Destination Institutions, Firm Heterogeneity and Exporter Dynamics: Empirical Evidence from China[1]

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Abstract

In this paper we study the effects of destination institutions and firm productivity on exporter dynamics in a heterogeneous firm setting. The empirical results, using a panel of Chinese firms, show that the quality of destination institutions has a significant and positive effect on probability of entry and survival and that these effects are increasing in firm productivity. In contrast, firms have higher initial sales and faster growth in destinations with weaker institutions and this effect is decreasing in firm productivity. We also find that exporter performances are increasing in firm experience and in the level of foreign ownership whereas the importance of destination institutions is decreasing in firm experience and in the level of foreign ownership. We show that while firms from regions with better institutions enjoy higher probability of entry, initial sales, survival and growth in markets with better institutions; the importance of productivity for exporter performance diminishes as the quality of local institutions improves. Lastly, firms that are more dependent on contract enforcement perform better in entry probability, initial sales, survival and growth in destinations with better institutions.

Keywords: Exporter dynamics; Firm heterogeneity; Institutional development; Total factor productivity; Developing countries; Chinese firms

JEL Classification: F14, O43, D24, L10

1. Introduction

Institutional development is a major determinant of bilateral trade flows. Institutional barriers in the form of incomplete contract enforcement or weak property rights increase the cost of doing business by creating uncertainty and information frictions for entrant firms and make their export ventures less likely to succeed, including entry, growth and survival dynamics as well as trade volumes (Anderson and Marcouiller, 2002; Levchenko, 2007; Fernandes et al., 2016; Sheng and Yang, 2016).[1] Aeberhardt et al. (2014), for example, show that better destination institutions increase the dependability between exporters and importers and thus increase the likelihood of exporter survival. Likewise, Söderlund and Tingvall (2014) find that better destination institutions increase firms' entry into new markets, choice of initial sales and survival rates. Institutional development is also shown to be a source of comparative advantage, affecting the quality and complexity of production processes (Levchenko, 2007; Nunn, 2007). Institutionally more developed countries, for example, are shown to specialize in higher value added sectors that are more dependent on external institutions (Ranjan and Lee, 2003; Acemoglu et al., 2007; Levchenko, 2007; Nunn, 2007; Feenstra et al., 2013). Institutional frictions also affect firms at the extensive margin, discouraging the introduction of new products (Sheng and Yang, 2016).

And yet, previous studies on the institutions and exporter dynamics assume that these effects are homogenous across firms. This oversight stands in stark contrast to the recent theoretical and empirical work highlighting the importance of firm heterogeneity in exporting decisions.[2] Particularly, among various sources of firm heterogeneity, firm productivity stands

[1] For a comprehensive survey on the effect of institution on trade, see Nunn and Trefler (2014).

[2] Experience (Braymen et al., 2011; Albornoz et al., 2012), networks (Chaney, 2014), learning dynamics (Eaton et al., 2014; Fernandes and Tang, 2014), sunk costs (Melitz, 2003; Bernard et

out as a major driver of exporter performance. First, given that high productivity firms often trade with more partners within and across different destinations, they may be less sensitive to destination institutions. If, for example, the relationship between an exporter and one of its local partners is broken, the firm can continue exporting either by maintaining an active relationship with another partner or by switching to a new partner. Probability of entry, initial sales, post-entry growth, and survival rates can all increase for such firms as they export to multiple destinations, work with multiple trade partners and distribution channels, and are more highly valued by their trade partners (Aeberhardt et al., 2014; Bernard et al., 2014; Chaney, 2014; Eaton et al., 2014; Araujo et al., 2016). Furthermore, similar to the export hysteresis literature (Das et al., 2007), even when they suffer losses in a market, high productivity firms can survive by offsetting these losses using earnings from other markets. The product variety and quality are also an increasing function of productivity as they allow firms to adjust their products to consumer demand, and therefore can help lower entry barriers through better risk diversification and experience (Bastos and Silva, 2010; Eaton et al., 2014; Manova and Zhang, 2012). For high productivity firms, for example, when one product loses its market appeal to foreign buyers, another product can substitute in, an advantage that low productivity firms do not enjoy. Recent studies also show that more productive exporters face lower demand elasticities and higher mark-ups, which allow them to have greater price dispersion and flexibility in export markets (Berman et al., 2012; Chatterjee et al., 2013). Even fixed export costs are shown to be less

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al., 2007; Fernandes and Tang, 2014; Castro et al., 2016), prevalence of other exporters (Alvarez et al., 2013; Bernard and Jensen, 2004), demand uncertainty, capital requirements, adjustment costs and financial frictions (Blum et al., 2013; Kohn et al., 2016) and matching failures (Eaton et al., 2014) are shown to be important determinants of exporter dynamics.

important for high productivity firms as they can substitute increasing productivity for higher fixed costs (Castro et al., 2016). More productive firms can also have better maneuvering abilities, know-how and managerial and operational capabilities to deal with poor destination institutions and search frictions, and therefore be less sensitive to institutional heterogeneity, increasing their export performance. Conversely, all these factors can be amplified in markets with better institutions as high productivity firms can take better advantage of well-defined institutions and contract enforcement.

The effect of destination institutions on exporter dynamics can also be conditional on the exporters' country of origin, shaped by their differing home-country experiences. Developing country firms, for example, enjoy a comparative advantage in markets with weak institutions thanks to their first-hand experiences at home (Aleksynska and Havrylchyk, 2013). Previous research also shows that firm heterogeneity, including productivity differences, is higher in developing than developed countries (Hsiel and Klenow, 2009). Likewise, developing country exporters are found to have higher entry and exit and lower survival rates (Eaton et al. 2008; Fernandes et al., 2016). And yet, no previous work has explored the effect of this higher heterogeneity on exporter dynamics, or its interaction with institutional heterogeneity. Similarities in incomes, endowments and preferences between exporting and importing countries can also affect exporter dynamics (Hallak, 2010; Regolo, 2013). The same might be true regarding the institutional experiences of exporters at home. That is, firms' own experiences in dealing with institutional barriers in their home regions can condition how they deal with institutional differences in other markets. However, the interaction of destination country institutions with firm heterogeneity and home country characteristics remain unexplored in the current literature. While we know that entry barriers and sunk costs are significant determinants

of trade dynamics among developed country firms, we know little about how firm heterogeneity affects developing country firms' reactions to these hurdles.

Our main goal in this paper is to combine these different strains of the literature. By doing so, we provide the first direct examination of the interaction of institutional development and firm heterogeneity in shaping exporter dynamics. We contribute to the literature in four areas. First, in a heterogeneous firm framework, we empirically examine how destination institutions affect exporters in four dimensions that are the probability of entry, probability of survival, initial sales and post-entry export growth. Second, we explore whether the effects of destination institutions are conditional on differences in firm productivity. Third, we explore four other sources of firm heterogeneity and their interactions with institutional development, including the strength of local institutions, firm experience, ownership structure, and firm dependence on institutional environment. Fourth, we explore these questions in the case of a major developing country, China, which is also the world's largest exporter since 2009.

Our empirical analysis is based on a panel of Chinese industrial firms during the period of 2000-2006. The empirical results suggest that firms enjoy higher entry and survival rates in countries with stronger institutions. In contrast, firms are likely to have higher initial sales and faster post-entry growth in countries with weaker institutions. Furthermore, we find that more productive firms experience higher entry and survival probabilities, higher initial sales and post-entry growth in countries with stronger institutions. Comparatively speaking, the results suggest that less productive Chinese firms face higher entry and survival barriers in institutionally more developed markets and yet enjoy higher initial sales and faster post-entry growth in institutionally less developed countries.

In the extensions, we offer several other innovations. First, we show that exporters from provinces with better institutions perform better in all four dimensions of exports in destinations with strong institutions. Conversely, firms from regions with weaker institutions enjoy a comparative advantage in institutionally less developed markets. We also find that the importance of productivity for exporter performance diminishes as the quality of local institutions improves. Second, past experience in other markets not only has a positive effect on export dynamics but also reduces the importance of destination institutions for entry and survival. Third, foreign-owned firms or joint ventures enjoy higher entry probability, initial sales and survival in markets with better institutions. The interaction of firm productivity with destination institutions is also weaker for these firms. Fourth, firms that are more dependent on contract enforcement perform better in destinations with better institutions in all aspects of export dynamics including entry, initial sales, survival and growth.

The rest of the paper is organized as follows. Section two introduces the key hypotheses of interest, empirical methodology, estimation method, and data description. Section three presents the empirical results, followed by extensions and robustness analysis in section four. The final section concludes.

2. Empirical Methodology

2.1 Probability of Entry

Firms undertake a costly search process to find a reliable distributor and establish an export relationship. Export markets with good institutions alleviate contracting and other search frictions and thereby allow lower entry barriers for foreign firms (Eaton et.al 2015). Good institutions also reduce information frictions, operational costs, uncertainty and risks, which increase the likelihood of exporting to those markets (Söderlund and Tingvall, 2014). However,

the effect of destination institutions on probability of entry is expected to be conditional on firms' productivity levels. Particularly, high productivity firms are likely face lower search costs and entry barriers given their previous export experiences in other markets (Braymen et al., 2011; Albornoz et al., 2012). Furthermore, high productivity firms have more diversified export destinations, and therefore are better equipped to take full advantage of good institutional environments (Manova and Zhang, 2012). As shown by Bernard and Jensen (2004), plant characteristics, especially those that are indicative of past success, strongly increase the probability of exporting. These channels are likely to amplify the effect of institutions on probability of entry for high productivity firms.

Based on these theoretical channels from the export search literature, we examine the effect of destination country institutions and firm productivity on the probability of entry into new export markets using a linear probability model in Eq. (1), which is similar to those in Bernard and Jensen (2004), Albornoz et al. (2012), and Fernandez and Tang (2014).

$$E_{ijt} = \alpha + \beta_1 Inst_j + \beta_2 TFP_{it} * Inst_j + C_{ijt} + \delta_{it} + \varepsilon_{ijt} \quad (1)$$

where E_{ijt} is the probability of entry of firm i into a new export market j, $Inst_j$ is the average institutional development in destination country j, and TFP_{it} is the level of total factor productivity (TFP) of firm i at time t. C_{ijt} is a vector of firm, destination, firm-destination and time specific control variables, and δ_{it} is firm-year fixed effects. The error term, ε, includes all other idiosyncratic influences on entry decisions. The robust standard errors here and in the rest of the paper are clustered at the firm-destination level.

To measure the probability of entry, E_{ijt}, we first identify a set of potential destinations including those that have been served by at least one firm in the same four-digit industry (using the Chinese Industry Classification, CIC) but not yet served by firm i at time t-1. By excluding

countries that have never been served by any firm in a given industry, we limit the potential export markets to those that Chinese firms have the ability or willingness to export to. As shown in Eq. (2), if firm *i* starts exporting to a new country in the potential destination group ($X_{ijt}>0$), E_{ijt} takes the value of one, and zero otherwise.[3]

$$\mathrm{E_{ijt}} = \begin{cases} 1, & \text{if} \quad X_{ijt-1} = 0, \quad X_{ijt} > 0 \\ 0, & \text{if} \quad X_{ijt-1} = 0, \quad X_{ijt} = 0 \end{cases} \tag{2}$$

We expect *Inst* to have a positive effect on entry decisions as it lowers entry barriers, search frictions and sunk costs. We also expect firm productivity to interact positively with destination institutions as more productive firms enjoy higher allocative efficiency and perform better when they face lower uncertainty and smaller regulatory barriers, and take better advantage of well-developed operating environments (Fernendes et al., 2016).

C_{ijt} includes the following control variables:

$RGDP_{jt}$ is the (log) real GDP in destination countries (in 2005 U.S. dollars). We expect *RGDP* to have a positive effect on firms' entry as it controls for the economic size and market potential of export markets. *RGDP*, here and thereafter, also control for the omitted variable problem as it is positively correlated with *Inst* and causes a downward bias on β_1.

Investment costs including transaction and information frictions are captured by: the (log) (km) distance between China and destination country *j* (*Distance*); a binary dummy variable equaling 1 if *China* and *j* share a common language (*Language*), or a common border (*Border*). The past economic and political ties are captured by binary variables equaling 1 if *China* and *j*:

[3] For firm entry and survival status, we face the problem of censored data from both ends of the distribution. To correct this problem we assign the survival status for year 2006 as missing and define a firm-year-destination as a new entry only if it appears after 2001.

have ever had a colonial link (*Colony*); were ever the same country (*Same Country*); have the same legal origin (*Legal*); have a preferential trade agreement (PTA); or if *j* is a member of World Trade Organization (WTO) at time *t*. These variables capture part of the familiarity effect from the *Inst* variable and therefore may cause a downward bias on β_1.

The firm-year fixed effects, here and thereafter, control for all observable (such as productivity, age, size, capital intensity, etc.) and unobservable (such as management quality and managerial goals) time-variant and firm specific determinants of firm entry and export decisions. While demanding on the data, firm-year fixed effects allow us to explore the within firm-year variation across different destinations. The disadvantage, however, is that the TFP variable is washed out by these fixed effects. Therefore, in the benchmark analysis we only focus on institutional development and its interaction with productivity. For robustness we later drop these fixed effects and replace them with a set of observable time-variant firm specific variables including: firm size (measured by real total sales, *Output*); firm age (*Age*); human capital intensity (measured by average real wages, *Wages*); and capital intensity (measured by real total capital stock divided by total number of employees, *Capital*).[4] In that case, we also include firm fixed effects and year fixed effects to control for any time-invariant and firm-specific factors as well as firm-invariant global or countrywide shocks that affect all firms symmetrically. Lastly, for robustness we also introduce country-year fixed effects for destination country *j* to rule out any other time-variant country-specific factors that may be correlated with destination country institutions. However, inclusion of this variable causes destination country and year specific

[4] Total sales are deflated by 4-digit industry specific output deflators, wages by 4-digit input deflators, and capital stock is by capital stock deflator, all from Brandt et al. (2012).

variables, including *Inst*, to drop. Thus, in this case we focus only on the interactive term of destination institutions and firm TFP.

2.2 Initial Sales

Theoretically, the effect of destination country institutions on firms' initial sales is indeterminate. On the one hand, good institutions can initiate higher initial choice of exports as firms face lower entry barriers and smaller risk of non-payment or default by their trade partners (Araujo et al., 2016). On the other hand, if developing country firms have a comparative advantage in weak institutional environments and therefore face less competition from their developed country rivals, *Inst* may have a negative effect on initial sales (Aleksynska and Havrylchyk, 2013). If this is the case, based on Araujo et al. (2016), we expect Chinese exporters to start big (small) in markets with less (more) developed institutional systems, which are similar (dissimilar) to their experiences at home. Furthermore, because the choice of initial sales can also affect firm survival and growth, firms can adjust their initial sales differently in high vs. low institutional development environments. In countries with weak institutions, for example, firms may have to start big and take higher risks to cover their sunk costs even though such a move may negatively affect their survival probabilities.[5] In contrast, in markets with better institutions firms can start small and test the waters first.

In either scenario, we expect the effect of institutions on initial sales to be conditional on the productivity level of exporters. Considering their production structures as well as managerial and operational capabilities and know-how, we expect high productivity firms in developing

[5] Supporting this argument, we find that the survival rate among the sample firms (after one period of entry) in countries in the first vs. fourth quartiles of institutional development is significantly different: 46% vs. 53%, respectively.

countries to be similar to those in developed countries. Furthermore, firms may face different institutional constraints at home, affecting learning processes. For example, compared to high productivity firms, low productivity firms in China may face higher institutional barriers in the domestic market and therefore gain relatively more "weak institution" experience. We expect that high productivity firms enjoy better relationship with, and easier access to government officials and judiciary, and therefore face lower levels of corruption, bureaucratic hurdles, or contract enforcement problems. In fact, it is often the case that many CEOs in large Chinese firms are former high-ranking government officials, allowing them both know-how and closer ties with law enforcement and government bureaucracy. Thus, we expect that high (low) productivity firms enjoy higher initial sales in markets with more (less) developed institutions. This framework is also consistent with Araujo et.al (2016), which predicts that exporters start with higher export volumes in markets they are familiar with.

We study the effect of institutional quality and firm productivity on the choice of initial sales in Eq. (3), which is similar to the one used by Araujo et al. (2016).

$$Sales_{ijt} = \alpha + \beta_1 Inst_j + \beta_2 TFP_{it} * Inst_j + C_{ijt} + \delta_{it} + \varepsilon_{ijt} \quad (3)$$

where the dependent variable, *Sales*, is the (log) initial exports of firm *i* to destination *j* at time *t*. We correct *Sales* for the partial year effect as firms enter a new destination in different months of the year, leading to a downward bias for the latecomers.[6] Other control variables are the same as those discussed in section 3.1.

[6] As in Bernard et al. (2014), we adjust initial sales using the number of months after entry. For example, if a firm enters a market in March and remains active in the rest of the year, its annual sales are compounded to include the missing two months, each month being weighted equally.

As discussed before, the expected effect of *Inst* on initial sale decisions in Eq (3) is indeterminate. However, we expect a positive effect from the interaction of institutions with firm productivity, suggesting that more productive firms start with higher sales in markets with more developed institutions.

2.3 Survival

Institutional development in destination markets is expected to increase the survival probabilities of exporters. First, institutional development facilitates well-defined contractual obligations between economic agents, and ensures proper enforcement of those obligations. As illustrated by Araujo et.al (2016), strong institutions make contractual defaults more difficult, and thus increase the expected longevity and dependability of partnerships. High punishing costs also deter any abuse by trade partners. Besides, in institutionally more developed destinations exporters can recover their losses faster after a failed partnership. Second, better institutions also help improve allocative efficiencies by lowering the regulatory hurdles and distortions, decrease uncertainty, and therefore increase the probability of exporter survival (Aeberhardt et al., 2014; Söderlund and Tingvall, 2014; Araujo et al., 2016; Fernendes et al., 2016).

Furthermore, we expect that the effect of institutions on survival is stronger for high productivity firms. First, we expect high productivity firms to have higher survival rates. Because high productivity firms are likely be multi-product exporters with brand names and longer export durations, and also engage in multi-distributor relationships, they are expected to have higher survival probabilities (Bernard et al., 2014; Chaney, 2014; Eaton et al., 2014). For example, if the export relationship between a high productivity exporter and one of its local partners is broken, the firm can continue selling its products either by maintaining an active relationship with another partner or by switching to a new partner, as in the export hysteresis

literature (Das et al., 2007). Furthermore, because such firms generate higher profits, they are more valued by their trade partners, which help lower the risk of default, generating more durable relationships and increasing the survival rates (Aeberhardt et al., 2014; Araujo et al., 2016). This idea is also consistent with Araujo et al. (2016) once we allow for more than one distributor for the high productivity exporters, which directly affects their survival dynamics. Likewise, given their higher product variety and product quality, higher productivity firms have better risk diversification and can adjust their product lines according to changes in consumer demand (Bastos and Silva, 2010; Eaton et al., 2014; Manova and Zhang, 2012).

Second, because of their experience, export orientation, size, operational and production structures, and dependence on external institutions, high productivity firms are expected to take better advantage of well-functioning institutional environments, and increase their survival probabilities. Contract enforcement or copyright protection, for example, is likely be more important for the survival of high productivity firms with brand names and high-end product lines such as tablet PCs than low-end firms that export generic products such as textiles. Furthermore, for a given level of destination institution, high productivity firms can make better use of laws and regulations, which makes their contract enforcement more effective and therefore deter potential defaults or contract violations, increasing the survival rates (Aeberhardt et al., 2014; Araujo et al., 2016). However, it is also true that more productive firms enjoy better maneuvering abilities, including know-how, experience, and managerial and operational capabilities to deal with institutional barriers, which may render them less important.

Based on this framework, we can explore the effects of destination country institutions and firm productivity on survival in export markets using Eq. (4) below:

$$S_{ijt}^{k} = \alpha + \beta_1 Inst_j + \beta_2 TFP_{it} * Inst_j + \beta_3 Sales_{ijt} + \gamma_i C_{ijt} + \delta_{it} + \varepsilon_{ijt} \qquad (4)$$

where S_{ijt}^{k} is firm survival. Similar to Fernandes and Tang (2014) and Arauio et al. (2016), in Eq. (5) we consider firms' exporting status over a given time period after entry and define the outcome variable, S_{ijt}^{k}, as a dummy variable equaling one when firms continue exporting to the same destination after *k* period(s) (k=1, 2, 3, 4).

$$S_{ijt}^{k} = \begin{cases} 1, & \text{if} \quad X_{ijt-1} = 0, \quad X_{ijt} > 0, \quad X_{ijt+k} > 0 \\ 0, & \text{if} \quad X_{ijt-1} = 0, \quad X_{ijt} > 0, \quad X_{ijt+k} = 0 \end{cases} \tag{5}$$

As discussed earlier, we expect *Inst* to have a positive effect on firm survival. The interaction effect between *Inst* and *TFP* is also expected to be positive as we anticipate more productive firms to survive longer in countries with better institutions where the risk of predatory, opportunistic, political or crony causes of firm survival or death is smaller. More productive firms are also expected to have better screening and matching capabilities, making the positive effect of institutions stronger. However, it is also possible that high productive firms are less sensitive to destination institutions thanks to the very same reasons that put them at an advantage compared to less productive firms.

Other control variables (C_{ijt} and δ_{it}) are the same as in Eq. (1) with the exception that we introduce initial sales of firm *i* in destination *j* ($Sales_{ijt}$) to account for different entry and expansion strategies (Eaton et al., 2011; Araujo et al., 2016). For example, some firms may choose to sell deliberately more in a new market in order to survive longer.

2.4 Post-Entry Growth

The effect of institutional development on firms' post entry growth rates, similar to initial sales, is indeterminate. To the extent that bad institutions create entry barriers, increase search, operational and frictional costs and encourage nepotism and corruption, we expect the relationship to be positive. However, if the case with developing country firms is different and if indeed they have a comparative advantage in operating in institutionally weak environments,

then the relationship may turn negative. Given that China has a relatively poor institutional development, ranking 141 out of 205 countries in the World Governance Indicators (WGI) database of the World Bank in 2007, Chinese firms may actually have faster growth in countries with weaker institutional development. It is also possible that developing country exporters have a disadvantage in institutionally well-developed markets as they lack the necessary know-how and experience, and also face stiffer competition.

For example, while Chinese IT company Huawei ranks number two in global smartphone market with a 16% share in 2018, surpassing Apple, and is one of the fastest growing companies in developing countries, it is not even in the top ten list in the US market and has a marginal market share, 0.4%. It also faces serious opposition from lawmakers and judiciary for violating copyrights in the US and EU, leading to its CFO being on house arrest in Canada on the requests of the US government, waiting for extradition to the US. While building on a different intuition, this prediction is consistent with the theoretical model in Araujo et al. (2016) where export growth is a negative function of destination country institutional quality.[7] However, if this is the case, we expect this effect to be stronger for less productive firms. High productivity firms enjoy lower entry barriers, lower search costs, and easier access to foreign distributors in more developed institutional environments. They can also take better advantage of good institutions, all of which help them grow faster. Because of their heavier reliance on contractual obligations, lack of a well functioning judiciary, law and order, or property rights, for example, should limit growth more for higher-end than lower-end firms.

[7] In Araujo et al. (2016, p.9), better institutions slow down the effect of reputation building and reduce the "information content of past histories" as firms cannot easily know whether a partner complied because of being a good partner or the threat of a legal challenge.

We test the effects of destination institutions and firm productivity on post-entry growth in Eq. (6):

$$Growth_{ijt} = \alpha + \beta_1 Inst_j + \beta_2 TFP_{it} * Inst_j + \beta_3 Sales_{ijt} + \gamma_i C_{ijt} + \delta_{it} + \varepsilon_{ijt} \qquad (6)$$

where *Growth* refers to the post-entry sales growth of surviving exporters and is equal to $\frac{X_{ijt}-X_{ijt-1}}{(X_{ijt}+X_{ijt-1})/2}$.[8]

As discussed earlier, the effect of *Inst* on growth in Eq. (6), and therefore the sign on coefficient β_1, is ambiguous. However, we expect the interaction variable between institutions and productivity to yield a positive sign on β_2, suggesting that the comparative advantage of Chinese firms in weaker institutional environments is stronger for less productive firms.

Regarding other control variables, we expect market size, geographic proximity, common language, shared legal origin, historical and colonial past, and bilateral trade agreements to have a positive effect on firm growth in export markets. As in Eq. (5), we also control for the level of initial sales (*Sales*). Other control variables (C_{ijt} and δ_{it}) are the same as in Eq. (1).

2.5 Data and Descriptive Statistics

The dataset we use is merged from two separate sources including the Chinese National Bureau of Statistics' (NBSC) annual surveys of industrial production and the Chinese customs data. The industrial production dataset provides balance sheet information for all industrial firms at 4-digit industrial classification with annual revenues above 5 million renminbi between 1998-2007, and covers over 88% of industrial output during this period with a minimum of 87% in 2001 and a maximum of 90% in 2003. There are more than 400 four-digit CIC manufacturing industries,

[8] Using the mean growth rate we avoid the problem of outliers caused by spikes in a single year and restrict the growth rate to -2 and +2.

including a minimum of 145,720 firms in 1999 and a maximum of 312,228 firms in 2007, with a total of 563,747 firms for the full period.[9] Firm level characteristics such as employment, capital stock, ownership type (i.e. foreign, state owned, domestic private), trade regime (i.e. processing vs. non-processing trade), geographical location, wage rate and gross output are acquired directly from the balance sheet information in the industrial firm survey. The second dataset, the customs data, is collected by the Chinese Custom Office and provides monthly transaction level information on all international trade of China with the rest of the world, including firm, product, and destination/source information at HS 8-digit industrial level for over 8,000 products and for over 200 destination/source countries between 2000 and 2006.[10] We aggregated the monthly transaction data into an annual frequency (in USD) to match the annual data from the production survey. In merging these two datasets, we used firm level information including name, phone number, zip code, name of representatives, etc. to match the firms. On average, we have matched more than 21% of the firms in the customs data with those in the industrial surveys.[11] Of these firms, around 31% are foreign-owned, 34% joint-ventures, and 34% are domestic.

In the empirical analysis we use only non-processing trade (i.e. ordinary trade) to limit the effects of unobservable connections between sellers and buyers, including global supply-

[9] In cleaning the raw data, we follow Brandt et al. (2012). We exclude the tobacco industry as it is highly regulated. More details on sample coverage are provided in the online Appendix.

[10] The industrial surveys are reported in domestic currency and we used the average annual exchange rate to convert them to the USD.

[11] Firms in the matched sample are relatively larger than the unmatched datasets. More details on the matched and unmatched samples are provided in the online Appendix.

chains and re-exports.[12] Similar to other studies, we have excluded exports to Hong Kong, Macau and Taiwan as well as those belonging to trade intermediaries in order to eliminate the concern of entrepot trade. To reduce noise and measurement error, we have further excluded firms that: i) have experienced a switch in their firm id's as it signals a merger or acquisition activity; ii) have less than nine employees, negative fixed assets, output value, or value added; and iii) are at the top 1% or bottom 1% of TFP distribution.[13]

We measure institutional development in destination countries using the WGI database of the World Bank, which reports six dimensions of governance for 205 economies since 1996. These six dimensions include: voice and accountability, political stability and absence of violence, government effectiveness, regulatory quality, rule of law, and control of corruption. We use the simple average of these six governance indicators to measure the overall institutional development of destination countries. Given the relatively short time span of our data as well as the slow-changing nature of institutional development, we use the average of this index between 2000 and 2006 and normalize its mean to zero. The top five WGI countries are Finland, Denmark, Iceland, Switzerland and Sweden while the lowest five are Somalia, Iraq, Congo (Dem), Afghanistan, and Myanmar.

We estimate the TFP with the Olley-Pakes method, which is described in detail in the online Appendix (Olley and Pakes, 1996). Before estimating the production function, we used the input and output deflators at 4-digit level constructed by Brandt et al. (2012), and for the capital stock we used the fixed asset price index by NBSC. We then normalized the TFP variable

[12] The processing trade consists of "purely assembly" and "import-and-assembly" type trade flows and as such they are expected to have a different set of determinants than ordinary trade.

[13] Including the top and bottom 1% of firms do not affect our results as reported in the Appendix.

with a mean of zero and variance of one. Among the sample firms we observe a high level of TFP heterogeneity across-plant and across-time. While the mean level of TFP is 0.414, it is -0.261 (-0.603) for the bottom 25th (10th) percentile of distribution and 1.002 (1.669) for the 75th (90th) percentile. Finally, the real GDP data are from the Penn World Table (8.0), the gravity controls are from the CEPII database, and WTO membership and PTA data are from the WTO.

Table 1 provides summary statistics for the firm level and country level variables that are used in the regression analysis. Table 2 shows the number of firms, the number of destination countries, and the entry and exit rates based on the firm-country-year triplets and also reports their shares in total exports for each year. During the period analyzed we observe a steady increase in the number of sample firms and destination countries. We also find a high rate of new entry and exit based on firm-country-year triplets, reaching 53% for the former and 38% for the latter. On average, continuous firms account for less than 9% of the total number of firm-country observations in a given year. However, these few surviving firms are responsible for more than half of total exports to those destinations during the period analyzed (i.e. 53%), while new entrants and exiters (columns 5 and 6) account for the rest. Among the destination countries, the top five markets with the highest entry probabilities are the US, Japan, South Korea, Germany, and the UK, while those with the lowest probabilities are Switzerland, Central African Republic, St. Kitts and Newis, Bermuda and Lesotho (more details are in the online Appendix). We also observe that around 62% of firms' exports are to high-income OECD, 17% to high-income non-OECD, 22% to middle-income, and 2% to low-income countries during the period analyzed.

<Insert Tables 1&2 here>

Table 3 shows firms' survival status and post-entry growth after k-periods of entry. Columns (1)-(5) show firms' survival dynamics where the number of surviving firms and

countries are based on observable survived observations. The survival rate in column (5) is calculated as the number of surviving firm-country-year triplet (at k=1, 2, 3, 4) divided by the total number of observations that are still observable after k-periods of entry (i.e. column (1)/(columns (1)+(2)). Supporting the findings of previous studies, we find that firm survival decreases significantly over time and almost half of firm-country relations die after one year (k=1), suggesting the presence of a very high rate of one-time exporters. In fact only 35% of firm-country relations last four years. In columns (6)-(8) we present summary statistics for the post-entry growth rate and find that its average (and median) is negative for firms with k=1, possibly caused by the high exit rate after first year of entry. Yet we also find that when k=2 or higher, the mean and median growth rates become positive and decline over time together with their standard deviations. The high dropout rate of Chinese firms may result from their exports being "order" driven, preventing these firms from developing longer-term relations with foreign customers and partners. The inability or unwillingness to develop a long-term export strategy may make these firms more short-termist and limit their export penetration in new markets.

<Insert Table 3 here>

In Table 4, we have the summary statistics for the length of export spells, defined as the number of years a firm-country reports non-zero exports. For example, if a firm continuously sells to a destination from 2001 to 2005, then this export spell length is 5. However, the spell durations include gaps as some firms temporarily stop exporting to a given destination. For example, if a firm exports to a certain destination during 2000-2002 and 2005-2006, but not 2003 or 2004, we treat them as two separate spells, 2000-2002 and 2005-2006 (column 2). Later in column (3), we also present the number of consecutive spells for periods 1-6. In columns (2) and (4) we show the percentage of spells that last 1-6 in total spells. Overall, a majority of spells,

59.6%, lasts one year and only less than 2% lasts six years. We provide further description of the sample and the dataset in the online Appendix.

<Insert Table 4 here>

3. Empirical Results

3.1 Probability of Entry

Table 5 presents regression results from Eq. (1) examining the effects of institutional quality and productivity on firms' entry probabilities into new export markets. Column (1) shows the effects of *Inst* by itself Column (2) introduces the TFP interaction variable and is our benchmark specification. In addition to firm-year fixed effects, as in columns (1)-(2), column (3) introduces two-digit industry fixed effects. In column (4), we replace firm-year fixed effects with observable and time-variant firm-level controls, including size (*Output*), *Age*, *Wages* (average skill intensity), and *Capital* (capital intensity), and also introduce firm, year and industry fixed effects. In column (5), in addition to firm level controls, we include firm and industry fixed effects together with country-year fixed effects to account for any unobserved destination country characteristics that are correlated with institutional development. However, as discussed earlier, when we include country-year fixed effects we lose *Inst* and country-pair gravity variables but retain *TFP* and *TFP*Inst*.

<Insert Table 5 here>

In columns (1)-(4), we find the institutional quality variable, *Inst*, to have a positive and statistically significant (at 1% level) effect on firms' entry probabilities, suggesting that Chinese firms find it easier to enter new markets with better institutions. Consistent with our hypothesis, in columns (2)-(5) we find that the positive effect of institutional quality on entry is significantly stronger for more productive firms. We also note that in Columns (1)-(4), country-specific

control variables appear with similar coefficient estimates and carry the expected signs. We find that destination market size (*RGDP*) has a positive and significant effect on firms' probability of entry while geographical distance has a negative and significant effect. Sharing a common border, official language, or colonial tie as well as previously being the same country all have a positive and significant effects on firms' entry decisions. Also, the destination country being a member of the WTO or having a trade agreement has a positive and significant effect. Yet, the legal origin variable is found to be negative. As a robustness test, we have repeated the regressions without this variable and found almost identical results (these results are reported in the online Appendix). In column (4) we also observe that increasing firm size and human capital intensity increase the probability of entry while firm age and physical capital intensity decrease it.

3.2 Initial Sales

Table 6 presents regression results from Eq. (3), testing the effects of destination institutions and firm productivity on initial sales in new export markets. As in Table 5, we provide five sets of regressions where column (1) includes destination institutions but not firm level productivity. Column (2), which is our benchmark specification, introduces the firm level productivity and destination institutions interaction, while column (3) adds the two-digit industry fixed effects. Columns (1)-(3) all include firm-year fixed effects, which control for all time-variant but firm specific effects, while column (4) replaces them with firm-specific and time variant control variables and adds firm and year fixed effects. Column (5) introduces country-year fixed effects together with firm level controls and firm and industry fixed effects. Independent of specification in columns (1)-(4), we find that Chinese firms are likely to have higher initial sales in countries with weaker institutions. This is a novel finding in the literature and provides support to recent research highlighting the comparative advantage of developing country firms in weaker

institutional environments, allowing them to start big as they face lower competition from Northern firms. Yet, they also expand our understanding of the starting-small hypothesis, which argues that because of higher uncertainty and entry costs, firms start with smaller sales (Rauch and Watson, 2003; Albornoz et al., 2012), especially when destination institutions are underdeveloped (Söderlund and Tingvall, 2014; Araujo et al., 2016). Our findings suggest a different narrative, at least in the case of developing country exporters, and show that exporters start big either to recover large sunk costs or to exploit their comparative advantage in weaker institutional environments.

<Insert Table 6 here>

The institutions and productivity interaction term is positive in columns (2)-(5), suggesting that the comparative advantage of developing country exporters in weak institutional environments is significantly less pronounced for more productive firms. In other words, institutional quality in destination markets has opposing effects on firms' initial sales at different ends of the productivity distribution. This is another novel finding of this study. We also find that the starting small hypothesis is likely to be true for high-productivity firms as their entry strategies appear to be more in line with those of developed country firms.

Looking at the country-level controls, we find that destination market size (*RGDP*) has a positive and significant effect on firms' initial sales. On the other hand, Chinese firms appear to enter markets with higher initial sales when they are more distant. Consistent with this finding, firms also appear to have lower initial exports to neighboring countries. Sharing a common language, colonial ties or legal origin increases the level of initial sales. As in Araujo et al. (2016), WTO membership and PTAs have a negative effect on the initial sale decisions. While this is a separate topic for future study, it is possible that the WTO membership and PTAs

encourage firm entry and thus increase the degree of competition in the same industry, causing lower initial sales. The threat of penalties through dispute settlement clauses against unfair business practices may also limit firms' initial sales in these countries.

3.3 Survival

Table 7 shows regression results from Eq. (4), exploring the determinants of firm survival after one year of entry (k=1). We find that firms are more likely to survive in countries with better institutions. Furthermore, consistent with our initial expectations, the results suggest that more productive firms are more likely to survive in countries with strong institutions. In contrast, less productive firms perform better in institutionally less developed markets. These results are robust to different specifications in columns (1)-(5) even after controlling for firm-year, firm, industry, year, or country-year fixed effects as well as time-variant firm and country specific factors.

<Insert Table 7 here>

Regarding other determinants of firm survival, we find that Chinese exporters are more likely to survive in countries with bigger domestic markets. Initial sales also have a significantly positive effect on firm survival. Furthermore, we find that physical proximity and sharing a common border, official language and a trade agreement all increase the probability of survival. Colonial linkages and legal origin, however, are found to have a negative effect on firms' survival probability. The findings shown in column (4) also suggest that survival probability increases in firm size but decreases in firm age, and human and physical capital intensity.

In Table 8, we consider survival probabilities after k periods of entry where k=2, 3, 4. Here, we ask whether destination institutions or firm productivity affects firms' survival status over a longer time span. As a comparison, we also report our benchmark regression results from Table 7 with k=1 in column (1). We continue to find a significantly positive and qualitatively as

well as statistically very similar effect of institutional quality on firm survival even after 2, 3, or 4 years of entry (the differences are not statistically significant). The interaction term between institutions and productivity is again positive and significant, even after controlling for country-year fixed effects in columns (5)-(7), suggesting that firms that are more productive survive longer in countries with better institutions. Other control variables are also quite similar to those before. As expected, we also find that the positive effect of initial sales decreases overtime though remain statistically significant. Different from previous results, however, the same country and colony dummies become insignificant.

<Insert Table 8 here>

3.4 Post-Entry Growth

In Table 9 we present results from Eq. (6), testing the determinants of post-entry export growth. Columns (1)-(5) include the same set of control variables as before and column (2) is our benchmark specification. Independent of specification and similar to the findings in Table 6, we find that Chinese firms grow faster in markets with weaker institutions, which provide further support to the comparative advantage hypothesis. Furthermore, consistent with the predictions of this hypothesis, the positive effect is significantly more pronounced for less productive firms. In contrast, more productive firms find it easier to grow in countries with better institutions. This is yet another novel finding of our paper, emphasizing the differing export dynamics of developing country firms. Unlike the evidence from developed countries, less productive firms in China appear to enjoy lower growth hurdles in countries with weaker institutions. Regarding other variables of interest, we find that destination market size has a significantly positive effect on growth. Likewise, sharing a common border, official language, colonial past, legal origin, trade agreement, and being ever the same country all have a positive effect. In contrast, firms with

higher initial sales appear to grow slower in later years. Unexpectedly, the WTO membership appears with a negative while distance appears with a positive effect.[14]

<Insert Table 9 here>

The economic significance of all our findings is quite high. Table 10 shows the change in entry probability, growth, initial sales and survival in the benchmark results if we move from the 25th to the 75th percentile in institutional development, i.e. moving from Papua New Guinea to Lithuania. We then look at the effect on our dependent variables at the (normalized) mean as well as at the 10th and the 90th percentile values of firm productivity (i.e. 0.43, -0.603 and 1.669, respectively). We find that for an average productivity firm, this move increases its entry probability by 0.007 and its survival probability by 0.027, suggesting a 13% increase in entry (0.007/0.051) and 5% increase in survival (0.027/0.528) probabilities. Furthermore, firms have lower initial sales by around 28% and experience around four-percentage points lower growth. We also find that entry, initial sales, survival and post-entry growth rates are significantly different between firms at the 10th and 90th percentiles of TFP distribution.

<Insert Table 10 here>

4. Extensions

4.1 Role of Local Institutions

If the lack of institutional development in destination countries creates a trade barrier, negatively affecting entry and survival dynamics, and yet works as a source of comparative advantage, positively affecting initial sales and growth, then we should expect such effects to be heterogeneous across firms depending on their home region institutional development. For example, similar to the effect of productivity differences, firms from regions with better

[14] Araujo et al. (2016) and Fernandes et al. (2016) also report this wrong sign problem.

institutions should find it easier to enter, survive and grow in markets with good institutions, very much like developed country firms. The opposite should be the case for firms from institutionally weaker regions. Furthermore, if more productive firms take better advantage of good institutions in destination markets, local institutional development and firm productivity may work as substitutes, resulting in a smaller interaction effect between destination institutions and TFP for firms from regions with better institutions.

To test this hypothesis, we add a domestic institutional quality variable, measured by judicial quality at the regional level in China, into our benchmark regressions. The data come from World Bank Doing Business Report (2008), which monitors the quality of the judicial system in enforcing contracts for 30 provincial capitals in China, and is measured by "court time", which is the number of days from the time the plaintiff files the lawsuit until the time of payment. Following Feenstra et al. (2013), we adjust "court time" as 600 minus the original value and then divide by 100 so that higher values indicate better local institutional quality. Table 11 reports the regression results from this exercise and shows that firms from institutionally more developed regions are more likely to enter and have higher initial sales, survival, and growth in destinations with better institutions. We also continue to find a significantly positive interaction between firm productivity and destination institutions. Consistent with our prediction, the triple interaction term for local institutions, destination institutions and TFP appear negative across all four specifications, suggesting that the positive effect of destination institutions on more productive firms is significantly reduced when those firms are from regions with better institutions. In other words, when a firm is from an institutionally more developed region, the effect of productivity and destination institution interaction becomes less pronounced. Conversely, the disadvantaged export performance of

lower productivity firms in destinations with good institutions can be alleviated if they come from regions with better local institutions.

<Insert Table 11 here>

4.2 Role of Exporter Experience

Previous export experience is shown to facilitate entry into new export markets and increase survival rates by reducing entry costs as firms gain knowledge about potential partners using their networks (Alvarez et al., 2013; Söderlund and Tingvall, 2014; Araujo et al., 2016). Therefore, we expect institutional entry barriers to be lower for firms with more experience, similar to the comparative advantage effect for developing country firms. To measure firm-year-country specific export experience, we construct an experience index by counting the number of previous destinations that shared a common border or same language, or belonged to the same continent and income group with the current destination. If a firm has no previous export experience, the experience variable will be zero. The results in Table 12 suggest that previous experience has a positive effect on entry, initial sales, survival and post-entry sales growth. Experience also reduces the importance of destination institutions in firm entry and survival, making institutions relatively less important. For initial sales, firms tend to start small in markets with better institutions, and more so if they are more experienced. For sales growth although the interaction term of institutions with the experience variable is negative, it is insignificant. This is not surprising given that once firms enter a new market, their new experiences there probably become more important than past experiences in other markets. We also find that the importance of productivity diminishes with experience, though at a statistically significant level only for

post-entry growth in Column (4). Likewise, when it comes to survival, the positive interaction of productivity with destination institutions is lower for firms with more experience.[15]

<Insert Table 12 here>

4.3 Role of Ownership Structure

The results we have reported so far suggest some fundamental differences in export behavior between Chinese firms and developed country firms. We also find substantial heterogeneity across Chinese firms based on their productivity and experience levels as well as their home region institutional development. A follow up to these findings is to explore the effect of ownership structure on exporter dynamics. For example, because of their international connections and home country characteristics (i.e. being mostly from developed countries) as well as their dependence on good institutions for international operations and management, we expect foreign firms or firms with foreign joint ventures to be more sensitive to institutional quality in destination markets.[16] By the same token, we also expect them to make better use of good institutions. However, the opposite may also be true if their experience in China helps them overcome such barriers in other less-developed markets. We consider three types of ownerships: domestic (including state-owned and private), joint ventures, and foreign-owned, and treat domestic firms as the omitted category. In our sample, around 34% of the firms are domestic, 34%

[15] We repeated this exercise by creating another *Experience* variable, defined as the total number of destinations previously served and are in the same quartile in institutional quality. The results, which are available in an online Appendix, are consistent with those reported here.

[16] Feenstra et al. (2013) report that the effect of local institutions on export performance is more important for foreign than domestic firms in China as they are more dependent on formal local institutions in resolving business disputes.

are joint-ventures and 32% are foreign. The results in Table 13 suggest that, compared to domestic firms, firms with foreign ownership or with joint-ventures enjoy higher entry probability, initial sales and survival in markets with stronger institutions. For sales growth, we do not detect any significant difference between firms based on ownership structure. Regarding the triple interaction between ownership type, destination institutions and productivity, it is expected to be negative if foreign and joint-ownership and the TFP variables are substitutes (i.e. foreign firms having better managerial and operational skills and better production technology). We find, however, that this is only true for the entry and initial sales decisions for joint ventures, and only for the entry decisions for foreign firms.

<Insert Table 13 here>

4.4 Firm Heterogeneity and Dependence on Contract Enforcement

Previous research highlights industry-level heterogeneity with regard to the effects of institutional differences. Countries with a strong rule of law and contract enforcement, for example, are shown to have a comparative advantage in industries that use differentiated inputs (Nunn, 2007). If this is indeed the case, we expect firms that are more dependent on contract enforcement to perform better in export markets that are endowed with better institutions. This exercise can also serve as an additional robustness test to rule out the possibility that omitted variable bias at the destination country level is driving our previous results.

To test this hypothesis, we construct a firm specific contract enforceability/dependence variable, which is meant to identify the technological characteristics of each firm, and measure the degree of dependence on contract enforceability, with higher values indicating more dependence. T o develop this measure, we use Chor (2010)'s measure of contract enforceability, which is based on Rauch (1999)'s classification of products into homogeneous, reference-priced,

and differentiated categories, as well as Nunn (2007). We then match this measure with the exports of firm *i* at HS-6-digit level. After determining the contract intensity of each exported product, we aggregate it at the firm level. Specifically, we construct an export value weighted composite institutional quality dependence index for each firm *i* in year *t* as follows:

$$ID_{it} = \sum_{pt} \left(\frac{v_{ipt}}{\sum_{pt} v_{ipt}} * ID_p \right)$$

where $\frac{v_{ipt}}{\sum_{pt} v_{ipt}}$ is the export share of product *p* of firm *i* at year *t;* ID_p is the institutional quality dependence for product *p* exported by firm *i* at year *t* (Chor, 2010; Alfaro et al., 2019). Next, we introduce this new variable as an interactive term in our benchmark regressions and examine the heterogeneous effect of destination institutional quality on export dynamics conditioned on firms' dependence on contract enforceability. We report results in Table 14 using "differentiated and reference-priced products and Rauch's "conservative" classification for *ID*.[17]

Results in Table 14 confirm our previous findings showing that better destination institutions has a positive effect on probability of entry and survival but a negative effect on initial sales and future sales growth. We also confirm that firms that are more productive perform better in markets with better institutions. Our results from the interaction term, *ID*Inst*, also reveal that firms that are more dependent on contract enforceability perform better in destination markets with better institutions in all aspects of export dynamics including entry, initial sales,

[17] Rauch (1999) provides two types of goods classification, "conservative" and "liberal. In the Appendix, we report results using three additional classifications: "differentiated" and "conservative"; "differentiated" and "liberal", and "differentiated and reference priced" and "liberal". Results from these exercises are similar to those reported in Table 14.

survival and growth. Furthermore, the triple interaction term, *Inst*TFP*ID* is negative in all four specifications suggesting that the heterogeneous effect of *Inst* and *TFP* is weakened for firms that are more dependent on contract enforcement.

<Insert Table 14 here>

4.5 Robustness Analysis

In this section we perform a rich battery of robustness tests. First, we introduce additional country level controls to control for omitted variable problem, which plagued previous studies such as Araujo et al. (2016). Particularly, how do we separate the effects of destination institutions from other characteristics of the destination country? In Tables 5-9, in addition to destination country GDP, we reported results including country-year fixed effects, which control for all other destination country specific and time variant factors. However, this came at a cost, as we no longer identified the *Inst* variable. To remedy this issue, in addition to firm-year fixed effects, we add additional time-variant destination country controls that may be correlated with the quality of institutions, including: real capital stock per worker (0.78), real GDP per capita (0.90), percentage of secondary education (0.49), TFP level at current PPPs (USA=1) (0.73). These variables are indeed highly correlated with the *Inst* variable, as shown by the simple correlations in parenthesis, and their inclusion help minimize the likelihood of omitted variable problem. The results, which are reported in the Appendix confirm over previous findings.

To control for omitted variable bias, we further experimented with additional control variables by including extended Gravity controls as in Morale et al. (2014). Intuitively, if a firm has ever exported to a destination, which shared a common border, a common language, or belonged to same continent or income quartile with the new destination, then it may be more likely enter such destinations. Thus, we create four dummy variables based on firms' previous

experiences along these four dimensions. For example, if a new (or potential) destination shares a common border with at least one previous destination country, we assign one to the extended border dummy, and zero otherwise. Next, we drop all initial sales observations that are associated with spells whose length is one period (one-time sales). In this case we rely on firms that start selling to more than one market and continue selling in those markets for more than one period. We also repeat regressions for the survival and growth analysis in Eqs. (4) and (6) after excluding initial sales. Our results remain unchanged and are available in the online Appendix.

Second, we examine measurement bias in our main variables of interest, which are institutional development and firm productivity. To this end, we first replace the institutional development variable with three alternative proxies, including: i) the international country risk guide composite political risk index (*ICRG*), which measures institutional development using an average index of 12 indicators (i.e. government stability, socio-economic conditions, investment profile, internal conflict, external conflict, corruption, military in politics, religion in politics, law and order, ethnic tensions, democratic accountability and bureaucracy quality); ii) political institutional quality index from Polity IV (*Polity IV*); iii) a factor variable constructed using the factor analysis on our six governance indicators.[18] Iv) instead of using a composite index with equal weights for each of the six components of the WGI, we repeat the benchmark regressions for each separately. As each indicator reflects a different dimension of institutional development, we want to make sure that our results are not sensitive to the weighting method or to a particular aspect of institutional development. After the sensitivity tests of the institutional development variable, we examine the robustness of our results to the TFP measurement. To this end, we

[18] The correlation coefficients between WGI, and ICRG and Polity IV are 0.95 and 0.56, respectively. Details on the factor analysis are available in the online Appendix.

develop two alternative measures of TFP by using the OLS method with firm-level fixed effects to compute the input shares, and by using the Levinsohn-Petrin method. The results from these exercises are almost identical to those reported before and are provided in the online Appendix.

Moreover, we need to make sure that our results are not sensitive to sample selection bias. To this end, we perform several tests: first, we treat a reentry as an old entry. That is, if there is a gap in exporting to a destination, we treat only the first occurrence as a new entry. Second, we use only consecutive spells and drop all other spells that have a gap. Third, we use a more restrictive sample and define an initial entry as a spell only when it appears after 2002. Fourth, we redefine ordinary exporters by focusing on firms whose ratio of ordinary exports to total exports (all trade regimes) is above 90% for a given firm-year-country triplet.[19] The results from these exercises are consistent with our earlier findings and are reported in the online Appendix.

Next, we repeat the survival analysis in Eq. (4) using the Cox-Hazard model, which allows us to focus on time-variant productivity instead of productivity at the time of entry as is the case with the dummy variable approach. Particularly, we adopt a set of Cox regressions as in Eq. (7), where we assume that the hazard is separable between an arbitrary function of time, *h(t)* and a part that depend on a vector of firm or country specific control variables, C_{ijt}.

$$\mathrm{h}\left(\mathrm{t}, \beta \mathrm{C}_{\mathrm{ijt}}\right) = \mathrm{h}(\mathrm{t}) \exp^{\left(\beta_0+\beta_1\varphi_{\mathrm{it}}+\beta_2\mathrm{Inst}_{\mathrm{jt}}+\beta_3\varphi_{\mathrm{it}}*\mathrm{Inst}_{\mathrm{jt}}+\beta_4\mathrm{C}_{\mathrm{ijt}}+\sigma_{\mathrm{y}}+\sigma_{\mathrm{s}}\right)} \quad (7)$$

where σ_y is a dummy variable for the starting year of a relationship, which is a standard treatment of right censoring. σ_s is a two-digit sector dummy, controlling for time invariant sector level characteristics that may influence different durations of export relationships. Consistent with our previous findings in Table 7, the (unreported) results show that the hazard rate is

[19] We have also experimented with a threshold level of 100% and found no change in the results.

decreasing in both firm productivity and institutional quality, and, as expected, the interactive term between TFP and institutions is negative and significant.

5. Conclusion

Firm and country heterogeneity play fundamental roles in shaping exporter behavior. Home and destination institutions, for example, affect the production and specialization processes at the product and industry levels. Likewise, firm level differences in productivity influence entry, growth and survival dynamics in export markets. In this paper we contribute to these discussions using a detailed firm-level dataset from China, and explore how institutions and firm productivity jointly affect firms' entry, initial sales, survival and post-entry growth dynamics. We also study the importance of other sources of firm heterogeneity, including quality of local institutions, exporter experience, ownership structure, and contract enforcement dependence.

Our empirical findings suggest that Chinese firms tend to have higher probability of entry and survival in destinations with better institutions. The positive effect of institutions is further reinforced for higher productivity firms. These two findings are consistent with the theoretical predictions of previous studies on this topic and are confirmed for the first time in an empirical study. Regarding the choice of initial sales and subsequent export growth, however, we find evidence against the traditional wisdom of starting small in destinations with weak institutions. In fact, Chinese firms appear to start relatively big, and, conditional on their survival, grow faster in weaker institutional environments. This finding, which is consistent with the theory on the comparative advantage of developing country firms in poor institutional environments, is another novel finding and has not been reported before. We also show that this comparative advantage is stronger for firms that have lower productivity. That is, less productive Chinese exporters start bigger and grow faster in countries that have weaker institutional development. In contrast, more

productive firms appear to enjoy higher initial sales and subsequent growth in markets with better institutions, very much like developed country firms. Our results also suggest that entry, initial sales, growth and survival probabilities are higher for firms with previous export experience in similar markets, or with access to foreign equity and joint ventures. We also find that the quality of home institutions has a significant but heterogeneous effect on exporter dynamics. Firms from regions with better institutions have higher probability of entry, higher initial sales, survival and post-entry growth in markets with better institutions. We also find that the joint effect of productivity and destination institutions is less pronounced for these firms. Lastly, we show that firms that are more dependent on the institutional environment, particularly on contract enforcement, for their production processes, perform better in institutionally more advanced markets in all four aspects of export dynamics.

Overall, our findings underline the importance of firm heterogeneity in identifying exporters' reactions to institution-driven destination country heterogeneity. The identification of the sources of these observations will shed further light to exporter dynamics and will help improve our understanding of differences between developed and developing country firms in international trade.

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Table 1: Summary statistics

Variable	Obs	Mean	Std.	Min	Max
$Entry_{ijt}$	12,918,366	0.051	0.221	0	1
(ln) Initial $Sales_{ijt}$	662,864	10.489	2.062	-0.030	20.026
$Survival^{k}_{ijt}$ *(k=1)*	487,139	0.528	0.499	0	1
Sales $growth_{ijt}$	599,140	-0.035	0.985	-2	2.000
$Inst_{jt}$	1,325,224	0.697	0.847	-2.090	1.952
TFP_{it}	1,073,395	0.414	0.932	-4.280	16.418
(ln) $Output_{it}$	1,322,183	19.928	1.366	8.982	27.925
(ln) Age_{it}	1,313,489	2.143	0.590	0.693	4.060
(ln) $Wage_{it}$	1,321,452	11.525	0.606	1.644	19.125
(ln) K-intensity	1,319,254	12.613	1.348	3.330	21.318
Experience	1,190,008	9.626	10.630	0	128
(ln) $RGDP_{jt}$	1,286,084	12.761	1.848	3.956	16.366
(ln) $Distance_{ij}$	1,325,883	8.678	0.714	6.696	9.868
$Continuity_{ij}$	1,325,883	0.106	0.308	0	1
$Language_{ij}$	1,325,883	0.124	0.330	0	1
Same $Country_{ij}$	1,325,883	0.118	0.323	0	1
$Colony_{ij}$	1,325,883	0.001	0.026	0	1
$Legal_{ij}$	1,325,883	0.080	0.271	0	1
WTO_{ij}	1,325,883	0.926	0.262	0	1
PTA_{ij}	1,326,668	0.154	0.361	0	1

Notes: The *Entry* variable includea all potential countries. For all others, the statistics are based on firms that report ordinary export transactions. *Entry* is a dummy variable equaling 1 if a firm enters a destination country from a set of potential countries. *Initial sales* are (log) real initial sales (in 2005 dollars). *Survival* is a dummy variable equaling 1 if a firm reports non-zero exports after one year of entry (k=1). *Sales growth* is the post-entry sales growth rate. *Inst* is the unweighted average of six governance indicators from WGI. *TFP* is total factor productivity estimated by Olley and Pakes method. *Output*, *Age*, *Wage* and *K-intensity* are firm level total sales, age, average wage bill and capital-intensity (i.e. total fix asset divided by total employment). *Experience* is the total number of previous destinations that share a common

border or same language, or belong to the same continent and income group with the current destination. *RGDP* is real GDP (in constant 2005 dollars). *Distance* is the geographical distance. *Continuity*, *Language*, *Same country*, *Colony*, and *Legal* are dummy variables equaling one if destination country has a common border, shares a common official language, was ever the same country, has a past colonial relationship, or shares a common legal origin with China. WTO and PTA are dummy variables equaling 1 if the destination country is a member of WTO or has signed a preferential trade agreement with China.

Table 2: Firm entry and exit into/from a new export market by year

			Firm-country-year observations		Export Values	
	(1)	(2)	(3)	(4)	(5)	(6)
Year	# of firms	Number of destinations	Entry	Exit	Entry	Exit
2000	12,828	188		43.22%		22.89%
2001	15,416	195	57.02%	37.52%	33.60%	16.68%
2002	18,226	195	53.69%	36.79%	29.33%	15.90%
2003	22,128	198	51.65%	36.76%	25.09%	16.46%
2004	35,895	199	62.43%	38.45%	41.87%	18.49%
2005	37,844	200	47.34%	37.68%	19.94%	15.63%
2006	45,103	201	48.75%		25.20%	
Total	65,870	201				
Average			53.48%	38.40%	29.17%	17.68%

Notes: Entry rates in 2000 and exit rates in 2006 for firm-country-year observations are excluded because of data censoring on both sides. *Entry* and *Exit* rates are calculated over one year. *Export values* refer to the share of entrant and exiter firms in total exports in a given year.

Table 3: Survival rate and post-entry export growth

	Survival of firm-country-year triplets					Post-Entry Growth Rate		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
k	Survival Obs	Non-Survival Obs	Surviving firms	Surviving countries	Survival Rate (%)	Mean (%)	Median (%)	Std
1	257,228	229,911	38,844	195	52.80	-13.13%	-15.69	1.046
2	153,667	193,104	28,063	192	44.31	5.12%	7.80	0.949
3	74,692	113,752	15,202	183	39.64	3.44%	5.42	0.937
4	39,503	71,099	9,696	170	35.72	1.45%	3.30	0.923

Notes: *k* is the number of survival periods after entry. *Std* is the standard deviation.

Table 4: Spell length

	(1)	(2)	(3)	(4)
Spell length	Number of spells	% share	Number of consecutive spells	% share
1	405,636	61.19%	328,717	59.60%
2	130,005	19.61%	108,788	19.72%
3	74,794	11.28%	66,063	11.98%
4	28,089	4.24%	24,700	4.48%
5	15,375	2.32%	14,300	2.59%
6	8,965	1.35%	8,965	1.63%
Total	662,864	100.00%	551,533	100.00%

Notes: Spell length is the number of years that a firm-country has been active in terms of reporting non-zero export flows. Consecutive spells are when the spells are in consecutive years.

Table 5: Probability of entry, institutional quality and firm productivity

	(1)	(2)	(3)	(4)	(5)
	No TFP	Benchmark	Industry FE	Firm Controls	Country-Year FE
$Inst_{jt}$	0.004***	0.004***	0.004***	0.004***	
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	
TFP_{it}*$Inst_{jt}$		0.002***	0.002***	0.002***	0.003***
		(0.0001)	(0.0001)	(0.0001)	(0.0001)
TFP_{it}				0.001**	0.001
				(0.0004)	(0.0004)
$RGDP_{jt}$	0.017***	0.017***	0.018***	0.019***	
	(0.00004)	(0.00004)	(0.00004)	(0.00004)	
$Distance_j$	-0.013***	-0.011***	-0.012***	-0.012***	
	(0.0002)	(0.0002)	(0.0002)	(0.0002)	
$Border_j$	-0.001**	0.001**	0.001***	0.002***	
	(0.0003)	(0.0004)	(0.0004)	(0.0004)	
$Language_j$	0.037***	0.035***	0.037***	0.037***	
	(0.001)	(0.001)	(0.001)	(0.001)	
Same country$_j$	0.073***	0.075***	0.075***	0.075***	
	(0.001)	(0.001)	(0.001)	(0.001)	
$Colony_j$	0.013***	0.015***	0.014***	0.014***	
	(0.001)	(0.001)	(0.001)	(0.001)	
$Legal_j$	-0.016***	-0.016***	-0.017***	-0.018***	
	(0.0002)	(0.0002)	(0.0002)	(0.0002)	
WTO_{jt}	0.003***	0.003***	0.003***	0.003***	
	(0.0002)	(0.0002)	(0.0002)	(0.0002)	
PTA_{jt}	0.001**	0.001***	0.001***	0.001***	
	(0.0003)	(0.0003)	(0.0003)	(0.0003)	
$Output_{it}$				0.008***	0.008***
				(0.0003)	(0.0003)
Age_{it}				-0.006***	-0.005***
				(0.001)	(0.001)
$Wage_{it}$				0.001**	0.001**
				(0.0003)	(0.0003)
$Capital_{it}$				-0.001***	-0.001***
				(0.0002)	(0.0002)
Constant	-0.028***	-0.041***	-0.047***	-0.123***	-0.050*
	(0.002)	(0.002)	(0.002)	(0.031)	(0.029)
Firm-year FE	Yes	Yes	Yes	No	No
Firm FE	No	No	No	Yes	Yes
Year FE	No	No	No	Yes	No
Industry FE	No	No	Yes	Yes	Yes
Country-year FE	No	No	No	No	Yes
# of Countries	178	178	178	178	188
# of Firms	60,054	49,142	49,142	48,939	48,939
Obs	11,203,242	9,156,435	9,120,514	9,078,166	9,639,999
R-Sq	0.130	0.130	0.119	0.098	0.114

Notes: The dependent variable is the probability of entry. *, **, and *** refer to significance at 10%, 5% and 1% levels. Standard errors in parenthesis are clustered at firm-country level.

Table 6: Initial sales, institutional quality and productivity

	(1)	(2)	(3)	(4)	(5)
	No TFP	Benchmark	Industry FE	Firm Controls	Country-Year FE
$Inst_{jt}$	-0.208***	-0.216***	-0.216***	-0.217***	
	(0.004)	(0.005)	(0.005)	(0.004)	
TFP_{it}*$Inst_{jt}$		0.032***	0.032***	0.026***	0.031***
		(0.004)	(0.004)	(0.004)	(0.004)
TFP_{it}				-0.040**	-0.038**
				(0.017)	(0.017)
$RGDP_{jt}$	0.162***	0.160***	0.160***	0.161***	
	(0.002)	(0.002)	(0.002)	(0.002)	
$Distance_{jt}$	0.103***	0.109***	0.109***	0.104***	
	(0.007)	(0.007)	(0.007)	(0.007)	
$Border_{j}$	-0.181***	-0.166***	-0.165***	-0.165***	
	(0.013)	(0.014)	(0.014)	(0.014)	
$Language_{j}$	0.068***	0.068***	0.068***	0.073***	
	(0.014)	(0.015)	(0.015)	(0.014)	
Same Country$_{j}$	0.225***	0.230***	0.230***	0.236***	
	(0.021)	(0.023)	(0.023)	(0.022)	
$Colony_{j}$	1.078***	1.122***	1.129***	1.165***	
	(0.105)	(0.116)	(0.116)	(0.103)	
$Legal_{j}$	0.137***	0.125***	0.125***	0.129***	
	(0.010)	(0.010)	(0.010)	(0.010)	
WTO_{jt}	-0.204***	-0.207***	-0.207***	-0.208***	
	(0.010)	(0.011)	(0.011)	(0.011)	
PTA_{jt}	-0.073***	-0.066***	-0.066***	-0.066***	
	(0.010)	(0.011)	(0.011)	(0.010)	
$Output_{it}$				0.048***	0.048***
				(0.012)	(0.012)
Age_{it}				-0.241***	-0.231***
				(0.017)	(0.017)
$Wage_{it}$				-0.025**	-0.028***
				(0.010)	(0.010)
$Capital_{it}$				-0.037***	-0.036***
				(0.007)	(0.007)
Constant	7.847***	7.832***	7.851***	8.759***	10.682***
	(0.066)	(0.072)	(0.073)	(0.518)	(0.516)
Firm-year FE	Yes	Yes	Yes	No	No
Firm FE	No	No	No	Yes	Yes
Year FE	No	No	No	Yes	No
Industry FE	No	No	Yes	Yes	Yes
Country-year FE	No	No	No	No	Yes
# of countries	178	178	178	178	188
# of firms	56,857	46,445	46,445	46,253	46,388
Obs	575,403	472,170	471,871	469,192	473,708
R-Sq	0.500	0.493	0.493	0.376	0.368

Notes: The dependent variable is the (log) level of initial sales. *, **, and *** refer to significance at 10%, 5% and 1% levels. Standard errors in parenthesis are clustered at firm-country level. For other variable definitions, refer to Table 1.

Table 7: Survival, institutional quality and productivity (k=1)

	(1)	(2)	(3)	(4)	(5)
	No TFP	Benchmark	Industry FE	Firm Controls	Country-Year FE
$Inst_{jt}$	0.019***	0.018***	0.018***	0.018***	
	(0.001)	(0.001)	(0.001)	(0.001)	
TFP_{it}*$Inst_{jt}$		0.004***	0.004***	0.005***	0.006***
		(0.001)	(0.001)	(0.001)	(0.001)
TFP_{it}				0.014**	0.013**
				(0.006)	(0.005)
$RGDP_{jt}$	0.035***	0.036***	0.036***	0.037***	
	(0.001)	(0.001)	(0.001)	(0.001)	
$Distance_{jt}$	-0.020***	-0.019***	-0.019***	-0.025***	
	(0.002)	(0.002)	(0.002)	(0.002)	
$Border_{j}$	0.021***	0.021***	0.021***	0.019***	
	(0.004)	(0.004)	(0.004)	(0.004)	
$Language_{j}$	0.025***	0.019***	0.019***	0.020***	
	(0.004)	(0.004)	(0.004)	(0.004)	
Same Country$_{j}$	-0.012**	-0.012*	-0.012*	-0.018***	
	(0.006)	(0.006)	(0.006)	(0.006)	
$Colony_{j}$	-0.037	-0.051*	-0.051*	-0.059**	
	(0.027)	(0.029)	(0.029)	(0.028)	
$Legal_{j}$	-0.014***	-0.014***	-0.014***	-0.016***	
	(0.003)	(0.003)	(0.003)	(0.003)	
WTO_{jt}	0.004	0.003	0.003	0.003	
	(0.003)	(0.004)	(0.004)	(0.004)	
PTA_{jt}	0.019***	0.021***	0.021***	0.022***	
	(0.003)	(0.004)	(0.004)	(0.003)	
$Initial_{ijt}$	0.060***	0.060***	0.060***	0.064***	0.064***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
$Output_{it}$				0.006	0.008**
				(0.004)	(0.004)
Age_{it}				-0.014***	-0.013**
				(0.005)	(0.005)
$Wage_{it}$				-0.005	-0.005
				(0.003)	(0.003)
$Capital_{it}$				-0.006**	-0.007***
				(0.002)	(0.002)
Constant	-0.381***	-0.403***	-0.378***	0.199	0.335*
	(0.018)	(0.020)	(0.020)	(0.195)	(0.195)
Firm-year FE	Yes	Yes	Yes	No	No
Firm FE	No	No	No	Yes	Yes
Year FE	No	No	No	Yes	No
Industry FE	No	No	Yes	Yes	Yes
Country-year FE					Yes
# of countries	178	178	178	178	188
# of firms	45,399	37,045	37,045	36,853	36, 912
Obs	427,703	350,872	350,573	348,343	344,268
R-Sq	0.473	0.465	0.465	0.338	0.331

Notes: The dependent variable is the probability of entry when k=1. *, **, and *** refer to significance at 10%, 5% and 1% levels. Standard errors in parenthesis are clustered at firm-country level. For variable definitions, refer to Table 1.

Table 8: Survival, institutional quality and productivity (k=1, 2, 3, 4)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	k=1	k=2	k=3	k=4	k=2	k=3	k=4
$Inst_{jt}$	0.018***	0.014***	0.019***	0.021***			
	(0.001)	(0.002)	(0.002)	(0.003)			
TFP_{it}*$Inst_{jt}$	0.004***	0.006***	0.004**	0.004*	0.007***	0.006***	0.006***
	(0.001)	(0.001)	(0.002)	(0.003)	(0.001)	(0.002)	(0.002)
TFP_{it}					0.012*	0.009	0.026*
					(0.007)	(0.009)	(0.015)
$RGDP_{jt}$	0.036***	0.040***	0.043***	0.042***			
	(0.001)	(0.001)	(0.001)	(0.001)			
$Distance_{jt}$	-0.019***	-0.017***	-0.017***	-0.016***			
	(0.002)	(0.002)	(0.003)	(0.004)			
$Border_j$	0.021***	0.031***	0.046***	0.043***			
	(0.004)	(0.005)	(0.007)	(0.009)			
$Language_j$	0.019***	0.025***	0.017***	0.013			
	(0.004)	(0.005)	(0.006)	(0.008)			
$Same\ Country_j$	-0.012*	-0.012	-0.013	0.006			
	(0.006)	(0.008)	(0.010)	(0.012)			
$Colony_j$	-0.051*	-0.025	0.044	-0.031			
	(0.029)	(0.032)	(0.044)	(0.054)			
$Legal_j$	-0.014***	-0.019***	-0.031***	-0.023***			
	(0.003)	(0.004)	(0.005)	(0.007)			
WTO_{jt}	0.003	0.001	-0.007	-0.012*			
	(0.004)	(0.004)	(0.006)	(0.007)			
PTA_{jt}	0.021***	0.014***	0.007	-0.006			
	(0.004)	(0.005)	(0.007)	(0.008)			
$Initial_{ijt}$	0.060***	0.046***	0.037***	0.028***			
	(0.001)	(0.001)	(0.001)	(0.001)			
Constant	-0.403***	-0.408***	-0.375***	-0.320***	0.984***	1.208***	1.145***
	(0.020)	(0.022)	(0.031)	(0.038)	(0.169)	(0.282)	(0.313)
Firm-year FE	Yes	Yes	Yes	Yes	No	No	No
Firm FE	No	No	No	No	Yes	Yes	Yes
Firm controls	No	No	No	No	Yes	Yes	Yes
Industry FE	No	No	No	No	Yes	Yes	Yes
Country-year FE	No	No	No	No	Yes	Yes	Yes
# of countries	178	178	178	178	188	188	187
# of firms	37,045	30,768	18,079	12,758	30, 639	17,935	12,616
Obs	350,872	248,352	131,700	76,257	240,897	126,529	71,920
R-Sq	0.465	0.509	0.525	0.555	0.405	0.429	0.483

Notes: The dependent variable is the probability of entry when *k*=1-4. *, **, and *** refer to significance at 10%, 5% and 1% levels. Standard errors in parenthesis are clustered at firm-country level. *Firm controls* include firm-time variant controls as in Table 5. For variable definitions, refer to Table 1.

Table 9: Post-entry growth, institutional quality and productivity

	(1)	(2)	(3)	(4)	(5)
	No TFP	Benchmark	Industry FE	Firm Control	Country-Year FE
$Inst_{jt}$	-0.028***	-0.037***	-0.037***	-0.036***	
	(0.003)	(0.003)	(0.003)	(0.003)	
TFP_{it}*$Inst_{jt}$		0.014***	0.014***	0.014***	0.018***
		(0.003)	(0.003)	(0.003)	(0.003)
TFP_{it}				-0.017	-0.016
				(0.013)	(0.013)
$RGDP_{jt}$	0.080***	0.081***	0.081***	0.082***	
	(0.001)	(0.001)	(0.001)	(0.001)	
$Distance_{jt}$	0.018***	0.019***	0.019***	0.016***	
	(0.004)	(0.004)	(0.004)	(0.004)	
$Border_{j}$	0.011	0.017*	0.017*	0.016*	
	(0.008)	(0.009)	(0.009)	(0.008)	
$Language_{j}$	0.025***	0.013	0.013	0.009	
	(0.008)	(0.009)	(0.009)	(0.008)	
Same Country$_{j}$	0.030***	0.025**	0.025**	0.019*	
	(0.011)	(0.012)	(0.012)	(0.012)	
$Colony_{j}$	0.165**	0.156	0.156	0.189**	
	(0.083)	(0.100)	(0.100)	(0.092)	
$Legal_{j}$	0.028***	0.024***	0.024***	0.026***	
	(0.007)	(0.007)	(0.007)	(0.007)	
WTO_{jt}	-0.021***	-0.024***	-0.024***	-0.025***	
	(0.007)	(0.008)	(0.008)	(0.007)	
PTA_{jt}	0.011*	0.013*	0.013*	0.015**	
	(0.006)	(0.007)	(0.007)	(0.006)	
$Initial_{ijt}$	-0.141***	-0.143***	-0.143***	-0.148***	-0.151***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
$Output_{it}$				0.163***	0.161***
				(0.010)	(0.010)
Age_{it}				0.021	0.024
				(0.015)	(0.015)
$Wage_{it}$				0.004	0.002
				(0.008)	(0.008)
$Capital_{it}$				-0.014**	-0.015***
				(0.006)	(0.005)
Constant	0.327***	0.326***	0.326***	-2.838***	-1.529***
	(0.038)	(0.043)	(0.043)	(0.365)	(0.375)
Firm-year FE	Yes	Yes	Yes	No	No
Firm FE	No	No	No	Yes	Yes
Year FE	No	No	No	Yes	No
Industry FE	No	No	Yes	Yes	Yes
Country-year FE	No	No	No	No	Yes
# of countries	174	173	173	173	182
# of firms	34,126	28,101	28,101	27,987	28, 094
Obs	384,940	315,419	315,417	313,668	318,171
R-Sq	0.331	0.325	0.325	0.184	0.174

Notes: The dependent variable is the post-entry mean growth rate. *, **, and *** refer to significance at 10%, 5% and 1% levels. Standard errors in parenthesis are clustered at firm-country level. For variable definitions, refer to Table 1.

Table 10: Economic significance of benchmark regressions

Change in:	Entry	Initial Sales	Survival	Growth
At mean TFP	0.007	-28.01%	0.027	-4.31%
At 10% of TFP	0.004	-32.51%	0.022	-6.28%
At 90% of TFP	0.010	-22.46%	0.034	-1.88%

Notes: Economic effects are calculated using the TFP value at the mean (0.43), 10^{th} (-0.603) and 90^{th} (1.669) percentiles of sample distribution. The point estimates are based on the benchmark regressions in Tables 5, 6, 7 and 9.

Table 11: Local institutional quality and export performance

	(1)	(2)	(3)	(4)
	Entry	Initial Sales	Survival	Sales Growth
Inst	0.001***	-0.340***	-0.001	-0.054***
	(0.0003)	(0.015)	(0.005)	(0.011)
*TFP*Inst*	0.007***	0.081***	0.026***	0.043***
	(0.0003)	(0.016)	(0.005)	(0.011)
*Local*Inst*	0.008***	0.390***	0.059***	0.054*
	(0.001)	(0.044)	(0.014)	(0.032)
*TFP*Local*Inst*	-0.015***	-0.155***	-0.069***	-0.091***
	(0.001)	(0.047)	(0.015)	(0.032)
Firm-Year FE	Yes	Yes	Yes	Yes
Country controls	Yes	Yes	Yes	Yes
# of countries	178	178	178	173
# of firms	49,104	46,412	37,012	28,096
Obs	9,151,056	471,831	350,539	315,393
R-sq	0.130	0.493	0.465	0.325

Notes: *, **, and *** refer to significance at 10%, 5% and 1% levels. Standard errors in parenthesis are clustered at firm-country level. All regressions include the same (unreported) set of country level controls (*Country controls*) as in previous tables. *Local* is the quality of local institutions in China. For other variable definitions, refer to Table 1.

Table 12: Experience and export performance

	(1)	(2)	(3)	(4)
	Entry	Initial Sales	Survival	Sales Growth
Inst	0.002***	-0.192***	0.012***	-0.052***
	(0.0001)	(0.005)	(0.002)	(0.006)
*TFP*Inst*	0.002***	0.039***	0.006***	0.010*
	(0.0001)	(0.005)	(0.002)	(0.005)
Experience	0.005***	0.009***	0.006***	0.006***
	(0.00004)	(0.001)	(0.0003)	(0.0004)
*Experience*Inst*	-0.0005***	-0.005***	-0.001***	-0.0004
	(0.00003)	(0.0005)	(0.0002)	(0.0003)
*Experience*TFP*	-0.0001	-0.0005	-0.0004	-0.001**
	(0.0001)	(0.001)	(0.0004)	(0.0004)
*Experience*TFP*Inst*	0.00001	-0.0003	-0.0004**	0.0002
	(0.00003)	(0.001)	(0.0002)	(0.0003)
Firm-Year FE	Yes	Yes	Yes	Yes
Country controls	Yes	Yes	Yes	Yes
# of countries	178	178	178	173
# of firms	49,142	46,445	37,045	23,568
Obs	9,156,435	472,170	350,872	286,272
R-sq	0.133	0.493	0.467	0.302

Notes: *, **, and *** refer to significance at 10%, 5% and 1% levels. Standard errors in parenthesis are clustered at firm-country level. All regressions include the same (unreported) set of country level controls (*Country-controls*) as in previous tables. *Experience* refers to firms' previous experience in similar markets. For other variable definitions, refer to Table 1.

Table 13: Ownership structure and export performance

	(1)	(2)	(3)	(4)
	Entry	Initial Sales	Survival	Sales Growth
Inst	0.001***	-0.247***	0.008***	-0.041***
	(0.0001)	(0.006)	(0.002)	(0.004)
*TFP*Inst*	0.003***	0.040***	0.005***	0.013***
	(0.0002)	(0.006)	(0.002)	(0.004)
*Joint Venture*Inst*	0.006***	0.056***	0.020***	0.007
	(0.0002)	(0.009)	(0.003)	(0.006)
*Foreign*Inst*	0.004***	0.086***	0.022***	0.010
	(0.0002)	(0.011)	(0.003)	(0.007)
*Joint Venture*TFP*Inst*	-0.003***	-0.025**	-0.005	-0.004
	(0.0002)	(0.010)	(0.003)	(0.006)
*Foreign*TFP*Inst*	-0.001***	-0.017	-0.002	0.009
	(0.0002)	(0.011)	(0.003)	(0.007)
Firm-Year FE	Yes	Yes	Yes	Yes
Country controls	Yes	Yes	Yes	Yes
# of countries	178	178	178	173
# of firms	48,526	45,893	36,555	28,023
Obs	9,095,582	470,099	349,470	315,030
R-sq	0.130	0.493	0.464	0.325

Notes: *, **, and *** refer to significance at 10%, 5% and 1% levels. Standard errors in parenthesis are clustered at firm-country level. All regressions include the same (unreported) set of country level controls (*Country-controls*) as in previous tables. *Foreign* and *Joint-venture* refer to foreign firms and local firms with foreign joint-ownership, respectively. For other variable definitions, refer to Table 1.

Table 14: Firm Heterogeneity and dependence on contract enforcement

	(1)	(2)	(3)	(4)
	Entry	Initial Sales	Survival	Sales Growth
$Inst_{jt}$	0.004***	-0.221***	0.016***	-0.038***
	(0.0001)	(0.005)	(0.001)	(0.003)
TFP_{it}*$Inst_{jt}$	0.002***	0.030***	0.003**	0.015***
	(0.0001)	(0.004)	(0.001)	(0.003)
ID_{it}*$Inst_{jt}$	0.007***	0.073***	0.017***	0.019***
	(0.0001)	(0.007)	(0.002)	(0.004)
$Inst_{jt}$* TFP_{it}*ID_{it}	-0.003***	-0.030***	-0.008***	-0.013*
	(0.0002)	(0.009)	(0.003)	(0.007)
$Initial_{ijt}$			0.060***	-0.143***
			(0.001)	(0.001)
Constant	-0.043***	7.798***	-0.410***	0.320***
	(0.002)	(0.072)	(0.02)	(0.043)
Firm-year FE	Yes	Yes	Yes	Yes
Country controls	Yes	Yes	Yes	Yes
# of Countries	178	178	178	173
# of Firms	48,925	46,250	36,867	28,000
Obs	9,133,118	471,506	350,319	315,074
R-sq	0.13	0.492	0.465	0.325

Notes: *, **, and *** refer to significance at 10%, 5% and 1% levels. Standard errors in parenthesis are clustered at firm-country level. All regressions include the same (unreported) set of country level controls (*Country-controls*) as in previous tables. ID is the institutional quality dependence variable as discussed in the text. For other variable definitions, refer to Table 1.