, and in some cases these do not appear to be consistent with their mandates to serve small firms in rural markets. Before discussing the details, we recognize that a strong caveat to the results is appropriate because the SMEs in our sample generally do not include the smallest firms due to data limitations. Thus, we can draw conclusions only about relatively large SMEs and not the smallest Indian firms to which the state-owned banks have the strongest mandate to serve.

Regarding the differences between SBI and nationalized banks, the data suggest that the nationalized banks are less likely than SBI to serve as the main bank for SMEs, and they are more likely to serve as the main bank for poorly performing firms in terms of ROA. Regarding meeting their

mandates, neither state-owned category is found to specialize in relationships with SMEs or opaque firms more generally – as discussed earlier, private banks tend to serve that role. Also, neither type of state-owned bank tends to disproportionately provide the main relationship in rural markets. The coefficients on population density in the multinomial logit estimations suggest no difference from private banks in serving rural customers. Although these findings are subject to strong caveat, they are consistent with the research discussed above that finds that state-owned banks do not meet their objectives to serve targeted sectors.

Results for determinants of multiple banking relationships

Table 4 shows regression results for the determinants of whether the firm has multiple banking relationships and the number of relationships. As noted, the probit equations use a dummy for multiple relationships, and the Poisson equations use the number of relationships. The findings for the two methods are generally consistent.

For both the probit and Poisson methods, we run the model with and without the main bank ownership variables – which were not included in prior research studies. Running the model both ways allows us to see if excluding bank ownership may have biased prior findings because fragility effects differ among ownership types (e.g., state-owned banks unlikely to terminate relationships due to bank distress). The findings in Table 4 are consistent with such an effect. In both the probit and Poisson estimations, the coefficient on the capital asset ratio moves from positive and insignificant to negative and significant when the ownership variables are included. Also, in 5 of 6 cases, the main bank ownership coefficients are statistically significant and the inclusion of these variables improves the Pseudo R-squared in both estimations, giving statistical justification for our innovation of including these variables.

We first test whether multiple banking is more likely when the firm's main bank is foreign-owned and less likely when its main bank is state-owned. The positive, significant coefficient on the foreign main bank dummy is consistent with the hypothesis that firms with foreign main banks may have multiple relationships because their main banks have weak ties to the country or disadvantages in processing local soft information. The negative, significant coefficient on SBI is consistent with the hypothesis that firms with SBI as their main bank have less need for or ability to obtain additional relationships. The conflicting signs on the coefficients of nationalized suggest that the same hypothesis does not hold for

nationalized banks and gives further evidence that the two types of state-owned banks tend to have different relationships.

Turning to the other hypotheses of multiple banking, we first test the effects of firm opacity and access to nonbank external finance. The data suggest that larger, less opaque, firms with better external access are more likely to have multiple relationships, consistent with the literature on the effects of bank size. As noted, this may reflect a greater need for multiple banks to provide additional services, a lesser need for a strong, exclusive relationship to address information problems, and/or a greater ability to bear costs of duplicative services. In both the probit and Poisson estimations, the coefficient on SME is negative and statistically significant, and the coefficients on the listed and business groups variables are positive and significant, although the coefficients on log age are not significant. In the Poisson estimation, the coefficients on ROA and leverage are also positive and significant, suggesting that better performing firms and those with relatively high proportions of external debt tend to have more relationships.

Second, we test whether foreign-owned and state-owned firms are more likely to have multiple relationships. The coefficients on the foreign-owned and state-owned firm dummies are all positive, consistent with expectations, but the foreign-owned coefficient loses its statistical significance when the main bank ownership variables are included. Thus, the data are consistent with the hypothesis that state-owned firms are more likely to have multiple banking relationships due to government backing that reduces the risk exposure and information problems faced by additional banks providing services to these firms. However, the predicted positive effect for foreign-owned firms due to backing by foreign parent companies or needs for more different types of services is not strongly supported by the data.

Third, we test the net effect of the number of banks in the market to see if the effect of mitigating market power versus the convenience effect dominates. The coefficient on number of banks is not significantly different from zero, suggesting that neither effect dominates. Unfortunately, we cannot distinguish between whether both effects are weak versus both effects are strong, but offsetting.

Finally, we test whether firms with financially fragile main banks are more likely to have multiple banking relationships. The findings using the complete specifications that include main bank ownership are all consistent with this hypothesis. The coefficients on main bank log assets and capital asset ratio are

negative and significant in the full specifications, consistent with the use of multiple relationships as a hedge against the possible loss of services from fragile main banks.[14]

Results for the determinants of second bank ownership type

Table 5 shows the results for the second bank ownership type. These are probit estimations for the probability that the second bank will be of each ownership type relative to the other three ownership types, using a Heckman selection model to take into account that only firms with multiple banks have a second bank.

In addition to the full specification, we run the model a) without any main bank characteristics, and b) with the main bank fragility variables but without the main bank ownership variables. Specification (a) allows us to examine whether the firm characteristics affect the main and second bank ownership type in similar ways without the confounding influence of controlling for the main bank. Specification (b) enables us to see if the main bank fragility results are altered significantly when the main bank ownership type is included, as occurred in the multiple banking model in Table 4. The findings suggest no significant effect of main bank fragility on the second bank ownership type in any specification, so we do not discuss specification (b) further. As above for the multiple banking model, most of the coefficients of the main bank ownership variables are statistically significant and their inclusion raises the Pseudo R-squared in each estimation of the second bank ownership equations.

The first hypothesis tested using this model is whether the firm characteristics affect the second bank ownership type in similar ways to their effect on the main bank type. For this test, we use the specification (a) with only the firm and local market characteristics to compare the coefficients on the firm characteristics in Table 5 with the probit findings in Table 3.[15] That is, we compare the effects of the firm characteristics on the second and main ownership types using virtually the same specification without the confounding effect of controlling for the main bank characteristics.

[14] We use main bank size as an indicator of fragility based on the argument that larger banks are less fragile, as in the prior literature (e.g., Detragiache, Garella, and Guiso 2000). However, bank size may also proxy to some degree for the first motive discussed above. A larger main bank may be better able to fulfill all of a firm's needs, reducing the likelihood of multiple relationships and the number of relationships. Thus, the negative, significant coefficients on log assets may reflect to some degree two different motives for multiple relationships.

[15] Because of complications caused by use of the Heckman correction that make it difficult to obtain standard errors, we are not able to use the alternative multinomial logit specification as we did for the main bank ownership type in Table 3.

The findings are mostly, but not entirely consistent with this hypothesis. In the first equation for private banks in Table 5, the coefficient on SME is positive and significant, and the coefficient on log age is negative and significant, suggesting that private banks tend to fulfill the role of second bank for opaque small and young firms, consistent with the main bank results. The coefficients on SME and log age for the other three ownership types are also consistent with this comparative advantage for private banks. Foreign banks tend to be the second bank for firms that are in business groups, consistent with the main bank results, but foreign banks do not appear to have clear advantages as a second bank for large firms and listed firms as they do as a main bank. We find that foreign-owned and state-owned banks have comparative advantages in being the second bank for foreign-owned and state-owned nonfinancial firms, respectively, consistent with the main bank findings. The only significant difference in this regard from the main bank findings is that nationalized bank findings are stronger rather than weaker than the SBI findings.[16] Regarding the differences between SBI and nationalized banks, the data suggest fewer differences between the two types of state-owned banks for the second relationship to opaque firms or poorly performing firms than for the main relationship. Again, neither type of bank appeared to specialize in SMEs or rural lending, although the strong caveat about the smallest firms again applies.

Second, we test whether any bank ownership type tends to act as second bank to offset the main bank fragility problems. None of the coefficients on main bank assets or the capital asset ratio are statistically significant in any of the equations, suggesting that no particular bank ownership type functions in this capacity.

Third, we test whether firms tend to have the same or different bank ownership type for the second relationship as for the main relationship. For this hypothesis, we examine the full specification and see whether firms with main bank type i tend to also have second bank type i. In the foreign, SBI, and nationalized bank equations, the coefficient on the dummy for the main bank being the same type is positive and significant. In the private bank equation, the main bank being private is the omitted category, and the coefficients on the other three main bank types are all negative and two are statistically

[16] The coefficient on the state-owned firm dummy in the SBI Probit equation is positive, but not statistically significant. However, the lack of significance appears to occur because the findings for SBI banks are weaker than those nationalized banks. The coefficients of state-owned firm dummy in the foreign and private bank regressions are both negative and significant, suggesting that SBI banks have an advantage in the role of second bank relative to these non-state-owned categories.

significant. Thus, for all four bank ownership types, firms have a significant probability of having a second bank of the same ownership type as the main bank. Use of the same bank type is consistent with partial market segmentation and multiple banking for the reason of offsetting main bank market power or fragility, with potentially inefficient duplication of services, but it is difficult to draw strong conclusions in this regard.

In the full specification for nationalized banks in Table 5, the coefficient on the main bank being foreign is also positive and significant, suggesting that firms with foreign main banks also often have nationalized second banks. As well, the coefficient on the main bank being nationalized in the foreign bank regression is positive, although not statistically significant. These findings suggest that there may be some complementarities across these two types of banks. Although we do not have data on the exact services involved in each relationship, it seems likely that multiple banking relationships may arise for these firms as they find benefits in purchasing international financial services from foreign banks and domestic services from nationalized banks. It is not surprising to find such complementarity between foreign-owned banks and one of the three domestic ownership types, but it may be surprising that the domestic type is a state-owned type. Interestingly, there is no evidence of complementarity between the two state-owned bank types – the coefficients on the main bank being the other state-owned type is negative in both cases, and is significant for the main bank being SBI in the nationalized regression. The second bank ownership regressions in Table 5 again strongly suggest that the two types of state-owned banks tend to have different relationships from one another with nonfinancial firms.

7. Conclusions

The research on banking relationships suggests that these are important tools for mitigating problems of asymmetric information and other imperfections in financial markets. The literature on multiple banking relationships implies that these may occur because a single bank is unable to fulfill all of a firm's financial needs, or because firms protect themselves from the market power or fragility of their main bank. Studies of bank ownership types are consistent with the hypotheses that foreign-owned, state-owned, and private, domestically-owned banks may vary significantly in terms of their performance, their abilities to process hard and soft information about firms, and their effects on growth of the economy.

All of these issues are also of considerable policy concern in developing nations. These countries often have significant problems of asymmetric information and other financial market imperfections that may be mitigated by relationship banking. The banks in these nations frequently have limited abilities to provide a full range of banking services, may operate with significant market power due to restrictions on competition, and may often be financially fragile, which might result in many firms having multiple banking relationships. Multiple relationships may be efficient, but may alternatively involve substantial costs of duplication and underinvestment in due diligence, depending on the underlying cause. Developing nations also typically have significant presence of all of the different bank ownership types, raising issues of the performance of their banking industries, access to credit by nonfinancial firms in these nations, and overall economic growth.

We address these research and policy concerns by formulating and testing a number of new hypotheses about the links between bank ownership type and banking relationships using data from an important developing nation. Specifically, we directly address hypotheses about the comparative advantages of the different ownership types in providing the main and second banking relationships for different categories of firms, and the effects of bank ownership types on whether the firms have multiple banking relationships. Our analysis uses data from India, one of the largest and fastest growing developing nations, and has a mix of all the major different bank ownership types. The Indian economy is also representative of many of the financial market imperfections prevalent in developing economies, which magnifies the importance of banking relationships and bank ownership issues.

Our data set is particularly informative on these issues because it has information on a large number of nonfinancial firms, their banks, and their markets, and also lists the firms' banking relationships in order of priority. This allows us to test, for example, whether firms tend to have the same or different ownership type for their main and second banking relationship, which may be informative as to the underlying reason for multiple relationships. The data set also distinguishes between two types of state-owned banks, SBI and nationalized banks, which have different governance structures and history. We are able to test whether the two types tend to have relationships with the same kind of firms and whether these relationships appear to be consistent with the mandates of these institutions.

Our findings on bank ownership type and main banking relationships suggest that private,

domestically-owned banks have a comparative advantage in providing main relationships with informationally opaque firms. The data also suggest that foreign- and state-owned banks may have advantages as main banks for foreign- and state-owned firms, respectively. In comparing the two types of state-owned banks, we find that SBI and nationalized banks tend to act as the main bank for somewhat different firms, and the relationships for neither type appear to be consistent with their mandates to serve rural and small firms, although an important caveat to this last finding is that our data set does not have information on the smallest firms in India.

The findings for the effects of the ownership type on multiple banking relationships are consistent with our hypothesis that firms with foreign main banks are more likely than other firms to have multiple relationships. However, only the findings for SBI banks are consistent with our hypothesis that firms with state-owned main banks are less likely than other firms to have multiple relationships. Our results for firms with nationalized main banks are mixed, giving additional weight to our general finding that the two types of state-owned banks tend to have different bank-firm relationships. The data are also consistent with some other expected reasons for multiple banking relationships. We find that firms with more financially fragile main banks are more likely than other firms to have multiple relationships, and that informationally opaque firms with limited access to nonbank external finance are more likely than others to rely on exclusive relationships.

Our findings for the effects of bank ownership type on second banking relationships suggest that the second bank type is generally affected by firm characteristics in similar ways to the main bank type, although there are some exceptions. The data also suggest that none of the four bank ownership types appears to have an advantage in serving as the second bank to offset financial fragility of the main bank. In addition, for all four ownership types, firms tend to have the same bank ownership type for second relationship as for the main relationship. This is consistent with partial market segmentation in which firms of a certain type usually only have strong relationships with banks of a certain ownership type. This finding of the same ownership type for two strongest relationships is also consistent with use of a second bank to offset main bank market power or fragility, with potential cost duplication and underinvestment in due diligence, but we do not have direct evidence of this. The data also suggest that there may be some complementarity between foreign and nationalized banks – firms with foreign main banks often have

nationalized second banks. This may reflect an efficient outcome in which the two bank types provide different services, although we do not have direct evidence on the services provided in each relationship. Overall, the results for multiple banking and second relationships give some evidence for both the efficient and inefficient motives for multiple relationships.

In terms of research implications, the findings in this paper clearly suggest that more research is needed on the links between bank ownership type and bank-firm relationships. Although most of the specific hypotheses, models, and tests run here are new, many of the results are comparable to those in the existing research literature. In these cases, our findings are mostly consistent with prior results. As examples, our findings that private banks may have a comparative advantage in main relationships with opaque firms and our results suggesting that the relationships of state-owned banks may not be consistent with their mandates are consistent with findings of poor performance for state-owned banks in the literature.

However, other findings here have no significant precedent in the prior research. Examples include our results that firms with foreign main banks are relatively likely to have multiple banking relationships; that firms often have the same bank ownership type for their main and second banking relationships, and the possible complementarity between foreign and nationalized banks in main and second relationships. These findings can only be confirmed with additional research that directly links bank ownership type to relationships.

With regard to policy implications, our findings raise some questions about whether state-owned institutions fulfill their mandates. The data suggest they may possibly crowd out private banks that might have a comparative advantage in relationships with relatively small, young firms, although with the significant caveat that our data do not include the smallest firms in India. As well, the differences between the two types of state-owned banks suggests that differences in governance structure and history of these institutions may have important effects on their relationship behavior. Importantly, all of our results may be affected by the regulatory environment in India described above in which all banks are required to lend to “priority sectors” at below-market rates. Our finding that foreign banks tend to serve as the main bank for large firms in urban markets may also in part reflect government restrictions on branching and ownership of subsidiaries by foreign banks. Although it is unlikely that these banks would

specialize in relationships with small, rural firms in the absence of these rules, the regulations likely reduced their number of relationships of foreign banks with these firms at the margin. These restrictions on the ability of foreign banks to expand within the country might also help explain some of the complementarity with nationalized banks, and why some firms with foreign main banks might need multiple banking relationships to fulfill their needs. Overall, with significant caveats, our results appear to suggest that government intervention in the financial sector, either directly via ownership of banks, or indirectly through other regulations may have had unfavorable effects on banking relationships in some cases for informationally opaque and other firms.

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Table 1: Banking Statistics

Statistics are from the Reserve Bank of India (RBI).

	# Banks	# Branches	# Accounts	Total Deposits (million US $)	Total Assets (million US $)
Foreign	46	251	26,830	12,544	21,579
SBI	8	13,550	989,850	66,146	85,381
Nationalized	20	32,579	2,346,410	115,979	132,856
Private	36	5,524	290,800	28,963	34,625

Table 2: Variable Definitions and Summary Statistics

Variable	Definition	Mean
Panel A: Firm Characteristics		
Firm Opacity:		
SME	Dummy variable equal to 1 if the firm is small or medium sized – defined as gross fixed assets less than Rs. 100 million (US$ 5.5 million) – and 0 otherwise. Source: CMIE	0.36
Log Age	Natural log of age. Source: CMIE (Mean shown is for Age, not Log Age)	26.57
Firm Access to External Finance:		
Listed	Dummy variable equal to 1 if the firm is listed on the Bombay Stock Exchange (BSE) or National Stock Exchange (NSE) and 0 otherwise. Source: CMIE	0.25
Business Groups	Dummy variable equal to 1 if the firm belongs to an Indian business group and 0 otherwise. Source: CMIE	0.36
Firm Ownership		
Foreign	Dummy variable equal to 1 if the firm is foreign-owned and 0 otherwise. Source: CMIE	0.07
State	Dummy variable equal to 1 if the firm is state-owned and 0 otherwise. Source: CMIE	0.04
Firm Performance		
ROA	The ratio of profit before interest and tax to total assets (with tails cut above 99th and below 1st percentile) Source: CMIE	0.04
Leverage	The ratio of total debt to equity. Source: CMIE	0.39

Table 2: Variable Definitions and Summary Statistics (Cont.)

Panel B: Banking Relationships and Bank Characteristics		
Banking Relationships:		
Multiple Banks Dummy	Dummy variable equal to 1 if the number of banking relationships is greater than 1 and 0 otherwise. Source: CMIE	0.61
Number of Banking Relationships	Numerical variable equal to the number of banking relationships. Source: CMIE	2.76
Main Bank Fragility		
Log Assets	The log of assets (in million Rs.) at the main bank. Source: Reserve Bank of India (RBI) (Mean shown is for Assets, not Log Assets)	331,042
Capital Asset Ratio	The ratio of the sum of total equity and total reserves to total assets at the main bank. Source: RBI.	5.14
Main Bank Ownership		
Foreign	Dummy variable equal to 1 if the main bank is a foreign bank and 0 otherwise. Source: RBI.	0.11
SBI	Dummy variable equal to 1 if the main bank is an SBI bank and 0 otherwise. Source: RBI.	0.16
Nationalized	Dummy variable equal to 1 if the main bank is a nationalized bank and 0 otherwise. Source: RBI.	0.61
Private	Dummy variable equal to 1 if the main bank is a private Indian bank and 0 otherwise. Source: RBI.	0.12
Second Bank Ownership		
Foreign	Dummy variable equal to 1 if the second bank is a foreign bank and 0 otherwise. Source: RBI.	0.07
SBI	Dummy variable equal to 1 if the second bank is an SBI bank and 0 otherwise. Source: RBI.	0.13
Nationalized	Dummy variable equal to 1 if the second bank is a nationalized bank and 0 otherwise. Source: RBI.	0.27
Private	Dummy variable equal to 1 if the second bank is a private Indian bank and 0 otherwise. Source: RBI.	0.13
Panel C: Local Market Characteristics		
Number of Banks	The total number of banks that operate in each state. Source: RBI.	60.35
At Least 1 Foreign Bank Present	Dummy variable equal to 1 if there is at least 1 foreign bank in the state. Source: RBI.	0.97
At Least 2 Foreign Banks Present	Dummy variable equal to 1 if there is are at least 2 foreign banks in the state. Source: RBI.	0.92
Population Density	Density of the population in 1,000 people per square kilometer. Source: Census India 2001.	1.25

Table 3: Determinants of Main Bank Ownership Type - Probit and Multinomial Logit Estimations

See Table 2 for variable definitions. The dependent variable is a dummy variable equal to 1 to indicate the main bank ownership type and 0 otherwise. In the probit equations, the probability of each ownership type is measured relative to the other three categories combined. In the multinomial logit equations, the probability of each of the first three ownership types are measured relative to the fourth category (private). Firm sector and regional dummies are included, but not shown. T-statistics based on robust errors shown in parentheses. *, **, and *** indicate significance at 10%, 5%, and 1%, respectively. The pseudo R-squared for the multinomial logit is obtained for the model as a whole and cannot be reported for each alternative as is the case in the probit models.

	PROBIT				**MULTINOMIAL LOGIT (Private banks omitted)**		
	FOREIGN	**SBI**	**NATIONALIZED**	**PRIVATE**	**FOREIGN**	**SBI**	**NATIONALIZED**
Firm opacity and access to external finance							
SME	-0.138	0.062	-0.126	0.238	-0.709	-0.297	-0.484
	[1.68]*	[0.97]	[2.33]**	[3.52]***	[3.63]***	[1.89]*	[3.70]***
Log age	-0.03	0.014	0.079	-0.16	0.212	0.279	0.311
	[0.65]	[0.37]	[2.38]**	[3.76]***	[1.87]*	[2.86]***	[3.74]***
Listed	0.379	-0.558	0.018	0.09	0.419	-1.114	-0.162
	[5.19]***	[6.97]***	[0.32]	[1.16]	[2.22]**	[5.38]***	[1.06]
Business groups	0.263	-0.076	-0.002	-0.071	0.598	0.013	0.136
	[3.73]***	[1.20]	[0.05]	[1.07]	[3.44]***	[0.08]	[1.07]
Firm ownership							
Foreign	1.048	-0.34	-0.49	-0.193	1.752	-0.288	-0.064
	[10.18]***	[2.55]**	[5.18]***	[1.49]	[6.18]***	[0.83]	[0.24]
State	-0.262	0.235	0.132	-0.472	0.4	1.287	1.007
	[1.36]	[1.73]*	[1.10]	[2.35]**	[0.71]	[2.70]***	[2.29]**
Firm performance							
ROA	0.936	0.444	-0.817	0.257	1.108	0.197	-0.976
	[2.85]***	[1.66]*	[3.62]***	[0.90]	[1.40]	[0.29]	[1.73]*
Leverage	-0.412	0.132	0.087	-0.129	-0.749	0.401	0.235
	[2.61]***	[1.64]	[1.19]	[1.40]	[2.09]**	[1.91]*	[1.28]
Local market characteristics							
At least 1 foreign bank present	0.639	-0.306	-0.234	0.5	0.369	-1.459	-1.106
	[2.35]**	[2.03]**	[1.63]	[2.13]**	[0.49]	[2.60]***	[2.09]**
Population Density	0.053	-0.025	-0.004	-0.015	0.117	-0.02	0.017
	[3.09]***	[1.65]*	[0.33]	[0.95]	[2.67]***	[0.50]	[0.55]
Constant	-1.613	-0.825	0.34	-1.369	-0.463	1.031	2.148
	[5.04]***	[3.82]***	[1.75]*	[4.81]***	[0.54]	[1.54]	[3.52]***
Observations	3423	3423	3423	3423	3423	3423	3423
Pseudo R-squared	0.138	0.059	0.028	0.049		0.081	

Table 4: Determinants of Multiple Banking Relationships and Number of Relationships - Probit and Poisson Estimations

See Table 2 for variable definitions. The dependent variable is a dummy variable equal to 1 if the firm has more than one banking relationship in the Probit regressions and a numerical variable in the Poisson regressions. Firm sector and regional dummies are included but not shown. T-statistics based on robust errors shown in parentheses. *, **, and *** indicate significance at 10%, 5%, and 1%, respectively.

	PROBIT		POISSON	
Firm opacity and access to external finance				
SME	-0.509	-0.494	-0.321	-0.289
	[8.91]***	[8.38]***	[10.61]***	[9.86]***
Log age	0.041	0.041	0.036	0.029
	[1.13]	[1.09]	[1.80]*	[1.49]
Listed	0.804	0.752	0.438	0.4
	[11.52]***	[10.53]***	[13.07]***	[12.39]***
Business groups	0.331	0.31	0.26	0.244
	[5.93]***	[5.36]***	[8.93]***	[8.67]***
Firm ownership				
Foreign	0.225	0.078	0.137	0.07
	[2.06]**	[0.68]	[2.96]***	[1.50]
State	0.778	0.909	0.727	0.724
	[5.77]***	[6.90]***	[9.90]***	[10.42]***
Firm performance				
ROA	-0.029	-0.05	0.397	0.396
	[0.12]	[0.20]	[3.28]***	[3.43]***
Leverage	0.094	0.129	0.09	0.094
	[1.19]	[1.59]	[2.48]**	[2.67]***
Main bank fragility				
Log Assets	-0.352	-0.149	-0.139	-0.087
	[14.91]***	[4.51]***	[13.50]***	[5.77]***
Capital Asset Ratio	2.737	-4.055	0.95	-2.354
	[1.48]	[2.03]**	[1.14]	[2.76]***
Main bank ownership				
Foreign		0.731		0.483
		[5.26]***		[9.69]***
SBI		-1.162		-0.413
		[8.69]***		[7.70]***
Nationalized		-0.111		0.229
		[1.17]		[5.63]***
Local market characteristics				
Number of Banks	0.006	0.004	0.002	0.001
	[1.84]*	[1.04]	[0.97]	[0.30]
Population Density	-0.015	-0.018	0.013	0.01
	[1.01]	[1.15]	[1.61]	[1.28]
Constant	4.257	2.298	2.346	1.783
	[10.34]***	[4.98]***	[11.72]***	[8.19]***
Observations	3363	3363	3363	3363
Pseudo R-squared	0.196	0.24	0.132	0.155

Table 5: Determinants of the Second Bank Ownership Type (corrected for selection bias) – Heckman Probit Estimations

See Table 2 for variable definitions. The dependent variable is a dummy variable equal to 1 to indicate the second bank ownership and 0 otherwise. The results shown are probit equations for the probability of each ownership type measured relative to the other three categories combined, correcting for the fact that only some firms have more than one banking relationship. The model is estimated by maximum likelihood Firm sector and regional dummies are included but not shown. T-statistics based on robust errors shown in parentheses. *, **, and *** indicate significance at 10%, 5%, and 1%, respectively.

	FOREIGN			SBI			NATIONALIZED			PRIVATE		
Firm opacity and access to external finance												
SME	0.081	0.149	0.086	-0.092	0.015	0.149	-0.135	-0.138	-0.196	0.324	0.167	0.119
	[0.53]	[1.06]	[0.64]	[0.71]	[0.12]	[1.46]	[1.26]	[1.34]	[2.11]**	[2.31]**	[1.17]	[0.83]
Log Age	-0.01	-0.006	-0.004	0.043	0.029	0.016	0.112	0.103	0.102	-0.167	-0.159	-0.149
	[0.18]	[0.11]	[0.08]	[0.94]	[0.63]	[0.37]	[2.71]***	[2.44]**	[2.45]**	[3.17]***	[3.36]***	[3.08]***
Listed	0.07	0.026	0.13	-0.2	-0.294	-0.407	0.118	0.075	0.149	-0.174	0.092	0.104
	[0.41]	[0.19]	[1.16]	[1.31]	[2.39]**	[4.43]***	[0.92]	[0.73]	[1.70]*	[0.63]	[0.63]	[0.80]
Business groups	0.357	0.348	0.404	-0.155	-0.195	-0.233	0.009	-0.011	0.019	-0.072	0.036	0.049
	[3.21]***	[3.08]***	[4.06]***	[1.60]	[2.27]**	[3.23]***	[0.12]	[0.15]	[0.25]	[0.58]	[0.38]	[0.54]
Firm ownership												
Foreign	1.2	1.203	1.188	-0.35	-0.361	-0.237	-0.547	-0.592	-0.615	-0.167	-0.088	-0.069
	[7.78]***	[8.11]***	[9.16]***	[2.20]**	[2.45]**	[1.78]*	[4.12]***	[4.67]***	[4.79]***	[1.02]	[0.62]	[0.50]
State	-0.509	-0.502	-0.403	0.053	-0.088	-0.274	0.429	0.417	0.508	-0.713	-0.526	-0.485
	[1.86]*	[1.82]*	[1.45]	[0.30]	[0.51]	[1.81]*	[2.79]***	[2.68]***	[3.49]***	[3.28]***	[2.19]**	[2.03]**
Firm performance												
ROA	0.52	0.418	0.373	-0.386	-0.294	-0.216	-0.266	-0.256	-0.292	0.469	0.429	0.442
	[1.18]	[0.95]	[0.83]	[1.19]	[0.91]	[0.72]	[0.93]	[0.89]	[1.04]	[1.47]	[1.28]	[1.31]
Leverage	-0.489	-0.441	-0.414	0.129	0.11	0.035	0.097	0.077	0.094	-0.067	-0.057	-0.033
	[2.51]**	[2.29]**	[2.11]**	[1.23]	[1.03]	[0.34]	[1.03]	[0.80]	[0.97]	[0.66]	[0.52]	[0.30]
Main bank fragility												
Log Assets		-0.053	-0.066		0.072	0.046		0.014	-0.027		-0.022	0.04
		[0.86]	[1.12]		[1.26]	[1.10]		[0.28]	[0.64]		[0.30]	[0.70]
Capital Asset Ratio		0.101	-5.525		-3.622	2.846		0.908	-1.28		0.727	0.836
		[0.04]	[1.55]		[1.54]	[1.13]		[0.46]	[0.54]		[0.34]	[0.31]
Main bank ownership												
Foreign			0.553			-0.79			0.437			-0.198
			[3.28]***			[5.76]***			[3.51]***			[1.23]
SBI			-0.799			1.119			-0.482			-0.841
			[1.96]*			[6.15]***			[2.23]**			[2.47]**
Nationalized			0.156			-0.186			0.308			-0.247
			[0.95]			[1.56]			[2.73]***			[2.01]**
Local market characteristics												
At Least 2 Foreign Banks Present	0.396	0.487	0.496	-0.308	-0.319	-0.275	0.29	0.257	0.256	-0.345	-0.302	-0.307
	[2.08]**	[2.47]**	[2.54]**	[2.22]**	[2.42]**	[2.21]**	[2.28]**	[2.03]**	[2.09]**	[2.72]***	[2.19]**	[2.27]**
Population Density	-0.013	-0.018	-0.025	-0.011	-0.009	0.002	0.006	0.009	0.003	0.019	0.013	0.012
	[0.57]	[0.78]	[1.08]	[0.59]	[0.48]	[0.09]	[0.38]	[0.55]	[0.21]	[1.02]	[0.64]	[0.61]
Constant	-1.538	-0.955	-0.907	-0.51	-0.985	-0.563	-0.728	-0.832	-0.604	0.088	-0.167	-0.78
	[3.59]***	[1.29]	[1.15]	[1.51]	[1.49]	[1.06]	[2.53]**	[1.45]	[1.13]	[0.20]	[0.23]	[1.24]
Observations	3423	3363	3363	3423	3363	3363	3423	3363	3363	3423	3363	3363
Pseudo R-squared	0.028	0.030	0.033	0.012	0.014	0.023	0.013	0.014	0.019	0.016	0.017	0.021