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Abstract

We find that foreign investors facilitate efficiency-enhancing structural change in the recipient countries. After countries liberalize their stock markets and allow foreign investors to acquire equity stakes in domestic firms, products that do not correspond to the liberalizing countries' comparative advantage disappear disproportionately faster from their export portfolios. At the same time, the overall long-term export performance of the liberalizing countries improves. Domestic stock market development does not play the same disciplining role in forcing termination of inefficient exports, suggesting a unique role for foreign investors in improving resource allocation in the real economy.

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1 Introduction

Can foreign investors trigger an efficiency-enhancing structural change in the real economy? While existing literature finds mostly positive level effects of financial openness on investment and economic growth (Henry 2000a; Bekaert, Harvey, and Lundblad 2005; Gupta and Yuan 2009; Levchenko, Rancière, and Thoenig 2009), things get more complicated when looking at the structural impact of foreign investors within the recipient countries. Not only do foreign-owned firms affect the productivity and corporate governance of their competitors and suppliers (Javorcik 2004; Albuquerque et al. 2019). The entry of foreign investors also brings economy-wide structural changes with ambiguous implications for the overall economic efficiency. On one hand, financial liberalization can trigger positive changes in corporate regulations and governance (Stulz 2005; Doidge, Karolyi, and Stulz 2007; Kaminsky and Schmukler 2008). On other hand, it can decrease incentives for government to pursue necessary economic reforms and invest into institutional quality (Fernández-Villaverde, Garicano, and Santos 2013; Challe, Lopez and Mengus 2019) as well as discourage domestic banks from proper monitoring of their corporate borrowers (Alessandria and Qian 2005; Tressel and Verdier 2011). Cheaper access to external finance due to the inflow of foreign capital can improve market efficiency by relaxing financing constraints (Gupta and Yuan 2009), but it can also worsen capital misallocation by benefitting mostly unproductive firms (Reis 2013; Gopinath et al. 2017). Getting the full picture of the structural impact of financial liberalization thus requires data that are both disaggregated and cover the whole economy.

This paper examines whether the entry of foreign investors helps to better align the export portfolio of the recipient country with its comparative advantage. Exploring the structural change brought by foreign investors in the context of international trade allows us to rely on highly disaggregated and exhaustive product-level data. We can therefore capture the overall structural impact of foreign investors, including firm-to-firm spillovers and economy-wide externalities. The data on international trade flows are also internationally comparable and available for a large set of diverse countries. This makes them a valuable complement to firm-level census data, which allow for an analysis of structural changes within one particular country (e.g, Varela 2018). Finally, the concept of comparative advantage in international trade provides a natural framework to examine allocative efficiency. After all, the idea that countries should specialize in exporting products where they possess comparative advantage represents one of the basic tenets of economic thinking.

Our empirical strategy consists in examining disaggregated export flows from multiple countries that at different points of time allow foreign investors to acquire equity stakes in domestic firms. We rely on UN Comtrade data that comprise detailed information on worldwide trade flows for more than a thousand different product categories. We combine these data with the stock market liberalization dates from Bekaert, Harvey, and Lundblad (2005) that capture the moments in time when governments of different countries for the first time allow foreign investors to acquire equity stakes in domestic firms. These stock market liberalization events allow for the estimation of a staggered treatment of financial integration and have been often used as quasi-natural experiments to explore the impact of foreign investors on domestic economy (see the review by Henry 2007 as well as Bekaert and Harvey 2000; Henry 2000a, 2000b; Bekaert, Harvey, and Lundblad 2005; Manova 2008; Gupta and Yuan 2009; Defever and Suedekum 2014). As a robustness test, we also develop a continuous measure capturing the intensity of stock market liberalization at the industry-country level.

Using data covering 1,299 products exported by 81 countries, we explore in a difference-in-difference framework whether stock market liberalization events push countries' export portfolios closer to their comparative advantage. We do find that this is indeed the case. After foreign investors are allowed to invest in domestic stock market, the products that do not correspond to the comparative advantage of the liberalizing country face significantly worse chances of remaining in the country's export portfolio compared to products that are well aligned with the comparative advantage. At the same time, the entry of foreign investors into domestic stock market improves the overall long-term export performance of the liberalizing country in the world market. These results are robust to controlling for various other financial and non-financial transmission channels that are associated with the strength of domestic banks and stock markets in the exporting countries, economic development, trade openness, and trade liberalization events.

The rest of the paper is organized as follows. Section 2 discusses in more detail the contribution of our paper in the context of existing literature. Section 3 describes the data, and Section 4 outlines our estimation strategy. Section 5 presents the main empirical results, and Section 6 reports the results of robustness checks. Section 7 provides some evidence that the economic mechanism driving our results relates to the monitoring by foreign investors. Section 8 concludes and suggests directions for further research.

2 Contribution and Related Literature

This paper is related to three strands of literature. First and foremost, we contribute to the literature looking at the economic impact of financial liberalization defined as opening of the domestic economy to foreign investors. The existing research tends to find positive effects of financial liberalization on aggregate economic outcomes like domestic investment (Henry 2000a), economic growth (Bekaert, Harvey, and Lundblad 2005; Gupta and Yuan 2009; Levchenko, Rancière, and Thoenig 2009), and international trade (Manova 2008; Defever and Suedekum 2014) while also raising concerns about potential adverse effects in terms of more volatile capital flows (Broner and Ventura 2016) and increased vulnerability to financial crises (Reinhart and Rogoff 2009).[1] More recently, the researchers started to look beyond the aggregate outcomes and explore the potential structural changes brought by foreign investors to recipient economies (e.g., Bekaert et al. 2007; Gopinath et al. 2017; Larrain and Stumpner 2017; Varela 2018).[2]

One of the main challenges in this research area is to capture the overall structural impact of foreign investors relevant for a broad group of countries. For one thing, the empirical work on allocative consequences of financial liberalization faces a trade-off between the cross-country coverage and comparability of the available data on the one side and their disaggregation level on the other side. Consequently, researchers often have to choose between maximizing the number of countries across different stages of financial and economic development in their sample and utilizing firm-level data.[3]

Maybe more fundamentally, identifying the overall structural effect of financial liberalization is difficult because foreign investors do not affect only those firms where they acquire equity stakes. For example, foreign-owned firms often improve the productivity

[1] Papers examining the impact of financial liberalization on the outcomes in financial markets rather than in real economy include, e.g., Bekaert and Harvey (2000), Henry (2000b), Kaminsky and Schmukler (2008).

[2] Related research examining the impact of domestic financial development rather than of foreign investors on allocation of physical capital includes, e.g., Wurgler (2000), Beck and Levine (2002), Love (2003), and Fisman and Love (2004, 2007).

[3] Bekaert et al. (2007) use country-time panel data covering 50 countries between 1980 and 2002 and show that financial openness is an important factor in aligning growth opportunities with actual growth. Larrain and Stumpner (2017) rely on firm-level data from 10 post-communist countries in Central and Eastern Europe and provide evidence that capital account liberalization helps financially constrained firms to demand more capital and produce at more efficient levels. Gopinath et al. (2017) explore the capital misallocation using firm-level data from Spain and extend part of their analysis to five other countries in Western Europe. Both papers rely on databases provided by ORBIS-AMADEUS that cover most of the manufacturing firms in the respective countries. Varela (2018) looks at impact of lifting the restrictions on international borrowing by using firm-level census data covering all manufacturing firms in Hungary.

of their local suppliers (e.g., Javorcik 2004). And while financial liberalization implies an additional source of financing for those firms that do succeed in attracting foreign investors, the aggregate structural implications of the cheaper access to external finance are unclear.[4] Financial liberalization can particularly benefit firms that have good growth prospects (Gupta and Yuan 2009), but it can also relax financial constraints disproportionately for larger unproductive firms (Gopinath et al. 2017). The risk of financial liberalization relaxing the financial constraints for the "wrong" firms and thus having overall negative allocative consequences is particularly high if the recipient country has an underdeveloped domestic financial system (Reis 2013, Gopinath et al. 2017).

Opening the economy to foreign investors also generates across-the-board structural changes in the recipient countries. On the positive side, financial liberalization can provide better incentives for domestic firms to improve corporate governance (Doidge, Karolyi, and Stulz 2007) and make it more difficult for governments to extract rents from all investors including the domestic ones (Stulz 2005). Allowing the entry of foreign investors can also trigger positive institutional reforms in the liberalizing countries ranging from improved law and order to a more forceful prosecution of insider trading (Kaminsky and Schmukler 2008). On the negative side, increased capital inflows can lead to an abandonment of necessary economic reforms and a general deterioration of institutional quality in the recipient countries (Fernández-Villaverde, Garicano, and Santos 2013; Challe, Lopez and Mengus 2019). Financial liberalization could also hinder the ability of domestic banks to effectively monitor the corporate borrowers (Alessandria and Qian 2005) as well as provide banks with incentives to collude with the borrowers and deliberately decrease the monitoring intensity (Tressel and Verdier 2011). The potential bias in estimating the overall structural impact of foreign investors by comparing the performance of acquired and non-acquired domestic firms could be further exacerbated if some spillovers also affect the stock prices of the remaining domestic firms, making those firms cheaper or more expensive and thus more or less likely to be later also acquired by foreign investors.[5]

The impact of these spillovers and externalities is presumably substantial, given that the measured effects of financial liberalization often differ depending on the aggregation

[4] Opening up to foreign capital usually leads to a lower real interest rate and cheaper access to external finance for domestic firms although in principle real interest rate could also increase following the financial liberalization. For a more detailed discussion see, e.g., Bekaert and Harvey (2000) or Henry (2000a).

[5] This so-called "feedback effect" has been so far analyzed mostly in the domestic context of US firms and investors (see, e.g., Bradley et al. 2010; Edmans, Goldstein, and Jiang 2012), but it could also affect an empirical analysis focusing on the structural impact of foreign investors.

level of the used data. For example, foreign investors seem to have strong impact on the productivity measured both at the firm level (Varela 2018) and at the country level (Bonfiglioli 2008; Bekaert, Harvey and Lundblad 2011; Chari, Henry and Sasson 2012), while at the industry there might be no productivity effects at all (Levchenko, Rancière, and Thoenig 2009).[6] The effects of financial liberalization on investment and economic growth also seems to be stronger when measured at a more disaggregated level (Henry 2007; Bekaert et al 2011). It is thus important to distinguish between the impact of financial liberalization on firms attracting foreign investors and the overall net effect on recipient economy (Mitton 2006, p. 646).

In our paper, we use the framework of international trade to analyze the impact of foreign investors on structural change and resource allocation at the product level. This approach allows us us to sidestep the issue of economic externalities and capture the overall allocative impact of financial liberalization while using highly disaggregated data that are both internationally comparable and available for a broad cross-section of diverse countries. In particular, we can rely on data covering the complete export portfolio of a given country and examine if the entry of foreign investors moves this portfolio closer to the country's comparative advantage. Moreover, the framework of international trade allows us to look beyond the usual focus on the misallocation of physical capital and examine the allocative impact of financial liberalization also under consideration of human capital and natural resources.[7]

Second, we contribute to the literature examining the disciplining impact of foreign investors. Several influential papers argue that foreign investors are more effective as external monitors because they lack business relations with local firms. Such relations often induce domestic investors to feel loyal to the local management (e.g., Gillan and Starks 2003; Ferreira and Matos 2008; Aggarwal et al. 2011; Bena et al. 2017; Luong et al. 2017). The impact of financial liberalization could also in this case extend beyond the firms where foreign investors ultimately acquire equity stakes. For instance, foreign-owned firms can generate substantial spillovers in terms of improved corporate governance to

[6] These contradictory results could be reconciled if the increase in the aggregate productivity was driven mostly by reallocation of resources from less productive to more productive sectors (Bonfiglioli 2008, p. 353). However, recent evidence suggests that the increases in aggregate productivity following financial liberalization in India and Hungary have been driven by increasing productivity within firms rather than such reallocation effects (Bollard, Klenow and Sharma 2013; Varela 2018).

[7] In particular, we base our empirical analysis on the Heckscher-Ohlin theory of international trade maintaining that exported products should intensively use those factors of production that are abundant and therefore cheap in the exporting country. The analyzed factors of productions include physical capital, human capital, and natural resources. Subsection 3.2 provides more details.

their domestic competitors (Albuquerque et al. 2019).[8] Our results are consistent with the argument of foreign investors being potentially more forceful in pushing the firms towards the efficient use of available resources. We show that allowing foreign investors to acquire equity in domestic firms pushes the export portfolio of the liberalized economy closer towards its comparative advantage. At the same time, we do not find any disciplining impact of domestic stock market development when it comes to termination of inefficient exports, with this latter result being also in accordance with previous research (Jaud, Kukenova, and Strieborny 2018).[9] Section 7 provides further corroborative evidence linking these results to the unique ability of foreign investors to increase efficiency through their superior monitoring abilities.

Third, the paper is related to the literature examining the determinants of establishing a long-term successful presence in the foreign markets. Besedeš and Prusa (2006a) were the first to apply the formal survival analysis in the context of international trade and showed how short-lived most of the exports are. Subsequent research confirmed the importance of export survival for the overall export performance of countries (e.g., Besedeš and Prusa 2006b; Nitsch 2009; Brenton, Saborowski, and von Uexkull 2010; Cadot et al. 2013). Long-term export survival indeed seems to be the decisive export margin separating the successful exporting countries from the unsuccessful ones (see, e.g., Besedeš and Prusa 2011). And while there has been research on the impact of domestic financial development on export survival (Jaud, Kukenova, and Strieborny 2015, 2018, 2021), we are not aware of a systematic analysis of the role of financial liberalization in this regard. More generally, our paper also relates to the literature examining the impact of finance on other margins of international trade like export entry or export volume (e.g., Beck 2002, 2003; Amiti and Weinstein 2011; Becker, Chen, and Greenberg 2013; Manova 2013; Paravisini et al. 2015).

[8] In the domestic US context, Aslan and Kumar (2016) and Gantchev, Gredil, and Jotikasthira (2019) explore both corporate governance and productivity spillovers from firms targeted by the hedge fund activism to the non-targeted firms. The transmission channels they identify (product market competition, attempts by the management of the non-targeted firms to avoid hostile activism themselves) might also be relevant in the case of foreign investors.

[9] Recent research about finance and relationship-specific investment (Strieborny and Kukenova 2016; Strieborny 2017) also indicates a special role for the foreign investors that goes beyond the development of domestic stock markets in general.

3 Data

Our unit of observation is an export spell - a continuous exporting of product k from country c to the world market. The final sample contains data on 1,299 products exported from 81 countries and focuses on export spells that started during the period of extensive financial liberalization between 1980 and 1997. The term "time" thus refers in this paper to the year when an export spell started unless stated otherwise. We follow these spells until 2006, the year before the global financial crisis began. This approach allows us to examine the impact of stock market liberalization events in 1980s and 1990s on the long-term export survival, in accordance with our focus on the structural change in the real economy brought about by the presence of foreign investors.

The period of 1980s and 1990s represents a fitting environment for examining the impact of financial liberalization on the real economy. Out of the eighty-one exporting countries in our sample, thirty-six countries experienced stock market liberalization between 1980 and 1997. A significant number of financially closed countries thus opened up their domestic stock markets to foreign investors during this period, with different countries allowing foreign investors to acquire equity stakes in domestic firms in different years. At the same time, this wave of staggered financial liberalization happened before the across-the-board explosion of cross-border financial flows in 2000s that preceded the global financial crisis.[10]

3.1 Financial variables

A stock market liberalization event occurs when government of a country opens up its domestic stock market to the presence of foreign investors, allowing them to acquire equity stakes in domestic companies. Bekaert, Harvey, and Lundblad (2005) report the official years of these liberalization events, covering the period of extensive financial liberaliza-

[10] These later cross-border financial flows could also affect the long-term survival of the export spells that started during the 1980-1997 period. Due to their across-the-board character, they would probably introduce bias against finding any differential impact of the previous staggered stock market liberalization events. Nevertheless, in one of the robustness tests reported in Table 10, we stopped following the export spells already in the year 1997 rather than 2006.

tion in many countries between 1980 and 1997.[11] Based on these years, we construct a liberalization dummy that is equal to one if a given country allows in a given year foreign investors to acquire shares in the domestic firms and zero otherwise. The liberalization dummy thus always equals one for the countries that implemented stock market liberalization prior to 1980. By the same token, the dummy always equals zero for the countries that did not liberalize their stock market until 1997. For countries that opened up their stock market to foreign investors during the period 1980-1997, the liberalization dummy takes value one if a given export spell is exposed to the liberalization event, i.e. if the official stock market liberalization date occurs before or during the life of the spell.

In Subsection 5.3 and Online Appendix D, we also use alternative measures of stock market liberalization. First, we construct a dummy variable based on the dates related to the first signs of liberalization that can sometimes precede the official liberalization dates. The source of these alternative dates for stock market liberalization events is Bekaert, Harvey, and Lundblad (2005). Second, we utilize two versions of a continuous variable capturing the stock market liberalization intensity at the industry-country level. Both versions are based on the proportion of domestic equities the foreign investors can acquire. We compute them from the data on the market capitalization of firms included in the IFC Investable index and IFC Global index available in the Emerging Stock Market Factbooks of International Finance Corporation.

As for other financial variables, our proxies for the level of domestic banking and stock market development in the liberalizing countries are the ratio of private credit to GDP and the ratio of stock market capitalization to GDP, respectively. Both variables are from the database by Beck, Demirgüç–Kunt, and Levine (2000). The industry measure of dependence on external finance at the ISIC 3-digit level is from Braun (2003). This measure goes back to the seminal paper by Rajan and Zingales (1998) and captures the share of capital expenditures that cannot be financed by internally generated funds. It is computed as ratio of the capital expenditures minus cash flow from operations to the capital expenditures for the median publicly listed company in a given US industry, using

[11] Appendix A provides a list of the countries. The original database of Bekaert, Harvey, and Lundblad (2005) covers 91 countries, including 41 countries that liberalized their stock market at some point during the 1980-1997 period, 16 countries that liberalized their stock market prior to 1980, and 34 countries that kept their stock market closed to foreign investors during the whole period under consideration. In our final sample, the number of all countries declines from 91 to 81 and the number of countries that liberalized their stock market during the 1980-1997 period declines from 41 to 36 due to the lack of data for some of the control variables.

the financial data on US firms from Compustat.[12]

3.2 Distance to comparative advantage

Our measure of distance to comparative advantage captures how far is a given product from the comparative advantage of a given country, based on the Heckscher-Ohlin theory of international trade. This workhorse model of comparative advantage maintains that exported products should intensively use those factors of production that are abundant and therefore cheap in the exporting country. In other words, the factor intensity of the exported products should correspond to the factor endowment of the country that exports them. Building upon on the notion of "product chain of comparative advantage" within the Heckscher-Ohlin theoretical framework (Jones 1956-57; Bhagwati 1972; Deardorff 1979), we measure the distance to comparative advantage using Euclidean metrics of distance between the vector of the country's factor endowments and the vector of the product's revealed factor intensities:

$$distance_{ck} = \sqrt{std(\kappa_c - \hat{\kappa}_k)^2 + std(h_c - \hat{h}_k)^2 + std(l_c - \hat{l}_k)^2}, \quad (1)$$

where κ_c, h_c and l_c are the country's endowments in physical capital, human capital and land, and $\hat{\kappa}_k$, $\hat{h}_k$ and $\hat{l}_k$ are the corresponding revealed factor intensities of product k. We standardize the differences between the product's factor intensities and the country's factor endowments to have zero mean and unit variance ("std" in Equation 1 stands for "standardized"). This allows us to give equal weights to all three production factors, which are measured in different units. The resulting metrics $distance_{ck}$ is time-varying as countries' factor endowments evolve over time, with the time subscript in Equation 1 omitted for simplicity.[13]

The data on countries' factor endowments and products' revealed factor intensities is taken from Cadot, Tumurchudur, and Shirotori (2009). Physical capital per worker is constructed according to the perpetual inventory method. Human capital endowment

[12] The idea of using data on publicly listed US companies to compute a generic industrial measure of dependence on external finance relies on the argument that these companies face relatively frictionless financial markets. Consequently, the need for external finance of a median US public company captures the true technologically determined need for external finance at the industry level that is unaffected by various financial and contractual frictions facing smaller firms or firms in less financially developed countries. See Rajan and Zingales (1998) and Braun (2003) for a more detailed discussion.

[13] The specific metric of distance to comparative advantage used here is a slightly modified version of a measure introduced by Cadot, Carrère, and Strauss-Kahn (2011). See Jaud, Kukenova, and Strieborny (2018) for a more detailed discussion.

is proxied by the average years of schooling. The land endowment corresponds to the number of hectars of arable land per person in a given country. The factor intensities for a product k are calculated as the weighted average of the factor endowments of the countries exporting this product. The revealed physical capital intensity of good k is calculated as:

$$\hat{\kappa}_{k,t} = \sum\nolimits_c \omega_{ck,t} \kappa_{c,t},$$

where κ_c is country c's endowment in physical capital at time t, and the weights are given by $\omega_{ck,t} = \frac{X_{ck,t}/X_{c,t}}{\sum_c X_{ck,t}/X_{c,t}}$ with X_c representing value of all products exported from country c and X_{ck} value of exports of product k from country c. The weight $\omega_{ck,t}$ will be thus higher for countries with a higher $X_{ck,t}/X_{c,t}$ ratio, i.e. for countries where product k represents a higher share in the country's overall exports. Consequently, the more a given country specializes in exporting a given product, the higher influence has the factor endowment of that country on that product's revealed factor intensity. The revealed human capital intensity and land intensity of product k are calculated in a similar way.[14]

3.3 Other variables

We use export data from the UN Comtrade database. The data is reported at the level of 4 or 5 digits of the SITC product classification and comprises 1,299 different product categories. We construct a survival database focusing on the information about the starting and ending year of a trade relationship. To correct for left-censored observations (i.e., export spells that are already in place at the beginning of the sample) and to match the survival database with the period covering the stock market liberalization events, we drop all export spells that started before 1980 and after 1997.

We construct several spell characteristics using the original export data. We compute the number of suppliers (i.e., exporting countries) of a given product to the world market (measured at the product-time level), initial export value of a given product (country-product-time level), total value of country's exports to the rest of the world (country-time level), and number of export spells during the sample period for a given country-product

[14] The original index of revealed comparative advantage goes back to the seminal paper by Balassa (1965). The approach used by Cadot, Tumurchudur, and Shirotori (2009) builds upon the methodology introduced by Hausmann, Hwang, and Rodrik (2007). Their formulation applies the normalization in the denominator of $\omega_{ck,t}$ to ensure that the weights add up to one when aggregating across all countries that export a given product.

pair (country-product level). These variables account for the level of competition and/or the potential market size of a given product, for the degree of confidence between partners at the initiation of a trade relationship, for the size and overall export performance of the country, and for the possibility that repeated exits and re-entries into exporting affect the chances for the long-term export survival, respectively.

The physical and human capital intensities at the level of ISIC 3-digits industrial sectors are taken from Braun (2003). The data identifying products as homogeneous, differentiated or price-referenced in trade publications (an intermediate category) is from Rauch (1999). The annual data for GDP per capita in the purchasing power parity terms (GDP pc in PPP terms) is taken from the World Development Indicator Report 2006, and is reported in constant 2000 US dollars. The data for real exchange rate is also taken from the World Development Indicators database. The trade openness variable (the sum of country's exports and imports divided by its GDP) is from the Penn World Tables. The IMF dummy capturing whether a given country was a subject to the IMF program (i.e., received an official IMF loan) in a given year is constructed based on data from the International Monetary Fund.

Trade liberalization dates come from the database of Wacziarg and Welch (2008) who extended and refined the trade polices database of Sachs and Warner (1995). Sachs and Warner (1995) define trade openness based on five conditions that capture trade policy. A country is open to trade if it meets *none* of the following criteria: Average tariff rates of 40 percent or more; Nontariff barriers covering 40 percent or more of trade; A black market exchange rate at least 20 percent lower than the official exchange rate; A state monopoly on major exports; A socialist economic system. In principle, Sachs-Warner's trade liberalization date is the date after which all of the Sachs-Warner openness criteria are continuously satisfied. However, due to lack of available data, not all trade liberalization dates identified by Sachs and Warner satisfy the five criteria of trade openness. Wacziarg and Welch (2008) updated trade liberalization dates based on new information which became available after the study of Sachs and Warner (1995). In addition to primary-source data on annual tariffs, nontariff barriers, and black market premium used by Sachs and Warner (1995), Wacziarg and Welch (2008) rely on a variety of secondary sources to identify the dates of abolishment of export marketing boards and the dates when multiparty governance systems replaced communist regimes.

The data on Legal System and Property Rights used in Section 7 come from the Economic Freedom Database by Fraser Institute. The index captures the degree of protection

of property rights in the countries for the year 1980. The index varies from 0 to 10, with the lower number corresponding to lower level of investor protection. Gwartney, Lawson, and Norton (2008) provide more details. The alternative measures of legal environment used in Online Appendix E (Efficiency of Judicial System, Rule of Law, Risk of Expropriation, Repudiation of Contracts by Government, and Investor Protection - an average of the three previous measures) are based on La Porta et al. (1998). The original sources of data for these alternative measures are from Business International Corporation and International Country Risk Guide (see La Porta et al. 1998 for details).

3.4 Preliminary evidence and descriptive statistics

This paper explores whether allowing foreign investors to acquire equity stakes in domestic firms triggers an efficiency-enhancing structural change, pushing the country's exporters to re-balance their export portfolios towards products consistent with the country's comparative advantage. Figure 1 and Figure 2 provide some preliminary graphical evidence supporting this hypothesis in the context of the long-term export survival. The two figures show Kaplan-Meier survival functions capturing the probability of a new export spell (continuous exporting of product k from country c to the world market) to survive after year 1,2, etc. Given the annual frequency of the data, the survival probability in the first year is one by default.

Figure 1 and Figure 2 show the average export survival rate for two categories of products - products that are in the 25th and 75th percentile of distance to comparative advantage, i.e. products that are close versus far away from the comparative advantage of the exporting country. Only countries that did liberalize during the period 1980-1997 are included. For these countries, Figure 1 reports the survival rate before and Figure 2 the survival rate after the event of stock market liberalization.

The comparison of Figure 1 and Figure 2 reveals that the overall export performance of countries improves after they allow foreign investors to acquire equity stakes in domestic companies - both survival functions move upwards. However, this effect is not uniform across products. The exported products that do correspond to the comparative advantage of the liberalizing countries benefit disproportionately more from the entry of foreign investors. The survival function for the products in the 25th percentile of distance to comparative advantage (blue line) moves upward more strongly and is much clearer above the survival function of products in the 75th percentile of distance to comparative

advantage (red line) in Figure 2 compared to Figure 1.[15]

Table 1 reports descriptive statistics regarding the export spells in our sample that supports the preliminary evidence from Figure 1 and Figure 2. Similarly to these two figures, the upper half of Table 1 focuses on the so-called "switchers" - countries that liberalized their stock market (switched from being financially closed to being financially open) during the 1980-1997 period. Comparing the numbers in the first and second row of Table 1 reveals that both average and median duration of export spells increase after a financially closed country allows foreign investors to acquire equity stakes in domestic firms.

The third and fourth row of Table 1 capture the situation in the liberalizing subsample before the event of stock market liberalization and can be thus seen as an analogue to Figure 1. We can see that the export performance of products that correspond to comparative advantage of a given country (bottom 25th percentile of distance to comparative advantage - DCA) is practically indistinguishable from the export performance of products that are far away from the comparative advantage (top 25th percentile of DCA). In particular, the median duration of export spells for both product groups is one year, while the average duration is only marginally longer for the products closer to the exporting country's comparative advantage (1.68 vs 1.66 years).

The fifth and sixth row of Table 1 (an analogue to Figure 2) reflect the situation after a country grants foreign investors access to its domestic stock market. The overall length of export spells increases for both categories of products, but the products corresponding to the comparative advantage benefit disproportionately more (average length increasing to 7.78 years and median length to 4 years) compared to products that are far away from the comparative advantage of the liberalizing country (average length increasing to 6.46 years and median length to 3 years).

The lower half of Table 1 repeats the whole exercise for the full sample of countries including also countries whose stock markets remained continuously closed or continuously open to foreign investors during the whole 1980-1997 period.

The preliminary evidence in Figure 1, Figure 2, and Table 1 suggests that allowing foreign investors to acquire equity stakes in domestic firms indeed helps countries to re-

[15] Note that the percentiles are defined on a country-by-country basis. Consequently, the graphs capturing the differential survival of products that are close versus far away from comparative advantage of liberalizing countries are not biased by differences across individual countries' alignment of their overall export portfolio with their comparative advantage.

balance their export portfolios towards their comparative advantage, making a better use of available resources. However, this evidence does not control for various alternative channels and other confounding factors at country, industry, and product level. Before introducing our formal regression framework in the next section, Table 2 reports the summary statistics for the variables included in the later empirical analysis.

4 Estimation Strategy

Our empirical approach relies on the use of difference-in-difference estimation strategy within the econometric framework of the survival analysis. The difference-in-difference strategy allows us to examine whether the entry of foreign investors affects exports differently depending on the alignment of individual products with the comparative advantage of a given country. The survival framework enables us to focus on the long-term structural impact of foreign investors in this regard, by looking at the export survival of individual products as our outcome variable.

We analyze the long-term export survival by estimating the widely used Cox Proportional Hazard Model (Cox 1972) that is described in more detail in Appendix B1. The main specification examining the impact on export survival of allowing foreign investors to invest in domestic stock market writes:

$$h_{ck}(t) = h_{0,k}(t) \exp[\beta_1 StMLib_{c,t_0} + \beta_2 StMLib_{c,t_0} * distance_{ck,t_0} + \beta_3 * distance_{ck,t_0} + \mathbf{Y}_{cki,t_0}\phi + \delta_c + \delta_{t_0} + \varepsilon_{ck,t_0}] \quad (2)$$

where $StMLib_{c,t_0}$ is the stock market liberalization dummy, $distance_{ck,t_0}$ is a distance of exported product k from the comparative advantage of exporting country c, δ_c are exporting-country fixed effects, δ_{t_0} are time fixed effects (with time referring to the year when the export spell started), and ε_{ck,t_0} is a stochastic error term. Y_{cki,t_0} is a vector including various control variables at the level of exporting country c, product k and industry i. All explanatory variables are measured at the beginning of the export spell (at time t_0), except for the stock market liberalization dummy, which takes value 1 if the liberalization event occurs before the initiation of a spell or during the life of a spell.[16]

[16] We slightly abuse the notation and use subscript t_0 also in the case of stock market liberalization: $StMLib_{c,t_0}$

Since the stock market liberalization variable varies across time and countries, we cluster the reported standard errors at the country-time level.

The liberalization dummy $StMLib_{c,t_0}$ is based either on the year of the official stock market liberalization or on the year of the first sign that stock market liberalization occurred. Alternatively, we also use two versions of a continuous variable capturing the intensity of stock market liberalization at the industry-country level. The stock market liberalization variable becomes in this case $StMLib_{ic,t_0}$ (i.e., it varies both across industries and across countries) and the corresponding specification writes:

$$h_{ck}(t) = h_{0,k}(t) \exp[\beta_1 StMLib_{ic,t_0} + \beta_2 StMLib_{ic,t_0} * distance_{ck,t_0} + \beta_3 * distance_{ck,t_0} + \mathbf{Y}_{cki,t_0}\phi + \delta_c + \delta_{t_0} + \varepsilon_{ck,t_0}] \quad (3)$$

The dependent variable in both Equation 2 and Equation 3 is the hazard rate of an export spell of product k from country c to the world market. The hazard rate captures the probability of export failure rather than export success and can be thus seen as a mirror image of the Kaplan-Meier survival functions reported in Figure 1 and Figure 2. In the Cox Proportional Hazard Model, the outcome variable is the probability of an export spell that started at time t_0 to fail at time t.

Our main variable of interest is the interaction between stock market liberalization and the product's distance to comparative advantage while we also allow the stock market liberalization and the distance to comparative advantage to enter the regression directly. The main interaction term ($StMLib_{c,t_0} * distance_{ck,t_0}$ or $StMLib_{ic,t_0} * distance_{ck,t_0}$) tests whether stock market liberalization has a differentiated effect on survival of different product categories. In particular, a positive coefficient β_2 would suggest that products relying intensively on scarce factors disappear at a faster rate from country's export portfolio after foreign investors are allowed to acquire equity stakes in domestic companies.

Depending on specification, the vector of control variables Y_{cki,t_0} contains various interaction terms controlling for alternative channels that could be correlated with the mechanism captured by the main interaction term. In particular, we interact the stock market liberalization with the dependence on external finance at the industry level to control for the possibility that stock market liberalizations disproportionately benefit industries that require a high level of external finance. Furthermore, we control for the possible differential impact of domestic banks and stock markets by interacting distance

to comparative advantage both with the ratio of stock market capitalization over GDP and with the ratio of bank credit to private sector over GDP. To control for non-financial alternative channels, we also include into several specifications the interactions of distance to comparative advantage with GDP per capita in the PPP terms, with trade openness, and with the trade liberalization dummy. Furthermore, we include in almost all specifications (except for the first two baseline ones) the interaction terms of physical and human capital endowment at the country level with the intensity of usage of physical and human capital at the industry level.

The product strata effects discussed in the last paragraph of this section absorb the direct effects of industry characteristics like dependence on external finance or intensity of usage of physical and human capital. By contrast, the control variables at the level of exporting country are time-varying and therefore *not* absorbed by the exporting-country fixed effects. This applies both to the stock market liberalization variable and to other time-varying country-level variables like stock market development, bank development, GDP per capita in the PPP terms, trade openness, trade liberalization dummy, physical capital per worker, human capital per worker (average years of schooling), and land endowment (arable land per worker).

Finally, we control in all regressions for various product-level variables that could affect the long-term export survival in the world market. We control for the number of active suppliers (i.e., exporting countries) of a product to the world market that represents the level of competition but also the potential market size for a given product. We also control for the initial export value at the beginning of the export spell, reflecting the degree of confidence between partners at the initiation of the trade relationship. The total value of country's exports to the rest of the world accounts for the size and overall export performance of the country. The number of export spells during the sample period for a given country-product pair captures the possibility that repeated exits and re-entries into exporting of given product affect the chances of the long-term export survival in the world market.[17]

We allow the shape of the baseline hazard function $h_{0,k}(t)$ to vary across products, by fitting a stratified Cox Proportional Hazard Model with the SITC product code as a stratification variable. Stratification by products adds more flexibility to the model

[17] Another standard way to control for the presence of repeated exits and re-entries into exporting within the survival framework consists in introducing a multiple spell dummy that is equal to one if there is more than one spell for a given product-country pair during the sample period. The approach chosen here is more general as it explicitly controls also for the number of these multiple spells.

and can be viewed as a more general way (compared to simple product fixed effects) of accounting for time-invariant unobserved characteristics of the products that affect the probability of export exit. Appendix B2 provides more details.

5 Main Empirical Results

All our estimations investigate exports at the product level from individual countries to the rest of the world, examining the differential impact of stock market liberalization on the long-term export survival of products, depending on the level of products' congruence with the comparative advantage of the exporting country. The odd-numbered columns report results for the full sample of countries including those countries where domestic stock market was closed or open to foreign investors during the whole period of 1980-1997. The even-numbered columns report results for the subsample of countries where the event of stock market liberalization occurred between 1980 and 1997.

The estimations in the even-numbered columns provide arguably a cleaner estimate for the differential impact of the stock market liberalization. The identification comes in this case purely from within-countries changes after the liberalization events. The regression results are thus not potentially biased by structural differences between countries that allowed foreign investors to acquire equity stakes in domestic firms already before 1980 (so that liberalization dummy always equals one for a given country) and countries where stock markets were closed to foreign investors during the whole 1980-1997 period (so that liberalization dummy always equals zero for a given country).

5.1 Baseline regressions

Table 3 provides first evidence about the impact of stock market liberalization on the long-term survival of exports from liberalizing countries to the rest of the world. All explanatory variables are measured in the year when a given export spell started except for the stock market liberalization dummy that is equal to one if the liberalization date occurred before or during a given export spell, i.e. if an export spell was exposed to the liberalization event. The main variable of interest is the interaction term between the stock market liberalization dummy measured at the country-time level and the distance to the comparative advantage measured at the country-product-time level. Both variables entering the main interaction term (i.e., the stock market liberalization and the distance to comparative advantage) are also directly included in the regressions.

Specifications in columns (1) and (2) of Table 3 include a basic set of control vari-

ables: number of suppliers (exporting countries) of a given product to the world market (measured at the product-time level), total value of country's exports to the rest of the world (country-time level), initial export value of a given product (country-product-time level), number of export spells during the sample period for a given country-product pair (country-product level). Specifications in columns (3) and (4) additionally include control variables at the country-time level as well as interactions of those variables with industry characteristics. The direct effects of industry characteristics are captured by the product strata variable. The time-varying country-level control variables include GDP per capita of the exporting country, physical capital per worker, average years of schooling in the country (capturing the level of human capital per worker), and arable land per worker (land endowment). The country-industry interaction terms combine endowments of physical [human] capital at the country level with the intensity of the usage of physical [human] capital at the industry level. These interaction terms control for the fact that exports from industries heavily using physical or human capital might face better survival odds if the exporting country is well-endowed with such capital. Columns (1) and (3) of Table 3 look at the full sample of countries and therefore also include countries where the domestic stock market was continuously open or closed to foreign investors during the whole period of 1980-1997. Columns (2) and (4) include only countries that actually did experience a liberalization event and opened up their domestic stock market to foreign investors between 1980 and 1997.

In all four columns of Table 3, both the stock market liberalization and its interaction with the distance to comparative advantage have the expected sign and are statistically significant. Stock market liberalization decreases the hazard rate of exports and thus improves the survival odds for products exported from the liberalizing country to the rest of the world. However, it helps disproportionately less when it comes to products that do not correspond to the comparative advantage of the exporting country. The positive and significant coefficient for the main interaction term ($StMLib_{c,t_0} * distance_{ck,t_0}$) suggests that the further away is the exported product from the comparative advantage of the exporting country, the higher hazard rate it faces after the stock market liberalization event.

Among the product-level control variables, only initial export and number of spells maintain statistically significant coefficient in all four specifications. The initial export (i.e., the export value at the beginning of a given export spell) that serves as a proxy for the degree of confidence between partners at the beginning of a new trade relationship has

the expected negative sign, decreasing the hazard rate of a given export spell. Repeated exits and re-entries into exporting worsen the long-term export survival (increase the hazard rate) in the world market, as demonstrated by the positive sign for the number of export spells within a given country-product pair during the sample period. Distance to comparative advantage has the expected positive sign, but it is not significant in the last specification reported in column (4). Number of suppliers that can capture both the level of competition and the potential market size also loses significance in the last column of Table 3. The variable controlling for the size of exporting country (total exports) loses significance in the third column of Table 3.

Similarly to some of the product-level control variables, there is no consistent pattern in terms of significance level also in the case of some of the additional controls at the country and country-industry level that enter the specifications in the last two columns of Table 3. These include GDP per capita, land endowment, and the interaction of physical capital endowment at the country level with the physical capital intensity at the product level. By contrast, the direct effect of physical capital and the effect of the human capital country-industry interaction have a consistent sign and are statistically significant at the 1 per cent level in both column (3) and column (4). The negative coefficients for these two variables suggest that exporting countries' endowment in physical capital decreases the export hazard rate and that human capital endowment disproportionately promotes exports from industries whose production process is particularly intensive in the use of human capital.

Before considering various alternative channels and performing other robustness tests, let us briefly discuss the economic magnitude of the mechanism captured by our main interaction term ($StMLib_{c,t_0} * distance_{ck,t_0}$, with the estimated coefficient β_2). This term captures the differential impact of stock market liberalization on hazard rate of products that are far away versus products that are close to the comparative advantage of the liberalizing country. For any two products, this differential effect is $\beta_2 * \Delta StMLib_{c,t_0} * \Delta distance_{ck,t_0}$, which in case of liberalization zero-one dummy simplifies to $\beta_2 * (1-0) * \Delta distance_{ck,t_0} = \beta_2 * \Delta distance_{ck,t_0}$. Let us take as an example India, a country that granted foreign investors access to its domestic market in 1992. Five years before the liberalization event, one of the products from the 75th percentile of distance to comparative advantage (DCA) in case of India was "hearing aids" (SITC code 89961, DCA value 1.471), and one of the products from the 25th percentile of distance to Indian comparative advantage was "refined copper included remelted" (SITC code 68212, DCA

value 0.482). Using the above formula and taking the estimated coefficient for our main interaction term from column (4) of Table 3 implies that after India liberalized its stock market, the difference between the hazard rates of a product far away from its comparative advantage (hearing aids) relative to hazard rate of product close to its comparative advantage (refined copper) increased by approximately 15 per cent.[18] Appendix C performs this calculation for all countries that have liberalized their stock market between 1980 and 1997 and where data for computing distance to comparative advantage five years before the liberalization event are available. Due to different levels of DCA dispersion within countries' export portfolios, the computed effects capturing the economic magnitude differ across countries. As shown in the last column of Appendix C, these effects range from 15 per cent in case of India to 50 per cent in case of Iceland, with the average effect being slightly above and the median effect being slightly below 30 per cent.[19]

5.2 Alternative channels

Table 4, Table 5, and Table 6 keep the extended set of explanatory variables from columns (3) and (4) of Table 3 and add additional controls capturing alternative financial and non-financial channels that could be correlated with our main mechanism. Like in Table 3, the odd-numbered columns report results for the full sample of countries including those countries where domestic stock market was closed or open to foreign investors during the period 1980-1997. The even-numbered columns report results for the subsample of countries where the event of stock market liberalization occurred between 1980 and 1997.

Table 4 examines alternative financial channels that could be correlated with the impact of stock market liberalization on the long-term export survival. Columns (1) and (2) add an interaction between stock market liberalization and dependence on external finance into the set of control variables, with the direct effect of the industry-level dependence on external finance being absorbed by the product strata variable. The additional interaction term controls for the possibility that an improved access to finance benefits in particular those industries that require a high share of external financing for their operations (Rajan and Zingales 1998; Manova 2008). A negative coefficient for this interaction

[18] $\beta_2 * \Delta distance_{ck,t_0} = 0.152 * (1.471 - 0.482) = 0.15$, which approximately equals 15 per cent, when applying the Taylor expansion in the context of the exponential functional form in the Cox Proportional Hazard Model.

[19] The pattern is similar but number of countries with available data lower when we measure distance to comparative advantage ten years before the liberalization event instead of five years. The results are available upon request.

term would confirm that after the event of stock market liberalization the hazard rate in the world market is disproportionately lower for exports from industries dependent on external finance.

Columns (3) and (4) of Table 4 include the interaction term of bank credit to private credit over GDP (capturing the level of domestic banking development in the exporting country) with distance to comparative advantage. This variable controls for the possibility that a strong banking sector disproportionately increases the hazard rate for products that do not correspond to the comparative advantage of the exporting country, in accordance with theories about disciplining role of debt and superior monitoring abilities of banks (Jaud, Kukenova, and Strieborny 2018).

Columns (5) and (6) of Table 4 include the interaction term of stock market capitalization over GDP (capturing the depth of stock markets in the exporting country) with the distance to comparative advantage. This allows for the possibility that the depth of stock markets interacts with the timing of the opening up of the stock market to foreign investors and/or that deep stock markets differentially affect export survival of products depending on their alignment with the comparative advantage of the exporting country.

The results for either the stock market liberalization or its interaction with distance to comparative advantage are not affected by controlling for additional finance channels in Table 4. Both terms maintain their expected sign and statistical significance. As for the alternative channels, the interaction term of stock market liberalization and dependence on external finance is significant with the expected negative sign in columns (1) and (2), confirming the results of Manova (2008) on export volume also in the context of long-term export survival. The interaction term of distance to comparative advantage with the bank development has the expected positive sign and is statistically significant in columns (3) and (4) while the interaction of distance to comparative advantage with the stock market development in columns (5) and (6) is insignificant, confirming the results of Jaud, Kukenova, and Strieborny (2018) in a different dataset with different set of exporting countries, a different sample period and a different destination market.[20]

Table 5 focuses on non-financial alternative mechanisms that could influence the differential impact of stock market liberalization on export dynamics of products that are closer versus products that are further away from the comparative advantage of the exporting

[20] In this paper, we use SITC data that are slightly more aggregated than data used by Jaud, Kukenova, and Strieborny (2018) but allow us to look at a longer time span. Additionally, we look at exports to the whole world market rather than focusing on the US destination market alone.

country. Regardless of the included additional channels, both stock market liberalization and its interaction with the distance to comparative advantage maintain their significant coefficients with the expected signs throughout Table 5.

Columns (1)-(6) of Table 5 look at the impact of economic development and trade openness in the exporting countries. These two alternative channels are captured by the interaction terms of distance to comparative advantage with GDP per capita and with the sum of exports and imports divided by GDP. Firstly, these additional variables control for the possibility that timing of stock market liberalization is affected by the level of economic development, phases of business cycle or trade openness in the liberalizing countries. Secondly, the levels of economic development and trade openness could affect differently the survival chances of products that are close to the comparative advantage of the exporting country versus products that are far away from it. Columns (1)-(2) include the interaction term of GDP per capita with distance to comparative advantage and columns (3)-(4) control for the interaction term of trade openness with distance to comparative advantage. Columns (5)-(6) control for both channels simultaneously. While trade openness seems to decrease the hazard rate overall, there is no evidence for a differentiated effect across products with varying levels of conformity with the comparative advantage. The interaction term between trade openness and distance to comparative advantage is insignificant in columns (3)-(6) where it is included. As for the differentiated impact of countries' level of economic development, the results in Table 5 highlight the importance of controlling for underlying structural differences between countries that opened up to foreign investors already before 1980 and countries that kept their stock market closed until 1997. In columns (1) and (5) that report the results for the whole sample, the interaction term of GDP per capita and distance to comparative advantage has a negative sign. In columns (2) and (4) that report results for the subsample of countries implementing stock market liberalization between 1980 and 1997, the estimated coefficient for the interaction term switches to the more intuitive positive sign, suggesting that products not well aligned with the comparative advantage exit the export portfolio disproportionately faster in countries with a higher level of GDP per capita.[21]

Columns (7) and (8) of Table 5 include the interaction between distance to comparative advantage and the trade liberalization dummy. This interaction term controls for the possibility that the timing of stock market liberalizations might coincide with trade

[21] The direct effect of GDP per capita (not reported) is included in the "Full set of controls" corresponding to column (4) of Table 3.

liberalization events, which could then drive our result of a higher post-liberalization hazard rate of the products poorly aligned with the comparative advantage of the liberalizing countries. Similarly to stock market liberalization events or trade openness, trade liberalization events also have a positive direct impact on long-term export performance, decreasing the hazard rate of exports. As for the differentiated effect across products, the interaction between trade liberalization and distance to comparative advantage is statistically significant with the expected positive sign in column (7) of Table 5, suggesting that free-market trade policies lead to disproportionately higher hazard rates for products not well aligned with the comparative advantage. Although this interaction term becomes insignificant in column (8), one needs to stress a certain unfairness of this particular horse race between stock market liberalization and trade liberalization. Trade liberalization is politically less controversial and therefore generally precedes stock market liberalization, often by a significant period of time. Many countries in the subsample of financial liberalizers from column (8) of Table 5 have thus liberalized their trade regime already before 1980 so that the trade liberalization dummy equals one for all export spells from these countries. This might leave insufficient variation to precisely estimate the differential impact of trade liberalization in this specification. In future research, we plan to look deeper into possible interactions and feedback effects between financial and trade liberalization when it comes to eliminating exports of products not corresponding to the comparative advantage of the liberalizing countries.

Table 6 allows various financial and non-financial channels to affect the long-term export survival simultaneously. In columns (1) and (2), we focus on channels that operate through liberalization events capturing sudden changes within countries over time. In particular, we control simultaneously for the differential impact of stock market liberalization on industries requiring a high level of external finance and for the differential effect of trade liberalization across products with varying levels of alignment with the comparative advantage. In columns (3)-(6), we focus on alternative channels that operate through the slowly-moving country characteristics varying mostly across rather than within countries. We thus control for domestic bank or stock market development together with economic development and trade openness, as well as for the potentially differential impact of all those variables across products with different levels of conformity with the comparative advantage.

Our main results remain robust throughout the whole Table 6. Allowing foreign investors to acquire equity stakes in domestic firms promotes the long-term presence of

exports from liberalizing countries to the world market (i.e., decreases the hazard rate of existing export spells) but it does disproportionately less so for products not well aligned with the comparative advantage of the exporting countries. As for alternative financial mechanisms, the results confirm the importance of stock market liberalizations for industries requiring a high share of external financing (columns (1)-(2)) and the important disciplining role of a well-developed domestic banking sector when it comes to aligning export portfolio of a given country with its comparative advantage (columns (3)-(4)). The general level of domestic stock market development once again fails to exercise the disciplining effect of the stock market liberalization (columns (5)-(6)), highlighting the unique role foreign investors seem to play in this regard. The results for interaction terms of distance to comparative advantage with non-financial variables also remain qualitatively mostly the same as in previous estimations. One exception is the general loss of significance for the interaction between GDP per capita and distance to comparative advantage once we simultaneously control for the alternative financial channels.

5.3 Alternative measures of stock market liberalization

This subsection discusses results based on three alternative measures of stock market liberalization - a dummy capturing the first sign of the liberalization process and two versions of a continuous variable capturing the intensity of the liberalization process at the industry-country level. The regressions in Table 7 include the extended set of explanatory variables from columns (3)-(4) of Table 3, with odd-numbered columns reporting the results from the full sample and even-numbered columns reporting the results from the subsample of countries who opened up to foreign investors during the 1980-1997 period.

In the first two columns of Table 7, we replace the dummy based on the official year of the stock market liberalization with a dummy capturing the first sign of liberalization. The official year of stock market liberalization corresponds to the date of a formal legal change allowing foreign investors to acquire equity stakes in domestic firms. The first sign of liberalization corresponds to the earliest of the following three dates: the year of official liberalization, the year of issuing the first American Depository Receipt (ADR, a security allowing the shares of non-US companies to be traded in the US financial markets), and the year of launching the first country fund (a fund with portfolio containing only stocks of a given country). The first sign of liberalization can thus either precede or coincide with the formal legal change allowing foreign investors to directly acquire equity stakes

in the domestic firms.[22]

In the last four columns of Table 7, we use a continuous variable capturing the intensity of the stock market liberalization. The measure represents the proportion of domestic stocks available to foreign investors at the industry-country level.[23] Based on data available in the Emerging Stock Market Factbooks of the International Finance Corporation, we compute the proportion of domestic stocks available to foreign investors by dividing the market capitalization of firms included in the IFC Investable index by the market capitalization of firms in the IFC Global index. These data are available at the level of 2-digits SIC industries while our international trade data are based on the SITC (Standard International Trade Classification) product classification. As there exists no direct concordance between those two classifications, we first apply the concordance tables from SIC industry classification to ISIC industry classification and subsequently apply the ISIC-SITC concordance tables. After this procedure, we are able to match the industry-country financial liberalization index to 632 out of our 1,299 product categories.[24]

The purpose of the estimations in columns (3)-(6) of Table 7 is allowing for different levels of liberalization intensity both across countries and across industries. Similarly to our main dummy, the intensity measure equals zero before the government officially allows foreign investors to acquire any equity stakes in domestic firms. After the official liberalization event, the value of the intensity measure can take any value between zero and one and it can also differ across industries within the same liberalizing country. In columns (3) and (4) of Table 7, we use IFC indices available for a given industry-country pair in a year that is closest to the official year of the stock market liberalization. In columns (5) and (6) of Table 7, we use the average value for a given industry-country pair.[25]

Throughout Table 7, our main interaction term remains positive and significant. Independently on the particular measure used, the ability of foreign investors to acquire

[22] First sign liberalization dummies based on these alternative dates have been also used in the previous literature (see, e.g., Bekaert, Harvey, and Lundbland 2005; Manova 2008; Moshirian et al. 2021).

[23] We are grateful to Christian Lundblad for suggesting this approach to us.

[24] Our approach builds upon previous literature that has used IFC data to construct liberalization intensity measures at the country level (see, e.g., Bekaert 1995; Edison and Warnock 2003; Bekaert, Harvey, and Lundbland 2005; De Jong and De Roon 2005; Bekaert et al. 2007).

[25] We thus abstract from the time variation in the liberalization intensity due to the limited availability of publicly available IFC data at the industry-country level across the time dimension. The focus on the cross-sectional variation is also in line with previous literature using a country-level measure of liberalization intensity in the context of international trade (Manova 2008; Defever and Suedekum 2014).

equity stakes in domestic firms pushes the export portfolio of the liberalizing countries closer to their comparative advantage.

We have also re-run Table 4, Table 5, and Table 6, using the three alternative measures of the stock market liberalization. The results reported in Online Appendix D are sometimes even stronger than in the main text (e.g., comparing the significance level for our main interaction term in columns (5) and (6) of Table VII-IX in Online Appendix D with columns (5) and (6) of Table 6 in the main text). This might be caused by two possible sources of a bias against finding significant results in our difference-in-difference framework when using a stock market liberalization dummy based on the official liberalization dates. First, foreign investors might acquire equity stakes in domestic firms via ADR or equity funds even before the official dates of stock market liberalization. The official liberalization dummy thus underestimates the influence of foreign investors before the liberalization event. Second, even after the government in principle allows foreign investors to acquire equity stakes in domestic firms, it might still keep in place certain restrictions on maximum foreign ownership or foreign voting rights. The official liberalization dummy thus overestimates the influence of foreign investors after the liberalization event. Consequently, the real difference in the ability of foreign investors to affect the country's export portfolio in the time before versus the time after the stock market liberalization is smaller than a binary dummy based on the official liberalization date would suggest. The use of such dummy thus biases the coefficient for the interaction term of liberalization dummy with distance to comparative advantage towards zero. The dummy for the first sign of liberalization or a continuous variable capturing the liberalization intensity address these issues to a certain extent although a possible measurement error might still generate a bias towards zero.[26] In that sense, the results for our main interaction term reported in this paper might represent only a lower bound for the true impact of foreign investors on pushing the export portfolios of countries towards their comparative advantage.

[26] Different definitions of availability of domestic equity to foreign investors make it difficult to measure stock market liberalization intensity exactly and unequivocally (see also Bekaert, Harvey and Lundblad 2003). For instance, Bekaert, Harvey, and Lundbland (2005) also base their country-level measure of liberalization intensity on ratios of IFC Investable index and IFC Global index and report an average liberalization intensity for Finland during the 1980-1997 period that is equal to one, i.e. 100 per cent. By contrast, Liljeblom and Löflund (2005) report that foreign ownership of companies in Finland was restricted to 40 per cent of equity and 20 per cent of voting rights prior to 1993.

6 Robustness Tests

Table 8, Table 9, and Table 10 provide a series of robustness tests to our main results. For brevity, we report in this subsection only results from the liberalizing subsample that arguably provides a cleaner estimate for our main interaction term due to elimination of cross-country structural differences between countries that liberalized their stock market already before 1980 and countries that remained closed to foreign investors for the whole time until 1997. The point of departure is thus the specification from column (4) of Table 3. Table 8 adds several control variables that could be correlated with our main interaction term. Table 9 provides a series of econometric robustness tests by employing alternative methods for clustering the standard errors and using different sets of fixed and strata effects. Table 10 addresses several timing issues within the survival framework (time-varying covariates, timing of stock market liberalization in the context of export spells, and an alternative handling of tied-spells termination events).

Column (1) of Table 8 controls for the possibility that the strength of domestic currency affects exports differentially, depending on individual products' alignment with the comparative advantage of the exporting country. We thus add both real exchange rate and its interaction with distance to comparative advantage into the set of control variables. In column (2), we control for the possibility that the entry of foreign investors affect exports of differentiated products differently from the exports of homogeneous products. Here we add interactions of stock market liberalization both with a dummy for differentiated products and with a dummy for products that are reference-priced in trade publications. The omitted dummy is the one for homogeneous products, i.e. the products bought and sold via organized exchanges (see Rauch 1999 for details). The direct effects of both product dummies are captured by the product strata effects. In column (3), we control for the fact that countries receiving a loan from the International Monetary Fund are often obliged to implement various economic reforms that could arguably both improve the overall export performance of the countries and affect the alignment of countries' export portfolio with their comparative advantage (e.g., if IMF-induced reforms affect the corporate governance of the exporting firms). We thus include both an IMF dummy that is equal to one if the exporting country is subject to an IMF program during the duration of a given export spell and an interaction of this dummy with distance to comparative advantage into our set of control variables. In the first three columns of Table 8, our main interaction term maintains its positive sign and statistical significance. Among the four additional interaction terms, only the interaction between stock market liberalization and

dummy for differentiated products included in column (2) is statistically significant. The negative impact of this control variable on the export hazard rate suggests that the entry of foreign investors promotes long-term export survival disproportionately more in the case of differentiated products.

In column (4) and (5) of Table 8, we control for the possibility that the speed with which countries' export portfolios move closer towards their respective comparative advantage varies over time due to various global and country-specific forms of underlying structural change that are unrelated to the process of financial liberalization (technological progress, globalization, processes of information diffusion and/or learning about foreign markets, time-varying corporate procedures, etc.). In column (4), we thus include interaction of distance to comparative advantage with the time trend. As the time is here the year of the initiation of the export spell, the direct effect of the time trend is captured by the time (i.e., spell initiation year) fixed effects. In column (5), we go a step a further and allow for the possibility that trajectories of structural change differ across exporting countries. In particular, we include country-specific time trends and their interactions with distance to comparative advantage into the set of control variables (coefficients not reported for space reasons). In both column (4) and column (5), the estimated coefficient for our main interaction term remains positive and significant. The entry of foreign investors into the domestic stock market thus seems to push export portfolios towards the comparative advantage of the liberalizing countries even after controlling for underlying structural changes captured by the differential impact of global and country-specific time trends.

Table 9 provides a series of econometric robustness tests related to alternative methods for clustering the standard errors, stratification, and the use of fixed effects. For a better comparison, the first column reports the estimation from the column (4) of Table 3. In second column, we cluster standard errors at the level of exporting country rather than at the country*time level, addressing the econometric issues raised by Bertrand, Duflo, and Mullainathan (2004). In the third column, we cluster the standard errors simultaneously alongside both exporting-country and time dimension, following the two-way procedure suggested by Cameron, Gelbach, and Miller (2006). As the only difference among these three estimations relates to the way how the standard errors are computed, the point estimates are the same in columns (1)-(3) of Table 9. In columns (4)-(7) of Table 9, we use alternative versions of fixed and strata effects (for the difference between the two, see Appendix B2). In the fourth column, we replace the product stratification by the

product*time stratification. This approach controls for all observable and unobservable effects that could vary both across products and over time, like the level of competition for a given product in the world market. Our proxy for such competition (number of suppliers - a variable that is included in the full set of controls) is thus absorbed by these more stringent strata effects in column (4) of Table 9. In the fifth column, we apply the product*country stratification that controls for various trade policies at product-country level (e.g., export subsidies) that could affect long-term survival of individual products from individual countries in the world market. In the sixth column, we replace separate time and exporting-country fixed effects by the interacted (exporting-country)*time fixed effects. This set of fixed effects controls for all influences that vary both across exporting countries and over time and consequently absorbs the direct effect of several control variables included in the full set of controls (total exports, GDP per capita, factor endowments).[27] In the seventh column, we take the contrary approach to columns (4)-(6) where we applied stricter sets of strata and fixed effects, and we instead refrain from the use of any strata or fixed effects. In all columns of Table 9, our main interaction term remains positive and significant.

In Table 10, we address several issues of timing that arise in the context of examining the effects of stock market liberalization events in the econometric framework of long-term export survival. In the first column, we allow for the possibility that the effect of our main variables of interest is not constant but gets stronger or weaker over the export spells' lifetimes.[28] The direct effect of stock market liberalization seems indeed to be time-varying. Allowing foreign investors to acquire equity stakes in domestic firms decreases the overall hazard rate of exports from the liberalizing country to the world market (negative and significant coefficient for stock market liberalization in the first sub-column of column (1) in Table 10) and this effect gets stronger over time (negative and significant coefficient for stock market liberalization in the second sub-column of column (1) in Table 10). At the same time, the entry of foreign investors disproportionately increases the hazard rate for products far away from the country's comparative advantage (positive and significant coefficient for our main interaction term in the first sub-column).

[27] By contrast, the (exporting-country)*time fixed effects do *not* absorb the direct effect of stock market liberalization. The liberalization dummy is not measured in the year when a given export spell started but instead equals one if the liberalization event occurred before or during the spell. This variable is thus spell-specific instead of varying solely across countries and time.

[28] The use of time-varying covariates in the Cox survival framework prevents convergence in the presence of large sets of fixed effects. In the first column of Table 10, we therefore drop time and exporting-country fixed effects and keep only stratification at the product level.

This differential effect seems to be constant, getting neither stronger nor weaker over the duration of export spells (insignificant coefficient for the main interaction term in the second sub-column).[29] In the second column of Table 10, we follow the export spells only until 1997 rather than 2006, unifying the time spans for stock market liberalization dates and export spells. In the third column of Table 10, we drop those observations where stock market liberalization occurs during the lifetime of a given export spell, i.e. we drop those export spells that were only "partially treated" by the ability of foreign investors to acquire equity stakes in domestic firms. In the fourth column of Table 10, we use the Efron method (Efron 1988) to handle tied-spells termination events.[30]

7 Monitoring by Foreign Investors

The results presented in Section 5 and Section 6 show that the entry of foreign investors into domestic stock market triggers an efficiency-enhancing structural change in the real economy by re-balancing countries' export portfolios towards their comparative advantage. A possible explanation for this result might lie in the monitoring and disciplining effects of foreign investors in domestic firms. An influential strand of literature argues that foreign investors are more effective as external monitors compared to domestic investors who often feel loyal to the local management (e.g., Gillan and Starks 2003; Ferreira and Matos 2008; Aggarwal et al. 2011; Bena et al. 2017; Luong et al. 2017). If that is true, then stricter monitoring by foreign investors should push the exporting managers in domestic firms to focus on products that correspond to the comparative advantage of the domestic economy and abandon those products that make suboptimal use of the available resources in the domestic economy. This section provides some preliminary evidence in accordance with this interpretation.[31]

If our findings are indeed driven by the superior monitoring skills of foreign investors, then the results should become stronger in a legal environment providing sufficient protection to the rights of investors in general and of foreign investors in particular. Arguably,

[29] Appendix B3 provides technical background for these interpretations of coefficients in the two sub-columns of column (1).

[30] Tied-spells termination events occur when two or several export spells end at the same time, violating one of the assumptions of the continuous-time Cox Proportional Hazard Model. In other estimations, we are using instead the standard Breslow method (Breslow 1974) that requires substantially less computing time.

[31] Efficiency-maximizing managers would abandon of their own volition those exports that use the available resources suboptimally. However, exporting activities might generate substantial managerial perks that would induce self-interested managers to keep alive also those exports that they know to be inefficient. Jaud, Kukenova and Strieborny (2018) present a formal model alongside these lines.

foreign investors can fully employ their monitoring abilities only if they can rely on a robust legal framework protecting their rights vis-vis corporate insiders and local government. Table 11 examines this hypothesis, based on a composite index Legal System and Property Rights from the Economic Freedom Database. The index captures various legal dimensions relevant for investor protection like integrity of legal system, legal enforcement of contracts, protection of property rights, impartiality of courts, judicial independence, etc., with higher values of the index corresponing to higher levels of investor protection. The index varies both across countries and over time. Due to possible endogeneity concerns, we use the values measured in 1980, which is the first year of our sample.

Column (1) of Table 11 runs our preferred specification for all countries from column (3) of Table 3 on the subsample of countries for which we have data on the Legal System and Property Rights variable. The number of observations thus drops by approximately 10 per cent from 85,675 to 77,165. In columns (2) and (3), we split this sample into countries below and above median of our variable capturing the legal environment in exporting countries. Our main interaction term is only marginally significant in the subsample of countries with a below-average legal system reported in column (2). By contrast, the main interaction term is highly significant in the subsample of countries with an above-average legal system reported in column (3). The size of the coefficient for our main interaction term is also substantially higher in the third column compared to the second column of Table 11. In columns (4)-(6), we repeat the exercise on the subsample of liberalizing countries that allowed foreign investors to acquire equity stakes in domestic firms for the first time at some point during the 1980-1997 period. The point of departure is thus column (4) of Table 3, with column (4) of Table 11 re-running the estimation on those liberalizing countries for which we have data on the Legal System and Property Rights variable. The number of observations now drops by around 7 per cent, from 45,699 to 42,376, suggesting that we have the legal data for the vast majority of the liberalizing countries. Columns (5) and (6) report the results for liberalizing countries below and above median of the Legal System and Property Rights variable.[32] The difference is even more pronounced than in the whole sample. In column (5), our main interaction term is insignificant. In column (6), the main interaction is highly significant with the size of its

[32] Note that the minimum thresholds identifying countries as "above average" in terms of Legal System and Property Rights variable are different in the full sample and the subsample of countries that experienced stock market liberalization during the 1980-1997 period. We have also re-run the estimations in columns (5) and (6) of Table 11 based on the threshold used in columns (2) and (3) of Table 11. The results are available upon request.

coefficient increasing more than tenfold compared to column (5). The results reported in previous sections thus seem to be driven solely by those liberalizing countries that had a sufficient level of investor protection in place already before allowing foreign investors to enter their domestic stock markets.[33]

In Online Appendix E, we provide a series of robustness tests by re-running Table 11 with sample splits based on alternative legal variables used by La Porta et al. (1998). These include Efficiency of Judicial System (an assessment of the "efficiency and integrity of the legal environment as it affects business, particularly foreign firms" produced by the country-risk rating agency Business International Corp.), Rule of Law (an assessment of the law and order tradition in the country produced by the country-risk rating agency International Country Risk - ICR), Risk of Expatriation (an ICR's assessment of the risk of "outright confiscation" or "forced nationalization"), Repudiation of Contracts by Government (an ICR's assessment of the "risk of modification in a contract taking the form of repudiation, postponement or scaling down" due to "budget cut-back, indigenization pressure, a change in government, or change in government economic and social priorities"), and Investor Protection (not used by La Porta et al. 1998, it is an average of the three ICR measures computed by us).

Some of these alternative variables might arguable represent an even better proxy for protection of investors in general and of foreign investors in particular. We have decided to report the results based on the Legal System and Property Rights variable in the main text because it has the best country coverage yielding the highest number of observations, and because it is measured at the beginning of our sample (1980) rather than representing the averages over the years 1980-1983 or 1982-1995 (see la Porta et al. 1998 for more details). If anything, the results based on the alternative legal measures are even stronger than the results reported in Table 11. For example, when it comes to the specification reported in column (2) based on the subsample of countries with below-average values of legal variables, our main interaction term is not significant at even 10 per cent level in the tables reported in Online Appendix E.

[33] Note that we obtain stronger evidence for a differential impact of stock market liberalization in countries with an above-average legal system (third and sixth column of Table 11) despite a significantly lower number of observations in this subsample compared to the subsample of countries with a below-average legal system (second and fifth column of Table 11). The difference in number of observations is due to fact that our sample split is based on the country-level variable Legal System and Property Rights. For instance, countries with an above-average legal system might have fewer but longer export spells compared to countries with a below-average legal system.

8 Conclusions

This paper provides evidence that allowing foreign investors to acquire equity stakes in domestic firms significantly improves the chances of domestic products to establish a successful long-term presence in the world market. However, this beneficial effect is not uniform across products but depends on the extent to which a given product corresponds to the comparative advantage of the country that opens up its stock markets to foreign investors. The further away a product is from the comparative advantage of the liberalizing country, the sooner it exits this country's export portfolio after the stock market liberalization event occurs.

Our results suggests that the entry of foreign investors triggers an efficiency-enhancing structural change, by pushing the recipient countries' export portfolios towards the products that make the optimal use of available resources. While we find strong evidence for this disciplining effect on export composition following the opening of stock markets to foreign investors, we find no such effect when looking at the standard proxy for domestic stock market development. The uniqueness of foreign investors in this regard seems to be in accordance with the existing literature that makes the case for superior monitoring abilities of foreign investors (Gillan and Starks 2003; Ferreira and Matos 2008; Aggarwal et al. 2011; Bena et al. 2017; Luong et al. 2017). Section 7 provides some preliminary evidence consistent with this interpretation.

Future research could build upon evidence presented in Section 7 and further explore the specific transmission channels from foreign investors to structural change in the real economy. One research venue could be connected to the "voice" (direct actions through board memberships, voting or behind-the scenes interventions) and "exit" (selling their equity stake or a part of it) as alternative mechanisms through which investors shape the actions of firms whose shares they hold. While recent literature examined these two mechanisms mostly in the common-law context of US shareholders and firms (see Edmans and Holderness 2017 for a recent survey), exploring them in the cross-border context of foreign investors and domestic firms could provide new insights. Foreign investors might namely choose different paths when it comes to voice versus exit, depending among other things on the legal and regulatory framework in both their own countries and the countries where they invest. Another venue for future research could lie in the interactions between foreign and domestic investors. For instance, the entry of foreign investors to an hitherto closed domestic stock market would arguably increase the liquidity of such market, improving the efficiency of exit strategy also for the existing domestic shareholders,

alongside the lines of Edmans and Manso (2011). By contrast, the impact of increased liquidity on voice strategy of existing shareholders could be either positive (e.g., Maug 1998) or negative (e.g., Bhide 1993; McCahery, Sautner, and Starks 2016).

Naturally, a rigorous analysis of specific transmission mechanisms from foreign investors to structural change cannot rely on product-level data alone. This kind of analysis would also require the use of firm-level data, and it would therefore need to address the issue of spillovers and economic externalities associated with foreign investors discussed in the Introduction. The limited availability of internationally comparable firm-level data would also imply a reduced country coverage of such empirical investigation.

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Appendix A: Stock Market Liberalizations - Country List (some of the countries below do not enter our regressions due to the lack of data for some of the control variables)

Domestic stock market opened up to foreign investors during 1980-1997: Argentina, Bangladesh, Brazil, Chile, Colombia, Cote d'Ivoire, Ecuador, Egypt, Ghana, Greece, Iceland, India, Indonesia, Israel, Jamaica, Japan, Jordan, Kenya, Malaysia, Malta, Mauritius, Mexico, Morocco, New Zealand, Nigeria, Oman, Pakistan, Peru, Philippines, Portugal, Saudi Arabia, South Africa, South Korea, Spain, Sri Lanka, Thailand, Trinidad and Tobago, Tunisia, Turkey, Venezuela, and Zimbabwe.

Domestic stock market opened up to foreign investors prior to 1980: Australia, Austria, Barbados, Canada, Denmark, Finland, France, Germany, Ireland, Italy, Netherlands, Singapore, Sweden, Switzerland, United Kingdom, and United States

Domestic stock market remained closed to foreign investors until 1997: Algeria, Benin, Burkina Faso, Cameroon, Central African Republic, Chad, Congo, Costa Rica, Dominican Republic, El Salvador, Fiji, Gabon, Gambia, Guatemala, Guyana, Haiti, Honduras, Iran, Kuwait, Madagascar, Malawi, Mali, Nepal, Nicaragua, Niger, Norway, Paraguay, Rwanda, Senegal, Sierra Leone, Syria, Togo, Uruguay, and Zambia.

Appendix B1: The Cox Proportional Hazard Model

The duration of a country export for a given product is defined as the time (measured in years) when a trade relationship has been in existence without interruption. The distribution of durations can be characterized in terms of the hazard function which is defined as the instantaneous probability that a trade relationship ends at time t given that it has survived until time t-1:

$$h(t|X) = Pr(T = t|T \geq t, X), t = 1, 2, ... \tag{4}$$

The Cox Proportional Hazard Model assumes that the hazard rate is the product of a unspecified baseline hazard function, which depends only on time, and the exponential function of the covariates:

$$h(t, x, \beta) = h_0(t) \exp(X^{'}\beta) \tag{5}$$

This specification assumes that the covariates affect the hazard function independently on time the trade relationship exists, shifting by the same magnitude all points of a baseline function. The coefficients can be interpreted as semi-elasticities, as they measure the effect of a change in the right-hand side variables on the log of the hazard rate. Due to this structure, the Cox Proportional Hazard Model is very versatile and can fit various models. The baseline hazard can vary across different groups, called strata, but the vector of parameters is restricted to be the same:

$$h_j(t, x, \beta) = h_{j0}(t) \exp(X^{'}\beta) \tag{6}$$

Since the baseline hazard function remains unspecified, only the order of duration provides information about the unknown parameters. The model is estimated by maximizing a partial likelihood function with respect to the vector of parameters β without specifying the form of the baseline hazard function $h_0(t)$. The estimated parameters reflect the relationship between the explanatory variables and the hazard function (i.e., the risk for a trade relationship to end).

There are several issues related to the duration analysis which need to be addressed. First, observations may be right-censored. This is the case when trade relationships are still in progress in the final year of the sample period. The Cox Proportional Hazard Model

can handle right-censored observations. Second, observations may be left-censored, which means that we cannot determine the date when they were initiated. In this situation, the actual length of the spells cannot be determined. To mitigate this problem, we estimate the model after dropping the left-censored observations, that is, the observations for which trade flows were recorded before 1980. Third, some trade relationships may have several periods of continuous exporting (spells). An exporter can enter the market, export for a while, exit and re-enter again. Such consecutive exits may be interrelated. The first exit may increase probability of the following exits. To account for this issue, we introduce a variable "number of spells" indicating the number of trade relationships for every country-product pair.

Appendix B2: Fixed Effects versus Stratification in the Cox Proportional Hazard Model

In a non-stratified Cox Proportional Hazard (PH) Model, all export spells would share a common underlying hazard rate $h_0(t)$. In a stratified Cox PH Model, the baseline hazard rate is allowed to vary across different groups (strata). Let us define strata at the product level, allowing export spells of different products k to have different underlying hazard rate $h_{0,k}(t)$. The overall hazard rate of product k would then write:

$$h(t|X) = h_{0,k}(t) \exp(X.\beta).$$

Let us now use product fixed effects instead. This means keeping underlying hazard rate uniform across products but including among regressors a set of dummy variables that are equal to one if the observation belongs to product k and zero otherwise. The overall hazard rate of product k would then write:

$$h(t|X) = h_0(t) \exp(X.\beta + \alpha_k D_k),$$

with α_k being the estimated coefficient for the dummy variable D_k and dummy variable D_k itself being equal to one for any export spell related to product k.

This expression can be rewritten as:

$$h(t|X) = h_0(t) \exp(X.\beta) \exp(\alpha_k D_k) = \overline{h_{0,k}(t)} \exp(X.\beta),$$

with $\overline{h_{0,k}(t)} \equiv h_0(t) \exp(\alpha_k D_k)$.

Using fixed effects can be thus interpreted as a particular case of stratification, which assumes that baseline hazard rates differ across products merely by the factor of proportionality.

Appendix B3: The Cox Proportional Hazard Model with Time-Varying Covariates

In the Cox Proportional Hazard Model, covariates have a proportional effect on hazard rate and do not change over the spell life:

$$h(t, x, \beta) = h_0(t) \exp(X^{'} \beta).$$

We can relax this assumption by using the extended (time-dependent) Cox model which incorporates time-varying effects of specific covariates by interacting these covariates with some known functions of time:

$$h(t, x, \beta) = h_0(t) \exp(X^{'} * g(\beta, t)),$$

where $g(\beta, t)$ is a specific function of time. If $g(\beta, t)$ is a simple function, it can be written as $g(\beta, t) = \beta * g(t)$.

Stata allows us to estimate the extended (time-dependent) Cox model by adding to the standard command *stcox* the option *tvc* to define time-varying covariates and the option *texp* to define the functional form for $g(t)$. More specifically, we would like to allow our three main variables of interest (distance to comparative advantage, stock market liberalization dummy, and their interaction term) to have time-varying effects on hazard rate. For $g_i(t)$ we use a default option, setting $g_i(t)$ to be a linear function of time: $g_i(t) = \beta_i + \gamma_i * t$

$$\begin{aligned} h_{ck}(t) = h_{0,k}(t) \exp[g_1(t) StMLib_{c,t_0} + g_2(t) StMLib_{c,t_0} * distance_{ck,t_0} \\ + g_3(t) * distance_{ck,t_0} + \mathbf{Y}_{ck,t_0} \phi + \varepsilon_{ck,t_0}] \end{aligned}$$

In the first sub-column of column (1) in Table 10, we present coefficients β_i (our standard Cox model coefficients). In the second sub-column of column (1) in Table 10, we present coefficients γ_i (the coefficients for time-varying components). For a given independent variable, significant coefficients with the same (opposite) signs in both sub-columns imply that the effect of the variable on the hazard rate gets stronger (weaker) over time. An insignificant coefficient in the second sub-column suggest that the effect of a given variable is constant over time.

Appendix C: Economic Magnitude of the Main Interaction Term

(DCA = distance to comparative advantage)

Country	Year when DCA measured	Date of StM Lib	DCA value (top 25%)	DCA value (bottom 25%)	Difference DCA	Coef(Lib x DCA) x Difference DCA =0.152 x Difference DCA
Argentina	1984	1989	4.049	1.212	2.836	0.431
Bangladesh	1986	1991	2.072	0.858	1.215	0.185
Brazil	1986	1991	1.689	0.493	1.196	0.182
Chile	1987	1992	2.995	0.305	2.690	0.409
Colombia	1986	1991	2.995	0.139	2.856	0.434
Ecuador	1989	1994	2.249	0.114	2.134	0.324
Egypt	1987	1992	2.007	0.214	1.793	0.273
Ghana	1988	1993	1.874	0.669	1.205	0.183
Greece	1982	1987	4.014	0.867	3.147	0.478
Indonesia	1984	1989	2.466	0.212	2.253	0.343
India	1987	1992	1.471	0.482	0.990	0.150
Iceland	1986	1991	4.645	1.360	3.285	0.499
Israel	1988	1993	4.353	1.162	3.190	0.485
Jamaica	1986	1991	2.798	0.686	2.112	0.321
Jordan	1990	1995	1.789	0.266	1.523	0.231
Kenya	1990	1995	1.886	0.298	1.588	0.241
Korea(republic of)	1987	1992	3.722	0.883	2.839	0.432
Sri Lanka	1986	1991	2.091	0.487	1.604	0.244
Mexico	1984	1989	2.162	0.376	1.785	0.271
Malta	1987	1992	2.575	0.734	1.841	0.280
Mauritius	1989	1994	2.910	0.198	2.712	0.412
Malaysia	1983	1988	1.474	0.376	1.098	0.167
New Zealand	1982	1987	3.791	1.312	2.480	0.377
Pakistan	1986	1991	1.875	0.120	1.755	0.267
Peru	1987	1992	2.459	0.122	2.337	0.355
Philippines	1986	1991	3.078	0.594	2.484	0.378
Portugal	1981	1986	2.430	0.458	1.972	0.300
Thailand	1982	1987	1.858	0.177	1.681	0.255
Trinidad &Tobago	1992	1997	2.360	0.679	1.680	0.255
Tunisia	1990	1995	2.340	0.642	1.698	0.258
Turkey	1984	1989	2.847	0.404	2.444	0.371
Venezuela	1985	1990	2.689	0.423	2.266	0.344
South Africa	1991	1996	2.120	0.382	1.738	0.264
Zimbabwe	1988	1993	1.934	0.073	1.860	0.283
Mean Magnitude						**0.314** (%)
Median Magnitude						**0.291** (%)

Figure 1: Kaplan-Meier Survival Functions for Liberalizing Countries I

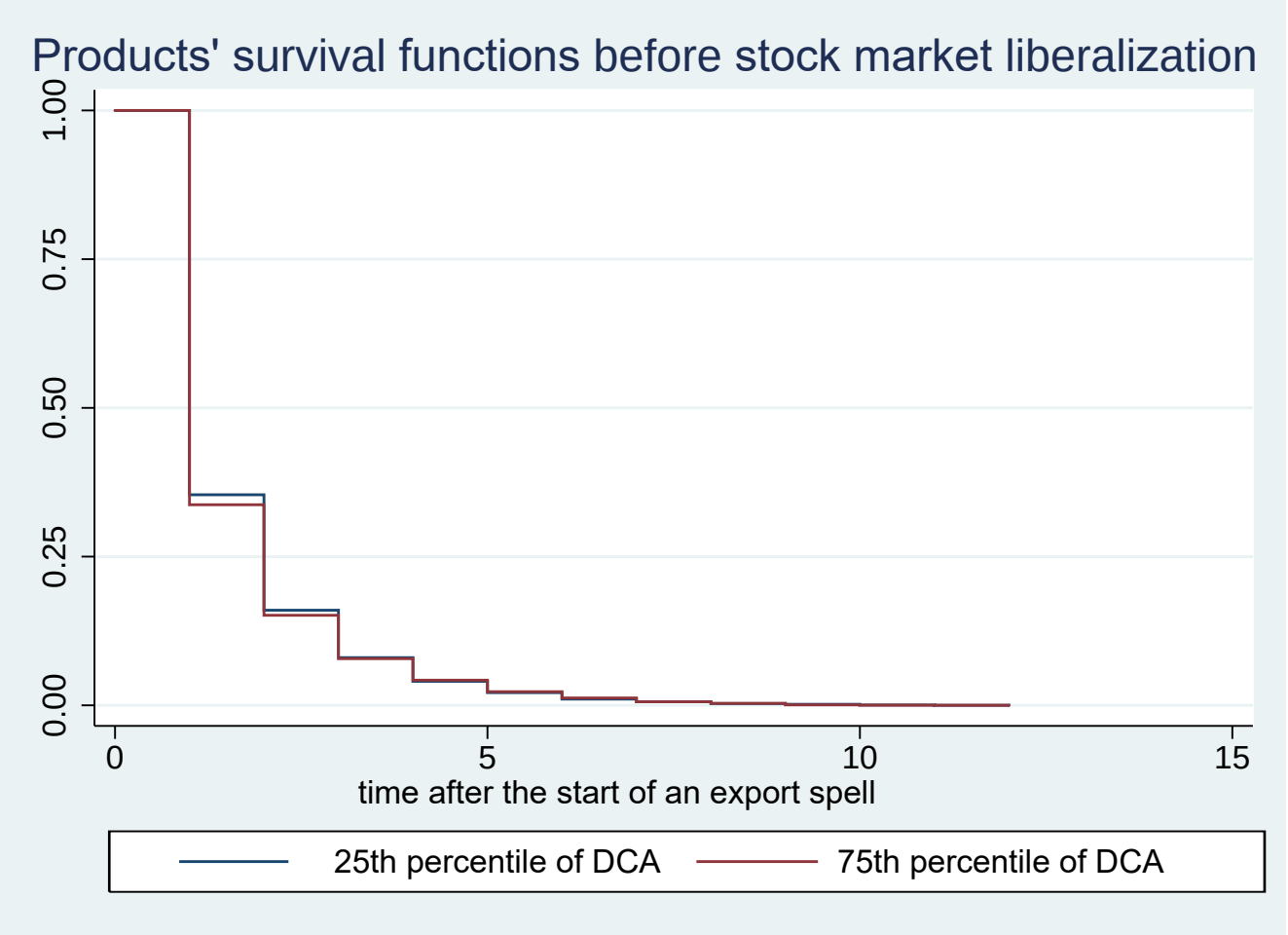

Figure (1) compares Kaplan-Meier survival functions of products belonging to the 25th and 75th percentiles (i.e, to the bottom and the top 25th percentile) of the distance to comparative advantage **before** the liberalization episodes. The more steeply these functions decrease after the initial year 0, the lower is the average survival probability of the related product groups.

Figure 2: Kaplan-Meier Survival Functions for Liberalizing Countries II

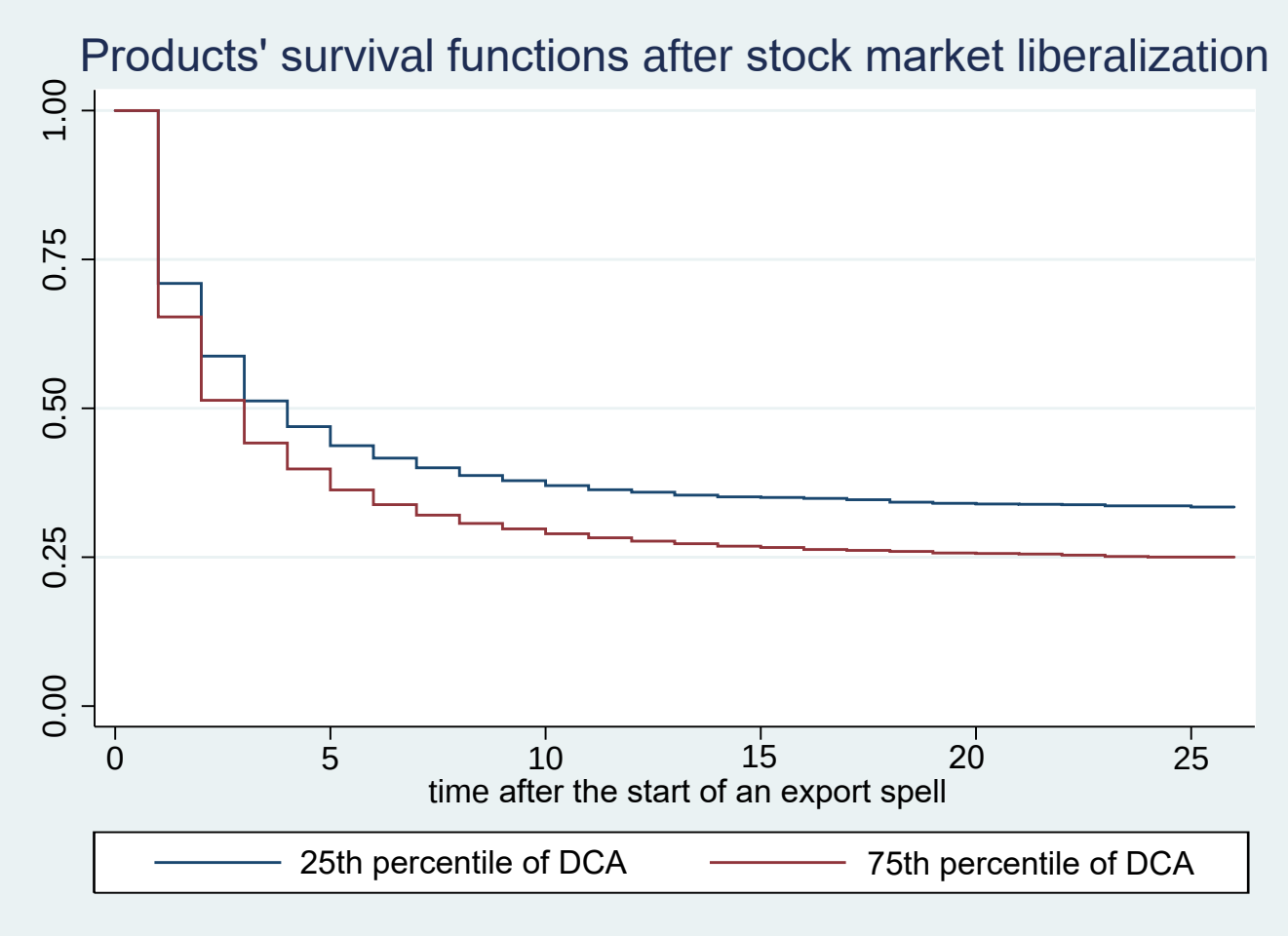

Figure (2) compares Kaplan-Meier survival functions of products belonging to the 25th and 75th percentiles (i.e, to the bottom and the top 25th percentile) of the distance to comparative advantage **after** the liberalization episodes. The more steeply these functions decrease after the initial year 0, the lower is the average survival probability of the related product groups.

Table 1: Descriptive Statistics - Export Spells

The table provides descriptive statistics for the export spells (continuous exporting of product k from country c to the world market) both for the full sample including also countries where the stock market was closed or open to foreign investors during the whole period of 1980-1997 and for the liberalizing subsample including only countries where the event of stock market liberalization occurred between 1980 and 1997, i.e. only countries that "switched" from being financially closed to being financially open. DCA refers to our measure of "distance to comparative advantage", with lower values (e.g., bottom 25th percentile) corresponding to products well aligned with the comparative advantage of the exporting country and higher values (e.g., top 25th percentile) corresponding to products far away from the comparative advantage of the exporting country.

LIBERALIZING SUBSAMPLE	(1) average length of the spell	(2) median length of the spell
Switchers, non-liberalized	1.68	1.00
Switchers, liberalized	7.44	3.00
Switchers, non-liberalized, bottom 25th percentile of DCA	1.68	1.00
Switchers, non-liberalized, top 25th percentile of DCA	1.66	1.00
Switchers, liberalized, bottom 25th percentile of DCA	7.78	4.00
Switchers, liberalized, top 25th percentile of DCA	6.46	3.00

FULL SAMPLE	(1) average length of the spell	(2) median length of the spell
All countries, non-liberalized	3.21	1.00
All countries, liberalized	5.33	2.00
All countries, non-liberalized, bottom 25th percentile of DCA	3.35	1.00
All countries, non-liberalized, top 25th percentile of DCA	2.87	1.00
All countries, liberalized, bottom 25th percentile of DCA	5.40	2.00
All countries, liberalized, top 25th percentile of DCA	4.94	2.00

Table 2: Summary Statistics

The table provides information on number of observations, mean value, standard deviation, and minimum and maximum values for all variables in our sample.

Variable	Obs	Mean	Std. Dev.	Min	Max
StM liberalization	118,542	0.334	0.472	0	1.000
Distance to comparative advantage	118,542	1.388	0.816	0.019	6.577
StM Liberalization x Distance to comparative advantage	118,542	0.473	0.836	0	6.577
Banks x Distance to comparative advantage	107,852	0.442	0.600	0.002	8.187
GDP pc x Distance to comparative advantage	116,375	11.504	7.430	0.160	64.479
Stock Markets x Distance to comparative advantage	50,828	0.292	0.642	0.000	12.424
Banks	107,852	0.290	0.228	0.014	2.179
log GDP pc of exporter in constant PPP dollars	116,375	8.236	0.954	6.166	10.384
Stock Markets	50,828	0.205	0.274	0.001	2.824
StM liberalization x External Finance Dependence	87,338	0.085	0.179	-0.451	1.140
External Finance Dependence x Banks	79,533	0.075	0.092	-0.695	1.734
External Finance Dependence	87,338	0.284	0.243	-0.451	1.140
Trade liberalization x Distance to comparative advantage	118,542	0.661	0.879	0	6.577
Trade liberalization	118,542	0.497	0.500	0	1.000
Trade openness x Distance to comparative advantage	118,542	0.948	1.367	0.004	24.563
Trade openness	118,542	0.646	0.374	0.063	4.253
GDP pc	116,375	8.236	0.954	6.166	10.384
Physical capital x Phys. cap. intensity	87,338	0.700	0.307	0.108	2.345
Human capital x Hum. cap. intensity	87,338	4.699	2.753	0.196	19.581
Physical capital	118,542	9.448	1.315	5.974	12.073
Human capital	118,542	4.599	2.389	0.366	12.206
Land endowment	118,542	0.652	0.650	0.001	6.550
Number of suppliers	118,542	4.654	0.409	0.693	5.361
Total exports	118,542	14.566	1.658	10.137	20.359
Initial exports	118,542	2.215	1.886	-0.691	13.723
Number of spells	118,542	5.202	2.061	1.000	13.000

Table 3: Stock Market Liberalization and Long-Term Export Survival - Baseline

The dependent variable is the hazard rate for an export spell of product k from country c to the world market that started at time t_0. All regressions are estimated using the Cox Proportional Hazard Model (Cox, 1972) and control for exporting-country and time fixed effects. Estimations also allow for different baseline hazard rate across products by defining product k as strata variable. Our main variable of interest is the interaction between the stock market liberalization dummy and the distance of exported product from the comparative advantage of the exporting country. The control variables include also the direct effects of stock market liberalization dummy (which equals one if and only if a given country allowed foreign investors to acquire equity stakes in domestic firms before or during the life of a given export spell) and distance to comparative advantage (defined as Euclidean distance of the revealed factor intensity of exported product k to the factor endowment of exporting country c). Product-level control variables include number of suppliers (i.e., number of countries exporting a given product to the world market), total value of country's exports to the rest of the world, initial value of the export of a given product, and number of export spells during the sample period for a given country-product pair. The remaining control variables are GDP per capita of exporting country, interactions of physical and human capital at the country level with the corresponding capital intensities at the industry level, and the direct effects of exporting countries' endowments of physical capital, human capital and land. All time-varying explanatory variables are measured in the initial year of the export spell t_0. We report coefficients and not hazard ratios. Robust standard errors clustered at (exporting country)*time ($c*t_0$) level are in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

	(1) All	(2) Lib	(3) All	(4) Lib
StM liberalization x Distance to comparative advantage	0.143***	0.152***	0.161***	0.152***
	(0.018)	(0.021)	(0.024)	(0.026)
StM liberalization	-1.116***	-1.655***	-1.184***	-1.697***
	(0.041)	(0.050)	(0.047)	(0.054)
Distance to comparative advantage	0.115***	0.031**	0.082***	0.004
	(0.009)	(0.014)	(0.011)	(0.016)
Number of suppliers	-0.372***	-0.340***	-0.076*	-0.015
	(0.019)	(0.024)	(0.045)	(0.059)
Total exports	0.109***	0.126***	0.008	0.233***
	(0.019)	(0.037)	(0.027)	(0.040)
Initial export	-0.073***	-0.069***	-0.073***	-0.068***
	(0.002)	(0.002)	(0.002)	(0.003)
Number of spells	0.112***	0.108***	0.115***	0.112***
	(0.002)	(0.003)	(0.002)	(0.004)
GDP pc			0.450***	-0.010
			(0.076)	(0.120)
Physical capital x Phys. cap. intensity			-0.080	-0.450**
			(0.103)	(0.179)
Human capital x Hum. cap. intensity			-0.030***	-0.031***
			(0.007)	(0.010)
Physical capital			-0.147***	-0.303***
			(0.054)	(0.096)
Human capital			0.003	-0.063*
			(0.028)	(0.037)
Land endowment			0.135*	0.448***
			(0.071)	(0.134)
Exporting-country and time FE; Product stratification	Yes	Yes	Yes	Yes
Observations	118,542	60,903	85,675	45,699

Table 4: Stock Market Liberalization and Long-Term Export Survival - Alternative Financial Channels

The dependent variable is the hazard rate for an export spell of product k from country c to the world market that started at time t_0. All regressions are estimated using the Cox Proportional Hazard Model (Cox, 1972) and control for exporting-country and time fixed effects. Estimations also allow for different baseline hazard rate across products by defining product k as strata variable. External finance dependence at the industry level is defined as capital expenditures minus cash flow from operations, divided by capital expenditures, for the median firm in a given industry. Banks is a proxy for the domestic banking development in the exporting country, measured as the ratio of the bank credit to private sector over the country's GDP. Stock markets is a proxy for the depth of domestic stock market in the exporting country, measured as the ratio of the stock market capitalization over the country's GDP. Other variables are defined in Table 3. Full set of controls corresponds to column (4) of Table 3. We report coefficients and not hazard ratios. Robust standard errors clustered at (exporting country)*time ($c * t_0$) level are in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

	(1) All	(2) Lib	(3) All	(4) Lib	(5) All	(6) Lib
StM liberalization x Distance to comparative advantage	0.158***	0.149***	0.130***	0.133***	0.062**	0.060**
	(0.024)	(0.026)	(0.025)	(0.028)	(0.027)	(0.030)
StM liberalization	-1.118***	-1.643***	-1.167***	-1.635***	-1.499***	-1.538***
	(0.048)	(0.054)	(0.049)	(0.058)	(0.058)	(0.062)
Distance to comparative advantage	0.079***	0.005	0.039***	-0.060***	0.050**	0.040*
	(0.011)	(0.016)	(0.015)	(0.023)	(0.020)	(0.021)
StM liberalization x External Finance Dependence	-0.229***	-0.187***				
	(0.036)	(0.042)				
Banks x Distance to comparative advantage			0.121***	0.180***		
			(0.037)	(0.054)		
Banks			0.195*	-0.101		
			(0.111)	(0.144)		
Stock Markets x Distance to comparative advantage					0.020	0.040
					(0.043)	(0.057)
Stock Markets					0.179*	0.128
					(0.102)	(0.114)
Full set of controls	Yes	Yes	Yes	Yes	Yes	Yes
Exporting country FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Product stratification	Yes	Yes	Yes	Yes	Yes	Yes
Observations	85,675	45,699	77,986	41,271	37,056	32,892

Table 5: Stock Market Liberalization and Long-Term Export Survival - Alternative Non-Financial Channels

The dependent variable is the hazard rate for an export spell of product k from country c to the world market that started at time t_0. All regressions are estimated using the Cox Proportional Hazard Model (Cox, 1972) and control for exporting-country and time fixed effects. Estimations also allow for different baseline hazard rate across products by defining product k as strata variable. Trade openness is defined as the sum of country's exports and imports divided by its GDP. Trade liberalization is a dummy variable based on trade liberalization dates from Wacziarg and Welch (2008), who updated the previous database by Sachs and Warner (1995). Other variables are defined in Table 3. Full set of controls corresponds to column (4) of Table 3. We report coefficients and not hazard ratios. Robust standard errors clustered at (exporting country)*time ($c * t_0$) level are in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

	(1) All	(2) Lib	(3) All	(4) Lib	(5) All	(6) Lib	(7) All	(8) Lib
StM liberalization x Distance to comp. adv.	0.172***	0.145***	0.157***	0.146***	0.168***	0.140***	0.127***	0.140***
	(0.027)	(0.026)	(0.024)	(0.026)	(0.027)	(0.026)	(0.025)	(0.029)
StM liberalization	-1.197***	-1.689***	-1.179***	-1.692***	-1.192***	-1.685***	-1.033***	-1.584***
	(0.051)	(0.054)	(0.047)	(0.054)	(0.050)	(0.054)	(0.051)	(0.056)
Distance to comparative advantage	0.241***	-0.327**	0.098***	-0.021	0.252***	-0.287**	0.061***	0.015
	(0.093)	(0.130)	(0.019)	(0.025)	(0.093)	(0.129)	(0.013)	(0.019)
GDP pc x Distance to comp. adv.	-0.020*	0.040**			-0.020*	0.033**		
	(0.012)	(0.016)			(0.012)	(0.016)		
Trade openness x Distance to comp. adv.			-0.022	0.048	-0.014	0.038		
			(0.026)	(0.037)	(0.027)	(0.037)		
Trade openness			-0.145*	-0.288**	-0.155*	-0.270**		
			(0.078)	(0.120)	(0.080)	(0.120)		
Trade liberalization x Distance to comp. adv.							0.038**	-0.041
							(0.019)	(0.030)
Trade liberalization							-0.634***	-0.552***
							(0.043)	(0.054)
Full set of controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Exporting country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Product stratification	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	85,675	45,699	85,675	45,699	85,675	45,699	85,675	45,699

Table 6: Stock Market Liberalization and Long-Term Export Survival - Alternative Channels Combined

The dependent variable is the hazard rate for an export spell of product k from country c to the world market that started at time t_0. All regressions are estimated using the Cox Proportional Hazard Model (Cox, 1972) and control for exporting-country and time fixed effects. Estimations also allow for different baseline hazard rate across products by defining product k as strata variable. Variables are defined in Table 3, Table 4, and Table 5. Full set of controls corresponds to column (4) of Table 3. We report coefficients and not hazard ratios. Robust standard errors clustered at (exporting country)*time ($c * t_0$) level are in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

	(1) All	(2) Lib	(3) All	(4) Lib	(5) All	(6) Lib
StM liberalization x Distance to comparative advantage	0.125***	0.137***	0.132***	0.124***	0.052*	0.050*
	(0.025)	(0.029)	(0.027)	(0.028)	(0.028)	(0.030)
StM liberalization	-0.971***	-1.531***	-1.169***	-1.625***	-1.486***	-1.524***
	(0.051)	(0.057)	(0.051)	(0.058)	(0.059)	(0.062)
Distance to comparative advantage	0.059***	0.015	0.172*	-0.334**	-0.115	-0.087
	(0.013)	(0.019)	(0.094)	(0.140)	(0.143)	(0.164)
StM liberalization x External Finance Dependence	-0.218***	-0.180***				
	(0.036)	(0.042)				
Trade liberalization x Distance to comparative advantage	0.038**	-0.039				
	(0.019)	(0.030)				
Trade liberalization	-0.634***	-0.553***				
	(0.043)	(0.054)				
Banks x Distance to comparative advantage			0.143***	0.137**		
			(0.040)	(0.064)		
Banks			0.163	0.009		
			(0.118)	(0.157)		
Stock Markets x Distance to comparative advantage					-0.002	0.054
					(0.047)	(0.060)
Stock Markets					0.300**	0.205
					(0.122)	(0.131)
GDP pc x Distance to comparative advantage			-0.014	0.034**	0.020	0.018
			(0.012)	(0.017)	(0.017)	(0.020)
Trade openness x Distance to comparative advantage			-0.035	0.005	0.007	-0.040
			(0.029)	(0.042)	(0.041)	(0.048)
Trade openness			-0.076	-0.170	-0.311*	-0.232
			(0.081)	(0.133)	(0.163)	(0.166)
Full set of controls	Yes	Yes	Yes	Yes	Yes	Yes
Exporting country FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Product stratification	Yes	Yes	Yes	Yes	Yes	Yes
Observations	85,675	45,699	77,986	41,271	37,056	32,892

Table 7: Alternative Measures of Stock Market Liberalization

The dependent variable is the hazard rate for an export spell of product k from country c to the world market that started at time t_0. All regressions are estimated using the Cox Proportional Hazard Model (Cox, 1972) and control for exporting-country and time fixed effects. Estimations also allow for different baseline hazard rate across products by defining product k as strata variable. In columns (1)-(2), the stock market liberalization measure is a dummy based on the year of the first sign of the stock market liberalization (the earliest among the following three dates: the year of official liberalization, the year of issuing the first ADR, the year of the first country fund launch). In columns (3)-(6), the stock market liberalization measure is a continuous variable capturing the liberalization intensity at the industry-country level. Both versions of the liberalization intensity are computed from IFC Investable index and IFC Global index. In columns (3) and (4), we use IFC indices available for a given industry-country pair in a year that is closest to the official year of the stock market liberalization. In columns (5) and (6), we use the average value for a given industry-country pair. Other variables are defined in Table 3. Full set of controls corresponds to column (4) of Table 3. We report coefficients and not hazard ratios. Robust standard errors clustered at (exporting country)*time ($c * t_0$) level are in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

VARIABLES	(1) All	(2) Lib	(3) All	(4) Lib	(5) All	(6) Lib
StM liberalization first sign x Distance to comparative advantage	0.126***	0.152***				
	(0.017)	(0.024)				
StM liberalization first sign	-1.063***	-1.498***				
	(0.040)	(0.051)				
StM liberalization intensity (closest year) x Distance to comparative advantage			0.269***	0.217***		
			(0.048)	(0.047)		
StM liberalization intensity (closest year)			-1.515***	-1.740***		
			(0.095)	(0.098)		
StM liberalization intensity (average) x Distance to comparative advantage					0.222***	0.173***
					(0.046)	(0.045)
StM liberalization intensity (average)					-1.516***	-1.846***
					(0.088)	(0.090)
Distance to comparative advantage	0.078***	-0.004	0.079***	0.018	0.079***	0.012
	(0.011)	(0.016)	(0.010)	(0.015)	(0.010)	(0.014)
Full set of controls	Yes	Yes	Yes	Yes	Yes	Yes
Exporting country FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Product stratification	Yes	Yes	Yes	Yes	Yes	Yes
Observations	85,675	45,699	65,266	28,739	65,266	28,739

Table 8: Robustness Checks I - Additional Controls

The dependent variable is the hazard rate for an export spell of product k from country c to the world market that started at time t_0. All regressions are estimated using the Cox Proportional Hazard Model (Cox, 1972) and control for exporting-country and time fixed effects. Estimations also allow for different baseline hazard rate across products by defining product k as strata variable. The real exchange rate is taken from the World Development Indicators database. The data identifying products as homogenous (omitted category), differentiated, or price-referenced in trade publications are from Rauch (1999). The IMF dummy captures whether a given country was a subject to the IMF program (i.e., received an official IMF loan) in a given year and is constructed based on data from the International Monetary Fund. Other variables are defined in Table 3. Full set of controls corresponds to column (4) of Table 3. We report coefficients and not hazard ratios. Robust standard errors clustered at (exporting country)*time ($c * t_0$) level are in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

	(1) Lib	(2) Lib	(3) Lib	(4) Lib	(5) Lib
StM liberalization x Distance to comparative advantage	0.218***	0.152***	0.126***	0.237***	0.218***
	(0.031)	(0.027)	(0.026)	(0.035)	(0.037)
StM liberalization	-1.760***	-1.556***	-1.610***	-1.794***	-1.815***
	(0.069)	(0.062)	(0.055)	(0.063)	(0.065)
Distance to comparative advantage	-0.010	0.007	0.009	0.171***	0.149***
	(0.050)	(0.017)	(0.021)	(0.047)	(0.046)
Real exchange rate x Distance to comparative advantage	0.009				
	(0.025)				
Real exchange rate	0.104***				
	(0.033)				
StM liberalization x Differentiated products		-0.245***			
		(0.035)			
StM liberalization x Price-referenced products		-0.041			
		(0.033)			
IMF dummy x Distance to comparative advantage			0.015		
			(0.033)		
IMF dummy			-0.461***		
			(0.055)		
Time trend x Distance to comparative advantage				-0.011***	
				(0.003)	
Exporter-time trend x Distance to comparative advantage					Yes
Exporter-time trend					Yes
Full set of controls	Yes	Yes	Yes	Yes	Yes
Exporting country FE	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes
Product stratification	Yes	Yes	Yes	Yes	Yes
Observations	23,829	42,634	45,699	45,699	45,699

Table 9: Robustness Checks II - Clustering, Stratification, and Fixed Effects

The dependent variable is the hazard rate for an export spell of product k from country c to the world market that started at time t_0. All regressions are estimated using the Cox Proportional Hazard Model (Cox, 1972). Variables are defined in Table 3. Regressions in columns (1)-(3) control for exporting-country and time fixed effects, and also allow for different baseline hazard rate across products by defining product k as strata variable. In column (4), we replace product stratification by the more stringent product*time stratification. In column (5), we replace product stratification by the more stringent product*(exporting-country) stratification. In column (6), we replace the separate exporting-country and time fixed effects by the interacted (exporting-country)*time fixed effects. Column (7) presents results without any fixed effects. Full set of controls corresponds to column (4) of Table 3. We report coefficients and not hazard ratios. Robust standard errors are in parentheses. They are clustered at (exporting country)*time ($c * t_0$) level in columns (1) and (4)-(7). In the second column, they are clustered at the exporting country level. In the third column, we follow the two-way procedure suggested by Cameron, Gelbach, and Miller (2006) and cluster the standard errors alongside both country and time dimension. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

	(1) Lib	(2) Lib	(3) Lib	(4) Lib	(5) Lib	(6) Lib	(7) Lib
StM Liberalization x Distance to comparative advantage	0.152***	0.152***	0.152***	0.146***	0.180***	0.168***	0.190***
	(0.026)	(0.054)	(0.054)	(0.028)	(0.029)	(0.028)	(0.035)
StM liberalization	-1.697***	-1.697***	-1.697***	-1.734***	-1.351***	-2.296***	-1.130***
	(0.054)	(0.087)	(0.150)	(0.064)	(0.055)	(0.059)	(0.065)
Distance to comparative advantage	0.004	0.004	0.004	0.031	-0.093***	0.001	-0.028*
	(0.016)	(0.026)	(0.026)	(0.020)	(0.029)	(0.016)	(0.015)
Full set of controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Exporting country FE	Yes	Yes	Yes	Yes			
Time FE	Yes	Yes	Yes		Yes		
(Exporting-country)*Time FE						Yes	
Product stratification	Yes	Yes	Yes			Yes	
Product*Time stratification				Yes			
Product*(Exporting-country) stratification					Yes		
Observations	45,699	45,699	45,699	45,699	45,699	45,699	45,699

Table 10: Robustness Checks III - Timing Issues in the Survival Framework

The dependent variable is the hazard rate for an export spell of product k from country c to the world market that started at time t_0. All regressions are estimated using the Cox Proportional Hazard Model (Cox, 1972) and control for exporting-country and time fixed effects. Estimations also allow for different baseline hazard rate across products by defining product k as strata variable. Variables are defined in Table 3. Column (1) presents results when we allow the effects of our main interaction term and its two components (StM liberalization x Distance to comparative advantage, StM liberalization, Distance to comparative advantage) to vary over the life of the spells. Appendix B3 discusses in detail the interpretation of the coefficients in the two sub-columns of the first column. Column (2) presents the results for the survival database constructed using exports data between 1980-1997. Column (3) shows the results of the estimation on a restricted sample that contains spells whose full length occurs after or before the liberalization episodes (i.e., dropping "partially treated" spells). In column (4), we use the Efron method (Efron, 1988) to handle tied-spells termination events. Full set of controls corresponds to column (4) of Table 3. We report coefficients and not hazard ratios. Robust standard errors clustered at (exporting-country)*time ($c * t_0$) level are in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

	(1) tvc	tvc	(2) 1980-1997	(3) dropping spells	(4) tied-spells
StM liberalization x Distance to comparative advantage	0.120***	0.018	0.160***	0.110***	0.171***
	(0.042)	(0.014)	(0.030)	(0.021)	(0.030)
StM liberalization	-0.717***	-0.299***	-1.810***	-0.973***	-2.058***
	(0.069)	(0.019)	(0.061)	(0.042)	(0.060)
Distance to comparative advantage	0.013	-0.005	0.010	0.008	0.012
	(0.025)	(0.012)	(0.016)	(0.013)	(0.020)
Full set of controls	Yes	-	Yes	Yes	Yes
Exporting country FE		-	Yes	Yes	Yes
Time FE		-	Yes	Yes	Yes
Product stratification	Yes	-	Yes	Yes	Yes
Observations	45,699	-	45,699	33,110	45,699

Table 11: Stock Market Liberalization and Long-Term Export Survival, Below and Above of the Median of Legal System

The dependent variable is the hazard rate for an export spell of product k from country c to the world market that started at time t_0. All regressions are estimated using the Cox Proportional Hazard Model (Cox, 1972) and control for exporting-country and time fixed effects. Estimations also allow for different baseline hazard rate across products by defining product k as strata variable. Variables are defined in Table 3. Columns (1)-(3) show results for the whole sample and columns (4)-(6) for the subsample of countries that experienced stock market liberalization during the 1980-1997 period. Columns (1) and (4) report results for all countries with available data on the legal index "Legal System and Property Rights". Columns (2) and (5) report results for countries with below-median value for this legal index. Columns (3) and (6) report results for countries with above-median value for this legal index. Full set of controls corresponds to column (4) of Table 3. We report coefficients and not hazard ratios. Robust standard errors clustered at (exporting country)*time ($c * t_0$) level are in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

	(1) All legal index available	(2) All legal index below median	(3) All legal index above median	(4) Lib legal index available	(5) Lib legal index below median	(6) Lib legal index above median
StM liberalization x Distance to comparative advantage	0.149***	0.070*	0.246***	0.138***	0.022	0.275***
	(0.025)	(0.036)	(0.035)	(0.027)	(0.039)	(0.033)
StM liberalization	-1.187***	-1.058***	-1.446***	-1.694***	-1.602***	-1.847***
	(0.049)	(0.064)	(0.072)	(0.055)	(0.071)	(0.080)
Distance to comparative advantage	0.074***	0.095***	-0.028	0.007	0.065***	-0.162***
	(0.013)	(0.015)	(0.028)	(0.016)	(0.021)	(0.032)
Full set of controls	Yes	Yes	Yes	Yes	Yes	Yes
Exporting country FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Product stratification	Yes	Yes	Yes	Yes	Yes	Yes
Observations	77,165	54,154	23,011	42,376	26,126	16,250