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The impact of foreign bank entry in emerging markets: Evidence from India

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ABSTRACT

This paper uses the entry of foreign banks into India during the 1990s—analyzing variation in both the timing of the new foreign banks' entries and in their location—to estimate the effect of foreign bank entry on domestic credit access and firm performance. In contrast to the belief that foreign bank entry should improve credit access for all firms, the estimates indicate that foreign banks financed only a small set of very profitable firms upon entry, and that on average, firms were 8 percentage points less likely to have a loan after a foreign bank entry because of a systematic drop in domestic bank loans. Similar estimates are obtained using the location of pre-existing foreign firms as an instrument for foreign bank locations. Moreover, the observed decline in loans is greater among smaller firms, firms with fewer tangible assets, and firms affiliated with business groups. The drop in credit also appears to adversely affect the performance of smaller firms with greater dependence on external financing. Overall, this evidence is consistent with the exacerbation of information asymmetries upon foreign bank entry.

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1. Introduction

In many less-developed countries (LDCs), inefficient domestic banks and a lack of competition among lenders result in high borrowing costs and limited financial access for many firms. More developed countries, such as the US, Japan, and those in the European community, argue that LDCs should allow foreign banks to enter into their economies.¹ By increasing competition, foreign bank entry may

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¹ In a memo to the World Trade Organization on June 6, 2005, delegations from Japan, the US, and EU argued that “Policies that impede competition, such as entry restrictions and restrictions on foreign banks, have been shown to raise the cost of financial services and hurt economic performance”. WTO Document #05-2335.

increase the supply of credit and improve efficiency.² However, banking theories that incorporate information asymmetries demonstrate that greater competition among banks may actually reduce some firms' access to credit (Petersen and Rajan, 1995). Moreover, the high cost of acquiring information about local firms may limit foreign banks to 'cream-skimming', where they lend only to the most profitable local firms (Dell'Ariccia and Marquez, 2004; Sengupta, 2007) and adversely affect both domestic banks and the firms that rely upon them (Detragiache et al., 2008; Gormley, 2007).

These competing theories naturally lead to this paper's central questions: does foreign bank entry improve credit access for domestic firms, and if so, which firms? Moreover, do these changes in the credit market affect the performance of domestic firms? The growing trend among LDCs to allow greater foreign bank entry and the degree of entry that typically occurs suggests that the answers may have important implications for financial policy in these economies. To answer these questions, this paper uses the entry of foreign banks into India during the 1990s to estimate the effect of foreign bank entry on domestic credit access. Geographical variation in foreign bank locations across India over time and the availability of firm-level loan data facilitates the use of novel identification techniques and makes India an ideal setting to analyze the impact of foreign bank entry. Using this data, I find evidence both of 'cream-skimming' by foreign banks and of a systematic drop in loans from domestic banks following foreign bank entry that lowers overall credit access for many domestic firms, particularly smaller firms, firms with fewer tangible assets, and firms affiliated with business groups. The drop in credit also appears to adversely affect the performance of smaller firms with greater dependence on external financing. Overall, this evidence is consistent with banking theories that incorporate information asymmetries and has numerous policy implications.

To identify the effect of foreign bank entry, I match financial data for Indian firms with the geographical location of newly-established foreign bank branches following India's 1994 commitment to the World Trade Organization (WTO) to allow greater foreign bank entry. Foreign bank entry was staggered: some districts received a foreign bank branch as early as 1994, while others did not receive such a branch until 2001, and as of today, many districts have yet to receive a foreign bank. I then compare changes in the borrowing patterns of domestic firms located geographically near the new banks to changes in the borrowing patterns of firms located further from the new banks. This use of variation *both* in the timing of the new foreign banks' entries *and* in their location within the country reduces potential biases that might arise from other country-wide changes to market openness, banking sector regulation, or access to public debt markets. Such country-wide changes would affect all firms in India and therefore unlikely explain changes in borrowing trends over time for firms located geographically near foreign banks versus those that are not. Moreover, by using firm-level data, I can also test for changes in credit access across different types of firms as well as control for any differences in the types of firms located in areas with a new foreign bank.

To account for the endogenously-determined location choice of the new foreign banks within India, I also use the geographical distribution of foreign firms in India before the WTO agreement as an instrument for the location choice of new foreign banks following the agreement. I assume that foreign banks chose to enter markets with firms from their home country in order to preserve pre-existing relationships with these firms, but that these foreign firms' presence is not otherwise related to domestic lending trends at the local level. This tendency for foreign banks to follow their customers abroad has been noted in a number of countries (Sabi, 1988; Brealey and Kaplanis, 1996) and seems to occur in India as well. Moreover, there is no evidence that a foreign firm's presence in India was otherwise related to the lending patterns of domestic firms located geographically nearby. Further buttressing the empirical design employed in this paper is the fact that numerous tests indicate that the necessary identification assumptions hold, and the instrumental variable (IV) estimates are similar in sign and magnitude to the ordinary least squares (OLS) estimates.

Overall, the estimates suggest that competition from foreign banks is associated with a reallocation of loans that is not necessarily a boon to the lion's share of domestic firms. The most profitable 10% of

² Characteristics unique to foreign banks may also directly increase credit access in LDCs. Foreign banks may be less susceptible to politically-connected loans (Agenor, 2003); domestic banks may benefit directly by adopting the technologies of foreign banks (Lensink and Hermes, 2004); and foreign banks may be more efficient, have access to international capital markets, and encourage the development of better auditing agencies (Levine, 1996).

firms located near a new foreign bank branch received larger loans, but on average, firms were 7.6 percentage points less likely to have a long-term loan of any size following the entry of a foreign bank. This limited increase in loan sizes appears to arise from new foreign bank loans targeted primarily towards the most profitable firms. The decline in credit for all other firms, however, originates from a systematic drop in domestic bank loans that appears to be supply-driven rather than demand-driven. Moreover, this reallocation of loans occurs only for firms located in the vicinity of a new foreign bank, suggesting that banking markets are localized—and there is no evidence to indicate that the borrowing relationships of these firms followed different trends from those of firms located elsewhere in India prior to the entry of a foreign bank. The observed reallocation occurs within one to two years of the entry of a foreign bank and appears to persist for the duration of the sample time period.

The reduction in overall bank credit also appears to disproportionately affect some firms' access to bank credit and their subsequent performance. The observed decline in loans is greater among smaller firms, firms with fewer tangible assets, and firms affiliated with large business groups. Moreover, smaller firms located in industries requiring greater external financing exhibit a drop in sales growth, profitability, cash reserves, and capital expenditures following foreign entry. These declines in performance indicate an inability to substitute into alternative forms of financing after the drop in credit from domestic banks, and in further support of this hypothesis, there is no evidence to indicate that firms' use of corporate bonds, equity issues, commercial paper, and other forms of financing increased following foreign bank entry. Additionally, the larger decrease in domestic loans allocated to firms with fewer tangible assets after foreign bank entry indicates domestic lenders may rely more heavily on fully collateralized loans after foreign bank entry.

This evidence provides support to a recent and growing theoretical literature regarding the unique implications of competition between lenders that differ in both their access to information about firms and their respective costs of capital. In particular, the findings appear to be the most consistent with [Detragiache et al. \(2008\)](#) and [Gormley \(2007\)](#). Both papers show that the entry of foreign lenders, which are assumed to have less access to 'soft' information than domestic lenders, can lead to a segmented market with 'cream-skimming', and that this segmentation can also reduce credit access for informationally opaque firms.³ The targeted lending of foreign banks in India and the subsequent decline of domestic bank loans to informationally opaque firms, as captured by a firms' size and group affiliation, is consistent with foreign lenders 'cream-skimming' the best firms and domestic lenders responding adversely to their entry. These findings also parallel an existing literature that examines the comparative disadvantage of large banks in the production and use of 'soft' information ([Berger et al., 2005](#)).

These findings have numerous implications for financial policy in LDCs, which in recent years has increasingly trended towards the allowance of greater foreign bank entry. While the potential benefits of foreign bank entry are many, particularly when domestic banks are primarily state-owned (as in India), the evidence suggests that information asymmetries may prevent many firms in these economies from realizing these benefits.⁴ This evidence suggests that it may be necessary to adopt additional policies—beyond allowing foreign bank entry—to increase efficiency and improve credit access in LDCs. For example, reducing information barriers endemic to LDC credit markets may increase the range of firms that foreign banks are willing to finance upon entry and reduce the likelihood that informationally opaque firms or firms that rely on more 'soft' information type lending will be adversely affected by their entry ([Detragiache et al., 2008](#); [Gormley, 2007](#)). The evidence also suggests that the sequencing of reforms and fostering of a well-developed domestic financial market prior to foreign bank entry may be important as well.

This paper is related to a number of recent studies on the impact of financial liberalization in emerging economies. The focus on a specific type of liberalization, foreign bank entry, is similar to recent work on the impact of foreign participation in domestic equity markets ([Bekaert and Harvey, 2000](#); [Bekaert et al., 2005](#); [Chari and Henry, 2004](#); [Henry, 2000a,b](#)). This paper also builds upon exist-

³ While [Dell'Arciccia and Marquez \(2004\)](#) and [Sengupta \(2007\)](#) also find that foreign lender entry can induce a segmented credit market, neither paper predicts a decline in credit access for informationally opaque firms.

⁴ The large degree of state-owned banking assets in India (about 80%) is quite common among developing countries. See [Barth et al. \(2001\)](#) for more details.

ing empirical work that makes use of firm-level and within-country variation to identify the impact of greater bank competition and banking deregulation (Cetorelli and Strahan, 2006; Zarutskie, 2006; Bertrand et al., 2007).

This paper is also related to a growing empirical literature that studies the type of domestic firm targeted by foreign banks and the country-level relationships between foreign bank entry, domestic bank performance, interest rates, and firms' debt usage and sales.⁵ This paper compliments this literature by analyzing the changes in firms' lending relationships with domestic banks and changes in their overall performance following foreign bank entry. The use of within-country variation also mitigates the concern of endogeneity bias that is present in cross-country comparisons and allows us to study the dynamic implications of foreign bank entry. This paper also provides novel evidence regarding the impact of liberalization when foreign bank entry occurs through de novo branches rather than the large scale acquisitions studied by Giannetti and Ongena (2009) in Eastern Europe. Recent theoretical work suggests foreign bank entry via de novo branching is more likely to have adverse effects than entry via acquisitions (Gormley, 2007).

Finally, this paper is related to recent work by Berger et al. (2008) on banking relationships in India. Their paper finds that Indian firms with less 'soft' information are more likely to report having a foreign bank relationship, but that these firms appear to perceive the foreign bank relationships as more 'fragile' in that they also choose to have multiple banking relationships with a diverse set of lenders. Rather than focus on lending relationships at a particular point in time and the potential fragility of foreign bank relationships, however, this paper instead focuses on how the initial arrival of a foreign bank changes the overall allocation of credit and domestic firms' credit access. Moreover, this paper studies how these changes may in turn have differing affects on the performance of some domestic firms.⁶

The remainder of the paper proceeds as follows. Section 2 provides a review of India's policy change regarding foreign banks and Section 3 describes the data. The baseline regression and identification strategy are explained in Section 4 and Section 5 reports the OLS estimates. Section 6 contains robustness checks and IV estimates. Section 7 analyzes the differential effect of entry on firms along with other potential effects on firm performance. Finally, Section 8 concludes.

2. Description of policy change

Prior to 1991, India's economy and financial system was heavily regulated and dominated by the public sector. A complicated regulatory regime required firms to obtain licenses for most economic activities, and many industries were reserved for the public sector, including much of the financial system. Bank nationalizations in 1969 and 1980 increased the public sector share of deposits to over 80%, and further branch licensing was rigidly controlled. Primarily focused on financing government deficits and serving government priority sectors such as agriculture, India's public banks lacked proper lending incentives and exhibited a high number of non-performing loans.⁷

Following a balance of payments crisis in 1991, however, a number of structural reforms were implemented that greatly deregulated many economic activities, and in November 1991, a broad

⁵ Claessens et al. (2001) uncover evidence that foreign bank entry is associated with lower profit margins among domestic banks, while Berger et al. (2001), Haber and Musacchio (2005), and Mian (2006) provide evidence that foreign banks tend to finance only larger, more established firms. Clarke et al. (2006) find that entrepreneurs in countries with high levels of foreign bank ownership perceive interest rates and access to loans as smaller constraints to their operations, while Detragiache et al. (2008) instead finds that foreign ownership is negatively related to aggregate measures of banking sector performance. Within Eastern European countries, Giannetti and Ongena (2009) find the share of foreign lending to be positively related to firm-level sales and overall debt usage, particularly for larger firms.

⁶ It would also be very interesting to study how the number and diversity of firms' reported banking relationships change after foreign bank entry. Unfortunately, firms' reported banking relationships, as used in Berger et al. (2008), are only currently available in the final year of the CMIE data. Giannetti and Ongena (2008), however, provides some suggestive evidence in this regard. Looking at foreign bank acquisitions in Eastern Europe, they find large and foreign-owned firms are more likely to establish relationships with the new foreign banks, and that with the exception of state-owned firms, foreign banks are less likely to terminate lending relationships.

⁷ See Ghemawat and Khanna (1998), Hanson (2003), and Tarapore (1999) for more details about India's licensing regime and financial system before 1991.

financial reform agenda was established in India by the Committee on the Financial System (CFS). The CFS was appointed by the Government of India to examine the existing financial system and make recommendations for improving its efficiency so as to more effectively meet the credit needs of firms. One of the committee's recommendations to meet this goal was to introduce greater competition into the banking system by allowing more foreign banks to enter India. It was argued that the entry of additional foreign banks would improve the competitive efficiency of the Indian banking system and induce an upgrading of banking technology.

However, no significant action was taken by the Government of India regarding the CFS recommendation on foreign banks until April 1994 when the government agreed to allow for an expansion of foreign banks under the WTO General Agreement on Trades in Services (GATS). In the initial GATS agreement, India committed to issue five additional branch licenses to both new and existing foreign banks each year. In a subsequent supplemental agreement in July 1995, India increased the limit to eight licenses per year, and in February 1998, the limit was increased to 12. While there were no restrictions on where foreign banks could choose to establish new branches, the expansion of foreign banks in India was by de novo branches only, as foreign banks were not allowed to own controlling stakes in domestic banks.⁸

In the years preceding the signing of the GATS agreement, very few licenses for new foreign bank branches were granted, and the presence of foreign banks in India was limited. On March 31, 1994 there were 24 foreign banks with 156 branches in India. Most of these banks, however, had begun operations before India's first nationalization of private banks in April 1969, and only seven new branches had opened since 1990. Moreover, most of India's 575 districts did not have a foreign bank, as roughly 75% of these foreign bank branches were concentrated in districts encompassing India's three largest cities: Delhi, Mumbai, and Kolkata.

In eight years following the acceptance of GATS, however, 17 new foreign banks and 89 new foreign bank branches were opened in India bringing the total number foreign banks to 41 with 212 branches as of March 2002.⁹ The expansion of foreign banks also increased their representation outside of India's most populous cities, as the number of districts with a foreign bank increased from 18 to 26, and foreign banks' share of total long-term loans increased as well. In March 1994, foreign banks accounted for 5% of all outstanding long-term loans. With their expansion of branches, their share of long-term loans increased and averaged roughly 8% from 1996 to 1998, and 10% from 1999 to 2001. More importantly, some back of the envelope calculations suggest foreign bank entry was sizeable in the eight districts receiving their first foreign bank. By 2003, foreign banks accounted for roughly 5.5% of long-term loans in these districts, and their share of loans is about 10% in districts that experienced entry earlier, between 1994 and 1996, suggesting foreign banks continue to grow their operations over time after entry.¹⁰

3. Data description

The data used to identify the location and date of opening for each foreign bank in India is the *Directory of Bank Offices* published by the Reserve Bank of India (RBI). Providing the location, name, opening date, and closing date for every bank office in India, the data set is used to construct a complete annual directory of all banks in India from 1988 to 2004.

Using this data, it is possible to map out the timing and location of arrival for the new foreign banks. Table 1 shows the number of foreign banks by district and year from 1990 to 2002. In the top half of the table are the 18 districts that already had a foreign bank before 1991. These include the three districts with very large metropolitan centers: Delhi, Greater Mumbai, and Kolkata. In the

⁸ Foreign banks wishing to expand needed to seek RBI approval, as do all banks under Section 23 of the Banking Regulation Act, 1949. Requests for new branches are evaluated on the "merits of each case and taking into consideration overall financial position of the bank, quality of its management, efficacy of the internal control system, profitability, and other relevant factors". See "Master Circular on Branch Licensing", DBOD.No. BLBC. 5/22.01.001/2004, Reserve Bank of India, Mumbai, pp. 4.

⁹ Thirty-three foreign bank branches closed during this time period, so the net change was only 56. Seventeen of these closures were from ANZ Grindlays Bank Ltd. and five from Standard Chartered Bank in 1998 and 1999.

¹⁰ Additionally, it is also worth noting that by introducing additional competition into the financial system, foreign bank entry can have significant and immediate effects on the lending decisions of domestic banks in general equilibrium even if the extent of their actual size of entry is limited (Dell'Ariccia and Marquez, 2004; Gormley, 2007; Petersen and Rajan, 1995; Sengupta, 2007).

Table 1

Number of foreign bank branches in India by district and year.

District name	State name	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Districts with pre-existing foreign bank branches														
Amritsar	Punjab	3	3	3	3	3	3	3	3	3	2	1	1	1
Bangalore Urban	Kanrataka	2	2	2	3	3	5	6	7	7	10	11	11	12
Coimbatore	Tamil Nadu	1	1	1	1	1	1	1	1	2	2	2	3	4
Darjiling	West Bengal	1	1	1	1	1	1	1	1	1	1	1	1	1
Delhi	Delhi	22	23	24	24	26	28	28	31	35	36	37	38	37
Ernakulam	Kerala	3	3	3	3	4	4	4	4	4	3	3	3	4
Greater Mumbai	Maharashtra	51	52	52	51	51	55	58	63	65	63	64	64	63
Haora	West Bengal	2	2	2	2	2	2	2	2	2	2	2	2	2
Hyderabad	Andhra Pradesh	1	1	1	1	1	2	2	2	2	4	6	8	8
Kamrup	Assam	1	1	1	1	1	1	1	1	1	1	1	1	1
Kanpur City	Uttar Pradesh	3	3	3	3	3	3	3	3	3	3	3	3	3
Kolkata	West Bengal	43	43	42	42	42	42	42	43	43	34	34	34	34
Kozhicode	Kerala	1	1	1	1	1	1	1	1	1	1	1	1	1
Chennai	Tamil Nadu	11	11	11	12	12	12	14	15	16	16	16	16	16
Simla	Himachal Pradesh	1	1	1	1	1	1	1	1	1	1	1	1	1
South Goa	Goa	1	1	1	1	1	1	1	1	1	1	1	1	1
Srinagar	Jammu and Kashmir	1	1	1	1	1	1	1	1	1	1	1	1	1
Vishakhapatnam	Andhra Pradesh	1	1	1	1	1	1	1	1	1	1	1	1	1
Districts receiving first foreign bank														
Thiruvananthapuram	Kerala					1	1	1	1	1	1	1	1	1
Ahmedabad	Gujarat						2	2	3	3	5	5	8	8
Pune	Maharashtra							1	1	4	5	5	5	6
Chandigarh	Chandigarh								1	1	1	1	2	2
Gurgaon	Haryana										1	1	1	2
Vadodara	Gujarat										1	1	2	2
Jaipur	Rajasthan												1	1
Ludhiana	Punjab												1	1
Total foreign bank branches		149	151	151	152	156	167	174	187	198	196	198	209	212

Notes: Number of foreign bank branches calculated using the *Directory of Bank Offices*. Bank numbers represent total branches as of March 31 for each year.

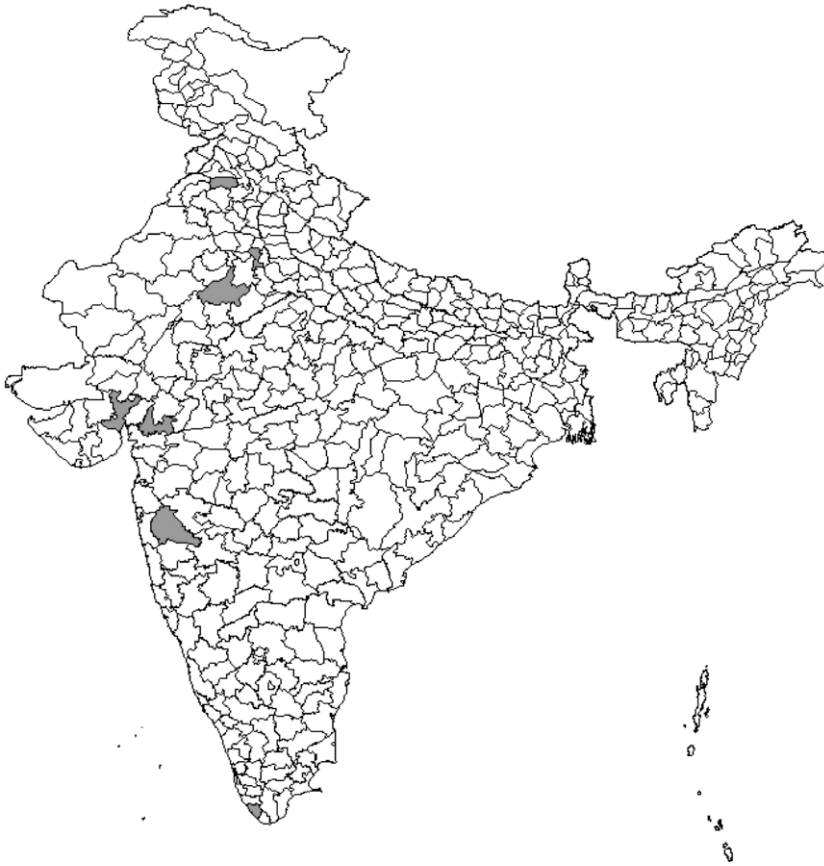


Fig. 1. Indian districts with first foreign bank entry between 1991 and 2002.

bottom half are the eight districts that received their first foreign bank during India's financial liberalization. As can be quickly seen, the overall increase in foreign bank branches largely coincides with the signing of the GATS in 1994, but the actual timing of entry across these eight districts is staggered across years. The district location of new foreign banks is mapped in Fig. 1 which highlights the eight districts that receive their first foreign bank between 1991 and 2002. The eight districts are relatively dispersed across India, spanning seven of India's 35 states.¹¹

The bank location data are matched up to the Prowess data set compiled by the Centre for Monitoring Indian Economy (CMIE). Prowess is a panel data set of firms from 1988 to 2002 where Indian and foreign firms with assets plus sales greater than 40 million Rupees (approximately \$900,000) are included in the data set. The data set provides the annual financial and accounting data of each firm along with descriptive variables including the ownership, year of incorporation, and registered address. Using each firm's address, it is possible to track their financial status at the district-level and to merge this data to the district location of the new foreign banks in India. CMIE compiles the financial data using the audited annual accounts that all registered companies in India must submit to the Registrar of Companies. The cutoff level of firm size in the Prowess data set seems to be an

¹¹ Citibank and Hong Kong and Shanghai Banking (HSBC) were responsible for half of the new foreign bank branches in the eight districts. Other banks opening branches in these districts were ABN AMRO, American Express Bank Ltd., ANZ Grindlays, BNP Paribas, Crédit Lyonnais, Deutsche Bank (Asia), Société Générale, and Standard Chartered. Each had pre-existing branches elsewhere in India at the time of entry in the eight districts.

arbitrary point chosen to limit the size of the database. For the remainder of this paper, the analysis is restricted to non-financial, domestic firms included in the Prowess data by 1991, and all financial variables from Prowess are adjusted for inflation using India's consumer price index.¹²

While foreign banks only entered eight new Indian districts after 1991, the financial data provided by Prowess indicates that a large number of Indian firms were likely affected by this entry. Of the districts that did not already have a foreign bank prior to 1991, these eight districts account for 25% of the observed firms and 24% of total sales reported by the Prowess database in 1991. These high numbers reflect foreign banks' tendency to locate in heavily populated districts, which is seen more explicitly in Table 2.

Table 2 provides pre-reform summary statistics of the firms included in Prowess broken down into three categories based on a firm's location. The first column reports summary statistics for firms found in the 18 districts with a foreign bank presence by 1991. These districts are more densely populated and heavily banked than all other districts. Firms in these districts are also twice as large on average, in terms of total assets, than all other firms in India which are reported in the other two columns. The second column provides statistics for firms in the eight districts that receive their first foreign bank from 1991 to 2002, and column three provides the summary statistics for firms found in districts still without a foreign bank by the end of 2002. The eight districts with a new foreign bank are also more densely populated and heavily banked than the remaining 154 districts that do not receive a foreign bank by 2002, but not nearly to the extent as districts already having a foreign bank.

The main comparison of interest in this paper is between firms located in the eight districts receiving their first foreign bank in the 1990s to those located in districts without a foreign bank. Among firms in these districts, bank credit accounts for roughly 2/3 of total borrowings. Short-term bank credit, which is defined as all cash credits, bank overdrafts, and working capital loans from banks with maturity less than a year, accounts for roughly 1/2 of their bank borrowings, while long-term loans with maturity of one year or more from banks and financial institutions (FIs) account for the other half of bank borrowings in each type of district.

The distinction between long-term 'bank' and 'FI' loans is important as it allows for a partial separation of loans provided by domestic and foreign banks. While the Prowess data does not provide a direct measure of loans from foreign banks, these loans will be included, along with loans from domestic commercial banks, in a firm's stock of 'bank' loans. Only about 44% of firms in districts without a foreign bank had such loans in 1993 as India's commercial banks typically do not provide many long-term loans. 'FI' loans, however, report firms' loans from India's *development* banks and will capture the *indirect* effects of foreign entry on domestic lending patterns. These development banks are large domestic entities and the primary providers of long-term loans in India, and because they specialize in long-term loans, they are particularly likely to be affected by the entry of foreign bank.¹³ According to the *Annual Accounts Data for Commercial Banks* published by the RBI, long-term loans accounted for 70% of total loans for Citibank and HSBC from 1996 to 2001.

4. Empirical strategy and identification assumptions

The basic OLS specification used in this paper is the following:

$$y_{i,d,t} = \beta_0 + \beta_1 \text{Foreign Bank}_{d,t} + \alpha_i + \delta_t + \varepsilon_{i,d,t} \quad (1)$$

The dependent variable is a firm-level outcome variable y for firm i , located in district d , in year t . The variable y will entail measures of firms' outstanding stock of loans from banks and FIs, and the different financial measures used are discussed below. Foreign Bank is an indicator for the presence

¹² Because Prowess only covers the relatively large firms in India, it contains observations for just 180–230 of India's more than 500 districts each year. By restricting the data to non-financial, domestic firms present in Prowess by 1991, the sample size drops to 176 districts. Appendix Table 1 provides further explanations of which observations are dropped from later regressions. The appendix also provides details on how firm locations are determined within Prowess.

¹³ The development banks include the Industrial Development Bank of India (IDBI), Industrial Finance Corporation of India (IFCI), and Industrial Credit and Investment Corporation of India Limited (ICICI). FIs were established in the 1950s and 1960s with the express purpose of providing long-term financing to firms.

Table 2

Summary statistics by type of district, using 1993 data.

	Districts with pre-existing foreign banks	Districts with no foreign bank in 1991	
	(1)	Foreign bank by 2002 (2)	No foreign bank by 2002 (3)
Firm characteristics			
Total assets (10 mn. Rp.)	511.78	229.21	259.12
1991–1993 average ROA (%)	2.48	3.75	2.07
Short-term bank credit/total borrowings	0.380	0.344	0.350
Long-term bank and FI loans/total borrowings	0.298	0.337	0.373
Short-term bank credit/assets	0.148	0.123	0.148
Long-term bank loans/assets	0.041	0.023	0.034
FI loans/assets	0.106	0.118	0.168
% of firms with long-term loan	80.2	87.5	88.1
% firms with bank loan	42.2	43.1	44.1
% firms with FI loan	69.3	80.6	81.4
District banking and population characteristics			
Population/km ²	6591	1228	476
Total banks/million people	135	118	72
% share of private banks	11.32	6.13	6.13
Number of districts	14	8	154
Number of firms	1047	156	500

Notes: Summary statistics are presented by the degree of district-level foreign bank presence. Statistics for districts with a foreign bank by 1991 are presented in column (1) while statistics for districts with no foreign bank in 1991 but with a foreign bank by 2002 are reported in column (2), and statistics for districts still without a foreign bank by 2002 are presented in column (3). Firm statistics are un-weighted averages calculated using 1993 Prowess data for all domestic, non-financial firms with positive sales and assets in 1991. Population and district area data are obtained from the 1991 census and the *Directory of Bank Offices*. District-level characteristics are calculated using un-weighted means.

of a foreign bank in district d in year t that is turned on for all firms in the district if a foreign bank was present in that year. All subsequent findings are similar when the district-level share of foreign banks is used instead of an indicator. However, the indicator of foreign bank entry is preferred since theory indicates that the mere entry of the foreign lender is sufficient to induce a segmentation of the market and exacerbate information asymmetries (Dell'Ariccia and Marquez, 2004; Sengupta, 2007; Gormley, 2007). A full set of firm dummies, α_i , absorb any fixed differences in firms' use of loans such that the coefficient of interest, β_1 , is estimated only using *within* firm changes. This ensures that firm-specific or location-specific characteristics that do not change over time will not drive the empirical findings. Moreover, the time dummies, δ_t , control for any country-level trends in lending patterns that may be caused by other changes in government policy or financial deregulation. Finally, because the variation of foreign entry occurs at the district-level, the standard errors are clustered at the district.

In this base specification, the effect of foreign bank entry is captured by the coefficient β_1 which is estimated using the changes in the borrowing patterns of firms located in the eight districts that receive their first foreign bank from 1991 to 2002 relative to firms in districts that never receive a foreign bank. There are two main advantages of this within-country analysis over the more standard approach of using cross-sectional, country-level analysis. First, the panel specification makes use of the staggered timing of entry by foreign banks between 1994 and 2001, and the coefficient β_1 is estimated using only changes in borrowing patterns at the time of foreign bank entry within each district. This panel variation and the inclusion of firm-level fixed effects eliminates the concern that fixed differences across districts, such as differing labor market regulations or financial development, will cause an omitted variable bias.¹⁴ Second, the use of within-country variation ensures that any findings for β_1 are attributable to the entry of the foreign bank rather than other country-level financial reforms

¹⁴ See Besley and Burgess (2004) for more information on how labor market regulations vary across Indian states.

implemented during the early 1990s. The impact of such country-level reforms would be absorbed by the year dummies, and the effect of foreign bank entry will be properly identified under the assumption that the trend in use and size of firms' loans in these eight districts would have been the same as those in the control group in the absence of the foreign banks' entry.¹⁵

The primary control group used is all firms in districts without a foreign bank at any point from 1991 to 2002. Firms headquartered in the 18 districts with a pre-existing foreign bank are dropped from the regression. As shown in Table 2, these districts are likely to be a poor control group since they are significantly more urban and contained firms that were much larger on average. As shown in Section 6, however, including these 18 districts does not significantly alter the main findings. As a robustness check, the regressions are also run using a smaller control group consisting only of firms found in the nine districts that receive their first foreign bank in 2003 and 2004: Aurangabad, Bhopal, Faridabad, Lucknow, Nagpur, Patna, Rajkot, Surat, and Thane. These nine districts potentially provide a better control group in that one might consider them "next in line" for foreign bank entry and hence, very similar to the eight districts that receive their foreign bank earlier.¹⁶

The basic specification in Eq. (1), however, does not allow us to test whether foreign bank entry differentially affects firms. This is done using a second specification, Eq. (2), that includes the interaction, Foreign Bank $\times$ ROA, where ROA is the demeaned average percent return over total assets of firm i from 1991 to 1993. Profits are measured using profit after taxes net of non-recurring transactions. A full set of year and profit interactions, $\delta \times$ ROA, are also included to allow firms across India to trend differently as a function of their past profitability.

$$y_{i,d,t} = \beta_0 + \beta_1 \text{Foreign Bank}_{d,t} + \beta_2 (\text{Foreign Bank}_{d,t} \times \text{ROA}_i) + \alpha_i + \delta_t + (\delta_t \times \text{ROA}_i) + \varepsilon_{i,d,t} \quad (2)$$

In this second specification, β_1 still describes the main effect of foreign bank entry since ROA is demeaned, whereas, β_2 describes the marginal effect of having a higher ROA beforehand. Inclusion of the interaction of Foreign Bank $\times$ ROA tests whether a firm's profitability matters more for credit access after foreign banks enter the district, under the assumption that a firm's past ROA is a positive predictor of future potential.¹⁷ This allows us to assess whether foreign bank entry is associated with a reallocation of credit from less profitable to more profitable firms, as would be indicated by $\beta_2 > 0$. Moreover, if there is a drop in credit driven predominately by fewer loans allocated to politically connected, unprofitable firms, this would also be indicated by $\beta_2 > 0$.

Finally, it is implicitly assumed that the effect of foreign bank entry is localized and realized predominately by firms headquartered in the district with a foreign bank. Both specifications presume that firms in India borrow from banks located near their registered address, and that these banks are located in the same district. In general, we expect this to hold as empirical work in other countries has demonstrated the average distance between firms and their bank is usually quite small.¹⁸ However, even if this assumption is not fully true, this would only bias the results against finding an effect of foreign bank entry. If firms borrow from outside their district, then firms located outside the eight

¹⁵ There, however, would still be a bias if other country-level financial reforms had a differential impact across districts that is correlated with both the location and timing of foreign bank entry across India. This possibility is explored further in Section 6.3 where a number of robustness checks are conducted to address this concern.

¹⁶ Subsequent findings are also robust to comparing just the pre- to post-entry changes for firms in a district with a new foreign bank. However, a concern with this pre- versus post-entry analysis is that any observed changes following foreign bank entry could also be caused by country-level trends that coincide with foreign entry. By including firms that did not experience foreign entry along with firm-level fixed effects, however, we are able to control for this by showing that not only did the allocation of credit change after foreign bank entry occurs, this change is different than in areas of the country where foreign bank entry does not occur.

¹⁷ Firms' average ROA from 1991 to 1993 is in fact positively correlated to ROA levels from 1994 to 2002. Pre-entry ROA is used rather than actual ROA since profits after 1993 are an endogenous outcome of foreign bank entry.

¹⁸ Analyzing small firms in the US, Petersen and Rajan (2002) finds that the average distance between a firm and its main bank was 67.8 miles in 1993, and the median distance was 5 miles. The Indian districts included in this sample had an average size of 2457 square miles. While the US firms sampled were on average six times smaller than the firms found in the Prowess data, it is likely the Indian firms also borrow locally as the positive relation between distance and borrowing costs are likely greater in a developing country such as India. Recent work on lending relationships and loan prices in Belgium, Italy, and the US also suggest that greater lending distances are associated with increased transportation and informational costs (Agarwal and Hauswald, 2007; Degryse and Ongena, 2005; Mistrulli and Casolaro, 2008).

treated districts may in fact be ‘treated’ causing the estimates to understate the true effect. Moreover, the ability to borrow from banks outside the district will only mitigate the local impact of foreign bank entry thus making it more difficult to discern an impact of foreign bank entry at the district-level.

To measure firms’ access to loans, a number of dependent variables, y , will be used. First, to test the effect on the amount of loans a firm reports, three different variables will be used: the stock of long-term commercial bank loans (Bank loans), the stock of loans from domestic development banks (FI loans), and the stock of loans from both commercial and development banks (total long-term loans). The natural log of all three measures is used, and all subsequent results are also robust to instead normalizing each variable by assets at the beginning of the sample period. Second, a set of indicators that equal one for firms with a loan from the given source are used to test for changes in the likelihood of a firm having a loan. While the two sets of financial measures are similar in nature, their distinction is important. The first set will capture whether firms in districts receiving a foreign bank experience a relative change in the *amount* of financing they receive, while the second set of indicators will test for whether a firm’s *likelihood* of having a loan is affected by foreign bank entry.

An alternative way to estimate these two separate effects would be to use a Heckman procedure to jointly estimate the change in likelihood and amount of loans (Heckman, 1979). Use of a Heckman procedure would also help control for any remaining selection bias driven by unobserved factors that are changing over time differentially across Indian districts that may be both driving the selection of which firms have loans and the overall amount of their loans. However, because of the incidental parameters problem, the Heckman procedure will be biased with the inclusion of firm-level fixed effects (Greene, 2004), and excluding the firm fixed effects to remedy this problem may introduce a bias if time-invariant differences in firms’ access to loans exists and is correlated with the likelihood of foreign bank entry. Despite these potential limitations, however, the Heckman estimates (both with and without firm-level fixed effects) show similar results to the OLS estimates. Moreover, the null hypothesis of zero selection bias is not rejected in most specifications. Therefore, for the remainder of this paper, I will only report OLS estimates based on the above specifications, but estimates derived using the Heckman procedure are available from the author upon request.

5. OLS estimates

The OLS estimates of the relation between long-term loans and the presence of a foreign bank are reported in Table 3. Columns (1)–(4) report the coefficients using an indicator for having a long-term loan as the dependent variable, while columns (5)–(8) report the coefficients when the dependent variable is the stock of total long-term loans.

Overall, the estimates of Table 3 indicate a decline in both the likelihood of receiving a loan and the size of loans following foreign bank entry that is unrelated to firm’s past profitability. In the base regression with all firms and no additional controls or interactions [column (1)], foreign bank entry coincides with a 7.6 percentage point drop in firms’ likelihood of having a long-term loan relative to firms located in districts without a foreign bank. The drop in the number of firms with a long-term loan is relatively large and coincides with the entry of foreign banks as shown in Fig. 2. Moreover, inclusion of the ROA interactions [column (2)] demonstrate that the decrease is largely unrelated to firms’ ROA, and if anything, there is weak evidence a firms’ ROA is marginally less important following foreign entry. Hence, there is no evidence that the decline is driven by a decline in loans allocated to the least profitable firms. The estimates in columns (5) and (6) also indicate a decline in overall loan sizes after foreign entry that is also unrelated to firms’ past profitability. The decline in loans and loan sizes is also robust to including industry-year interactions [columns (3) and (7)] and restricting the sample to eventually “treated” districts [columns (4) and (8)].

To better understand where the changes in loan allocations are coming from, the regressions are now conducted separately for loans from banks and FIs. Again, the regressions pertaining to bank loans will proxy for the “direct” effect of new foreign bank loans, while the FI loan regressions will capture the “indirect” effect of foreign bank entry on the domestic loans from India’s development banks. The regressions for bank and FI loans are reported in Tables 4 and 5.

Table 3

Effect of foreign bank entry on total long-term loans.

Dependent variable	Indicator for long-term loan				Ln(long-term loans + 1)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Foreign bank	−0.076*** (0.027)	−0.075*** (0.028)	−0.080*** (0.028)	−0.077** (0.032)	−0.202 (0.155)	−0.240* (0.140)	−0.206 (0.149)	−0.344** (0.121)
Foreign bank × ROA		−0.003* (0.002)	−0.003 (0.002)	−0.002 (0.002)		0.006 (0.008)	0.010 (0.010)	0.010 (0.009)
Observations	7088	7088	7088	2617	7088	7088	7088	2617
R-squared	0.55	0.56	0.67	0.56	0.75	0.76	0.81	0.77
Number of districts	162	162	162	17	162	162	162	17
ROA-year interactions		X	X	X		X	X	X
4-digit industry-year interactions			X				X	
"Treated" control group used				X				X

Notes: This table reports coefficients from regressions of total long-term loans onto district and firm characteristics using OLS with firm and year fixed effects. The dependent variable is an indicator for having a long-term loan in columns (1)–(4) and $\ln(1 + \text{long-term loans})$ in columns (5)–(8). Yearly observations from 1991 to 2002 are included for domestic, non-financial firms with positive sales and assets in 1991 but not located in a district with a foreign bank by 1991. 'Foreign Bank' is equal to one for firms located in a district with a foreign bank in the given year, and zero otherwise. 'ROA' is a firm's 1991–1993 average percent return on assets, demeaned. Columns (3) and (7) include 4-digit industry-year interactions. Columns (4) and (8) restrict the sample to 'treated' firms located in districts with a foreign bank by 2004. Standard errors, clustered at the district-level, are reported in parentheses.

* 10% level

** 5% level

*** 1% level.

In Tables 4 and 5, we see that the decrease in both the *likelihood* of having a long-term loan and the eventual *amount* of lending is driven entirely by a fall in FI loans [columns (5)–(8)] rather than loans from commercial banks [columns (1)–(4)]. This implies that competition from foreign banks indirectly affects the allocation of credit by India's domestic development banks. Again, a firm's ROA does not appear to have any effect on whether it is less likely to receive an FI loan or the overall amount of FI loans the firm receives. Therefore, there does not appear to be any evidence to support the hypothesis that domestic lenders respond positively to competition by adopting new screening technologies and improving their credit allocation. Instead, domestic development banks respond to the competition from foreign banks by systematically reducing the number and size of domestic loans allocated to

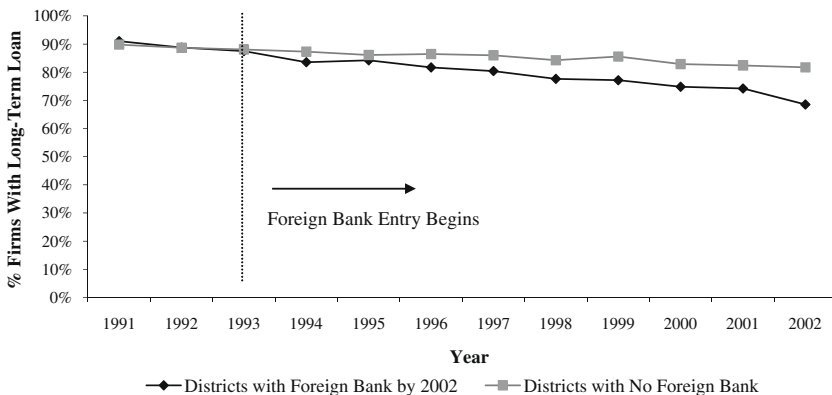


Fig. 2. Event study graph of foreign bank entry, 1991–2002. 'Districts with a Foreign Bank by 2002' represents all firms located in districts that receive their first foreign bank between 1991 and 2002, and 'Districts with No Foreign Bank' represents all firms located in districts a foreign bank by 2002. The percent of firms with a long-term loan in each type of district is calculated using domestic, non-financial firms with positive sales and assets in 1991.

Table 4

Access to bank and FI loans.

Dependent variable	Indicator for bank loan				Indicator for FI loan			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Foreign bank	0.008 (0.038)	0.009 (0.039)	−0.014 (0.035)	0.038 (0.038)	−0.084 ** (0.040)	−0.087 ** (0.039)	−0.065 * (0.037)	−0.073 ** (0.035)
Foreign bank * ROA		−0.003 * (0.002)	−0.002 (0.002)	−0.003 (0.002)		−0.001 (0.001)	0.000 (0.002)	−0.001 (0.001)
Observations	7088	7088	7088	2617	7088	7088	7088	2617
R-squared	0.46	0.47	0.56	0.45	0.64	0.65	0.72	0.65
Number of districts	162	162	162	17	162	162	162	17
ROA-year interactions		X	X	X		X	X	X
4-digit industry-year interactions			X				X	
"Treated" control group used				X				X

Notes: This table reports coefficients from separate regressions of bank and FI loan indicators onto district and firm characteristics using OLS with firm and year fixed effects. The dependent variable is an indicator for having a bank loan in columns (1)–(4) and an indicator for FI loans in columns (5)–(8). Yearly observations from 1991 to 2002 are included for domestic, non-financial firms with positive sales and assets in 1991 but not located in a district with a foreign bank by 1991. 'Foreign Bank' is equal to one for firms located in a district with a foreign bank in the given year, and zero otherwise. 'ROA' is a firm's 1991–1993 average percent return on assets, demeaned. Columns (3) and (7) include 4-digit industry-year interactions. Columns (4) and (8) restrict the sample to 'treated' firms located in districts with a foreign bank by 2004. Standard errors, clustered at the district-level, are reported in parentheses.

* 10% level.

** 5% level.

domestic firms, regardless of their potential, and this decrease in loans from the domestic banks is not offset by an increase in loans from foreign banks.¹⁹

Interestingly, while we find no average affect on the likelihood or amount of bank loans, we find a relative increase in importance of firms' ROA for the *amount* of bank loans [columns (1)–(4), Table 5]. This positive relation for bank loans, but no relation for FI loans [columns (5)–(8), Table 5] suggests an increase in loan sizes for more profitable firms that is being driven by new loans from the foreign banks rather than domestic banks. While some domestic commercial bank loans are also included in the measure of 'bank' loans, the lack of a similar improvement in efficiency for domestic development banks suggests the increase in loan sizes to profitable firms is being driven by new foreign bank loans rather than any change in domestic loans.

Moreover, the increase in bank loan sizes for relatively more profitable firms appears driven by lending patterns consistent with the 'cream-skimming' behavior that is generally associated with foreign banks rather than domestic banks. In particular, the positive interaction in Table 5 appears driven by an increase in bank loans to only the top 10% of firms in terms of ROA. It is easy to see this in Fig. 3, which breaks down the trend in bank loans of firms from 1991 to 2002 based on their ROA from 1991 to 1993. As seen in Fig. 3, the trend in loans to the most profitable 10% of firms was relatively flat from 1991 to 1994. Beginning in 1995, however, there is a very large growth in loans for the top 10% in districts with a foreign bank, while the top 10% in other districts do not show any increase in loans. The increase in loans to more profitable firms is restricted to the top 10%, however, as there is no evidence that foreign bank entry is associated with an increase in loan amounts for firms with an ROA above the median but not in the top 10% or for firms with an ROA below the median. In unreported results, the importance of these very profitable firms is confirmed in that their removal from the earlier

¹⁹ It is difficult to discern exactly where the domestic capital went. One possible explanation is that FIs raised less capital on external markets via the issuance of bonds, commercial paper, etc. While data is only available beginning in 1996, the real value of external capital raised by development banks was constant from 1996 to 1998 and declining thereafter. Another potential explanation is that bank capital was redirected elsewhere. From 1992 to 1993, 24% of bank deposits were held as government securities, but from 1994 to 1998, it increased to 29%, exceeding the statutory requirement of 25%. Data limitations, however, do not allow one to test whether either of these changes were driven by development banks located in districts with new foreign banks.

Table 5

Size of bank and FI loans.

Dependent variable	Ln(bank loans + 1)				Ln(FI loans + 1)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Foreign bank	0.156 (0.132)	0.124 (0.126)	0.112 (0.105)	0.069 (0.131)	−0.321** (0.137)	−0.346** (0.138)	−0.298* (0.158)	−0.397*** (0.113)
Foreign bank × ROA		0.008** (0.004)	0.011** (0.005)	0.009* (0.004)		0.003 (0.010)	0.008 (0.001)	0.007 (0.011)
Observations	7087	7087	7087	2617	7088	7088	7088	2617
R-squared	0.50	0.51	0.62	0.50	0.77	0.77	0.82	0.78
Number of districts	162	162	162	17	162	162	162	17
ROA-year interactions		X	X	X		X	X	X
4-digit industry-year interactions			X				X	
"Treated" control group used				X				X

Notes: This table reports coefficients from regressions of bank and FI loan sizes onto district and firm characteristics using OLS with firm and year fixed effects. The dependent variable is the Ln(bank loans + 1) in columns (1)–(4) and the Ln(FI loans + 1) in columns (5)–(8). Yearly observations from 1991 to 2002 are included for domestic, non-financial firms with positive sales and assets in 1991 but not located in a district with a foreign bank by 1991. 'Foreign Bank' is equal to one for firms located in a district with a foreign bank in the given year, and zero otherwise. 'ROA' is a firm's 1991–1993 average percent return on assets, demeaned. Columns (3) and (7) include 4-digit industry-year interactions. Columns (4) and (8) restrict the sample to 'treated' firms located in districts with a foreign bank by 2004. Standard errors, clustered at the district-level, are reported in parentheses.

* 10% level.

** 5% level.

*** 1% level.

regressions in Table 5, columns (1)–(4), largely eliminates the positive coefficient. Moreover, the increase in loans also seems to be primarily caused by only the largest firms. Dropping firms with assets in 1991 exceeding the median, also eliminates the increase in loan sizes to profitable firms.

Interestingly, however, this increase in loans to only the most profitable firms does not appear to occur in districts where a new foreign bank entrant already had a bank branch established elsewhere in the same state. And, there is no evidence of such an increase in districts where the initial foreign bank entrant had previous operating experience elsewhere in India. Both of these results are consistent with the argument that foreign banks with more previous operating experience may have better information about the local firms and hence rely less on 'cream-skimming' following entry into the new areas of the country. However, there is still strong evidence of a drop in domestic bank credit in these districts following foreign bank entry suggesting the domestic banks still lowered their overall amount of lending.²⁰

Overall, the OLS estimates are supportive of models incorporating asymmetric information. The increase in loans to the most profitable 10% of firms is suggestive that these firms were under-financed in the closed economy, and that foreign bank entry improves the allocation of credit by targeting more loans to these firms. However, the increase in loans appears limited to small subset of profitable firms, which is consistent with theories that asymmetric information induces 'cream-skimming' behavior by foreign banks. At the same time, foreign bank entry also led to a systematic reduction in long-term lending by the domestic development banks that is not offset by a corresponding increase in loans from foreign banks. This finding is consistent with models that suggest foreign bank entry may adversely affect some firms. While part of this decline in credit may be the consequence of an efficient reduction in loans to less profitable firms, the extent of the drop and its non-relation to a firm's past profits is suggestive that some viable domestic firms were also less likely to receive a loan after entry. Additionally, the findings are similar if I instead restrict the sample to listed firms and use pre-entry measures of Tobin's Q as a proxy for a firm's future potential instead of using past profits. Overall, there is no evidence that the decline in domestic loans is larger among firms with lower past profitability or fewer investment opportunities.

²⁰ These results are available from the author upon request.

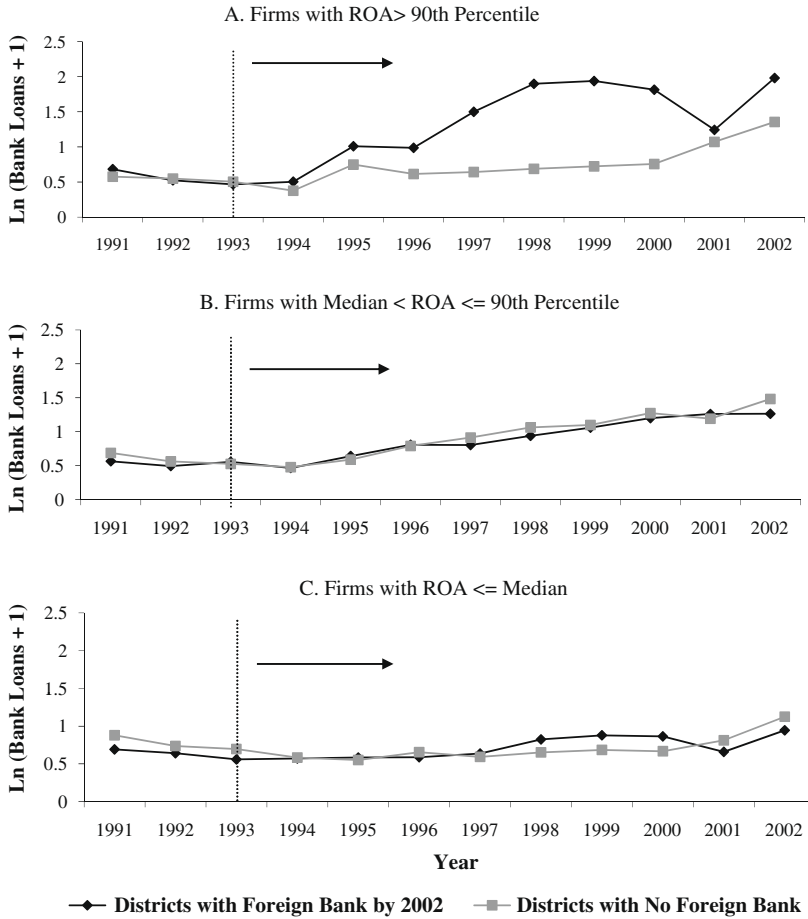


Fig. 3. Average bank loan sizes by ROA. 'Districts with Foreign Bank by 2002' represents firms located in districts that receive their first foreign bank between 1991 and 2002, and 'Districts with No Foreign Bank' represents firms located in districts without a foreign bank by 2002. Each line represents the average $\text{Ln}(\text{bank loans} + 1)$ of firms with positive sales and assets in 1991 where ROA is the average return on assets of firms from 1991 to 1993.

6. Robustness checks and IV estimates

While the initial regressions are supportive of predictions that additional competition from foreign banks will induce a reallocation of credit when information asymmetries are large, one might be concerned about a potential selection bias in the OLS estimates. Since foreign banks endogenously chose where to locate new branches in India, it is possible the foreign banks selected into districts that were either already trending differently in bank or FI loans or were going to trend differently in the future for reasons other than the entrance of the foreign bank.

6.1. Testing for pre-trends

To test for a pre-existing trend in both the increase in bank loans to the most profitable firms and the decrease in overall FI loans, two fully saturated OLS regressions are estimated. In the first specification, the amount of bank loans is regressed onto indicators for years pertaining to foreign bank entry for firms with an ROA in the top 10%. In the second specification, all firms are included

and the dependent variable used is the indicator for FI loans. By allowing the impact of foreign bank entry to vary by year in these two specifications, it is possible to determine whether there is any evidence that the observed changes in either case was already occurring prior to foreign bank entry. Similar to before, firm and year fixed effects are included, and standard errors are clustered at the district-level. The point estimates from these two specifications, in a five-year period surrounding foreign bank entry [year $t = 0$], are plotted in Fig. 4.

Overall, the point estimates from these specifications indicate that the observed loan reallocations occurred approximately one to two years following foreign banks' initial entry, and there is no evidence of a differential pre-trend prior to their entry. In Fig. 4A, we see that the increase in bank loan sizes for very profitable firms exhibited a sharp increase about two years following foreign entry into their district, while in the five years prior to foreign bank entry, there is no evidence that loan sizes to these profitable firms were growing a different rate relative to profitable firms located elsewhere in India. Likewise, in Fig. 4B, we see that the number of firms with FI loans did not exhibit a statistically significant drop until one to two years following foreign bank entry.

6.2. IV estimates

However, there is still the concern that foreign banks could have selected into districts that were going to trend differently in the future for reasons unrelated to the actual entry.

A review of press releases of the foreign banks establishing new branches in India during the late 1990s suggests new branch locations in India were chosen to decrease the distance to existing borrowers and to establish a presence in high-growth cities. Inaugurating the opening of a new branch in Surat in 2004, Sanjay Nayar, Citigroup Country Officer for India, stated "We're very happy to move closer to our clients. . ." Regarding the opening of a new branch in Vadodara in 2005, Naill Booker, CEO of HSBC—India, stated, "The markets in western India hold enormous potential for growth and there are huge opportunities for us. . .". While the location choice based on existing clients is unlikely to pose an identification problem, the selection into high-growth districts could cause a positive bias in the OLS estimates if these districts would have seen a growth in loans even in the absence of foreign bank entry.

To address this potential identification problem, the pre-1994 presence of foreign firms is used as an instrument for the location of new foreign banks. I assume that foreign banks are more likely to enter districts with firms from their home country to preserve pre-existing relationships or take advantage of their competitive advantage in obtaining information about the firms in their home country. This tendency for foreign banks to follow their customers abroad has been noted in a number of countries,²¹ and seems to occur in India also. Within the sample of data, there are 52 foreign-owned firms spread across 26 of the 162 districts. Five of the eight districts that receive their first foreign bank during the 1990s have a foreign-owned firm present in 1993.

To test the relation between the location of foreign banks and foreign-owned firms, the following first stage regression is used:

$$\text{Foreign Bank}_{d,t} = \text{const.} + \text{Foreign Firm}_{d,1993} \times \text{Post-1993}_t + \alpha_i + \delta_t + \varepsilon_{i,d,t} \quad (3)$$

The instrument for Foreign Bank is the interaction between a district-level indicator variable for having a foreign-owned firm present in 1993, Foreign Firm, and a Post-1993 year indicator. This is a firm-level regression with firm and time dummies, and the standard errors are clustered at the district-level. The results of the first stage are reported in Table 6. As can be seen, the presence of a foreign-owned firm in 1993 is a positive and significant predictor of a foreign bank being present in

²¹ For example, Sabi (1988) finds a positive correlation between the amount of US FDI and banking assets in 23 less-developed countries from 1975 to 1982; Yamori (1998) finds that Japanese financial companies tend to invest in countries with greater amounts of Japanese FDI; and Brealey and Kaplanis (1996) find a positive correlation between the number of foreign banks present in a country and the amount of FDI from the parent country of the foreign banks. There is also evidence that foreign banks' choose their locations for other reasons beyond just following their existing customers (Berger et al., 2003; Buch and Golder, 2001; Focarelli and Pozzolo, 2005; Seth et al., 1998; Stanley et al., 1993), but these alternative reasons will likely only work against finding any effect in the first stage of the instrument variable estimation.

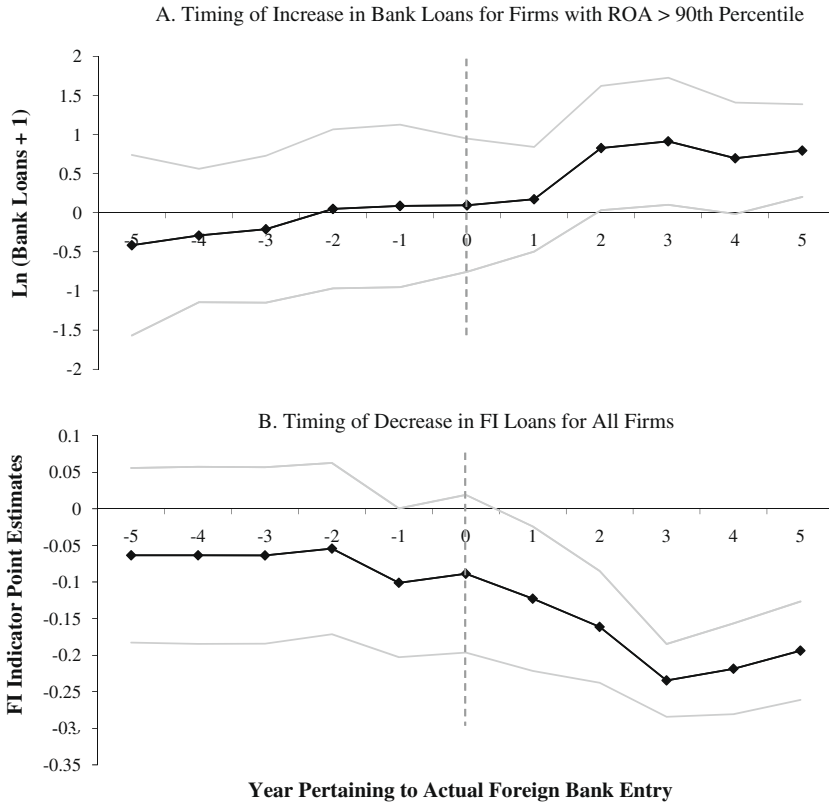


Fig. 4. Timing of changes in loan allocation. This figure plots point estimates from fully saturated OLS regressions of loan measures onto indicators for years pertaining to actual foreign bank entry. The regressions include firm and year dummies and use yearly observations from 1991 to 2002 for firms with positive assets and sales in 1991 but not located in a district with a foreign bank by 1991. In panel A, the dependent variable is $\ln(\text{bank loans} + 1)$, and the regression is restricted to firms with an ROA above the 90th percentile, where ROA is the average return on assets of firms from 1991 to 1993. In panel B, the dependent variable is FI loan indicator, and all firms are included. While both regressions are fully saturated, only point estimates for five years preceding and following foreign entry are plotted. The standard errors were clustered at the district-level, and the 95th percentile confidence intervals are shown.

the years 1994–2002. The estimates imply that the presence of foreign-owned firm in 1993 increased a districts' likelihood of receiving a foreign bank after 1994 by about 34 percentage points relative to districts that did not have a foreign-owned firm.

In order for the instrument to be valid, however, the location of foreign firms, in itself, should be uncorrelated with the borrowing trends of domestic firms. While the original location choice of foreign firms was also probably strategic,²² this assumption seems plausible in that the median year of incorporation for foreign firms used in the sample is 1974, nearly 20 years prior to the liberalization of the mid-1990s. Therefore, the location of foreign-owned firms is less likely to be directly correlated to domestic lending patterns in the mid- to late 1990s than the location choice of the new foreign banks. The IV estimates reported below are also very similar when the sample is restricted to foreign firms established at least 10 years prior to India's liberalization in 1994. Using only these older, for-

²² The location of foreign direct investment (FDI) within the US suggests foreign firms tend to locate in areas with lower taxes, higher per-capita incomes, lower wages, and more extensive transportation infrastructures (Coughlin et al., 1991; Hines, 1996). Cheng and Kwan (2000) find similar results for China.

Table 6

First stage regression.

	Dependent variable = 'Foreign Bank'
Foreign-owned firms in 1993 $\times$ Post-1993	0.341*** (0.124)
Observations	7088
R-squared	0.65

Notes: This table reports coefficients from regressions using OLS with firm and year fixed effects. The dependent variable is 'Foreign Bank', which is equal to one for firms located in a district with a foreign bank in the given year, and zero otherwise. On the RHS, 'Foreign-Owned Firms in 1993', an indicator equal to one for firms located in districts with at least one foreign-owned firm in 1993, is interacted with a Post-1993 year indicator. Yearly observations from 1991 to 2002 are included for firms with positive sales and assets in 1991 but not located in a district with a foreign bank by 1991. Standard errors, clustered at the district-level, are reported in parentheses.

*** 1% level.

foreign firms further limits endogeneity concerns regarding the location choice of recently established foreign firms. Moreover, there is no evidence that domestic firms in districts with a foreign firm were trending differently in their use of long-term loans in the five years prior to the signing of GATS in 1994.

With the instrument seeming to satisfy the identification assumptions, I now proceed to the IV estimates of Eq. (2). The interaction *Foreign Firm* $\times$ *Post-1993* is used to instrument for the location of foreign banks, *Foreign Bank*, and the interaction *Foreign Firm* $\times$ *Post-1993* $\times$ *ROA* is used to instrument for *Foreign Bank* $\times$ *ROA*. The IV estimates are reported in Table 7.

The IV estimates confirm the OLS estimates. The arrival of a foreign bank is still associated with a drop in the average firm's likelihood of receiving a long-term loan [Table 7, column (3)]. The IV estimates suggest foreign bank entry is associated with a 12.4 percentage point reduction in firms' likelihood of having either a loan, which is larger than OLS estimate of 7.6 percentage points and statistically significant at the 10% level.²³ Moreover, foreign bank entry is still associated with a positive and significant increase in the marginal importance of ROA for bank loan sizes [Table 7, column (5)], and the magnitude of the effect is similar to the OLS estimate.

6.3. Additional robustness checks

Overall, both the drop in firms' likelihood of having a long-term loan and the increase in the relative importance of firms' past ROA in determining the size of bank loans after foreign bank entry are robust to using a number of different specifications and control variables. The inclusion of urban-year interactions or state-year interactions do not alter the findings, indicating that the selection of foreign banks into relatively more urban states or districts are not driving the findings. The results are also robust to controlling for changes in a variety of firm-level characteristics over time, such as size and export intensity. Dropping firms that permanently exit the data set before 2002 or further restricting the data to balanced panel of firms also does not impact the basic findings.

Including firms located in the 18 districts with pre-existing foreign banks also does not change the paper's main findings. With their inclusion, however, the basic specification no longer just estimates the effect of foreign bank entry, but instead estimates the average effect of entry and exit since some districts, such as Kozhikode and South Goa, exhibit a complete exit by foreign banks between 1991 and 2002. Since there is no reason to believe the two events should induce equal effects, I create and add controls to capture the separate effects of foreign bank entry and exit when using this larger sample of districts. After doing this, foreign bank entry is still associated with a significant drop in firms' likelihood of having a loan and an increase in the amount of loans allocated to very profitable firms. Moreover, restricting the sample to districts with pre-existing foreign banks also does not

²³ The less significant IV estimates (relative to the OLS) are not surprising since the IV estimation only uses pre- versus post-1993 variation, which fails to capture the staggered entry of foreign banks across districts after 1993.

Table 7

Instrumental variable estimates of foreign bank entry.

Dependent variable	Indicator for...			Ln(amount + 1)		
	FI loan (1)	Bank loan (2)	Either loan (3)	FI loans (4)	Bank loans (5)	Both loans (6)
Foreign bank	−0.131 (0.089)	−0.124 (0.137)	−0.124* (0.068)	−0.809** (0.386)	−0.056 (0.313)	−0.678* (0.410)
Foreign bank × ROA	0.000 (0.004)	−0.001 (0.005)	−0.002 (0.003)	0.024 (0.036)	0.029* (0.017)	0.036 (0.033)
Observations	7088	7088	7088	7088	7087	7088
R-squared	0.65	0.46	0.56	0.77	0.53	0.76
Number of districts	162	162	162	162	162	162

Notes: This table reports coefficients from regressions of various loan measures onto district and firm characteristics using instrumental variable estimates with firm and year fixed effects, and ROA-year interactions. 'Foreign Bank' is equal to one for firms located in a district with a foreign bank in the given year, and zero otherwise. 'ROA' is a firm's 1991–1993 average percent return on assets, demeaned. Instruments used are 'Foreign-Owned Firm in 1993' × Post-1993 year dummy and 'Foreign-Owned Firm in 1993' × 'ROA' × Post-1993 year dummy, where 'Foreign-Owned Firms in 1993', an indicator equal to 1 for firms located in districts with at least one foreign-owned firm in 1993. Yearly observations from 1991 to 2002 are included for domestic, non-financial firms with positive sales and assets in 1991 but not located in a district with a foreign bank by 1991. Standard errors, clustered at the district-level, are reported in parentheses.

* 10% level.

** 5% level.

change the main results. Within these 18 districts, an increase in foreign banks' total share of branches in a district is associated with a decline in the likelihood of firms having a loan.

The findings also do not appear to be driven the increase in domestic private banks across India that occurred following a wave of banking deregulation in 1993. Assets held by private banks in India increased from 4.5% in 1993 to 12.1% in 2001. The entry of private banks could bias the above estimates if their growth across India is correlated with *both* the location *and* timing of foreign bank entry across India. However, this is unlikely as the initial growth of private banks preceded foreign bank entry and was far more widespread. Nearly half of India's districts saw an increase in private banks between 1992 and 2002, and the growth rate of private banks in districts with a new foreign bank was similar to that of districts that did not receive a foreign bank until after 2002. On average, domestic bank branches grew 2.1% each year from 1994 to 2001 in districts that received a new foreign bank during the sample period, which is similar to the 1.7% growth rate for districts that did not receive a new foreign bank until after 2002. The difference is not statistically significant. Moreover, the inclusion of district-level controls for the total number of domestic private banks or other non-foreign banks do not alter the main findings.

For the same reason, changes in the regulation of development banks in the early 1990s are also unlikely to explain the above findings. Prior to 1991, India's domestic development banks frequently engaged in government 'directed' lending programs and were shielded from competition via regulatory barriers to entry. The subsidization of FIs was curtailed in the early 1990s and regulations inhibiting the provision of long-term loans by other banks were removed as part of a general reform to put FIs and commercial banks on equal footing in terms of regulations, supervision, and operations. However, these reforms pre-date the entry of foreign banks into Indian districts by two to eight years, and they applied uniformly to development banks across all Indian districts. Additionally, these earlier reforms also indicate that the development banks did operate according to market forces at the time of foreign bank entry. The drop in loans among these lenders following foreign entry is also consistent with these lenders responding to competitive pressures.²⁴

²⁴ But, it is possible that the absence of banking competition in India prior to 1991 contributed to the reallocation of credit following foreign bank entry. This might occur if the development banks were particularly inexperienced at effectively screening potential clients because of their previous government support. However, similar 'directed' lending programs and regulatory barriers are quite common in many LDCs that allow greater foreign bank entry suggesting the experience of India's development banks after foreign bank entry may not be all that unique.

The observed decline in domestic loans also appears to reflect a decrease in the supply of credit rather than a change in demand. If foreign firms or the most profitable domestic firms receive better financial services after entry, local domestic firms within the same industries as these firms are likely to face greater competition. In this case, the decline in loans could be demand-driven as domestic firms respond negatively to increased competition from other firms. However, this does not seem to be the case. Excluding domestic firms identified in the same industry and district as foreign firms does not change the estimates. Excluding firms found in the same industry as treatment firms with an ROA in the top 10% also does not affect the estimates.

Finally, the findings also do not appear driven by a shift to alternative capital markets, such as public equity markets, which were developing quite rapidly in India during the 1990s (Gopalan and Gormley, 2007). There is also no evidence to indicate firms' equity issuances increased following foreign entry. There is also no evidence of an increase in the amount of short-term loans, commercial paper, debentures, fixed deposits, or trade credit after foreign bank entry. There was weak evidence, however, of an increase in the amount of corporate loans used by firms after foreign entry, particularly among group-affiliated firms. This would be consistent with group-affiliated firms mitigating the drop in bank credit by relying more on internal capital markets after foreign bank entry.

7. Differential impact and firm performance

7.1. Firm size, tangibility, and group affiliation

If information asymmetries play an important role in explaining the reallocation of credit following foreign bank entry, then we would expect foreign bank competition to affect firms with opaque informational structures more than other firms. Moreover, firms with fewer tangible assets may also be more likely to lose access to credit after foreign entry if domestic lenders rely more on collateral when making lending decisions rather than investing in the costly screening technologies to identify creditworthy firms. To test these hypotheses, the sample is divided into firms based on measures of size and 'tangibility' in 1991 prior foreign bank entry, where size is measured using total assets and a firm's 'tangibility' is measured as in Berger et al. (1996).²⁵

In Table 8, OLS estimates of the impact of foreign bank entry on the amount of long-term loans are reported separately for firms in the bottom and top quartile of 'size' and 'tangibility'.²⁶ Consistent with the hypothesis that more informationally opaque firms may be adversely affected by foreign entry, there is a decrease in the average size of loans allocated to smaller firms after foreign entry, but no significant effect on larger firms [columns (1) and (2)]. The difference, however, is not statistically different at conventional levels [t -stat = 1.21]. Moreover, there is a decrease in the size of loans allocated to firms with less tangible assets following foreign bank entry suggesting lenders relied more heavily on collateralized loans following foreign bank entry [columns (3) and (4)], and this decline is statistically different from that for firms with more tangible assets [t -stat = 1.9]. In both cases, there is also evidence that past profitability for smaller, less tangible firms is less important following foreign bank entry suggesting the decrease in loan sizes to these firms is widespread.

In another test of the asymmetric information hypothesis, the sample is divided into firms associated with a business group and all other non-group firms.²⁷ The information hurdle faced by lenders is

²⁵ Specifically, Berger et al. (1996) use data on proceeds from discontinued operations of US firms to define tangibility as $(0.715 \times \text{receivables} + 0.547 \times \text{inventory} + 0.535 \times \text{fixed assets} + \text{cash})/\text{total assets}$.

²⁶ The results are robust to dividing the sample at different cutoffs. Moreover, this estimation could also be done in a single estimation with triple interactions. While the implied point estimates would be the same, the triple-difference estimation would directly test whether coefficients for firms in the top and bottom quartiles are statistically different from each other. The results of these t -tests are reported in the text, but for clarity, I only report the separate double-difference estimates in Table 8. The same is true for Table 9.

²⁷ Groups in India are typically controlled via a complicated network of company shareholdings, and their existence pre-dates liberalization in 1947. (See Dutta (1997) and Ghemawat and Khanna (1998) for more details.) CMIE tracks group affiliation in Prowess through "continuous monitoring of company announcements and a qualitative understanding of the group-wise behavior of individual companies" (Prowess Help Files, Data Dictionary). Khanna and Palepu (2000a) find the CMIE classification to be consistent with other available lists of Indian groups.

Table 8

Differential impact of foreign entry on credit access.

	Small firms (1)	Large firms (2)	Low tangibility (3)	High tangibility (4)
<i>Dependent variable = Ln(long-term loans + 1)</i>				
Foreign bank	−0.116** (0.053)	0.164 (0.242)	−0.658*** (0.200)	−0.213 (0.195)
Foreign bank × ROA	−0.013* (0.007)	0.008 (0.012)	−0.073*** (0.024)	0.016 (0.019)
ROA-year interactions	X	X	X	X
Observations	1666	1863	1737	1796
R-squared	0.42	0.49	0.74	0.71
Number of districts	80	82	74	88

Notes: This table reports coefficients from regressions of Ln(long-term loans + 1) assets onto district and firm characteristics using ordinary least square estimates with firm and year fixed effects, and ROA-year interactions. 'Foreign Bank' is equal to one for firms located in a district with a foreign bank in the given year, and zero otherwise. 'ROA' is a firm's 1991–1993 average percent return on assets, demeaned. Yearly observations from 1991 to 2002 are included for domestic, non-financial firms with positive sales and assets in 1991 but not located in a district with a foreign bank by 1991. In columns (1) and (2), the sample is further restricted to firms with total assets in the bottom and top quartiles as of 1991. In columns (3) and (4), the sample is restricted to firms with 'tangibility' in the bottom and top quartiles as of 1991, where 'tangibility' is measured using Berger et al. (1996) and is equal to $(0.715 \times \text{receivables} + 0.547 \times \text{inventory} + 0.535 \times \text{fixed assets} + \text{cash})/\text{total assets}$. Standard errors, clustered at the district-level, are reported in parentheses.

* 10% level.

** 5% level.

*** 1% level.

likely higher for firms associated with a business group because of their complicated networks and the relative ease of diverting funds within the group. Given this, we should expect to see foreign bank competition have a stronger negative effect on the amount of credit allocated to these firms. If foreign banks face greater difficulties in screening group-affiliated firms, then we should also expect to find foreign banks more likely to target non-group firms. Both of these predictions in fact seem to be true in the example of India.

As seen in Table 9, the decrease in firms' likelihood of having an FI loan is only statistically significant for group-affiliated firms [column (1)] and not for non-group firms [column (3)]. This drop in credit to group-affiliated firms occurs despite the stronger average performance of group firms relative to non-group firms prior to foreign bank entry. The average ROA of group firms in 1993 was 4.9% relative to −0.9% for non-group firms. Group-affiliated firms also exhibit a higher Tobin's Q on average relative to non-group firms during the 1990s.²⁸ Hence, the decline in loans to group-affiliated firms does not appear to arise because of an efficient reallocation of credit away from underperforming, politically-connected firms. Instead, the systematic drop in credit among these firms is suggestive that foreign bank competition adversely affects the ability of domestic banks to finance informationally opaque firms.

One alternative hypothesis for the drop in overall bank credit to group-affiliated firms is that foreign banks only choose to finance the largest group member after entry, and these loans are then redistributed to other group firms. This could lead to a drop in overall likelihood of having a loan among group-affiliated firms, but an increase in the total bank loans of the entire group. However, in unreported regressions, the drop in the likelihood of receiving a loan is equally strong for group firms without another group member in the same district, and there is weak evidence to indicate a decrease in the overall amount of loans allocated to an entire group after foreign entry. Moreover, the decline in the likelihood of having a loan among group-affiliated firms is also equally strong for firms with group members located in districts containing India's largest cities versus those without. Therefore, the decline in domestic loans to these group-affiliated firms does not appear driven by a

²⁸ These findings of stronger performance among group firms are consistent with Khanna and Palepu (2000b), which finds that the benefits of group ownership structure in India often offsets the costs in terms of overall performance.

Table 9

Access to loans for group versus non-group firms.

Dependent variable	Group firms		Non-group firms	
	FI loan indicator (1)	Bank loan indicator (2)	FI loan indicator (3)	Bank loan indicator (4)
Foreign bank	−0.107*** (0.037)	0.015 (0.056)	−0.021 (0.060)	−0.026 (0.049)
Foreign bank × ROA	0.003 (0.004)	−0.011*** (0.004)	−0.006*** (0.001)	0.005** (0.002)
ROA-year interactions	X	X	X	X
Observations	4140	4140	2948	2948
R-squared	0.59	0.45	0.69	0.47
Number of districts	121	121	115	115

Notes: This table reports coefficients from regressions of FI and bank loan indicators onto district and firm characteristics using OLS with firm and year fixed effects. Yearly observations from 1991 to 2002 are included for domestic, non-financial firms with positive sales and assets in 1991 but not located in a district with a foreign bank by 1991. The sample is restricted to 'Group' firms in columns (1) and (2), and 'Non-Group' firms in columns (3) and (4). 'Foreign Bank' is equal to one for firms located in a district with a foreign bank in the given year, and zero otherwise. 'ROA' is a firm's 1991–1993 average percent return on assets, demeaned. Standard errors, clustered at the district-level, are reported in parentheses.

** 5% level.

*** 1% level.

substitution away from local credit markets towards credit obtained by group members located in large cities.

In contrast, the non-group firms see a relative drop in the marginal importance of ROA for the likelihood of having an FI loan [column (3)] but an increase in the marginal importance of past profits in obtaining a bank loan [column (4)]. This is consistent with profitable, non-group firms dropping their relationships with domestic development banks and becoming clients of the new foreign banks. This is not true, however, of the group-affiliated firms. Not only are group-affiliated firms less likely to receive an FI loan following foreign bank entry, the relative importance of their past ROA is less with regards to their ability to obtain commercial bank loans [column (2)]. Both shifts in the importance of past profits for non-group firms are statistically different than that observed for group firms [*t*-stats = 2.05 and 3.43].

7.2. Firm performance and profitability

If competition from foreign banks induces a reallocation of loans away from informationally opaque borrowers, it is also possible the entry of a foreign bank could affect firm sales, profits, cash usage, and capital expenditures (CAPEX) of these firms. This will be particularly true among financially constrained firms that rely heavily on external financing. To test this, the sample is again divided between smaller and larger firms based on the total assets of firms in 1991. Firms in the bottom quartile are classified as 'small' and firms in the top quartile are 'large'. Smaller firms are most likely to be financially constrained, and in Table 8, it was shown that these firms experienced a larger drop in their loans following foreign entry. Therefore, if foreign bank entry reduces credit access to these firms, we would expect to observe a decline in their performance after entry relative to larger firms. To test this, the following equation is estimated:

$$y_{i,j,d,t} = \beta_0 + \beta_1 \text{Foreign Bank}_{d,t} + \beta_2 (\text{Foreign Bank}_{d,t} \times \text{RZ}_j) + \alpha_i + \delta_t + (\delta_t \times \text{RZ}_j) + \varepsilon_{i,j,d,t} \quad (4)$$

where y is the performance measure of firm i , in industry j , district d , at time t . Similar to before, firm and year fixed effects are included. RZ is the industry-level measure of external finance dependency constructed by Rajan and Zingales (1998). A higher value indicates that US firms of that industry rely more heavily on external financing for their investments. Inclusion of this variable interacted with the indicator for foreign bank entry will test for whether there is a differen-

Table 10

Effect of foreign bank entry on firms' performance.

Dependent variable	Small firm				Large firms			
	Ln(sales) (1)	ROA (2)	Cash/assets (3)	CAPEX (4)	Ln(sales) (5)	ROA (6)	Cash/assets (7)	CAPEX (8)
Foreign bank	0.009 (0.174)	0.029 (0.112)	−0.246 (0.174)	−0.064 (0.129)	0.108 (0.142)	0.026 (0.020)	−0.006 (0.008)	0.071 (0.076)
Foreign bank × RZ	−0.602** (0.247)	−0.701** (0.311)	−1.143* (0.612)	−0.809*** (0.003)	0.328 (0.330)	0.154* (0.080)	−0.003 (0.017)	0.226 (0.261)
RZ-year interactions	X	X	X	X	X	X	X	X
Observations	1591	1611	1611	1611	1687	1694	1694	1694
R-squared	0.80	0.39	0.34	0.80	0.79	0.66	0.51	0.92
Number of districts	77	77	77	77	73	73	73	73

Notes: This table reports coefficients from regressions of various firm measures onto district and firm characteristics using OLS estimates with firm and year fixed effects, and RZ-year interactions. 'Foreign Bank' is equal to one for firms located in a district with a foreign bank in the given year, and zero otherwise. 'RZ' is the demeaned 3-digit industry-level measure of external finance dependency provided by Rajan and Zingales (1998). ROA is the firms average percent return on assets and CAPEX is Ln(gross fixed assets). Yearly observations from 1991 to 2002 are included for domestic, non-financial firms with positive sales and assets in 1991 but not located in a district with a foreign bank by 1991. In columns (1)–(4), the sample is restricted to firms with total assets in the bottom quartile as of 1991, and in columns (5)–(8), the sample is restricted to firms with total assets in the upper quartile as of 1991. Standard errors, clustered at the district-level, are reported in parentheses.

* 10% level.

** 5% level.

*** 1% level.

tial change in the performance of firms that require more external financing after foreign bank entry.²⁹

Overall, the estimates reported in Table 10 indicate that smaller firms, with greater external financing needs, exhibited a marked decline in performance following foreign bank entry in India, whereas there is no discernible impact on larger firms. As show in column (1), while there is no average drop in the growth of sales among smaller firms, there is a significant drop among smaller firms located in industries that require more external financing. Moreover, in columns (2)–(4), we see these same firms also exhibit a decline in profitability, capital expenditures, and cash reserves following foreign bank entry relative to small firms located elsewhere in India. These findings suggest that these smaller, external finance dependant firms were unable to substitute into alternative sources of financing following the decline in overall domestic bank credit and may have instead relied more heavily in internal cash to fund investments. In columns (5)–(8), however, we see that larger firms, even those located in industries requiring more external financing, do not experience a drop in performance. This may indicate their greater ability to tap alternative capital markets or the greater willingness of foreign lenders to finance these firms.

8. Conclusions

The entrance of new foreign banks to India is associated with a reallocation of loans that is not necessarily a boon to the lion's share of domestic firms. The most profitable 10% of firms located near a new foreign bank branch received larger loans, but on average, firms were 7.6 percentage points less likely to have a long-term loan of any size following the entry of a foreign bank. This limited increase in loan sizes appears to arise from new foreign bank loans targeted

²⁹ In using this measure of financial dependency, I implicitly assume that the use of external finance across industries in the US accurately captures inherent, technological differences in each industry's demand for external finance and that these same technological demands in the US apply to industries in India. It is important to note, however, that if this assumption is violated, this will only work against finding any differential effect across Indian firms based on this measure of financial dependency. Please see Rajan and Zingales (1998) for more details about this methodology.

primarily towards the most profitable firms. The decline in credit for all other firms, however, originates from a systematic drop in domestic bank loans. The findings are robust to using a number of different specifications, control variables, and instrumentation, and the timing of the loan reallocation coincides with foreign bank entry within each district. Moreover, the decline in domestic credit appears to be driven by shifts in the supply of loans rather than the demand for loans.

This reallocation of loans following foreign bank entry in India suggests that information asymmetries in the market for loans are a significant factor in LDCs. While credit access is improved for many very profitable firms, the extent and nature of the drop in loans to informationally opaque firms, as captured by a firms' size and group affiliation, suggests that some firms with positive net present value projects may have found it difficult to obtain loans after foreign bank entry. Furthermore, the reduction in credit also appears to adversely affect the performance of smaller firms located in industries requiring greater external financing. A larger decrease in the size of loans allocated to firms with fewer tangible assets after foreign bank entry also indicates that domestic lenders relied more heavily on collateralized loans after foreign entry.

While the potential benefits of foreign bank entry are many, the evidence suggests that information asymmetries may prevent many firms in these economies from realizing these benefits, which is consistent with recent theoretical work by [Detragiache et al. \(2008\)](#) and [Gormley \(2007\)](#). This finding parallels an existing literature that examines the comparative disadvantage of large banks in the production and use of 'soft' information ([Berger et al., 2005](#)), and the potential effects that greater competition may have on the lending relationships that small and medium-sized entrepreneurs rely on ([Boot and Thakor, 2000](#); [Petersen and Rajan, 1995](#)). Since this study focuses on foreign bank entry via de novo branching, however, the policy implications may not necessarily apply to cases where foreign bank entry instead occurs through mergers and acquisitions. Recent theoretical work suggests that the adverse affects of foreign bank entry may be more likely to occur when foreign bank entry is limited to de novo branching ([Gormley, 2007](#)).

Overall, the empirical findings presented in this paper suggest that a proper sequencing of reforms in developing economies may be necessary to realize the benefits of foreign lender entry when foreign bank entry occurs via de novo branches. Specifically, reducing information barriers prior to foreign lenders' entry may improve the allocation of credit following liberalization and increase the range of firms foreign banks are willing to finance upon entry. For example, policymakers may consider strengthening accounting disclosure rules and promoting the development of credit evaluating agencies. By reducing banks' costs of obtaining information about firms, such policies may increase the range of firms foreign banks finance and reduce the scope for a systematic drop in loans from domestic banks in response to increased competition.

Appendix A. Determining firm location within Prowess

The Prowess data set reports the district location of each firm's registered office, head office and registrar office. Nearly all firms (about 95%) report the district location of their registered office, while only 25% report district location of their head office or registrar office. To determine a firm's location, the district of the registered office is used primarily. The registered office is the address each firm of more than 20 persons in India must submit to the Registrars of Companies (RoC) as dictated by the Companies Act, 1956. All communications and notices to the company are addressed to the registered office and is the official address of the company where statutory books and records must be kept. Every company must affix this address outside of every office or place at which activities of the company are carried out, and firms are required to file their balance sheet and annual return each year with the RoC. If the district location of the registered office is missing, however, the district location of the head office is used next, and the district location of the registrar address is used last. Only about 2% of firms are missing the district location of all three offices ([Table 1A](#)).

Table 1A

Firm observations dropped by year.

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Total number of firms in prowess data	2068	2415	3013	4004	5144	5607	5720	5658	5984	6385	5559	3571
<i>Observations dropped</i>												
Missing district location	13	21	42	71	106	127	131	126	146	163	119	50
No sales or assets in 1991	61	458	1085	2021	3135	3589	3723	3697	4006	4369	3748	2249
Foreign-owned firms	202	198	199	194	192	189	192	198	199	200	188	118
Financial or banking firms	89	86	82	86	83	85	85	84	81	81	72	58
In district with foreign bank in 1991	1047	1015	992	1000	994	984	970	959	969	993	922	698
Number of firms in regressions	656	637	613	632	634	633	619	594	583	579	510	398

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