

## **External Finance and Firms' Sales:**

### **Evidence from Chinese Firms**

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**Abstract:** A rich literature has shown that external finance is an important resource for firms to overcome trade costs and to engage in exporting activities. In this paper, we build on the rationale and extend it both to domestic and international trade costs, by studying whether there are significant differences in the importance of external finance on firms' domestic and international sales. In addition to international trade costs, China has witnessed some substantial overt and/or covert trade costs across its provincial borders, which provide an interesting country case study for external finance and firms' domestic and international sales. We utilize the World Bank Survey of 12,000 firms operating in China, and differentiate firms' sales destinations within their home provinces, outside their home provinces, exports only, and domestic plus international sales. In so doing, we explicitly compare how firms' external finance helps firms overcome trade barriers across provincial borders and across national borders. Our results indicate that external finance is indeed very important for firms to overcome either provincial trade barriers, or international trade barriers, or both; and the effects of external finance vary across firms' ownership structures and their sales destinations.

**Keywords:** Domestic trade barriers; External financing; Multi-destination market sales

**JEL:** F14; F63; M21

## 1. Introduction

Studies on firms' exports have documented an important role of external finance. Rajan and Zingales (1998), at the aggregate level, examine the role of external finance on economic growth. They argue that financial development reduces the costs of external finance to firms; and consistent with their argument, they find that industrial sectors that are relatively more in need of external finance develop disproportionately faster in countries with more developed financial markets. Researchers have extended that rationale and studied the role of finance on exports. Studies, both at the country-level (Svaleryd and Vlachos, 2002; Svaleryd and Vlachos, 2005; Do and Levchenko, 2007; Manova, 2008) and at the firm-level (Berman and Hericourt, 2010; Minetti and Zhu, 2011; Manova, 2013; Behrens et al., 2013; Feenstra et al., 2014), have provided empirical support that external finance promotes exports. Focusing on exports, the implicit assumption in the studies is that there are considerable costs associated with exports, which include added costs in acquiring information about foreign markets, customizing products to fit foreign tastes, setting up international distribution networks and the like.<sup>1</sup> In order for firms to overcome these added costs associated with exports, firms are either more productive, supported by a series of studies lead by Melitz (2003), or as studied here, have access to external finance.

In this paper, we build on the literature regarding external finance and exports, but extend it to firms' domestic and international sales. Although it is a common assumption that a country's domestic market is integrated in the trade literature, it is rarely the case, even in very developed countries such as the United States,<sup>2</sup> and is especially so for many large developing countries such as China. China's domestic market is highly fragmented, despite the continuous efforts made by China's central government to foster a nationally integrated market. Market segmentation in China has presented substantial trade barriers across provincial borders. Thus, external finance would be as important for firms to sell in other provincial markets as in international markets.

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<sup>1</sup> The presence of sunk costs in international trade has been widely reported, such as Roberts and Tybout (1997), Bernard and Jensen (2004), Das et al., (2007), and Roberts et al., (2012).

<sup>2</sup> Trade costs within domestic borders have been documented in a few studies, which have shown that domestic trade costs hinder intra-national trade flows (Wolf, 2000; Hillberry and Hummels, 2003; Hillberry and Hummels, 2008; Coughlin and Novy, 2013; Nitsch and Wolf, 2013). Even in very open countries like the United States (US), trade flows appear to be substantially impeded by state borders. In certain cases, the intra-national border effect in US is found to be surprisingly higher than its international counterparts (Coughlin and Novy, 2013).

To a large degree, China's segmented domestic markets by provincial borders are a by-product of the series of reforms introduced, with fiscal policy the major one. Since 1978, to promote fiscal responsibility at the local levels, Chinese central government has made continuous efforts to break down its centralized fiscal management system with various forms of fiscal contracting system and tax sharing system (Shen et al., 2012). While such reforms have contributed to China's rapid regional economic growth (Zhang and Zou, 1998; Jin and Zou, 2005), they have also helped raise interregional trade barriers and thus local protection, by maximizing local fiscal revenue (Huang et al., 2015). These protective measures have caused market fragmentation in China, widely documented in many studies (Young, 2000; Poncet, 2003; Naughton, 2003; Bai et al., 2004; Poncet, 2005; Xu and Fan, 2012; Huang et al., 2015). For example, Poncet (2003) finds that provincial border effects in China are as close as or even higher than those among European countries or those between the United States and Canada. Wong (2012) finds that China's domestic trade across provincial borders is nearly twice as large as international trade costs. Indeed, Huang et al. (2015) reports that only the more productive firms choose to sell outside their home provincial markets, due to the existing provincial trade barriers.

In the presence of the well documented domestic market entry costs, and in line of finance and exports, we would expect that Chinese firms would need to resort to external finance to overcome domestic trade costs as well. This is the focus of this study. Specifically, we examine how firms' access to external finance helps them advance their sales into other domestic provincial markets, and the international markets. In so doing, we complement previous studies both on external finance, and on Chinese firms' exports, including Du and Girma (2007), and Feenstra et al., (2014).<sup>3</sup> The combined focus will provide an interesting perspective and comparison of how external finance would affect firms' decision to sell domestically and internationally.<sup>4</sup> It is worth noting, unlike international trade, that Chinese domestic trade flows can be further facilitated by the close psychic distances including the same or similar culture, the same official language, and the same set of rules of law, as argued

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<sup>3</sup> It is now a fact that only a fraction of firms become exporters (such as Bernard and Jensen, 1995, for the US).

<sup>4</sup> For example, Behrens et al., (2013) have tried to investigate the effect of financial crisis on Belgium firms' domestic sale. The authors find that finance crisis in the recent years not only negatively affects Belgium firms' foreign trade, but also causes a similar effect on their domestic sale.

in Huang et al., (2015). If, despite the close psychic distance among the provinces, firms' sales outside their home provinces would still require similar assistance from external financing as international sales, it would signal the substantial barriers across China's provincial borders.

We use the *China Investment Climate Survey* (2005) by the World Bank of 12,000 firms operating in China to inform our study. The survey provides very detailed information about firms' sale activities, including sales in the cities where they operate, in other cities within their home provinces, in other provinces, and exports. Empowered by the rich data, we can answer how external finance affects firms' sale choices in different destinations.

## **2. Chinese Firms' External Finance**

Studying external finance on firms' sales behavior in the Chinese context offers an interesting perspective, especially given its development stage of the financial markets. The study covers the period of the early 2000s. Before and during the period, China's financial market, despite the tremendous rapid development during the 1980s and 1990s, had big challenges to function on market discipline. Researchers have reported that many allocations of the financial resources are largely inefficient and China's banking system is still under-developed, even today (Allen et al., 2005; Guariglia and Poncet, 2008; Cull et al., 2009; Huang et al., 2011). Due to the competing demand for loans during the fast development periods of the 1990s, many Chinese firms faced serious financial constraints. But the private sector has been further discriminated against, which is supported by many studies in the literature (Langlois, 2001). A survey of private firms in Beijing, Chengdu, Shunde (Guangdong), and Wenzhou (Zhejiang), conducted in 1999 by the International Finance Corporation (IFC), revealed that about 80% considered their lack of access to finance to be a serious constraint. As private firms had less access to bank loan and are financial constraint, they relied heavily on self-financing for both start-up and expansion. In the case of post start-up investments, the sample firms in the IFC survey continued to depend overwhelmingly on internal sources, with at least 62 percent of their financing coming from the principal owners or out of retained earnings.<sup>5</sup>

But, financial constraints for firms with other ownerships were not of the same magnitude.

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<sup>5</sup> In a recent study, Meggison et al. (2014) find that the level of cash holdings increases as state ownership declines in China's share-issue privatized firms. The authors calculate that a 10 percentage-point decline in state ownership leads to an increase of about RMB 55 million in cash holdings, and they conclude that this negative relation can be attributable to the soft-budget constraint inherent in state ownership since the Chinese financial system is dominated by the state-owned banks.

For instance, Poncet et al. (2010) find that Chinese private firms are credit constrained while state-owned firms (SOEs) and foreign-owned firms are not. Lin and Tan (1999), and Cull and Xu (2000, 2003) also find that SOEs in China have better access to credit in state-owned banks and can expect to receive financial help in times of distress.

There are many factors affecting private firms' access to financing, due partly to factors within the financial system and partly to the nature of Chinese private enterprises. Gregory and Tenev (2001) pointed out that local governments encouraged bank lending to state-owned enterprises by extending explicit or implicit guarantees or through other means on one hand, and banks did not consider a bad loan to a state-owned enterprise to be as serious as a bad loan to a private enterprise on the other. Banks expect that government would bail out a bad loan to state-owned firms, but not to private firms. This view seems to be supported by other studies. For example, Chan et al., (2014) find that political connection does matter for firms' access to bank loan; and show that politically-connected firms face no financing constraints whereas firms without connection experience significant constraints. The IFC survey also reported that about 70 percent of private firms said that paperwork was a moderate or major obstacle to their application for a formal loan.

Within the Chinese context of domestic trade costs and the difficulty of getting financing loans, it would be much appealing to examine firms' access to financial loans and their sales behaviors both at the domestic and international markets. Given the unequal opportunities for firms (private, state-owned and foreign owned) to get external finance, it is thus not surprising that the World Bank Survey asked firms the importance of the loans after they got access to external finance. We utilize that piece of information fully in our empirical study.

### **3. A Closer Look at the Data**

The World Bank survey randomly chooses 12,400 firms located in 120 cities: 100 firms in each city, but 200 firms in the four municipality cities (Beijing, Tianjin, Shanghai, and Chongqing). The survey collects detailed sales information in firms' home cities (where the firm locate), other cities in the same province (home province), other provinces, as well as exports in international markets. To serve our study, we group firms (exclusive between types) based on their sales as the following: sales only in their home provinces—*ProvFirm*; sales outside their home provinces (with or without sales in firms' home provinces)—*DomFirm*;

sales only in international markets (pure exporters)—*PureExpFirm*; and sales in domestic markets and in international markets—*AllSeller*. Both *PureExpFirm* and *AllSeller* firms are exporters—the only difference between them is that one group of firms also have domestic sales. Table 1 reports the distribution of firms in each category. Among all the firms, about 15% of firms sell only within their home provinces; and 38% (4,672 firms) have exports overseas, which is higher than the export ratios reported in studies of some other countries (such as Bernard and Jensen, 1995, for the US). The higher export participation ratio might reflect China's fast export growth and volume during the last thirty years.

Clearly, the criterion for grouping firms in the study is incremental, and does not differentiate firms' sales shares in each destination. For instance, as far as sales in domestic markets are concerned, some of the *AllSeller* firms might sell only in their home provinces, some only outside their home provinces and others both in and outside their home provinces. To reflect this disparity, Table 2 reports firms' sales shares in each destination. Table 2 indicates that a majority of firms have sales in their home provinces, as the number of firms now include all *ProvFirm* firms, and some *DomFirm* and *AllSeller* firms which sell in their home provinces. In total, home provincial markets account for 44.1% of the total sales for all firms, other provincial markets (domestic trade) account for 39.4%—indicating a total domestic sales share of 83.5%, and exports account for 16.5%. Thus, domestic trade is over 2 times as large as exports, a similar observation as in Wong (2012).

Turning to firms' external finance, we focus on firms' access to loans from banks and other financial institutions. The World Bank survey asks firms how seriously financial constraint affects their business operation, and whether they have borrowed loans. Among the 12,400 firms, 7,435 firms borrowed financial loans, accounting for about 60%. Firms' access to financial loans is not significantly different among the different ownership types of private, state-owned, and foreign-owned: the loan rate is 61% for private firms (5,401 in 8,990), 57% for state-owned firms (640 in 1,122), and about 58% for foreign-owned firms (1,394 in 2,388). The external finance rate is even slightly higher for private firms than for other types.

#### **4. The Estimation Strategy**

We use an indicator variable, *loan*, for firms' access to external finance. It takes the value

of 1 for firms which had financial loan, and 0 otherwise. In addition, we include a host of other control variables known to affect firms' sales activities. They are: firm scale— $\ln(\text{Scale})$ , where Scale is measured as a firm's core business revenue; average labor revenue— $\ln(\text{S/L})$ , firms' sales (S) divided by the total number of employees (L); capital labor ratio— $\ln(\text{K/L})$ , where K is a firm's net fixed capital; R&D expenditure as a share in total sales— $\text{RD/Sales}$ , and firm age (Age). Along the ownership structure, we group firms in four groups: private, SOE (state-owned), HMT (firms owned by overseas Chinese from Hong Kong, Macao and Taiwan), and FDI (firms owned by other foreign investors). We include ownership dummies to control for the potential differences among them. We also control for industry and firm location (city) specific effects by introducing industry and city binary variables. To purge out some potential endogeneity, we use the values for year 2003 for the control variables whenever it is appropriate.

Here, we model firms' choice to enter different sales destinations depending on the profits they derive from their total sales. Let  $k$  denote each firm type we have discussed earlier. We thus have  $k = \{1,2,3,4\}$ , with  $k = 1$  for *ProvFirm* firms,  $k = 2$  for *DomFirm* firms,  $k = 3$  for *PureExpFirm* and  $k = 4$  for *AllSeller* firms. If a firm chooses a certain firm type  $j$ , then profits derived from type  $j$  are assumed to be higher than from any other types. That is:

$$\Pi^j(x_0, z) > \Pi^k(x_0, z), j \neq k, \text{ and } j, k \in \{1,2,3,4\} \quad (1)$$

Where  $\Pi$  indicates profits, which depend on firm characteristics ( $x_0$ ) and other factors ( $z$ ). Let  $\varepsilon$  be an idiosyncratic term and  $X = (x_0, z)$ , we model firms' profits as:

$$\Pi^k(x_0, z) = \beta'_k X + \varepsilon_k \quad (2)$$

To model firms' choice for a specific firm type, we use the multinomial logit method (MNL), with *ProvFirm* ( $k = 1$ ) as the base category, i.e.:

$$P(K = k) = \frac{\exp(\beta'_k X)}{1 + \sum_{k=2}^4 \exp(\beta'_k X)} \quad (3)$$

While it is convenient that the MNL modelling specifies the multiple choices firms face, it is not straight forward to interpret the coefficients. Accordingly, researchers tend to introduce relative-risk ratios (rrr), which we will follow. For firm type  $j$ , the  $rrr_{j/1}$  for vector  $X$ , compared with the base category firm type 1 (*ProvFirm*), is derived as:



$$rrr_{j/1} = \frac{P(K=j|X+1)/P(K=1|X+1)}{P(K=j|X)/P(K=1|X)} \quad (4)$$

The interpretation of *rrr*, say, for firms choosing type 2 ( $k=2$ ),  $rrr_{2/1}$ , is the following. Compared with *ProvFirm*, one unit increase in  $X$  will lead to the relative odd of choosing firm type 2 ( $K=2$ )  $rrr_{2/1}$  times what it was before the change. So, the value of  $rrr_{2/1}$  greater than unity indicates that increase in  $X$  leads to a higher probability to choose firm type 2 than the base type, and vice versa.

The empirical application of the MNL model rests on the independence of irrelevant alternatives (IIA) assumption. The IIA assumption requires that the choice of any option does not affect the relative probability of choosing other options. In the empirical analysis, we use the Hausman test to test the IIA assumption (Hausman and McFadden, 1984).

## 5. The Main Estimation Results

### 5.1. The Baseline Results

Table 3 reports the baseline estimation results. We will explain the associated effects of the variables in turn below.

*Loan*—compared with the base type firms, having financial loans significantly increases firms' probability of choosing to be *DomFirm* (selling outside firms' home province), to be *PureExpFirm* (with sales only in international markets), or to be *AllSeller* (with sales both in domestic and international markets). The loan effect on *AllSeller* is the largest, followed by *DomFirm* and then by *PureExpFirm*; and the test statistics indicate that the three coefficients are significantly different from one another. This finding leads to three conclusions. First, having access to bank loans is important in firms' export decisions—for both *PureExpFirm* and *AllSeller* firms, a result consistent with those in the literature (Svaleryd and Vlachos, 2002; Svaleryd and Vlachos, 2005; Do and Levchenko, 2007; Minetti and Zhu, 2011; Manova, 2013). Second, financial loans *also* increase firms' probability to choose to sell across their home provincial borders—for both *DomFirm* and *AllSeller* firms. This underlies our basic rationale that there exist entry barriers across provincial borders in China. Third, the magnitudes of the coefficients suggest that domestic trade barriers are as much a hurdle on trade flows as international trade barriers, despite the close psychic distances across

provincial borders. In fact, the importance of external finance is even more important for firms to overcome domestic trade barriers than international trade barriers, at least for pure exporters, an instinctively Chinese phenomenon.<sup>6</sup> This might be driven by the mainly processing nature of exports by pure exporters, which will be examined more in detail later.

The coefficients on the controls have the expected signs. The coefficients for  $\ln(\text{Scale})$ ,  $\ln(\text{S/L})$ ,  $\ln(\text{K/L})$ , Age, and RD/Sales are all positive and significant, indicating their importance in firms' sales activities. For firms' ownership, compared with the base type (*SOE*), being *private*, *HMT* or *foreign* helps firms sell either in other provincial markets, or become exporters or both, *ceteris paribus*.

## 5.2. Possible Endogeneity

Although the above results unambiguously suggest that having loans help firms overcome trade barriers to sell their products in other provinces and in the international markets, one might argue that it might be the other way around—firms first sell their products in other markets to indicate their growth potential, and then get loans from banks and/or other financial institutions. In the following subsection, we will introduce an instrumental variable (IV) to control for the potential endogeneity issue.

Regarding the IV, we follow some previous works by using the average of the industry-city in similar contexts, as Fisman and Svensson (2007) and Cai et al., (2010). Here, we use the overall tendency of firms getting bank loans in the industry-city as the IV. A firm's own loan status is understandably related with the industry and city average, especially in China—if firms locate in cities with well-developed financial institutions, it would be much easier for them to get financial loans than those locating in the weaker financial environment (such as inland areas)—signaling a higher city average. Similarly, firms might be more likely to get loans if the industry heavily relies on external financing for daily operation. Thus, a firm's chance of getting financial loans will be influenced and related to the industry-city where the firm locates. Meanwhile, it is reasonable to assume that an industry-city average access to financial loans will not be correlated with a particular firm's unexplained error term

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<sup>6</sup> Lu (2010) finds that, unlike findings by studies in many other countries, productivity for Chinese exporters are not higher than non-exporters: they are typically less productive and sell less in the domestic market than non-exporters, and the distribution of export intensity exhibits a U-shape, with more than half of China's exporters exporting most of their output.

in choosing a particular firm type. Given the non-linear nature of the estimation, we will resort to a two-step procedure as suggested in Hilbe (2011). In the first step, we use OLS to regress the *loan* indicator on the IV and all other exogenous variables to get the predicted values of *loan*. In the second step, we replace firms' loan status with the predicted values in the MNL estimation. Results are reported in Table 4. Testing the validity of the IV comes down as testing the joint significance of the instruments in this context (Cameron and Trivedi, 2009). "One commonly used diagnostic is, therefore, the F statistic for joint significance of the instruments. . . . A widely used rule of thumb suggested by Staiger and Stock (1997) views an F statistics of less than 10 as indicating weak instruments" (Cameron and Trivedi , 2009: P190)". The F-test statistic obtained is 29.86, much larger than the criteria suggested, rejecting the hypothesis that the IV is weak.

Now, let's turn to the second stage results in Table 4. The signs of the coefficients are unchanged, though with much larger magnitudes, compared with the baseline results. The different magnitudes suggest that, without correcting endogeneity, we estimate a lower bound of loan effects on firms' choice of choosing certain firm types. Overall, the results reinforce the conclusion that access to financial loans help firms overcome domestic and international trade barriers to advance their sales.

### **5.3. External Finance and Firms' Sales Shares**

As indicated by Tables 1 and 2, the number of firms in each category differs, which comes from not only the different sales volumes by firms, but also by many firms having sales in many destinations. Take *AllSeller* firms to illustrate the point. We categorize a firm as *AllSeller* as long as it has sales both domestically and internationally, but we do not differentiate the sales *shares* an *AllSeller* firm has in different destinations. It can be that some *AllSeller* firms export the majority of their goods to the foreign countries, while others only export a small part of their products, although the sum of the sale shares across all destinations is 1. Here, we take an alternative approach to examine the role of external finance on firms' sales decisions. This alternative approach looks at how firms alter their sales' shares in different sales destinations. If external finance helps firms overcome either domestic or international trade costs, then we expect to see that external finance will increase

firms' sales shares in other provinces and in the international markets. We adopt a fractional multinomial logit model (fractional MNL, as specified in Papke and Wooldridge (1996), to capture the decision of firms in their sale shares in the possible destinations. Here, the associated results are in Table 5.

The results indicate that having external finance significantly increases firms' sales shares in other cities within their home provinces, in other provinces and in the international markets. They do not confirm our findings, but also shed additional lights on the significant roles external finance played in firms' sales decisions, when they face both domestic and international trade costs.

## **6. Sensitivity Analyses**

### ***6.1. The Degree of Financial Constraint***

Although more than half of the firms in the sample get access to financial loans, their degree of reliance on external finance is different. In the survey, firms are asked whether financial loans are important for their operations. Among the 7,435 firms with financial loans, 1,981 firms thought the financial loan was not important, 3,441 believed it was somewhat important, while 2,013 firms believed it was very important. If firms' perceived importance of financial loans is an indication of their presumed effects for firms to overcome trade barriers, we would expect that the effects would be larger for firms in high need of financial loans than others. To test that, we re-estimate the baseline results with parallel sub-samples of firms with their reported importance of loans. Table 6 reports the results.

From the associated results, we can draw two conclusions. First, domestic trade costs are well and alive. Getting financial loans is an important factor for firms to choose *DomFirm* type firms, and the result is consistent with firms' perceived importance. And so is true for *AllSeller* firms. By contrast, there is not a clear pattern for firms with access to financial loans to choose to be pure exporters. The results indicate that financial loans are important factors for firms to overcome domestic and international trade costs. For pure exporters though, the different results might be due to their specialty in China. Most of the pure exporters in China engage in processing exports, a step in the global production chain, and foreign-ownership is very common. Due to their processing nature, the importance of financing loan to them is not

clear cut: they might have financial backings from their overseas parent firms or ordering firms. Second, even firms give the financial loans a “no” importance rating, the estimated results still point to a higher probability of firms becoming *DomFirm* or *AllSeller* firms, compared with the base firm type. It suggests that getting financial loans help firm overcome trade barriers across provincial and national borders.

## **6.2. Firm Ownerships**

This section speaks to a well discussed disparity in firms’ access to financial loans in China, with the presumed favorites of SOEs (Langlois, 2001), although the survey results do not point to significant differences among the ratios of firms getting loans in each firm type. To that end, we will need to conduct joint analysis of firms’ ownership types and the importance of loans, so that we can clearly analyze the effects of loans across firms’ ownership structures. The joint analyses lead to a total of 9 parallel analyses, presented in Table 7. Some interesting observations emerge.

For SOEs, access to financial loans is not helpful to overcome domestic trade barriers, nor is it important for SOEs to choose to be pure exporters. Financial loans are important factors SOEs to become exporters, only when they need them.

The picture is very different for private firms. Access to financial loans is very important for them to overcome trade barriers to sell outside their home provinces, to engage in the global production chain as pure exporters, or to become exporters. The importance of financial loans is clearly evidenced by firms’ needs: the more firms need financial loans, the larger the estimated effects.

For Foreign-owned firms (HMT-owned and other foreign ownership), the role of financial loans is not clear. Access to financial loans does not play an important role for them to sell outside their home provinces in China. Nor is it important for them to engage international markets. Access to financial loans even decreases firms’ probability to choose to be pure exporters.

The estimation results point to the different market entry patterns among firms with their ownership structures. For SOEs, their unique institutional structure might help them enter other provincial markets, but not across borders. For foreign firms, it would be relatively

easier for them to sell their goods internationally due to their unique multinational advantages including global sales and service networks.

### **6.3. Local Market Protection**

We now turn our attention to the novelty of domestic trade barriers. Firms' experiences with local governments' protection vary. Some firms felt the negative effects, while others didn't, as evidenced by the survey results. For firms with sales outside their home provinces (5,910 firms), when asked whether they experienced negative effects from local protection on these sales, 2,479 firms answered yes, and 3,431 firms answered no. If, as we have argued, entry barriers across provincial borders are prevalent, then financial loans would help firms overcome these barriers regardless whether firms *felt* them or not. To test that, we split the *DomFirm* firms into *DomFirm+* and *DomFirm-* to highlight their perceived difference of local protection, with "+" for "yes" firms. We expect that external financing would play a positive role in firms' decision to sell in other provincial and international markets, with a larger effect for those which felt the provincial entry barriers. These results are reported in Table 8.

As expected, for firms with negative experiences of local protection, financial loan has a larger effect than those without. The results not only confirm our main findings, but also lend support on the rationale that financial loans help firms overcome provincial entry barriers: the stronger the provincial barriers firms experience, the larger the expected effects from access to financial loans.

### **6.4. Location Heterogeneity**

One of obvious development patterns in China since the economic reform policy in 1978 is uneven economic growth rate and development. While the coastal areas have enjoyed the favorable policies from the beginning of the reform, the inland areas only had similar development policies many years later. Along with the favorable development policies are financial reforms, rendering firms in certain locations some advantages in access to financial loans. This section will explicitly examine the location heterogeneity in firms' choices. We divide the sample into East and Inland areas: the East area includes Beijing, Tianjin, Hebei,

Liaoning, Shanghai, Jiangsu, Zhejiang, Fujian, Shandong, Guangdong and Haihan, with the rest in the Inland sub-sample.

Table 9 records the corresponding results. In each area, we first run a regression without differentiating firms' perceived importance of loans, and then split the sub-sample into the perceived "no" importance and "some" importance (low importance plus high importance). The table reveals some interesting results. First, within each area, for firms which believed that financial loan is important, the results unambiguously indicate that financial loan is significant in raising their probability to become *DomFirm*, *PureExpFirm*, or *AllSeller* firms: the coefficients are the largest for *AllSeller*, followed in order by *DomFirm* and by *PureExpFirm*. This is consistent with previous findings and reinforces our conclusion that financial loans are important for firms to overcome trade barriers.

Second, comparing results between the East and Inland, it is evident that the effects of financial loans are larger for firms located in Inland than for those located in East, for every firm type. This result reflects that the different degrees of openness, the infrastructure system and governance. The East area enjoys geographical advantage of nearby port facilities, good infrastructure system connecting cities, and better (and faster) government service than Inland areas. The results reflect that the marginal effects of financial loans are more important for firms located in Inland areas than in the East.

### **6.5. Industry Heterogeneity**

Although industry dummy could capture some of the industry heterogeneity, here, we choose to group the industries into two categories, depending on their dependence on external finance, following Rajan and Zingales (1998) for the industry clarification. We code *fdep* with the value of 1 for those industries whose dependence on external financing is high, and 0 otherwise. In our sample, there are 6,044 firms in the external-dependence group and the remaining in the other group. Among the 6,044 firms which have higher degree of external financing dependence, about 82% sell their goods to other provincial markets, and 43% have exports. For the 6,356 firms with low dependence on financing, 73% sell their goods to other provincial markets, and 32% percent have exports.

In addition, we introduce another variable, *imp*, to capture firms' various degrees of their

reliance on external financing on their business operation and growth. The indicator takes on discrete values of 0, 1, 2, 3 and 4, with larger value indicating higher importance of external financing. The interaction of *loan* with *fdep* will capture the difference of *loan* on industries, and the triple interaction term of *loan*, *fdep* and *imp* captures the additional difference of the importance of access to finance for industries dependent on external financing. We add the two interaction terms additively, with results in Table 10.

Results in the upper part of the Table suggest that *loan* is more important for industries more dependent on external financing, except for *PureExpFirm* firms where the coefficient on the interaction term is not significant. Adding the triple interaction term highlights the growing importance for the external financing dependent industries—the positive and significant coefficient for *DomFirm* and for *AllSeller* implies that the higher the importance of access to finance, the larger the estimated effects.

This result confirms our earlier analyses on the perceived importance of finance on firms' decision to sell outside their home provinces and in the international markets. The probability is not significantly higher for firms to choose *PureExpFirm*, even if they operate in high external financing dependent industries, which once again reflects that pure exporters are a special category of firms by largely being a part of a global production chain.

## **7. Conclusions**

The paper examines an important issue of firms' access to external finance to help firms overcome internal and external barriers in their sales. A good body of studies has indicated that external finance is helpful for firms to become exporters, while this study looks at whether there are any significant differences in the importance of external finance on firms' domestic and international sales.

We take advantage of a detailed survey by the World Bank of 12,000 firms and differentiate their sales destinations in fine classifications as home province, outside home provinces, pure exporters and domestic plus international sales. In so doing, we can explicitly compare the trade barriers across provincial borders and across national borders. In addition, we utilize firms' perceived importance of external financing on their operations and their perceived experience of provincial protections on their domestic sales. Our results indicate



that external finance is important for firms to overcome either provincial trade barriers, or international trade barriers, or both. Firms that deemed external finance important would experience larger effects than those that indicated that external finance are not as important. The effects of external finance vary across firms' ownership structures along sales destinations: while external finance is generally important for private firms to choose to sell either outside their home province or in the international market, it is so for SOEs when they sell overseas, and the effects for foreign-owned firms are not clear. We find that external finance is more important for firms located in the inland; and for those operating in industries more reliant on external finance than others.

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**Table 1: Firms and Their Sales Activities**

		Definition	No. of firms	share (%)
<i>Firms with no exports</i>	<i>ProvFirm</i>	Sales only in firms' home province	1817	14.65
	<i>DomFirm</i>	Sales also in other provinces, with or without sales in firms' home province	5910	47.66
<i>Firms with exports</i>	<i>PureExpFirm</i>	Exports only (no domestic sales)	955	7.70
	<i>AllSeller</i>	Exports plus domestic sales	3718	29.98
<i>Total</i>			12400	100

**Table 2: Firms' Sales in Multiple Destinations**

	Sales in Home Province	Sales outside home provinces	Exporters
No. of Firms	8818	9627	4672
Firm Share as of			
Total (%)	71.12	77.65	37.69
Share in total sales (%)	44.1	39.4	16.5

**Table 3: Firms' Financing and Sales Destinations**

	<i>DomFirm</i>	<i>PureExpFirm</i>	<i>AllSeller</i>
loan	1.649*** (0.101)	1.264** (0.143)	2.326*** (0.169)
ln(Scale)	1.471*** (0.037)	2.085*** (0.092)	2.467*** (0.072)
ln(S/L)	0.789*** (0.030)	0.461*** (0.032)	0.506*** (0.022)
ln(K/L)	1.059*** (0.024)	0.779*** (0.032)	1.104*** (0.031)
age	0.999* (0.001)	0.999 (0.001)	0.998** (0.001)
RD/Sales	1.094*** (0.020)	1.016 (0.033)	1.127*** (0.021)
Private	1.537*** (0.156)	3.853*** (1.396)	2.130*** (0.258)
HMT	1.219** (0.200)	30.370*** (11.676)	4.030*** (0.722)
FDI	2.165*** (0.404)	75.693*** (29.971)	11.311*** (2.236)
Industry fixed effects	yes	yes	yes
City fixed effects	yes	yes	yes
obs		12372	

Note: \*\*\*, \*\* and \* denote 1%, 5% and 10% significance level respectively.

**Table 4. IV Results**

	<i>DomFirm</i>	<i>PureExpFirm</i>	<i>AllSeller</i>
<i>loan</i>	3.604 <sup>***</sup> (0.516)	3.067 <sup>***</sup> (0.757)	6.258 <sup>***</sup> (1.038)

Note: \*\*\*, \*\* and \* denote 1%, 5% and 10% significance level respectively. The regression includes all other covariates, but results are omitted here for brevity.

**Table 5. Multi-destination: Sale Shares**

	outcityshare	outprovshare	expshare
<i>loan</i>	0.297 <sup>***</sup> (0.037)	0.335 <sup>***</sup> (0.030)	0.383 <sup>***</sup> (0.088)

Note: \*\*\*, \*\* and \* denote 1%, 5% and 10% significance level respectively. The regression includes all other covariates, but results are omitted here for brevity.

**Table 6. Degree of Financial Constraint**

	<i>DomFirm</i>	<i>PureExpFirm</i>	<i>AllSeller</i>
Loan_no importance	1.248 <sup>**</sup> (0.112)	1.021 (0.159)	1.736 <sup>***</sup> (0.177)
Loan_low importance	1.792 <sup>***</sup> (0.144)	1.563 <sup>***</sup> (0.214)	2.567 <sup>***</sup> (0.234)
Loan_high importance	1.947 <sup>***</sup> (0.186)	0.915 (0.188)	2.746 <sup>***</sup> (0.295)

Note: \*\*\*, \*\* and \* denote 1%, 5% and 10% significance level respectively. The regression includes all other covariates, but results are omitted here for brevity.



**Table 7. Different Ownership Types**

Ownership		<i>DomFirm</i>	<i>PureExpFirm</i>	<i>AllSeller</i>
<b>SOE</b>	Loan	1.214 (0.255)	0.657 (0.521)	1.861** (0.464)
	Loan_no importance	1.132 (0.354)	0.001 (0.001)	1.304 (0.491)
	Loan_importance	1.263 (0.293)	0.883 (0.724)	2.064*** (0.556)
	Loan	1.754*** (0.115)	2.487*** (0.393)	2.819*** (0.229)
<b>Private</b>	Loan_no importance	1.328** (0.128)	2.124*** (0.452)	1.986*** (0.226)
	Loan_importance	1.969*** (0.145)	2.663*** (0.457)	3.245*** (0.287)
	Loan	1.198 (0.243)	0.634** (0.138)	1.193 (0.236)
<b>Foreign</b>	Loan_no importance	1.005 (0.282)	0.739 (0.221)	1.364 (0.368)
	Loan_importance	1.295 (0.290)	0.582*** (0.141)	1.106 (0.243)

Note: \*\*\*, \*\* and \* denote 1%, 5% and 10% significance level respectively. The regression includes all other control variables, not reported for brevity.

**Table 8. Presence of Local Market Protection**

	<i>DomFirm-</i>	<i>DomFirm+</i>	<i>PureExpFirm</i>	<i>AllSeller</i>
loan	1.521*** (0.100)	1.860*** (0.132)	1.264*** (0.142)	2.336*** (0.169)

Note: \*\*\*, \*\* and \* denote 1%, 5% and 10% significance level respectively. The regression includes all other control variables, not reported for brevity.

**Table 9. Location Heterogeneity**

Location		<i>DomFirm</i>	<i>PureExpFirm</i>	<i>AllSeller</i>
<b>Coast</b>	Loan	1.436 <sup>***</sup> (0.140)	1.247 (0.169)	2.086 <sup>***</sup> (0.219)
	Loan_no importance	1.216 (0.159)	1.099 (0.201)	1.755 <sup>***</sup> (0.243)
	Loan_importance	1.572 <sup>***</sup> (0.173)	1.337 <sup>*</sup> (0.203)	2.290 <sup>***</sup> (0.268)
	Loan	1.672 <sup>***</sup> (0.124)	1.620 <sup>**</sup> (0.330)	2.524 <sup>***</sup> (0.239)
<b>Inland</b>	Loan_no importance	1.195 (0.138)	1.675 <sup>**</sup> (0.486)	1.687 <sup>***</sup> (0.239)
	Loan_importance	1.882 <sup>***</sup> (0.154)	1.584 <sup>***</sup> (0.358)	2.889 <sup>***</sup> (0.294)

Note: \*\*\*, \*\* and \* denote 1%, 5% and 10% significance level respectively. The regression includes all other control variables, not reported for brevity.

**Table 10. Industry Heterogeneity**

	<i>DomFirm</i>	<i>PureExpFirm</i>	<i>AllSeller</i>
loan	1.292 <sup>***</sup> (0.086)	1.366 <sup>***</sup> (0.135)	1.686 <sup>***</sup> (0.132)
loan*fdep	1.847 <sup>***</sup> (0.167)	1.180 (0.177)	2.273 <sup>***</sup> (0.219)
loan	1.293 <sup>***</sup> (0.086)	1.367 <sup>***</sup> (0.163)	1.689 <sup>***</sup> (0.133)
loan*fdep	1.287 <sup>**</sup> (0.159)	1.097 (0.212)	1.554 <sup>***</sup> (0.203)
loan*fdep*imp	1.271 <sup>***</sup> (0.077)	1.002 (0.104)	1.288 <sup>***</sup> (0.081)

Note: \*\*\*, \*\* and \* denote 1%, 5% and 10% significance level respectively. The regression includes all other control variables, not reported for brevity.