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Local Financial Development and constraints on private firms' exports: Evidence from City Commercial Banks in China

Zhao Chen, Sandra Poncet & Ruixiang Xiong

Highlights

- The development of city commercial banks (CCBs) across China has alleviated the restraining effect of financial constraints on private firms' exports

- Greater CCBs presence has reduced the systematic advantage of foreign owned firms over domestic private firms in export markets related to the formers' enhanced capacity to tap into the fundings from their parent company.

- However when gauged against state-owned firms, the relative situation of private firms has not improved and has even deteriorated.

- This casts doubt on the capacity of CCBs alone to resolve the problem of capital misallocation in China.

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▊ Abstract

We provide evidence that the development of city commercial banks (CCBs) across China has alleviated the restraining effect of China's domestic financial market inefficiency on the export activity of domestic private firms. Looking at the export behavior of 260 cities between 1997 and 2012 we confirm the well-established under-performance of domestic private firms in financially more vulnerable sectors compared to foreign affiliates in China. We show that a larger number of city commercial banks' branches raises domestic private firms' export disproportionately more in financially dependent sectors, so as to reduce the systematic disadvantage of domestic private firms over foreign-owned firms in export markets related to their greater financial exclusion. We however find that the private firms export performance has deteriorated relative to that of state-owned firms casting doubt on the capacity of development of CCBs to put an end to the systematic bias of lending in favor of the state sector.

▊ Keywords

City Commercial Banks, Local Fnancial Development, China, Financial Constraints, Export Performance.

▊ JEL

F10, F14, F36, G32.

Working Paper ▊

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RESEARCH AND EXPERTISE
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Local Financial Development and Constraints on Private-Firm Exports: Evidence from City Commercial Banks in China

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1. Introduction

China's banking sector has undergone substantial restructuring in recent decades in an attempt to move away from its notoriously inefficient State-centered system (Dollar and Wei, 2007). Various rounds of reforms have focused on the commercialization of the four national State-owned banks that continue to dominate the banking sector. The latest ingredients to their convulsive restructuring include the injection of new capital, the divestment of pervasive Non-Performing Loans, the introduction of strategic private and foreign investors, and public listing on domestic and foreign stock exchanges (Lin et al., 2015).[1] A no-less ambitious parallel approach pursued by the Chinese authorities consists in allowing the entry of successive waves of new types of financial institutions. A great deal of attention was given to the entry of foreign banks following China's entry into the WTO (Lai et al., 2016, Lin, 2011; Lin and Zhang, 2009). However their combined share of Chinese banking assets was only 1.3% in 2015, limiting their potential impact.

The growth of the now 133 City Commercial Banks (CCBs), which started in the mid 1990s, was much more substantial: they now account for 11.4% of Chinese banking assets. As the name suggests, city commercial banks were originally allowed to operate only within the city from which they originated. However, since 2004, they have been authorized to expand outside their home area. Their fast growth, better management and innovative behavior are the driving forces behind the mounting effective market competition between banks (Lin et al., 2015; Ferri, 2009). In contrast to the national State-owned banks, whose lending remains focused on notoriously inefficient State-owned enterprises, CCBs target the growing demand for investment loans from local small and medium-sized enterprises, which have been the main engine of China's rapid economic growth. This suggests an improvement in the famous misallocation of capital in China (Hsieh and Klenow, 2009, Brandt et al., 2013). However, to our knowledge there has been no empirical work on this issue. This paper tries to fill this gap.

The inefficiency of China's financial system mainly stems from non-market distortions resulting from government policies (Dollar and Wei, 2007; Allen et al., 2005). The State-dominated banking system allocates credit mainly to support the development of State-owned enterprises (SOEs), while the development of private enterprises has been

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[1]Despite those reforms and the new market-based regulatory framework, the distribution of credit by the four State-owned banks seems to have remained largely policy- rather than commercially-motivated (Podpiera, 2006; Park and Sehrt (2001).

impeded (Chen et al., 2016). One stylized fact in China's malfunctioning banking system is an ownership bias in lending, discriminating against domestic private firms. These credit constraints faced by Chinese private firms have been manifested in the systematic under-performance of private firms, especially in financially-dependent sectors, compared to firms with foreign ownership that can access foreign capital markets or funding from their parent companies, (Manova et al., 2015). We here ask whether the growth of CCBs has helped reduce this performance gap.

Our analysis of the repercussions of local financial development in China exploits data on sectoral exports for 260 cities between 1997 and 2012. We ask whether the development of city commercial banks across China has alleviated the constraints from China's domestic financial market inefficiency on the export activity of domestic private firms. Our estimation strategy follows a large empirical literature pioneered by Rajan and Zingales (1998), identifying the effect of credit frictions via geographical variation in financial development and sectoral variation in financial vulnerability (Manova, 2013). A number of heterogeneous-firm trade models with financial frictions support the use of export data to detect financial constraints and track their change over time (Chaney, 2016; Manova, 2013). These models formalize the intuition that if financial development helps tilt growth towards financially-dependent industries,[2] then the impact of development should be accentuated for export growth, as export-market access is more demanding in terms of external finance due to fixed entry costs, delays in cross-border transit and greater risk.

We first build on Manova et al. (2015), who use 2005 data to show that Foreign-firms, especially fully-foreign firms, suffer fewer financial constraints in China, possibly because they can access foreign capital markets or can obtain funding from their parent companies. We confirm this diagnostic over our data period (1997-2012): foreign affiliates and joint ventures exhibit better export performance than do domestic private firms in financially-vulnerable sectors. Our evaluation of the ongoing financial reforms in China tests the prediction that greater financial-system efficiency should affect the export structure of private firms, with the most-dependent sectors being disadvantaged in environments with greater distortions, but benefiting more from greater financial-system efficiency.

Our key contribution is our focus on one specific component of the ongoing restructuring of China's banking sector: the emergence of city commercial banks. CCB development in a city is measured by the number of local branches. Our main variable of interest is the interaction of CCBs with sectoral financial vulnerability. We identify the loosening of credit constraints with Chinese financial reform by seeing how the comparative export disadvantage of private firms in financially-vulnerable sectors falls with local CCB presence.

Our baseline results show that domestic private firms' export performance rose faster in sectors with greater financial vulnerability when there were more CCBs, hence dampening the systematic disadvantage (via financial exclusion) of domestic private firms compared to foreign-owned firms in export markets. The development of CCBs then seems to have relaxed the financial constraints that weigh on local private firms. However, when using State-owned firm export performance to gauge the sensitivity of private-firm exports to financial frictions, we find that the relative performance of private firms has worsened. Hence, while CCBs appear to have extended lending to private firms, thus promoting a

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[2]In the following we refer interchangeably to financially-dependent and financially-vulnerable sectors.

reallocation of their export activity to sectors with greater capital requirements, they have not reversed State firms' preferential access to financing. The local financial development introduced by city commercial banks has not put an end to the systematic lending bias in favor of the State sector. These results are robust to controlling for the inclusion of fixed effects accounting for time-varying shocks to the city or the sector in a way that is specific to firm type, controls for confounding factors such as the credit-constraint relaxing effects of economic development, foreign presence or foreign-bank entry, and the use of alternative proxies for financial vulnerability.

We make three contributions to the literature. First, we are the first to our knowledge to evaluate the effect of local bank availability on domestic private firms in China. Our analysis adds to the emerging literature showing the importance of within-country variation in financial development, notably in developing countries (Guiso et al., 2004; Kendall, 2012; Fafchamps and Schündeln, 2013). Only few papers have looked at the outcomes of Chinese financial reforms in terms of spatial heterogeneity with respect to local bank presence, and most have used measures of financial development at the level of the 31 Chinese provinces. Our count measure of city commercial bank branches provides much more spatial variation over a long period (1997-2012), and directly picks up the effect of new financial institutions to reform banking.[3]

Second, previous work has also struggled with the endogeneity of financial development. Our identification strategy interacts the financial-development measure with sectoral financial vulnerability, and further with dummies for firm-ownership type. We in particular do not require that the development of CCBs be exogenous to financial constraints. Our conclusions would in fact be strengthened under the likely scenario that CCBs developed in response to controls over, and deficiencies in, the State-banking sector (Girardin and Ping, 1997). Our panel of city-product-year export flows by firm type also allows us to control for city-year and product-year fixed effects, so that the estimated coefficients do not reflect particular shocks to cities or sectors in a given year.

Third, existing research on Chinese financial reform has mostly concentrated on the outcomes of GDP and productivity (Guariglia and Poncet, 2008; Lai et al., 2016; Wang, 2015). Despite the growing evidence on the link between financial development and export performance, and the role of trade as an engine for development in China, very little work has explicitly related banking reform to Chinese exports. Our focus on private firms is especially relevant here, as their exports grew at the impressive annual rate of 90% between 1997 and 2012, five times the average growth rate of Chinese exports. Our findings on the positive role played by CCBs with respect to the key Chinese export sector sheds light on an effective policy tool that can consolidate the benefits of Chinese economic opening.

In addition to the contributions cited above, our work relates to two other literatures. First, we provide an additional test of the well-known hypothesis that financially more-developed

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[3]The standard measure of provincial banking efficiency is the market share of banks other than the four State-Owned Commercial Banks (SOCBs).This is only available up to 2004 (Guariglia and Poncet, 2008; Jarreau and Poncet, 2014). In Lai et al. (2016), which looks at the productive gains from the opening up of regions to foreign-bank entry, the key variable is a dummy for the restrictions on foreign banks being lifted.

countries export relatively more from financially more-vulnerable industries (Beck, 2002; Manova, 2013). As we rely on regional variations within one single country (China), our identification strategy of comparing Chinese cities avoids the problem of omitted legal and institutional-system variables that arises in cross-country analysis. Second, we are in line with the empirical finding that FDI may relax domestic firms' credit constraints (Harrison et al., 2004), notably in the Chinese context of State intervention in finance (Guariglia and Poncet, 2008). China's financial repression has made it difficult for domestic private firms to enter into contracts with foreign buyers, creating fertile conditions for foreign firms to extend equity financing instead (Huang, 2003). We find that the role of FDI in mitigating the debilitating effect of malfunctioning national State-Owned Commercial Banks on private exports falls as CCBs expand.

As we consider the emergence of city commercial banks, we effectively study a part of what Ferri (2009) refers to as the "New Tigers". Our finding that CCBs are beneficial for private domestic firms are in line with those in Ferri (2009) of better average performance of new banks compared to State-owned commercial banks that are burdened with non-performing loans from unprofitable State-owned enterprises. Our conclusion that CCB presence does not prevent preferential lending to State firms also resonates with the conclusion in Ferri (2009) that the "New Tigers" cannot by themselves solve China's deep-rooted financial inefficiency, as State-owned commercial bank reform is necessary for better banking in China.

The remainder of this article is structured as follows. In the following section we describe China's banking sector and the emergence of city commercial banks. Section 3 presents our data and financial-dependence indicators, and provides evidence that credit constraints restrict private domestic firms' export activity. Section 4 sets out our empirical strategy to analyze the effects of city commercial banks, and discusses the empirical results and robustness checks. The last section concludes.

2.   China's financial banking system: the emergence of city commercial banks

This section provides a short background to the evolution of China's financial system and the reform giving rise to city commercial banks (CCBs). This helps us to understand why the number of CCB branches in a city can be seen as a proxy for the liberalization of the local financial sector in China.

2.1.   China's State-dominated banking sector

A number of waves of reforms have diversified the monolithic system that prevailed before 1979, when the People's Bank of China, owned and controlled by the central government, served as both the central bank and a commercial bank. A first step in the early 1980s consisted in moving the commercial transactions of the PBOC to four newly-established State-owned banks (SOBs): the Bank of China, China Construction Bank, the Agricultural Bank of China, and the Industrial and Commercial Bank of China. As indicated by their names, these four banks, which remained wholly-owned by the State until 2005-06, served mainly as policy-lending tools for the government (Lin et al., 2015).

A major reform was initiated in 1994, when the central government decided to separate policy banks from commercial banks, and established three policy-lending banks (the Export-Import Bank, the Agricultural Development Bank and the China Development Bank) to take over government policy lending by the four specialized State-owned banks, which were officially renamed as State-owned commercial banks (SOCBs). Despite the new market-based regulatory framework the lending practices of the four SOCBs failed to improve (Podpiera, 2006; Park and Sehrt, 2001). These remained less determined by the analysis of the associated risks than the identity of the borrower, so as to ensure that public enterprises and local authorities had access to bank loans. The SOCBs' bad governance and excessive focus on notoriously inefficient State-owned enterprises generated a considerable burden of non-performing loans, and triggered a number of recapitalization rounds and bail-outs (Fu and Heffernan, 2009; Lin, 2011).

More recent reform efforts to improve banking came about after China's WTO entry in 2001. As part of the accession deal China committed to the gradual entry of foreign banks. Looming market competition among banks pushed the central government to corporatize the four State-owned banks. The regulatory framework evolved to reduce the influence of local governments, liberalize controls on interest rates and credit, and reinforce bank supervision. From 2003, the balance sheets of SOCBs were strengthened with non-performing loans being written off and massive capital injections. Public listing was organized the following years on the Shanghai and Hong Kong stock exchanges, introducing minority private and foreign ownership of their capital. The objective of this "equitization" process was twin: capital provision, but especially improved management practices. There is only little vidence of this latter change: the literature finds no obvious improvement in efficiency after foreign investment and the regulatory change (Zhang et al., 2016; Fu and Heffernan, 2009).

2.2.   The rise of new actors: City Commercial Banks

Another facet of Chinese banking reforms relates to rising competition from domestic financial intermediaries other than the big SOCBs. A variety of new bank types started to appear in the Chinese financial system in the mid-1980s, including urban and rural credit cooperatives, trust and investment companies, financial companies, and other institutions. Their role remained nevertheless minor for the most part of the 1990s. At the launch of the 1994 reform, State-owned banks held 80% of the total deposits and loans in the banking system. The most important changes include the development of Urban Credit Co-operatives (UCCs), later turned into city commercial banks, and the establishment of new banks, notably the creation of the current dozen national and regional joint-stock commercial banks, eight of which have foreign investors.[4]

The Urban Credit Co-operatives were the most dynamic of the new financial institutions to emerge in the mid-1980s. Their comparative advantage in using local information, monitoring and enforcing sanctions on borrowers allowed them to better circumvent the traditional information asymmetry than national State-owned banks (Girardin and Ping,

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[4]The joint-stock banks emerged through restructuring the former wholly state-owned entities. The government often maintained majority ownership of the stock but allowed the ownership structure to embrace private (including foreign) capital. Six banks operate on a regional basis (mostly in the coastal area).

1997). They were also subject to less regulation, and hence fewer of the inherent deficiencies, than the big State-owned banks. They responded well to the growing demand for investment loans by enterprises, both in the State and non-State sectors.

However, mismanagement and excessive risk-taking progressively built up due to the lack of supervision. These excesses prompted the authorities to launch a restructuring process in 1995 consisting in both standardizing the UCCs and merging them into new Urban Co-operative Banks. The Urban Cooperative Banks were set up after balance-sheet risks were reduced through bad-asset stripping and capital injection, notably by local governments. These measures intended to address concerns over high administrative costs due to sub-optimal scale and ensure an appropriate share-holding structure and compliance with business-prudency rules. The State Council's Official Announcement in 1995 states that urban cooperative banks should be established in steps, with first experiments in Beijing, Tianjin, Shanghai and then expansion to another 35 large and medium cities.[5] The capital structure of UCBs was set up so as to have local governments play a significant role, but also to include shares from urban enterprises and residents.[6] Although the CCBs were typically used by local governments to handle local projects and programs, the stated goal in the State Council's Official Announcement in 1995 was also to serve the local economy, especially small and medium urban enterprises. In 1998, the Urban Cooperative Banks were renamed city commercial banks (CCBs). The CCBs differ from the SOCBs in one important dimension: they have many shareholders. Although some of these shareholders may themselves be in the public sector, or belong to either the public administration or the SOE system, the plurality of shareholders encourages better corporate governance and performance, as it significantly reduces political interference in bank business (Ferri, 2003; Ferri, 2009).

The growth of CCBs reflects the government's efforts to liberalize and reform the banking sector. At first city commercial bank business was confined to the urban districts of their home city. From 2006 onwards some CCBs that met certain size and experience conditions were allowed to open branches in other cities in their home province,[7] and even in other cities in other provinces.[8] In 2007 CCBs were allowed to expand their operations to non-urban areas, further entering into head-on competition with traditional financial actors. These successive reforms alleviated the geographic banking segmentation that was one of the main restrictions to the CCBs' ability to effectively compete with State-owned commercial banks. They also prompted a series of mergers and reorganization intended to address another CCB weakness: their smaller size. Starting in 2005, a number of CCBs

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[5]The official "Notice of the State Council on the Establishment of Urban Cooperative Banks" is accessible online at: http://govinfo.nlc.gov.cn/gzsfz/zfgb/199510/201108/t20110818_959535.html?classid=363.

[6]The share arrangements are that the local-government share should be about 30%, while a single legal entity cannot hold a share of over 10% and single person cannot hold a share of over 2%. See the official 1997 notice from the People's Bank of China: "Provisions on the administration of Urban Cooperative Banks", accessible online at: http://www.chinalawedu.com/news/1200/22016/22021/22172/2006/3/ji98562828202523600256-0.htm.

[7]The conditions for opening branches in other cities in the same province include: being in existence for over three years with total assets of at least 15 billion Yuan; registered capital (paid in capital) of at least 500 million Yuan; a capital-adequacy ratio of of at least 8%; and a core capital-adequacy ratio of at least 4%.

[8]Stricter conditions apply for opening branches outside of the home province.

merged so as to create larger entities. This restructuring continued as the government encouraged qualified domestic and foreign strategic investment in the CCBs, and even allowed some of them to make an initial public offering on the Hong Kong Stock Exchange.

Table 1 sets out the historical evolution of the Chinese banking sector. The market share of the State-owned commercial Banks has declined steadily, with their combined share of banking assets falling from 80% in 1994 to 58% in 2003. This decline carried on in the 2000s. As of 2015, the asset share of the large SOCBs reached a record low of 39.2%. Even so, the four SOCBs remain the main bank type in China. The share of CCBs has climbed steadily, doubling between 2003 and 2015. With an asset share of 11.4% the CCBs are now the "third tier" of Chinese banking institutions.

Table 1 – Structure of China's banking sector: the share of assets by bank type

	Policy Banks	State-Owned commercial Banks	City Commercial Banks	Foreign commercial banks	Joint Stock Commercial Banks	Rural Banks
2003	7.7	58.0	5.3	1.5	10.7	9.6
2004	7.6	56.9	5.4	1.8	11.5	9.7
2005	7.8	56.1	5.4	1.9	11.9	8.4
2006	7.9	55.1	5.9	2.1	12.4	7.9
2007	8.1	53.7	6.3	2.4	13.7	8.2
2008	8.9	51.6	6.5	2.1	14.0	8.3
2009	8.7	51.3	7.1	1.7	14.9	6.9
2010	8.0	49.2	8.2	1.8	15.6	6.7
2011	8.2	47.3	8.8	1.9	16.2	6.4
2012	8.4	44.9	9.2	1.8	17.6	6.0
2013	8.3	43.3	10.0	1.7	17.8	5.7
2014	9.1	41.2	10.5	1.6	18.2	5.1
2015	9.7	39.2	11.4	1.3	18.6	4.3

Source: Annual reports of the China Banking Regulatory Commission.

In our empirical analysis, we measure the local development of city commercial banks by the local number of branches, taken from the official website of China's Banking Regulatory Commission.[9]. Figure A-1 shows that number of CCBs and their branches throughout the country rose sharply in the 2000s. There were 113 active city commercial banks in 2012, as opposed to 62 in 1997. Figures A-2 to A-5 show that the history and extent of bank presence varies across Chinese cities. In 1995, CCBs operated in only 21 cities, a figure that rose to 70 in 1997, 109 in 2002, 164 in 2007 and 291 in 2012. CCBs started in a small number of, mostly provincial capital, cities. By 2012, the last year in our sample, CCB operations had expanded to cover most Chinese cities.

The literature unanimously concludes that CCBs are more cost- and profit-efficient than national State-owned banks (Berger et al., 2009; Ariff and Can, 2008; Fu and Heffernan, 2009). This better performance is attributed to their mixed ownership structure, which alleviates in part their policy-lending obligations (Ferri, 2009). Local knowledge and privileged links with local authorities also improve their assessments of the credit-worthiness of local companies (Martin, 2012). In light of these features we expect CCBs to have better capital-allocation practices than the dominant national State-Owned Banks, so that their development would improve the credit-market conditions of private firms. These latter receive a significant share of CCB loans. Zhu et al. (2012) find that 14.5% of the top 10 borrowers from each CCB were private firms, a much higher figure than the corresponding

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[9]The site address is http://www.cbrc.gov.cn/.

6.16% for foreign firms. Although the data is not directly comparable as it is calculated over all loans, Firth et al. (2009) find that the non-State firm loan share of SOCBs is only 7%, confirming that CCBs are more likely to lend to private firms than are traditional national operators.

It is not clear however that CCBs are completely immune from the systematic lending bias in favor of the State sector. The existing institutionally-grounded political pecking order of firms in China leads to the systematic over-allocation of loans to the State sector, even by profit-seeking banks. State firms enjoy preferential treatment from the government at a number of levels, including licensing approvals, government contracts, property rights protection and taxation. This combined with soft-budget constraints gives them an unfair competitive edge that makes it rational for banks, and not just national State-owned banks, to lend them money. It is also important to note that city commercial banks are in most cases controlled by local governments. In fact few CCBs have any private investment capital. CCBs' largest shareholders are State-owned 80% of the time: half being an SOE or a State-owned asset management company[10] and the other half the local government. The influence of the local government is especially prevalent, as CCB operations are largely confined to the local area. While some local governments are more efficient than the central government, others can be more bureaucratic and less developed. City commercial banks face pressure from local governments to grant policy loans for political purposes rather than profit maximization. Of the top 10 borrowers from CBBs, 33% were State-owned firms or State-owned asset management companies (Zhu et al., 2012).[11] The extent to which CCBs reduce or reinforce discrimination against private firms in the allocation of credit remains an open question. This is what we will address in our empirical analysis.

3. Credit constraints and exports in China

In this section, we present our data and indicators of financial dependence, and provide some evidence that credit constraints restrict private domestic firms' export activity.

3.1. Data

Our key variables are export flows, disaggregated by city, product and type of firm, and a set of proxies for sector-level financial vulnerability.

3.1.1. Trade data

The data collected by Chinese Customs include annual export values and quantities by city[12] at the HS 8-digit product level separated by firm ownership. We can thus distinguish

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[10]State-owned asset management companies are wholly State-owned companies created by the government in the process of the incorporation of State-owned firms. Their role, similar to that of institutional investors, is to preserve and increase the market value of State-owned assets. They manage the assets of State-owned firms and are in charge of stripping off bad assets and promoting operational efficiency.

[11]The remaining loans went to development and land-trading companies, and local governments or government-affiliated companies.

[12]China is divided into four municipalities (Beijing, Tianjin, Shanghai and Chongqing) and 27 provinces which are further divided into prefectures.

between State-owned enterprises (SOEs),[13] private domestic firms and foreign-owned firms. These latter include fully foreign-owned firms and joint ventures (with foreign ownership of under 100%). Our sample covers 260 Chinese cities.

The Chinese HS8-digit classification is not consistent over time. To account for the changes following the different revisions of the international HS classification in 2002, 2007 and 2012, we aggregate the data to the HS 6-digit level (1996 revision). This aggregation[14] yields a panel of 4,581 products over the 1997-2012 period.

In our empirical analysis, the HS6 product-level trade flows are matched to 36 ISIC three-digit sectors for which Manova et al. (2015) provide measures of financial vulnerability. We use the correspondence table between the international trade nomenclature and the ISIC Rev. 2 categories from World Integrated Trade Solution (WITS).[15]

3.1.2. Measures of sector-level reliance on external finance

The literature proposes different measures of sectoral financial vulnerability. These typically proxy for either intrinsic financial requirements or the capacity to overcome credit restrictions. We use the two best-practice measures proposed in the literature: *External financial dependence* and *Asset tangibility*, as they can be directly linked to firms' exposure to and ability to overcome financial constraints (Manova, 2013). The first reflects the requirement for outside funds arising from upfront long-term investments. It is calculated as the share of capital expenditures not financed out of cash flows from operations, and hence focuses on financial needs relating to long-term investments. It is argued to correspond mostly to fixed costs (Manova et al., 2015). The second measure picks up the ability to overcome financial constraints, namely the capacity to raise external finance by pledging available tangible assets as collateral (*Asset tangibility*). Sectors differ in the tangibility of their assets that they used in production. As more external finance can be raised by pledging assets such as plant, property, and equipment, the share of these tangible assets in total asset book value, *Asset tangibility*, is key in reducing financial vulnerability. Larger values of financial dependence are assumed to increase firms' sensitivity to the availability of outside capital, while greater asset tangibility should have the opposite effect. These two sectoral measures capture conceptuallydistinct dimensions of financial vulnerability, and are not particularly highly correlated with each other (see Table A-1). It is thus common practice to include them both to account for the different ways in which firms' operations are affected by credit constraints.

These two measures being negatively correlated does not however make the empirical results easy to read. We hence follow Manova et al. (2015), and calculate the first principal component of external finance dependence and asset tangibility. As can be seen in Table A-1, this measure (which we prefer in our empirical analysis) logically rises with *External finance dependence* and falls with *Asset tangibility*: sectoral financial sensitivity is larger when external finance needs are high but collateralizable assets are limited.

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[13]We define SOEs as including collectively-owned firms.
[14]The correspondence tables between HS6 products over time come from UNCTAD and can be found at http://unstats.un.org/unsd/trade/conversions/HSCorrelation and Conversion tables.htm.
[15]This table is taken from http://wits.worldbank.org/product_concordance.html.

As a robustness check we also use a measure of short-run working capital needs (*Inventories ratio*). This indicator, first proposed by Raddatz (2006), is the ratio of inventories to annual sales. This focuses on variable costs and liquidity aspects. It reflects another dimension of firm dependence on access to external financing: the time lag between investments and the receipt of the corresponding revenues. All measures are provided in the appendix to Manova et al. (2015), and were calculated by Kroszner et al. (2007) for the 1980-1999 period following the method in Rajan and Zingalez (1998) and Claessens and Laeven (2003).

The measures are constructed from Compustat's annual industrial files for all publicly-traded U.S.-based companies. The indicator in each sector is the median firm value in each 3-digit ISIC sector. The use of US-based indices of sectoral financial vulnerability has become standard in the literature on the repercussions of financial liberalization following the pioneering work of Rajan and Zingales (1998). The hypothesis is that there is a technological component to financial vulnerability which is common to firms around the world. This component determines why industries differ in their need for credit, beyond the situation of the local economy in terms of liquidity constraints. As the United States is one of the better-developed financial systems, the variation in the use of financial services across US firms should pick up the technology-specific component of external finance needs.

In addition, the use of financial measures in US firm data ensures that financial vulnerability is exogenous to Chinese financial development. The indices would likely differ if calculated on Chinese firm data, showing that firms organize production differently in credit-constrained environments. Our identification does not rely on the level of sectoral financial sensitivity per se, but rather its ranking. This latter has been shown to be fairly persistent across countries and over time, which is consistent with it reflecting the innate technological component of sector financial vulnerability that is exogenous to individual firms (Claessens and Laeven, 2003; Kroszner et al., 2007).

3.2. Firm domestic private ownership and credit constraints

As a prerequisite to the analysis of the effect of CCBs, we first provide evidence of the systematic influence of credit constraints on Chinese export performance, and that these constraints produce an advantage for foreign-owned firms over private domestic firms that grows with sectoral financial vulnerability. The credit constraints of the different firm types are identified from the way in which the finance content of exports varies by firm-ownership type (Manova et al., 2015; Jarreau and Poncet, 2014).

We thus regress our dependent variable in Equation 1, the export value of city c of HS6-product k in year t, by firm type F, on the interaction of Financial Vulnerability$_s$ and firm-type dummies, controlling for the local determinants of specialization and local supply shocks specific to given firm-ownership types through a variety of fixed effects.

$$\ln \text{Export}_{ckt}^{F} = \beta^{F} \text{ Financial Vulnerability}_{s} + \mu_{ckt} + \nu_{ct}^{F} + \epsilon_{ckt}^{F} \tag{1}$$

Here Export_{ckt}^{F} is the export value from city c in HS6-product k at year t for firm type F,

and Financial Vulnerability$_s$ is one of our four indices at the sector level s. Our sample consists of a panel of yearly observations for 260 Chinese cities.

The effect of credit constraints on exports is identified from the variation across firm types. We use fully foreign-owned firms, i.e. those that are the least financially-constrained, as the omitted category.

Our baseline specification includes city-HS6 product-year fixed effects, μ_{ckt}, as well as city-firm-type-year fixed effects, ν_{ct}^F. The former picks up the level effect of Financial Vulnerability$_s$, so that we measure how the other firm types differ from the benchmark of fully-foreign firms in their specialization in sectors with different financial vulnerability.

Table 2 directly builds on Manova et al. (2015), and considers three firm types, with domestic private firms and joint-ventures (JVs) being compared to fully-foreign owned firms. We expect a gap between the exports of domestic private and fully-foreign firms that rises with sectoral financial vulnerability. A similar pattern, although less-pronounced, is expected for joint ventures.

We include State-owned firms in Table 3. The conventional wisdom in China is that State-owned firms benefit from "soft budget constraints" via State-owned banks, as State bank lending is still partly political rather than commercial (Park and Serht, 2001). Although we would thus expect State-owned firms to also have a comparative advantage over domestic private firms in financially-vulnerable sectors, the pervasive inefficiency and regulations associated with the former may prevent them from realizing this advantage. Despite their preferential access to loans from State-owned banks, State-owned firms appear much less efficiently-managed than private firms (Dollar and Wei, 2007; Song et al., 2011; Khandelwal et al., 2013). The relative sorting of SOEs according to the sectoral need for external funds is less informative regarding their credit constraints as their export decisions in part reflect governmental priorities rather than profit-maximization (Manova et al., 2015). A variety of subsidies, regulations or softer influence allows the Chinese government to exert considerable control over State-owned firms, notably with respect to the extent of their presence in certain industries.

The results in Table 2 confirm that domestic private firms export significantly less than fully-foreign firms in financially more-dependent industries, relative to less financially-dependent industries. They also export significantly less than do joint ventures, but less markedly so, suggesting that JVs benefit less than fully-owned foreign firms from internal capital markets. Private firms thus seem to have a greater comparative disadvantage over fully-foreign-owned companies in sectors where there is more external-finance dependence (column 1). As expected, the interaction between financial dependence and the domestic private firm-type dummy is positive when dependence refers to tangible assets (column 2). In column 3 we use the first principal component of these two sectoral measures and confirm that private firms are systematically handicapped relative to fully-foreign-owned companies in sectors that require more outside funding to finance long-term investments and dispose of fewer tangible assets. In column 4 we compare sectors with different inventories-to-sales ratios (signaling working-capital needs) and find that private firms have a systematic disadvantage in inventory-intensive sectors with greater finance requirements due to longer production cycles. The results hence confirm that credit con-

Table 2 – Firm-ownership types and export-structure distortions: Private domestic and joint-venture firms relative to fully-foreign firms

Dependent variable:	Log export value (city/HS6/firm-type/year)			
Financial vulnerability measure	Financial dependence	Asset tangibility	First Principal Component Fin dependence and Asset tang.	Inventories ratio
	(1)	(2)	(3)	(4)
Fin. Vuln. × Domestic Private Firms	-0.894[a]	3.001[a]	-0.425[a]	-5.036[b]
	(0.300)	(0.888)	(0.078)	(2.324)
Fin. Vuln. × Joint-Ventures	-0.323[c]	1.747[b]	-0.205[a]	-3.807[c]
	(0.187)	(0.782)	(0.068)	(2.229)
City-firm-type-year Fixed Effects	Yes	Yes	Yes	Yes
City-HS6 product-year Fixed Effects	Yes	Yes	Yes	Yes
Observations			1,722,571	
R-squared	0.693	0.693	0.694	0.692

The table considers the effect of credit constraints on city-product exports across sectors for domestic private firms and JVs compared to fully-foreign firms. Heteroskedasticity-robust standard errors are reported in parentheses. Standard errors are clustered at the city-year level. [a], [b] and [c] indicate significance at the 1%, 5% and 10% confidence levels. Financial-vulnerability indices at the sector level are from Manova et al. (2015) and are calculated on US firm data.

straints vary by firm type and foreign ownership alleviates the impact of financial-market imperfections on trade (Manova et al., 2015; Jarreau and Poncet, 2014).

Table 3 shows that State-owned firms have a comparative disadvantage relative to foreign firms in financially-sensitive sectors, as attested by the negative significant coefficients on the interaction between sectoral financial vulnerability and State-ownership. The sensitivity of State-owned firm exports to financial vulnerability is nevertheless smaller than that for private firms, in line with their preferential treatment and access to external finance from the domestic banking system (Dollar and Wei, 2007). We thus find that private domestic firms underperform relative to fully-foreign firms, which gap grows with financial vulnerability and the size of which is virtually unchanged when we account for State-owned firms.[16]

4. City Commercial Banks and private-firm credit constraints

We here use a difference in difference approach to ask whether the dampening effect of credit constraints on domestic private firms' exports was affected by the development of local banks in China. If the development of CCBs produced effective financial liberalization, we expect this to be especially beneficial for discriminated private firms, and in general that the impact will be ordered by financial dependence.

Equation 2 asks whether private firms in cities with more CCBs exported more, and especially in sectors with greater financial vulnerability.

$$\ln \text{Private Export}_{ckt} = \beta \text{ CCB presence}_{ct} \times \text{Financial Vulnerability}_s \qquad (2)$$
$$+ \mu_{ck} + \nu_{kt} + \lambda_{ct} + \epsilon_{ckt}$$

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[16]Adding data for State-owned firms affects the estimates of the City-HS6 product-year fixed effects, which explains the minor differences in the coefficients for private domestic firms and JVs in Tables 3 and 2.

Table 3 – Firm-ownership types and export-structure distortions: domestic private firms, State firms and joint ventures with respect to fully-owned firms

Dependent variable:	Log export value (city/HS6/firm-type/year)			
Financial vulnerability measure	Financial dependence	Asset tangibility	First Principal Component Fin dependence and Asset tang.	Inventories ratio
	(1)	(2)	(3)	(4)
Fin. Vuln. × Domestic Private Firms	-0.923^a	2.775^a	-0.412^a	-4.333^c
	(0.316)	(0.975)	(0.085)	(2.493)
Fin. Vuln. × Joint-Ventures	-0.316^c	1.754^b	-0.201^a	-3.830^c
	(0.181)	(0.735)	(0.067)	(2.104)
Fin. Vuln. × State-owned Firms	-0.789^b	2.149^c	-0.339^a	-1.855
	(0.337)	(1.165)	(0.098)	(2.835)
City-firm-type-year Fixed Effects	Yes	Yes	Yes	Yes
City-HS6 product-year Fixed Effects	Yes	Yes	Yes	Yes
Observations			3,251,116	
R-squared	0.679	0.678	0.679	0.678

This table shows how the effect of credit constraints on city-product exports across sectors differs for domestic private firms, State firms and JVs, compared to fully-foreign firms. Heteroskedasticity-robust standard errors appear in parentheses. Standard errors are clustered at the sector level. ^{a}, ^{b} and ^{c} indicate significance at the 1%, 5% and 10% confidence levels. Financial-vulnerability indices at the sector level are taken from Manova et al. (2015) and are calculated on US firm data.

Here Private Export$_{ckt}$ is the export value of private domestic firms in city c in HS6-product k in year t. CCB presence$_{ct}$ is measured by the number of city commercial bank branches in year t in city c. Financial Vulnerability$_s$ is one of our four indices of financial vulnerability at sector level s.

Our specification includes city-product (μ_{ck}) and product-year (ν_{kt}) fixed effects. The former capture all the time-invariant characteristics of a particular city-product combination that might affect the export performance of private firms for a certain good in a certain city: examples might include local factor endowments or local regulations and know-how. These absorb the level effect of Financial Vulnerability$_s$. Our analysis hence exploits the within-city-product variation in export performance. Product-year fixed effects are also included to account for differences in exports between products from both time-varying demand and supply shocks at the product level.

Our preferred specification also includes city-year fixed effects λ_{ct} that capture time-varying local factors and shocks, including local economic performance and financial development. These also absorb the level effect of CCB presence$_{ct}$ so that our variable of interest, Bank liberalisation$_{ct}$ × Financial Vulnerability$_s$, is identified from the variation between sectors of the export effect of a change in the number of CCB branches in a city. This specification ensures that our results do not reflect differences between cities in terms of economic performance or export potential.

As our dependent variable is at the more disaggregated city-product-year level, we cluster standard errors at the level of our key explanatory variable, city-sector-year (Moulton, 1990).

4.1. City commercial banks and private-firm exports

Table 4 shows, for all four indicators of financial vulnerability, that local bank development causes private-firm exports to grow more in sectors where finance is most needed, suggesting that credit constraints have been loosened.

The odd columns of Table 4 show the estimation results from Equation 2 without the dyadic city-year fixed effects, including only city-HS6 and HS6-year dummies. This produces an estimated coefficient on CCB presence in the city on private-firm exports. This is positive and significant in all but one column, suggesting export gains from bank presence. As these estimates are potentially subject to endogeneity concerns, our main identification strategy exploits the extent to which these export gains vary with financial dependence, and focuses on the interaction between CCB presence and financial vulnerability at the sector level. This coefficient, β, reveals that export gains are larger in sectors with greater external finance dependence (column 1), fewer tangible assets (column 2), a larger first principal component of these first two variables (column 3), and a higher inventories-to-sales ratio, signaling greater working-capital needs (column 4). CCB presence thus relaxes the financial constraints on private exporters.

One possible concern in these results is that the CCB coefficients may pick up the effects of omitted variables that are correlated with financial frictions and influence export performance. To allay this worry, the even columns show our benchmark specification in Equation 2, which includes city-year fixed effects. The estimated coefficients hence do not reflect local features (such as comparative advantage or reforms) or time-varying supply or demand conditions that are particular to a good. The CCB presence variable logically drops out here, and we continue to find that the CCB effect of private-firm exports rises with sectoral financial needs.

Table 4 – Number of CCBs and private export-structure distortions

Dependent variable:	Log private export value (city/HS6/year)							
Financial-vulnerability measure	Financial dependence		Asset tangibility		First Principal Comp.: Fin dep and Asset tang.		Inventories ratio	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
No. of CCBs	0.005^a (0.001)		0.007^a (0.001)		0.005^a (0.001)		-0.001 (0.001)	
No. of CCBs × Fin. Vuln.	0.001 (0.001)	0.001^b (0.004)	-0.008^a (0.0027)	-0.003^c (0.0018)	0.0006^a (0.0002)	0.0004^a (0.00017)	0.030^a (0.009)	0.020^a (0.006)
City-HS6 Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
HS6-year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
City-year Fixed Effects	No	Yes	No	Yes	No	Yes	Yes	Yes
Observations	1,443,325							
R-squared	0.741	0.752	0.741	0.752	0.741	0.752	0.741	0.752

This table shows the effect of bank liberalization, proxied by the number of local city commercial bank branches, on city-product exports from Chinese private firms across sectors, depending on their financial vulnerability. Heteroskedasticity-robust standard errors appear in parentheses. Standard errors are clustered at the city-sector-year level. ^{a}, ^{b} and ^{c} indicate significance at the 1%, 5% and 10% confidence levels. Financial-vulnerability indices at the sector level are taken from Manova et al. (2015) and are calculated on US firm data.

We may also consider that some time-varying local factors have differential effects on exports across sectors. Table 5 accounts for the possibility that time-varying differences in economic conditions may also relax credit constraints. Each column considers sectoral

financial vulnerability as well as its interactions with a number of macro conditions. In the even columns we look at per capita GDP, as well as two variables reflecting the degree of foreign-capital inflows.[17] This allows us to account for richer cities being more likely to be financially developed, and that FDI may be used to alleviate the costs associated with the inefficient banking sector in China (Guariglia and Poncet, 2008). We use the ratio of inward FDI to GDP and the number of special zones in the city to attract overseas investment (Wang, 2013).[18]

Table 5 – Number of CCBs and private export-structure distortions: Macro controls

Dependent variable:	Log private export value (city/HS6/year)							
Financial-vulnerability measure	Financial dependence		Asset tangibility		First Principal Comp.: Fin dep and Asset tang.		Inventories ratio	
	(1)	(2)	(3)	(4)				
No. of CCBs × Fin. Vuln.	0.0013^a	0.0013^a	-0.0033^c	-0.0029^c	0.001^a	0.001^a	0.020^a	0.0175^a
	(0.0005)	(0.0005)	(0.0018)	(0.0018)	(0.0002)	(0.0002)	(0.006)	(0.006)
GDP/pop × Fin. Vuln.	-0.067	-0.058	-0.261	-0.332	0.005	0.012	0.754	1.126
	(0.065)	(0.065)	(0.243)	(0.242)	(0.025)	(0.025)	(0.743)	(0.740)
FDI/GDP × Fin. Vuln.	-0.025^a	-0.024^a	0.033	0.030	-0.008^a	-0.008^b	-0.238^b	-0.222^b
	(0.007)	(0.007)	(0.035)	(0.032)	(0.003)	(0.003)	(0.100)	(0.010)
Special zones × Fin. Vuln.	-0.025^b	-0.028^a	0.031	0.051	-0.007^c	-0.010^b	0.029	-0.093
	(0.010)	(0.011)	(0.050)	(0.051)	(0.004)	(0.004)	(0.178)	(0.181)
Foreign banks × Fin. Vuln.		-0.050		0.338^a		-0.034^a		-1.991^a
		(0.031)		(0.124)		(0.012)		(0.413)
City-HS6 Fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
HS6-year Fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
City-year Fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,443,126							
R-squared	0.752	0.752	0.752	0.752	0.752	0.752	0.752	0.752

This table looks at the effect of bank liberalization, proxied by the number of local city commercial bank branches, on city-product exports from Chinese private firms across sectors, depending on their financial vulnerability. Heteroskedasticity-robust standard errors appear in parentheses. Standard errors are clustered at the city-sector-year level. ^{a}, ^{b} and ^{c} indicate significance at the 1%, 5% and 10% confidence levels. Financial-vulnerability indices at the sector level are taken from Manova et al. (2015) and are calculated on US firm data. FDI/GDP and GDP/POP are in logs.

The estimated coefficients on the per-capita GDP interactions are insignificant, suggesting that the effect of economic development on private-firm export performance is the same across industries. On the contrary, the interactions between sector-level financial vulnerability and FDI per capita or the number of special zones often attract negative and well-estimated coefficients, suggesting that the credit constraints on private firms are indeed looser in localities with large FDI inflows. Our coefficients of interest are nevertheless largely unchanged in these new specifications: our baseline estimates are not contaminated by the correlation of financial development with foreign economic activity.

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[17] The city-level variables such as GDP, population and FDI come from China Data Online, provided by the University of Michigan. We use per capita GDP and FDI over GDP in logs.

[18] Starting in 1979, the Chinese government established a multitude of spatially-targeted programs as jumping-off points for its internationalization strategy. After the first wave of special economic zones there were different rounds of high-technology development zones, export-processing zones etc. These offered a variety of tax and customs-duty incentives, and various types of preferential treatment to attract (notably foreign) investors. We know whether a city hosted such a zone in a given year from Chinese Customs trade data, which provide export flows aggregated by 5-digit location, where the fifth digit identifies the zone type (1 is a Special Economic Zone, 2 is an Economic and Technological Development Zone, 3 is a Hi-Tech Industrial Development Zone, and 5 is an Export-Processing Zone).

Accounting for the number of special zones partially allows us to take the emerging role of foreign banks into consideration. Starting in the 1990s, Special Economic Zones were the only place where foreign banks were allowed to open branches and conduct foreign-currency business with foreigners. In the odd columns of Table 5, we more directly account for the phasing out of the restrictions on foreign banks' local currency business after China's entry into the WTO in 2001. We follow Lai et al. (2016) and rely on a dummy that identifies when restrictions on foreign banks were lifted in each city.[19] The interactions between financial vulnerability and this proxy for foreign-bank entry do not attract the expected signs. We suspect that this reflects insufficient variation: the restrictions were lifted in the same year (2006) for 140 of the 160 cities in our sample, and the 20 cities that liberalized earlier did so between 2001 and 2005. Reassuringly however, the inclusion of these variables does not change our key coefficients, suggesting that our estimates of the repercussions of CCB development do not reflect foreign-bank entry.

As we do not have an instrument for CCB development, we do of course need to be careful about causality. However, our conclusions do not require growing CCB presence to be exogenous to initial local financial inefficiency. Our results would actually be stronger were CCBs to have developed as a response to demand from financially-constrained private firms. Financial reform in China is however generally thought to be centrally-planned, rather than as a response to the political demand from private entrepreneurs. As explained in Section 2.2, the locations of the first would-be city commercial banks were announced by the State Council in 1995, and followed the typical Chinese-style strategy of incremental experimentation. While we do not argue that the procedure was random, we do believe that the development of CCBs was not dictated by prior financial conditions or the performance gaps across firm-ownership types. The literature nevertheless suggests that, once established, CCBs developed faster in more favorable (richer and more liberalized) locations (Ferri, 2009). The interaction terms between financial vulnerability and the proxies for income, FDI, outward orientation and foreign-bank presence are expected to account for this phenomenon.

To summarize: our main findings are of a relative rise in private-firm exports following the development of CCBs, which is sharper in sectors with greater financial vulnerability. We interpret this as evidence that CCBs improved the financial conditions faced by domestic private firms and dampened the repercussions of credit constraints on their export activity. The key question is whether CCBs helped to smooth out the systematic disadvantage faced by domestic private firms vis-à-vis foreign-owned firms in export markets in financially-vulnerable sectors, as shown in Section 3.2. This is what we turn to in the next Section.

4.2.   Financial liberalization and the export-performance gap across firm-ownership types

We refine our analysis of the effects of local banking liberalization by considering different firm-ownership types. We ask whether the loosening of credit constraints for private firms

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[19]As announced in the WTO accession protocol, restrictions were to be removed upon accession for Shanghai, Shenzhen, Tianjin and Dalian; within one year for Guangzhou, Zhuhai, Qingdao, Nanjing and Wuhan; within two years for Jinan, Fuzhou, Chengdu and Chongqing; within three years for Kunming, Beijing and Xiamen; and within four years for Shantou, Ningbo, Shenyang and Xi'an. By 2006, all restrictions were to be removed.

in Section 4.1 was particular to this firm-ownership type, and calculate the analogous effect for foreign firms, which suffer less from financial constraints in China. Effective financial liberalization would be expected to reduce the systematic advantage of fully-foreign over private firms in financially-vulnerable sectors found in Section 3.2. Our approach corresponds to a triple difference. Accounting for firm types transforms Equation 2 into Equation 3:

$$\ln \text{Export}^F_{ckt} = \beta \ \text{CCB presence}_{ct} \times \text{Financial Vulnerability}_s \times \text{Private} \qquad (3)$$
$$+ \ \mu^F_{kt} + \nu^F_{ck} + \lambda^F_{ct} + \epsilon^F_{ckt}$$

Here Export^F_{ckt} is the export value from city c of HS6-product k in year t, by firm type F. Fully-foreign firms are the omitted category to which other firm-types are compared. In our baseline specification we compare private domestic firms to fully-foreign firms; in a second stage we add State-owned firms so as to consider State firms' preferential access to financing.

We allow all the pairwise fixed effects in Equation 2 to vary by firm-ownership type. The fixed effects ν^F_{kt} account for all time-varying demand and supply drivers of the export performance of a given HS6 product, separately for domestic private and foreign firms. The inclusion of fixed effects μ^F_{ck} absorbs all the factors that are specific to a city-product pair and firm ownership type, and rules out the possibility that our estimates just reflect the pattern of firm types by factor intensity, which is correlated with financial characteristics. The city-year and firm-type λ^F_{ct} dummies capture the overall repercussions of local economic conditions (including financial development) on the exports of the various firm types. These fixed effects also account for heterogeneity in the effect of financial reforms on firm-type exports, and absorb any variable correlated with banking reforms that might affect the structure of exports across firm types (but in a way that does not depend on financial vulnerability). Our identification strategy, which filters the effect of CCBs by sector-level financial intensity, hence focuses on factors that work through financial channels, as reflected by the heterogeneous effect by sectoral financial vulnerability.

For the sake of conciseness, we concentrate on our preferred measure of sectoral financial vulnerability, the first principal component of financial dependence and asset tangibility, and use the inventories ratio as a robustness check. We expect a larger fall in the export disadvantage of private firms in sectors with greater external finance needs, limited collateralizable assets and a large inventories ratio.

Table 6 shows the estimated coefficients in Equation 3. In the baseline Column 1, the interaction is between CCB presence and our preferred measure of financial vulnerability; interactions with GDP per capita, the FDI over GDP ratio and the number of special zones are added in Column 2, and that with the proxy for the lifting of foreign-bank restrictions in Column 3. Columns 4 to 6 follow the same logic, with the ratio of inventories to annual sales as the measure of sectoral financial vulnerability.

We consistently observe across columns that the export gains from CCBs are larger for domestic private firms than for fully-foreign firms, and grow with financial vulnerability.

Table 6 – Number of CCBs and export performance gap across firm types

Dependent variable: Firm types	Log export value (city/HS6/firm-type/year) domestic private and foreign firms					
Financial vulnerability measure	Principal Component Fin dep and Asset tang.			Inventories ratio		
	(1)	(2)	(3)	(4)	(5)	(6)
No. of CCBs × Fin. Vuln. × Private	0.0012[a]	0.0010[a]	0.0011[a]	0.043[a]	0.040[a]	0.040[a]
	(0.0003)	(0.0003)	(0.0003)	(0.010)	(0.010)	(0.010)
GDP/POP × Fin. Vuln. × Private		0.120[a]	0.105[a]		3.09[a]	3.24[a]
		(0.039)	(0.040)		(1.19)	(1.20)
FDI/GDP × Fin. Vuln. × Private		-0.037[b]	-0.037[b]		0.042	0.037
		(0.015)	(0.015)		(0.399)	(0.399)
Special zones × Fin. Vuln. × Private		0.019[a]	0.021[a]		0.161	0.131
		(0.007)	(0.007)		(0.248)	(0.250)
Foreign banks × Fin. Vuln. × Private			0.045[c]			-0.576
			(0.025)			(0.714)
City-firmtype-sector Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
HS6-firmtype-year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
City-firmtype-year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
City-HS6-year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations		927,110			927,110	
R-squared	0.912	0.912	0.912	0.912	0.912	0.912

This table examines how the effect of credit constraints on city-product exports across sectors differs for domestic private and fully-foreign firms. Heteroskedasticity-robust standard errors appear in parentheses. Standard errors are clustered at the city-sector-year level. [a], [b] and [c] indicate significance at the 1%, 5% and 10% confidence levels. Financial-vulnerability indices at the sector level are taken from Manova et al. (2015) and are calculated on US firm data. FDI/GDP and GDP/POP are in logs.

The coefficient β on "Number of CCBs × Financial Vulnurability × Private" is positive and significant, indicating that the export gains from CCBs are greater for private firms and grow with sectoral credit constraints. This suggests that the gap betweewn private and foreign firm export performance (due to the former's financial constraints) shrank significantly as the number of CCBs rose.

Our findings are robust to controls that allow the effect of economic development, foreign-capital availability and the presence of foreign banks on export performance to differ between private and foreign firms in a way that varies by industry, and is possibly correlated with CCB presence. Even after including a large battery of fixed effects and controls, our estimates continue to convey a very clear message: more CCB branches in a city is associated with the greater rebalancing of exports toward finance-intensive sectors for private firms compared to fully-foreign firms. As fully-foreign firms suffer from fewer financial constraints in China, the local presence of CCBs may effectively relax the credit constraints weighing on domestic private firms.

These estimates do not however allow us to determine whether CCBs have modified the well-documented institutionally-based political pecking order in Chinese firms, with a systematic lending bias in favor of the State sector. We thus add data on exports by State-owned firms to our panel of cities. We estimate an Equation adding an interaction term between CCB presence and financial vulnerability for State-owned firms, and test whether the estimated coefficient is the same as that for private firms.

Table 7 shows the estimates using the same format as Table 6: for our two measures of financial vulnerability we first present the baseline results (columns 1 and 4) before successively adding terms to pick up that GDP per capita, FDI, policy zones (in columns 2

Table 7 – Number of CCBs and the export-performance gap by firm type: adding State firms

Dependent variable: Firm types	Log export value (city/HS6/firm-type/year) domestic private, State-owned and foreign firms					
Financial-vulnerability measure	Principal Component Fin dep and Asset tang.			Inventories ratio		
	(1)	(2)	(3)	(4)	(5)	(6)
No. of CCBs × Fin. Vuln. × Private	0.00092^a	0.00071^a	0.00071^a	0.033^a	0.023^b	0.022^b
	(0.00026)	(0.00027)	(0.00027)	(0.0087)	(0.0090)	(0.0090)
No. of CCBs × Fin. Vuln. × State	0.0014^a	0.0011^a	0.0011^a	0.054^a	0.040^a	0.040^a
	(0.0003)	(0.0003)	(0.0003)	(0.008)	(0.008)	(0.008)
GDP/POP × Fin. Vuln. × Private		0.0774^b	0.0736^b		3.218^a	3.381^a
		(0.0325)	(0.0328)		(1.076)	(1.078)
FDI/GDP × Fin. Vuln. × Private		-0.0244^b	-0.0243^b		0.120	0.123
		(0.0108)	(0.0108)		(0.307)	(0.307)
Special zones × Fin. Vuln. × Private		0.015^b	0.0155^a		0.486^b	0.444^b
		(0.0059)	(0.0060)		(0.213)	(0.217)
Foreign banks × Fin. Vuln. × Private			0.0251			-0.733
			(0.0209)			(0.646)
GDP/POP × Fin. Vuln. × State		-0.0216	-0.0248		0.492	0.496
		(0.0250)	(0.0251)		(0.849)	(0.850)
FDI/GDP × Fin. Vuln. × State		-0.018^a	-0.018^a		0.284	0.280
		(0.011)	(0.011)		(0.299)	(0.299)
Special zones × Fin. Vuln. × State		0.026^a	0.027^a		0.803^a	0.808^a
		(0.006)	(0.006)		(0.188)	(0.190)
Foreign banks × Fin. Vuln. × State			0.0345^a			0.156
			(0.0192)			(0.571)
City-firm-type-sector Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
HS6-firm-type-year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
City-firm-type-year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
City-HS6-year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations		2,334,529			2,334,529	
R-squared	0.880	0.880	0.880	0.880	0.880	0.880
F-Test β Private = β State	5.31	2.75	2.76	8.77	5.41	5.98
Proba F	0.02	0.097	0.097	0.003	0.02	0.015

This table considers how the effect of credit constraints on city-product exports across sectors differs for domestic private and fully-foreign firms. Heteroskedasticity-robust standard errors appear in parentheses. Standard errors are clustered at the city-sector-year level. ^{a}, ^{b} and ^{c} indicate significance at the 1%, 5% and 10% confidence levels. Financial-vulnerability indices at the sector level are taken from Manova et al. (2015) and are calculated on US firm data. The F-test at the foot of each column tests the equality of the estimated coefficients on the No. of CCBs × Fin. Vuln. for domestic private and State-owned firms. The probabilities (below 0.1) indicate that this equality is rejected at the 10% confidence level. FDI/GDP and GDP/POP are in logs.

and 5) and foreign bank operations (in columns 3 and 6) vary by firm ownership in a way that is proportional to the sectoral financial sensitivity to credit constraints. Adding information on State-owned firms does not modify the previous estimates of the interactions for private firms.[20] The coefficient on the interaction term between Number of CCBs and Financial Vulnerability for State-owned firms is positive and significant in all specifications: as local CCB presence rises there is a greater propensity for State-owned firms compared to fully-foreign firms to reallocate their export activity to sectors with greater capital requirements, suggesting a relatively improved financial access for State firms.

The F-tests at the foot of the columns indicate that we reject (at the 10% confidence level) the null hypothesis that the coefficients are equal for private firms and State-owned

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[20]Adding data for State-owned firms affects the estimates of the City-HS6 product-year fixed effects that are now identified using export flows from the three ownership types.

firms, so that if anything the systematic discrimination of private firms relative to State-owned firms has risen with CCB development. This continues to hold when we account for heterogeneity in macro-economic conditions (per capita GDP, FDI etc.) in the following columns. State-owned firms appear to enjoy a greater advantage over private firms in finance-dependent sectors as CCBs expand.

Our conclusions are thus mixed. On the one hand the development of CCBs has relaxed the financial constraints weighing on local private firms and alleviated the restraining effect of China's domestic financial-market inefficiency on domestic private firm exports. This evolution has reduced the systematic advantage of foreign-owned firms over domestic private firms in export markets, as the former can access foreign capital markets or tap into funding from their parent company. However, when gauged against State-owned firms, the relative situation of private firms has not improved and has even deteriorated. The growing presence of CCBs has been shown to produce an export-growth bias in favor of financially-vulnerable sectors which is greater for State-owned firms compared to other firm types, including domestic private firms. This casts doubt on the capacity of CCBs alone to resolve the problem of capital misallocation in China.

5.   Conclusion

This paper has investigated the extent to which the development of city commercial banks (CCBs) has contributed to the reduction of financial distortions in China. We first look at the export patterns of 260 Chinese cities between 1997 and 2012 and confirm that domestic private firms systematically under-perform compared to foreign affiliates in financially more vulnerable sectors, in line with lending discrimination against domestic private firms. Despite being the main engine of China's rapid economic growth, domestic private firms have difficulties in borrowing from the national State-owned banks that dominate China's banking sector. We show that the restrictions from China's domestic financial-market inefficiency on domestic private firm exports falls with the development of a new type of financial institutions: city commercial banks. We find that the number of CCB branches raises domestic private firm exports disproportionately more in financially-dependent sectors, suggesting that local bank development has helped lift constraints on private firm exports. The local presence of CCBs is furthermore associated with a more pronounced rebalancing of exports toward finance-intensive sectors for private firms compared to fully-foreign firms (considered here as the "unconstrained' reference group) suggesting that CCB development has reduced the disadvantage of domestic private firms over foreign-owned firms in export markets related to the former's greater financial exclusion. We do however also find that private firm exports fell relative to those of State-owned firms, casting doubt on the capacity CCBs to put an end to the systematic lending bias in favor of the State sector in China.

6.   References

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7. Appendix

Table A-1 – Correlations between industry-level financial vulnerability

	Financial dependence	Asset tangibility	First Principal Component Fin. dep and Asset tang.
Financial dependence	1		
Asset tangibility	-0.12 (0.50)	1	
First Principal component	0.81 (0.01)	-0.68 (0.01)	1
Inventories ratio	-0.23 (0.17)	-0.64 (0.01)	0.21 (0.22)

This table shows the correlation between the various measures of sectoral financial vulnerability. The coefficients are calculated across the 36 sectors. The significance levels appear in parentheses.

Table A-2 – Firm-ownership types and export-structure distortions: comparison with respect to fully-foreign firms

Dependent variable:	Log export value (city/HS6/firm-type/year)			
	(1)	(2)	(3)	(4)
Fin. dep. × Domestic Private Firms	-0.750^a	-0.750^a	-0.791^a	-0.791^a
	(0.255)	(0.255)	(0.282)	(0.282)
Fin. dep. × Joint-Ventures	-0.238	-0.238	-0.229	-0.229
	(0.180)	(0.180)	(0.174)	(0.174)
Fin. dep. × State-owned Firms			-0.692^b	-0.692^b
			(0.316)	(0.316)
Asset Tang. × Domestic Private Firms	2.591^a	2.591^a	2.333^a	2.333^a
	(0.593)	(0.593)	(0.671)	(0.671)
Asset Tang. × Joint-Ventures	1.631^b	1.631^b	1.645^b	1.645^b
	(0.732)	(0.732)	(0.690)	(0.690)
Asset Tang.. × State-owned Firms			1.785^c	1.785^c
			(0.927)	(0.927)
City-firm type-year Fixed Effects	Yes	Yes	Yes	Yes
City-HS6-year Fixed Effects	Yes	Yes	Yes	Yes
Observations	1,729,818	1,729,818	3,291,010	3,291,010
R-squared	0.695	0.695	0.681	0.681

This table examines how the effect of credit constraints on city-product exports across sectors differs for fully-foreign firms and other firm types. In Columns (1) and (2), domestic private firms and JVs are compared to fully-foreign firms. Columns (3) and (4) further consider State-owned firms together with domestic private firms and JVs, and compare these to fully-foreign firms. Heteroskedasticity-robust standard errors appear in parentheses. Standard errors are clustered at the sector level. ^{a}, ^{b} and ^{c} indicate significance at the 1%, 5% and 10% confidence levels. Financial-vulnerability indices at the sector level come from Manova et al. (2015) and are calculated on US firm data.

Figure A-1 – The development of city commercial banks over time
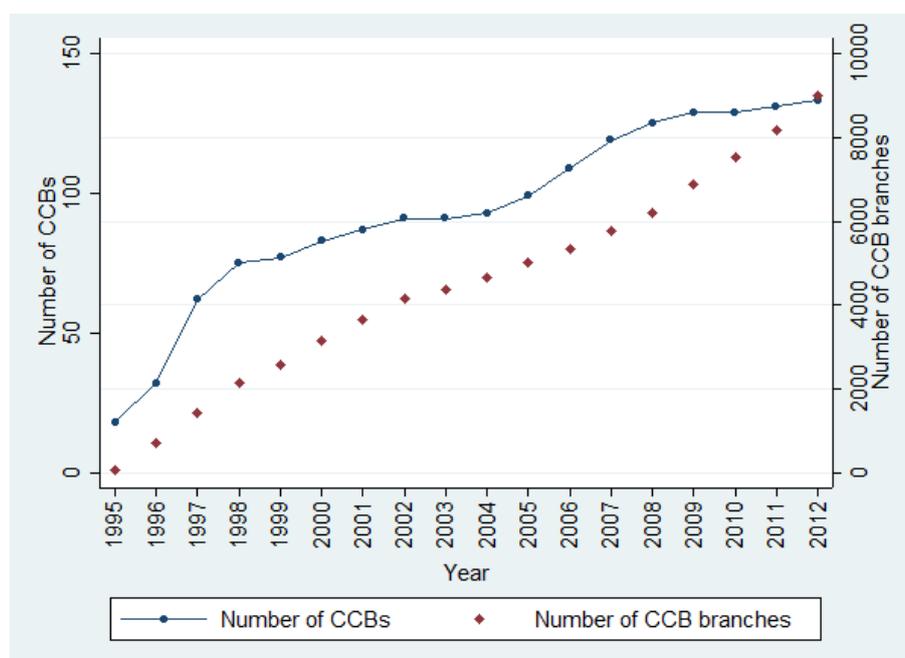
Source: Official website of China's Banking Regulatory Commission (http://www.cbrc.gov.cn/)).

Figure A-2 – The number of city commercial bank branches in 1997
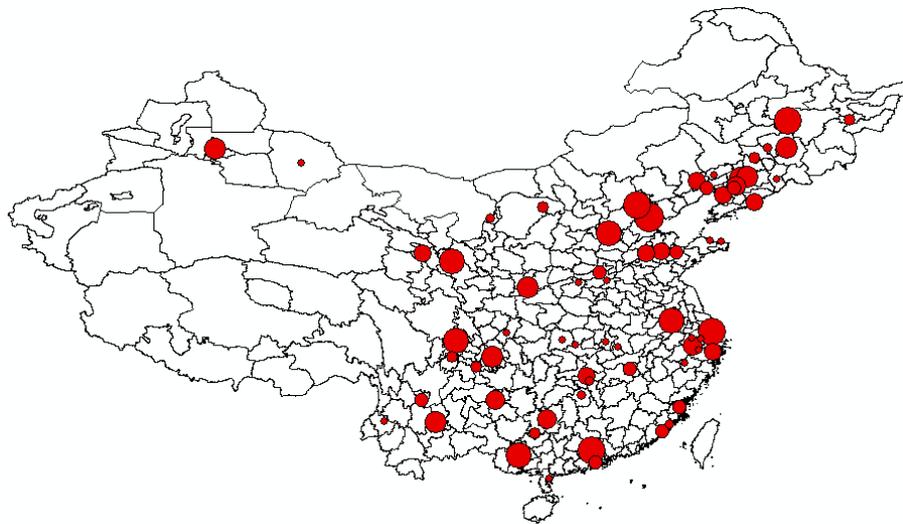
Source: The official website of China's Banking Regulatory Commission (http://www.cbrc.gov.cn/)).

Figure A-3 – The number of city commercial bank branches in 2002
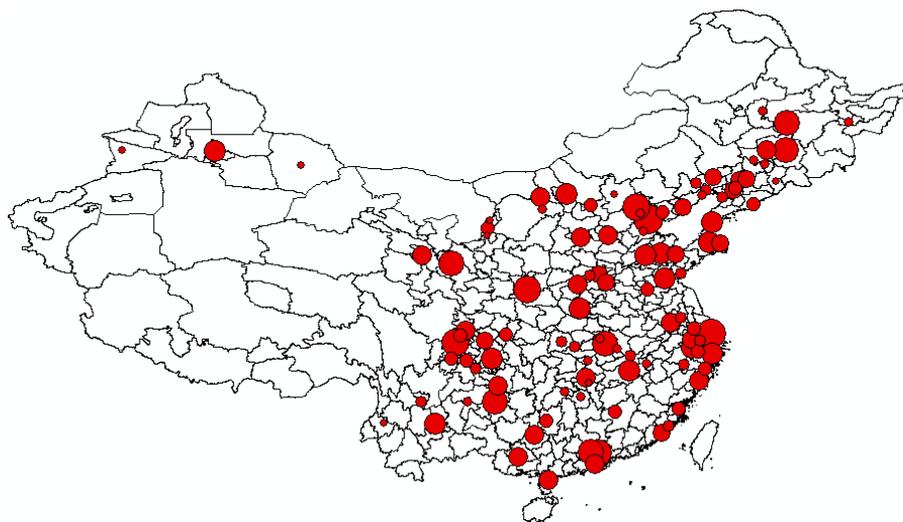
Source: The official website of China's Banking Regulatory Commission (http://www.cbrc.gov.cn/)).

Figure A-4 − The number of city commercial bank branches in 2007
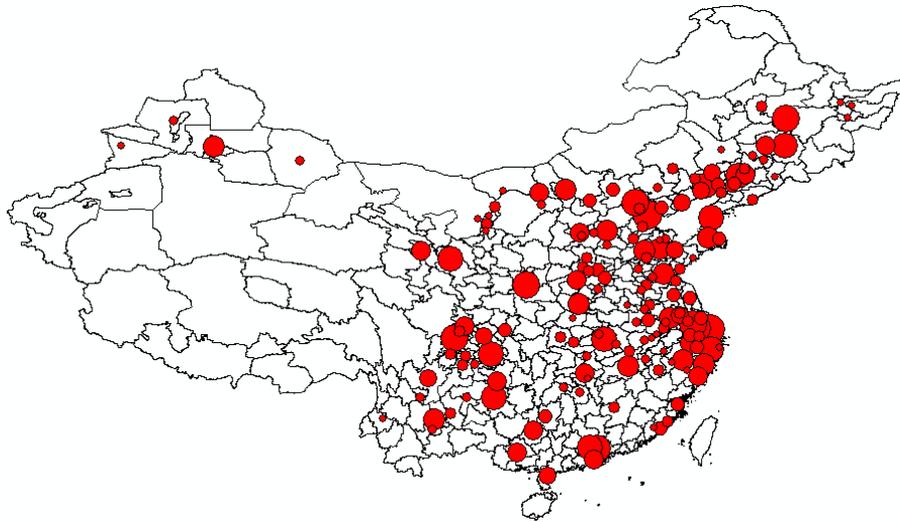
Source: The official website of China's Banking Regulatory Commission (http://www.cbrc.gov.cn/)).

Figure A-5 − The number of city commercial bank branches in 2012

Source: The official website of China's Banking Regulatory Commission (http://www.cbrc.gov.cn/)).