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Inventory investment and the choice of financing: Does financial development play a role?

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Abstract

This paper uses a panel of 224,604 Chinese firms over the period 2004-2009 linked with a set of unique city-level financial development data to examine how financial development affects the way corporate inventory investment is financed. We find that financial development enhances the use of interest-bearing loans and discourages the use of trade credit in financing inventory investment. These effects are more pronounced after the 2007 property rights reform, as well as for privately-owned firms, small firms, firms with no political connections, and firms located in coastal regions. Our results are robust to using a variety of different specifications, as well as different measures of financial development and estimation methods.

JEL classifications: D92; E22; G3; O16

Keywords: Financing choice; Trade credit; Interest-bearing loans; Inventories; Financial development; Financing constraints

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1. Introduction

Inventories are the most volatile component of a country's gross domestic product (GDP). Specifically, even though it constitutes less than 1% of GDP in advanced economies, aggregate inventory investment is 20 times more volatile than GDP (Dasgupta *et al.*, 2019). Similarly, in the Chinese context, China's annual inventory investment only accounted for 3.5% of GDP over the period 1992-2010, but its fluctuations explained as much as 20% of the total fluctuations in GDP (Long *et al.*, 2020). As a result, inventory investment plays a major role in business cycle fluctuations both in western countries and in China (Blinder and Maccini, 1991; Caglayan *et al.*, 2012; Nikolov, 2013; Maccini *et al.*, 2015; Lin and Liu, 2016) and is frequently considered as a leading indicator for the overall performance of the economy (Kim, 2020; Trading Economics, 2020).[1]

A number of studies investigate the role of financial variables such as, for example, the debt-to-assets ratio or cash flow, in explaining corporate inventory investment. They find that inventory investment is particularly sensitive to changes in financial variables, especially if compared to fixed investment.[2] At the same time, a growing literature shows that financial development significantly affects firms' decisions on how to finance their activities. In particular, well-developed financial markets reduce the costs of external finance, making it easier for firms to finance their activities using bank loans or issuing shares (Rajan and Zingales, 1998; Fisman and Love, 2003; Ge and Qiu, 2007).

[1] For instance, according to Blinder and Maccini (1991), 87% of the drop in Gross National Product (GNP) during the average US post-war recession could be explained by the decline in inventory investment. Similarly, Maccini *et al.* (2015) show that in the 2007-09 recession, inventories accounted for one-third of the fall in US GDP, whilst Nikolov (2013) documents that, in the euro area, the contribution of inventories to GDP growth fluctuations since 2008 has been nearly 19%, even if inventories represented only 0.5% of fixed investment and 0.1% of GDP in 2012. In the Chinese context, Lin and Liu (2016) argue that economic fluctuations are always accompanied by sharp fluctuation in inventory investment, which implies that there is a strong correlation between the two. They explain this by showing that most companies, and especially those operating in the manufacturing sector, anticipate drops in demand and start to destock inventories before downturns actually start. Similarly, companies anticipate increases in demand and begin to restock ahead of economic upturns. This can explain why according to Trading Economics (2020), changes in inventories can be considered as a leading indicator for the overall performance of the Chinese economy.

[2] See, for instance, Carpenter *et al.* (1994; 1998), Guariglia (1999, 2000), Guariglia and Mateut (2006), Guariglia and Schiantarelli (1998), and Daripa and Nilsen (2011) who explain inventory investment as a function of a range of financial variables such as the debt to assets ratio, the coverage ratio, trade credit, cash flow, liquidity, and so on. The high sensitivity of inventory investment to changes in financial variables can be explained by its low adjustment costs.

By contrast, informal, and more expensive, sources of finance such as trade credit have been found to be prevalent in less developed financial markets and/or for firms facing tighter financial constraints (Fisman and Love, 2003; Guariglia and Mateut, 2006; Mateut *et al.*, 2006; Ge and Qiu, 2007; Cull *et al.*, 2009).[3,4]

In this paper, we examine the role of interest-bearing loans and trade credit in financing Chinese firms' inventory investment, differentiating firms on the basis of the financial development characterizing the cities in which they operate.[5] Our specific aim is to understand how financial development affects firms' choice of loans and trade credit in financing inventory investment. In other words, we aim at testing the indirect effect of financial development on firms' inventory investment, which occurs by changing the mix between interest-bearing loans and trade credit used to finance inventory investment.

The Chinese setting provides an ideal laboratory to address these issues for four reasons. First, China has been characterized by rapid growth despite a malfunctioning financial system (Allen *et al.*, 2005). It is therefore interesting to understand how Chinese firms finance themselves. Second, in China, changes in inventories are considered as a leading indicator for the overall performance of the economy (Trading

[3] Trade credit appears when customers delay payment of their bills to the suppliers. It can therefore be seen as a short-term loan extended by suppliers to their customers. Trade credit is also often referred to as accounts payable. Hereafter, we will use these two terms interchangeably.

[4] Trade credit is typically more expensive than bank credit, especially because customers generally do not use the early payment discount (Petersen and Rajan, 1997). As explained in Guariglia and Mateut (2006), a common form of trade credit contract is known as the ''2/10 net 30'' type. ''2/10'' means that the buyer gets a 2% discount for payment within 10 days. ''Net 30'' means that full payment is due 30 days after the invoice date. After that date, the customer is in default. The combination of a 2% discount for payment within 10 days and a net period ending on day 30 defines an implicit interest rate of 43.9%, which can be seen as the opportunity cost to the buyer to forgo the discount in exchange for 20 additional days of financing (Ng *et al.*, 1999; Petersen and Rajan, 1997). Furthermore, Chod (2017) argues that trace credit is more expensive than bank credit simply because banks have access to cheaper capital. Finally, another reason why trade credit is more expensive than bank credit is that it is often used for price discrimination (Petersen and Rajan, 1997; Nilsen, 2002).

[5] We focus on interest-bearing loans and trade credit, as these are often used to finance working capital investment such as investment in inventories (Petersen and Rajan, 1997; Restrepo *et al*., 2019). Ideally, we would have focused on bank loans (Restrepo *et al*., 2019). However, as bank loans are not directly observable in our dataset, we refer to interest-bearing loans instead. Following Liu *et al*. (2020), these are given by the firm's total liabilities net of accounts payable. According to Cong *et al*. (2019) and Allen and Gu (2020), bank loans make up more than 70% of interest-bearing loans during our sample period. It should also be noted that our measure of interest-bearing loans includes long-term loans. Yet, very few firms in China make use of long-term loans and the ratio of long-term liabilities to assets is very low (around 3%). Our results were robust to excluding long-term loans from our measure of interest-bearing loans.

Economics, 2020). Third, China's financial development is strongly unbalanced.[6] As a result, firms in cities with different levels of financial development may experience different costs of financing. Fourth, in 2007, China introduced a property rights reform, which can be seen as an exogenous regulation shock and provides a clean identification of the causal effect of financial development on the choice of financing of inventory investment.

The National Bureau of Statistics (NBS) of China provides us with a sizeable dataset, which enables us to test the extent to which Chinese manufacturing firms' inventory investment is affected by the availability of formal and informal credit. We then construct a unique dataset of city-level financial development indicators and merge it with our firm-level dataset. This enables us to investigate the extent to which firms operating in cities characterized by different levels of financial development use different mixes of interest-bearing loans and trade credit to finance their inventory investment.[7] Our final dataset contains 224,604 mostly unlisted firms operating in 287 cities covering the entire Chinese territory over the period 2004-2009.[8]

We observe that Chinese firms make use of both interest-bearing loans and trade credit to finance their investment in inventories. Furthermore, we find that financial development encourages firms to change the way they finance their inventory investment away from trade credit and towards loans. These effects are more pronounced after the 2007 property rights reform, as well as for privately-owned firms, small firms, firms with no political connections, and firms located in coastal regions.

[6] Based on our main measure of city-level financial development (*City_FinDev*), defined as the ratio of total loans in the city's financial system to the city's gross regional product, we note a substantial cross-sectional variation in financial development over our sample period (2004 to 2009). Specifically, *City_FinDev* ranges from a minimum value of 7.5% to a maximum value of 318.4% and has a mean value of 72.3% and a standard deviation of 41.2%.

[7] One of the key obstacles of conducting research on the substitutability between interest-bearing loans and trade credit as financing sources for corporate activities across countries is that different countries are characterized by different accounting standards and institutional settings, making them not strictly comparable. Because we focus on a single country, our study is not affected by this problem.

[8] Our sample starts in 2004 when information on accounts payable became available in the NBS dataset. It stops in 2009 as accounts payable are not available in 2010. Because we estimate dynamic models of inventory investment, we are unable to use the 2011 and 2012 waves of the dataset. Additionally, data collected in 2011 and subsequent years are not compatible with those collected in previous years as the criterion of 'above-scale' industrial firms (i.e. the condition for a firm to be included in the dataset) has changed from 5 million yuan, and above before 2011 to 20 million yuan thereafter.

Given that trade credit is typically more expensive than bank credit (Petersen and Rajan, 1997; Nilsen, 2002), by further enhancing financial development throughout the country, Chinese authorities could ensure that firms gain access to cheaper formal finance, which would enhance their inventory investment, and ultimately promote economic growth.

From a general viewpoint, our work brings together the literature on the financing of corporate activities and the literature on financial development and growth. Specifically, by focusing on the role of interest-bearing loans and trade credit in financing inventory investment, we contribute to the literature on how firms' real activities are financed. We build on this literature by looking, for the first time, at how financial development affects the mix between interest-bearing loans and trade credit used by firms to finance their inventory investment.

Furthermore, as inventory investment contributes significantly to economic growth in China,[9] we also add to the literature on financial development and economic growth, not by seeing how financial development directly contributes to growth (which has been done many times in the past), but by stressing, for the first time, its indirect effect on the mix between trade credit and interest-bearing loans that firms use to finance their inventory investment (which is an important determinant of economic growth).

From a more specific viewpoint, our paper builds on Carpenter *et al*. (1994; 1998) and Guariglia and Mateut (2006), who look at the role of financial variables in determining inventory investment in the US and the UK, respectively, by analyzing, for the first time, the role played by interest-bearing loans and trade credit in explaining Chinese firms' inventory investment, differentiating firms according to ownership, financial conditions, and location. Second, we extend Fisman and Love's (2003)

[9] From a macroeconomic perspective, the link between inventory investment and economic growth can be justified considering that changes in inventories are a key component of gross domestic product (GDP), which is defined as the sum of final sales of domestic products and change in inventories (i.e. inventory investment). As such enhancing inventory investment will, by construction, lead to an increase in GDP, which, in turn, feeds into economic growth. From a microeconomic perspective, inventory investment enables firms to accumulate a sufficiently large stock of working capital. When a negative cash flow shock hits them, firms can easily draw down their stock of working capital, and then replenish it after a positive cash flow shock. In this way, their fixed capital investment, which is characterized by high adjustment costs, and is an important determinant of economic growth, can be insulated from cash flow fluctuations (Ding *et al.*, 2013).

country-industry level analysis by investigating, for the first time, the extent to which city-level financial development influences firms' choice of financing within one country. Third, we provide further evidence on the substitution hypothesis, which posits that firms tend to increase their use of trade credit when accessing bank credit becomes more difficult (Meltzer, 1960; Petersen and Rajan, 1997; Burkart and Ellingsen, 2004; Chen *et al.,* 2019). Finally, our study provides microeconomic evidence on the debate surrounding the finance-growth nexus in China (e.g. Allen *et al.,* 2005; Guariglia and Poncet, 2008; Zhang *et al.,* 2012), focusing on inventory investment, which significantly contributes to GDP fluctuations (Long *et al.*, 2020).

The remainder of the paper is organized as follows. Section 2 provides some economic background. We develop our hypotheses in Section 3. Section 4 presents the dataset and summary statistics. Section 5 describes the specification of our models and the estimation methodology. In Section 6, we discuss our main results and present a variety of robustness tests. Section 7 focuses on the effects of financing constraints. Section 8 discusses the role of the 2007 property rights reform, and Section 9 concludes.

2. **Economic background**

China has been considered as a counterexample to the traditional view in the finance-growth literature according to which financial development facilitates economic growth (Boyreau-Debray, 2003; Allen *et al.,* 2005; World Bank, 2006; Guariglia and Poncet, 2008). Despite a poorly developed financial system, it has in fact one of the fastest-growing economies in the world (Allen *et al.,* 2005).

The financial system in China is mainly bank-based.[10] The majority of Chinese banks, including the "Big Five",[11] are controlled by the government. The influence and

[10] This is consistent with the World Development Indicators (2020), according to which, over the period 2004-2009, domestic credit provided to the private sector by Chinese banks (deposit taking corporations except central banks) as a percentage of GDP was 112%, and was ranked 14th out of 219 countries. For comparison, it is noteworthy that China's percentage is much higher than the corresponding precentage observed in the US over the same period (57%).

[11] China's banking sector is dominated by the "Big Five" stated-owned commercial banks, which are the Bank of China (BOC), the China Construction Bank (CCB), the Agriculture Bank of China (ABC), the Industrial and Commercial Bank of China (ICBC), and the Bank of Communications (BoCom).

intervention of the government play a significant role in banks' decisions. For instance, the central bank explicitly sets primary deposit and lending interest rates and target levels for loan volumes. Furthermore, due to political reasons, in many circumstances, the government controls lending by directing a large number of loans to particular firms, sectors, and regions (Elliott and Yan, 2013). The dominance of state-owned banks also causes a massive misallocation of financial resources, as these banks have a preferential policy of lending to the low-performing state-owned enterprises (SOEs), which crowds out the access to credit for the more dynamic private sector in general and small- and medium-sized enterprises (SMEs) in particular (Allen *et al.*, 2005; Guariglia and Yang, 2016). As a result, China's underdeveloped and inefficient banking system hinders to some extent the fast progress of economic growth (Guariglia and Poncet, 2008).

Yet, there is no consensus on the role of financial development in China's economic success. Cull and Xu (2005) show that access to bank loans is positively connected with China's profit reinvestment. Based on the positive relationship observed between bank financing and firms' growth rates and reinvestment rates, Ayyagari *et al.* (2010) argue that there is evidence that private firms benefit from utilizing bank loans. Liang (2006) shows that financial development positively affects economic growth in coastal areas, and World Bank (2006) argues that capital market depth is also positively associated with growth. Using city-level data, Zhang *et al.* (2012) show that economic growth is positively correlated with financial development.

Despite these conflicting views, it cannot be denied that Chinese firms do not always have easy access to bank loans. Considering that raising external equity capital is also difficult, and that bonds still do not represent a primary form of external financing in China (Jiang *et al.*, 2020), trade credit, which can provide funds through inter-firm transactions, has been found to play an important role in financing China's rapid growth. Using survey data, Ge and Qiu (2007) investigate the extent to which the high growth of the non-state sector can be sustained by trade credit financing. They argue that high usage of trade credit helps non-SOEs bypass the limited access to formal finance and meet their financing needs. Furthermore, Cull *et al.* (2009) find interesting patterns in the extension of trade credit by firms owned by different agents. Specifically,

they show that poorly performing SOEs, who are always able to obtain bank loans from state-owned banks, tend to redistribute these loans via trade credit to prop up their faltering customers. They also find that profitable private firms are more likely to extend trade credit to support their trading partners than their unprofitable counterparts, who cannot afford to do so. Degryse *et al.* (2016) find that the use of informal finance, including trade credit, promotes the high sales growth of small Chinese firms. Guariglia and Mateut (2016) show that Chinese firms with strong political affiliations find it easier to obtain short-term external sources of finance, which they use to extend more trade credit than their non-affiliated counterparts. Allen *et al.* (2019) consider trade credit as "constructive informal finance". They argue that because this type of financing is characterized by an information advantage and monitoring mechanisms, it supports firm growth. In summary, the evidence above suggests that trade credit is an important extension to the availability of funds for Chinese firms.

In summary, despite the poor development of the Chinese financial system, some firms are able to obtain and benefit from bank loans. Yet, other firms find it difficult to obtain loans at a reasonable cost, and, as a result may use trade credit to finance their activities. As trade credit is more expensive than bank credit, the latter is generally preferred. Having wider access to bank credit benefits therefore firms' activities. We hereafter analyze the extent to which local financial development affects the mix between loans and trade credit used by Chinese companies to fund their inventory investment.

3. Hypotheses

3.1. Direct effects of interest-bearing loans, trade credit, and financial development on inventory investment

We first hypothesize a positive association between both interest-bearing loans and trade credit and inventory investment. This can be explained considering that both trade credit and loans are sources of external finance, which can be used to fund the investment in inventories (Petersen and Rajan, 1997; Guariglia and Mateut, 2006;

Restrepo *et al.,* 2019). Furthermore, we hypothesize that a higher level of financial development is also positively associated with inventory investment. This can be explained bearing in mind that firms located in more financially developed cities typically have easier and cheaper access to external finance (Beck *et al.,* 2008), which can, in turn be used to enhance inventory investment. These hypotheses can be summarised as follows:

H1a: *Interest-bearing loans are positively associated with inventory investment*.

H1b: *Trade credit is positively associated with inventory investment.*

H1c: *Financial development is positively associated with inventory investment.*

3.2. Indirect effect of financial development on the mix between interest-bearing loans and trade credit used to finance inventory investment

According to Petersen and Rajan (1997), firms use trade credit as a source of finance mostly because they are unable to raise funds from the traditional bank finance channel. Trade credit is in fact typically more expensive than bank credit (Petersen and Rajan, 1997; Ng *et al.,* 1999; Nilsen, 2002; Pike *et al.,* 2005; Giannetti *et al.,* 2011; Chod, 2017). As a result, the growth of those firms that rely on this type of informal financing may be constrained. In line with this argument, Rajan and Zingales (1998) suggest that the development of financial markets can reduce the costs of formal external finance, and consequently enhance growth. Fisman and Love (2003) emphasize the importance of financial development in explaining the substitution between bank credit and trade credit. They argue that firms in countries with more developed financial markets rely more on cheaper bank loans to finance their growth. By contrast, in countries with less developed financial systems, firms do not have easy access to bank loans, and, consequently, are forced to make more use of expensive trade credit, which hinders their growth.

We relate to this literature by focusing on Chinese firms' inventory investment, which is typically financed either by interest-bearing loans or by trade credit (Petersen and Rajan, 1997; Guariglia and Mateut, 2006; Restrepo *et al.,* 2019). Considering that

China contains very heterogeneous cities in terms of financial development,[12] in line with Fisman and Love (2003), we hypothesize that, whilst firms are expected to use both trade credit and interest-bearing loans to fund their inventory investment (Hypotheses 1a and 1b), as trade credit is typically more expensive than bank credit which represents the bulk of interest-bearing loans (Petersen and Rajan, 1997; Ng *et al.*, 1999; Nilsen, 2002; Pike *et al.*, 2005; Giannetti *et al.*, 2011; Chod, 2017), a higher level of financial development will enable firms to make more use of cheaper interest-bearing loans and less use of more expensive trade credit to finance their inventory investment. In other words, financial development affects inventory investment indirectly by affecting the mix between interest-bearing loans and trade credit used by firms to finance their inventory investment: It makes loans more easily available and cheaper, which encourages firms to make higher use of loans and lower use of trade credit to finance their inventory investment. Our second hypothesis can be summarised as follows:

H2: *Financial development enhances the use of interest-bearing loans and discourages the use of trade credit in financing inventory investment.*

3.3. The role of financing constraints

In principle, firms can choose to finance their activities using either formal loans or informal trade credit. Yet, when they are financially constrained, they might not be able to obtain credit from formal financial institutions due to the cost premium associated with the use of external finance. This problem will be exacerbated in cities characterized by poor financial development. Petersen and Rajan (1997) argue that

[12] It is noteworthy that geographical segmentation is an important characteristic of the Chinese banking system. Huang *et al.* (2020) document that city and rural financial institutions rarely operate outside their own city or province. They justify this considering that until 2006, these banks were not allowed to do business outside their province of origin. Subsequently, although reforms between 2006 and 2009 technically allowed them to operate across provincial boundaries, only very few inter-province licenses were actually approved. Huang *et al.* (2020) further argue that even the large commercial banks and policy banks (which together account for 50% of total bank assets) generally operate on a local basis. In our empirical analysis, we look at financial development at the city-level and divide the Chinese territory into 287 prefecture-level cities or municipalities.

suppliers are usually willing to extend trade credit to firms with limited access to credit markets, as this enhances credit-financed sales and boosts demand. In addition, suppliers are more willing to offer trade credit to firms more likely to face financial constraints than financial institutions because they are in a better position than banks to gather information on their customers, have an advantage in salvaging value from constrained firms' assets, and implicitly hold a stake in these firms. In line with this argument, and focusing on China, Guariglia and Mateut (2016) document that more financially constrained firms indeed have a higher reliance on trade credit financing. We therefore expect that in cities characterized by low financial development, financially constrained firms will show a higher dependence on trade credit to finance their inventory investment.

Similarly, Beck *et al.* (2008) argue that financial development is particularly important for lowering informational barriers and transaction costs that hinder small firms' growth.[13] This suggests that the difficulties faced by small, financially constrained firms in obtaining interest-bearing loans will be lower the higher the financial development. In line with this argument, we expect those Chinese firms more likely to face financing constraints to make heavier use of interest-bearing loans to finance their inventory investment in cities characterized by higher financial development. This leads to our third hypothesis:

H3: *Financial development has a stronger impact on the choice of financing of inventory investment for firms more likely to face financing constraints.*

Following Poncet *et al*. (2010) and Guariglia *et al.* (2011), we consider private firms and firms located in coastal regions (which face a higher competition for a limited pool of funds) more likely to face financing constraints. Other firms in this group are small

[13] Small firms are assumed more likely to face financial constraints than large firms (Beck *et al.*, 2005; Clementi and Hopenhayn, 2006; Guariglia, 2008; Yang and Guariglia, 2016). See Section 7.2 for a further discussion of this point.

firms, as well as companies without political connections. These criteria are defined and discussed in Section 7.

4. Data and summary statistics

4.1. Data

We utilize firm-level data drawn from the annual accounting reports of industrial firms conducted by the National Bureau of Statistics (NBS) of China from 2004 to 2009. The NBS data contains accounting variables and firm-specific information for enterprises in the manufacturing and mining sectors with annual sales above 5 million RMB ("above-scale" industrial firms). These firms come from 31 provincial-level administrative units, which can be further decomposed into 287 prefecture-level cities or municipalities (or main districts). The original sample contains 1,957,370 observations. We firstly drop observations with negative values for the stock of inventories, sales, total assets, total fixed assets, interest-bearing loans, accounts payable, current assets, current liabilities, total equity, total assets net of total fixed assets, and total assets net of liquid assets, which constitute 6.5% of the sample. Furthermore, to minimize the potential influence of outliers, we exclude the top and bottom one percent of the distribution of each of our continuous regression variables. We also drop firms that do not have complete records on the key variables used. This leads to a final unbalanced panel made up of 224,604 mostly unlisted firms, which corresponds to 579,250 firm-year observations.[14,15] Table A1 in Appendix A shows that our panel ranges from a minimum of 45,289 observations in 2004 to a maximum of 126,230 observations in 2007. All variables are deflated using the gross domestic

[14] We cannot separate public listed firms from the unlisted ones as the NBS dataset does not have an identifier for public listed companies. There are around 1000 listed firms in the manufacturing and mining industries covered by the NBS dataset, which accounts for about 0.4% of the total observations.
[15] Brandt *et al.* (2012) document that there has been a high rate of entry and exit of firms during the sample period. This may have a significant impact on how inventory investment is financed. Our results were robust to estimating our models based on firms which have been present throughout the sample period and which make up 68.3% of our sample. These results are not reported for brevity but are available upon request.

product (GDP) deflator, which is provided by the Federal Reserve Bank of Atlanta.[16] We next merge the data with the city- and district-level financial development data, which are collected from the *China City Statistical Yearbook*.[17]

A vast literature shows that ownership has a significant impact on how Chinese firms make use of different sources of funds (Allen *et al.*, 2005; Ge and Qiu, 2007; Ayyagari *et al.*, 2010; Guariglia *et al.*, 2011; Guariglia and Yang 2016).[18] In our study, we classify firms into four ownership categories (state-owned, foreign, collective, and private firms), based on the majority share of capital paid-in by each type of investor in each year.[19] For instance, a firm is categorized as state-owned in a given year if the proportion of its paid-in-capital owned by the state in that year is greater than 50%.

4.2. Measures of financial development

To investigate the extent to which financial development affects the use of different financial sources, we construct a set of financial indicators to proxy the level of financial development in the city where the firm resides. Typically, financial development should proxy for the overall depth and availability of financial intermediaries and markets across areas. In other words, it should measure how easily borrowers and savers can be brought together.

[16] We use this GDP deflator instead of that provided by Chinese statistical and government agencies because it adjusts for seasonality more appropriately and is comparable to the deflators commonly used in the studies on OECD (Organisation for Economic Co-operation and Development) countries. For details about how to construct this GDP deflator, see Chang *et al.* (2016) and Higgins *et al.* (2016).

[17] The yearbook contains aggregate data on loans, deposits, savings and other financial variables at the city level.

[18] Specifically, there is a large imbalance in the allocation of financial resources in China. Although private firms have been expanding very rapidly and make a significant contribution to China's growth, the majority of domestic bank credit goes to the less efficient state-owned sector, hence depriving private firms of access to bank credit (Allen *et al.*, 2005; Cull *et al.*, 2009; Ayyagari *et al.*, 2010; Guariglia *et al.*, 2011; Guariglia and Yang, 2016).

[19] The NBS dataset classifies investors into the following six categories: state investors; foreign investors (excluding those from Hong Kong, Macao, and Taiwan); Hong Kong, Macao, and Taiwan investors; legal entities; individuals; and collective investors. Following Guariglia *et al.* (2011), we group foreign investors and Hong Kong, Macao, and Taiwan investors into a single category named foreign firms. Similarly, legal entities-owned and individual-owned firms are grouped into the private firm category. Our results were robust to only considering firms owned by individuals as the private category.

As in Zhang *et al.* (2012), we measure financial development at the city-level,[20] and construct the following three indicators. *City_FinDev* is the ratio of total bank and non-bank loans in the city's financial system to the city's Gross Regional Product (GRP).[21] *City_FinDev2* is the ratio of total deposits in the city's financial system to the city's GRP. These two indicators serve as proxies for the overall depth of financial intermediation. *City_FinDev3* is the ratio of total household savings in the city's financial system to the city's GRP. Following Zhang *et al.* (2012), it can be seen as an alternative measure of financial development. Next, we measure financial development at the district level.[22] To this end, we construct the indicator *City_FinDev4* , which denotes the ratio of total loans in the city's main district to GRP. Finally, we design a composite index of financial development, *City_FinDev5*, at the city level, by aggregating *City_FinDev*, *City_FinDev2* and *City_FinDev*3 following the procedure outlined in Amidžic *et al.* (2014).[23]

Figures 1 and 2 show maps of the level of financial development measured as the ratio of total loans to GRP (*City_FinDev)* across different Chinese cities in 2004 and 2009. There are 287 municipality- or prefecture-level cities in our maps. The figures suggest that there is a substantial imbalance in the level of financial development across different cities of China. This can have a significant impact on how difficult firms located in different cities find it to raise funds, as well as on their choice of financing.

[20] There are three levels of cities in China: municipalities (Beijing, Shanghai, Tianjin and Chongqing), which are directly governed by the central government and are administratively equivalent to provinces; prefecture-level cities, which are directly governed by the provincial government and are ranked below provinces and above counties in China's administrative structure; and county-level cities, which are governed by prefecture-level governments. In this paper, we use 287 municipality- or prefecture-level cities, including both urban and rural areas, to measure financial development. Similar results, not reported for brevity, were found excluding the municipalities.

[21] As discussed in Appendix B, bank loans mainly include loans from the following institutions: the "Big Five" banks, joint-stock commercial banks, city commercial banks, foreign banks, policy banks, rural commercial banks, and rural cooperative banks. Non-bank loans include loans from institutions of the following types: rural credit cooperatives, urban credit cooperatives, postal savings banks, new-type rural financial institutions, financial asset investment companies, trust and investment corporations, private credit agencies, financial lease companies, consumer financial companies, automobile financial companies, and so on. It is important to note that bank loans make up the largest part of the total (Elliott and Yan, 2013; Cong *et al.*, 2019; Allen and Gu, 2020). See footnote 5 for more details on this point.

[22] A district refers to a subdivision of a prefecture-level city or a municipality. A district of a municipality is generally a prefecture-level area; and a district of a prefecture-level city is a county-level area. The main districts of a city are typically densely populated areas.

[23] See Appendix B for more details on how this indicator is constructed.

Not surprisingly, coastal provinces, major municipalities, and capitals of provinces enjoy the highest financial development. The level of financial development in 2009 is slightly lower than in 2004.[24] Specifically, 5 out of 12 coastal provinces show a drop in their ratio of total loans to GRP between 2004 and 2009. The corresponding numbers for central and western regions are, respectively, 7 out of 8 and 7 out of 10. The imbalanced nature of financial development across different cities of China provides us with a unique opportunity to analyze how financial development affects the way firms finance their inventory investment.

[Insert Figure 1 here]

4.3. Summary statistics

Table 1 reports the means and medians for a number of key variables used in this study. Column 1 refers to the full sample, whilst columns 2 to 5 correspond to state-owned, collective, private and foreign firms. Focusing on the full sample, we observe that firms experience positive inventory and sales growth. However, private firms (which represent 76.6% of the observations in the sample) are the major contributor to this growth. By contrast, the other three types of firms experience low or even negative inventory and sales growth over the sample period.

We observe that state-owned and foreign firms are generally larger than collective and private firms. Furthermore, state-owned and collective firms have a significantly longer history than private and foreign firms, as the latter were only allowed to start their business after China's reform and opening-up policy, which was launched under the leadership of Deng Xiaoping at the 1978 Third Plenum.

With regards to different uses of funds, SOEs exhibit the largest interest-bearing loans to assets ratios (0.421) and the lowest trade credit to assets ratio (0.127), compared to the rest of the sample. This is consistent with Ding *et al.* (2013) and Guariglia *et al.* (2011). Due to the soft budget constraints from which they benefit, SOEs are able to obtain more bank credit than other firms, despite experiencing negative sales growth.

[24] This drop in the ratio of total loans to GRP is due to the fact that GRP increased more than loans.

Consequently, SOEs do not need to rely too much on informal finance, such as trade credit.

[Insert Table 1 here]

In terms of financial development,[25] Table 2 shows that the average ratios of total loans, total deposits and total household savings to GRP are 72.3%, 114.3%, and 68.0%, respectively, suggesting that the financial system in China remains mainly bank-based.[26] Our descriptive statistics also show that coastal regions generally have a higher level of financial development compared to their interior counterparts.[27]

[Insert Table 2 here]

5. Model specifications

5.1. Baseline specification

Our baseline specification is an extension of Lovell's stock adjustment model (1961), which has been widely used in the literature to explain the dynamic adjustment of inventory investment (Kashyap *et al.*, 1994; Guariglia, 1999; Benito, 2005; Guariglia and Mateut, 2006).[28] Specifically, denoting with *I*, the logarithm of firms' inventories; with *S*, the logarithm of sales; with *Loans*, the ratio of the sum of long-term and short-term debt (net of accounts payable) to total assets (used as a proxy for a firm's bank financing); and with *TC* (trade credit), the ratio of accounts payable to total assets,[29] we initially estimate the following equation:

[25] The total number of observations in Table 2 is 1692, corresponding to 281 to 285 prefecture-level cities or municipalities in each year. Although our dataset contains 287 prefectures in total, this does not mean that data on 287 cities are available in each year, as some cities are only present in some years.
[26] See footnote 10 for further evidence confirming the fact that China's financial system is mainly bank-based.
[27] See Appendix B for details about the provinces belonging to the coastal and interior regions. The latter include both central and western regions. It is noteworthy that the majority of the firms (76.9%) in our sample are located in coastal regions.
[28] The rationale behind the stock adjustment model is that when a firm's actual level of inventories is different from the desired target level, which is proportional to sales, the firm will only try to adjust inventories partially towards the target level in any one period due to adjustment costs.
[29] Similar results were found when defining *Loans* and *TC* in logarithms. These results are not reported for brevity, but available upon request.

$$\Delta I_{j,t} = \beta_0 + \beta_1 \Delta I_{j,t-1} + \beta_2 \Delta S_{j,t} + \beta_3 \Delta S_{j,t-1} + \beta_4 (I_{j,t-1} - S_{j,t-1}) + \beta_5 Loans_{j,t} + \beta_6 TC_{j,t} + V_j + V_t + V_k + V_p + V_0 + e_{j,t} \quad (1)$$

where the subscript *j* indexes firms; *k,* industries; *p*, provinces; *o,* ownership; and *t*, time (where *t* = 2004-2009). The lagged inventory growth and sales growth are included in the regression to capture short-run dynamics. Following Guariglia (1999), the coefficient β_1, which represents the adjustment speed of inventories, is expected to be positive. β_2 is also expected to be positive, as firms need to avoid remaining out of stock when they face high demand for their goods.[30] The error-correction term $(I_{j,t-1} - S_{j,t-1})$ captures the cost of inventories being far from a target level expressed in terms of sales. Consistent with error-correction behavior, we expect β_4 to be negative. In other words, future inventory investment will increase (drop) if inventories are lower (higher) than the target.

The error term in Equation (1) consists of several components. V_j is a firm-specific component, embracing all time-invariant firm characteristics likely to influence inventory investment, as well as any additive measurement errors. We control for this component by using a fixed-effects estimator. V_t is a time-specific component, accounting for possible business cycle effects, which we account for by including time dummies in all our models. V_k and V_p represent industry- and province-specific effects, respectively, which we control for by including both industry and province dummies.[31] We also include ownership dummies to control for the heterogeneity in ownership structure in the Chinese context (V_0). Lastly, $e_{j,t}$ is an idiosyncratic component of the error term.

For hypotheses H1a and H1b to hold, we expect interest-bearing loans and trade

[30] Although β_3 could be negative, we expect $\beta_2 + \beta_3$ to be positive as firms need to avoid remaining out of stock when they face high demand for their goods.

[31] We obtained similar results using city dummies instead of province dummies. These are not reported for brevity but are available upon request. Our results were also robust to removing from our sample all firms that switch between ownership groups, provinces, and/or industries. In this case, the province, ownership, and industry dummies were dropped as they were absorbed in the v_j component of the error term. It is noteworthy that only 4.86%, 6.17%, and 5.40% of the firms in our sample respectively switch between ownership groups, provinces, and industries.

credit to be positively associated with inventory investment in Equations (1). In other words, we expect to see positive β_5 and β_6 coefficients. This can be explained considering that the more external financing is available, the more firms will be able to invest in inventories.

5.2. Financial development and the choice of financing

To shed light on the extent to which the level of financial development of the city where firms reside can influence their choice of financing, we augment Equation (1) with the interactions of bank credit and trade credit with *City_FinDev*, which denotes the level of financial development of the city where the firm is located. We also include the variable *City_FinDev* non-interacted in the equation. This leads to the following augmented model:

$$\begin{aligned}\Delta I_{j,t} = {} & \beta_0 + \beta_1 \Delta I_{j,t-1} + \beta_2 \Delta S_{j,t} + \beta_3 \Delta S_{j,t-1} + \beta_4 (I_{j,t-1} - S_{j,t-1}) + \beta_5 Loans_{j,t} + \beta_6 TC_{j,t} + \beta_7 City\_FinDev_{c,t} \\ & + \beta_8 Loans_{j,t} * City\_FinDev_{c,t} + \beta_9 TC_{j,t} * City\_FinDev_{c,t} + V_j + V_t + V_k + V_p + V_0 + e_{j,t}\end{aligned} \quad (2)$$

where the subscript *c* indexes cities. In line with hypothesis H1c, the coefficient associated with *City_FinDev* is expected to be positive, as firms located in more financially developed cities will find it easier to fund their inventory investment. Furthermore, the coefficients associated with the interaction terms tell us the extent to which financial development affects the association between loans and trade credit, on the one hand, and inventory investment, on the other. Because in more financially developed cities, interest-bearing loans are more easily accessible and cheaper (Rajan and Zingales 1998), for Hypothesis 2 to hold, we expect financial development to strengthen the association between loans and inventory investment. In other words, we expect β_8 to be positive and significant. Similarly, we expect a higher level of financial development to discourage firms' use of more expensive trade credit in financing inventory investment, as better financial development is associated with higher availability of cheaper loans. In other words, we expect β_9 to be negative and significant. In a nutshell, Hypothesis 2 posits that financial development makes loans more easily

available and cheaper, which encourages firms to make higher use of loans and lower use of trade credit to finance their inventory investment.

To test our third hypothesis, according to which financial development will have a stronger impact on the choice of financing of inventory investment for firms more likely to face financing constraints, we estimate Equation (2) separately for firms more and less likely to face financial constraints. We expect the coefficients associated with both $Loans_{j,t} * City\_FinDev_{c,t}$ and $TC_{j,t} * City\_FinDev_{c,t}$ to be larger (in absolute value) for more financially constrained firms.

6. Empirical results

6.1. Main results

We estimate Equations (1) and (2) for the whole sample using the fixed-effects estimator, which enables us to take into account the V_j component of the error term (i.e. unobserved firm-specific heterogeneity). The results are shown in Table 3. Column 1 reports the estimation results of the baseline model (Equation (1)). The coefficients associated with interest-bearing loans and trade credit in column 1 are both positive and statistically significant at the 1% level, which indicates that, in line with hypotheses H1a and H1b, both sources of finance are used to fund inventory investment. They suggest that a 10% increase in interest-bearing loans and trade credit are respectively associated with a 5.19% and a 5.87% higher inventory investment. Considering that the mean value of inventory investment is 3.1% (see Table 1), these are sizeable effects.

Focusing on the other regressors, the significant and positive coefficient associated with the lagged dependent variable suggests that there is persistence in firms' inventory investment. Also, current sales growth is positively and significantly related to inventory accumulation, whilst lagged sales growth is significantly and negatively related to it. The sum of the coefficients on the change in sales is positive, suggesting that the stock of inventories moves together with sales growth, as there is a high cost of being out-of-stock when firms face high demand for their goods. As predicted by theory, the coefficient associated with the error-correction term is significant and negative,

suggesting that inventories move towards their long-run target and tend to close the gap with their desired level. These findings are generally consistent with the literature (Kashyap *et al.,* 1994; Guariglia, 1999; Benito, 2005; Guariglia and Mateut, 2006).

[Insert Table 3 here]

Columns 2-4 of Table 3 focus on the role of financial development on the extent to which firms use interest-bearing loans and trade credit to finance inventory investment. We initially use the ratio of total loans to GRP (*City_FinDev*) as an indicator of financial development. In column 2, we include the level of financial development and the interaction between interest-bearing loans and financial development in the model. The marginal effect associated with *City_FinDev* evaluated at sample means is positive and significant at the 1% level.[32] It suggests that a 10% increase in financial development is associated with a 2.75% higher investment in inventories, which is economically significant. This result provides support for Hypothesis H1c.

Furthermore, in line with Hypothesis 2, the coefficient associated with the interaction between interest-bearing loans and financial development is positive and significant (0.119), implying that a higher level of financial development is associated

[32] As *City_FinDev* appears in the Equation both individually and interacted with bank loans, its average marginal effect evaluated at sample means, accounts both for its direct effect on inventory investment and its indirect effect through loans. This marginal effect is obtained using the *margins, dydx (.)* command in Stata. It is noteworthy that in our specifications, we do not focus on the effects of financial development on interest-bearing loans and trade credit. In unreported results, we observe that financial development is positively associated with loans, but the association between financial development and trade credit appears to be statistically insignificant. The latter finding can be explained considering that trade credit may be used for purposes different from purely financial ones. For instance, firms who have access to cheaper bank loans may still choose to use trade credit as it reduces transaction costs by separating payment from delivery (Ferris, 1981; Emery, 1987). Furthermore, by allowing buyers to use a product before paying for it, trade credit also helps reduce the costs of verifying product quality (Lee and Stowe, 1993). Finally, a number of papers have found that in some cases, trade credit actually flows from small, financially constrained suppliers towards large financially healthy corporations. This may be a result of power imbalances in the supply chain whereby more powerful companies actually impose long payment periods on smaller firms (Murfin and Njoroge, 2015; Cosci *et al*., 2019). If firms choose to use trade credit for these non-financial reasons, then it is not surprising that financial development does not affect the trade credit to assets ratio. It is also possible that financial development affects trade credit usage through two main channels that operate in opposite directions. Specifically, a higher level of local financial development may make loans cheaper and hence reduce the need for firms to use trade credit. Yet, as state-owned enterprises and/or profitable private firms in China have been found to offer trade credit to other firms (Cull *et al*., 2009; Guariglia and Mateut, 2016), a higher level of local financial development may make access to financing easier for these firms, which may in turn have more means to offer more trade credit to smaller firms which do not have access to loans even if financially developed cities. This could make the overall use of trade credit higher. The fact that we do not observe a significant association between local financial development and trade credit does not contradict our main finding, which suggests that the specific use of trade credit to finance inventories is discouraged by higher financial development.

with a stronger association between bank lending and inventory investment. Specifically, the positive impact of interest-bearing loans on inventory growth is 8.7% [0.119*(1.31-0.58)] higher in a city with financial development at the 75th percentile (1.31) relative to a city with financial development at the 25th percentile (0.58).[33] One reason for this finding could be that financial development reduces firms' costs of accessing formal external finance (Rajan and Zingales 1998).

In column 3, we include the interaction between trade credit and financial development. The coefficient associated with this interaction term is negative and significant (-0.20), suggesting that financial development weakens the association between trade credit and the accumulation of inventories. Specifically, the positive link between trade credit and inventory growth is 14.6% [0.20*(1.31-0.58)] lower in a city with financial development at the 75th percentile (1.31) relative to a city with financial development at the 25th percentile (0.58). This provides additional evidence in favor of Hypothesis 2. The marginal effect associated with *City_FinDev* is also significantly positive (0.273) at the 1% level in this specification.

Finally, in column 4, we include financial development, interest-bearing loans, trade credit, and both the interactions of interest-bearing loans and trade credit with the financial development indicator. The coefficients associated with interest-bearing loans, trade credit and *City_FinDev* are all positive and statistically significant. Moreover, the coefficient associated with the interaction between financial development and interest-bearing loans (0.0697) is once again positive and significant, while the coefficient associated with the interaction between trade credit and financial development (-0.159) is still negative and significant. In line with hypothesis H2, these findings suggest that a high level of financial development promotes the use of cheaper interest-bearing loans, whilst a low level of financial development forces firms to use more expensive trade credit to finance their inventory investment. These findings are consistent with Allen *et al.* (2019), who show that constructive informal financing such as trade credit supports economic growth when bank credit supply lags behind economic demand.

[33] The values of 0.58 and 1.31 represent the 25th and 75th percentiles of *City_FinDev* within the sample used in estimation.

6.2. Robustness tests

We conduct a series of robustness tests to check the validity of our results. In Section 6.2.1, we check whether our main findings are robust to using different indicators of financial development. In Section 6.2.2, we verify whether our results hold when we control for the possible endogeneity of financial development and other right-hand side variables. In Section 6.2.3, we show that our results are robust to augmenting the models with different sets of additional variables.

6.2.1. Using different measures of financial development

We first verify whether our results are robust to using different city-level proxies for financial development (Zhang *et al.*, 2012). These are the ratio of total deposits to the city's GRP (*City_FinDev2*) and the ratio of total household savings to the city's GRP (*City_FinDev3*). We also use *City_FinDev4,* which is defined as the ratio of total loans to the GRP of the city's main district. Finally, we construct a composite index of financial development, *City_FinDev5,* by aggregating *City_FinDev*, *City_FinDev2* and *City_FinDev*3 following the procedure outlined in Amidžic *et al.* (2014). These indicators are thoroughly described in Section 4.2 and descriptive statistics are presented in Table 2.

Table 4 presents the estimates of Equation (2) based on each of these alternative financial development indicators in turn. Regardless of how we measure financial development, the estimates suggest that the coefficients associated with the interactions between financial development and both interest-bearing loans and trade credit are statistically significant at the 1% level. The positive coefficient on the former interaction and the negative coefficient on the latter are consistent with our prior findings and with hypothesis H2, according to which city-level financial development has a significant impact on firms' choice between interest-bearing loans and trade credit. In particular, in highly financially developed cities, firms tend to use more interest-bearing loans to finance their inventory investment, whilst in poorly financially developed cities, they tend to use more trade credit. Also, in line with hypothesis H1c,

all financial development indicators non-interacted have a positive and significant direct impact on inventory growth. Similarly, in all specifications, the coefficients associated with loans and trade credit remain positive and statistically significant, providing further support for Hypotheses H1a and H1b. As for the other explanatory variables, the estimates are qualitatively similar to those reported in Table 3. In summary, these results suggest that our main findings are robust to using different city-level financial development indicators.

[Insert Table 4 here]

6.2.2. Accounting for endogeneity

6.2.2.1 Using a fixed-effect Instrumental Variable (IV) estimator

Financial development has often been considered to be endogenous in the finance-growth literature (Rajan and Zingales, 1998; Becker, 2007; Butler and Cornaggia, 2011). Economic outcomes may in fact have an impact on the demand for financial resources and instruments, which may, in turn, affect financial development indicators based on loans, deposits, or savings. Although it seems unlikely, in our case, that inventory investment is causal to our proxies for financial development, we take a cautious approach and verify whether our results are robust to instrumenting financial development to reduce these potential endogeneity concerns. To this end, following Becker (2007) and Butler and Cornaggia (2011), we first use the proportion of seniors in a given province and year as an instrument for financial development.[34] The intuition is that, compared to other age groups, seniors are less likely to participate in the labor force, and typically consume less, while they hold more bank deposits. Thus, a large proportion of seniors in a region will be positively associated with the local capital supply rather than the demand for business finance. As in Butler and Cornaggia (2011), this variable is used to instrument both *City_FinDev* and its interactions with interest-bearing loans and trade credit.

[34] Seniors are defined as people aged 65 and over. Data for the fraction of seniors is drawn from the National Bureau of Statistics (NBS). As we noticed a few outliers in our instrumental variable, we dropped them before running the regression.

Next, following Guiso *et al.* (2004), we use the number of bank branches in each city and year as an instrument for financial development and its interactions with loans and trade credit. The banks mainly include state-owned commercial banks (the "Big Five"), joint-stock commercial banks, and city commercial banks.[35] The rationale for using this instrument is that the number of bank branches is likely to be correlated with the level of financial development, but unlikely to be correlated with inventory investment.

The results of our fixed effects IV estimates are presented in Table 5. Column 1 presents the results using the number of seniors as an instrument for city-level financial development and its interactions. In column 2, we present the results using the number of bank branches in each city and year as an instrument. In both cases, in line with Hypotheses H1a, H1b, and H1c, interest-bearing loans, trade credit, and financial development all carry positive and statistically significant coefficients. Furthermore, in line with Hypothesis 2 and with the results reported in Table 3, we observe that the interactions between financial development and both interest-bearing loans and trade credit still respectively show positive and negative coefficients. In short, our main results are robust to accounting for the potential endogeneity of financial development.[36]

A rule of thumb for instrument validity is that the F-statistics associated with the first stage regressions relating each endogenous regressor to the entire set of instruments be greater than 10. We can see that in both columns 1 and 2 of Table 5, the F-statistics always meet this condition, suggesting that the relationship between the included endogenous regressors and the instruments is sufficiently strong to justify inference from the results. Other tests, such as the Cragg-Donald F-statistic and the Anderson statistic, which are reported in Table 5, also suggest that the instruments are adequate to identify the equation.[37]

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[35] We collected the information on bank branches manually from the official website: http://xkz.cbirc.gov.cn/jr/.

[36] The relatively small number of observations in column 2 is due to missing data on bank branches.

[37] The former, which is a test for weak identification, is much higher than the critical values proposed by Stock and Yogo (2005). The latter is distributed as chi-square under the null that the equation is

[Insert Table 5 here]

6.2.2.2 Using the system Generalized Method of Moments (GMM) estimator

Next, we go one step further and treat all regressors including the interaction terms as potentially endogenous. We re-estimate Equation (2) using the system GMM estimator developed by Arellano and Bover (1995) and Blundell and Bond (1998). We use levels of our regressors lagged three times and further as instruments in the first-differenced equations, and first-differences of these same variables lagged twice as additional instruments in the level equations. To ensure the validity of our instruments and the specification of the models, we present the *Hansen (J)* test and the test for third-order serial correlation of the differenced residuals (*m(3)* test).[38]

Column 3 of Table 5 presents the results. Although the *Hansen (J)* test indicates some issues with the instruments and/or the specification[39], the *m(3)* test suggests that the instruments used are valid, and our model is correctly specified. The coefficients associated with the interaction terms between both interest-bearing loans and trade credit and financial development are still significant and exhibit the expected signs, suggesting that our main findings are robust to controlling for the possible endogeneity of the regressors. However, we observe that financial development non-interacted is no longer significant. Loans non-interacted and lagged inventory investment also become insignificant. The fact that some variables lose significance when we use GMM could be explained bearing in mind that we use instruments lagged at least three periods. These instruments could be too distant in time to warrant the significance of the coefficients. Yet, as discussed in footnote 38, including instruments lagged twice caused the test for second-order autocorrelation of the differenced residuals to fail.

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unidentified. It should be noted that the Sargan test for overidentifying restrictions is not reported as the number of excluded instruments is identical to the number of endogenous variables.

[38] We initially used two lags of the regressors as instruments. Yet, because we found evidence of serial correlation of order two in the differenced residuals, we restricted the instrument set to lags three and deeper (Roodman, 2009). The full list of instruments used appears in the note to Table 5.

[39] The *J*-test rejects the null that the over-identifying restrictions are valid. This could be due to the fact that the presence of intra-cluster correlation or heteroskedasticity cause standard statistics to over-reject the null (Arellano and Bond 1991; Hall and Horowitz 1996). In line with this argument, using Monte Carlo experiments, Blundell *et al.* (2001) demonstrate that the Sargan test tends to over-reject the null hypothesis of valid instruments for the system GMM, especially for large samples.

6.2.3. Accounting for omitted variable bias

The associations that we found so far between interest-bearing loans and trade credit, on the one hand, and inventory investment, on the other, could be driven by one or more omitted variables, which are correlated with both loans/trade credit and inventory investment. If that were the case, we would get an inconsistent estimate of the effect of loans/trade credit on inventory investment.

We believe that by estimating our model with fixed effects (as done in the baseline and IV specifications) or in first differences (as done in the GMM specifications), we control for all omitted observed and unobserved time-invariant firm-characteristics, which are subsumed in the V_j component of the error term in Equations (1) and (2). However, these strategies might not solve the problem completely, as there could be time-varying omitted variables that drive the relationship between loans/trade credit and inventory investment. In order to deal with this problem, we undertake five further tests, which are described below.

6.2.3.1 Controlling for time-varying industry effects

Although all our models include industry, province, and year fixed effects, it is still possible that some unobserved time-varying industrial or provincial factors influence our estimation, leading to biased results. In our first test, we argue that interest-bearing loans/trade credit and inventory investment might have changed across different industries around the same time. This could be a concern considering that some industries may be more reliant on trade credit or interest-bearing loans. Following Thapa *et al.* (2020) and Bose *et al.* (2021), we therefore take this concern into account by verifying whether our baseline results in Table 3 are robust to including interactions between industry and time fixed effects into the model. The results are presented in Table C1 in Appendix C. Column 1 only includes interest-bearing loans and trade credit. Column 2 also includes financial development and its interaction with loans. Column 3 includes financial development and its interaction with trade credit, whilst column 4 includes financial development and both above-mentioned interactions. We can see that,

as in Table 3, interest-bearing loans and trade credit still carry positive and significant coefficients, whilst their interactions with city-level financial development still carry a positive and a negative coefficient, respectively. Local financial development non-interacted also shows a positive coefficient.

6.2.3.2 Controlling for time-varying provincial effects

In our second test, we further argue that both loans/trade credit and inventory investment might have varied across different provinces around the same time. To take this possibility into account, we follow Ren *et al.* (2021) and verify whether our results are robust to including provincial dummies interacted with year dummies in our baseline models. Once again, the results, which are presented in Table C2 in Appendix C, are very similar to the baseline results reported in Table 3.

6.2.3.3 Controlling for time-varying industry effects together with time-varying provincial effects

Our third test consists in including both the interactions between industry and time dummies and those between province and time dummies in the same model. The results are presented in Table C3 in Appendix C. Once again, we can see that, as in the baseline model, the coefficients associated with interest-bearing loans, trade credit, and financial development are all positive and significant. Furthermore, the coefficient associated with the interaction between loans and financial development is also positive and significant, whilst that associated with the interaction between trade credit and financial development is negative and significant.

6.2.3.4 Including additional control variables

Next, we verify that our main results in Table 3 are robust to estimating a new error-correction inventory investment model augmented with a series of additional control variables which could determine both our financial variables and inventory investment.

Specifically, we add the firm's age, liquidity,[40] the return on assets (ROA, measured as the ratio of the firm's total profits over total assets), collateral (defined as the ratio of the firm's tangible to fixed assets), and investment in fixed capital into the baseline error-correction model. The results, which are reported in Table C4 in Appendix C, show that all new additional variables with the exception of the firm's age, carry significant signs. Moreover, once again, in line with our hypotheses, the coefficients associated with interest-bearing loans, trade credit, and financial development are still positive and significant, whilst the coefficient on the interaction between loans and city-level financial development is positive, and that on the interaction between trade credit and local financial development is negative.

6.2.3.5 Estimating a "kitchen-sink" model

Our final test consists in estimating a "kitchen-sink" style model, which includes the additional control variables mentioned in the previous sub-section, together with the interactions between industry dummies and time dummies, and the interactions between provincial dummies and time dummies at the same time. The results are reported in Table C5 in Appendix C. Once again, they are consistent with our baseline results. This test, as well as the four tests described above suggest that our initial findings were unlikely to be driven by omitted variables.

6.2.3.6 Summary

We have shown that our baseline results are robust to including in our error-correction inventory investment models time-varying industry effects, time-varying provincial effects, as well as additional control variables both separately and contemporaneously. This makes it unlikely that the baseline results were driven by the omission of relevant variables. Yet, we recognize that even though we added several new variables, which could be common determinants of both inventory investment and the financial variables,

[40] *Liquidity* is defined as (current assets-current liabilities) over total assets and is used as a measure of internal finance (Chen and Guariglia, 2013). The slightly smaller number of observations in this table and the next one is due to missing values characterising some of the additional control variables included.
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we are simply not able to control for all confounding social, economic or policy events during our sample period, many of which may be unobservable. In other words, we have mitigated, but not completely solved the omitted variable bias problem. Our results need therefore to be taken with a pinch of salt.

7. Taking financing constraints into consideration

This section is aimed at testing Hypothesis 3, according to which financial development has a stronger impact on the choice of financing of inventory investment for firms more likely to face financing constraints. In Section 7.1, we differentiate firms according to ownership and, in line with Poncet *et al.* (2010) and Guariglia *et al.* (2011), consider private firms as most likely to face financing constraints. Then, in Section 7.2, we classify firms on the basis of alternative criteria which have been used in the literature to assess financial constraints, namely size and political affiliation. Finally, in Section 7.3, we differentiate firms according to whether they operate in coastal or inland regions. As they compete for a limited pool of funds, the former are more likely to face liquidity constraints (Guariglia *et al.*, 2011).

7.1. Differentiating firms according to ownership

7.1.1 Main results

In Table 6, we present estimates of Equation (2) differentiating firms by ownership types. Specifically, we partition our firms into state-owned (column 1), collective (column 2), private (column 3), and foreign (column 4), according to the shares of paid-in-capital contributed by the four types of investors in each year.

Our results suggest that the coefficients associated with the interaction terms between financial development and interest-bearing loans, on the one hand, and trade credit, on the other, are both statistically significant only for private firms (column 3). Specifically, the positive association between interest-bearing loans (trade credit) and inventory growth for private firms is 0.0846*0.73=6.2% higher (0.167*0.73=12.2% lower) in a city with financial development at the 75th percentile (1.30) relative to a city with financial development at the 25th percentile (0.57). In other words, in line with

Hypothesis 3, when they operate in cities characterized by a relatively high level of financial development, private firms, which are most likely to face financing constraints (Poncet *et al*., 2010; Guariglia *et al*., 2011), tend to make more use of cheaper interest-bearing loans to finance the accumulation of inventories. By contrast, in cities with a relatively low level of financial development, discrimination in bank lending becomes severe, and private firms are forced to rely more on expensive trade credit to invest in inventories. These results are in line with Ge and Qiu (2007), who, using survey data, show that high usage of trade credit helps non-SOEs bypass the limited access to formal interest-bearing loans and meet their financing needs.

[Insert Table 6 here]

For state-owned firms, none of the interaction terms are statistically significant, suggesting that the level of financial development has no impact on the choice of trade credit or interest-bearing loans to finance inventory investment. This finding is consistent with the view that due to strong connections with local governments and their role in maintaining social stability and keeping low unemployment rates, SOEs have the privilege to access funds from state banks, regardless of the level of financial development of the city in which they operate (Poncet *et al.*, 2010; Guariglia *et al.*, 2011).

Similar results are found for collective firms, with the exception of the negative and significant coefficient associated with the interaction between loans and the financial development indicator. This can be explained considering the low and negative average inventory investment characterizing collective firms (-1.0%, Table 1), which suggests that, in cities characterized by higher financial development, these firms may prefer to use interest-bearing loans for purposes other than inventory investment.

For foreign firms, only the interaction between financial development and trade credit shows a significant and negative coefficient, whilst the interaction with interest-bearing loans is not significant. This suggests that the higher the level of financial development of the city where they operate, the less do foreign firms rely on expensive

trade credit to finance their inventory investment.[41] However, if they are located in more financially developed cities, they do not show more reliance on interest-bearing loans. This is consistent with the view that regardless of the financial development of the city in which they operate, foreign firms keep a relatively low level of interest-bearing loans. In line with this argument, the descriptive statistics reported in Table 1 show that, compared to firms owned by other agents, foreign firms have the lowest interest-bearing loans to assets ratio. A possible explanation is that these firms are able to obtain funds from their parent companies. Additionally, the demand for bank finance may be lower for foreign firms due to their high profitability (Cull *et al.*, 2009).

Finally, we find that the coefficients associated with both interest-bearing loans and trade credit non-interacted are positive and significant for all types of firms. However, the coefficient associated with financial development is only significantly positive for private and foreign firms, which suggests these firms' inventory investment can directly benefit from financial development. By contrast, financial development is irrelevant to the inventory investment decisions of state-owned and collective firms, which enjoy privileged access to interest-bearing loans and show negative average inventory investment.

7.1.2. Robustness checks

A potential criticism of our ownership-based results is that a firm's true ownership may change during the sample period and this change could be endogenous. Firms could in fact change ownership to take advantage of or to avoid certain policies that affect particular ownership classes.[42] To tackle this issue, we first re-define a firm's ownership based on the average shares of capital paid-in by our four types of investors during the sample period, which are time-invariant. Next, to minimize the endogenous nature of the ownership structure, we also use the ownership classification made on the basis of

[41] The fact that the coefficient associated with the interaction between trade credit and financial development is actually larger in absolute value for foreign firms than for private does not contradict Hypothesis 3 as, according to Guariglia *et al*. (2011), both private and foreign firms show a strong sensitivity of asset growth to cash flow, which suggests both groups of firms are likely to face financing constraints.

[42] Just under 5% of the firms in our sample change ownership across the period.

ownership shares immediately before the start of the sample period. In both cases, we find similar results to those reported in Table 6.[43]

7.2. Differentiating firms according to size and political affiliation

We next re-estimate Equation (2) differentiating firms according to their likelihood of facing financial constraints. We make use of a conventional criterion (firms' size) and a Chinese-specific criterion (political affiliation) to proxy for the level of financing constraints faced by firms.

Small firms and firms without political affiliation are assumed more likely to face more serious financial constraints than large firms and firms with political affiliation (Beck *et al.,* 2005; Clementi and Hopenhayn, 2006; Guariglia, 2008; Guariglia *et al.*, 2011; Xu *et al.,* 2013; Guariglia and Mateut, 2016; Guariglia and Yang, 2016). This can be explained as follows. First, in China, legal protection for creditors is still weak, and small and medium-sized borrowers sometimes fail to pay back their loans (World Bank, 2006). Furthermore, it is more difficult for small firms to provide banks with collateral or evidence of a good track record. As there are no specific rules for SMEs' financial reporting, these firms are more likely to be subject to asymmetric information in financial markets, leading to higher financial premiums. In some cases, banks may even be reluctant to lend to small firms (Guariglia, 2008; Guariglia and Yang, 2016).

Second, compared to their unaffiliated counterparts, firms with political affiliation (*Lishu*) are more likely to have connections and private communication with the (central, provincial, or local) governments, which mitigates asymmetric information.[44] Politically affiliated firms are also more likely to have government support and subsidies, which gives them better access to key resources, such as interest-bearing loans at better conditions, tax benefits, and business operation licenses (Li *et al.,* 2008).

[43] These results are not reported for brevity but are available upon request. It should be noted that the NBS dataset does not provide information about firms' ownership in the years 2008 and 2009. To overcome this problem, we assume the ownership of firms does not change after 2007.
[44] See Appendix B for a detailed definition of political affiliation.

As a result, politically unaffiliated firms are more likely to face financing constraints than their politically affiliated counterparts.

The estimates of Equation (2) for firms characterized by relatively low and high financial constraints are reported in Table 7. In column 1 (2), we consider a firm facing low (high) financial constraints in a given year if its real total assets lie in the top (bottom) half of the distribution of the corresponding variable of all firms belonging to the same ownership group and operating in the same industry in that year.[45] In columns 3 and 4, we present results for firms with and without political affiliation, respectively.

[Insert Table 7 here]

We observe that the coefficients associated with the interaction terms (*Loan* City_FinDev* and *TC*City_FinDev*) are all significant for financially constrained firms regardless of how financial constraints are measured. Additionally, the magnitude of these coefficients is higher (in absolute value) for financially constrained firms compared to their financially healthier counterparts. For example, for small firms (column 2), the coefficients associated with *Loan* City_FinDev* and *TC*City_FinDev* are respectively 0.103 and -0.126, whereas the corresponding coefficients are only 0.0997 and -0.08 for larger firms (column 1). Furthermore, the coefficients associated with the two interactions are respectively 0.120 and -0.183 for firms without political affiliation (column 4) and -0.0214 and -0.0001 (insignificant) for firms with political affiliation (column 3). Based on the *t*-test proposed by Acquaah (2012), the differences in the coefficients associated with the interactions between the two groups are statistically significant in three out of four cases. Once again, these findings are in line with Hypothesis 3.

Furthermore, the coefficients associated with interest-bearing loans, trade credit, and financial development are positive and significant across all types of firms. Interestingly, the marginal effects associated with financial development are higher for

[45] As a robustness check, we also defined a firm as facing a relatively high (low) level of financing constraints in a given year if its total real assets fell in the bottom 30% (top 70%) of the distribution of the corresponding variable of all firms belonging to the same ownership group and operating in the same industry in that year. The results, which are not reported for brevity but available upon request, were very similar to those reported in Table 7.

firms more likely to face financing constraints (0.306, in column 2; and 0.327, in column 4) compared to their financially healthier counterparts (0.226, in column 1; and 0.083, in column 3), suggesting that financial development has a higher impact on inventory investment for financially constrained firms. This is consistent with the view that financially constrained firms are in higher need of external financing, and, as a result, can accumulate more inventories in cities with more financial development where it is easier to obtain interest-bearing loans (Beck *et al.*, 2008).

7.3. Differentiating firms according to regions

We next group the 31 Chinese provincial-level units into coastal and interior regions.[46] The rationale for this classification is that China not only has a very large territory, but its regional economy is far beyond full integration. During the transition period from a planned to an open market economy, the coastal region enjoyed the fastest growth rate in China. It also benefited from the open-door policy and the coastal development strategy (Chen, 2010), which can explain the high financial development figures reported in Table 2. Yet, firms operating in the fast-growing coastal region face high competition for a limited amount of funds (Guariglia *et al.*, 2011). They are therefore likely to suffer from severe financial constraints. In line with this argument, a World Bank's survey (2006) documents that firms in coastal regions, and especially SMEs, often find it difficult to obtain interest-bearing loans and, as a result, tend to meet their financial needs from informal sources of finance such as trade credit. Thus, residing in a city characterized by higher financial development could help these firms to gain easier access to formal funds, and, consequently, to rely less on expensive trade credit to accumulate inventories.

By contrast, interior regions are typically less developed and less financially sound than their coastal counterparts. As a result, the Chinese government established policies aiming at developing these regions, lowering the costs, and increasing the availability

[46] Interior regions encompass central and western regions. See Appendix B for details on the distribution of provincial-level units within regions.

of finance (Goodman, 2004; Guariglia *et al.*, 2011).[47] Firms operating in these regions are therefore less likely to face financing constraints as they benefit from financial incentives and heavily depend on policy-driven loans regardless of the financial development of the city where they are located (Ru, 2018).

Considering that regional variation is likely to affect firms' use of funds, we re-estimate Equation (2) separately for firms located in coastal and interior regions. Column 1 of Table 8 reports estimates for the former, and column 2, for the latter.

[Insert Table 8 here]

We observe that in all specifications, the coefficients associated with interest-bearing loans and trade credit are always positive and significant, suggesting that both types of financing promote inventory investment. The marginal effects associated with *City_FinDev* are also significant and positive in both coastal and interior regions. The magnitude of the former (0.29) is much higher than that of the latter (0.10). This suggests that firms operating in coastal regions, where there is high competition for a limited amount of funds, benefit the most from city-level financial development.

Next, focusing on the interaction terms (*Loan* City_FinDev* and *TC*City_FinDev)*, column 1 shows that for coastal firms, the use of interest-bearing loans is enhanced, and the use of trade credit discouraged in cities characterized by a higher financial development.

By contrast, column 2 shows that the coefficient associated with the interaction between interest-bearing loans and financial development is not significant. This is consistent with the view that firms operating in interior regions benefit from financial incentives and policy-driven loans regardless of where they are located (Ru, 2018). As a result, financial development is relatively unimportant to their use of interest-bearing

[47] After the late 1990s, regional development policies such as "the western development strategy", "the northeast revival strategy", and "the rise of central China strategy" have been implemented by the Chinese government in order to speed up the development of central and western regions and reduce regional imbalance. These policies involved the investment of a substantial amount of state funds in interior regions, especially in infrastructure, energy, and natural resources projects (Goodman, 2004). In line with these arguments, Liang *et al.* (2017) document that local governments in central and western regions have borrowed substantially to finance government-led infrastructure construction and other fixed asset investments through local government debt and urban construction and investment bonds (also known as Chengtou bonds).

loans. As firms operating in interior regions are less likely to face financial constraints than their coastal counterparts, this finding, coupled with the significant coefficient associated with the same interaction in column 1, is in line with Hypothesis 3.

Coming to the coefficient associated with the interaction between trade credit and financial development, it is significant in both coastal and inland regions, but larger in absolute value for the latter.[48] As firms located in coastal regions are more likely to face financial constraints than those in inland regions, this contradicts Hypothesis 3. A possible explanation is that in inland regions, local governments in more financially developed cities find it easier to borrow money, which they then use to support firms (Liang *et al.*, 2017). As a result, firms in more financially developed cities may have access to a pool of cheap loans, and as a result, may be able to reduce their use of expensive trade credit more.[49]

8. The role of the 2007 property rights reform

In Sections 6.2.2.1 and 6.2.2.2, we used IV fixed-effects and GMM models to account for the possible endogeneity of city-level financial development. However, our baseline regressions could still suffer from endogeneity problems. An alternative strategy to deal with this issue would be to exploit some exogenous regulation shock in the Chinese financial market. To this end, we have identified the property rights reform that took place in 2007 as a relevant exogenous regulation shock. Below we discuss our approach aimed at exploiting this quasi-natural experiment using a difference-in-differences (DiD) methodology.

To avoid a model with too many interaction terms, rather than estimating a model of inventory investment as a function of loans and trade credit within the DiD setting, we replace the latter two variables with a *Mix* variable, which represents the firm's loan share and is defined as the ratio between interest-bearing loans and the sum

[48] Based on the *t*-test proposed by Acquaah (2012), the differences in the coefficients associated with both the interactions between the two groups are statistically significant.

[49] Unreported statistics suggest that the trade credit to assets ratio is lower in the interior regions (13.6%) compared to the coastal regions (15.8%). The higher coefficient associated with the interaction between trade credit and financial development for inland firms can therefore not be explained by the fact that these firms use more trade credit.

of loans and trade credit (Kashyap *et al.*,1993). We first introduce this variable non-interacted in the model. Next, we introduce an interaction of the *Mix* with city-level financial development. We then apply a difference-in-differences approach exploiting the 2007 property rights reform. To reduce the possibility that our results could be driven by differences in firms' fundamentals between the treated and control groups, we next verify whether our results are robust to estimating our DiD specifications on matched samples. We believe that this approach provides a clean identification of the causal effect of financial development on the choice of financing of inventory investment.

8.1 Estimating inventory investment models as a function of the *Mix*

In order to directly test the extent to which the mix between interest-bearing loans and trade credit relates to inventory investment, we create a *Mix* variable in the spirit of Kashyap *et al.* (1993), defined as the ratio between interest-bearing loans and the sum of interest-bearing loans and trade credit. The mean value of the *Mix* within our sample is 0.69, suggesting that, on average, firms tend to make more use of interest-bearing loans than trade credit. One possible reason for this finding is that trade credit is typically more expensive than loans (Petersen and Rajan, 1997; Ng *et al.,* 1999; Nilsen, 2002; Pike *et al.,* 2005; Giannetti *et al.,* 2011; Chod, 2017).

We then estimate an error-correction model of inventory investment similar to that presented in Equation (1) but replacing the loans and trade credit variables with the *Mix*. Our new model takes the following form:

$$\Delta I_{j,t} = \beta_0 + \beta_1 \Delta I_{j,t-1} + \beta_2 \Delta S_{j,t} + \beta_3 \Delta S_{j,t-1} + \beta_4 (I_{j,t-1} - S_{j,t-1}) + \beta_5 Mix_{j,t} + V_j + V_t + V_k + V_p + V_0 + e_{j,t} \quad (3)$$

where all subscripts, variables and components of the error term are the same as those in Equation (1), with the exception of the *Mix* which is defined above.

In a world characterized by perfect capital markets, firms could substitute between different sources of financing in a costless way. Hence, the *Mix* should not

affect any real corporate activity. Yet, in the Chinese context, many firms are unable to easily access interest-bearing loans at a reasonable cost (Guariglia et al., 2011), and are forced to make use of trade credit to finance their inventory investment, especially in cities characterized by relatively poor financial development. As the coefficients on loans and trade credit reported in Table 3 show that trade credit plays a more prominent role than loans in financing inventory investment, we expect the *Mix* to carry a negative sign in our main model. In other words, the higher the proportion of loans carried by the firm, the lower will the firm's investment in inventories be. This is because bank loans (which represent the largest component of interest-bearing loans) are hard to get in China and, consequently, firms prefer to use them for purposes other than inventory investment, such as, for instance, investment in fixed capital.

The estimates of Equation (3) are presented in column 1 of Table 9. In line with our expectations, we can see that the *Mix* carries a negative coefficient. This suggests that a higher loan share is indeed associated with a lower investment in inventories, probably because Chinese firms prefer to use trade credit rather than loans to finance their inventory investment. As interest-bearing loans are hard to get and/or expensive, it is in fact likely that firms prefer to use them to finance investment in fixed capital rather than inventory investment. To verify whether this is the case, we also estimated a dynamic model for investment in fixed capital as a function of sales growth, lagged sales growth, the firm's size, age, and ROA, and the *Mix*. The results, which are presented in column 2 of Table 9, show that the coefficient associated with the *Mix* is positive and statistically significant. These results, coupled with those in column 1, confirm that firms with a higher leverage share indeed prefer to invest in fixed capital rather than in inventories.

[Insert Table 9 here]

Next, we include in Equation (3) both city-level financial development and its interaction with the *Mix*. We expect the sign associated with the interaction to be positive and significant. In cities characterized by higher financial development, it is in fact easier for firms to obtain loans and, as a result, firms will have an incentive to use

cheaper loans rather than expensive trade credit to finance their inventory investment. We therefore expect that a higher loan share will become positively associated with higher investment in inventories in cities characterized by a sufficiently high level of financial development. The results in column 3 of Table 9 show that the *Mix* still carries a negative coefficient, whilst the interaction between the *Mix* and financial development attracts a positive coefficient. The coefficients suggest that the association between inventory investment and the *Mix* becomes positive once financial development reaches a value of 1.15 (0.133/0.119), which is close to the mean value of financial development in the sample used to run this regression (1.005). Furthermore, as in previous tables, in columns 3 of Table 9, financial development non-interacted shows a positive coefficient, suggesting that a higher level of financial development promotes inventory investment.

In a nutshell, these results suggest that overall, firms with a higher loan share will invest less in inventories. However, this tendency reverses if they are based in cities with a sufficiently high level of financial development, where loans are easier and cheaper to get and can be used to fund a wider range of activities.

8.2 The 2007 property rights reform

We next use the property rights reform of 2007 as an exogenous regulation shock and analyze how it affected the financing of inventory investment of firms located in cities with different degrees of financial development. The reform was the result of China's new Property Rights Law, which was passed on March 16, 2007 and came into effect on October 1 of that same year. As explained by Berkowitz *et al*. (2015), the reform strengthened property rights for firms and their creditors. Specifically, as a result of the reform, if a firm defaulted on a loan, creditors were given the right to seize its collateral. Creditors were also promised full compensation in case a borrower damaged the collateral associated with a loan. Furthermore, the local governments' power to expropriate private assets was limited. As a result, creditors faced a lower risk to see the collateral underlying their secured loans expropriated. Finally, the reform also enabled borrowers to use liquid assets as collateral (Zeng *et al*., 2019). Its enactment should therefore have made it easier for firms to gain access to formal external finance

such as bank loans.

Li *et al.* (2021) argue that the reform is likely to matter only (or at least more) if it is enforced, which is more likely to happen in provinces with a better legal and institutional environment. To test whether this is the case, they use several measures for the legal and institutional environment characterizing Chinese provinces. One of these measures is financial development. The authors find that the effects of the reform on export quality (which is the focus of their study) were stronger in provinces characterized by a better legal and institutional environment in general, and by a higher level of financial development in particular. Following Li *et al.*'s (2021) arguments, we expect the reform to make access to loans easier for firms, especially if they are based in cities characterized by a sufficiently high level of financial development prior to the reform, where the reform is more likely to be enforced. Conversely, the reform is less likely to matter in cities where loans were not widely used prior to 2007.

8.3 Difference-in-differences approach

We hereafter use the 2007 property rights reform as a quasi-natural experiment and make use of a DiD methodology. This approach enables us to remove biases in the differences in the sensitivity of inventory investment to financial variables among firms located in cities characterized by different levels of financial development that could be the result of permanent differences between these firms. It also enables us to remove biases from differences over time that could be the result of trends.

8.3.1 Main specification

Firms located in cities characterized by relatively high pre-reform financial development, where the enforcement of the reform is likely to be higher (Li *et al.,* 2021), make up our treatment group. We therefore define a treatment dummy variable, *Treat*, which is equal to 1 for firms located in cities with relatively high financial development prior to the reform, and 0 otherwise. We initially define cities as having relatively high ex-ante financial development if their average financial development in the pre-reform years lies in the top half of the distribution of the average financial development of all

cities over that period. We next verify whether our results are robust to defining cities as having relatively high financial development if their average financial development in the pre-reform years lies in the top two thirds and three quarters of the same distribution. Firms located in other cities constitute our control group. Next, as the reform came into effect in 2007, we create a dummy *Post* equal to 1 in 2007 and subsequent years, and 0 otherwise. We then estimate the following DiD model:

$$\begin{aligned}\Delta I_{j,t} = {} & \beta_0 + \beta_1 \Delta I_{j,t-1} + \beta_2 \Delta S_{j,t} + \beta_3 \Delta S_{j,t-1} + \beta_4 (I_{j,t-1} - S_{j,t-1}) + \beta_5 Treat_c + \beta_6 Post_t + \beta_7 Mix_{j,t} \\ & + \beta_8 Post_t * Mix_{j,t} + \beta_9 Treat_c * Mix_{j,t} + \beta_{10} Treat_c * Mix_{j,t} * Post_t + V_j + V_k + V_p + V_0 + e_{j,t}\end{aligned} \quad (4)$$

where all variables and components of the error terms are either identical to those in Equation (1) or defined above.[50] The key term in Equation (4) is the triple interaction between the *Mix*, the *Treat* dummy, and the *Post* dummy. The coefficient associated with this interaction captures the difference-in-differences estimate in the sensitivity of inventory investment to the *Mix* between treated and control firms across the pre- and post-reform periods. In other words, the coefficient captures the extent to which firms with a higher loan share based in cities characterized by a relatively high level of pre-reform financial development show a different inventory investment after the reform relative to firms located in less financially developed cities. We expect this coefficient to be positive and significant. As a result of the reform, interest-bearing loans will in fact be available more easily, especially in regions characterized by relatively high pre-reform financial development, where the enforcement of the reform is likely to be higher (Li *et al.,* 2021). As a result, treated firms will have a higher incentive to use cheaper loans rather than expensive trade credit to finance their inventory investment, meaning that a higher loan share will be associated with higher investment in inventories.

[50] We do not include year dummies in the models because doing so would introduce collinearity with the *Post* dummy. As a result, the V_t component of the error term is excluded in Equation (4).

8.3.2 Results

The estimates of Equation (4) are presented in Table 10. Column 1 presents results in which treated firms are firms located in cities in the top half of the distribution of pre-reform average financial development. In column 2, treated firms are those in cities in the top two thirds of the distribution, and in column 3, those in cities in the top three quarters of the distribution. We can see that the coefficient associated with the *Mix* non-interacted is negative, and so is the coefficient associated with the interaction between the *Mix* and the *Post* dummy (column 1).[51] These coefficients suggest that the *Mix* is negatively associated with inventory investment throughout the sample period, suggesting that firms are more likely to use trade credit rather than interest-bearing loans to finance their inventory investment. Yet, in line with our expectations, in all specifications, the coefficient associated with the triple interaction is positive, statistically significant and much larger than the sum of the two above-mentioned negative coefficients. This suggests that, after the reform, the negative association between the *Mix* and inventory investment is reversed for firms located in cities with relatively high pre-reform financial development. This finding can be explained bearing in mind that after the reform, it becomes easier for firms located in high pre-reform financial development cities to obtain loans. As a result, these firms will tend to invest more in inventories the higher their loan share. These results do not necessarily mean that the *Mix* increased for treated firms after the reform.[52] They just suggest that a higher loan share is more likely to be associated with higher inventory investment for treated firms after the reform. In other words, firms with a higher loan share located in cities characterized by higher pre-reform financial development became more willing to invest in inventories after the reform.[53]

[51] The coefficient associated with the *Mix* non-interacted is, however, only statistically significant in column 1, whilst the coefficient associated with the interaction between the *Mix* and the *Post* dummy is significant in all specifications.

[52] Unreported results confirm in fact that the mean value of the *Mix* did not show a statistically significant difference among the pre- and post-reform periods for treated firms, regardless of how we defined treated firms.

[53] For comparison, we estimated a dynamic model for investment in fixed capital as a function of sales growth, lagged sales growth, size, age, ROA, and the same interaction terms involving the *Mix*, the treated dummy, and the post dummy as in Equation (4). Regardless of the way we defined treated firms, the coefficient associated with the triple interaction was never statistically significant, suggesting that

[Insert Table 10 here]

In summary, in this Section, we have used the 2007 property rights reform as a quasi-experiment. We have found that whilst the *Mix* was negatively associated with inventory investment throughout the sample period, indicating that firms generally prefer trade credit to interest-bearing loans to finance their inventory investment, firms located in cities with high pre-reform financial development show a positive association between the *Mix* and inventory investment after the reform. We have explained these findings considering that the reform made it easier for these firms to obtain loans, which, being cheaper than trade credit, could then be used to finance inventory growth. This approach provides further support to our Hypothesis 2, whilst enabling us to alleviate the endogeneity problem characterizing financial development in our initial models.

8.3.3 Testing the parallel trend assumption

The validity of the difference-in-differences approach critically depends on the parallel trend assumption that the sensitivity of inventory investment to the *Mix* among the treated firms would have behaved similarly to that of the control firms in the absence of the the Property Rights Law. In order to make sure that pre-existing trends were not there, we replaced the triple interaction term between *Mix, Treat,* and *Post* in Equation (4) with the following interaction terms, each based on a different year: *Treat*Mix*year2005*, *Treat*Mix*Year2006*, *Treat*Mix*Year2007*, *Treat*Mix*Year2008*, *Treat*Mix*Year2009*. We expect the coefficients associated with the interactions involving the years preceding the reform to be statistically insignificant and those associated with the years following the reform to be significant. We also replaced *Mix*Post* and *Treat*Post*, with interactions with individual year dummies.

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after the reform, there was no change in the association between the *Mix* and investment in fixed capital for treated firms. Nevertheless, the *Mix* itself and/or the *Mix* interacted with the treated dummy always showed a positive coefficient, indicating that a higher loan share is generally associated with a higher investment in fixed capital. These results, which are not reported for brevity, but are available upon request, suggest that the reform did not affect the association between the *Mix* and investment in fixed capital, but only that between the *Mix* and inventory investment. In other words, the reform made firms with a higher loan share located in cities with high pre-reform financial development more willing to invest in inventories.

The results are presented in Table 11. In column 1, treated firms are defined as those located in cities characterized by a pre-reform financial development in the top half of the distribution. In column 2, treated firms are those in cities in the top two thirds of the distribution, and in column 3, those in cities in the top three quarters of the distribution. As our key coefficients are those associated with the triple interactions, we only report the coefficients associated with the interactions between *Mix, Treat*, and the year dummies. In line with our expectation, we can see that in all specifications, only the coefficients associated with *Mix*Treat*Year2008* and *Mix*Treat*Year2009* are statistically significant. In other words, firms located in cities with relatively high pre-reform average financial development start to show higher inventory investment the higher their *Mix* only in 2008 and 2009, i.e. after the property rights reform.[54] This confirms our hypothesis that after the reform, it became easier for firms located in those cities where the enforcement of the reform was likely to be higher, to obtain loans. As a result, firms with a higher loan share became more willing to invest in inventories after the reform.

[Insert Table 11 here]

In conclusion, the results in Table 11 indicate that our main DiD estimates do not capture any pre-existing trends, and that the parallel trend assumption is supported.

8.4 Difference-in-differences estimation on matched samples

8.4.1 Rationale for repeating the previous analysis on matched samples

In our baseline DiD regressions, we separated firms into those belonging to the treatment group and those belonging to the control group based on the ex-ante level of financial development of the city where they reside. Specifically, we defined a firm as belonging to the treatment (control) group if the pre-reform average financial development of the city in which it operates falls within the top part (bottom part) of the distribution of the average pre-reform financial development of all cities. In line

[54] The statistically insignificant coefficient associated with *Treat*Mix*Year2007* could be explained bearing in mind that, as discussed above, the Property Rights Law only came into effect on October 1st 2007.

with Li *et al.* (2021), we argued that firms in the treatment group are more likely to benefit from the 2007 property rights reform as the reform is more likely to be enforced in cities that start off with a sufficient level of financial development. We found that after the reform, the association between the *Mix* and inventory investment turns from negative to positive for treated firms (see Table 10). We explained this finding arguing that the reform made it easier and cheaper for treated firms to obtain loans. As a result, firms with a higher loan share became more willing to invest in inventories after the reform. Yet, our findings could also be accounted for by other possible explanations. There could, in fact, be systematic differences between firms in the treatment and control groups. Comparing firms in the treatment and control groups, in unreported descriptive statistics, we observe in fact that the former are typically larger, older and show a higher investment in both fixed capital and inventories, as well as lower sales growth and lower liquidity.[55] As such, our results could be driven by differences in fundamentals between firms in the two groups.

8.4.2 Creating the matched samples

An ideal way to mitigate this concern would be to randomly assign firms to the treatment and control groups. As this is not feasible, to minimize the effects of selection based on observed firm characteristics, we make use of a propensity score matching method (PSM, Abadie and Imbens, 2011) to create a matched sample of treated and control firms which are as similar as possible. In order to do this, we follow Chen *et al.* (2019) and only focus on the cases in which the treated firms are defined as those based in cities with pre-reform financial development in the top two thirds and three quarters of the distribution. As our control group is the smallest in both cases, we initially redefine our control group as the treatment group.[56] Next, for each newly defined

[55] The differences in the means of all the above-mentioned variables among firms in the treatment and control groups were statistically significant at the 1% level.

[56] We did not perform this exercise for the split at the median, as propensity score matching is typically applied when the treatment group is smaller than the control group or vice versa. In line with this principle, Chen *et al*. (2019) initially split their sample into high- and low-quality firms if their profitability falls above or below the industry median. Yet, when they undertake their propensity score analysis, they redefine firms as treated if their profitability falls in the top quartile of the distribution (see Section 4.5.2

treated firm, we identify a control firm with similar characteristics. To this end, we initially estimate a Logit model aimed at assessing the probability of being in the newly defined treatment group as a function of pre-sample size, sales growth, inventory investment, leverage, and liquidity, as well as year dummies, ownership dummies, and industry dummies.[57] Fitted values from this regression give the propensity score.

Next, we perform a one-to-one nearest neighbor matching with replacement, which matches each treated firm with the control unit which is closest in terms of propensity score (Rosenbaum and Rubin, 1983). With matching with replacement, comparison units can be used as matches more than once if necessary. Dehejia and Wahba (2002) show that matching with replacement reduces bias compared to matching without. Following Chen *et al.* (2019), we use the caliper matching method, in which caliper refers to the difference in the predicted probabilities between the treatment and control firms. We match within a caliper of 1%.

8.4.3 Assessing the quality of the matching

In order to improve matching quality, we impose the common support, which helps avoid matching bias by dropping those treated observations whose propensity scores are higher than the maximum or lower than the minimum of the propensity score of untreated firms. It should be noted, however, that very few observations fail to satisfy the common support condition.

To gauge the quality of the matching procedure, we run variable-specific balancing tests (Leuven and Sianesi, 2003). Table 12 reports the means of all variables used to obtain the propensity score for the treated and control groups in the matched sample, the t-statistic indicating whether the differences in these means across the two groups are statistically significant, and the mean variable-specific standardized percentage bias. The first (last) four columns of the Table refer to the case in which treated and control firms are defined based on the 25% (33.33%) threshold of pre-

on page 13). It is also noteworthy that our results were robust to using different sets of explanatory variables within the Logit model.

[57] Provincial dummies are excluded as our treatment variable is a geographical variable.

reform financial development. In both cases, the *t*-test results suggest that, despite the relatively large size of our sample, for almost all our conditioning variables, we cannot reject the null hypothesis of no difference in means between treated and matched controls after matching. This is reassuring as the *t*-tests are heavily dependent on sample size (Imbens and Wooldridge, 2009). Another reassuring fact that emerges from the Table is that the mean variable-specific standardized percentage bias is always lower than 5% after matching (Rosenbaum and Rubin, 1985). Finally, Rubin (2001) recommends Rubin's B statistic to be less than 25, and Rubin's R statistic to be between 0.5 and 2 for the samples to be sufficiently balanced, which is what we find. These statistics suggest that the matching process excludes meaningful differences along observed matching dimensions between firms in the treatment and control groups.

[Insert Table 12 here]

8.4.4 Main results

Having identified a matched sample of highly comparable propensity score matched firms, our final step consists in estimating our DiD models again on this matched sample. Before doing so, we redefine our treatment group as the control group to ensure that our regression results are comparable to the baseline estimates. The combination of matching and a difference-in-differences approach means that we look for divergence over time in sensitivities of inventory investment to the *Mix* between firms located in cities with a relatively high level of pre-reform financial development and matched control firms with similar characteristics.

The estimates of our DiD specification based on the matched sample are reported in Table 13. The results confirm the findings in Table 10. We can see, in fact, that the coefficient associated with the triple interaction between the *Mix*, the *Treat* dummy variable, and the *Post* dummy variable is positive and significant. This suggests, once again, that after the reform, the association between the *Mix* and inventory investment becomes positive for firms located in those cities with sufficiently high pre-reform financial development, where the reform was more likely to be enforced.

[Insert Table 13 here]

8.4.5 Results accounting for financing constraints

We next provide estimates of DiD models on matched samples differentiating firms according to ownership, size and political affiliation, and location. The aim of this exercise is to test the extent to which, financially constrained firms (i.e. private firms, firms based in coastal regions, small firms, and politically unaffiliated firms) located in cities with relatively high pre-reform financial development are affected more by the 2007 reform compared to their financially healthier counterparts.

Table 14 presents the DiD estimates on matched samples differentiating firms by ownership (Panel A); size and political affiliation (Panel B); and location (Panel C). For brevity, the Table only refers to the case in which the treated firms are defined as those whose pre-reform average financial development falls in the top three quarters of the distribution. Similarly, for brevity, the Table only reports the coefficients on the triple interaction term between the *Mix*, the *Treat* dummy, and the *Post* dummy.[58]

The results in Panels A of the Table suggest that the coefficients associated with the triple interaction terms are only significant for private companies, which are most likely to be financially constrained. Furthermore, Panels B and C show that the coefficients associated with the triple interaction are only significant for small firms, unaffiliated firms, and firms located in the coastal region. Based on the *t*-test proposed by Acquaah (2012), the differences in the coefficients associated with the triple interactions for firms located in coastal and interior provinces; small and large firms; and affiliated and unaffiliated firms are always statistically significant at the 1% level.

[Insert Table 14 here]

These results suggest that after the reform, it was mainly financially constrained firms located in cities characterized by a relatively high pre-reform financial development which invested more in inventories if they had a higher loan share. This can be explained considering that the reform made it easier for these firms to obtain loans and, as a result, they could use these loans not only to invest in fixed capital

[58] Full results for each type of firm are available upon request.

(which they did even before the reform), but also to invest in inventories. The fact that this higher tendency to invest in inventories the higher the *Mix* was driven by firms more likely to face financing constraints provides further support for our third hypothesis.

8.5 Summary

We find that overall, the higher their loan share, the lower firms' inventory investment. Yet, this association becomes positive with a sufficiently high level of financial development. Moreover, taking into account the 2007 property rights reform, firms located in cities with a higher pre-reform level of financial development (i.e. in cities where the reform was more likely to be enforced) started showing a positive association between loan share and inventory investment after the reform. These effects are more pronounced for private firms, firms located in coastal areas, small firms, and politically unaffiliated firms. We can conclude that financial development coupled with the 2007 property rights reform encourages firms to change the way they finance their inventory investment away from trade credit and towards interest-bearing loans. As loans are cheaper, this is likely to enhance inventory investment and hence economic growth.

9. Conclusion

Using a panel of 224,604 Chinese firms operating in 287 cities over the period 2004-2009, together with a set of unique city-level financial development data, this paper presents evidence on how financial development affects the use of different sources of financing, namely interest-bearing loans and trade credit, to finance corporate inventory investment.

Our results suggest that both interest-bearing loans and trade credit play a significant role in financing inventory investment. We also find that financial development promotes firms' inventory investment. Furthermore, we document that financial development encourages firms to change the way they finance their inventory investment away from trade credit and towards loans. These effects are more pronounced after the 2007 property rights reform, as well as for privately-owned firms,

small firms, firms with no political connections, and firms located in coastal regions. Our results are robust to using a variety of specifications; different measures of financial development, financial constraints, and corporate ownership; as well as different estimation methods. Our work adds city-firm-level evidence within one single country to Fisman and Love (2003)'s findings about the relation between financial development and trade credit in a country-industry-level setting.

Our findings provide a portrait of the choice of financing used by different types of Chinese firms. They offer new insights into the finance-growth relationship in an emerging market by providing microeconomic evidence on the relationship between financial development and inventory investment, which is known to significantly affects economic growth. The importance of informal and more expensive finance such as trade credit for private coastal financially constrained firms operating in cities characterized by low financial development suggests that poorly developed and inefficient financial markets might be an obstacle restricting the fast growth of these firms. If these firms were to develop difficulties in obtaining trade credit, then China's fast growth could be jeopardized. Given that private firms and SMEs operating in coastal regions constitute the engine of growth of the Chinese economy, policymakers should think about creating a more supportive legal and regulatory system to promote the use of formal sources of funds for these firms. A more effective financial system and further improvements in the allocation of resources would therefore benefit the economy. Positive steps in this direction have already been taken. In addition to the 2007 property rights reform, more recent reforms to the financial system have led to a significant increase in the flow of loans to the private sector in recent years (Lardy, 2014; Borst and Lardy, 2015).

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Appendix A: Structure of the panel

Table A1 presents the structure of our panel.

[Insert Table A1 here]

Appendix B: Variable definitions

Firm-level variables

I: inventories, measured as the sum of the firm's work-in-progress inventories, raw materials, and finished goods.

ΔI: inventory investment, measured as the log-difference of the firm's inventories of end of year *t* and end of year *t*-1.

S: total sales (including both domestic and overseas sales).

ΔS: sales growth, measured as the log-difference of the firm's total sales of end of year *t* and end of year *t*-1.

TC: trade credit, measured as the ratio of accounts payable to total assets.

Loans: interest-bearing loans, measured as the ratio of the sum of long-term and short-term debt (net of trade credit) to total assets.

Age: number of years the firm has been incorporated.

Total Assets: natural logarithm of the sum of the firm's fixed and current assets.

Liquidity: ratio of the difference between current assets and current liabilities to total assets.

Investment: Investment in fixed capital to assets ratio. This variable is calculated as the ratio of the difference between the book value of tangible fixed assets of end of year *t* and end of year *t*-1, adding depreciation, and dividing by total assets.

ROA: return on assets, calculated as the ratio of total profits to total assets.

Size: logarithm of the firm's total assets

Collateral: ratio of the firm's fixed assets to total assets.

Deflator: All variables (except *Age*) are deflated using the GDP deflator, which is obtained from the Federal Reserve Bank of Atlanta.

Ownership: We classify firms into four ownership categories (SOEs, foreign, collective, and private firms), based on the majority share of capital paid-in by each type of investor in each year.

Political affiliation (Lishu):

Lishu=10: affiliated at the central level; *Lishu*=20: affiliated at the provincial level; *Lishu*=40: affiliated at the city or district level; *Lishu*=50: affiliated at the county level; *Lishu*=61: affiliated at the street level; *Lishu*=62: affiliated at the town level; *Lishu*=63: affiliated at the township level; *Lishu*=71: affiliated at the community level; *Lishu*=72: affiliated at the village level; *Lishu*=90: no political affiliation.

We define firms with political affiliation if they have any type of political affiliation (i.e. $Lishu \neq 90$), and firms without political affiliation, otherwise *(Lishu*=90).

Chinese regional/provincial units

Regions:

Coastal; interior (central and western).

Provincial Units:

There are 31 provincial-level administrative units in mainland China: Coastal provinces (Beijing, Fujian, Guangdong, Hainan, Hebei, Jiangsu, Liaoning, Shandong, Shanghai, Tianjin, and Zhejiang); central provinces (Chongqing, Anhui, Heilongjiang, Henan,

Hubei, Hunan, Jiangxi, Jilin, and Shanxi); and western provinces (Gansu, Guangxi, Guizhou, Neimenggu, Ningxia, Qinghai, Shaanxi, Sichuan, Xinjiang, and Yunnan).

City-level financial development indicators

City_FinDev: ratio of total loans (from both bank and non-bank institutions) in the city's financial system to the city's gross regional product (GRP). Bank loans mainly include loans from the following institutions: the "Big Five" banks, joint-stock commercial banks, city commercial banks, foreign banks, policy banks, rural commercial banks, and rural cooperative banks. Non-bank loans include loans from institutions of the following types: rural credit cooperatives, urban credit cooperatives, postal savings banks, new-type rural financial institutions, financial asset investment companies, trust and investment corporations, private credit agencies, financial lease companies, consumer financial companies, automobile financial companies, and so on.

City_FinDev2: ratio of total deposits in the city's financial system to the city's GRP.

City_FinDev3: ratio of total savings in the city's financial system to the city's GRP.

City_FinDev4: ratio of total loans in the city's main district to the GRP of the city's main district.

City_FinDev5: Composite index of financial development calculated by aggregating *City_FinDev*, *City_FinDev2* and *City_FinDev*3 following the procedure outlined in Amidžic *et al.* (2014). In a nutshell, we first standardized *City_FinDev*, *City_FinDev2* and *City_FinDev*3. Second, we used factor analysis to derive a weighting scheme. Third, we computed the composite index based on a weighted geometric mean of each component for each city in each year.

Appendix C: Augmenting our models with different sets of additional variables

Table C1 presents estimates of our inventory investment models augmented with time-varying industry effects. Table C2 presents estimates of our inventory investment models augmented with time-varying provincial effects. Table C3 presents estimates of our inventory investment models augmented with both time-varying industry effects and time-varying provincial effects. Table C4 presents estimates of our inventory

investment models augmented with additional control variables. Table C5 presents estimates of our inventory investment models augmented with time-varying industry effects, time-varying provincial effects, and additional control variables.

[Insert Tables C1 to C5 here]

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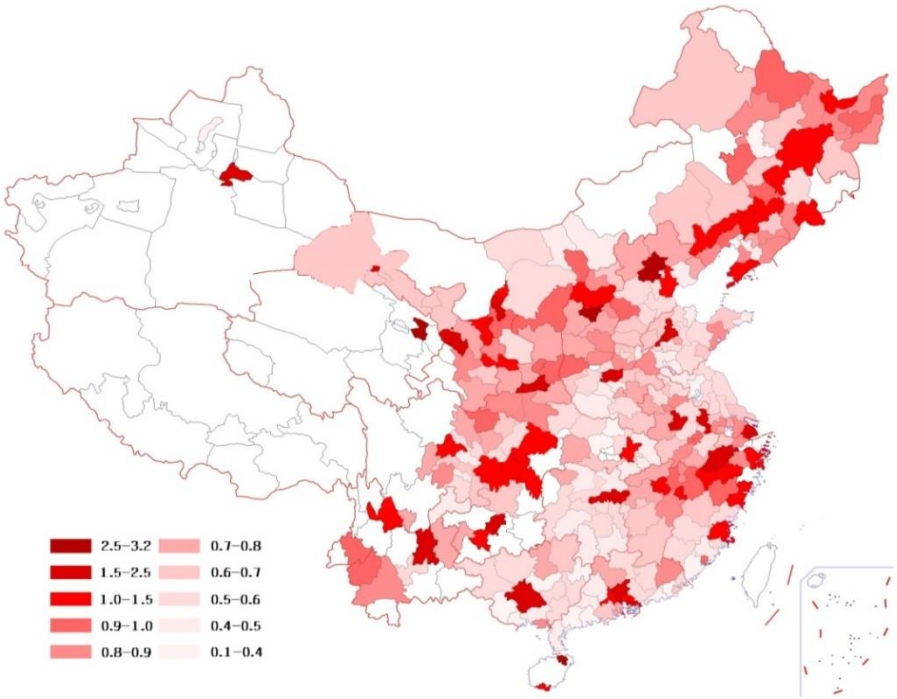
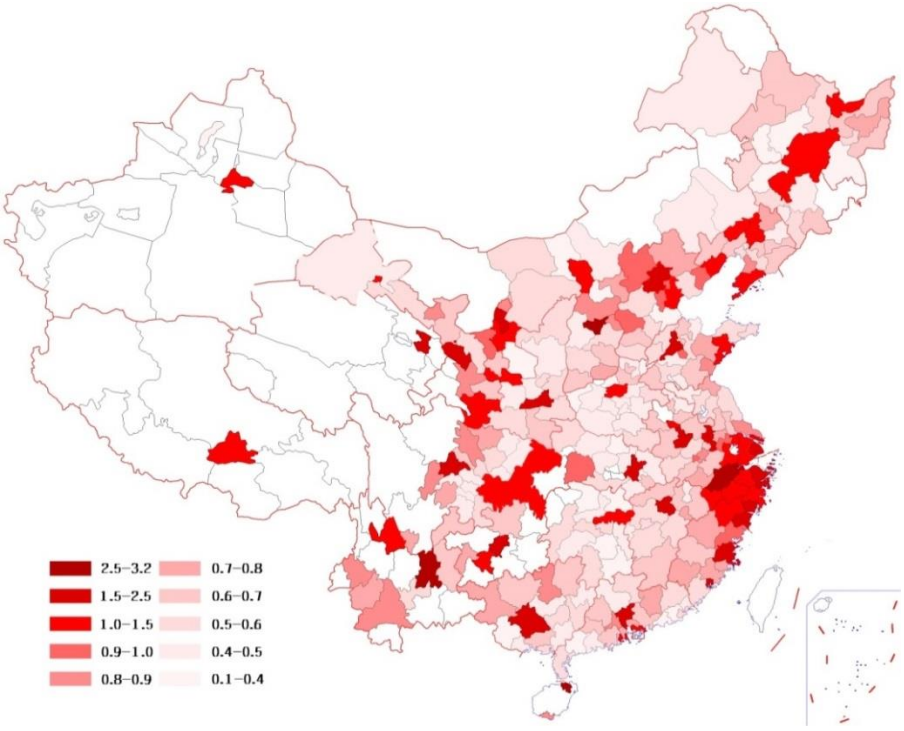
Figure 1: City-level financial development in China



2004



2009

Note: This figure presents the city-level financial development in China in 2004 and 2009. The level of financial development of a city is measured by the ratio of total loans (from both bank and non-bank institutions) in the city's financial system to the city's gross regional product (GRP).
Source: *China City Statistical Yearbook.*

Table 1
Sample means and medians (in parentheses) of key variables

	(1) *All*	(2) *SOEs*	(3) *Collective*	(4) *Private*	(5) *Foreign*
ΔI	0.031	-0.049	-0.010	0.044	-0.005
	(0.025)	(-0.023)	(-0.009)	(0.033)	(0.009)
ΔS	0.060	-0.005	0.031	0.077	-0.008
	(0.062)	(0.011)	(0.038)	(0.078)	(0.008)
I-S	-2.614	-1.797	-2.564	-2.735	-2.165
	(-2.434)	(-1.638)	(-2.372)	(-2.568)	(-1.977)
TC	0.153	0.127	0.157	0.147	0.185
	(0.099)	(0.079)	(0.102)	(0.093)	(0.130)
Loans	0.374	0.421	0.380	0.395	0.259
	(0.363)	(0.412)	(0.366)	(0.392)	(0.210)
Total Assets	9.432	9.785	9.445	9.354	9.756
	(9.412)	(9.850)	(9.428)	(9.319)	(9.784)
Age	9.516	22.767	15.697	8.863	8.523
	(7.000)	(16.000)	(13.000)	(7.000)	(8.000)
Observations	579,250	13,576	31,728	443,669	89,474

Note: This table reports sample means and medians (in parentheses) of key variables used in this paper. *SOEs, collective, private*, and *foreign* respectively denote state-owned, collective, privately-owned, and foreign-owned firms. Definitions of all other variables are shown in Appendix B. All variables except *Age* are deflated using the GDP deflator provided by Federal Reserve Bank of Atlanta.

Table 2
Sample means and medians (in parentheses) of the indicators of financial development

	(1) *All*	(2) *Coastal*	(3) *Interior*
City_FinDev	0.723	0.781	0.6911
	(0.600)	(0.647)	(0.5812)
City_FinDev2	1.143	1.189	1.118
	(1.015)	(1.068)	(0.9893)
City_FinDev3	0.680	0.661	0.690
	(0.654)	(0.64)	(0.666)
City_FinDev4	1.036	1.094	1.005
	(0.908)	(0.990)	(0.864)
City_FinDev5	0.273	0.283	0.268
	(0.258)	(0.266)	(0.2537)
Observations	1692	597	1095

Note: This table reports sample means and medians (in parentheses) of the indicators of financial development used in this paper. Column 1 presents the statistics for the full sample; column 2, for cities located in coastal provinces; and column 3, for cities located in central and western provinces. Definitions of all variables are shown in Appendix B.

Table 3
Inventory investment models: Baseline specifications

Dependent Variable: $\Delta I_{j,t}$	(1)	(2)	(3)	(4)
$\Delta I_{j,t-1}$	0.0122***	0.0139***	0.0139***	0.0140***
	(0.0017)	(0.0018)	(0.0018)	(0.0018)
$\Delta S_{j,t}$	0.456***	0.458***	0.458***	0.458***
	(0.0031)	(0.0032)	(0.0032)	(0.0032)
$\Delta S_{j,t-1}$	-0.272***	-0.275***	-0.275***	-0.275***
	(0.0033)	(0.0034)	(0.0034)	(0.0034)
$I_{j,t-1}$- $S_{j,t-1}$	-0.967***	-0.973***	-0.973***	-0.973***
	(0.0023)	(0.0024)	(0.0024)	(0.0024)
$Loans_{j,t}$	0.519***	0.401***	0.511***	0.446***
	(0.0101)	(0.0191)	(0.0105)	(0.0205)
$TC_{j,t}$	0.587***	0.585***	0.777***	0.739***
	(0.0139)	(0.0143)	(0.0270)	(0.0289)
$Loans_{j,t}$* $City\_FinDev_{c,t}$		0.119***		0.0697***
		(0.0169)		(0.0187)
$TC_{j,t}$*$City\_FinDev_{c,t}$			-0.200***	-0.159***
			(0.0235)	(0.0260)
$City\_FinDev_{c,t}$		0.230***	0.304***	0.272***
		(0.0118)	(0.0106)	(0.0136)
Observations	579,250	549,602	549,602	549,602
Margin $City\_FinDev_{c,t}$		0.275***	0.273***	0.274***
R^2	0.47	0.47	0.47	0.47
ρ	0.73	0.73	0.73	0.73

Note: All specifications were estimated using a fixed-effects estimator. Test statistics and standard errors (in parentheses) of all variables in the regressions are asymptotically robust to heteroscedasticity. The subscript *j* indexes firms, the subscript *c*, cities, and the subscript *t*, time, where *t* = 2004-2009. The dependent variable is inventory growth, $\Delta I_{j,t}$. Time, industry, provincial, and ownership dummies were included in all models, but their coefficients are not reported for brevity. See Appendix B for definitions of all variables. ρ denotes the proportion of the total error variance accounted for by unobserved heterogeneity. *Margin* denotes the marginal effects of relevant variables. ***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively.

Table 4
Inventory investment models: Alternative measures of financial development

Dependent Variable: $\Delta I_{j,t}$	(1) *City_FinDev2*	(2) *City_FinDev3*	(3) *City_FinDev4*	(4) *City_FinDev5*
$\Delta I_{j,t-1}$	0.0128***	0.0123***	0.0132***	0.0136***
	(0.00175)	(0.00175)	(0.00176)	(0.00175)
$\Delta S_{j,t}$	0.457***	0.456***	0.457***	0.457***
	(0.00321)	(0.00321)	(0.00321)	(0.00321)
$\Delta S_{j,t-1}$	-0.274***	-0.274***	-0.275***	-0.274***
	(0.00341)	(0.00341)	(0.00341)	(0.00340)
$I_{j,t-1}$- $S_{j,t-1}$	-0.970***	-0.969***	-0.972***	-0.972***
	(0.00242)	(0.00242)	(0.00243)	(0.00242)
$Loans_{j,t}$	0.451***	0.454***	0.428***	0.465***
	(0.0221)	(0.0276)	(0.0213)	(0.0211)
$TC_{j,t}$	0.688***	0.666***	0.741***	0.728***
	(0.0303)	(0.0388)	(0.0300)	(0.0293)
$Loans_{j,t}$* $City\_FinDev_{c,t}$	0.0477***	0.0942**	0.0690***	0.144***
	(0.0141)	(0.0379)	(0.0149)	(0.0538)
$TC_{j,t}$*$City\_FinDev_{c,t}$	-0.0722***	-0.121**	-0.127***	-0.418***
	(0.0188)	(0.0534)	(0.0212)	(0.0738)
$City\_FinDev_{c,t}$	0.106***	0.0737***	0.111***	0.721***
	(0.00965)	(0.0214)	(0.00940)	(0.0405)
Observations	549,602	549,602	548,918	549,602
Margin $City\_FinDev_{c,t}$	0.106***	0.074***	0.111***	0.721***
R^2	0.47	0.47	0.47	0.47
ρ	0.73	0.73	0.73	0.73

Note: All specifications were estimated using a fixed-effects estimator. In columns 1-4, *City_FinDev2*-*City_FinDev5* are respectively used as indicators of financial development. Test statistics and standard errors (in parentheses) of all variables in the regressions are asymptotically robust to heteroscedasticity. The subscript j indexes firms, the subscript c, cities, and the subscript t, time, where t = 2004-2009. The dependent variable is inventory growth, $\Delta I_{j,t}$. Time, industry, ownership, and provincial dummies were included in all models, but their coefficients are not reported for brevity. See Appendix B for definitions of all variables including the indicators of financial development. ρ denotes the proportion of the total error variance accounted for by unobserved heterogeneity. *Margin* denotes the marginal effects of relevant variables. ***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively.

Table 5
Inventory investment models: IV and system-GMM estimates

Dependent Variable: $\Delta I_{j,t}$	(1)	(2)	(3)
	IV (Senior)	*IV (Branches)*	*GMM*
$\Delta I_{j,t-1}$	0.0151***	0.0435***	0.005
	(0.00184)	(0.00245)	(0.015)
$\Delta S_{j,t}$	0.460***	0.457***	0.616***
	(0.00329)	(0.00422)	(0.048)
$\Delta S_{j,t-1}$	-0.275***	-0.353***	0.246***
	(0.00346)	(0.00494)	(0.040)
$I_{j,t-1}$- $S_{j,t-1}$	-0.976***	-1.061***	-0.196***
	(0.00262)	(0.00346)	(0.015)
$Loans_{j,t}$	0.388***	0.388***	-0.207
	(0.0692)	(0.0406)	(0.187)
$TC_{j,t}$	0.981***	0.681***	0.616***
	(0.109)	(0.0564)	(0.239)
$Loans_{j,t}$* $City\_FinDev_{c,t}$	0.130*	0.144***	0.301**
	(0.0743)	(0.0400)	(0.144)
$TC_{j,t}$*$City\_FinDev_{c,t}$	-0.420***	-0.0918*	-0.456**
	(0.114)	(0.0544)	(0.223)
$City\_FinDev_{c,t}$	0.277***	0.329***	-0.010
	(0.0766)	(0.0407)	(0.075)
Observations	466,867	280,903	549,602
Margin $City\_FinDev_{c,t}$	0.582***	0.366***	-0.010
R^2	0.47	0.48	
Anderson p-value	0.00***	0.00***	
Cragg-Donald F-stat	2704	11,006	
F-stat for $City\_FinDev_{c,t}$	2777	29,928	
F-stat for $Loans_{j,t}$* $City\_FinDev_{c,t}$	6754	39,829	
F-stat for $TC_{j,t}$*$City\_FinDev_{c,t}$	5592	11,035	
m3 test (p-value)			0.70
Hansen/Sargan test(p-value)	0.00***	0.00***	0.00***

Note: The specifications in columns 1 and 2 were estimated using a fixed-effects instrumental variable (IV) estimator. The specification in column 3 was estimated using the system GMM estimator. Test statistics and standard errors (in parentheses) of all variables in the regressions are asymptotically robust to heteroscedasticity. The subscript *j* indexes firms, the subscript *c*, cities, and the subscript *t*, time, where *t* = 2004-2009. The dependent variable is inventory growth, $\Delta I_{j,t.}$ Time, industry, provincial, and ownership dummies were included in all models, but their coefficients are not reported for brevity. See Appendix B for definitions of all variables. In column 1, *City_FinDev* is instrumented using the proportion of seniors (people aged 65 and older) in a given province and year. In column 2, *City_FinDev* is instrumented using the number of bank branches in each city in a given year. The banks include state-owned commercial banks (the Big 5), joint-stock commercial banks, and city commercial banks. The Cragg-Donald F-statistic is aimed at testing whether the model is weakly identified. The Anderson canonical correlation statistic is distributed as chi-square under the null that the equation is unidentified. The F-statistics of the first stage regression for *City_FinDev* and its interaction with loans and trade credit are also reported. In column 3, we treat all regressors as potentially endogenous. Instruments in the first-differenced equation are: $\Delta I_{j,t-3}$ to $\Delta I_{j,t-6}$; $\Delta S_{j,t-3}$ to $\Delta S_{j,t-6}$; $(I_{j,t-3} - S_{j,t-3})$ to $(I_{j,t-6} - S_{j,t-6})$; $Loans_{j,t-3}$ to $Loans_{j,t-6}$; $TC_{j,t-3}$ to $TC_{j,t-6}$; $(Loans_{j,t-3}*City\_FinDev_{c,t-3})$ to $(Loans_{j,t-3}*City\_FinDev_{c,t-3})$;$(TC_{j,t-3}*City\_FinDev_{c,t-3})$ to $(TC_{j,t-3}*City\_FinDev_{c,t-3})$; $City\_FinDev_{c,t-3}$ to $City\_FinDev_{c,t-6}$. First-differences of these same variables lagged twice are used as additional instruments in the level equations. *m3* is a test for third-order serial correlation in the first-differenced residuals, asymptotically distributed as $N(0,1)$ under the null of no serial correlation. The Hansen *J* test of over-identifying restrictions is distributed as Chi-square under the null of instrument validity. *Margin* denotes the marginal effects of relevant variables. ***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively.

Table 6
Inventory investment models: Distinguishing firm-years on the basis of ownership

Dependent Variable: $\Delta I_{j,t}$	(1) *SOEs*	(2) *Collective*	(3) *Private*	(4) *Foreign*
$\Delta I_{j,t-1}$	-0.00448	0.0136	0.0161***	0.0234***
	(0.0139)	(0.0083)	(0.0020)	(0.0045)
$\Delta S_{j,t}$	0.421***	0.418***	0.458***	0.477***
	(0.0208)	(0.0145)	(0.0038)	(0.0077)
$\Delta S_{j,t-1}$	-0.285***	-0.312***	-0.275***	-0.279***
	(0.0233)	(0.0163)	(0.0040)	(0.0084)
$I_{j,t-1}$- $S_{j,t-1}$	-0.902***	-0.967***	-0.984***	-0.990***
	(0.0187)	(0.0113)	(0.0028)	(0.0062)
$Loans_{j,t}$	0.612***	0.697***	0.414***	0.522***
	(0.1230)	(0.0934)	(0.0236)	(0.0582)
$TC_{j,t}$	0.951***	0.712***	0.668***	1.122***
	(0.2000)	(0.1280)	(0.0339)	(0.0706)
$Loans_{j,t}$* $City\_FinDev_{c,t}$	0.0056	-0.182**	0.0846***	0.0626
	(0.1070)	(0.0848)	(0.0220)	(0.0497)
$TC_{j,t}$*$City\_FinDev_{c,t}$	-0.0475	-0.130	-0.167***	-0.242***
	(0.1700)	(0.1120)	(0.0310)	(0.0609)
$City\_FinDev_{c,t}$	0.0307	0.0848	0.317***	0.231***
	(0.0704)	(0.0597)	(0.0164)	(0.0327)
Observations	11,720	30,384	420,215	86,559
Margin $City\_FinDev_{c,t}$	0.027	-0.004	0.326***	0.202***
R^2	0.44	0.46	0.48	0.47
ρ	0.80	0.77	0.73	0.73

Note: All specifications were estimated using a fixed-effects estimator. Test statistics and standard errors (in parentheses) of all variables in the regressions are asymptotically robust to heteroscedasticity. The subscript *j* indexes firms, the subscript *c*, cities, and the subscript *t*, time, where *t* = 2004-2009. The dependent variable is inventory growth, $\Delta I_{j,t}$. *SOEs, collective, private*, and *foreign* respectively denote state-owned, collective, privately-owned, and foreign-owned firms. Time, industry, and provincial dummies were included in all models, but their coefficients are not reported for brevity. See Appendix B for definitions of all variables. ρ denotes the proportion of the total error variance accounted for by unobserved heterogeneity. *Margin* denotes the marginal effects of relevant variables. ***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively.

Table 7
Inventory investment models: Distinguishing firm-years on the basis of financial constraints

Dependent Variable: $\Delta I_{j,t}$	(1) *Low_FC* (Large)	(2) *High_FC* (Small)	(3) *Low_FC* (With PA)	(4) *High_FC* (Without PA)
$\Delta I_{j,t-1}$	0.00386	0.00898***	-0.00254	0.0235***
	(0.00254)	(0.00253)	(0.00473)	(0.00216)
$\Delta S_{j,t}$	0.421***	0.378***	0.393***	0.471***
	(0.00478)	(0.00500)	(0.00840)	(0.00402)
$\Delta S_{j,t-1}$	-0.262***	-0.328***	-0.282***	-0.280***
	(0.00466)	(0.00522)	(0.00882)	(0.00427)
$I_{j,t-1}$- $S_{j,t-1}$	-0.955***	-0.990***	-0.982***	-0.999***
	(0.00354)	(0.00355)	(0.00658)	(0.00299)
$Loans_{j,t}$	0.391***	0.390***	0.514***	0.376***
	(0.0302)	(0.0313)	(0.0482)	(0.0258)
$TC_{j,t}$	0.712***	0.702***	0.700***	0.710***
	(0.0458)	(0.0412)	(0.0697)	(0.0362)
$Loans_{j,t}$* $City\_FinDev_{c,t}$	0.0997***	0.103***	-0.0214	0.120***
	(0.0265)	(0.0291)	(0.0457)	(0.0234)
Diff-test (t-value)	-1.08		-35.01***	
$TC_{j,t}$*$City\_FinDev_{c,t}$	-0.0841**	-0.126***	-0.000147	-0.183***
	(0.0404)	(0.0372)	(0.0641)	(0.0324)
Diff-test (t-value)	7.55***		19.46***	
$City\_FinDev_{c,t}$	0.199***	0.291***	0.0912***	0.311***
	(0.0193)	(0.0215)	(0.0322)	(0.0173)
Observations	269,415	280,187	98,856	398,009
R^2	0.48	0.49	0.48	0.48
ρ	0.76	0.73	0.78	0.73
Margin $City\_FinDev_{c,t}$	0.226***	0.306***	0.083***	0.327***

Note: All specifications were estimated using a fixed-effects estimator. Test statistics and standard errors (in parentheses) of all variables in the regressions are asymptotically robust to heteroscedasticity. The subscript *j* indexes firms, the subscript *c*, cities, and the subscript *t*, time, where *t* = 2004-2009. The dependent variable is inventory growth, $\Delta I_{j,t}$. *Low_FC*, and *High_FC* are dummy variables equal to 1 in a given year, respectively, if a firm is likely to face low and high financial constraints relatively to all firms in the same ownership group operating in the same industry it belongs to in that year, and 0 otherwise. Specifically, in column 1 (2), we consider a firm facing low (high) financial constraints in a given year if its real total assets lie in the top (bottom) half of the distribution of the corresponding variable for all firms belonging to the same ownership group and operating in the same industry in that year. In columns 3 and 4, we consider a firm facing relatively low financial constraints in a given year if it has political affiliation (*Lishu*<90) and facing relatively high financial constraints if it has no political affiliation (*Lishu*=90), respectively. Time, industry, ownership, and provincial dummies were included in all models, but their coefficients are not reported for brevity. See Appendix B for definitions of all variables. *Diff-test* represents the t-statistics associated with the *t*-tests for differences in corresponding coefficients between *Low_FC*, and *High_FC* firms (Acquaah, 2012). ρ denotes the proportion of the total error variance accounted for by unobserved heterogeneity. *Margin* denotes the marginal effects of relevant variables. ***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively.

Table 8
Inventory investment models: Distinguishing firm-years on the basis of location

Dependent Variable: $\Delta I_{j,t}$	(1) *Coastal*	(2) *Interior*
$\Delta I_{j,t-1}$	0.0105***	0.0224***
	(0.00194)	(0.00407)
$\Delta S_{j,t}$	0.442***	0.471***
	(0.00372)	(0.00712)
$\Delta S_{j,t-1}$	-0.286***	-0.252***
	(0.00387)	(0.00717)
$I_{j,t-1}$-$S_{j,t-1}$	-0.965***	-1.029***
	(0.00269)	(0.00576)
$Loans_{j,t}$	0.398***	0.531***
	(0.0246)	(0.0412)
$TC_{j,t}$	0.648***	0.892***
	(0.0341)	(0.0601)
$Loans_{j,t}$*$City\_FinDev_{c,t}$	0.0879***	0.00227
	(0.0214)	(0.0462)
Diff-test (t-value)	13.67***	
$TC_{j,t}$*$City\_FinDev_{c,t}$	-0.0959***	-0.219***
	(0.0294)	(0.0649)
Diff-test (t-value)	17.82***	
$City\_FinDev_{c,t}$	0.268***	0.126***
	(0.0161)	(0.0334)
Observations	432,320	117,282
Margin $City\_FinDev_{c,t}$	0.286***	0.097***
R^2	0.49	0.49
ρ	0.73	0.77

Note: All specifications were estimated using a fixed-effects estimator. Test statistics and standard errors (in parentheses) of all variables in the regressions are asymptotically robust to heteroscedasticity. The subscript *j* indexes firms, the subscript *c*, cities, and the subscript *t*, time, where *t* = 2004-2009. The dependent variable is inventory growth, $\Delta I_{j,t}$. *Coastal* (*Interior*) indicate firms located in coastal (central and western) provinces. Time, industry, ownership, and provincial dummies were included in all models, but their coefficients are not reported for brevity. See Appendix B for definitions of all variables. *Diff-test* represents the t-statistics associated with the *t*-tests for differences in corresponding coefficients between firms in *Coastal* and *Interior* provinces (Acquaah, 2012). ρ denotes the proportion of the total error variance accounted for by unobserved heterogeneity. *Margin* denotes the marginal effects of relevant variables. ***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively.

Table 9
Inventory and fixed asset investment models: Replacing *Loans* and *TC* with *Mix*

	(1)	(2)	(3)
Dependent Variable	$\Delta I_{j,t}$	*Investment*	$\Delta I_{j,t}$
$\Delta I_{j,t-1}$	0.0113***		0.0133***
	(0.00178)		(0.00178)
$\Delta S_{j,t}$	0.457***	0.0874***	0.459***
	(0.00325)	(0.00227)	(0.00325)
$\Delta S_{j,t-1}$	-0.270***	0.0485***	-0.271***
	(0.00345)	(0.00224)	(0.00344)
$I_{j,t-1}$- $S_{j,t-1}$	-0.964***		-0.968***
	(0.00245)		(0.00246)
$Mix_{j,t}$	-0.0199***	0.0102**	-0.133***
	(0.00705)	(0.00467)	(0.0143)
$City\_FinDev_{c,t}$			0.202***
			(0.0136)
$Mix_{j,t}$* $City\_FinDev_{c,t}$			0.119***
			(0.0131)
$Investment_{j,t-1}$		-0.407***	
		(0.00206)	
$Size_{j,t}$		0.414***	
		(0.00305)	
$Age_{j,t}$		0.00123***	
		(0.000327)	
$ROA_{j,t}$		-0.110***	
		(0.00787)	
Observations	539,753	500,937	539,753
Margin $City\_FinDev_{c,t}$			0.285***
R^2	0.46	0.17	0.47
ρ	0.73	0.62	0.73

Note: All specifications were estimated using a fixed-effects estimator. Test statistics and standard errors (in parentheses) of all variables in the regressions are asymptotically robust to heteroscedasticity. The subscript *j* indexes firms, the subscript *c*, cities, and the subscript *t*, time, where *t* = 2004-2009. The dependent variable is inventory growth, $\Delta I_{j,t}$, in columns 1 and 3, and the investment in fixed capital to assets ratio (*Investment*), in column 2. *Mix* is defined as *Loans/(Loans+TC).* See Appendix B for definitions of all other variables. Time, industry, ownership, and provincial dummies were included in all models, but their coefficients are not reported for brevity. ρ denotes the proportion of the total error variance accounted for by unobserved heterogeneity. *Margin* denotes the marginal effects of relevant variables. ***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively.

Table 10
Inventory investment models: Difference-in-differences approach with *Mix*

Dependent Variable: $\Delta I_{j,t}$	(1) *Treat50*	(2) *Treat33*	(3) *Treat25*
$\Delta I_{j,t-1}$	0.0145***	0.0132***	0.0128***
	(0.00178)	(0.00178)	(0.00178)
$\Delta S_{j,t}$	0.471***	0.471***	0.470***
	(0.00323)	(0.00323)	(0.00323)
$\Delta S_{j,t-1}$	-0.254***	-0.252***	-0.252***
	(0.00340)	(0.00340)	(0.00340)
$I_{j,t-1}$- $S_{j,t-1}$	-0.969***	-0.966***	-0.965***
	(0.00246)	(0.00246)	(0.00246)
$Mix_{j,t}$	-0.0384**	-0.00823	-5.66e-05
	(0.0176)	(0.0211)	(0.0233)
$Treat_c$	0.0126	0.0171	-0.00464
	(0.0209)	(0.0232)	(0.0248)
$Post_t$	-0.211***	-0.180***	-0.175***
	(0.0148)	(0.0175)	(0.0192)
$Treat_c$ * $Post_t$	0.0864***	0.0481**	0.0434**
	(0.0172)	(0.0194)	(0.0209)
$Mix_{j,t}$* $Treat_c$	0.00859	-0.0244	-0.0305
	(0.0209)	(0.0236)	(0.0255)
$Mix_{j,t}$* $Post_t$	-0.0613***	-0.0875***	-0.0956***
	(0.0191)	(0.0228)	(0.0253)
$Mix_{j,t}$* $Treat_c$* $Post_t$	0.129***	0.132***	0.129***
	(0.0226)	(0.0255)	(0.0277)
Observations	539,753	539,753	539,753
R^2	0.47	0.46	0.46
ρ	0.73	0.73	0.73

Note: All specifications were estimated using a fixed-effects estimator. Test statistics and standard errors (in parentheses) of all variables in the regressions are asymptotically robust to heteroscedasticity. The subscript *j* indexes firms, the subscript *c*, cities, and the subscript *t*, time, where *t* = 2004-2009. The dependent variable is inventory growth, $\Delta I_{j,t}$. *Mix* is defined as *Loans/(Loans+TC)*. *Treat50* is a dummy equal to 1 if the firm is located in a city with pre-reform loans to GRP ratio in the top half of the distribution. *Treat33* is a dummy equal to 1 if the firm is located in a city with pre-reform loans to GRP ratio in the top two thirds of the distribution. *Treat25* is a dummy equal to 1 if the firm is located in a city with pre-reform loans to GRP ratio in the top three quarters of the distribution. *Post* is a dummy variable equal to 1 in 2007, 2008, and 2009, and 0 otherwise. See Appendix B for definitions of all other variables. Industry, ownership, and provincial dummies were included in all models, but their coefficients are not reported for brevity. ρ denotes the proportion of the total error variance accounted for by unobserved heterogeneity. ***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively.

Table 11
Inventory investment models: Difference-in-differences approach with *Mix*, testing for the parallel trend assumption

Dependent Variable: $\Delta I_{j,t}$	(1) *Treat50*	(2) *Treat33*	(3) *Treat25*
$Mix_{j,t}$ * $Treat_c$ *Year2005*	-0.0809	-0.0900	-0.0695
	(0.0497)	(0.0566)	(0.0606)
$Mix_{j,t}$* $Treat_c$ *Year2006*	0.0288	0.0138	0.00630
	(0.0467)	(0.0530)	(0.0570)
$Mix_{j,t}$ * $Treat_c$ *Year2007*	0.0412	0.0399	0.0236
	(0.0468)	(0.0531)	(0.0571)
$Mix_{j,t}$* $Treat_c$ *Year2008*	0.171***	0.156***	0.137**
	(0.0476)	(0.0538)	(0.0580)
$Mix_{j,t}$ * $Treat_c$ *Year2009*	0.282***	0.256***	0.274***
	(0.0477)	(0.0540)	(0.0582)
Observations	539,753	539,753	539,753
R^2	0.47	0.47	0.47
ρ	0.74	0.74	0.73

Note: All specifications were estimated using a fixed-effects estimator. Test statistics and standard errors (in parentheses) of all variables in the regressions are asymptotically robust to heteroscedasticity. The subscript *j* indexes firms, the subscript *c*, cities, and the subscript *t*, time, where *t* = 2004-2009. The dependent variable is inventory growth, $\Delta I_{j,t}$. *Mix* is defined as *Loans/(Loans+TC)*. *Year2005-Year2009* are year dummies. *Treat50* is a dummy equal to 1 if the firm is located in a city with pre-reform loans to GRP ratio in the top half of the distribution. *Treat33* is a dummy equal to 1 if the firm is located in a city with pre-reform loans to GRP ratio in the top two thirds of the distribution. *Treat25* is a dummy equal to 1 if the firm is located in a city with pre-reform loans to GRP ratio in the top three quarters of the distribution. See Appendix B for definitions of all other variables. Lagged inventory investment, sales growth, the error-correction term, the *Mix*, the *Treat* dummy, additional interactions involving the *Mix*, the year dummies, and the *Treat* dummy, as well as industry, ownership, time, and provincial dummies were included in all models, but their coefficients are not presented for brevity. ρ denotes the proportion of the total error variance accounted for by unobserved heterogeneity. ***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively.

Table 12
Balancing tests for matched sample

Variable	*Treat25**	Control	Diff.	%Bias	*Treat33**	Control	Diff.	%Bias
	(n= 42,705)	(n= 42,705)	(*t*-test)		(n= 49,034)	(n= 49,034)	(*t*-test)	
Δ*I*	0.150	0.153	0.43	0.3	0.156	0.154	-0.19	-0.1
Δ*S*	0.308	0.311	0.67	0.5	0.300	0.300	0.05	0.0
Size	9.107	9.101	-0.88	-0.6	9.115	9.110	-0.97	-0.6
Liquidity	0.100	0.099	-0.98	-0.7	0.092	0.094	0.93	0.6
Loans	0.346	0.345	-1.14	-0.8	0.356	0.356	-0.25	-0.2
Industry_1	0.116	0.115	-0.33	-0.2	0.103	0.102	-0.45	-0.3
Industry_2	0.158	0.161	1.23	0.8	0.162	0.163	0.14	0.1
Industry_3	0.128	0.129	0.42	0.3	0.137	0.138	0.44	0.3
Industry_4	0.100	0.100	0.36	0.2	0.108	0.105	-1.85*	-1.2
Industry_5	0.020	0.020	-0.29	-0.2	0.022	0.021	-1.11	-0.7
Industry_6	0.041	0.040	-1.22	-0.8	0.038	0.036	-2.10**	-1.3
Industry_7	0.154	0.155	0.22	0.1	0.156	0.157	0.76	0.5
Industry_8	0.113	0.111	-0.82	-0.6	0.110	0.110	-0.26	-0.2
Industry_9	0.086	0.084	-0.9	-0.6	0.079	0.079	-0.35	-0.2
Year 2006	0.200	0.195	-1.81	-1.2	0.242	0.245	-0.91	-0.6
Year 2007	0.246	0.243	-0.87	-0.6	0.229	0.227	1.28	0.8
Year 2008	0.222	0.227	1.74*	1.2	0.285	0.286	-0.73	-0.5
Year 2009	0.286	0.289	0.67	0.5	0.014	0.014	0.37	0.2
SOEs	0.013	0.014	0.53	0.4	0.040	0.041	0.49	0.3
Collective	0.039	0.038	-0.55	-0.4	0.825	0.822	1.06	0.7
Private	0.824	0.820	-1.39	-0.9	0.121	0.122	-1.19	-0.8
Foreign	0.124	0.127	1.72*	1.2	0.156	0.154	0.53	0.3
R-statistic		1.01				0.99		
B-statistic		3.1				3.3		

Note: This table reports means of firm characteristics used in the matching process for the treated and control firms, as well as differences in these variables across the two groups. *t*-tests are conducted for comparing the differences in the means of relevant variables between the treated and control groups after matching. *Treat25* (Treat33*)* is a dummy equal to 1 if the firm is located in a city with pre-reform loans to GRP ratio in the bottom quarter (third) of the distribution. *Size* is measured as the firm's total assets. *Liquidity* is defined as (current assets-current liabilities) over total assets. *Industry_1* to *Industry_9* are industry dummies. *Year 2006 – Year 2009* are year dummies. *SOEs, collective, private*, and *foreign* are dummy variables respectively equal to 1 for state-owned, collective, privately-owned, and foreign-owned firms, and 0 otherwise. See Appendix B for definitions of all other variables. All variables used in the matching process except the dummies are evaluated in the pre-sample period. ∗∗, and ∗ indicate statistical significance at the 5%, and 10% levels, respectively. %bias is the % difference of the sample means in the treated and control groups as a percentage of the square root of the average of the sample variances in the treated and matched groups. Rubin (2001) recommends a B statistic lower than 25 and an R statistic between 0.5 and 2 for the samples to be sufficiently balanced. These statistics are reported at the foot of the Table.

Table 13
Inventory investment models: Difference-in-differences approach with *Mix* using matched samples

Dependent Variable: $\Delta I_{j,t}$	(1) *Treat25*	(2) *Treat33*
$\Delta I_{j,t-1}$	0.0152**	0.0167***
	(0.00637)	(0.00589)
$\Delta S_{j,t}$	0.466***	0.476***
	(0.0114)	(0.0107)
$\Delta S_{j,t-1}$	-0.215***	-0.217***
	(0.0113)	(0.0108)
$I_{j,t-1}$- $S_{j,t-1}$	-1.011***	-1.002***
	(0.00909)	(0.00851)
$Mix_{j,t}$	-0.0126	0.0254
	(0.0422)	(0.041)1
$Treat_c$	0.173**	0.0504
	(0.0821)	(0.0739)
$Post_t$	-0.166***	-0.170***
	(0.0329)	(0.0323)
$Treat_c$ * $Post_t$	-0.0224	-0.0196
	(0.0623)	(0.0585)
$Mix_{j,t}$* $Treat_c$	-0.098	-0.0327
	(0.0835)	(0.0773)
$Mix_{j,t}$* $Post_t$	-0.103**	-0.105**
	(0.0438)	(0.0424)
$Mix_{j,t}$* $Treat_c$* $Post_t$	0.178**	0.199**
	(0.085)	(0.0789)
Observations	85,410	98,068
R^2	0.49	0.48
ρ	0.77	0.76

Note: This table reports the results of the difference-in-differences (DiD) estimation conducted on matched samples. All specifications were estimated using a fixed-effects estimator. Test statistics and standard errors (in parentheses) of all variables in the regressions are asymptotically robust to heteroscedasticity. The subscript *j* indexes firms, the subscript *c*, cities, and the subscript *t*, time, where *t* = 2004-2009. The dependent variable is inventory growth, $\Delta I_{j,t}$. *Mix* is defined as *Loans/(Loans+TC)*. *Treat25 (Treat33)* is a dummy equal to 1 if the firm is located in a city with pre-reform loans to GRP ratio in the top three quarters (two thirds) of the distribution. *Post* is a dummy variable equal to 1 in 2007, 2008, and 2009, and 0 otherwise. See Appendix B for definitions of all other variables. Industry, ownership, and provincial dummies were included in all models, but their coefficients are not reported for brevity. ρ denotes the proportion of the total error variance accounted for by unobserved heterogeneity. ***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively.

Table 14
Inventory investment models: Difference-in-differences approach (matched samples) with *Mix* accounting for ownership, location and financial constraints

	(1)	(2)	(3)	(3)
Panel A	*SOEs*	*Collective*	*Private*	*Foreign*
$Mix_{j,t}$* $Treat25_c$* $Post_t$	0.830	-0.366	0.274***	0.0137
	(0.824)	(0.488)	(0.105)	(0.220)
Observations	1,216	3,158	68,792	10,234
R^2	0.58	0.53	0.50	0.52
ρ	0.96	0.90	0.77	0.79
Panel B	*Low_FC*	*High_FC*	*Low_FC*	*High_FC*
	(Large)	(Small)	(With PA)	(Without PA)
$Mix_{j,t}$* $Treat25_c$* $Post_t$	0.105	0.273**	-0.294	0.270**
	(0.145)	(0.118)	(0.279)	(0.105)
Diff-test (t-value)	29.11***		76.24***	
Observations	38,902	46,046	15,828	65,022
R^2	0.50	0.51	0.54	0.52
ρ	0.74	0.78	0.82	0.78
Panel C	*Coastal*	*Interior*		
$Mix_{j,t}$* $Treat25_c$* $Post_t$	0.301***	0.0660		
	(0.108)	(0.169)		
Diff-test (t-value)	35.03***			
Observations	58,834	25,540		
R^2	0.51	0.49		
ρ	0.78	0.81		

Note: This table reports the results of the difference-in-differences (DiD) estimation conducted on matched samples. All specifications were estimated using a fixed-effects estimator. Test statistics and standard errors (in parentheses) of all variables in the regressions are asymptotically robust to heteroscedasticity. The subscript *j* indexes firms, the subscript *c*, cities, and the subscript *t*, time, where *t* = 2004-2009. The dependent variable is inventory growth, $\Delta I_{j,t}$. *Mix* is defined as *Loans/(Loans+TC)*. *Treat25* is a dummy equal to 1 if the firm is located in a city with pre-reform loans to GRP ratio in the top three quarters of the distribution. *SOEs, collective, private*, and *foreign* respectively denote state-owned, collective, privately-owned, and foreign-owned firms. *Low_FC* and *High_FC* are dummy variables equal to 1 in a given year, respectively, if a firm is likely to face low and high financial constraints relatively to all firms in the same ownership group operating in the same industry it belongs to in that year, and 0 otherwise. Specifically, in coumn 1 (2) of Panel B, we consider a firm facing low (high) financial constraints in a given year if its real total assets lie in the top (bottom) half of the distribution of the corresponding variable for all firms belonging to the same ownership group and operating in the same industry in that year. In columns 3 and 4 of Panel B, we consider a firm facing relatively low financial constraints in a given year if it has political affiliation (*Lishu*<90) and facing relatively high financial constraints if it has no political affiliation (*Lishu*=90), respectively. *Coastal* (*Interior*) denote firms located in coastal (central and western) provinces. See Appendix B for definitions of all other variables. Lagged inventory investment, sales growth, lagged sales growth, the error-correction term, *Mix*, *Treat*, *Post, Treat*Post*, *Mix*Treat*, *Mix*Post*, as well as industry, and provincial dummies were included in all models, but their coefficients are not reported for brevity. Ownership dummies were included in all models in Panels B and C, but their coefficients are not reported for brevity. *Diff-test* represents the t-statistics associated with the *t*-tests (Acquaah, 2012) for differences in corresponding coefficients between *Low_FC*, and *High_FC* firms (Panel B) and between firms in the *Coastal* and *Interior* regions (Panel C). ρ denotes the proportion of the total error variance accounted for by unobserved heterogeneity. ***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively.

Table A1

Structure of the unbalanced panel

Year	*Number of observations*	*Percentage*	*Cumulative*
2004	45,289	7.82	7.82
2005	56,580	9.77	17.59
2006	115,317	19.91	37.49
2007	126,230	21.79	59.29
2008	109,647	18.93	78.22
2009	126,187	21.78	100
Total	579,250	100	

Note: The table shows the number and percentages (and cumulative percentages) of the observations across years.

Table C1
Inventory investment models: Controlling for time-varying industry effects

Dependent Variable: $\Delta I_{j,t}$	(1)	(2)	(3)	(4)
$\Delta I_{j,t-1}$	0.0143***	0.0157***	0.0157***	0.0157***
	(0.00170)	(0.00176)	(0.00176)	(0.00176)
$\Delta S_{j,t}$	0.458***	0.459***	0.460***	0.460***
	(0.00309)	(0.00321)	(0.00321)	(0.00321)
$\Delta S_{j,t-1}$	-0.272***	-0.275***	-0.275***	-0.275***
	(0.00328)	(0.00341)	(0.00341)	(0.00341)
$I_{j,t-1}$- $S_{j,t-1}$	-0.971***	-0.976***	-0.976***	-0.976***
	(0.00235)	(0.00243)	(0.00243)	(0.00243)
$Loans_{j,t}$	0.516***	0.403***	0.509***	0.449***
	(0.0101)	(0.0191)	(0.0105)	(0.0205)
$TC_{j,t}$	0.588***	0.586***	0.778***	0.744***
	(0.0139)	(0.0143)	(0.0270)	(0.0289)
$Loans_{j,t}$* $City\_FinDev_{c,t}$		0.114***		0.0635***
		(0.0169)		(0.0187)
$TC_{j,t}$*$City\_FinDev_{c,t}$			-0.202***	-0.164***
			(0.0235)	(0.0260)
$City\_FinDev_{c,t}$		0.211***	0.284***	0.255***
		(0.0118)	(0.0106)	(0.0137)
Observations	579,250	549,602	549,602	549,602
Margin $City\_FinDev_{c,t}$		0.254***	0.253***	0.253***
R^2	0.57	0.57	0.57	0.57

Note: All specifications were estimated using a fixed-effects estimator. Test statistics and standard errors (in parentheses) of all variables in the regressions are asymptotically robust to heteroscedasticity. The subscript *j* indexes firms, the subscript *c*, cities, and the subscript *t*, time, where *t* = 2004-2009. The dependent variable is inventory growth, $\Delta I_{j,t}$. Time, industry, provincial, and ownership dummies were included in all models, together with interactions between time and industry dummies, but their coefficients are not reported for brevity. See Appendix B for definitions of all variables. *Margin* denotes the marginal effects of relevant variables. ***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively.

Table C2
Inventory investment models: Controlling for time-varying provincial effects

Dependent Variable: $\Delta I_{j,t}$	(1)	(2)	(3)	(4)
$\Delta I_{j,t-1}$	0.0230***	0.0233***	0.0233***	0.0233***
	(0.00170)	(0.00175)	(0.00175)	(0.00175)
$\Delta S_{j,t}$	0.466***	0.466***	0.466***	0.466***
	(0.00308)	(0.00320)	(0.00320)	(0.00320)
$\Delta S_{j,t-1}$	-0.279***	-0.282***	-0.282***	-0.282***
	(0.00327)	(0.00340)	(0.00340)	(0.00340)
$I_{j,t-1}$- $S_{j,t-1}$	-0.989***	-0.992***	-0.992***	-0.992***
	(0.00236)	(0.00244)	(0.00244)	(0.00244)
$Loans_{j,t}$	0.488***	0.412***	0.486***	0.451***
	(0.0101)	(0.0191)	(0.0104)	(0.0205)
$TC_{j,t}$	0.561***	0.559***	0.711***	0.691***
	(0.0138)	(0.0143)	(0.0270)	(0.0288)
$Loans_{j,t}$* $City\_FinDev_{c,t}$		0.0792***		0.0369**
		(0.0170)		(0.0188)
$TC_{j,t}$*$City\_FinDev_{c,t}$			-0.158***	-0.137***
			(0.0234)	(0.0259)
$City\_FinDev_{c,t}$		0.133***	0.183***	0.168***
		(0.0150)	(0.0142)	(0.0164)
Observations	579,250	549,602	549,602	549,602
Margin $City\_FinDev_{c,t}$		0.162***	0.159***	0.160***
R^2	0.57	0.58	0.58	0.58

Note: All specifications were estimated using a fixed-effects estimator. Test statistics and standard errors (in parentheses) of all variables in the regressions are asymptotically robust to heteroscedasticity. The subscript *j* indexes firms, the subscript *c*, cities, and the subscript *t*, time, where *t* = 2004-2009. The dependent variable is inventory growth, $\Delta I_{j,t}$. Time, industry, provincial, and ownership dummies were included in all models, together with interactions between time and provincial dummies, but their coefficients are not reported for brevity. See Appendix B for definitions of all variables. *Margin* denotes the marginal effects of relevant variables. ***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively.

Table C3
Inventory investment models: Controlling for time-varying industry and provincial effects

Dependent Variable: $\Delta I_{j,t}$	(1)	(2)	(3)	(4)
$\Delta I_{j,t-1}$	0.0235***	0.0238***	0.0238***	0.0238***
	(0.00170)	(0.00176)	(0.00175)	(0.00175)
$\Delta S_{j,t}$	0.467***	0.466***	0.467***	0.467***
	(0.00309)	(0.00321)	(0.00321)	(0.00321)
$\Delta S_{j,t-1}$	-0.279***	-0.282***	-0.282***	-0.282***
	(0.00327)	(0.00340)	(0.00340)	(0.00340)
$I_{j,t-1}$- $S_{j,t-1}$	-0.990***	-0.993***	-0.992***	-0.993***
	(0.00236)	(0.00244)	(0.00244)	(0.00244)
$Loans_{j,t}$	0.487***	0.412***	0.486***	0.451***
	(0.0101)	(0.0191)	(0.0104)	(0.0205)
$TC_{j,t}$	0.562***	0.560***	0.713***	0.693***
	(0.0138)	(0.0143)	(0.0270)	(0.0288)
$Loans_{j,t}$* $City\_FinDev_{c,t}$		0.0794***		0.0368**
		(0.0170)		(0.0188)
$TC_{j,t}$*$City\_FinDev_{c,t}$			-0.159***	-0.137***
			(0.0234)	(0.0259)
$City\_FinDev_{c,t}$		0.130***	0.181***	0.165***
		(0.0150)	(0.0142)	(0.0164)
Observations	579,250	549,602	549,602	549,602
Margin $City\_FinDev_{c,t}$		0.160***	0.156***	0.157***
R^2	0.57	0.58	0.58	0.58

Note: All specifications were estimated using a fixed-effects estimator. Test statistics and standard errors (in parentheses) of all variables in the regressions are asymptotically robust to heteroscedasticity. The subscript j indexes firms, the subscript c, cities, and the subscript t, time, where t = 2004-2009. The dependent variable is inventory growth, $\Delta I_{j,t}$. Time, industry, provincial, and ownership dummies were included in all models, together with interactions between time and industry dummies and interactions between time and provincial dummies, but their coefficients are not reported for brevity. See Appendix B for definitions of all variables. *Margin* denotes the marginal effects of relevant variables. ***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively.

Table C4
Inventory investment models: Including additional control variables

Dependent Variable: $\Delta I_{j,t}$	(1)	(2)	(3)	(4)
$\Delta I_{j,t-1}$	0.0157***	0.0167***	0.0167***	0.0167***
	(0.00171)	(0.00177)	(0.00177)	(0.00177)
$\Delta S_{j,t}$	0.447***	0.447***	0.447***	0.447***
	(0.00342)	(0.00356)	(0.00356)	(0.00356)
$\Delta S_{j,t-1}$	-0.270***	-0.272***	-0.272***	-0.272***
	(0.00336)	(0.00349)	(0.00349)	(0.00349)
$I_{j,t-1}$- $S_{j,t-1}$	-0.969***	-0.974***	-0.974***	-0.974***
	(0.00239)	(0.00247)	(0.00247)	(0.00247)
$Loans_{j,t}$	0.874***	0.745***	0.873***	0.873***
	(0.0152)	(0.0228)	(0.0158)	(0.0158)
$TC_{j,t}$	0.950***	0.956***	1.126***	1.126***
	(0.0183)	(0.0190)	(0.0303)	(0.0303)
$Loans_{j,t}$* $City\_FinDev_{c,t}$		0.138***		0.0996***
		(0.0174)		(0.0195)
$TC_{j,t}$*$City\_FinDev_{c,t}$			-0.181***	-0.119***
			(0.0240)	(0.0269)
$City\_FinDev_{c,t}$		0.145***	0.224***	0.177***
		(0.0122)	(0.0109)	(0.0143)
$Age_{j,t}$	0.000744	0.000714	0.000665	0.000693
	(0.000609)	(0.000644)	(0.000644)	(0.000644)
$ROA_{j,t}$	-0.801***	-0.783***	-0.784***	-0.784***
	(0.0116)	(0.0120)	(0.0120)	(0.0120)
$Collateral_{j,t}$	-0.684***	-0.676***	-0.679***	-0.677***
	(0.0170)	(0.0176)	(0.0176)	(0.0176)
$Liquidty_{j,t}$	0.634***	0.636***	0.632***	0.635***
	(0.0136)	(0.0142)	(0.0142)	(0.0142)
$Investment_{j,t}$	0.117***	0.117***	0.118***	0.117***
	(0.00267)	(0.00277)	(0.00277)	(0.00277)
Observations	526,778	449,440	449,440	449,440
Margin $City\_FinDev_{c,t}$		0.197***	0.196***	0.196***
R^2	0.50	0.50	0.50	0.50

Note: All specifications were estimated using a fixed-effects estimator. Test statistics and standard errors (in parentheses) of all variables in the regressions are asymptotically robust to heteroscedasticity. The subscript *j* indexes firms, the subscript *c*, cities, and the subscript *t*, time, where *t* = 2004-2009. The dependent variable is inventory growth, $\Delta I_{j,t}$. *ROA* is the return on assets. *Age* is the firm's age. *Collateral* is the ratio of the firm's fixed to total assets. *Liquidity* is defined as (current assets-current liabilities) over total assets. *Investment* is the fixed capital investment to assets ratio. See Appendix B for definitions of all other variables. Time, industry, provincial, and ownership dummies were included in all models, but their coefficients are not reported for brevity. *Margin* denotes the marginal effects of relevant variables. ***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively.

Table C5: Inventory investment models: Including additional control variables together with time-varying industry and provincial effects

Dependent Variable: $\Delta I_{j,t}$	(1)	(2)	(3)	(4)
$\Delta I_{j,t-1}$	0.0232***	0.0231***	0.0231***	0.0231***
	(0.00172)	(0.00177)	(0.00177)	(0.00177)
$\Delta S_{j,t}$	0.453***	0.452***	0.453***	0.453***
	(0.00342)	(0.00356)	(0.00356)	(0.00356)
$\Delta S_{j,t-1}$	-0.275***	-0.277***	-0.277***	-0.277***
	(0.00336)	(0.00350)	(0.00350)	(0.00350)
$I_{j,t-1}$- $S_{j,t-1}$	-0.985***	-0.987***	-0.987***	-0.987***
	(0.00240)	(0.00249)	(0.00249)	(0.00249)
$Loans_{j,t}$	0.852***	0.764***	0.855***	0.796***
	(0.0152)	(0.0228)	(0.0158)	(0.0242)
$TC_{j,t}$	0.934***	0.938***	1.078***	1.043***
	(0.0183)	(0.0190)	(0.0303)	(0.0322)
$Loans_{j,t}$* $City\_FinDev_{c,t}$		0.0986***		0.0628***
		(0.0175)		(0.0196)
$TC_{j,t}$*$City\_FinDev_{c,t}$			-0.148***	-0.109***
			(0.0240)	(0.0269)
$City\_FinDev_{c,t}$		0.0235	0.0802***	0.0523***
		(0.0161)	(0.0153)	(0.0176)
$Age_{j,t}$	0.000588	0.000693	0.000662	0.000677
	(0.000608)	(0.000642)	(0.000642)	(0.000642)
$ROA_{j,t}$	-0.750***	-0.741***	-0.743***	-0.742***
	(0.0117)	(0.0121)	(0.0121)	(0.0121)
$Collateral_{j,t}$	-0.665***	-0.664***	-0.666***	-0.664***
	(0.0170)	(0.0176)	(0.0176)	(0.0176)
$Liquidty_{j,t}$	0.630***	0.631***	0.628***	0.630***
	(0.0136)	(0.0141)	(0.0141)	(0.0141)
$Investment_{j,t}$	0.115***	0.116***	0.116***	0.116***
	(0.00267)	(0.00276)	(0.00276)	(0.00276)
Observations	526,778	449,440	449,440	449,440
Margin $City\_FinDev_{c,t}$		0.061***	0.057***	0.059***
R^2	0.60	0.60	0.60	0.60

Note: All specifications were estimated using a fixed-effects estimator. Test statistics and standard errors (in parentheses) of all variables in the regressions are asymptotically robust to heteroscedasticity. The subscript *j* indexes firms, the subscript *c*, cities, and the subscript *t*, time, where *t* = 2004-2009. The dependent variable is inventory growth, $\Delta I_{j,t}$. *ROA* is the return on assets. *Age* is the firm's age. *Collateral* is the ratio of the firm's fixed to total assets. *Liquidity* is defined as (current assets-current liabilities) over total assets. *Investment* is the fixed capital investment to assets ratio. See Appendix B for definitions of all other variables. Time, industry, provincial, and ownership dummies were included in all models, together with interactions between time and industry dummies and interactions between time and provincial dummies, but their coefficients are not reported for brevity. *Margin* denotes the marginal effects of relevant variables. ***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively.