Do Lenders Respond to Import Competition? Evidence from Bank-Firm Loan Level Data*

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Abstract

How do lenders respond to import competition? Using a novel bank-firm loan level database matched with balance sheet data, we study this question in the context of India following China's accession to the WTO in 2001. We find strong evidence of endogenous financial constraints and heterogeneity in lender responses to higher import competition. Private banks connected to firms in high exposure sectors drop credit supply by around 25–57% with no effect for government-owned banks'. Drop in credit supply is overwhelmingly driven only by intensive margin. We also show that our results are not driven by other general equilibrium effects such as firm, industry, and geographical characteristics. Banks with a larger share of loans to firms in high exposure sectors suffer a drop in profitability and external borrowing thereby reducing their credit supply. The drop in credit supply also affects real outcomes of firms with economically meaningful implications in terms of sales, use of production factors (labour, capital, and raw materials), and stock of assets. To the best of our knowledge, ours is one of the first to show that shocks to the real economy can also have significant spillover effects to the financial sector.

Keywords: Import Competition, High exposure, Lenders' Responses, Credit Supply, Private Banks, Govt. Banks, Bank-Firm Loan Level Data

JEL Codes: F14, F62, G21, E51

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1 Introduction

Do lenders respond to import competition? Understanding the effects of import competition on credit supply is crucial and of first order importance considering (a) lenders' balance sheet (such as returns to capital, profitability, etc.) can be affected by debtor firms' ability to cope with import competition (import competition affecting their sales, profit margins, etc.);[1] (b) shocks to the real economy can be transmitted to the financial sector through general equilibrium channels; and (c) with increasing global integration, trade shocks are becoming more common than ever.[2] However, research on creditors' response to import competition has been limited, partially due to the non-availability of representative micro-level loan data. The current paper exploits a novel lender-firm matched loan data from India to causally document how import competition leads to a rise in financial frictions and lending constraints for banks, resulting in reduced supply of bank credit to firms with high exposure to import competition.

India forms an ideal setting to study such an intervention owing to the overall bank-dependency of the economy and limited role of capital markets. Moreover, the Indian banking system is sufficiently diverse to identify heterogeneity in lender responses to import competition.[3] While state-owned banks dominate the financial sector during our period of study, policies of financial liberalization undertaken in the beginning of the 1990s led to increased operations by both domestic private banks, and foreign banks. In 2001, three-fourths of commercial bank loans were issued by government banks, while 15% of loans were issued by domestic private banks, and the remaining 10% by foreign private banks.[4]

The former, on one hand, are shown to be prone to a high degree of political interference (Cole, 2009),[5] are bestowed with an implicit sovereign guarantee which reduces the down-side faced by these banks from losses arising from poor credit allocation (Banerjee and Duflo, 2004) and the accumulation of non-performing assets. Government-owned banks have also been perceived to have poor employee incentives (e.g., for loan officers) and weak corporate governance relative to private banks. These banks also have social objectives in terms of offering financial intermediation to underserved regions and populations, which precludes them from operating as profit-maximizing entities.

On the other hand, studies like Micco and Panizza (2006); Bertray et al. (2012); Cull

[1] This could also be due to the fact that returns from investments in sectors exposed to higher import competition can decline.

[2] For instance, higher import competition can put downward pressure on worker wages, affecting household savings and bank deposits.

[3] Paravisini et al. (2017) highlight that banks are typically heterogeneous in terms of their lending patterns.

[4] By 2007, the share of credit issued by domestic private banks had grown to 20%, while that issued by foreign private banks had shrunk to 7%.

[5] Studies using granular data from Pakistan (Khwaja and Mian, 2006), Brazil (Carvalho, 2014), Italy (Sapienza, 2004) have documented the role of politically motivated lending by government banks in contributing to resource misallocation and credit inefficiencies.

and Martinez-Peria (2013); Coleman and Feler (2015); Acharya and Kulkarni (2019) have highlighted that lending by government-owned banks tend to be less responsive to any kinds of shocks than private banks and their overall pro-cyclical nature, particularly during times of financial crisis (in contrast to both private and foreign banks).[6] In contrast, domestic private banks have similar features to traditional banks with profit-maximizing motives, and stronger corporate governance. All these factors can stymie the overall response of government-owned lenders to import competition, leading us to our second hypothesis: high exposure to import competition can affect credit allocation to firms, and this effect would be expected to be stronger for private, relative to government-owned banks.

Using an empirical strategy motivated by Autor et al. (2013), we exploit the causal identification in the growth of China's manufacturing productivity in the 1990s and consequent accession to the WTO as a result of internal market reforms. China's entry to the WTO in 2001 resulted in a sharp increase in the share of Chinese manufacturing imports (as a fraction of India's total imports) from less than 5% in 1995, to almost 25% in 2007 – an increase of around 400% (Chakraborty et al., 2022).[7] We utilize this sudden, but significant increase in imports as a plausible exogenous variation in import competition and examine how import competition can affect credit issued by lenders, across sectors' exposure to Chinese import competition. This allows us to study lenders' response to import competition induced solely due to changes in China's domestic productivity, and not driven by local changes in credit demand in India.[8]

Panels A and **B** of **Figure 1** provides some preliminary evidence in that respect. While **Panel A** shows that the average loan issued by a bank almost doubled after 2001, **Panel B** shows this trend to be absent for private banks. The share of loans issued by a private Indian bank to the average firm dropped from 38% in 1995 to 31% in 2007 – a decline of almost 20%. Given China's rising dominance in India's trade during this period, a natural and important question to ask is whether this relative decline in lending from Indian private banks is in response to increased import competition from China. **Panels C** and **D** examines the unconditional relationship between the change in the share of Chinese imports in India's total imports, and the share of loans issued by private and government-owned banks, respectively. While we find a significant negative relationship for private banks, there is no such correlation for the share of credit issued by government-owned

[6] A large body of research has empirically studied the role of state-owned banks in financial development, growth and the allocation of credit. An early pioneer, La Porta and Shleifer (2002) show that government-owned banks were prevalent globally, with almost 40% of banking assets being held by government-owned banks in 1995. However, financial development, economic growth and productivity were weaker in countries with high government involvement in the banking system.

[7] Similar pattern is also observed for the import penetration ratio from China, which increased from less than 1 to almost 8% over the same time period.

[8] In other words, increase in the degree of (product market or import) competition affects firm profitability and if lenders can precisely assess the impact of import competition on firm profitability, they can in turn respond by limiting credit to firms/sectors most affected by import competition.

banks.

The existence of this unconditional relationship motivates us to examine the causal relationship between higher import competition and lender responses, based on the change in industries' exposure to Chinese imports. To address concerns that domestic technology and demand shocks in India can affect both lenders' responses and imports, we follow Chakraborty et al. (2020) and use changes in imports from China to Latin American countries to instrument for sectoral changes in Chinese import competition to India. Our source of variation in a lender's exposure to import competition relies on whether the lender lends to a firm operating in a sector facing higher import competition from China.

We exploit variation in firms exposure to import competition based on their sectors of operation to estimate whether credit supply responds to higher import competition, and test for heterogeneity in response across government, private and foreign ownership of creditors. Our baseline reduced form results show that higher import competition forces *private* banks only to reduce the supply of new credit to firms by 25–57%: equivalent to about 6–15% of an average firm's assets. There is however no corresponding effect from government-owned banks, non-banking financial corporations, or foreign banks. Consistent with the stickiness in firms' lending relationships, we find that the lending adjustment from private banks in response to heightened import competition to occur exclusively along the intensive margin, with no change in the extensive margin.

The baseline results are robust to a battery of checks using alternate outcome variables, alternate identification strategies (OLS or 2SLS), alternate definitions of import competition, or using aggregate changes in the share of imports before and after 2001. Importantly, we show robustness to controlling for firms' credit demand using firm-year fixed effects (Khwaja and Mian, 2008), as well as state-year fixed effects to control for sub-regional macroeconomic shocks or state government policies to aid firms facing enhanced import competition. We also show the stability of our results to the interaction of bank characteristics with firm fixed effects, controlling for unobservable firm-specific factors correlated with bank characteristics, such as relationship banking or connections between firm boards and lenders.

We also rule out that the credit decline by private banks to firms facing higher import competition from China can be explained by other firm, industry, or geographical factors correlated with industries' exposure to Chinese imports. We show that the decline in credit from private lenders also hold for exporters (which are highly productive), firms belonging to industries with low dependence on external finance, firms across both downstream and upstream industries, and firms located in states with low initial exposure to Chinese imports. These results suggest that the mechanism of credit decline relates to the internal capital market of banks exposed to high import competition, and not from other general equilibrium factors.

Considering mechanisms, we use detailed data from lenders' balance sheets to examine the potential mechanisms driving our results. We find that relative to other lenders, private banks with higher exposure to import competition had significantly lower profitability ratios coupled with drop in their borrowing. We find no differential reduction in deposits. The findings suggest that the reduction in private bank lending to firms facing higher import competition is in response to lower profit margins from such lending activities. And, this get magnified as the banks simultaneously experienced a drop in their external borrowing. This is distinct from Federico et al. (2020), who shows using Italian data that lenders with higher exposure to import competition reduce credit in response to the reduced repayment ability of firms. The absence of a differential reduction in deposits also negate the explanation that import competition negatively affected workers' savings, leading to a withdrawal of retail deposits and affect banks' lending operations. Overall, our results are consistent with the theoretical predictions of Holmstrom and Tirole (1997), Froot and Stein (1998), Deyoung et al. (2015).

Finally, we exploit bank and firm identifiers to match the lending data with firm balance sheet information to identify firm level impacts of increased exposure to import competition. We identify that firms operating in sectors with higher exposure to Chinese imports, *and* connected to private banks, experienced a 12% overall decline in bank borrowing, as well as secured borrowing. Using detailed information on firms' credit sources, we rule out that the decline in firms' bank borrowings is not offset by an increase in borrowing from other sources such as trade credit. This rules out competing explanations that a reduction in bank borrowing in response to higher import competition was driven by firms' endogenous switching of their source of credit. Overall, the decline in credit supply also has sizeable real effects on firms outcomes in the form of lower sales, exports, compensation, raw materials, capital employed, and fixed assets.[9]

Our study contributes to several strands of literature. First, how an economy adjusts to trade shocks. An overwhelming amount of literature focuses on several firm level outcomes, such as employment (Autor et al. (2013); Chakraborty et al. (2020)), prices (Bugamelli et al. (2015); Amiti et al. (2020)), markups (Edmond et al. (2015); Caselli and Schiavo (2020)), product portfolio (Liu (2010); Chakraborty and Henry (2019)), innovation (Autor et al., 2020b), outsourcing (Chakraborty et al., 2022), quality upgrading (Amiti and Khandelwal, 2013), productivity (Bloom et al. (2016); Chen and Steinwender (2021)); regional level outcomes such as voting (Autor et al., 2020a), mortality rates (Pierce and Schott, 2020); individual level outcomes such as physical and mental health (McManus and Schaur (2016); Adda and Fawaz (2020)), etc.

[9]The effect on exports is significantly larger than both total sales and domestic sales which indicates that the demand for liquidity of exporters is highest. The linkages between financial sector and firms' export activities have attracted significant attention in the recent years (Chor and Manova (2012); Amiti and Weinstein (2011); Minetti and Zhu (2011); Bricongne et al. (2012); Paravisini et al. (2014); Bronzini and D'Ignazio (2017)).

There is now a small and growing literature investigating how trade shocks can induce capital reallocation (Antras and Caballero (2009); Lanteri et al. (2022)).[10] But, both the studies focus on macro dimensions of the trade shock. In contrast, we contribute to this literature using detailed micro level bank-firm loan data and investigating how lenders' allocate credit in response to trade shocks. This forms the primary contribution of our paper.

Our study complements Federico et al. (2020) which uses Italian bank-firm loan data and adds to this nascent literature by showing somewhat similar effects for Indian firms. We distinguish ourselves from Federico et al. (2020) in three key ways. First, while Federico et al. (2020) identifies a secular decline in lender credit in response to higher import competition, we show that not all banks behave similarly. Government-owned or public-sector banks do not respond to import competition, whereas private banks do. Second, examining lenders' balance sheets, we show that the key mechanism explaining the reduction in credit supply is a decline in private banks' profitability, as opposed to a rise in non-performing loans. Finally, our data from firm balance sheets provides information on different sources of borrowing, which allows us to clearly show that our effect is not a result of endogenous substitution of bank credit across different sources.

Second, this paper also contributes to the literature on the effects of credit constraints on trade (Manova (2008, 2013); Amiti and Weinstein (2011); Minetti and Zhu (2011); Chor and Manova (2012); Paravisini et al. (2014)). All of these studies look at how credit shocks affect firms' exports. We, in contrast investigate the effects of import competition on lending of banks to the real economy. Third, our study also relates to the literature on the shocks that directly affects the financial sector (Khwaja and Mian (2008); Paravisini (2008); Schnabl (2012); Jiménez et al. (2014); Baskaya and Kalemli-Ozcan (2016); Cingano et al. (2016)). We deviate from the literature to exploit a shock that primarily hits the real sector and transmits to the financial sector. This allows us to learn not only about the consequences of the trade shock, but about how supply side shocks to the real sector can spread into the general economy.

The rest of the paper is structured as follows. Section 2 describes all the different sources of the data that we use. Section 3 explains our identification strategy and the problems associated. Section 4 reports our baseline results on the intensive and extensive margin of credit, the different robustness checks, the mechanisms behind our findings (using bank balance sheet information), other possible explanations, effects on aggregate firm borrowing, and firm level outcomes. Section 5 concludes.

[10]The former focuses on the effects of capital flows across countries due to deepening of trade integration, while the latter investigates the reallocation of machines and physical capital in Peru after the China shock.

2 Data

Our paper combines data from two different sources: (a) loan level data from the Ministry of Corporate Affairs (MCAI), and (b) firm level data from the PROWESS database, hosted by the Centre for Monitoring the Indian Economy (CMIE).

2.1 Bank-Firm Loan Level Data

Since 1990, the MCAI tracks all secured loans issued to registered firms from both bank and non-bank financial institutions.[11] The data provides an unique charge number, the firm's name to which credit has been issued, an unique company identification number (CIN) corresponding to the firm, loan value, issuance date, and the issuing lender's identity. The firm CIN provides information on firm location (registered headquarters), listing status, year of incorporation, and industry of operation. Firms are mandated (i) to file with the MCAI using the unique charge number within 20 days of the loan being issued, and (ii) notify the MCAI once the loan is fully repaid and the account closed. The date of first modification of the loan is also required to be reported. The MCAI data thereby captures any new lending undertaken by firms from financial institutions (banks and non-banks) and any modifications of the terms of the loan covenant.

We use data between 1995–2007, covering over 87,000 new loans issued to manufacturing firms from domestic private banks, state-owned banks, foreign private banks and non-banking financial corporations (NBFCs). From this universe of loans, we focus on a sub-sample of 45,000 loan issuances to firms which can be matched to the PROWESS dataset (discussed below). Summary statistics along the intensive and extensive margin of loans issued to Indian manufacturing firms is shown in **Table 1**. We use the granular firm-creditor matched information on loans to identify how firms' exposure to import competition affected (i) the supply of secured credit, and (ii) whether such credit extensions varied across the type of lending institution (see below).

The median (average) loan issued by a bank is INR 38 (332) million, pointing to a large right-tailed distribution driven by a handful of large loans. Median loan size of a foreign bank is the largest at INR 70 million, while the same is comparable across government and private banks at INR 43 and 45 million, respectively; it is lowest for NBFCs at INR 16 million. On the other hand, the average loan size of a government-owned bank is largest at INR 430 million, followed by foreign, and domestic private banks. Along the extensive margin, the median and average number of loans obtained by a firm in any given year is 2 and 4, respectively. Unlike the intensive margin, this is similar across various lending institutions.

On average (over the years and bank-types), these loans account for approximately

[11] MCAI is a ministry within India's federal government. Firm registrations are handled by the MCAI.

10–30% percent of the total outstanding credit from commercial banks, with 60% of the loans issued by government-owned, 14% by domestic private, 6% by foreign, and 20% by NBFCs. **Panel A** of **Table C1 (Appendix C)** presents additional summary statistics of financial institutions in terms of total assets, deposits, capital, and profitability. The median financial institution in our sample has assets worth INR 430 billion, INR 320 billion of deposits, INR 4 billion of capital, and 2.2% operating profits as a ratio of working funds.

2.2 Firm Level Data

We complement our bank-firm matched loan data with firm level data from the PROWESS database – a large financial database maintained by the CMIE – to identify how lenders' response to import competition affects real outcomes. PROWESS compiles data from publicly available balance sheets of firms and provides information on sales, assets, exports, imports, capital, wage payments, profits, and borrowings by source of credit. The data covers both listed and unlisted firms, spanning 105 disaggregated manufacturing industries (at 4-digit National Industrial Classification (NIC)), and has been widely used in studies focusing on firm outcomes in India (see for instance, Goldberg et al. (2010); Topalova and Khandelwal (2011); Chakraborty and Raveh (2018)). The majority of the firms in the dataset are either private Indian firms or affiliated to private business groups, whereas a small percentage of firms are government or foreign-owned.[12]

We limit our sample to firms which obtained at least 1 secured loan between 1995 and 2007. **Panel B** of **Table C1 (Appendix C)** bestows median values for a few important firm characteristics. Median lending to an average Indian manufacturing firm equaled INR 38 million, and was spread across 2 banking relationships.[13] Annual median sales equaled INR 1.2 billion, while median assets was INR 1.2 billion, with value-addition being INR 0.5 million. Almost 85% of firms had some outstanding loan from banks, and bank loans averaged about 25% of a firm's total assets, with the annual interest expense being 10.4%. Bank dependence of firms can be gleaned from the fact that only 41% of the firms in the sample were listed on either of the two major stock exchanges.

In addition to firms, the PROWESS also provides crucial information on banks' balance sheets, reporting key measures of profitability such as return on assets, operating profit as a ratio of working funds, as well as non-performing assets, deposits, capital, and banks' borrowings from various sources, which we exploit while exploring the mechanisms through which import competition affect lenders' credit allocation.[14]

[12]The dataset accounts for more than 70% of economic activity in the organized industrial sector, and 75% (95%) of corporate (excise duty) taxes collected by the Indian Government. Around 20% of firms in the dataset operate in the chemicals industry, followed by food products and beverages (12.81%), textiles (10.81%) and basic metals (10.46%).

[13]The Prowess reports the number of banking relationship a firm has, without specifying the nature of banking relationship, or disaggregating credit by bank.

[14]For details on the important variables used in our analysis, please see **Appendix A**.

3 Empirical Strategy

Our main empirical strategy takes the form of a difference-in-difference design which compares loan outcomes for firms across their exposure to import competition from China, before and after China's accession to the WTO. We measure a firm's exposure to import competition based on the corresponding exposure of the industry in which the firm operates. We use the following fixed effects estimating equation:

$$Log(Loan)_{bit} = \beta(HExp_k \times Post_t) + \gamma \mathbf{X}_{it} + \phi_i + \theta_{kt} + \eta_{bt} + \epsilon_{ibt} \tag{1}$$

The unit of observation is a loan issued to firm i, by a financial institution b in year t. $HExp_k$ is a dummy equalling 1 if firm i operates in industry k which has "high" exposure to Chinese imports, following China's accession to the WTO in 2001. $Post_t$ is a dummy equaling 1 for years succeeding China's accession to WTO, i.e., post–2001. This provides us with 7 years of pre-treatment and 6 years of post-treatment data between 1995 and 2007.

Our primary specification in Equation (1) includes firm, industry-year, and bank-year fixed effects. Firm fixed effects (ϕ) control for time-invariant firm characteristics, such as networks and managerial capabilities which may be correlated with the amount of credit received by a firm. Industry-year fixed effects (θ) partials out industry level time-varying shocks (say aggregate demand shocks or industry-specific regulations) which uniformly credit demand for all firms operating in a given industry and year. Bank-year fixed effects (η) control for bank-specific time-varying policies affecting lending such as directed lending policies or bank capital. $\mathbf{X}$ is a vector of time-varying firm level covariates, such as age, age squared, firm size (real assets), and technology adoption.[15]

Our coefficient of interest is β, which estimates the percentage change in new loan issuances in the post–2001 period, across firms operating in "high" and "low" exposure industries. We define $HExp$ as

$$HExp_k = \begin{cases} 1 & \text{if } \Delta ShChinaImp_k^{India} > Median \\ 0 & \text{otherwise} \end{cases} \tag{2}$$

where

$$\Delta ShChinaImp_k = \mu_{k,2002-2007}^{China} - \mu_{k,1995-2001}^{China} \tag{3}$$

μ is the average share of imports from China by an Indian industry k (as a fraction of world imports). The first term computes the average share of imports between 2002 and 2007, i.e., the post-treatment period, while the second term does the same for the pre-treatment period. Industries exhibiting a greater than median change (increase) in the

[15] This is measured as the sum of R&D expenditure and technology transfers, as a share gross value-added

share of Chinese imports subsequent to China's accession to the WTO are classified as "high" exposure industries.

Estimating Equation (1) using OLS is likely to yield a biased coefficient for β. For instance, changes in domestic demand for industry k's products can simultaneously be correlated with both imports from China and domestic demand for credit, biasing upwards the estimated β. Alternatively, enhanced competition from China can hurt domestic producers, leading to a reduction in credit demand, causing β to be biased downwards. Additionally, industry-specific demand shocks that drive Chinese imports could also simultaneously influence domestic credit flows.

We counter this endogeneity concern by extending the empirical strategy of Autor et al. (2014), and exploiting changes in Chinese imports in the post-WTO period in other emerging markets – namely, a set of 10 Latin American countries (Chakraborty et al., 2020).[16] The over-arching goal is to isolate the variation in Chinese imports to emerging markets driven exclusively by supply side shocks in China – primarily internal reforms, domestic technological innovations, improved access to intermediate capital goods, and the migration of skilled workers to major production centres (Autor et al., 2013). This would provide an exogenous shifter of imports to India, parsed of any confounding effects arising from changes in domestic preferences in India.

We discuss below the two key conditions which need to be satisfied for for Chinese imports to Latin American economies to serve as a valid instrument for Chinese imports to India. First, we would need a strong first stage – i.e. Chinese imports to Latin American economies should be highly correlated with Chinese imports to India. The top two rows of **Figure 2** compares the distribution of the average share of Chinese imports to India and Latin American economies (at the 4-digit industry level) before and after China's entry to the WTO. Across both the panels, we see a sharp rightward shift of the kernel density plots corresponding to the post–2001 period. This indicates comparable increases in the average share of Chinese imports across industries in the post–2001 period for both the economies.

Next, in the bottom row of **Figure 2** we show the unconditional correlation between $\Delta ShChinaImp_j^{India}$ and $\Delta ShChinaImp_j^{LA}$.[17] The figure shows a strong positive correlation ($\beta = 1.07$, $se(\beta) = 0.096$), pointing to the commonality in industry-level variations in Chinese imports to Latin American countries and India after China's accession to the WTO. This supports our contention that industry-specific increases in Chinese imports to emerging markets is driven by enhancements in China's domestic productivity, as opposed to changes in local demand or preferences in India/Latin America.[18]

[16] These are Argentina, Brazil, Costa Rica, Chile, Colombia, Mexico, Paraguay, Peru, Uruguay, and Venezuela.

[17] **Figure B1 (Appendix B)** shows that the evolution of Chinese import share from 2002 to 2007 for India and Latin American countries are very similar.

[18] This is further corroborated by **Figure B2 (Appendix B)**. **Figure B2** plots the unconditional correlation between Indian and Latin American share of Chinese imports in the initial period of our

In addition to a strong first stage, we also need to satisfy the exclusion restriction. Namely, Chinese imports to Latin American economies should affect firm loan outcomes in India only through its impact on Chinese imports to India. Of particular concern is correlated demand shocks across India and Latin American economies. Additionally, it is possible that higher imports from China to Latin American economies principally comprise of intermediate capital goods, which in turn boost imports from Latin America to India, and affects demand for credit. Alternately, higher competition from Chinese exporters can affect Indian exports to Latin America, which too can affect credit demand in India.

We choose Latin American economies as our instrument set, primarily to counter the above factors as during the period of study, India had limited trade relations and no trade agreements with these economies. This reduces the likelihood of correlated demand shocks, and as seen from **Figure B3 (Appendix B)**, exports from India to Latin American economies, and imports to India from Latin American economies did not change significantly around the time of China's accession to the WTO.[19] This alleviates concerns pertaining to common unobserved technological and demand shocks across these economies which can lead to a violation of the exclusion restriction (Chakraborty et al., 2020).[20]

A second concern regarding the exclusion restriction is whether exports from India fuel China's productivity. For instance, it is possible that accession to the WTO increase Indian exports to China, which in turn had a positive impact on China's own exports. **Table C2 (Appendix C)** compares India's trade with China and other large trading partners at three different points in time: 1995, 2001 and 2007. It shows that China accounted for the largest increase in India's imports relative to other countries and major regions of the world. India's share of Chinese imports grew by around 2000% between 1995 and 2007. This is much larger than the 1156% increase in Chinese imports for the U.S. between 1991–2007 (Autor et al., 2013) and India's increase of exports to China.[21]

Based on the evidence discussed above pertaining, we estimate the following reduced form specification to causally identify how an increase in import competition affect lenders' responses:

$$Log(Loan)_{ibt} = \beta(HExp_k^{LA} \times Post_t) + \gamma \mathbf{X}_{it} + \phi_i + \theta_{kt} + \eta_{bt} + \epsilon_{ibt} \tag{4}$$

analysis, which is 1995. The plots show no correlation between the Chinese share of imports between India and Latin America before China became the member of the WTO. And, this got reversed after 2001 as shown by **Figure 2**.

[19]We plot the trend of imports and exports by India from and to Latin American economies during 1995–2007 in **Figure B3 (Appendix B)**. The figure does not show any consistent pattern in trade between India and Latin American economies.

[20]Our results are also robust to use of alternate IVs.

[21]Similarly, the Chinese share of manufacturing imports for Mexico, another developing economy that has drawn significant attention in the literature increased by a factor of 8 over 1995–2007 (Iacovone et al., 2013). This is dwarfed by India, for whom it increased by a factor greater than 20 over the same time period. In comparison, Indian imports from ASEAN (another large trading partner), the US and the EU increased by 391%, 169% and 137%, respectively.

Three key assumptions need to be satisfied for a causal interpretation of β in Equation (4). First, $\Delta ShChinaImp_k^{LA}$ should be positively correlated with $\Delta ShChinaImp_k^{India}$. This is equivalent to the "first-stage" of the IV strategy corresponding to the reduced-form specification in Equation (4). Second, $\Delta ShChinaImp_k^{LA}$ should only capture changes in Chinese manufacturing activity induced by local productivity shocks in China, and be orthogonal to industry k's domestic credit demand in India. Third, loan disbursement to firms in industries with high and low exposure to Chinese imports should have evolved comparably in the absence of China's accession to the WTO.

Figure 2 provides strong evidence with regard to the first assumption, and we formally discuss the first stage coefficients when describing our IV coefficients. We also justified how limited trade relations between Indian and Latin American economies during this period, as well as the relatively small volume of exports from India (relative to imports) makes it likely for the exclusion restriction to be satisifed. Subsequently, we use **Figure 3** to showcase that the last assumption of parallel trends in outcomes across industries with relatively high and low exposure to Chinese imports is also likely to be satisfied. First, **Panel A** shows little correlation between new loan issuances to Indian manufacturing firms and exposure to Chinese imports in the years prior China's entry to the WTO. Next, we use the matched creditor-firm loan level data from the pre-2001 to rule out differential trends in loan disbursement across firms belonging to high and low exposure industries. Reassuringly, **Panel B** compares median loans to firms belonging to high and low exposure industries as defined in Equation (2) and finds no difference in the median loan amount across industries with high and low exposure prior to 2001, which changes substantially since then.[22] In Section 4.1, we formally establish this using an event-study specification.

3.1 Differential Trends?

Our reduced form specification in Equation 4 isolates changes in industry-level import exposure stemming from domestic productivity growth in China. Nonetheless, there could still be systematic differences across firms in industries with high and low exposure to Chinese imports, which in turn could have led to differential trends in new loan issuances prior to 2001.[23] If this was further aggravated by exposure to import competition, we would be misattributing to import competition differential changes in firms' loan issuances across industries' exposure to Chinese imports.

We follow Imbens and Wooldridge (2008) to address the first concern and show balancing tests comparing key bank and firm characteristics across high and low exposure sectors in

[22] The difference in terms of a median loan to a firm in the high-exposure sector vs. low-exposure sector ranges from 20–60% which was 4–10% in the pre-2001 period.

[23] Alternatively, if firms anticipated China's accession to the WTO and were aware of China's comparative advantage, they could have increased their loan demand prior to 2001, which would have mechanically reduced their loan demand in the aftermath of China's accession to the WTO.

Table 2. If the absolute value of the normalized difference for any characteristic across the two sectors exceed 0.25, it would suggest an imbalance across the groups. **Panel A** performs this for bank characteristics; **Panel B** does likewise for firms. Reassuringly, only one out of 14 characteristics across firms and banks have an absolute value of the normalized difference exceeding the threshold of 0.25. This suggests that bank and firm outcomes did not systematically vary prior to China's accession to the WTO.

Next, we show in **Table 3** that new loan issuances for firms across high- and low-exposure sectors did not follow differential trends prior to 2001. The outcome of interest in columns (1) – (3) is the volume of new loans issued; in columns (4) – (6), the number of loans issued to each firm. All specifications condition on industry-year and bank-year fixed effects, in addition to firm level covariates. Columns (1) and (4) interact the $HExp_k$ dummy with a constant linear time-trend. Columns (2) and (5), replaces the linear time trend with individual year dummies, interacted with $HExp_k$. Finally, columns (3) and (6) collapses the data to the firm level and regresses average loan outcomes on $HExp_i$. Collectively, these estimates offer little evidence of any systematic difference across industries with high and low exposure to Chinese imports in the period prior to China's entry to the WTO.[24] Based on these results, we contend that firms and banks were observationally equivalent across industries' exposure to Chinese import competition, in the period preceding China's entry to the WTO, alleviating concerns on whether industries' exposure to Chinese imports was proxying for systematic observable or unobservable differences across industries.

4 Results

This section presents our key empirical findings. We begin by documenting the change in credit issued by lenders across firms' exposure to import competition, and explore heterogeneity by lender ownership. Next, we examine mechanism(s) by directly investigating the effect of import competition on bank balance sheets. We conclude by documenting the aggregate impact of import competition on firm outcomes.

[24] We run a similar exercise by looking at the correlation between Chinese imports in the pre-2001 period and various other firm characteristics (such as sales, investments in plant and machinery, compensation, raw materials, assets, leverage ratio, etc.) in **Figure B4 (Appendix B)**. Our unconditional correlation plots across different firm characteristics did not show any evidence correlation between industries' exposure to Chinese imports prior to China's accession to the WTO and any firm level outcomes. This rules out any negative selection of firms operating in industries which subsequently faced high import competition from China.

4.1 Import Competition and Bank Lending

4.1.1 Intensive Margin

Panel A of **Table 4** presents our baseline results estimating the reduced form specification outlined in Equation (4). The outcome of interest is the intensive margin of credit issued to firms – (log) amount of new loan issued. Column (1) estimates the average effect of import competition on the volume of new credit controlling for firm, industry-year and creditor-year fixed effects, along with firm characteristics. Industry-year fixed effects restricts the comparison of loan outcomes to firms within the same broad industry category and year, with the identifying variation arising from whether a firm is operating in an industry with relatively high or low exposure to Chinese imports. Creditor-year fixed effects control for time-varying lending policies specific to each lender and time-period, while firm fixed effects absorb time-invariant level differences in firms' credit demand, and ability to obtain credit. Our coefficient of interest is positive, albeit small and not statistically significant, indicating no change in new loan volumes across industries' exposure to Chinese imports.

As noted earlier, lenders' response to increased competition could vary by lender ownership. If private banks' incentives are more aligned with market forces, leading to a quicker response to changes in market conditions, there could be heterogeneity in the impact of import competition on new credit across private and government-owned banks. We explore this hypothesis using the following triple difference specification:[25]

$$\begin{aligned} Log(Loan)_{ibt} &= \beta_1 \ (HExp_k \times Post_t) \ + \ \beta_2 \ (HExp_k \times Post_t \times PvtBank_b) \\ &+ \gamma \mathbf{X}_{it} + \phi_i + \theta_{kt} + \eta_{bt} + \epsilon_{ibt} \end{aligned} \tag{5}$$

$PvtBank_b$ is a dummy equaling 1 if the lending entity is a private bank. In the simplest instance, where the ownership of lending entities is divided into only private and government banks, β_1 estimates the change in lending outcomes from government-owned banks for firms in industries with high exposure to Chinese imports, relative to those with low-exposure. β_2, on the other hand, identifies the differential effect on new loan issuances for firms with high exposure to Chinese imports across private banks. The sum $\beta_1 + \beta_2$ estimates the net impact of import competition on new credit issued by private banks.

Our estimates from column (2) show evidence of significant heterogeneity by lender-type. While β_1 continues to be positive (but imprecisely estimated), the triple interaction term identifying heterogeneity across domestic private banks is negative and statistically significant at the 5% level. β_2 implies that relative to other lenders, loans issued by private banks declined by more than 25% percent for firms operating in industries with high-exposure to Chinese imports (relative to low-exposure).

[25] Our regression specification also contains the other double interaction terms. We choose not to put them just for expositional purposes.

Columns (3) and (4) include two additional triple interaction terms to check for further heterogeneity by government banks, and NBFCs. The omitted category against which the triple interaction coefficients are benchmarked in this specification are foreign private banks. We select foreign private banks as our reference category for two reasons: first, these banks typically have limited (and specialized) operations in India, which reduces their exposure to aggregate shocks. Second, these banks have access to cheaper sources of capital and funds owing to their foreign holding companies, which again mitigates the effect to which they might be impacted by local trade shocks (Federico et al., 2020).

Our key result remains unchanged by this additional level of disaggregation: if anything, the triple-interaction coefficient corresponding to the differential effect of private banks increases in magnitude, suggesting a 40% differential decline in new credit issued from these banks. The coefficients corresponding to NBFCs and government-owned banks are both negative but statistically non-significant, relative to the credit issued by foreign banks. Expectedly, the double-difference coefficient corresponding to credit issued by foreign private banks is also statistically non-significant. Summing across the coefficients indicate that average credit from private banks to firms in industries facing high-exposure to import competition declined by over 20% post China's entry to the WTO. A simple back of the envelope calculation reflects that this decline in credit is equivalent to INR 67 million, or 6% of firm assets.[26]

The present specification uses industry-year fixed effects to partial out the impact of industry-specific shocks on credit demand which is common to all firms within the broad industry for a given year. This however does not account for local demand shocks, which might affect the demand for credit. This is particularly relevant as Autor et al. (2013) showed the impact of trade competition on labour markets to be regionally concentrated. To this effect, we exploit lenders' pincodes provided in the MCAI database to control for local credit demand using pincode-year fixed effects, under the assumption that credit markets are local.[27] Column (5) of **Table 4** shows that the coefficient declines in magnitude but continued to remain statistically significant, indicating a 25% reduction in new loan issuance from private banks.

A causal interpretation of our reduced form coefficients is subject to the assumption that firm credit would have evolved comparably across industries facing high and low import competition in the absence of China's accession to the WTO. While the counterfactual cannot be directly tested, we exploit data prior to China's entry to the WTO to estimate the event-study specification as described in Equation (5). In particular, we modify the event-study specification to match the triple-interaction specification of column (2) of **Table 4**

[26]The mean pre-2001 assets for firms in industries with high-exposure to Chinese imports was INR 1,124 million.

[27]Thus, pincode-year fixed effects would fail to capture local demand if lenders were issuing credit to firms located far away from lenders.

and show the coefficients corresponding to both the double interaction term and private banks in **Figure 4**.

The coefficients are benchmarked to the year 2001; the circles shows the point estimates while the vertical lines denote 95% confidence intervals. The left-hand panel shows the annual treatment effect for new credit issued from lenders which are not domestic private banks: namely NBFCs, government banks, and foreign private banks. We do not find any discernible differential trend across firms' in industries facing high exposure to Chinese imports in either the pre- or post-2001 period. The right-hand panel identifies the differential treatment effect from private banks and identifies a sharp drop in new credit issued from private banks subsequent to China's entry to the WTO. The drop is evident in the year of China's entry to the WTO (2002) albeit not precisely estimated. Subsequently, the triple interaction terms are negative and statistically significant at the 5% in the first and second years subsequent to China's accession to the WTO (years 2003 and 2004). This points to a relatively quick reduction in credit issued by private banks for firms facing higher import competition. The triple interaction coefficient is also negative and statistically significant in the final year of the sample, five years after China's entry to the WTO.[28] Importantly, none of the triple interaction coefficients are statistically significant prior to China's entry to the WTO. Consequently, **Figure 4** confirms that firms in industries facing high import competition from China saw a reduction in credit from private banks only, and this reduction in credit was concentrated in the first three years following China's accession to the WTO.[29]

4.1.2 Controlling for Firms' Credit Demand

Our baseline results identify a reduction in credit by private banks to firms operating in industries with relatively high exposure to import competition, while the event-study plots confirms that the timing of this decline coincided with China's accession to the WTO. However, this decline in loan volume can emanate from either (a) a reduction in lenders' willingness to issue credit to firms facing higher import competition, or (b) an endogenous reduction in firms' credit demand, owing to an overall downsizing of operations in the face of heightened foreign competition. To isolate the credit supply channel, we adopt the approach of Khwaja and Mian (2008) and Jiménez et al. (2012) and focus on the subset of firms which obtain multiple loans in a year. Restricting our sample to such firms permits the use of firm-year fixed effects, leading us to compare loan volumes across private banks

[28] The triple interaction coefficients for years 3 and 4 are negative, but not precisely estimated.

[29] We also check our results using overall import competition index in order to negate the fact that our findings are due to rise in Chinese share of imports in India and not overall increase in imports. **Table C3** in **Appendix C** presents our results using aggregate changes (1995–2001 and 2002-2007) in overall imports (columns (1) – (2)) and overall imports minus Chinese imports (columns (3) – (4)). As these estimates demonstrate, we do not find any significant responses from the private lenders to firms belonging to high exposure sectors of the overall increase in imports.

and other financial institutions for the same firm in a year. Results using this restrictive specification are shown in column (6).

Reassuringly, our benchmark finding holds – we identify a negative and statistically significant coefficient corresponding to the triple interaction term for private banks. While the negative coefficient corresponding to government owned banks rise in magnitude, the confidence intervals are too wide to reject a null effect. Thus, even after conditioning on firms' credit demand, we continue to identify a large differential reduction in new loan volumes from private banks to firms exposed to higher import competition. This assuages the concern that the coefficients identified in columns (2) – (4) are driven by an endogenous reduction in firms' credit demand: if so, we would have found no difference in new loan sizes across private banks and other financial institutions, after conditioning on firms' credit demand.

4.1.3 Alternate Sample Choices

Another potential concern with our baseline results is that increased foreign competition could have pushed low productivity firms to exit the market, causing a mechanical reduction in new loan issuances. Column (7) controls for this by restricting the sample to firms which were only present throughout the sample. The triple interaction term remains negative, statistically significant, and comparable in magnitude to those obtained in columns (2) – (4).

In columns (8) and (9), we drop foreign banks and NBFCs from our sample, thereby comparing the supply of credit across domestic private and government-owned banks. Column (8) uses firm-year fixed effects, whereas column (9) controls for firm, industry-year, creditor-year, and bank location-year fixed effects. The results in both instances are comparable, with the triple interaction coefficient increasing in magnitude when controlling for firm demand.[30]

4.1.4 Distinguishing Between Type of Imports

We address here two alternate concerns which can bias our baseline coefficients: imports of intermediate goods and the competition of Indian exports with Chinese exports in international markets. If intermediate inputs from China are cheaper and of higher quality, it can positively affect their productivity, which in turn can increase their demand for credit (Iacovone et al., 2013). Consequently, if intermediate inputs form a major component of Chinese exports to both Latin American economies and India, we would be under-estimating the impact of import competition on credit demand. We account for this

[30] We also use growth rates of loans issued by a bank to a firm as the dependent variable to check whether the drop in new loans issued to firms in the high exposure sectors is a short or medium-term phenomenon. Our estimates show that the increase in Chinese competition also had a negative effect on the growth rates of loans issued by banks, hinting thereby towards a possible long-run effect.

in column (10) by directly controlling for the share of intermediate inputs imported by India from China in our reduced form specifications.[31] We use the methods in Equations (2) and (3) to identify high-exposure sectors in terms of imported intermediate inputs, and interact them with the $Post_t$ and $PvtBank_b$ indicators to account for the impact of input market competition. Column (10) shows our main result to be robust to the addition of this additional control.

Column (11) factors in competition between Chinese and Indian exports in the international market. Our instrument isolates increases in Chinese imports to emerging markets arising due to domestic productivity increases in China. If domestic productivity-induced increases in China's exports are correlated across emerging and advanced economies, these exports are also likely to compete with Indian exports to advanced economies.[32] This in turn can affect exporters' demand for credit, leading us to misattributing to import competition the impact of heightened competition from Chinese products in export markets. To this effect, we construct an index that aggregates the shares of imports from China into US, EU, and ASEAN and follow Equations (2) and (3) to identify the sectors which are highly exposed to the export market competition from China. Column (11) shows that controlling for export market competition from China also does not alter our benchmark finding.

4.1.5 Extensive Margin

Having established that higher import competition negatively affects the volume of loans issued by private banks, we now test for a corresponding impact along the extensive margin of credit allocation. Specifically, we examine whether the margin of adjustment for credit is only along the intensive margin, or whether creditors opted to terminate lending relationships with firms facing higher import competition. We use the following specification:

$$y_{ibt} = \beta(HExp_k \times Post_t) + \gamma \mathbf{X}_{it} + \phi_i + \theta_{kt} + \eta_{bt} + \epsilon_{ibt} \tag{6}$$

Table C4 (Appendix C) shows limited impact of trade exposure on the number of loans issued by a lender to firms in the post-2001 period. We use three different indicators for y_{ibt}: (a) total number of loans issued by a bank to each firm in an individual year

[31] We use India's 2001 input-output (I/O) tables for this exercise which provides input coefficients for each 4-digit industry (NIC 2004 industry codes. We weight the I/O coefficient of each sectoral input by its import share, and then by the Chinese share in imports for that sector. Summing these measures provide the average weighted sum of intermediate goods imported from China for each sector, with the weights being comprised of the coefficients of the I-O table. We also verify robustness to using the 1999 I/O coefficients.

[32] For example, USA is the largest trading partner of India in terms of exports. India exported US$ 40.4 Billion in 2017; this accounted for about 15.3% of India's total exports. The same figure (percentage of exports to US) was around 16% for 2017. In the case of China, the percentage share of exports to the US was around 19% in 2017. The numbers are similar for EU as well.

(columns (1) and (2)); (b) probability of a new loan issued by a bank to a firm after 2001 (columns (3) and (4));[33] and (c) change in the number of loans before and after 2001 (columns (5) and (6)). We focus only on the differential effect for private banks and continue to use firm, creditor-year (or creditor-period), and industry-year (or industry-period) fixed effects.

While the triple-difference terms corresponding to private banks continue to be negative, they are either imprecisely estimated, or significant only at 10% level.[34] The limited impact of import competition on extensive margin lending implies that while private banks reduced lending to firms facing high import competition, there was no overall disruption in lending relationships. These findings are consistent with broader empirical evidence pointing to the stickiness in lender-firm relationships.

4.2 Alternate Specifications and Robustness Checks

This section shows that our baseline results are stable to alternate specification choices. Results using different methods and measures are reported in **Table 5**.

We start by using two alternate estimation strategies – IV and OLS in **Panel A**. Columns (1) – (4) show that we obtain similar results employing an instrumental variable strategy instead of the reduced form specification described in Equation (4). Here, we directly instrument $HExp_k^{IN}$ as defined in Equation (2) with $HExp_k^{LA}$. Column (1) of **Table 5** yields a negative and statistically significant coefficient on the triple interaction term, confirming the results obtained using the reduced form specification.[35] On the other hand, the double difference term is positive, albeit not precisely estimated. The IV coefficients are economically significant, and larger in magnitude than the reduced form coefficients. We find that firms operating in industries with relatively high exposure to Chinese imports saw an additional 55% reduction in new credit volume from private banks. Summing across the coefficients, the net reduction in new loan volumes for these firms from private banks is 46%. Column (2) of **Table 5** further disaggregates lenders by government-owned banks and NBFCs, with the reference category being foreign banks, and continues to identify a negative and significant coefficient on the triple interaction term corresponding to domestic private banks alone.[36]

[33] This is a dummy variable equalling 1 if a firm i has initiated a lending relationship with any financial institution in any year after 2001. Therefore, β would estimate whether firms in industries with relatively high exposure to Chinese imports were more likely to start a new lending relationship in the post-treatment period, relative to firms operating in industries facing low import competition from China.

[34] We have also collapsed the annual firm level observations into two observations per firm: namely one prior to China's entry into WTO (pre-2001), and one after (post-2001) and estimated a first difference specification. The results again are very similar to those using annual firm data.

[35] The F-stats and J-stats of the first stage regressions are well above the critical values of identifying weak instruments.

[36] **Table C5** (**Appendix C**) uses an alternate IV strategy and control group. For these estimations, we use the share of other developing countries such as Brazil, Indonesia, Malaysia, and Mexico as the

Column (3) combines the IV strategy with firm-year fixed effects to control for firms' annual credit demand: even with this restrictive specification, we continue to identify a negative differential impact on private bank credit to firms operating in industries with high exposure to Chinese imports. Column (4) replaces the bank-year fixed effects with the interaction of bank characteristics such as return to assets, capital adequacy ratio and net worth, with the WTO_t dummy. This explicitly controls for the possibility that China's accession to WTO may have directly affected bank operations in India through these margins. Our coefficient of interest remains unchanged to this alternate specification choice. On the whole, the results obtained using the IV specification concur with our preferred reduced form specification: domestic private banks reduced lending to firms operating in industries facing higher import competition. The fact that we continue to identify a negative coefficient on the triple interaction term when conditioning on firm-time fixed effects underline that the credit decline emanates from a reduction in private banks' willingness to extend credit, as opposed to a reduction in firms' overall credit demand.

Column (5) presents OLS estimates using our standard specification (firm, industry-year, and creditor-year fixed effects), while column (6) also controls for firm demand using firm-year fixed effects. The triple interaction terms turn out to be negative and statistically significant, but smaller in magnitude than the IV coefficients. This is consistent with other papers empirically identifying the impact of higher import competition (see for instance Autor et al. (2013) and Autor et al. (2014)) akin to Autor et al. (2014) and points to the presence of factors positively correlated with both the demand for Chinese imports, and domestic credit. One plausible explanation is that the industries facing higher import competition were dominated by firms with better networks with private banks. If these firms responded to increased import competition by increasing their demand for credit, it would dampen the "true" negative impact of import competition on new lending.

Next, we substitute our main measure of Chinese competition with three other different measures in **Panel B**. We follow Federico et al. (2020) in columns (7) and (8) and define our variable of interest at the bank level rather than the industry level. Thus, each bank's exposure to the China shock is expressed as the volume of loans issued to firms operating in sectors with a high exposure to Chinese imports, as a fraction of the bank's total manufacturing portfolio volume. Specifically, we define:

$$Expsoure_b = \frac{\sum_i C_{ib}^{HExp} HExp_k}{\sum_i C_{ib}} \tag{7}$$

where C_{ib} is total loans disbursed by bank b to all manufacturing firms. $HExp_{ik}$ is defined using Chinese imports to Latin American economies. To limit endogenous portfolio

instrument for Indian imports (Chinese). And, we use the govt-owned banks as the omitted category. Our results continue to show very similar effects – private banks connected to firms in the high exposure sector drops the supply of new loans by 30–34%.

adjustments by banks in anticipation of China's entrance into the WTO, we use data between 1995 and 2001 to construct this alternate measure of banks' exposure to the import competition shock.[37] Interacting lenders' pre-2001 sectoral loan exposures with $HExp_{ik}$ makes $Expsoure_b$ exogenous to local economic conditions in India affecting credit supply. Thus, while variations in sectoral access to bank credit prior to 2001 can affect sectors' demand for imports, it is unlikely that domestic bank credit across sectors would be correlated with changes in import competition in Latin American economies. Resultantly, we interact $Expsoure_b$ with the WTO_t dummy and control for firm-year fixed effects in these regressions. Our estimates, which only capture changes to credit supply, continue to be qualitatively similar to the reduced form, IV, and OLS estimates. Using this alternate measure of exposure to import competition, we find new loan issuances from private banks to have dropped by around 50% in the aftermath of China's entry to the WTO.

Based on the strong correlation between sectoral Chinese imports before and after China's entry to the WTO, columns (9) and (10) substitute $HExp_{ik}$ using the actual volume of imports from China. Specifically, we use total Chinese imports to Latin American economies in industry k (4-digit industry classification) as a share of total imports. We restrict imports to between 1995 and 2000 to limit any spurious correlation between Chinese imports and domestic industry output.[38] In effect, each industry is now assigned a time-invariant share of imports based on the period prior to China's accession to the WTO. The coefficients in columns (9) and (10) estimate that a 10 percentage point increase in the sectoral share of Chinese imports (to Latin America) in the pre-2001 period reduces private bank credit to firms by 19% in the aftermath of China's accession to the WTO.

Lastly, we use the difference in the average share of imports before and after China's accession to the WTO as our independent variable of interest. This is defined as:

$$China_k^{LA} = IMP_{k,1995-2001}^{China} - IMP_{k,2002-2007}^{China} = \Delta IMP_k^{China} \tag{8}$$

The results shown in columns (11) and (12) with this definition remains comparable – a higher share of Chinese imports had a negative impact on lenders' credit response, and this was driven by private banks.

[37] We measure our average of bank exposure over multiple years rather than taking a single year (e.g., 1998), so that we can avoid some bias that may arise from a year specific shock at the beginning of the period.

[38] For instance, it is possible that an industry uses intermediate inputs for its production, which becomes cheaper due to Chinese imports, leading to an increase in the industry's output in the aftermath of China's entry to the WTO. Moreover, this was a period of increase tariff liberalization, which too could have affected industry performance. As the Indian economy operated under near-autarky conditions prior to 1991, using industry output from 1994 provides us with a measure of the domestic potential of each industry, unaffected by trade.

4.2.1 Robustness Checks

A battery of additional robustness checks are presented in **Table C6 (Appendix C)** using the reduced form specification. We start by shortening the time period in column (1). This is motivated by two factors: first, creditors' response may have been affected due to other events coinciding with the post-treatment period, such as a drop in firms' credit ratings. Second, a longer time period may undermine the true effects of lenders' response to higher import competition. This is particularly relevant when the event-study plot in Figure B4 showed that the sharpest reduction in private bank credit occurred within the first three years of China's entry to the WTO. Consistent with the event study plots, restricting the time period between 1995 and 2004 effectively strengthens our the results: the magnitude of the coefficients increase substantially, confirming that lenders' response was immediate and was partially subdued over the medium and long term. These coefficients are also consistent with the event-study plots which identified a sharp reduction in new loan volumes by private banks in the first and second years following China's accession to the WTO.[39]

Column (2) controls for firms' prior linkages with private banks, accounting for any private information held by firms, which in turn could have allowed them to optimally respond by substituting private bank credit with credit from other sources. The decline in loan volumes from private banks would then be an upshot of a mechanical decline in firms' credit demand, as opposed to the causal impact of Chinese imports on lenders' credit supply. Reassuringly, the results in column (2) are unchanged upon including a dummy indicating whether a firm had a prior connection with a private bank.

Column (3) adds state-year fixed effects to control for time-varying state-specific policies which might affect the outcome of interest. Column (4) interacts the state-year dummies with the high exposure dummy. Columns (5) and (6) interacts bank level characteristics, such as return to assets, capital adequacy ratio and net worth with the WTO_t dummy and firm fixed effects, respectively. Our main results remain unchanged and are comparable to the initial estimates. Across all specifications explored, private banks significantly reduce new credit issuances to firms in industries with a relatively higher exposure to Chinese imports.

Column (7) explores non-linearities in industries' exposure to Chinese imports, across terciles of their exposure to import competition. We find the reduction in credit volumes to be concentrated in private banks for firms operating in industries falling in the second tercile of exposure to Chinese imports. While the triple interaction coefficient corresponding to the top tercile is negative, the large standard error disallows us from rejecting the null of no differential effect.

Finally, **Figure 5** shows that our findings are not driven by any individual state or

[39] Our results also hold if we further restrict our time period till 2003. It is only the magnitude of the significance that reduces.

industry characteristics. Here, we re-estimate our triple difference specification, dropping one state and industry (at 3-digit level) at a time and plotting the coefficients. The top row shows the coefficients corresponding to dropping each state; the bottom row does the same for each industry. The vertical lines correspond to the 95% confidence intervals. In both instances, we find the triple interaction coefficient corresponding to private banks to be negative and statistically significant, while that corresponding to government banks being attenuated towards 0 and not precisely estimated. The coefficient plots rule out that industry level import competition is confounded either by state or industry-specific policies contemporaneous with China's entry to the WTO.[40]

4.3 What Happened to Bank Balance Sheets?

Our baseline results documented a reduction in new loan issuances to firms operating in industries with higher exposure to Chinese imports. This was driven entirely by private banks and the results were unchanged even after controlling for firm demand, indicating a supply-side response. This section explores the impact of exposure to Chinese imports on banks' balance sheets to identify the mechanisms explaining the reduction in lending.

We posit three potential channels through which higher import competition can affect bank lending. First, higher import competition can reduce the perceived profitability of the select sectors, reducing banks' lending to these sectors. In this case, the lender anticipates reduced profit opportunities[41] and reallocates credit to other sectors. We do not expect this to impact banks' profitability or non-performing assets, as banks are responding in anticipation of losses from continued lending to these sectors.

Second, a large literature has documented that increased import competition can negatively affect firm performance, especially over the short-run, which in turn can negatively affect firms' creditworthiness. Lenders can respond to such delayed repayments (from firms) by reducing credit to firms in sectors facing higher import competition. This would be consistent with the event-study plots which show new loan issuances to decline after a year's

[40] Another major event that may affect our results is the SARFESI Act (2002). This overlaps with China's WTO accession in 2001. SARFAESI Act (2002) increased creditor's rights in seizing collateral for secured loans. Vig (2013) show that SARFAESI Act (2002) reduced firm's borrowing due to fear of premature liquidation and this is especially for true for high-tangible or firms which belong to the top quartile of tangibility distribution (> 75th percentile). Also, SARFAESI Act (2002) affected sectors with higher NPA, which could be due to import competition itself. Therefore, it could so happen that import competition shocks are correlated with the strengthening of the creditor rights' law and we are wrongly assigning the effect of creditor rights on import competition. In order to rule out this mechanism, we divide our dataset into different bins of tangibility distribution following Vig (2013) in **Table C7 (Appendix C)** and run our estimations. We find opposite to Vig (2013) – drop in the credit supply happened for firms below the 75th percentile of tangibility distribution. And, it is higher for firms below the 25th percentile of tangibility distribution. This is again opposite of Vig (2013).

[41] This can arise either due to reduced profits earned by firms, which would affect their ability to repay lenders. Alternately, an increase in import competition might make it costlier for lenders to evaluate and price loans to firms in these sectors. Increases in the cost of financial intermediation can also reduce the volume of financial intermediation.

lag, implying that banks may have observed firm repayment abilities in the aftermath of the shock, and subsequently chosen to cut back credit. If higher import competition affects firms' repayment abiities, we would also expect it to affect lenders' profitability.

Finally, a number of studies have empirically documented the negative labour market effects of import competition, which can affect lenders' liquidity if liquidity constrained depositors draw down their savings from banks. As lenders are mandated to maintain a select level of liquidity, deposit withdrawals can impede lending if lenders are forced to maintain statutory liquidity levels when faced with high withdrawals.

We empirically investigate the above three mechanisms exploiting detailed information on lenders' balance sheets from the PROWESS dataset. To formally test the link between import competition and lending capacity of exposed creditors, we estimate the following specification:

$$Y_{bt} = \beta(HExp_b \times Post_t) + \alpha_b + \delta_t + \gamma \mathbf{X}_{b,<2001} \times Post_t + \epsilon_{bt} \tag{9}$$

The dependent variable Y_{bt} corresponds to lender b, observed in year t. Our outcomes of interest from a bank's balance sheet are: non-performing assets, ratio of operating profit to working funds, return on assets, bank borrowing, and bank deposits. We also control for a vector of bank pre-2001 characteristics ($X_{b,<2001}$) interacted with a post-2002 dummy. α and δ denotes bank and time fixed effects, respectively. Standard errors are clustered by bank.

The high exposure dummy ($HExp$) is now defined at the level of lenders. As lenders are likely to be connected to firms operating in both high and low exposure sectors, we use the share of loans made to high exposure sectors to classify lenders into "high" and "low" exposure categories. In particular, $HExp_b$ equals 1 if the lender's lending to the high exposure sector exceeds the low exposure sector. β now estimates the differential change in balance-sheet outcomes for lenders with high exposure to import competition, in the aftermath of China's entry to the WTO.

Results are presented in **Table 6**. We start by looking at the non-performing assets of creditors in column (1). Unlike Federico et al. (2020), we find no evidence that higher import competition led to an increase in non-performing assets of either domestic private banks, or other lenders. Columns (2) and (3) use two different indicators of lenders' profitability ratios – operating profit as a ratio of working funds and return to assets, respectively. Consistent with our second hypothesis, we identify a differential decline in profitability for private banks which have a relatively higher exposure to Chinese imports. Conditional on lender exposure to import competition, we also find weak evidence that average private bank borrowings from other banks declined (column (4)). This is consistent with an overall decline in credit operations by domestic private banks with high exposure to import competition. Lastly, we explore for the liquidity channel in column (5) using total deposits

of lenders as the outcome of interest. However, we find no evidence of a differential decline in private bank deposits.

Overall, the results examaining balance sheets of financial institutions suggest that lenders with higher exposure to import competition faced declining profits, but the decline in profits was not accompanied by higher non-performing loans. This does not support the explanation that higher exposure to import competition increased borrowers' delinquency, but points to a reduction in profitability from lending to such sectors. Additionally, private banks with a larger share of their loan portfolio in industries facing higher exposure to import competition could not offset these losses with external funding from other banks. It is thereby plausible that these banks subsequently cutback on their respective lending portfolios to maintain their overall capital ratios, which remained unaffected.

4.4 Other Possible Explanations

Our results from the previous sections document that the volume of new loan issuances decline to firms facing higher import competition, and this decline is driven entirely by private banks. We also show that profit ratios dropped for private banks during this period, accompanied by a reduction in their external borrowing. In this section, we rule out competing explanations to our findings which may arise through spurious correlations between sectoral exposure to import competition and other firm, industry, and spatial characteristics.

4.4.1 Firm Characteristics

We start by considering firm characteristics, such as size and exporting status in **Panel A** of **Table C8 (Appendix C)**. It is possible that firms operating in industries facing higher import competition have a higher likelihood of being financially constrained, and lenders opt to reduce credit to financially constrained firms in the period succeeding China's accession to the WTO. We split our sample using median firm size – measured as average firm assets prior to 2001 – and re-estimate our baseline specification for small and large firms. We consider exporting status as both a signal of firm size and quality as exporters are likely to be more productive and large firms. If industries facing higher import competition are dominated by non-exporters, that can serve as a potential explanation for the reduction in bank credit.

Our results from size and exporting status of a firm show contrasting effects. We identify a negative coefficient on the triple interaction term for small firms and exporters. If exporting is a signal for innovation and enhanced firm performance, our findings rule out that the decline in private bank credit was driven by inferior quality firms, which also happened to be concentrated in industries with high exposure to import competition.

4.4.2 Industry Characteristics

Panel B focuses on industry characteristics. First, we split the sample by industry level index of external financial dependence Rajan and Zingales (1998). We use the median industry score to assign firms to industries with high and low dependence on external finance. The intuition here is that financial constraints are more likely to bind in industries with higher dependence on external sources of finance. Thus, if industries with high import competition were also more dependent on external financing and private banks reduced credit to financially constrained firms, we would be misattributing the effect of financial constraints on lending to import competition

Our estimates, in contrast, show that the reduction in private bank lending is concentrated among firms operating in industries with relatively low dependence on external finance. This rules out the fact that the decline in private bank credit to firms facing higher import competition from China can be explained by the fact that these firms were also financially constrained. If so, we would have observed the negative effect to be concentrated amongst firms operating in industries with a relative high dependence on external finance.

Next, we divide industries based on their production process – upstream or downstream. Anecdotal evidences suggest that India registered a significant growth in the imports of intermediate inputs from China. Therefore, it is possible that firms belonging to the upstream industries are driving the overall effect as those comprises the high-exposure sectors.

We investigate this by disaggregating our sample based on the "upstreamness" of an industry, following Antràs et al. (2012).[42] We split the sample based on whether a firm operates in an industry whose score on the upstreamness index exceeds the median upstreamness score across all manufacturing industries. Our results show that firms belonging to both types of industries are affected, albeit with higher effects for firms in upstream industries.

4.4.3 Spatial Characteristics

In **Panel C**, we further explore heterogeneity in our results using regional characteristics. We start by following Topalova (2010), Autor et al. (2013) and construct regional exposure to Chinese imports. It is possible that banks might have endogenously located in areas with high initial exposure to Chinese imports and China's accession to the WTO in 2001 compounded this effect. We use the address of firms' headquarters to match them to states and construct the following regional exposure index:

$$Expsoure_{ks} = (\frac{Chinese\ Imports_{k,1995}}{World\ Imports_{k,1995}})Employment\ Share_{ks,1995} \tag{10}$$

[42] Upstreamness is a standard statistic that is widely used in the firm networks literature, and is computed by assigning discrete weights based on the distance from final use of an industry's output. For our purposes, industries' upstreamness is computed using the 1993–94 input-output table for the Indian economy. For details, see Kisat and Phan (2020).

Employment Share$_{ks,1995}$ is the employment share of an industry k in state s (as a fraction of total employment). We classify a state to have high ex-ante exposure to Chinese imports if *Exposure*$_{ks}$ exceeds the median value across all manufacturing industries. Our estimates portray that it is the initial low and not high exposure sectors that are driving the results although the estimate is noisy.

Lastly, it is possible that the reduction in private bank loans is driven by regions where there was agglomeration of low-skilled workers. Banks which have incurred losses prior to China's entry to the WTO, or have depleted levels of capital can reduce loans to firms in regions where returns from human capital is lower.

In order to explore whether such is the case, we re-estimate the reduced form triple difference specification after disaggregating the sample by skill intensity. Skill intensity is measured as the share of non-production workers in a region. The point estimates show that private bank credit declined for regions with both high and low share of skilled workers. This reassures us that the reduction in private bank credit to firms facing higher import competition is not due to any spurious correlation between industries facing higher import competition and other firm, industry or regional characteristics. Overall, these results show that the reduction in private bank credit to firms in industries facing higher import competition cannot be systematically explained by any other general equilibrium factors.

4.5 Firm Level Effects

4.5.1 Aggregate Firm Credit

We now examine what happened at the firm level. We start by looking at overall firm credit. Our primary objective here is twofold: (a) to check whether our benchmark results do hold at a different level of aggregation, and (b) to rule out that the decline in private bank credit to firms facing higher import competition is due to the endogenous substitution of private bank credit by firms with credit from other sources, such as trade credit.

We use firm level data from the PROWESS database for this exercise. The key advantage of the PROWESS is that it provides detailed data on firm borrowings across multiple institutional and non-institutional sources, and also contains information on trade credit. We exploit this data and use the following specification to identify the impact of higher import competition on aggregate firm level credit:

$$y_{it} = \beta_1(HExp_k \times Post_t) + \beta_2(HExp_k \times Post_t \times PvtBank_b) + \gamma \mathbf{X}_{it} + \phi_i + \theta_{kt} + \epsilon_{it} \quad (11)$$

Our unit of observation here is firm i, operating in industry k at year t. Since, our data is at firm-year level, we only use firm (ϕ) and 3-digit industry-year (θ) fixed effects. The industry-year fixed effects restrict our comparison to firm outcomes within the same broad industry category and year. The identifying variation comes from changes in firms'

exposure to Chinese imports at a granular (4-digit) level. β_1 estimates the impact of import competition on firm credit for firms which do not have any relationship with private banks. On the other, β_2 estimates the differential impact for firms with a relationship with a private bank. A firm is deemed to have a relationship with a private bank if it had transacted with a private bank in at least 1 year prior to 2001. However, our sample is only restricted to a subset of firms which have balance sheet information in the PROWESS, and can also be linked to the MCAI database. Standard errors continue to be clustered at 4-digit industry level.

Consistent with the evidence documented till now, column (1) in **Panel A** of **Table 7** shows a reduction in overall secured bank borrowing (this is the sum of total borrowing by a firm from government-owned and private banks) for firms operating in industries with high exposure to Chinese imports, *and* having a relationship with a private bank. On the contrary, as seen from the double interaction term, firms un-associated with private banks exhibit little change in overall bank borrowings. These results thereby validate the reduced form findings using the loan-level data.

Columns (2) – (5) rules out the possibility that the reduction in private bank credit can be explained by an endogenous firm level substitution of private bank credit with credit from other sources, such as NBFCs, foreign lending, and trade credit. In fact, our estimates show a large and statistically significant reduction in borrowing from NBFCs. While column (4) shows a weak positive impact on foreign borrowing for firms exposed to higher import competition, it is relatively small in magnitude to offset the decline in overall bank borrowing.[43]

Figure B5 (Appendix B) plots the evolution of aggregate bank borrowings, secured bank borrowings, and a dummy equaling 1 if a firm had any bank borrowing. For all three outcomes of interest, the coefficient plots show a decline in bank borrowing for firms in industries facing higher exposure to import competition.

4.5.2 Real Effects

As private banks proactively reduced credit supply to firms in industries with high exposure to Chinese competition, we now explore what happened to those firms in terms of their performance using a reduced form specification similar to Equation (11). In this case y or our outcomes of interest assumes the following: total sales, exports, domestic sales, sales from manufacturing, imports, production factors, and fixed assets.

Results reported in **Panels B** and **C** of **Table 7** supports the explanation that increased import competition negatively affected operations for firms which had any prior relationship with at least 1 private bank. Columns (6) – (10) in **Panel B** reports lower aggregate sales,

[43] In this case, our double interaction term, $HExp_k \times PvtBank_b$ is strong and negatively. This shows that firms were not borrowing from foreign sources prior to the China's entry to the WTO, but it got reversed after 2001.

exports, domestic sales, and overall manufacturing activity for firms facing high import competition from China, and associated with a private bank. Intriguingly, the double-difference term effectively reports a null effect, signifying that sales of firms facing higher import competition, but not linked to private banks, remained unaffected. Columns (11) – (15) of **Panel B** also documents a lower capital stock, employee compensation, raw materials, and fixed assets for firms facing higher import competition.

Figure B6 (Appendix B) shows the event-study plots corresponding to four key outcomes of **Table 7** – sales, labour compensation, working capital, and stock of assets. First, for none of the four outcomes we find a strong differential trend for firms in industries facing high import competition prior to China's accession to the WTO in 2001. Consistent with **Figure 4** which showed an immediate decline in private bank lending, we find a significant reduction in working capital and sales within a year of China's entry to the WTO. This is consistent with the observations of Banerjee and Duflo (2014) that bank loans predominantly finance firms' working capital.

5 Concluding Remarks

Do import competition affect lenders' or creditors decision(s)? Does the responses vary hetereogeneously with bank ownership? This study answers these questions by exploiting a novel dataset on Indian bank-firm level loan information. Focusing on China's membership to the WTO as an exogenous shock for the Indian domestic economy, we find that banks with portfolio of loans concentrated in sectors exposed to competition from China decrease their lending relative to less exposed banks. And, this is particularly true for private banks with no such responses from government-owned banks. Our results are robust to any alternate explanatory mechanisms, such as firm, industry, and regional characteristics. The drop in credit supply or such adjustments happened primarily along the volume of loans or the intensive margin of credit. We find limited evidence of such adjustments along the extensive margin.

Examining the mechanisms, we find that higher import competition from China leads to significant drop in profitability ratios of private banks with subsequent decline in outside borrowing. This leads to lead to an erosion of their core capital consequently reducing their credit supply. We find that firms are unable to substitute their drop in credit with alternative sources of credit, such as credit from NBFCs, trade credit, etc. Therefore, the aggregate credit of firms linked to exposed banks decreases relative to other firms. This translates into real negative effects on sales, exports, employment, production-related factors, and fixed assets.

Overall, our results have two important implications: (a) trade shocks may result in endogenous credit constraint of banks, but hetereogeneously; and (b) decrease in banks'

supply of credit in the aftermath of a trade shock may be an important channel behind the welfare costs associated with trade liberalization episodes.

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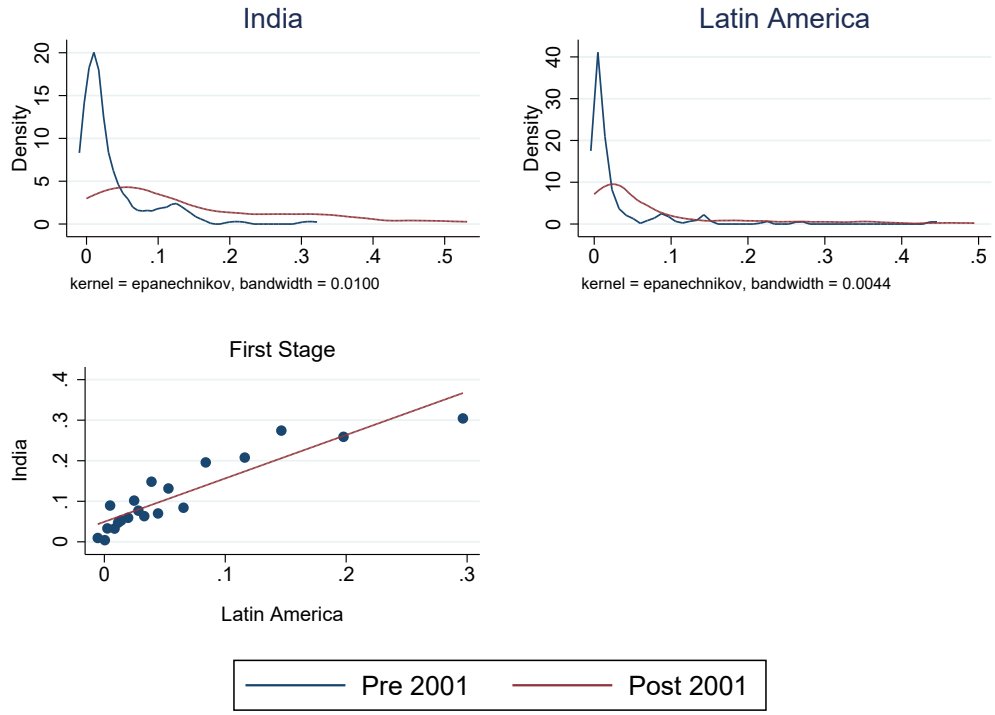
Figure 1: Import Competition and Credit Allocation by Private Banks, Indian Manufacturing Firms, 1995–2007

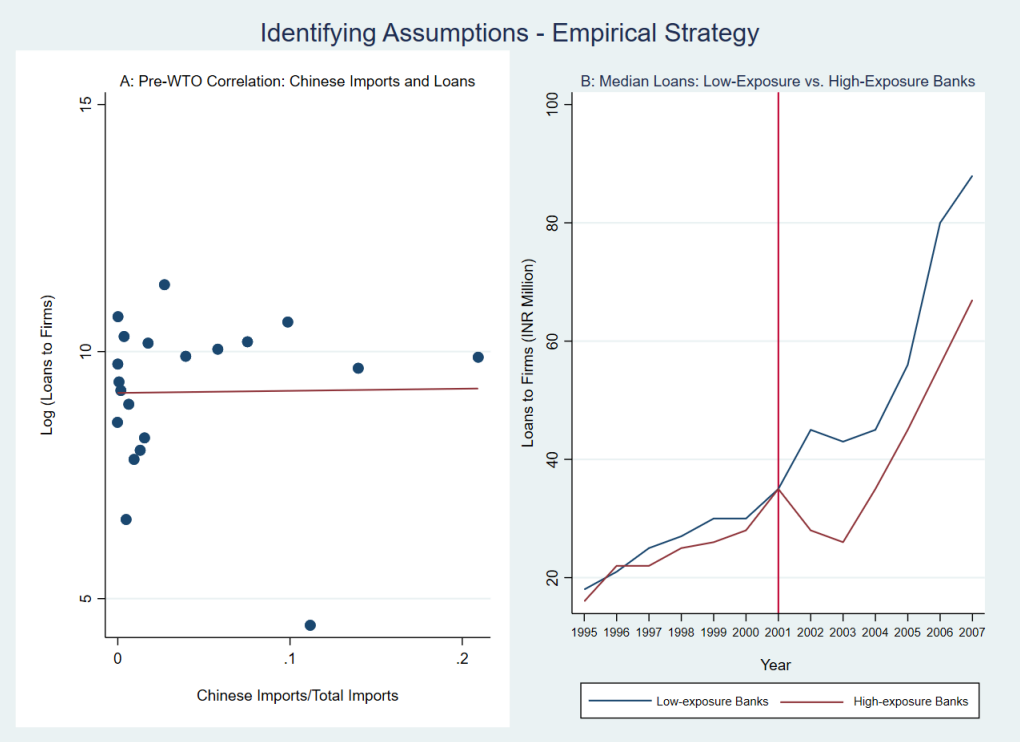
Notes: Panel A plots the median loan received by an average Indian manufacturing firm. It is expressed in INR Million. Panel B plots the median share of loan received by a firm from a private bank. It is calculated as the share of loans received by a firm from a private bank to total loans received. Panel C plots the unconditional correlation between share of loan received by a firm from a private bank and Chinese import share for India (Chinese Imports/Total Imports). Panel D plots the unconditional correlation between share of loan received by a firm from a public-sector bank and Chinese import share for India (Chinese Imports/Total Imports). The data are divided into 20 bins of each variable.

Figure 2: Chinese Imports to Latin America and India: Pre- and Post-2001



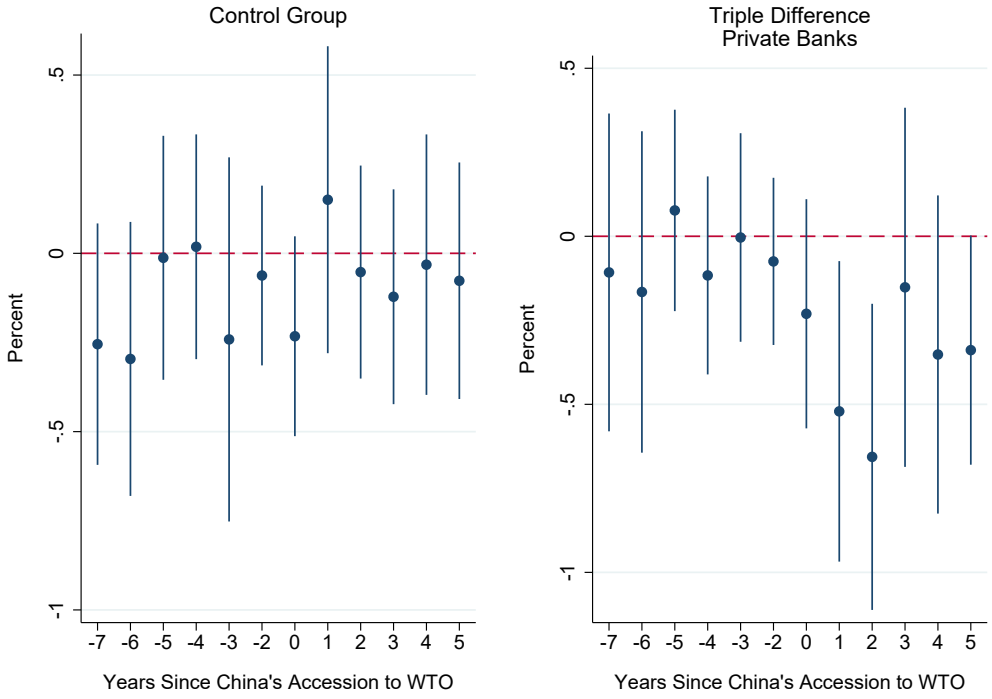
Notes: This figure shows the distribution of Chinese imports to India and Latin American countries, before and after China's entry to the WTO in 2001. The top row shows kernel density plots of the fraction of Chinese imports in 4-digit manufacturing industries, before and after China's entry to the WTO. The left-panel shows the distribution for India; whereas the right panel for Latin American economies. The bottom figure shows the correlation in the change in the industry-specific share of Chinese imports between India and Latin American economies.

Figure 3: Identifying Assumptions – Empirical Strategy



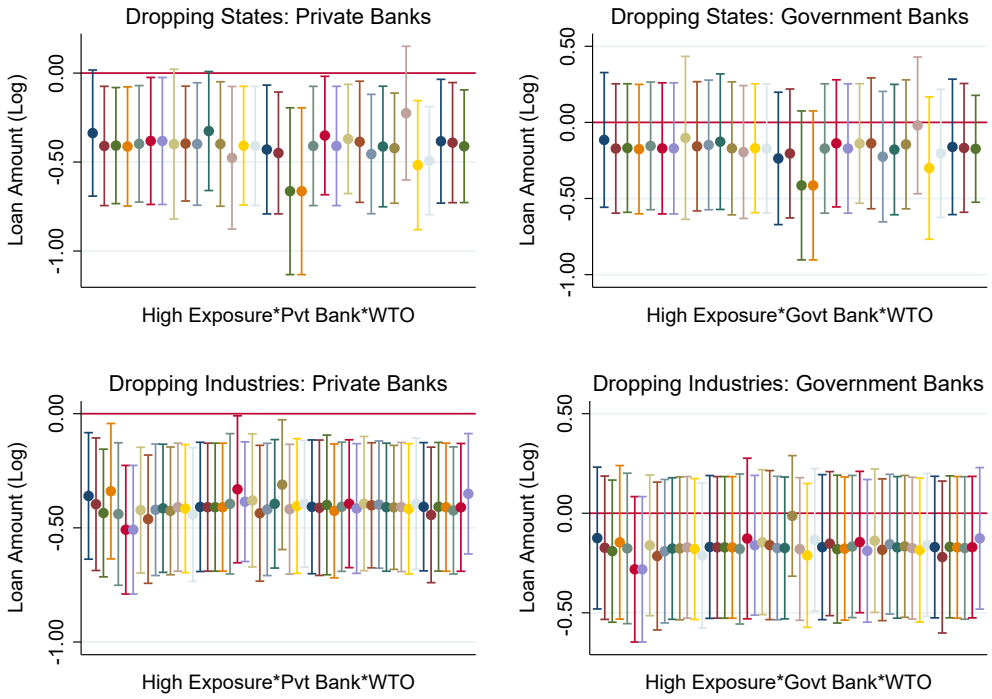
Notes: Panel A plots the unconditional correlation between volume of loans and Chinese imports in the pre-2001 period. Panel B presents the median loan given by a bank to a firm belonging to high- and low-exposure sectors with respect to Chinese competition for the years 1995–2007.

Figure 4: Exposure to Chinese Imports and Loans: Event Study Framework



Notes: These figures shows event-study plots identifying how credit varies over time in industries with high exposure to Chinese imports, relative to low exposure. The unit of observation is loans. The outcome variable is logged loan amount (in millions). The reference year is 2001 – the year of China's accession to the WTO. $t = -7$ corresponding to the year 1995; $t = 0$, the year 2002; and $t = 5$, the year 2007. The vertical lines show the 95% confidence intervals. The left panel shows the double difference coefficient, which is the combined effect on loans from NBFCs, government-owned and foreign banks for firms in industries with relatively high exposure to Chinese imports; the right panel shows the differential effect for private banks. All specifications include firm, 2-digit industry-year, creditor, creditor-location and firm age fixed effects. Standard errors are clustered by 4-digit industries.

Figure 5: Exposure to Chinese Imports and Loans: Robustness to Dropping Individual States and Industries



Notes: This set of coefficient plots shows the robustness of the results to dropping individual states and industries. The top row shows robustness to dropping individual states; the bottom row, individual industries. The right panel estimates the differential effect for private banks; the left panel, for government owned banks. The unit of observation is loans to firms (logged). All specifications include firm, bank-year, 3-digit industry year and age fixed effects. Standard errors are clustered by bank and 4-digit industry. The vertical lines plot the 90% confidence intervals.

Table 1: Summary Statistics: Loans

	Mean	Median	25th Percentile	75th Percentile
	(1)	(2)	(3)	(4)
Panel A: Intensive Margin				
All Banks	332.77	38	7.3	145
Govt.-owned Bank	429.74	42.5	9	164
Private (Domestic) Bank	198.90	45	7.5	150
Foreign Bank	334.80	70	20	200
Non-Banking Institutions	121.44	15.6	4	67.5
Panel B: Extensive Margin				
All Banks	3.78	2	1	4
Govt.-owned Bank	3.62	2	1	4
Private (Domestic) Bank	4.34	3	1	5
Foreign Bank	3.71	2	1	5
Non-Banking Institutions	3.92	2	1	4

Notes: Table reports values for 1995–2007. Values are expressed in INR Millions in Panel A and numbers in Panel B.

Table 2: Balancing Tests

	High-Exposure		Low-Exposure		Normalized
	Median	Std. Dev	Median	Std. Dev	Difference
	(1)	(2)	(3)	(4)	(5)
Panel A: Bank Characteristics					
Total Assets	257,532.1	643,331	263,993.7	690,753.5	–0.07
Non-Performing Loans	16,313.9	53,206.22	18,812	56,288.21	–0.07
Bank Deposits	170,245.6	501,778.2	182,915.2	542,176.2	–0.06
Bank Capital	4,472.56	4,216.73	4,541.42	4,485.23	–0.01
Bank Borrowing	1,788.4	35,276.09	1,922.3	37,541.62	–0.04
Return on Assets	2.09	4.19	2.16	4.27	–0.02
Operating Profit/Working Funds	1.85	0.87	1.88	0.92	–0.05
Tier 1 Capital	11.14	659.37	11.37	633.19	0.001
Panel B: Firm Characteristics					
Bank Credit	23	765.64	25	333.69	–0.04
Sales	631.5	2,937.08	1,057	5,971.19	–0.26
Total Assets	722.6	4,306.42	1165	30,258.27	–0.13
Capital Employed	564.3	3,551.36	893.6	23,211.51	–0.23
Value-added	287.4	1,890.77	496.1	17,516.82	–0.24
Number of Banking Relations	2	2.54	2	3.76	–0.15

Notes: Table reports median values for 1995–2001. Values are expressed in INR Millions, except return on assets, operating profit/working funds, tier-1 capital. All these are in ratios. Column (5) shows the normalized difference between the two groups. Following Imbens and Wooldridge (2008), an absolute value above 0.25 would suggests an imbalance between the two groups.

Table 3: Differences in Pre-China Shock Trends, 1995–2001: High- and Low-exposure Firms

	Log(Loan$_{bit}$)			Log(Number of Loans$_{bit}$)		
	(1)	(2)	(3)	(4)	(5)	(6)
$HExp_k$ ×Time Trend	0.003			–0.050		
	(0.096)			(0.049)		
$HExp_k$ ×Year 1995		–0.038			–0.070*	
		(0.162)			(0.038)	
$HExp_k$ ×Year 1996		–0.136			–0.170	
		(0.145)			(0.133)	
$HExp_k$ ×Year 1997		0.057			–0.121	
		(0.201)			(0.105)	
$HExp_k$ ×Year 1998		0.055			0.056	
		(0.161)			(0.072)	
$HExp_k$ ×Year 1999		–0.147			–0.017	
		(0.119)			(0.045)	
$HExp_k$ ×Year 2000		0.082			–0.125	
		(0.153)			(0.082)	
$HExp_k$ ×Year 2001		0.089			0.069	
		(0.113)			(0.070)	
$HExp_i$			–0.077			–0.276
			(0.090)			(0.204)
R-Square	0.56	0.56	0.12	0.71	0.71	0.07
N	41,994	41,994	4,472	41,994	41,994	4,507
Firm Controls	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	No	Yes	Yes	No
Industry FE (3-digit)*Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Bank FE*Year FE	Yes	Yes	Yes	Yes	Yes	Yes

Notes: All the regressions are run for the years 1995–2007. Columns (1) – (3) use total loans and columns (4) – (6) use the number of loans advanced by a bank b to a firm i in year t as the dependent variable, respectively. $HExp_k$ is a measure of the exposure index of Chinese imports. In other words, we define $HExp_k$ as a measure of Chinese competition that an Indian industry (k) faces in its domestic market. It takes a value 1 if the average share of imports by any industry (k) for the period 1995-–2001 is greater than the median share of Chinese imports for all of manufacturing industries (for the period 1995–2001). For our estimations, we use the share of Chinese imports by Latin American countries (Brazil, Colombia, Venezuela, Ecuador, Peru, Bolivia, Chile, Paraguay, Argentina and Uruguay) as the instrument for Indian imports (Chinese). '$TimeTrend$' is a linear time trend pre-2002. '$Year1995$', '$Year1996$', '$Year1997$', '$Year1998$', '$Year1999$', '$Year2000$', '$Year2001$' are year dummies. These dummies equal to 1 for the respective years. Firm Controls include total real assets and GVA (gross value-added) share of technology adoption of a firm. Standard errors corrected by clustering at both industry (4-digit) and bank level are in the parenthesis. Intercepts included but not reported. * denotes 10% level of significance.

Table 4: Benchmark Results

	Log(Total Loan$_{bit}$)										
						Firm X Year FE	Balanced Panel	Drop Foreign + NBFCs		Imported Inputs	Foreign Competition
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
$HExp_k \times Post_{2002}$	0.021	0.051	0.101	0.201	0.138				–0.045	0.202	0.004
	(0.081)	(0.082)	(0.161)	(0.203)	(0.225)				(0.158)	(0.124)	(0.099)
$HExp_k \times Post_{2002} \times PvtBank_b$		–0.256**	–0.305**	–0.409**	–0.253**	–0.446**	–0.360***	–0.566**	–0.260**	–0.352***	–0.254**
		(0.104)	(0.151)	(0.170)	(0.101)	(0.218)	(0.072)	(0.248)	(0.129)	(0.129)	(0.120)
$HExp_k \times Post_{2002} \times GovtBank_b$			–0.066	–0.171	–0.157	–0.449					
			(0.146)	(0.214)	(0.207)	(0.372)					
$HExp_k \times Post_{2002} \times NBFC_b$				–0.134	0.032	0.257					
				(0.251)	(0.276)	(0.386)					
$HExp_k^{Input} \times Post_{2002}$										–0.202	
										(0.137)	
$HExp_k^{Input} \times Post_{2002} \times PvtBank_b$										0.119	
										(0.103)	
$HExp_k^{Foreign} \times Post_{2002}$											0.116
											(0.072)
$HExp_k^{Foreign} \times Post_{2002} \times PvtBank_b$											–0.008
											(0.140)
R-Square	0.56	0.56	0.56	0.56	0.65	0.65	0.60	0.66	0.62	0.56	0.56
N	41,994	41,994	41,994	41,994	30,833	28,385	6,238	21,909	22,498	41,994	41,994
Firm Controls	Yes	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes
Industry FE (3-digit)*Year FE	Yes	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes
Bank FE*Year FE	Yes	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes
Firm FE*Year FE	No	No	No	No	No	Yes	Yes	Yes	No	No	No
Bank Branch Location FE*Year FE	No	No	No	No	Yes	No	No	No	Yes	No	No

Notes: All the regressions are run for the years 1995–2007. Columns (1) – (11) use logarithm of loans advanced by a bank b to a firm i in year t as the dependent variable, respectively. $HExp_k$ is a measure of Chinese competition that an Indian industry (k) faces in its domestic market. It takes a value 1 if the average share of imports by any industry (k) for the period 1995-–2001 is greater than the median share of Chinese imports for all of manufacturing industries (for the period 1995–2001). For all these estimations, the import competition index is measured at NIC 2004 4-digit level. $HExp_k^{Input}$ is measure of Chinese competition for imported intermediate inputs that an Indian industry (k) faces in its domestic market. It takes a value 1 if the average share of imported intermediate inputs by any industry (k) for the period 1995-–2001 is greater than the median share of Chinese intermediate input imports for all of manufacturing industries (for the period 1995–2001). We use the input coefficients at the industry level (4-digit) from the input-output (I-O) table 2001 to compute the imported intermediate inputs from total imports. For columns (1) – (11), we use the share of Chinese imports by Latin American countries (Brazil, Colombia, Venezuela, Ecuador, Peru, Bolivia, Chile, Paraguay, Argentina and Uruguay) for Indian imports (Chinese) in a reduced form equation. $HExp_k^{Foreign}$ is a measure of Chinese competition that an Indian industry (k) faces in the foreign markets. We use the combined share of Chinese imports for US, EU, and ASEAN as the measure of foreign competition that an Indian firm faces from China in its export market. $Post_{2002}$ is a dummy variable intended to capture the effect of China's entry to the WTO. It takes a value of 1 for the years following the signing of the WTO agreement by China. $PvtBank_b$, $GovtBank_b$, and $NBFC_b$ takes a value 1 if a firm is connected to any private (domestic), govt.-owned, and non-banking financial corporation, respectively. Firm Controls include total real assets and GVA (gross value-added) share of technology adoption of a firm. Standard errors corrected by clustering at both industry (4-digit) and bank level are in the parenthesis. *,**,*** denotes 10%, 5%, and 1% level of significance, respectively.

Table 5: Using Different Methods and Measures

Panel A: Different Methods

	Log(Total Loan$_{bit}$)					
	(1)	(2)	(3)	(4)	(5)	(6)
	2SLS				OLS	
$HExp_k \times Post_{2002}$	0.087	0.319		0.160	0.023	
	(0.113)	(0.358)		(0.118)	(0.098)	
$HExp_k \times Post_{2002} \times PvtBank_b$	–0.549***	–0.786**	–0.641*	–0.431**	–0.249**	–0.321**
	(0.206)	(0.334)	(0.378)	(0.186)	(0.107)	(0.140)
$HExp_k \times Post_{2002} \times GovtBank_b$			–0.577	–1.092		
			(0.611)	(0.896)		
$HExp_k \times Post_{2002} \times NBFC_b$			0.616	0.367		
			(0.594)	(0.737)		
R-Square	0.56	0.56	0.65	0.55	0.56	0.65
N	41,994	41,994	28,327	31,464	41,994	28,385
F-Stat (1st Stage)	3168.70	1183.41	863.39	2480.73	–	–
Hansen J-Stat (1st Stage)	0.051	0.018	0.047	0.046	–	–
Firm Controls	Yes	Yes	No	Yes	Yes	No
Firm FE	Yes	Yes	No	Yes	Yes	No
Industry FE (3-digit)*Year FE	Yes	Yes	No	Yes	Yes	No
Bank FE*Year FE	Yes	Yes	No	No	Yes	No
Firm FE*Year FE	No	No	Yes	No	No	Yes
Bank Controls*WTO	No	No	No	Yes	No	No

Panel B: Different Measures

	Log(Total Loan$_{bit}$)				$\Delta Log(Loan_{bi,95-07})$	
	All	Private		Private		Private
	(7)	(8)	(9)	(10)	(11)	(12)
$BExp_k$	4.201	92.871***				
	(2.591)	(32.817)				
$BExp_k \times Post_{2002}$	–1.117*	–51.678***				
	(0.675)	(17.584)				
$ShImp_{k,95-01} \times Post_{2002}$			–1.801**	0.610		
			(0.797)	(0.571)		
$ShImp_{k,95-01} \times Post_{2002} \times PvtBank_b$				–1.905**		
				(0.816)		
$\Delta IMP^{China}_{k,95-07}$					–1.318***	–0.873**
					(0.486)	(0.438)
$\Delta IMP^{China}_{k,95-07} \times PvtBank_b$						–3.297**
						(1.672)
R-Square	0.76	0.80	0.56	0.56	0.14	0.12
N	24,044	5,913	34,741	34,741	34,869	34,869
Firm Controls	Yes	Yes	Yes	Yes	Yes	Yes
Firm-Bank FE	Yes	Yes	No	No	No	No
Firm FE	No	No	Yes	Yes	No	No
Firm FE*Year FE	Yes	Yes	No	No	No	No
Industry FE (3-digit)*Period FE	No	No	No	No	Yes	Yes
Bank FE*Period FE	No	No	No	No	Yes	Yes
Industry FE (3-digit)*Year FE	No	No	Yes	Yes	No	No
Bank FE*Year FE	No	No	Yes	Yes	No	No

Notes: All the regressions are run for the years 1995–2007. In Panel A: for columns (1) – (4), we use the share of Chinese imports by Latin American countries (Brazil, Colombia, Venezuela, Ecuador, Peru, Bolivia, Chile, Paraguay, Argentina and Uruguay) as the instrument for Indian imports (Chinese); for columns (5) and (6) we use the share of Chinese imports by India. For all these estimations, the import competition index is measured at NIC 2004 4-digit level. In Panel B: columns (7) – (10) use the logarithm of loans advanced by a bank b to a firm i in year t as the dependent variable; columns (11) – (12) use the change in the amount of loans between the periods 1995–2001 and 2002–2007 as the dependent variable. $HExp_k$ is a measure of Chinese competition that an Indian industry (k) faces in its domestic market. It takes a value 1 if the average share of imports by any industry (k) for the period 1995-–2001 is greater than the median share of Chinese imports for all of manufacturing industries (for the period 1995–2001). $BExp_k$ is a measure of the exposure index of Chinese imports at the bank level. We define it the following way: for each bank b, we measure its exposure to the China shock as the share of its loans to firms belonging to the high-exposure sectors on its total loans to manufacturing firms. To attenuate endogeneity issues and possible portfolio adjustments by banks in anticipation of China's entrance into the WTO, we measure banks' exposure averaging the shares over the years 1995–2001. We then interact it with our $HExp_k$ measure. $HExp_k$ is a measure of Chinese competition that an Indian industry (k) faces in its domestic market. It takes a value 1 if the average share of imports by any industry (k) for the period 1995-–2001 is greater than the median share of Chinese imports for all of manufacturing industries (for the period 1995–2001). We use the share of Chinese imports by Latin American countries (Brazil, Colombia, Venezuela, Ecuador, Peru, Bolivia, Chile, Paraguay, Argentina and Uruguay) for Indian imports (Chinese) in a reduced form equation. $\Delta IMP^{China}_{k,95-07}$ is the change in the Chinese share of imports by India between the periods 1995–2001 and 2002–2007. $ShImp_{k,95-01}$ is the average share of Chinese imports in total imports of India at 4-digit industry level before China joined the WTO in 2001. For our estimations, the import competition index is measured at NIC 2004 4-digit level. $Post_{2002}$ takes a value of 1 for the years following the signing of the WTO agreement by China. $PvtBank_b$ takes a value 1 if a firm is connected to any private (domestic) bank. Firm Controls include total real assets and GVA (gross value-added) share of technology adoption of a firm. Standard errors corrected by clustering at both industry (4-digit) and bank level are in the parenthesis. *,**,*** denotes 10%, 5%, and 1% level of significance, respectively.

Table 6: What Happened to Bank Balance Sheet?

	NPAs	Profitability Ratios		Bank Borrowing	Bank Deposits
		Operating Profit/ Working Funds	Return on Assets		
	(1)	(2)	(3)	(4)	(5)
$HExp_k \times Post_{2002}$	–0.009**	0.482***	0.333***	–0.002	0.005
	(0.004)	(0.097)	(0.106)	(0.007)	(0.008)
$HExp_k \times Post_{2002} \times PvtBank_b$	0.008	–0.920**	–1.147***	–0.052*	0.052
	(0.007)	(0.425)	(0.386)	(0.032)	(0.057)
R-Square	0.74	0.74	0.39	0.46	0.69
N	1,641	1,641	1,641	1,641	1,641
Bank Controls (Pre-2001) $\times$Post$_{2002}$	Yes	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes

Notes: All the regressions are for the years 1995–2007. NPAs (Column (1)), Bank Deposits (Column (4)), and Bank Borrowing (Column (5)) are expressed as a share of total assets of a bank. Operating Profits/Working Funds (Column (2)) and Return on Assets (Column (3)) is expressed in simple ratio terms. 'Bank Borrowing' is a sum of banks' borrowing from India's Central Bank (popularly known as Reserve Bank of India), inter-bank borrowing, and borrowing from others. $HExp_k$ is a measure of Chinese competition that an Indian industry (k) faces in its domestic market. It takes a value 1 if the average share of imports by any industry (k) for the period 1995–2001 is greater than the median share of Chinese imports for all of manufacturing industries (for the period 1995–2001). For our estimations, we we use the share of Chinese imports by Latin American countries (Brazil, Colombia, Venezuela, Ecuador, Peru, Bolivia, Chile, Paraguay, Argentina and Uruguay) for Indian imports (Chinese) in a reduced form equation. The import competition index is measured at NIC 2004 4-digit level. $Post_{2002}$ is a dummy variable intended to capture the effect of China's entry to the WTO. It takes a value of 1 for the years following the signing of the WTO agreement by China. $PvtBank_b$ takes a value 1 for any domestic private bank. Bank Controls are a vector of variables: networth of a bank and capital adequacy ratio. Standard errors corrected by two-way clustering at bank and year level are in the parenthesis. *,**,*** denotes 10%, 5%, and 1% level of significance, respectively.

Table 7: Firm Level Effects

Panel A	Secured Bank Borrowing	NBFC Borrowing	Foreign Borrowing	All Other Borrowing	Trade Credit
	(1)	(2)	(3)	(4)	(5)
$HExp_k \times Post_{2002}$	0.017	–0.299	–0.688	–0.231	0.107
	(0.135)	(0.209)	(0.452)	(0.233)	(0.124)
$HExp_k \times Post_{2002} \times PvtBank_b$	–0.118**	–0.341***	0.161*	–0.028	–0.047
	(0.052)	(0.085)	(0.090)	(0.081)	(0.050)
R-Square	0.93	0.86	0.93	0.88	0.92
N	25,253	13,981	13,893	22,964	24,791
Panel B	Total Sales	Exports	Domestic Sales	Sales from Manufacturing	Total Imports
	(6)	(7)	(8)	(9)	(10)
$HExp_k \times Post_{2002}$	0.032	–0.135	–0.003	0.015	–0.008
	(0.117)	(0.088)	(0.145)	(0.074)	(0.216)
$HExp_k \times Post_{2002} \times PvtBank_b$	–0.072*	–0.225*	–0.120***	–0.093**	–0.037
	(0.045)	(0.129)	(0.041)	(0.046)	(0.066)
R-Square	0.91	0.88	0.96	0.90	0.87
N	24,620	17,330	17,259	25,144	19,912
Panel C	Capital Employed	Total Compensation	Raw Materials	Technology Adoption	Fixed Assets
	(11)	(12)	(13)	(14)	(15)
$HExp_k \times Post_{2002}$	–0.057	0.122	0.020	0.308*	–0.020
	(0.129)	(0.083)	(0.099)	(0.162)	(0.105)
$HExp_k \times Post_{2002} \times PvtBank_b$	–0.076**	–0.049*	–0.128**	–0.175	–0.073**
	(0.034)	(0.028)	(0.049)	(0.120)	(0.034)
R-Square	0.96	0.94	0.91	0.87	0.96
N	25,235	25,710	24,277	10,356	25,287
Firm FE	Yes	Yes	Yes	Yes	Yes
Industry FE (3-digit)*Year FE	Yes	Yes	Yes	Yes	Yes

Notes: All the regressions are run for the years 1995–2007. We use natural logarithm of our outcomes of interest. 'Secured Bank Borrowing' is the sum of total borrowing by a firm from domestic private and public-sector banks. 'NBFC Borrowing' is the sum of borrowing across all domestic Non-Banking Financial Corporations. 'Foreign Borrowing' is the sum of borrowing across all foreign sources, such as foreign banks, foreign NBFCs, etc. 'All Other Borrowing' is a sum of borrowing for the following categories: inter-corporate loans, loans from promoters, directors, and shareholders, borrowings from Govt., fixed deposits, hire purchase loans, commercial papers, debentures and bonds, and deferred credit. 'Trade Credit' is defined as the ratio of account receivables to sales of a firm. 'Total Sales', 'Exports', Domestic Sales', 'Sales from Manufacturing', and 'Total Imports' is the total sales, exports, domestic sales (total sales – exports), sales from manufacturing goods, and total imports (capital goods + finished goods + raw materials + stores and spares) of a firm. 'Capital Employed' is the amount of capital employed by a firm in its production process. 'Total Compensation' is the total labour compensation of a firm. 'Raw Materials' is the amount of raw materials used by a firm in its production process. 'Technology Adoption' is the sum of R&D expenditure and foreign technology transfer of a firm. 'Fixed Assets' is the amount of gross fixed assets of a firm. $HExp_k$ is a measure of Chinese competition that an Indian industry (k) faces in its domestic market. It takes a value 1 if the average share of imports by any industry (k) for the period 1995-–2001 is greater than the median share of Chinese imports for all of manufacturing industries (for the period 1995–2001). For our estimations, we we use the share of Chinese imports by Latin American countries (Brazil, Colombia, Venezuela, Ecuador, Peru, Bolivia, Chile, Paraguay, Argentina and Uruguay) for Indian imports (Chinese) in a reduced form equation. The import competition index is measured at NIC 2004 4-digit level. $Post_{2002}$ is a dummy variable intended to capture the effect of China's entry to the WTO. It takes a value of 1 for the years following the signing of the WTO agreement by China. $PvtBank_b$ takes a value 1 if a firm is connected to any private (domestic) bank. Standard errors in parentheses are clustered at the industry level (4-digit). Intercepts are not reported. *,**,*** denotes 10%, 5%, and 1% level of significance, respectively.

Appendix

(FOR ONLINE PUBLICATION)

A Dataset

We use an annual panel of Indian manufacturing firms that covers 7200+ firms, across 105 industries, over the period of 1995–2007. The firm level data is used from the PROWESS database of the Centre for Monitoring Indian Economy (CMIE). All monetary-based variables measured in Millions of Indian Rupees (INR), deflated by 2005 industry-specific Wholesale Price Index (WPI). We use 2004 National Industrial Classification (NIC). This firm level data is matched with bank-firm loan level proprietary data for 600+ banks from Ministry of Corporate Affairs (MCAI) based on unique firm identifiers for our analysis. As for the import penetration ratios, we source data from the WITS and UN-COMTRADE database and match it with our firm level data based on 4-digit industry classification.

Variable Definitions

Loan: This is the amount of credit supply by a bank to an individual firm in a single year.

Chinese Competition at Domestic Market: This is the Chinese import penetration ratio in the domestic market of India. It is calculated as the share of Chinese imports in industry k at time t by India divided by total domestic production plus imports minus exports for industry k in 1995 for India. Data obtained from WITS and UN-COMTRADE database.

External Financial Dependence: This measure is based on Rajan and Zingales (1998) industry level index of external financial dependence.

Production Process – Upstream or Downstream: We follow Antràs et al. (2012) and compute an upstreamness index at the 4-digit industry level for the manufacturing firms. Upstreamness is a standard statistic that is widely used in the firm networks literature. It is computed by assigning discrete weights based on the distance from final use of an industry's output. For this purpose we use the 1993–94 I-O table. For details on the estimation method, please see Kisat and Phan (2020).

Initial Trade Exposure: We follow Topalova (2010) to compute our regional level initial exposure to Chinese import competition. We multiply the share of Chinese imports (in total imports) at the 4-digit industry level with the employment share (in total employment) of each industry in each state for the year 1995.

Skill Intensity: This is defined as the ratio of non-production workers to total employees for each industry at each state. For our analysis, we use the average of this ratio for each industry for the years before China became the member of the WTO, i.e., 1995-2001.

Total Bank Borrowing: This is the sum of borrowing across all possible sources (domestic + foreign) by a firm.

Secured Bank Borrowing: This is the sum of secured borrowing across all domestic banks (public + private) by a firm.

NBFC Borrowing: This is the sum of borrowing from all domestic Non-Banking Financial Corporations (NBFCs) by a firm.

Foreign Borrowing: This is the sum of borrowing from all foreign sources (banks + NBFCs) by a firm.

All Other Borrowing: This is the sum of borrowing from all other possible sources – inter-corporate loans, loans from promoters, directors, and shareholders, borrowings from Govt., fixed deposits, hire purchase loans, commercial papers, debentures and bonds, and deferred credit – by a firm.

Trade Credit: This is defined as the ratio of accounts receivables to sales of a firm. A higher ratio implies that a significant amount of cash is tied up. In other words, an increase in accounts receivable to sales ratio from one year to the next indicates that investment in the accounts receivable is growing more rapidly than sales.

NPAs – Non-Performing Assets: This is defined as the amount of non-performing loans of a bank.

Operating Profit/Working Funds: This is defined as the ratio of a bank's operating profits to its average working funds. Working funds refers to the total resources of a bank. It can be construed as either total liabilities or total assets. Total resources would essentially include capital, reserves surplus, deposits accepted from customers, borrowings, other liabilities and provisions. It could also be looked at as total assets excluding accumulated losses, if any.

Bank Borrowing: This is defined as the total amount of borrowing done by a bank from all the different sources such as borrowing from other similar banks, central bank, etc.

Bank Deposits: This is defined as the total amount of deposits received by a bank.

Total Sales: Total Sales of a firm.

Exports: Total exports of a firm.

Domestic Sales: Total Sales minus Exports of a firm.

Sales from Manufacturing: This is defined as the amount of sales from the manufacturing goods.

Total Imports: This is defined as the sum of imports done by a firm on account of (a) capital goods, (b) raw materials, (c) stores and spares, and (d) finished goods.

Capital Employed: This defined as the amount of capital employed in the production process by a firm.

Total Compensation: This is defined as the sum of wages and incentives paid by a firm towards its all employees.

Raw Materials: This is defined as the expenditure on raw materials used by a firm.

Technology Adoption: This is the sum of R&D expenditure and royalty payment for foreign technical knowhow for a firm.

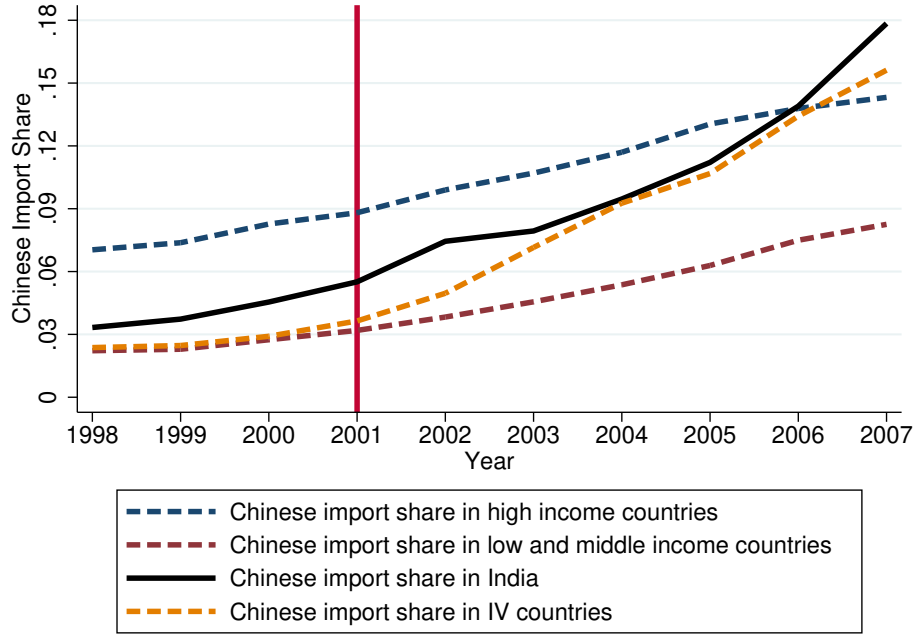
Fixed Assets: This is the fixed assets of a firm.

Volume of Credit: This is the amount of credit give by a bank to an industry.

Number of Credit Accounts: This is the number of industries for which credit was supplied by a bank.

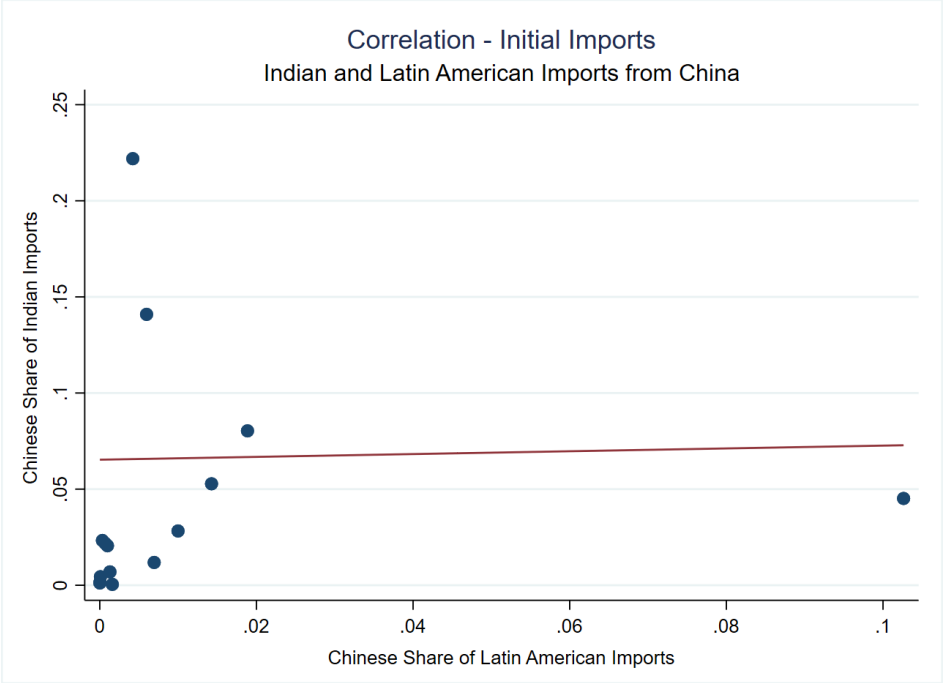
B Figures

Figure B1: Chinese Import Share in India and Different Country Groups



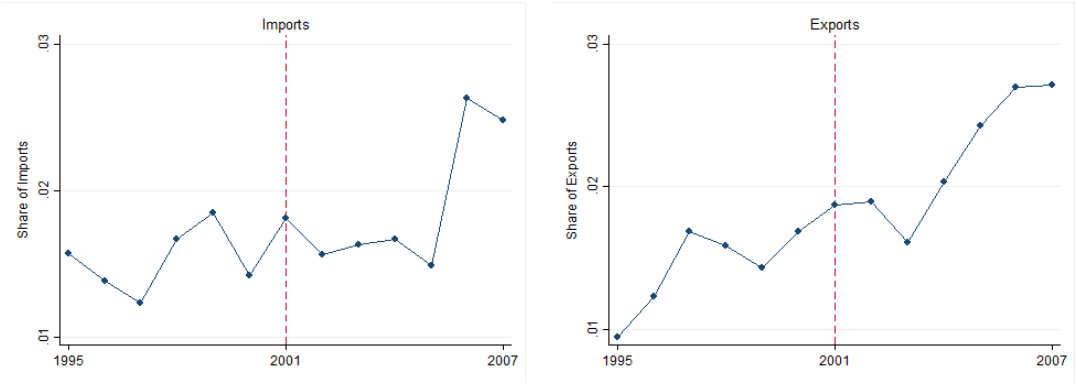
Notes: Chinese import share to a particular country is the ratio of imports from China in that country to all imports in that country. Data are sourced from the UN-COMTRADE database. Source: Chakraborty et al. (2020).

Figure B2: Initial Correlation Between Chinese Share of Indian and Latin American Imports



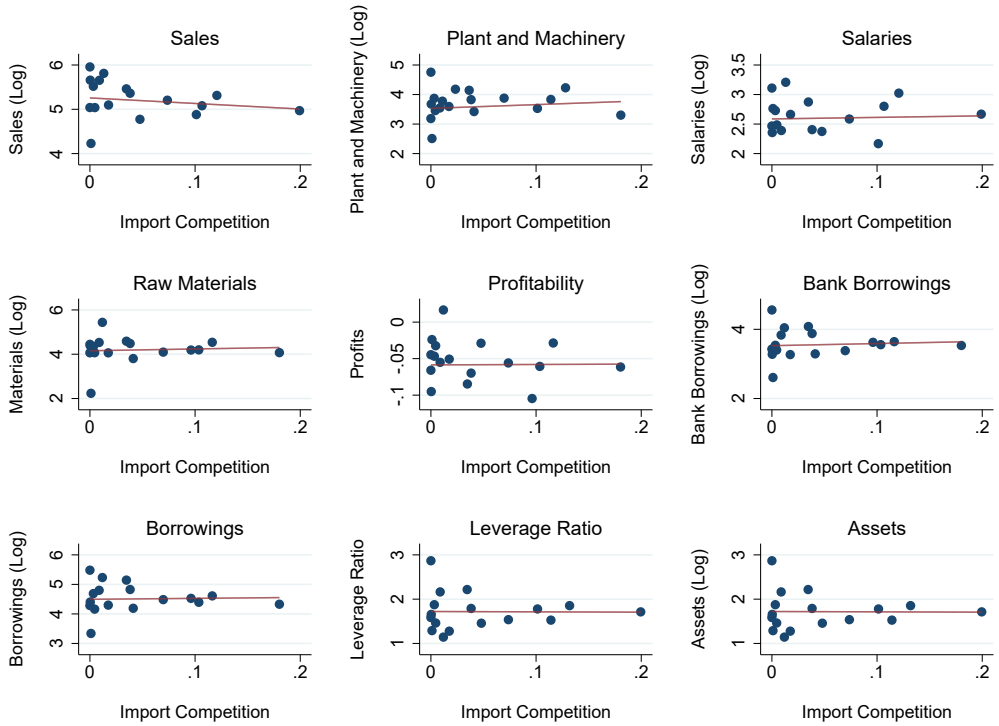
Note: This figure shows the correlation between Chinese share of Indian and Latin American imports. Data are sourced from the UN-COMTRADE database.

Figure B3: Trade (Exports and Imports) between India and Latin American Economies



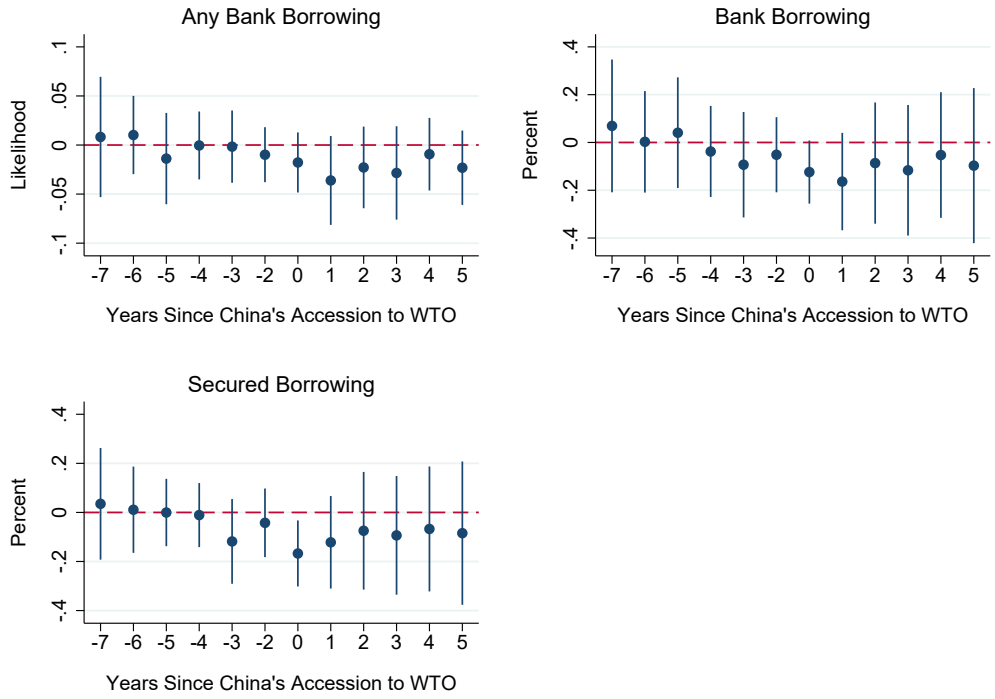
Notes: This figure shows trade between India and Latin American economies during the period 1995–2007. The left-panel shows the share of imports by India from Latin American economies; the right-panel shows the share of exports by India to Latin American economies. The Latin American economies considered are: Argentina, Brazil, Chile, Columbia, Costa Rica, Mexico, Paraguay, Peru, Uruguay, and Venezuela. Source: UN-COMTRADE.

Figure B4: Exposure to Import Competition and Pre-WTO Firm Characteristics



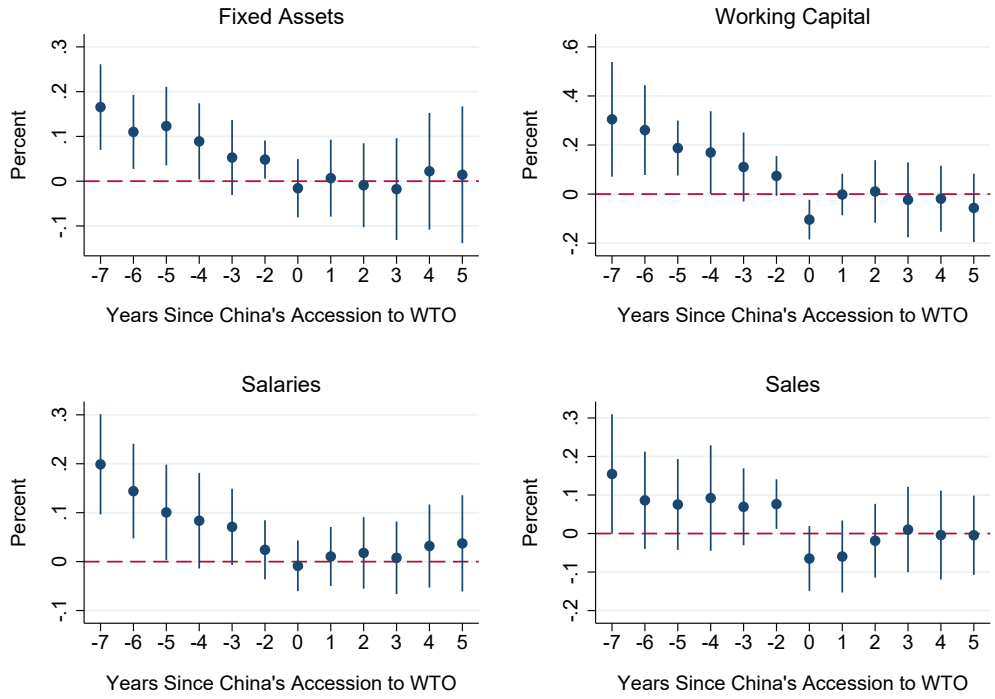
Notes: This figure shows the correlation between firm characteristics and industries' exposure to Chinese imports. The horizontal axis is the change in sectoral share of Chinese imports in Latin American countries. The vertical axis in each instance shows the firm characteristic of interest, measured prior to 2001.

Figure B5: Exposure to Chinese Imports and Firm Borrowing: Event-Study Plots



Notes: These figures shows the event-study plots for aggregate level of firm borrowing. The unit of observation here is a firm. The vertical line corresponds to the year 2001 – the year of China's entry to the WTO. Dashed lines show the 95% confidence intervals. Intensive margin bank borrowing is the total amount of bank borrowings for a firm (logged); extensive margin bank borrowing is a dummy equaling 1 if the firm has any outstanding loan from any bank. All specifications included firm, 3-digit industry-year, and firm age fixed effects. The outcome variable in the top-left panel is a dummy equaling 1 if a firm had any bank borrowing in a year; the remaining outcome variables are logged. Standard errors are clustered at 4-digit industry level.

Figure B6: Exposure to Chinese Imports and Firm Outcomes: Event-Study Plots



Notes: These figures shows the event-study plots for selected firm outcomes. The unit of observation here is a firm. The vertical line corresponds to the year 2001 – the year of China's entry to the WTO. Dashed lines show the 95% confidence intervals. All specifications included firm, 3-digit industry-year, and firm age fixed effects. All outcome variables are logged. Standard errors are clustered at 4-digit industry level.

C Tables

Table C1: Summary Statistics

	Median	Std. Dev
	(1)	(2)
Panel A: Bank Characteristics		
Total Assets	431,123.5	1,210,451
Non-Performing Loans	14,540.5	40,243.2
Bank Deposits	319,726.1	956,748.9
Bank Capital	4,100	4,488.911
Bank Borrowing	3,417	98,774.93
Return on Assets	0.98	2.31
Operating Profit/Working Funds	2.18	0.90
Panel B: Firm Characteristics		
Bank Credit	37.8	10,138.99
Sales	1,163.2	35,721.8
Total Assets	1,149.8	34,784.87
Capital Employed	851.8	25,716.62
Value-added	522.1	18,545.59
Number of Banking Relations	2	5.21

Notes: Table reports median values for 1995–2007. Values are expressed in INR Millions, except return on assets and operating profit/working funds. Both of these are in ratios.

Table C2: India's Trade with China and Others

	Trade with China		Imports from Other Countries			
	Imports from China	Exports to China	ASEAN excluding China	US	EU27	World
	(1)	(2)	(3)	(4)	(5)	(6)
1995	9.74	2.76	26.49	40.90	94.80	351.70
2001	17.63	6.65	38.41	31.30	71.75	320.05
2007	212.84	29.40	129.94	109.93	224.37	1193.06
Growth (1995-2007)	2085.22%	965.22%	390.52%	168.78%	136.68%	239.22%

Notes: Numbers represent real trade values (deflated using Wholesale Price Index of the Indian manufacturing sector) in USD Millions. Source: Chakraborty et al. (2022).

Table C3: Using Overall Import Competition Index

	Log(Total Loan$_{bit}$)			
	Overall Import Competition		Overall Import Competition minus China	
	(1)	(2)	(3)	(4)
$HExp_k \times Post_{2002}$	0.034	0.432	–0.018	0.519
	(0.178)	(0.360)	(0.156)	(0.328)
$HExp_k \times Post_{2002} \times PvtBank_b$	–0.122	–0.380	–0.071	–0.422
	(0.156)	(0.255)	(0.159)	(0.331)
$HExp_k \times Post_{2002} \times GovtBank_b$	0.206	–0.233	0.083	–0.335
	(0.166)	(0.297)	(0.143)	(0.287)
R-Square	0.56	0.64	0.56	0.64
N	41,994	30,995	41,994	30,995
Firm Controls	Yes	No	Yes	No
Firm FE	Yes	Yes	Yes	Yes
Industry FE (3-digit)*Year FE	Yes	No	Yes	No
Bank FE*Year FE	Yes	No	Yes	No
Firm FE*Year FE	No	Yes	No	Yes

Notes: All the regressions are run for the years 1995–2007. Columns (1) – (4) use the logarithm of loans advanced by a bank b to a firm i in year t as the dependent variable. $HExp_k$ is a measure of overall import competition that an Indian industry (k) faces in its domestic market. It takes a value 1 if the average of the total imports by any industry (k) for the period 1995-–2001 is greater than the median of the total imports for all of manufacturing industries (for the period 1995–2001). The import competition index is measured at NIC 2004 4-digit level. $Post_{2002}$ takes a value of 1 for the years following the signing of the WTO agreement by China. $PvtBank_b$ and $GovtBank_b$ takes a value 1 if a firm is connected to any private (domestic) and govt-owned bank, respectively. Firm Controls include total real assets and GVA (gross value-added) share of technology adoption of a firm. Standard errors corrected by clustering at both industry (4-digit) and bank level are in the parenthesis. *,**,*** denotes 10%, 5%, and 1% level of significance, respectively.

Table C4: Extensive Margin

	Log(No. of Loans)		Pr(Loan = 1 $if year > 2001$)		$\Delta No.of Loan_{bi,95-07}$	
	(1)	(2)	(3)	(4)	(5)	(6)
$HExp_k \times Post_{2002}$	0.058	0.066	0.008	0.008		
	(0.047)	(0.050)	(0.005)	(0.005)		
$HExp_k \times Post_{2002} \times PvtBank_b$		–0.071		–0.001		
		(0.064)		(0.007)		
$\Delta IMP^{China}_{k,95-07}$					0.039	0.592
					(0.786)	(0.750)
$\Delta IMP^{China}_{k,95-07} \times PvtBank_b$						–4.700*
						(2.837)
R-Square	0.98	0.71	0.98	0.98	0.27	0.27
N	41,994	41,994	41,994	41,994	43,937	43,937
Firm Controls	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	No	No
Industry FE (3-digit)*Year FE	Yes	Yes	No	No	No	No
Bank FE*Year FE	Yes	Yes	No	No	No	No
Industry FE (3-digit)*Period FE	No	No	No	No	Yes	Yes
Bank FE*Period FE	No	No	No	No	Yes	Yes

Notes: All the regressions are run for the years 1995–2007. Columns (1) – (2) use the number of loans disbursed by a bank (b) to a firm (i) in a year (t); columns (3) – (4) use the probability of new loan issued by a bank b to a firm i after 2001; and columns (5) and (6) use the change in the number of loans disbursed by a bank (b) in year (t) between the periods 1995–2001 and 2002–2007, respectively as the dependent variable. $HExp_k$ is a measure of Chinese competition that an Indian industry (k) faces in its domestic market. It takes a value 1 if the average share of imports by any industry (k) for the period 1995-–2001 is greater than the median share of Chinese imports for all of manufacturing industries (for the period 1995–2001). For our estimations, we we use the share of Chinese imports by Latin American countries (Brazil, Colombia, Venezuela, Ecuador, Peru, Bolivia, Chile, Paraguay, Argentina and Uruguay) for Indian imports (Chinese) in a reduced form equation. The import competition index is measured at NIC 2004 4-digit level. $Post_{2002}$ is a dummy variable intended to capture the effect of China's entry to the WTO. It takes a value of 1 for the years following the signing of the WTO agreement by China. $\Delta IMP^{China}_{k,95-07}$ is the change in the Chinese share of imports by India between the periods 1995–2001 and 2002–2007. $PvtBank_b$ takes a value 1 if a firm is connected to any private (domestic) bank. Firm Controls include total real assets and GVA (gross value-added) share of technology adoption of a firm. Standard errors corrected by clustering at both industry (4-digit) and bank level are in the parenthesis. *,**,*** denotes 10%, 5%, and 1% level of significance, respectively.

Table C5: Using a Different IV and Control Group

	Log(Total Loan$_{bit}$)				
	(1)	(2)	(3)	(4)	(5)
$HExp_k \times Post_{2002}$	0.022	0.057	–0.008	–0.005	–0.013
	(0.102)	(0.099)	(0.110)	(0.113)	(0.117)
$HExp_k \times Post_{2002} \times PvtBank_b$		–0.298***	–0.333**	–0.338**	–0.327**
		(0.100)	(0.130)	(0.141)	(0.145)
$HExp_k \times Post_{2002} \times Foreign_b$				0.028	0.038
				(0.230)	(0.225)
$HExp_k \times Post_{2002} \times NBFC_b$					0.053
					(0.198)
R-Square	0.51	0.51	0.56	0.56	0.56
N	27,430	27,430	26,865	26,865	26,865
Firm Controls	Yes	Yes	No	No	No
Firm FE	Yes	Yes	No	No	No
Industry FE (3-digit)*Year FE	Yes	Yes	Yes	Yes	Yes
Bank FE*Year FE	Yes	Yes	Yes	Yes	Yes
Firm FE*Year FE	No	No	Yes	Yes	Yes

Notes: All the regressions are run for the years 1995–2007. Columns (1) – (5) use the logarithm of loans advanced by a bank b to a firm i in year t as the dependent variable. $HExp_k$ is a measure of Chinese competition that an Indian industry (k) faces in its domestic market. It takes a value 1 if the average share of imports by any industry (k) for the period 1995-–2001 is greater than the median share of Chinese imports for all of manufacturing industries (for the period 1995–2001). For our estimations, we use the share of other developing countries (Brazil, Indonesia, Malaysia, and Mexico) as the instrument for Indian imports (Chinese). The import competition index is measured at NIC 2004 4-digit level. $Post_{2002}$ takes a value of 1 for the years following the signing of the WTO agreement by China. $PvtBank_b$, $Foreign_b$, and $NBFC_b$ takes a value 1 if a firm is connected to any private (domestic), foreign, and non-banking financial corporation, respectively. Firm Controls include total real assets and GVA (gross value-added) share of technology adoption of a firm. Standard errors corrected by clustering at both industry (4-digit) and bank level are in the parenthesis. *,**,*** denotes 10%, 5%, and 1% level of significance, respectively.

Table C6: Robustness Checks

	Log(Total Loan$_{bit}$)						
	Year $\leq$ 2004	Pre-2001 Bank Dummy	State X Year FE	$HExp_k$ X State FE	WTO X Bank Controls	Firm FE X Bank Controls	Non-Linearities
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
$HExp_k \times Post_{2002}$	0.030	0.066	0.003	0.024	0.106	0.102	
	(0.097)	(0.090)	(0.075)	(0.079)	(0.088)	(0.088)	
$HExp_k \times Post_{2002} \times PvtBank_b$	–0.434***	–0.153*	–0.263**	–0.264**	–0.202*	–0.201*	
	(0.146)	(0.088)	(0.131)	(0.133)	(0.120)	(0.119)	
$T2HExp_k \times Post_{2002}$							0.134
							(0.098)
$T3HExp_k \times Post_{2002}$							–0.100
							(0.098)
$T2HExp_k \times Post_{2002} \times PvtBank_b$							–0.421***
							(0.135)
$T3HExp_k \times Post_{2002} \times PvtBank_b$							–0.042
							(0.135)
R-Square	0.58	0.56	0.56	0.56	0.55	0.55	0.56
N	27,229	41,994	35,010	35,018	31,465	31,464	41,994
Firm Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE (3-digit)*Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bank FE*Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: All the regressions are run for the years 1995–2007. Columns (1) – (7) use logarithm of loans advanced by a bank b to a firm i in year t as the dependent variable. $HExp_k$ is a measure of Chinese competition that an Indian industry (k) faces in its domestic market. It takes a value 1 if the average share of imports by any industry (k) for the period 1995-–2001 is greater than the median share of Chinese imports for all of manufacturing industries (for the period 1995–2001). $T2HExp_k$ and $T3HExp_k$ are exposure indices for 2nd and 3rd tercile of exposure to the Chinese imports. $T2HExp_k$ takes a value 1 if the average share of imports by any industry (k) for the period 1995-–2001 is greater than the median share of Chinese imports, but less than 75th percentile. $T3HExp_k$ takes a value 1 if that share is greater than 75th percentile. For our estimations, we we use the share of Chinese imports by Latin American countries (Brazil, Colombia, Venezuela, Ecuador, Peru, Bolivia, Chile, Paraguay, Argentina and Uruguay) for Indian imports (Chinese) in a reduced form equation. The import competition index is measured at NIC 2004 4-digit level. $Post_{2002}$ is a dummy variable intended to capture the effect of China's entry to the WTO. It takes a value of 1 for the years following the signing of the WTO agreement by China. $PvtBank_b$, $NBFC_b$, and $Foreign_b$ takes a value 1 if a firm is connected to any private (domestic), non-banking financial corporation, and foreign bank, respectively. Firm Controls include total real assets and GVA (gross value-added) share of technology adoption of a firm. Standard errors corrected by clustering at both industry (4-digit) and bank level are in the parenthesis. *,**,*** denotes 10%, 5%, and 1% level of significance, respectively.

Table C7: Checking for the SARFESI ACT (2002)

	Log(Total Loan$_{bit}$)		
	$>$ 75th percentile	$<$ 75th percentile	$<$ 25th percentile
	(1)	(2)	(3)
$HExp_k \times Post_{2002}$	0.113	0.053	0.609
	(0.287)	(0.087)	(0.445)
$HExp_k \times Post_{2002} \times PvtBank_b$	–0.207	–0.195**	–0.826*
	(0.405)	(0.097)	(0.462)
R-Square	0.68	0.57	0.63
N	4,329	37,174	4,263
Firm Controls	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes
Industry FE (3-digit)*Year FE	Yes	Yes	Yes
Bank FE*Year FE	Yes	Yes	Yes
Firm FE*Year FE	No	Yes Yes	Yes

Notes: All the regressions are run for the years 1995–2007. Columns (1) – (3) use the logarithm of loans advanced by a bank b to a firm i in year t as the dependent variable. $HExp_k$ is a measure of overall import competition that an Indian industry (k) faces in its domestic market. It takes a value 1 if the average of the total imports by any industry (k) for the period 1995-–2001 is greater than the median of the total imports for all of manufacturing industries (for the period 1995–2001). For our estimations, we we use the share of Chinese imports by Latin American countries (Brazil, Colombia, Venezuela, Ecuador, Peru, Bolivia, Chile, Paraguay, Argentina and Uruguay) for Indian imports (Chinese) in a reduced form equation. The import competition index is measured at NIC 2004 4-digit level. $Post_{2002}$ takes a value of 1 for the years following the signing of the WTO agreement by China. $PvtBank_b$ takes a value 1 if a firm is connected to any private (domestic) bank. Firm Controls include total real assets and GVA (gross value-added) share of technology adoption of a firm. Standard errors corrected by clustering at both industry (4-digit) and bank level are in the parenthesis. *,**,*** denotes 10%, 5%, and 1% level of significance, respectively.

Table C8: Heterogeneity: Firm, Industry, and Spatial Characteristics

	Log(Total Loan$_{bit}$)			
	(1)	(2)	(3)	(4)
Panel A: Firm Characteristics				
	Size		Exporting Status	
	Big	Small	Exporter	Non-Exporter
$HExp_k \times Post_{2002}$	–0.060	0.261*	0.001	0.113
	(0.132)	(0.142)	(0.133)	(0.134)
$HExp_k \times Post_{2002} \times PvtBank_b$	–0.192	–0.366*	–0.331*	–0.125
	(0.178)	(0.189)	(0.179)	(0.162)
R-Square	0.48	0.60	0.51	0.61
N	21,393	20,077	17,574	23,938
Panel B: Industry Characteristics				
	External Financial Dep		Production Process	
	High	Low	Upstream	Downstream
$HExp_k \times Post_{2002}$	–0.055	0.180	0.118	0.054
	(0.091)	(0.126)	(0.088)	(0.109)
$HExp_k \times Post_{2002} \times PvtBank_b$	–0.079	–0.460***	–0.490***	–0.385**
	(0.149)	(0.131)	(0.134)	(0.183)
R-Square	0.59	0.58	0.61	0.58
N	19,143	22,230	17,787	17,951
Panel C: Spatial Characteristics				
	Initial Exposure		Skill Intensity	
	High	Low	High	Low
$HExp_k \times Post_{2002}$	–0.093	0.121	0.625	0.029
	(0.093)	(0.171)	(1.054)	(0.078)
$HExp_k \times Post_{2002} \times PvtBank_b$	–0.178	–0.268*	–0.531**	–0.228**
	(0.169)	(0.162)	(0.224)	(0.118)
R-Square	0.57	0.60	0.67	0.57
N	21,586	19,612	5,403	35,726
Firm Controls	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
Industry FE (3-digit)*Year FE	Yes	Yes	Yes	Yes
Bank FE*Year FE	Yes	Yes	Yes	Yes

Notes: All the regressions are for the years 1995–2007. $HExp_k$ is a measure of Chinese competition that an Indian industry (k) faces in its domestic market. It takes a value 1 if the average share of imports by any industry (k) for the period 1995-–2001 is greater than the median share of Chinese imports for all of manufacturing industries (for the period 1995–2001). For our estimations, we we use the share of Chinese imports by Latin American countries (Brazil, Colombia, Venezuela, Ecuador, Peru, Bolivia, Chile, Paraguay, Argentina and Uruguay) for Indian imports (Chinese) in a reduced form equation. The import competition index is measured at NIC 2004 4-digit level. $Post_{2002}$ is a dummy variable intended to capture the effect of China's entry to the WTO. It takes a value of 1 for the years following the signing of the WTO agreement by China. $PvtBank_b$ takes a value 1 if a firm is connected to any private (domestic) bank. We use total assets of a firm as the size indicator. In terms of external financial dependence, we follow the definition by Rajan and Zingales (1998). For division into upstream and downstream industries, we calculate an upstreamness index based on Antràs et al. (2012), and industries which fall below the median of the index are categorised as downstream and the rest upstream. For profitability of banks, we use deposits plus advances per employee as the indicator. Firm Controls include total real assets and GVA (gross value-added) share of technology adoption of a firm. Standard errors corrected by clustering at both industry (4-digit) and bank level are in the parenthesis. *,**,*** denotes 10%, 5%, and 1% level of significance, respectively.