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## Trade finance and exports: Firm-level evidence from China

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**World Trade Organization**

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**TRADE FINANCE AND EXPORTS:  
FIRM-LEVEL EVIDENCE FROM CHINA**

Jiancong Liu<sup>\*</sup>, Marc Auboin<sup>†</sup>, Beliyu Haile<sup>‡</sup>, Yu Wang<sup>§</sup>

*Manuscript date: 31 July 2024*

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## TRADE FINANCE AND EXPORTS: FIRM-LEVEL EVIDENCE FROM CHINA

Jiancong Liu\*, Marc Auboin†, Beliyu Haile‡, Yu Wang§

*Manuscript date: 31 July 2024*

### **Abstract:**

We use panel data for listed firms from China for 2013-2021 to examine the association between their export earnings and trade finance, particularly those receiving trade loans. Results show that a percent increase in trade finance loan is associated with 0.067-0.083 percent increase in export earnings depending on the model. When we proxy trade finance by the sum of trade finance loans and export-adjusted notes receivable, elasticity estimates range between 0.18-0.31 depending on the sample of exporters. These estimates are comparable to single and multi-instrument trade finance instrument elasticities in the literature. Elasticity of export earnings is higher for smaller firms that may have relatively limited financing options from domestic capital markets. Given that listed firms represent the largest companies, we acknowledge that study findings may not be generalizable to the universe of highly heterogeneous Chinese traders. Nonetheless, our results suggest that well-functioning markets for trade finance are likely to enhance trade, while, by contrast, lack of affordable trade finance can be a barrier to trade, or a trade cost, in its own right.

**Key Words:** Trade, empirical studies on trade, trade finance.

**JEL codes:** F10, G21, O16, F14, F19.

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## 1 INTRODUCTION

Limited availability of affordable trade finance can be a significant barrier to international trade as firms encounter specific costs and transactional risks when conducting cross-border transactions. These risks include payment and delivery risks, along with funding costs related to the time gap between the production, shipment, and payment of goods. In the past few decades, the literature made headways in highlighting, both at the firm and country level, the role of financial frictions (firm's financial constraints, dependence on external finance, cost of finance), the impact of cyclical and financial developments, and the role of health/quality of banks providing trade finance, *inter alia*, on trade flows.

Productivity levels, the intensity of financial constraints, and/or firm's financial vulnerability might impact trade on the internal or external margins, or both (Chaney 2016; Manova 2013). The literature considered heterogeneity at many levels, across firms and sectors (Manova 2013); and lately across firms in countries at various levels of development, generally showing a negative association between the higher cost, higher perception of risk, and lower availability of trade finance, on the one hand, and on the other, exports especially to poorer and smaller economies (Demir, Michalski, and Ors 2017; Hoefele, Schmidt-Eisenlohr, and Yu 2016; Niepmann and Schmidt-Eisenlohr 2017; Paravisini *et al.* 2015).

Recent WTO-IFC studies in West Africa and the Mekong regions showed that only 25% of goods trade was supported by trade finance. The share of bank-intermediated trade finance for the WTO-IFC target countries in West Africa is below the continental average of 40%, itself lower than the global average (AfDB 2020). In selective, fragmented trade finance markets, bank rejection rates for trade finance applications are high and tend to fall disproportionately on new clients and smaller firms. When selected, these firms face higher prices and collateral requirements. Earlier literature showed that, while access to trade finance increased the probability of becoming an exporter, high cost of finance affected countries with a lower level of financial development and for sectors with a higher level of financial vulnerability (Berman and Héricourt 2010); hence a country's level of financial development affected firms' probability of becoming exporters. Firms with higher levels of financial vulnerability tended to depend on "lower" quality banks (Amiti and Weinstein 2011).

Firm-level data from the World Bank Enterprise Surveys (WBES) show that 71% of the working capital needs of exporters<sup>1</sup> in low- and middle-income countries (LMICs) is financed from internal funds and retained earnings while 18% and 9% is financed, respectively, by bank and non-bank financial institutions (Annex Figure A1). WBES data also show that 40% of total annual sales of exporters was paid post-delivery. Absent affordable trade finance, the lag between export financing and export earnings imposes severe liquidity constraints on firms (Contessi and Francesca 2013; Dornel, Engel, and Malouche 2021).

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<sup>1</sup> An exporter is defined as an enterprise with at least 10% of annual sales directly exported to international markets (IFC 2023).

Studies based on customs data show that for middle-income countries such as Türkiye, China and Colombia, trade takes place to an increasing degree on open account, as trust develops between local suppliers and foreign buyers (Ahn, Khandelwal, and Wei 2011; Demir and Javorcik 2018). While this offers opportunities for supply chain finance arrangements, supply chain finance markets are non-existent or in their infancy in many low-income countries, thereby leaving significant gaps between local firms and FDI-firms benefiting from foreign buyers' support. Recently conducted bank surveys helped identify key supply and demand constraints to expanding trade and supply chain finance markets, from high collateral requirements used as offsets for weak contract enforcement, to limited financial literacy, lack of capacity and scale of local banks, absence of non-bank solutions, insufficient access to foreign currency, and shortages of low-cost funding (AfDB 2020; IFC and WTO 2022, 2023).

This study examines the association between firm export earnings and trade finance using firm-level data from China. We hypothesize that access to trade finance by Chinese exporters improves export earnings. There are relatively few academic papers on the use of international trade finance in China, despite a rather dense literature on domestic trade credit and working capital needs. There is also scarcity of firm-level data on trade finance. The literature generally links the level of financial sector development or openness to trade expansion (Usman, 2023, Qiu *et al.*, 2022). China's large trade finance market played a pivotal role in facilitating cross-border trade transactions for Chinese firms, relying on large, internationalized banks to supply various instruments (import bill advance, letters of credit, payment guarantees, trade finance loans) and advanced technologies for risk management (e.g., cloud computing, blockchain). One key insight from the trade finance literature is that, despite variations in the magnitude of trade flow elasticities across studies, elasticity estimates are consistently significant.

Consistent with previous findings, we find a strong positive association between trade finance loans and export flows. Export earnings elasticity to trade finance loans is estimated between 0.067-0.083. We find a higher elasticity (0.18-0.31) when measuring trade finance by the sum of trade finance loans and export-adjusted net notes receivable. Single trade finance instrument elasticity (for loans) is consistent with single instrument trade elasticities in the literature. Elasticity estimates based on a broader definition of trade finance are consistent with multi-instrument trade finance elasticities previously reported that range between 0.1 and 0.2. Our findings suggest that well-functioning commercial trade finance markets are important to enhance exports.

The rest of the paper is organized as follows. Section 2 describes the data, key indicators, and estimation strategy. Section 3 discusses descriptive and regression results. Section 4 concludes the paper by identifying study implications and limitations.

## 2 METHOD

### 2.1 DATA AND KEY VARIABLES

The main data source we use is the China Stock Market & Accounting Research Database (CSMAR) (GTA Information Technology 2024). We use four CSMAR datasets for listed firms<sup>2</sup> for the period 2013 to 2021. The *first* dataset provides information about bank loans received by listed firms along with a description of the intended use of the loan. Certain loans clearly make a reference to trade financing or overseas business (imports, exports). Trade finance loans identified this way and received throughout the year are summed to generate firm-year level amount.<sup>3</sup> In a baseline model of export earnings (discussed further in Section 2.2), we control for trade finance loans defined this way.

The *second* firm-level dataset contains annual financial statements, including total assets, debts, equity, sales, net profits, net notes receivable (NNR) and net accounts receivable (NAR). We use the share of inventories and intangible assets of the firm's total assets as a proxy for managerial practices and innovation ability. Per the definition in CSMAR database, notes receivable (NR) are notes that are neither due nor discounted at banks yet, including trade and bank acceptances but excluding endorsed notes receivables. NNR are the difference between NR and provisions for bad debts. In an alternative model of export earnings, we use the sum of trade finance loans and export-adjusted NNR to proxy trade finance. Since CSMAR dataset does not distinguish between receivables linked to domestic sales versus exports, we adjust NNR by multiplying it with the share of the firm's annual export earnings of its total annual sales, i.e., "export-adjusted notes receivable" (EANR). As we show later, the average NNR scaling factor is about 23% and 28% for all listed exporters and exporters with trade finance loans, respectively.

We used EANR as one element reflecting open account payments due to listed exporting firms from international trade. EANR can be associated to trade finance, as notes receivable records in the firms' balance sheets promissory notes against which such firms are legally entitled to receive payments. Promissory notes are a written promise to pay cash to another party on or before a specified future date. Such payment obligations are widely regarded as core trade financing instruments.<sup>4</sup>

We did not use net accounts receivable, though. They are part of a broader accounting concept, referring to the total amount of future receipts expected from the firm's customers. Even when adjusted by exports, they cannot be attached to any financial instrument, *a priori*. In principle,

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<sup>2</sup> The sample of listed firms includes companies with China A-shares, i.e., companies based in mainland China - that are listed on either the Shanghai or Shenzhen Stock Exchanges.

<sup>3</sup> We kept loan data entries where minimum and maximum values are the same and excluded loans where the two are different.

<sup>4</sup> Promissory notes are one of the oldest methods of direct financing and of support to financing for cross-border trade. Notes are transferable, negotiable, and discountable. They are mentioned as a trade finance instrument in most reference definitional manuals including by the Global Supply Chain Finance Forum (BAFT *et al.* 2016) and the International Trade Centre (ITC 2009).

account receivables could become a source of financing if negotiated and discounted, but this information was not available in our database. It is likely, though, that firms in China use some account receivables, for example in the form of invoices, as a source of trade finance, though factoring.<sup>5</sup>

The *third* CSMAR dataset contains information about exporter characteristics including ownership type (private, state owned, and other), industry classification, age and sex composition of senior firm management, and the number of employees. This dataset is used to construct several variables we control for in the export earnings model. The *fourth* dataset contains information about the amount of foreign earnings of listed firms. Of the 2,074 listed firms (12,715 firm-year observations) in the CSMAR database for 2013-2021, 95% had positive export earnings, 8.7% received trade finance loans, and 82% had net notes receivables. Export earnings of all the listed firms accounted for, on average, 17% of China's total annual manufacturing exports during the study period. In addition to the four firm-level CSMAR datasets discussed above, we use CSMAR data about the assets of listed banks and merge it with bank trade finance asset data from Wind Economic Database (Wind Information Co. 2024) for selected banks for which trade finance data was available for 2022. Subsequently, we compute the share of trade finance of total bank assets for China for comparison with selected comparator countries.

Other data sources we use include the World Bank Enterprise Surveys (WBES) to examine the sources of financing of working capital for exporters in emerging and developing countries (The World Bank 2024a), the World Trade Organization (WTO) for the value of Chinese exports (WTO 2024), the World Bank WDI database for per capita income and credit available to the private sector (The World Bank 2024b), and the International Finance Cooperation (IFC) and WTO bank survey datasets for bank assets and trade finance balances for selected countries in Africa and Asia (IFC and WTO 2022, 2023). The IFC–WTO bank surveys covered 75 (West Africa) and 53 (Mekong) banks with trade finance business.

## 2.2 STATISTICAL MODELS

To test our hypothesis that trade finance improves export flows, we first estimate the fixed effects model in Equation 1 on a subsample of listed exporters that received trade finance loans (baseline specification).

$$\ln export_{ft} = \alpha + \beta \ln TFL_{ft} + \mathbf{X}'_{ft} \boldsymbol{\Gamma} + \theta_f + \varepsilon_{ft} \quad (1)$$

where  $f$  and  $t$  are indices for firm and year;  $\ln export$  is the logarithm (ln) of export earnings in Chinese Yuan (CNY);  $\ln TFL$  is ln of trade finance loans to exporters (CNY) as defined in Section 2.1;  $\mathbf{X}$  is a matrix of firm-level indicators;  $\theta$  is the unobserved time-invariant firm fixed effect; and  $\varepsilon$  is

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<sup>5</sup> Estimates from the international factoring association (FCI) indicate show that international factoring of receivables from China accounted for about 18% of total factoring flows in 2023.

the model error term. Guided by previous literature on the determinants of firm export performance and the data we have,  $X$  includes firm ownership type, the number of employees to proxy firm size, sector (manufacturing vs other), the share of women in senior firm management, the average age of senior management, and two financial indicators—ratios of tangible assets and net inventories to total assets. An additional variable we include in  $X$  is bank loans, an indicator we do not expect to be as important in explaining export earnings as trade finance loans. Given the log-log specification,  $\beta$  measures the elasticity of export earnings to trade finance loans, i.e., a percent increase in trade finance loans is associated with  $\beta$  % change in export earnings. We do not expect non-trade finance loans to be as important in explaining export earnings as trade finance loans. As a sensitivity check, we present estimates of  $\beta$  with and without controlling for  $X$ .

To examine the combined effects of multiple trade finance instruments, we specify the alternative model shown in Equation 2.

$$\ln export_{ft} = \alpha + \beta \ln TFL\_NR_{tf}^{adj} + X'_{ft} \Gamma + \theta_f + \epsilon_{ft} \quad (2)$$

where  $\ln TFL\_NR_{tf}^{adj}$  is the sum of trade finance loans and export-adjusted net notes receivables (NNR) defined before and other variables as described in Equation 1. Previous evidence from China shows a positive association between firm access to bank loans and its notes payables (Bai, Cai, and Qin 2021). Net note receivables are assets on the balance sheet of firms, which can clearly be identified as payment obligations due by foreign clients when related to an export, on the firm's balance sheets. They are present for the balance sheets of most exporters in our sample reflecting the open account relations between companies, clients and foreign subsidiaries. They can be discounted or used as collateral against liabilities. In investment grade firms, they can have the status of near securities.

For the sake of comparability, we first estimate Equation 2 on the same subsample of exporters used to estimate Equation 1 (i.e., exporters that received trade finance loans) and re-estimate Equation 2 on an expanded subsample of all listed exporters (i.e., those that received trade finance loans and/or notes receivables).

We examine potential heterogeneity in export earnings elasticity by fitting a version of the model in Equation 2. To do so, we control for three indicators of firm characteristics and their interaction terms with  $\ln TFL\_NR_{tf}^{adj}$  (in three separate regressions). The three indicators are firm ownership type, gender composition of senior firm management, and firm size. We define an indicator for smaller firms that takes one if the number of employees in the company is below the median for our sample and zero if above. Given that listed firms are generally large, the small vs large comparison is a within-CSMAR comparison. The indicator for firm ownership type takes one if privately owned and

zero if state-owned enterprises (SOEs) or other ownership arrangements.<sup>6</sup> For gender composition of senior management, we define an indicator that takes one if the share of women in senior management is above the median for our sample and zero if below.

Larger exporters with better access to bigger internal capital markets may be able to manage payment delays or shortages of working capital better than smaller exporters in the absence of trade finance. If so, we expect the coefficient of the interaction term between the smaller firm indicator and the trade finance measure to be positive and significant. Previous studies have shown that privately owned Chinese firms may be less likely to receive funds from formal sources (e.g., bank loans) than SOEs that may have preferential access to financing (Bai, Cai, and Qin 2021; Chen and Tillmann 2019). Women-owned enterprises are generally underserved by the formal banking sector and tend to rely more on own capital and informal sources (GPFI and IFC 2011). As such, their exports may be more sensitive to access to trade finance. For the heterogeneity analysis, we present only elasticities from the model of export earnings that controls for firm characteristics. Standard errors from all regressions are clustered at the firm level.

### **3 RESULTS AND DISCUSSION**

#### **3.1 DESCRIPTIVE SUMMARY**

Chinese commercial banks have been instrumental in facilitating international trade transactions by offering both traditional trade finance instruments and new trade finance solutions such as supply chain finance. According to a survey of trade finance by the Central Bank of China (State Administration of Foreign Exchange), banks use four broadly defined trade finance instruments including import bill advance (IBAs) by overseas institution, trade finance by domestic banks, letters of credit (LC), and payment guarantee (PGs).<sup>7</sup> We first compare China's bank-based trade finance with that of selected low-to-middle income countries (Viet Nam, Cambodia, Lao People's Democratic Republic, Nigeria, Ghana, Senegal, and Côte d'Ivoire), with a view to understand the importance of the trade finance industry relative to the trade sector of the developing countries under review.

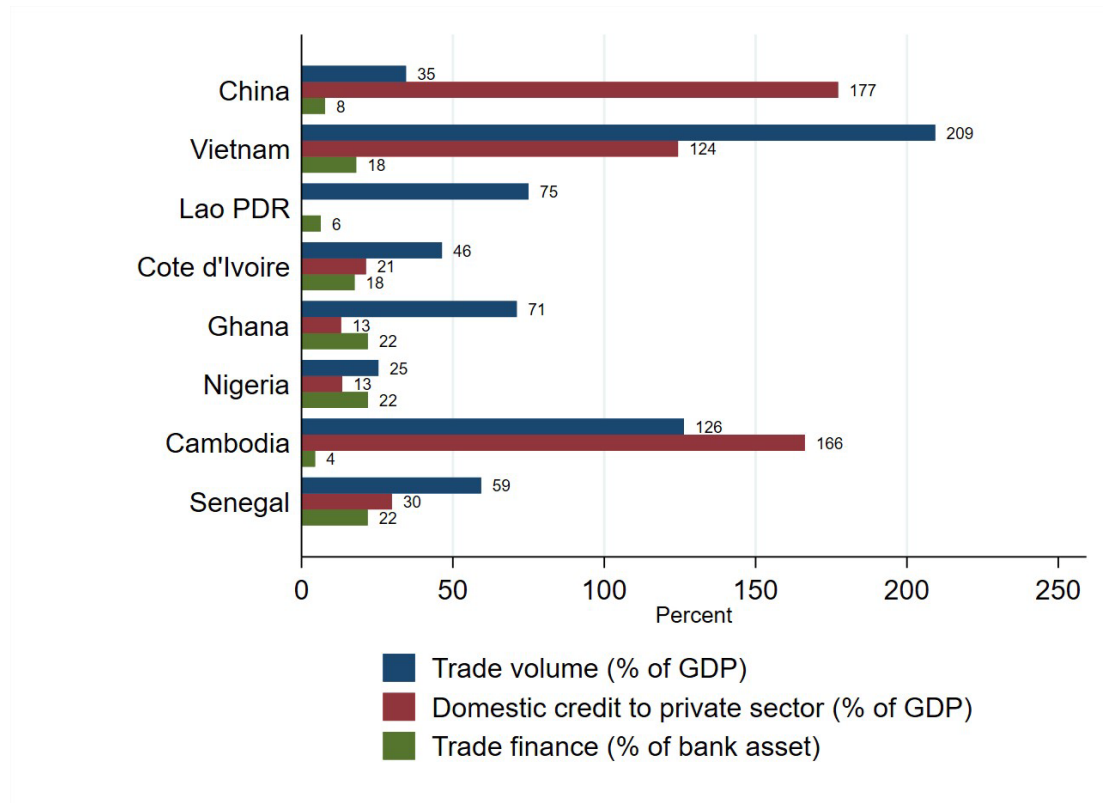
Figure 1 shows the share of bank trade finance of total bank assets for target countries. Trade finance shares are comparable for West African countries but differs across Mekong region. Cambodia's trade finance share is about half that of China (4% vs 8%), while Viet Nam's share is much higher than that of China (18%). Domestic credit available to the private sector as a share of GDP is the highest in China (177%), but generally low in West Africa (ranging between 13%-30%). Several global and local factors determine the volume of bank-intermediated trade finance including growth in trade flows and availability of funds (Vasishtha 2014).

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<sup>6</sup> Other ownership types include Sino-foreign equity joint venture, solely foreign funded, and collectively owned businesses.

<sup>7</sup> IBAs refer to overseas banks advancing import payments for domestic importers to overseas exporters while PGs refer to domestic banks guaranteeing deferred payment by domestic importers.

Figure 1: Trade flow, private sector credit, and trade finance for selected countries (2022/23)



Source: Authors based on various data. Countries are ranked based on per capita GNI (from top to bottom).

Returning to firm-level results, about 61% of listed exporters that received trade finance loans were privately owned while the rest were either SOEs (28%) or have other ownership types (10%) (Appendix Table A1). About 85% of these firms are in the manufacturing sector. This high concentration is expected given that manufacturing accounted for over 90% of Chinese merchandise exports during the study period. On average, overseas earnings accounted for about 28% of the operating revenue the firms (Appendix Table A1). Average tenure of trade finance loans is about 1.3 years and 65% of the trade finance loans were received directly by the listed firms in our sample while the rest of the loans went to their subsidiaries. The share of trade finance loans of export earnings is below 50% for about one-fifth of the firm-year pairs, 50%-100% for 10% of the observations, 100%-1,000% for over half the sample and above 1,000% for 17% of the sample. Appendix Table A2 provides similar summaries for the expanded sample of listed exporters (including those without trade finance loans but with notes receivables).

As a further check of the relevance of the firm data, we merged listed firms-level data of CSMAR with customs data. At firm-year level, around 73% of observations (firm-year) involve firms that are both exporters and importers. Of the left 27%, 54% of firms are exporters only, and 46% of firms are importers only. The same pattern holds when firm cross-sectional data is used: almost 78% of firms are both exporters and importers. For the remaining 22% of firms, 45% are only exporters

and 55% are only importers. This finding is important when regressing trade loans against exports: trade finance loans finance pre-shipment operations, possibly including imports, as the large majority (about 75%) of exporters were also importers.

### 3.2 REGRESSION RESULTS

Non-parametric unconditional regression results in Figure 2 show a positive association between export earnings and the two trade finance measures: trade finance loans from commercial banks and the sum of trade finance loans and export-adjusted notes receivable. The association is stronger for the expanded measure of trade finance (Figure 2, panel B). These patterns persist when controlling for firm-level characteristics (Tables 1 – 3).

Figure 2: Export earnings and trade finance for listed Chinese exporters (2013-2021)

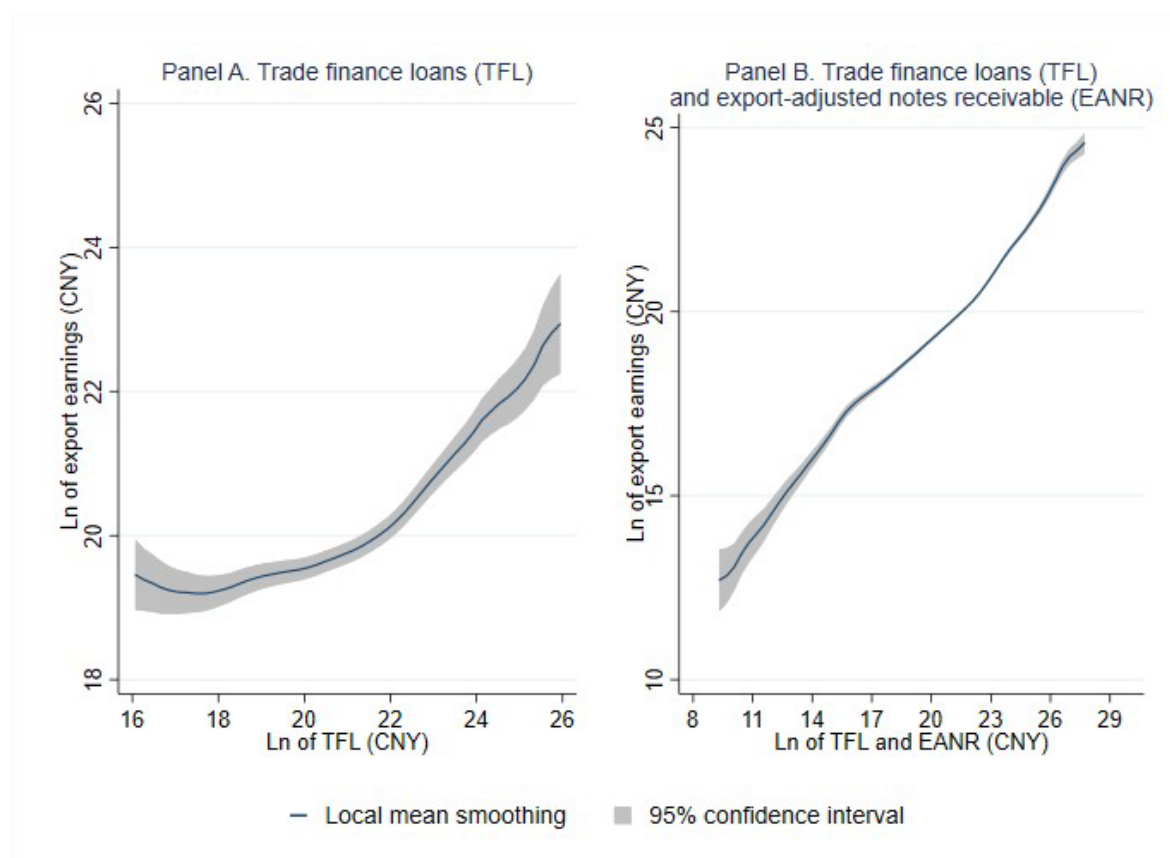


Table 1 presents results based on a subsample of listed exporters that received trade finance loans (Equation 1). A percent increase in trade finance loans is associated with 0.083% increase in export earnings (column 1). Controlling for firm characteristics marginally reduces the elasticity estimate to 0.067 (column 2). When focusing on one (important) trade finance instrument—trade finance loans—, our results show that the availability of such loans increases export flows, as they logically reduce the working capital constraint generated by the time lag between the post-shipment payment and costs of production and international shipment.

Trade finance loans might have also enabled exporters to finance inputs, an important function, considering that 73% of listed firms were also importers based on customs data. Previous evidence from China has shown negative effects of credit constraints on exports both at the extensive and insensitive margins (Zhang, Kong, and Yang 2015) as well as on the quality of exports via intermediate inputs import (Kong, Qin, and Liu 2020) or via crowding out of the credit market by high-debt ("zombie") firms (Xu, Fang, and Mao 2023). The negative effects of trade credit constraints on firms' ability to compete in international markets is widely documented (Defever, Riano, and Varela 2020; Paravisini *et al.* 2015; Chor and Manova 2012).

Table 1: Association between export earnings and trade finance loans

	(1)	(2)
	Dependent variable: Ln of export earnings	
Ln of trade finance loans	0.083** (0.0321)	0.067** (0.0289)
Firm-level controls	No	Yes
Number of firms	399	399
Number of observations	1,113	1,113
Within R-squared	0.011	0.079

Note: Reported are fixed effects estimates from Equation 1 on a subsample of listed exporters with trade finance loans. Column 1 controls only for Ln of trade finance loans. Column 2 controls for firm-level variables listed in Section 2.2. Robust standard errors clustered at firm level in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

When we consider the sum of trade finance loans and exported-adjusted notes to measure trade finance but keep the sample of exporters the same as that in Table 1 (i.e., exporters with trade finance loans), elasticity estimates increase to about 0.18 implying 0.12 points increase (Table 2). The elasticity estimate based on the expanded trade finance measure and sample of listed exporters (with positive trade finance loans and/or notes receivables) is much higher, estimated at 0.31 (Table 3).

Table 2: Association between export earnings and trade finance (proxied by bank loans and notes receivables) (sample of exporters with trade finance loans)

	(1)	(2)
	Dependent variable: Ln of export earnings	
Ln trade finance loans and export-adjusted notes receivable	0.184*** (0.0491)	0.189*** (0.0433)
Firm-level controls	No	Yes
Number of firms	399	399
Number of observations	1,113	1,113
Within R-squared	0.038	0.111

Note: Reported are fixed effects estimates from Equation 2 on a subsample of listed exporters with trade finance loans. Column 1 controls only for Ln of trade finance loans plus export-adjusted notes receivable, where the latter refers to firm's net notes receivable multiplied by the share of its export earnings of its total sales. Column 2 controls for firm-level variables listed in Section 2.2. Robust standard errors clustered at firm level in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

Table 3: Association between export earnings and trade finance (proxied by loans and notes receivables) (sample of exporters with trade finance loans and/or notes receivables)

	(1)	(2)
	Dependent variable: Ln of export earnings	
Ln trade finance loans and export-adjusted notes receivable	0.312*** (0.0164)	0.310*** (0.0158)
Firm-level controls	No	Yes
Number of firms	1,720	1,720
Number of observations	10,132	10,132
Within R-squared	0.227	0.280

Note: Reported are fixed effects estimates from Equation 2 on an expanded sample of all listed exporting firms with trade finance loans or notes receivable or both. Column 1 controls only for Ln of the sum of trade finance loans and export-adjusted notes receivable, where the latter is computed by multiplying the firm's net notes receivable by the share of export earnings of its total sales. Column 2 controls for firm-level variables listed in Section 2.2. Robust standard errors clustered at firm level in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

These findings highlight the importance of financial markets that can offer a wider range of alternative or cumulative trade finance products to address the needs of traders. While trade finance loans can provide working capital for exporters particularly when inputs are required, promissory notes in theory address, at little additional cost, the transactional risk of payment for exporters. Previous research has shown the positive effect of the quality and health of financial institutions on the delivery of services to traders (Chor and Manova 2012; Amiti and Weinstein 2011).

Finally, results from the heterogeneity analyses show statistically significant differential in elasticity by firm size (Table 4, panel A). Specifically, export earnings elasticity for relatively smaller firms is about 6 percentage points higher than that of large firms (0.34 vs 0.28).

Table 4: Association between export earnings and trade finance (proxied by trade finance loans and notes receivables) by firm characteristics.

	<i>Panel A. Firm size</i>
Ln trade finance loans and export-adjusted notes receivable (TFLNR)	0.278*** (0.0195)
Small firms (Small)	-1.066** (0.4174)
Small X TFLNR	0.057*** (0.0205)
	<i>Panel B. Ownership type</i>
Ln trade finance loans and export-adjusted notes receivable (TFLNR)	0.272*** (0.0249)
Privately owned enterprises (Private)	-0.013** (0.0063)
Private X TFLNR	0.001** (0.0003)
	<i>Panel C. Gender composition of senior management</i>
Ln trade finance loans and export-adjusted notes receivable (TFLNR)	0.307*** (0.0174)
Women-managed enterprises (Women)	0.033 (0.3259)
Women X TFLNR	0.004 (0.0156)

Note: Reported are fixed effects estimates from Equation 2 on an expanded sample of all listed exporters with trade finance loans or notes receivable or both. Sample includes 1720 firms and 10, 132 firm-year observations. Trade finance is proxied by ln of the sum of trade finance loans and export-adjusted notes receivable, where the latter is computed by multiplying the firm's net notes receivable by the share of export earnings of its total sales. All regressions control for firm-level variables listed in Section 2.2. Robust standard errors clustered at firm level in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

High costs and administrative requirements for traditional trade finance offering, low capacity of the financial sector to provide modern trade finance solutions, high rejection rates, and the large use by firms of second-best solutions outside the financial sector (informal forms of borrowing) are some features of countries at lower levels of trade finance development (IFC and WTO 2022, 2023). These constraints are often more severe among small and medium sized firms. The results of Table 3 highlighting higher elasticity of export earnings for relatively smaller exporters when we proxy trade finance by the sum of loans and notes receivables are not surprising. Smaller firms are traditionally

more financially constrained than large firms, hence more sensitive on the external margin to an increased access to combined trade finance instruments.

The elasticities we estimate are within the range found in the literature. For example, one study of trade finance in West Africa based on bank surveys and counterfactual analysis showed that increasing the availability of trade finance in the four largest ECOWAS economies (Nigeria, Ghana, Côte d'Ivoire and Senegal) to the average level for Africa and lowering trade finance costs could increase trade flows by 11% (Auboin, Bekkers, and Quarti 2023). This corresponded to elasticities of trade with respect to trade finance that range between 0.15 and 0.25 depending on the country. The counterfactual analysis assumed an increased range of products, a higher share of trade supported by trade finance and a lower cost of trade finance instruments (fees and interest rates).

For China, and considering lack of CSMAR data on trade finance loan interest rates<sup>8</sup>, the elasticity estimates we present capture the availability (vs costs) of trade finance loans. Higher elasticities reported in Tables 2 and 3 for trade finance are measured by the sum of trade finance loans and notes receivables and are comparable to elasticities reported previously including 0.3 in Auboin and Engemann (2014), 0.2 in Chor and Manova (2012) and about 0.04 in Niepmann and Schmidt-Eisenlohr (2017b), when only letters of credit are considered (comparable to the 0.67 we estimate for China when only trade finance loans are considered).

## 4 CONCLUSION

Limited access to affordable trade finance has been shown to deter international trade in developing and emerging countries, negatively impacting competitiveness, job creation, and overall economic growth. Specific to export trade, extra up-front expenditures, variable trade costs, and delays in the realization of export revenues necessitate access to affordable financial products and services to ease liquidity constraints and for insurance.

Firms engaged in cross-border trade can finance their businesses through inter-company credit (buyer's or seller's credit carried through a variety of payment obligations such as promissory notes, as well as others), bank-intermediated finance such as general credit facilities and trade-specific loans (import/export loans), payment guarantees, and trade credit insurance. By default, when trade finance is not available, firms finance the working capital needs generated by cross-border operations from internally generated working capital (retained earnings). Increasingly, in modern supply chains, firms can obtain financing out of receivables, through factoring and reverse factoring arrangements. Despite the low risk of non-repayment for trade finance products, there is large unmet demand especially among small and medium enterprises. The lag between export financing and the realization of export revenues imposes severe liquidity constraints on firms contributing to their mortality.

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<sup>8</sup> CSMAR loan dataset does not have interest rates for trade finance loans for all but 23 firms.

Evidence presented here based on firm-level data from China shows strong positive association between access to trade finance loans from commercial banks and export earnings. The association is also positive between firm's notes receivables and export earnings. Factoring receivable, including notes receivables is among the trade finance instruments available for firms with limited cash flow. The cash conversion cycle of receivables can be short, and be considered as near cash, or collateral for financing. They can be discounted or used as collateral against liabilities, including payables. In investment grade firms, they can have the status of near securities. In large companies running international supply chain operations, including with foreign subsidiaries or parent companies, there can be large and high frequency supplier-buyer transactions, implying large accounts receivable and accounts payable.

We conclude the paper by acknowledging limitations with our study by way of identifying areas for further research. First, the panel of listed exporters may not be representative of the universe of Chinese exporters since listed exporters accounted for about 17% of total Chinese manufacturing exports. Similarly, the subsample of listed exporters with trade finance loans may not represent listed exporters given that only about 9% of the listed exporters received trade finance loans from banks. As in other emerging markets, there is likely a significant heterogeneity among an estimated half a million firms engaged in international trade.

Second, we tagged commercial bank loans to exporters as trade finance loans based on descriptions about the intended use of loans. While we did not have customs data for the whole duration of our study period (2013-2021), we merged listed firms from CSMAR database with customs data for 2013-2016 to assess engagement in import and export trade. Results show that over 70% of the listed firms in the CSMAR database were both exporters and importers. As such, we do not know if and how much of trade finance loans received by exporters may have been used to finance imports. Our estimates of export elasticities would be underestimated if some of the commercial bank loans tagged as trade finance loans were used to finance both exports and imports.

Third, while our study emphasizes the importance for firms to access a potentially higher range of trade finance products, the data limitations does not allow to go deeper in the impact that access to such product can have. It was not possible to use factoring data at firm level, although the use of international factoring among Chinese exporters seems to be significant, judging from aggregate data collected by the International Factoring Association from financial institutions engaged in such activities. Also, firm level data on letters of credit was not available. While letters of credit do not necessarily provide for financing per say (except for post-shipment letters of credit, which carry an import loan tied up with the letter), it is a significant risk mitigant for both importers and exporters (obligation to deliver the goods against payment).

Fourth, data on the cost of trade finance instrument, particularly on loans, was insufficient to be used for the regressions. Finally, without additional details about the use of trade finance loans and considering the time lag between production, exports, and the realization of export earnings, our mapping of bank loans received each year to firm export earnings in the respective year may be

prone to errors. In other words, the study does not reflect the wealth of instruments nor the full intensity of use, at the firm level, of trade finance in China. It is nevertheless a first step, emphasizing the role of these instruments in the export performance of firms.

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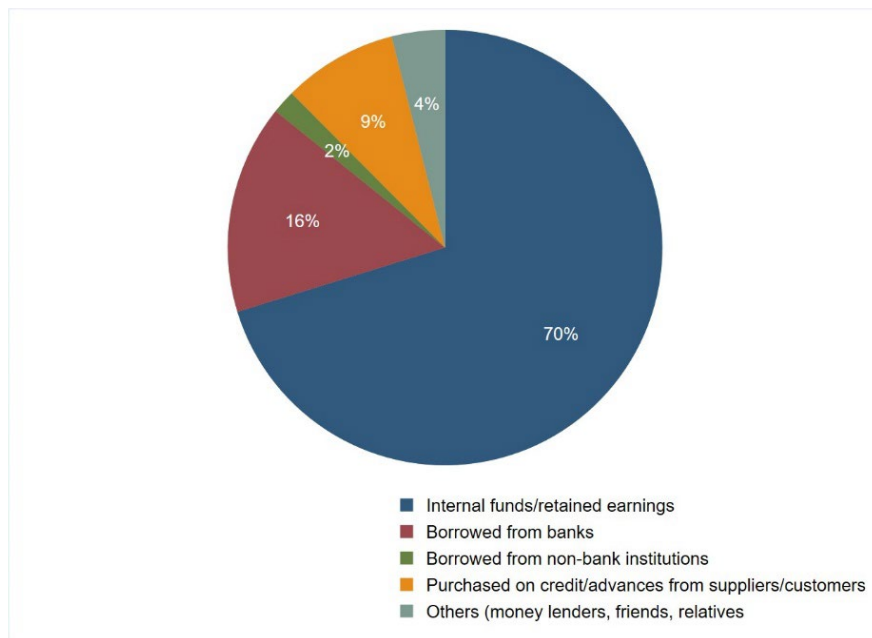
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## ANNEX

Figure A1: Sources of working capital financing for exporters in low- and middle-income countries (LMICs)



Source: Authors calculations based on harmonized data from the World Bank Enterprise Surveys (The World Bank 2024a). WBES data cover 84 LMICs and cover the period 2015–2023.

Table A1: Descriptive summary of key indicators for listed Chinese exporters with trade finance loans

	Mean	Standard Deviation
<i>Firm characteristics</i>		
Years since firm's establishment	19	6
Number of employees (thousands)	3	10
Privately owned (%)	61	49
State-owned (%)	28	45
Share of firms in manufacturing (%)	85	35
<i>Firm balance sheet</i>		
Operating revenue (millions CNY)	9,790	25,753
Total assets (millions CNY)	6,541	12,305
Share of net notes receivable of total assets (%)	9	10
Share of net accounts receivable of total assets (%)	19	12
<i>Firm export earnings</i>		
Export earnings (millions CNY)	2,388	6,230
Share of export earnings of firm's total sales (%)	28	26
Export earnings share of Chinese manufacturing exports (%)	2.0	0.7
<i>Commercial loans to firms</i>		
Trade finance loans (millions CNY)	5,000	16,409
Tenure of trade finance loans (years)	1.3	1.1
Share of trade finance loans directly to listed firms (vs subsidiaries) (%)	65	43
Non-trade finance loans (millions CNY)	2,721	7,942

Note: Summaries are for 399 listed exporters with trade finance loans and 1,113 firm-year observations for the period 2013-2021.

Table A2: Descriptive summary of key indicators for *all* listed Chinese exporters with trade finance loans or notes receivables or both

	Mean	Standard Deviation
<i>Firm characteristics</i>		
Years since firm's establishment	18	6
Number of employees (thousands)	2	8
Privately owned (%)	59	49
State-owned (%)	30	46
Share of firms in manufacturing (%)	82	38
<i>Firm balance sheet</i>		
Operating revenue (millions CNY)	10,788	43,596
Total assets (millions CNY)	8,769	42,487
Share of net notes receivable of total assets (%)	7	10
Share of net accounts receivable of total assets (%)	19	12
<i>Firm export earnings</i>		
Export earnings (millions CNY)	1,917	7,132
Share of export earnings of firm's total sales (%)	22	23
Export earnings share of Chinese manufacturing exports (%)	2.0	0.7
<i>Commercial loans to firms</i>		
Trade finance loans (millions CNY)	549	5,657
Tenure of trade finance loans (years)	1.3	1.1
Share of trade finance loans directly to listed firms (vs subsidiaries) (%)	65	43
Non-trade finance loans (millions CNY)	167	2069

Note: Summaries are for 1,720 listed exporters with trade finance loans or notes receivables (or both) and 10,132 firm-year observations for the period 2013-2021.