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INSTITUTIONS AND EXPORT DYNAMICS

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ABSTRACT

Institutions and Export Dynamics*

We study the role of contract enforcement in shaping the dynamics of international trade at the firm level. We develop a theoretical model to describe how agents build reputations to overcome the problems created by weak enforcement of international contracts. We find that, all else equal, exporters start their activities with higher volumes and remain as exporters for a longer period in countries with better contracting institutions. However, conditional on survival, the growth rate of a firm's exports to a country decreases with the quality of the country's institutions. We test these predictions using a rich panel of Belgium exporting firms from 1995 to 2008 to every country in the world. We adopt two alternative empirical strategies. In one specification we use firm-year fixed effects to control for time-varying firm-specific characteristics. Alternatively, we model selection more explicitly with a two-step Heckman procedure using

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1 Introduction

Imperfect enforcement of contracts can prevent mutually beneficial transactions from taking place. This problem tends to be particularly severe for transactions that involve agents in different jurisdictions, as in international trade. Empirical research using aggregate data has found that weak contract enforcement indeed depresses aggregate trade levels significantly.[1] Yet we know virtually nothing about how contracting institutions shape the dynamics of trade at the firm level; this is our focus in this paper. We show that weak institutions affect trade volumes also at the level of firms. More importantly, they decrease firm survival rates while at the same time *increasing* growth of the exporting firms that manage to cope. Hence, it is not that bad contracting institutions simply imply a higher sunk, fixed or even variable cost of exporting; they also have manifold implications for the dynamic pattern of exporting firms.

We show this with a simple two-country dynamic model where producers in one country export their goods to another country by engaging in partnerships with local distributors. Potential exporters search for prospective partners under incomplete information, being unable to observe the type of their distributors. This makes exporters initially cautious, as some of the distributors are opportunistic and default on their contracts if they can do so without incurring extra costs. But others are forward-looking and have an incentive to abide by their contractual obligations. By doing so they build private reputations within their relationships, and through this mechanism they can, over time, (imperfectly) compensate for the problem created by asymmetric information and inadequate enforcement of contracts. An implication is that producers in successful partnerships increase their exports to a country over time. This helps to explain the significant variation in export volumes across firms observed in micro data sets.[2] Another implication is that the conditional probability of a partnership failure decreases with its duration.[3]

Our main interest is, however, in comparing how firms' export behavior depends on the strength of the contracting institutions of their destinations. The model generates several interesting testable implications based on this distinction. First, producers selling to countries with good contracting

[1] Anderson and Marcouiller (2002) and Ranjan and Lee (2007), for example, find sizeable effects of institutional variables on bilateral trade flows using gravity specifications. Turrini and van Ypersele (2010) show that differences in legal systems depress trade also within a country (France), although the effect is larger across countries.

[2] See for example Eaton et al. (2008). There are alternative, complementary explanations for this stylized fact. For example, Rauch and Watson (2003) model buyers who need to make irreversible investments to train foreign suppliers in an environment with asymmetric information. Arkolakis (2010) studies the implications of increasing marginal penetration costs. Albornoz et al. (2010) and Eaton et al. (2010) analyze the consequences of uncertain export profitability and of foreign demand, respectively.

[3] This is different but related to Besedes and Prusa's (2006) finding that the hazard of trade relationships between the United States and other countries at the product level decreases with their duration.

institutions start their activities there with higher volumes. Second, they tend to serve those markets for a longer period. These results stem from two reinforcing effects. There is a direct effect from better institutions: they make contractual defaults more difficult, which both increases the expected longevity of partnerships and makes producers more confident about the workings of their partnerships; this in turn induces them to start with higher volumes. There is also a "cleansing" effect from good institutions. Since opportunistic agents are more constrained in those environments, their relationships last longer. As a result, in steady state relatively few low-type distributors are available for matches with new exporters, who in turn start their foreign sales with a better prior about their distributors. This too leads to higher initial export volumes and greater average export spells.

Third, conditional upon survival, the growth of a firm's exports to a country *decreases* with the quality of the country's institutions. The reason is that, in a good institutional environment, the private reputation of a distributor evolves slowly over time, as successful interactions are less informative of the distributor's type when institutions impose tighter constraints on agents' behavior. A corollary is that, for firms with export experience in a market, the relationship between export *levels* to that market and the country's institutional strength is generally ambiguous. On one hand, tighter enforcement of contracts raises the expected return of foreign exporters, boosting trade volumes. On the other hand, it has the perverse effect of slowing down the learning of exporters. The net effect on the level of trade for experienced exporters may therefore be either positive or negative.

We test these predictions using a rich panel of Belgian firms that contains both goods exports values and their destinations from 1995 to 2008. Our data allows us to control for a wide range of factors at the firm, destination and time dimensions. We employ two alternative empirical specifications. In one we use *firm-year* fixed effects to control for time-varying firm-specific characteristics that affect firm decisions about where to export, for how long and how much. Therefore, we identify the effects of institutions on firms' export dynamics only from within-firm-year variation in export destinations, so for example unobservable time-varying shocks to firm productivity are fully accounted for. In our second specification, we model market selection more explicitly with a two-step Heckman procedure where in the first stage we model firm entry and survival in foreign markets and in the second stage we estimate the choice of export volumes and export growth. Our exclusion restrictions are based on "extended gravity" variables proposed by Morales et al. (2011). As Morales et al. (2011) show, characteristics of a firm's previous export destinations are good predictors of the firm's entry sunk costs in other destinations, but generally do not affect the firm's

operational profit in new destinations.

We find support for our theoretical predictions from both estimation methods. Overall, our findings reveal that weak contracting institutions cannot be thought simply as an extra sunk or a fixed export cost, as is usually believed; they also affect firms' export levels and their dynamic patterns in foreign markets in a non-trivial way. Essentially, if institutions are unable to neutralize the problems created by informational frictions, firms can overcome those problems over time by building private reputations within their relationships. Such a mechanism operates more strongly, the weaker the country's contracting institutions.[4]

Naturally, reliance on private reputations is not the only way to deal with informational problems in countries where institutions impose lax restrictions on agents' behavior. In such an environment, an exporting firm may want, for example, to acquire a domestic importer if controlling the partner's actions is facilitated when the partner is an affiliate. Or the firm may decide to export through a wholesaler that has experience in assessing "difficult" markets. Similarly, the difficulties firms face when exporting to institutionally weak countries are not the same for all firms. Surely some are more apt to penetrate those markets than others, either because of the type of goods they produce or because of different characteristics. We shed light on those differences by examining empirically whether a firm's export dynamics are less affected by the importing country's institutional environment when the firm has a subsidiary in the importing country (the answer we find is "no"), when it exports through a wholesaler ("maybe"), when it exports simpler products ("probably"), and when the firm is more experienced ("yes").

To our knowledge, this is the first formal theoretical and empirical analysis of the dynamic process in which firms engaged in international exchange build reputations as a response to the imperfect enforceability of contracts. This permits us to take a first look at how institutions shape firms' dynamics in foreign markets. The paper that is closest to ours is the recent study by Besedes et al. (2011), who examine how credit constraints in the origin country affect import growth at the product level in the European Union and the U.S.[5] Exploring a mechanism that is intuitively similar to ours, they find that imports of more financially dependent goods from less developed countries are initially constrained but grow relatively fast.

The bulk of the recent but growing literature on institutions and international trade has focused

[4] This is also in line with evidence from studies that focus on the development of trust. For example, McMillan and Woodruff (1999), analyzing Vietnam, show forcefully how relationships based on trust arise and develop in an environment where contract enforcement is virtually absent.

[5] See also Aeberhardt et al. (2011), who study related but different empirical implications obtained from a variant of our model.

instead on developing and testing the implications from static frameworks. Significant attention has been given to the fundamental question of how different types of institutions shape the pattern of comparative advantage across countries (Acemoglu et al. 2007; Antràs 2005; Costinot 2009; Cuñat and Melitz 2011; Levchenko 2007; Nunn 2007). Much work has also been done to understand how contractual frictions affect the structure of trade through their effects on the boundaries of the firm.[6] From a different perspective, McLaren (1999) characterizes the circumstances under which firms choose to base their relationships on trust instead of on (enforceable) contracts. More recently, Antràs and Foley (2011) analyze how the choice of financial terms in international transactions depends on the quality of the institutions in the importing and exporting countries. In the same spirit of our analysis, they also study how this effect changes over time, as agents develop their relationships. Our paper is also related to a new burgeoning literature on the role of intermediation in international trade, which documents the importance of intermediaries and develops an understanding of the circumstances when international trade is likely to be carried out indirectly, through intermediaries.[7] Finally, our paper is connected as well to a broader literature that seeks to explain how informal cooperative coalitions form and develop in the absence of formal enforcement institutions.[8]

The paper proceeds as follows. In section 2 we develop the model and characterize the steady state of the economy. In section 3 we derive testable implications focusing on the various channels through which institutional quality shapes international trade at the firm level. We describe the data in section 4. In section 5 we show our empirical findings, including evidence for differential effects for different types of good, firms and export modes. We conclude in section 6.

2 Model

We develop a model where agents learn about the reliability of their trade partners through experience. The main thrust of the model is that this learning depends on the country's institutions, because weaker institutions provide agents with a greater scope to behave opportunistically. This can be modeled in many different ways. We choose to make some strong assumptions that allow

[6] For example, Bernard et al. (2010a) and Corcos et al. (2009) estimate the effect of product contractibility and countries' institutions on the choice and the level of intra-firm trade. For a recent survey of this topic, see Antras and Rossi-Hansberg (2009).

[7] See, among others, Bernard et al. (2010b, 2011), Felbermayr and Jung (2011), Ahn et al. (2011) and Tang and Zhang (2011). For an earlier influential contribution in this area, see Feenstra and Hanson (2004).

[8] See Greif (1993) for an insightful early contribution to that literature. He analyzes how medieval merchants sustained trade among them and why they accomplished that by developing a system of collective, rather than private, punishment for dishonest agents.

us to keep the analysis simple. Most of those assumptions can be relaxed, however; in the end of this section we discuss alternatives to them.

2.1 Environment

Consider an economy with two countries, Home and Foreign. In Home there is a $[0,1]$ continuum of agents with the ability to produce differentiated goods, and in Foreign there is a $[0,1]$ continuum of agents with the ability to internally distribute such goods. Each producer is a monopolist in his own market and has a constant marginal cost of production, c.[9] Thus, the sales of a producer in the domestic market has no impact on his sales abroad. All producers have the same discount factor, $\delta_e \in (0,1)$. In contrast, distributors in Foreign come in two different types: a measure $\widehat{\theta}$ of distributors is myopic and has a zero discount factor, while a measure $1-\widehat{\theta}$ is patient and has a discount factor $\delta_d \in (0,1)$. The type of a distributor is her private information.

The assumption that distributors differ in terms of their discount factors captures the idea that they condition their behavior on characteristics that are unobservable to the producers. Clearly, there are alternative interpretations as to what those unobservable characteristics may be. For instance, at the end of this section we discuss an alternative where distributors may differ in terms of their ability to distribute goods in Foreign.

In every period, there is a probability $x \in (0,1)$ that a producer in Home meets with a distributor in Foreign. If a meeting occurs, we say the producer and the distributor have found a "business opportunity." They then decide whether to form a partnership in which the producer exports goods to the distributor, who sells them in Foreign. If they do, at the end of every period in which the partnership is active they also decide between maintaining and breaking the partnership. We assume that each producer and distributor can participate in only one partnership at a time. We discuss the implications from relaxing this assumption at the end of the section.

At the beginning of every period in any ongoing partnership, the producer proposes a one-period contract to the distributor. We impose restrictions to prevent the separation between myopic and patient distributors during the contracting stage. If such separation were possible, we would be unable to study the dynamic interplay between the process of reputation formation and the volume of trade. We prevent separation by restricting the class of contracts as follows. The contract specifies the quantity q of goods to be exported and distributed in Foreign, and that the distributor has to return the ensuing revenue to the producer. The contract also specifies a payment $\kappa > 0$ to

[9] Note that it is straightforward to extend the model to allow for heterogeneous firms. This would, however, generate no insight beyond those already well known from Melitz (2003) and the literature that paper spurred.

the distributor, which we treat as exogenous.[10]

In reality, learning about the quality of one's match involves learning not about a single dimension like an agent's discount factor but about many dimensions (the agent's honesty, work ethic, knowledge, overall reliability etc.). In such a multi-dimensional setting, learning tends to happen both through experience and through contract screening. We focus on a single dimension and restrict contracts so that we can shut down the latter channel and highlight the workings of the former.

In every period after the partnership is formed and the volume of trade is chosen by the producer, the distributor decides between performing according to the contract (returning the revenue to the producer) and defaulting (keeping the revenue for herself). We want to emphasize that the possibility of default is closely linked to the institutional quality of Foreign. We do so by assuming that in each period while the partnership is active, the distributor privately finds an opportunity to default on the contract without incurring costs with probability $1-\lambda$. With probability λ, the distributor does not find such an opportunity. This probability is independent across distributors and over time. Thus, the parameter λ provides a measure of the strength of Foreign's contract enforcement institutions.[11]

We want to study situations where distributors can act opportunistically in their relationships with exporters. Our assumption that distributors can "steal the revenue" from exporters captures this idea in a simple way. At the end of this section we discuss alternative ways in which such opportunistic behavior may arise.

Finally, at the end of each period there is a probability $1-\sigma \in (0,1)$ that an ongoing partnership will break down for exogenous reasons (e.g. the product becomes "obsolete"). When a partnership ends, for endogenous or exogenous reasons, the distributor exits the market and is replaced by another distributor of the same type. Similarly, the producer loses the ability to sell in Foreign's market and is replaced by a new producer.[12]

Figure 1 describes the sequence of events within a period. In what follows, we let $\beta_e \equiv \sigma\delta_e$ and

[10] Restrictions like these are common in the reputations literature. For instance, in Tirole's (1996) classic model of collective reputation, there are agents who are 'honest' and others who are 'dishonest.' Both are behavioral types. Only agents of the third type ('opportunistic') act strategically. The contract offered by the principal in Tirole's model precludes screening and is very simple: the principal can only offer one of two tasks.

[11] We study the consequences of contract enforcement institutions in Foreign, but not in Home, because our data has multiple import countries (hence there is variation in that dimension) but only one exporting country, where contracting institutions are relatively strong, Belgium.

[12] This assumption is adopted only to simplify exposition. In the online Appendix (http://personal.lse.ac.uk/ornelas/AMO_OnlineAppendix.pdf) we consider the case where producers return to the pool of unmatched producers after the end of a partnership, showing that the qualitative results are unchanged.

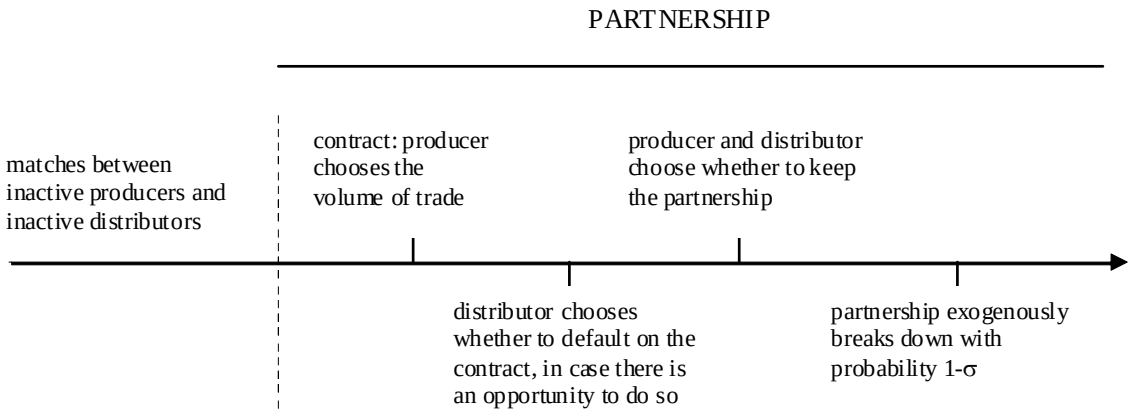

Figure 1: Sequence of Events within a Period

$\beta_d \equiv \sigma\delta_d$ denote the relevant discount factors of producers and patient distributors, respectively.

2.2 Equilibrium

Consider the following strategy profile. Each producer forms a partnership whenever he meets a distributor. In a partnership, the producer chooses the quantity to export in each period by maximizing current expected profits. The producer terminates an existing partnership if and only if the distributor defaults on the contract. Each myopic distributor defaults whenever he finds an opportunity to do so, while patient distributors never default. A distributor never terminates a partnership. In this subsection we show that this strategy profile is part of a sequential equilibrium and characterize a steady state in which entry and exit in Foreign's market are equalized.

2.2.1 Producer's Behavior

Assume that distributors behave as above. The problem of a producer is as follows. At the beginning of every period, if he is not in a partnership and finds a business opportunity, he decides whether to take the opportunity and form a partnership. If the producer is in a partnership, in every period he writes a one-period contract with the distributor establishing the volume of output to sell in Foreign and the compensation to the distributor; at the end of the period he decides whether to maintain it.

Reputation All decisions of a producer depend on his belief about the type of the distributor he is paired with. In turn, beliefs depend on past decisions made by the distributor.

It is immediate to see that, since patient distributors never default, the producer concludes that the distributor is myopic as soon as he observes a default. The situation is different if the producer has never observed a default. Let θ_k denote the posterior belief that the distributor is myopic in an ongoing partnership that started at date t and is currently in period $t+k$, and let $\theta_0 \in (0,1)$ be the producer's prior belief that the distributor is myopic. Repeated application of Bayes rule yields

$$\theta_k = \frac{\lambda^k \theta_0}{\lambda^k \theta_0 + 1 - \theta_0}. \tag{1}$$

Note that θ_k decreases with k and converges to zero as k goes to infinity, regardless of θ_0. That is, as long as the distributor does not default and the partnership is not terminated exogenously, the producer becomes increasingly convinced that the distributor is patient. We interpret $1-\theta_k$ as the *reputation* of the distributor. A reputation of being patient means that the producer's belief θ_k that his distributor is myopic is relatively small.

Contract Denote the producer's current belief that the distributor is myopic by θ. The producer pays the cost of production. He receives the revenue if the distributor does not default, an event with probability $\theta\lambda + 1 - \theta$. Otherwise, he receives nothing. Thus, the producer's current expected profit when the contract establishes production level q is

$$\pi(q, \theta; \lambda, c, \kappa) = -cq + (\theta\lambda + 1 - \theta)\, R(q) - \kappa, \tag{2}$$

where $R(q)$ is the revenue from selling q units in Foreign.

The assumptions on the structure of contracts imply that they cannot be used to extract information about the distributor's type. Thus, when proposing a contract the producer chooses q to maximize $\pi(q, \theta; \lambda, c, \kappa)$. Denoting the producer's optimal quantity by Q, the first-order necessary condition if the producer chooses to sell a strictly positive quantity is

$$-c + (\theta\lambda + 1 - \theta)\, R'(Q) = 0. \tag{3}$$

Condition (3) requires $R'(Q) > 0$. The second-order necessary condition for Q requires $R''(Q) < 0$. The optimal quantity $Q = Q(\theta; \lambda, c)$ depends on the belief θ of the producer, on the institutional parameter λ, and on the marginal cost of production c.

We impose restrictions on the structure of demand and the range of parameters $\{\lambda, c, \kappa\}$ such

that the following conditions are satisfied:

$$\begin{aligned} A1 &: Q(1;\lambda,c) > 0, \\ A2 &: \pi(Q,1;\lambda,c,\kappa) < 0, \\ A3 &: \pi(Q,0;\lambda,c,\kappa) > 0. \end{aligned}$$

$A1$ implies that the quantity that maximizes current variable expected profits is strictly positive even when the producer is certain that the distributor is myopic ($\theta = 1$). In that case, however, $A2$ implies that the producer's current expected profit is strictly negative. $A3$ implies, in turn, that the producer's current expected profit is strictly positive when he is certain that the distributor is patient ($\theta = 0$).

Partnership Consider an ongoing partnership in which the producer has a belief θ that the distributor is myopic such that $\pi(Q,\theta;\lambda,c,\kappa) > 0$. The flow payoff of the producer is given by

$$\pi(\theta) = -cQ + (\theta\lambda + 1 - \theta)\, R(Q) - \kappa, \tag{4}$$

while his continuation payoff depends on the posterior beliefs. If the producer observes a default, he infers that the distributor is myopic. Assumption $A2$ then implies that he terminates the partnership. If the producer does not observe a default, his belief that the distributor is patient increases. Since $\pi(\theta)$ is decreasing in θ, this implies that the producer maintains the partnership.

It remains to consider whether the producer would ever *want* to start a partnership. This decision depends on his prior θ_0 about the average quality of the inactive distributors (i.e., those who are not in a partnership). Note that an unmatched producer faces a stationary problem. Thus, he either forms a partnership upon meeting with a distributor for the first time or he never forms a partnership. The following lemma fully characterizes the behavior of producers. This and all other proofs are in the Appendix.

Lemma 1 *There is a unique value* $\overline{\theta} \equiv \overline{\theta}\,(\theta_0,\lambda,c,\kappa,\sigma,\delta_e) \in (0,1)$ *such that, if* $\theta_0 < \overline{\theta}$*, a producer forms a partnership whenever he finds a business opportunity. Moreover, he chooses to maintain the partnership if and only if the distributor does not default, and exports* $Q(\theta;\lambda,c)$ *in every period while the partnership is active.*

In subsection 2.2.3 we characterize θ_0 in terms of primitives and establish conditions under which $\theta_0 < \overline{\theta}$.

2.2.2 Distributor's Behavior

We now solve the problem of the distributor, taking as given the behavior of the producers. First note that since producers pay the cost of production, the gain of a distributor in a partnership is always positive.

Consider a myopic distributor. By definition, she does not care about the future and therefore does not bother to build a reputation. Hence, a myopic distributor has an incentive to default and keep the revenue whenever she finds an opportunity to do so. A patient distributor, on the other hand, anticipates that after a default her partnership will be terminated, given the strategy of the producers. Conversely, if there is no default her reputation with the producer improves and the relationship is maintained with probability σ. Hence, as long as she is not too impatient and the probability of an exogenous breakdown of the partnership is not too large, she never defaults. Lemma 2 formalizes this claim.

Lemma 2 *There is a unique value* $\underline{\beta_d} \in \left(\frac{R[Q(1;\lambda,c)]}{R[Q(1;\lambda,c)]+\kappa}, \frac{R[Q(0;\lambda,c)]}{R[Q(0;\lambda,c)]+\kappa}\right)$ *such that a patient distributor never defaults if and only if* $\beta_d \geq \underline{\beta_d}$.

If $\beta_d < \underline{\beta_d}$, there would exist at least one $k \in \mathbb{N}$ such that the distributor defaults on the contract if given the opportunity to do so in the k^{th} period of a partnership. Assumption $A2$ then implies that the producer would terminate the partnership at the end of the $(k-1)^{th}$ period, as he would anticipate the behavior of the distributor. In turn, this implies that the distributor would not have any incentive to honor her contract in the $(k-1)^{th}$ period. Proceeding this way it is easy to see that the only equilibrium would involve default whenever possible in any ongoing partnership, implying negative expected profits from entry for the producer. Concentrating on the interesting case where producers are willing to export, we assume henceforth that $\beta_d \geq \underline{\beta_d}$.

We focus on the polar case where distributors with low discount factor always default and distributors with high discount factor never default, but this could be relaxed. More generally, one could think of an environment where distributors come in many types. For instance, discount factors could be independent random realizations of a uniform distribution in the unit interval. We conjecture that, as in our present structure, this modified environment would also exhibit a positive relationship between the discount factor of the distributor and the period she starts defaulting on the contract (which would be never for those distributors with very high discount factors, as here). This implies that a producer would end a partnership as soon as a default is observed, and that a producer who does not observe a default would increase his posterior that the distributor is relatively patient. It also implies that, as we will show to be the case here, the quantity produced

would increase with the duration of the partnership. The upshot is that the benefit of "cheating" increases over time, explaining why distributors with relatively high discount factors would default later in the relationship.

2.2.3 Steady State

We consider a steady state in which entry and exit in Foreign's market are equalized, and where the frequency of inactive myopic distributors and the aggregate volume of trade are both constant. The steady state is however characterized by continual changes in both the extensive and the intensive margins: some producers enter in Foreign while others exit, whereas continuing exporters adjust their sales according to the evolution of their beliefs; aggregate trade is constant because the distribution of partnerships in terms of age does not change.

To characterize the steady state, let m_t and p_t be, respectively, the measures of myopic and of patient distributors that are inactive at date t. For now, assume that an exporter always wants to enter a partnership. Lemmas 1 and 2 then imply that

$$m_{t+1} = (1 - x\sigma\lambda)m_t + (1 - \sigma\lambda)(\widehat{\theta} - m_t), \tag{5}$$

$$p_{t+1} = (1 - x\sigma)p_t + (1 - \sigma)(1 - \widehat{\theta} - p_t). \tag{6}$$

If a myopic distributor is inactive at date t, she remains inactive at the beginning of date $t + 1$ unless she finds a business opportunity at date t (an event with probability x), there is no exogenous breakdown (an event with probability σ), and she does not default (an event with probability λ). If at least one of those events does not realize, the distributor remains without a partner at the beginning of period $t+1$. If instead the myopic distributor is in a partnership at date t, she becomes inactive at the beginning of date $t + 1$ unless there is no exogenous breakdown and no default. A similar reasoning applies to the patient distributor, with the difference that she never defaults.

In the Appendix, we show in Lemma 3 that m_{t+1} and p_{t+1} strictly decrease over time and converge, respectively, to

$$m = \frac{(1 - \sigma\lambda)\widehat{\theta}}{1 - \sigma\lambda(1 - x)} \tag{7}$$

and

$$p = \frac{(1 - \sigma)(1 - \widehat{\theta})}{1 - \sigma(1 - x)}. \tag{8}$$

Thus, the frequency of inactive myopic distributors in steady state, $\theta_0 = \frac{m}{m+p}$, is given by

$$\theta_0 = \frac{(1 - \sigma\lambda)\left[1 - \sigma(1 - x)\right]\widehat{\theta}}{(1 - \sigma\lambda)\left[1 - \sigma(1 - x)\right]\widehat{\theta} + (1 - \sigma)\left[1 - \sigma\lambda(1 - x)\right](1 - \widehat{\theta})}.$$

It is easy to check that $\theta_0 > \widehat{\theta}$. Observe that this steady state is reached only if producers are always willing to enter Foreign's market upon finding a business opportunity. To focus on this case, henceforth we assume that $\theta_0 < \overline{\theta}$.[13] Notice that in this case there is no zero-profit condition characterizing the steady state. Instead, the equilibrium is such that entry is limited by search costs (i.e. the availability of business opportunities).

Proposition 1 follows directly from Lemma 1, Lemma 2 and the assumption that $\theta_0 < \overline{\theta}$.

Proposition 1 *A producer starts a partnership whenever he finds a business opportunity, maintains the partnership as long as he does not observe a default, and exports $Q(\theta_k; \lambda, c)$ in each period k in which the partnership is active, where θ_k is his period-k belief that the distributor is myopic. A myopic distributor defaults whenever there is an opportunity to do so. A patient distributor never defaults. Irrespective of type, a distributor never terminates a partnership. This strategy profile, together with the Bayesian updating described in equation* (1)*, is a sequential equilibrium.*

Notice that, although producers are ex ante identical in our model, they are ex post heterogeneous: at any point in time, some producers export while others do not, and those that do sell different quantities abroad depending on the age of their partnership. That is, ours is a model where firm heterogeneity arises endogenously, as a result of distinct individual experiences in a foreign market. This contrasts with the standard modeling strategy in the literature, after Melitz (2003), of assuming that firms differ in terms of their productivity. We abstract from that important, but well known, source of heterogeneity to study an additional force that causes firms to behave differently in foreign markets, namely individual experiences in an environment marked with incomplete information and imperfect enforcement of contracts. Naturally, in our empirical implementation we control for differences in firm productivity.

Finally, a comment is in order before we proceed. Up to this point we have considered a particular strategy profile and we have shown that this strategy profile is part of a sequential equilibrium. However, there are other equilibria. For example, there is always a "no-trade" equilibrium where the distributor defaults irrespective of her type and the producer, anticipating that the distributor will always default, does not enter in any partnership. Equilibria like this are clearly unappealing, both analytically and in the sense that the surplus they entail is always inferior to the one implied by the strategy profile in Proposition 1.

[13] Note that θ^*, where $\pi(\theta^*) \equiv 0$, is a lower bound for $\overline{\theta}$. Intuitively, since in equilbrium the producer's profit within a partnership increases over time, the producer must be willing to enter any partnership that offers non-negative current profits. Note also that θ^* depends on λ, c and κ, while θ_0 depends on σ, λ, x and $\widehat{\theta}$. Thus, there is always a range of parameters such that $\theta_0 < \overline{\theta}$. This is the case, for example, if $\widehat{\theta}$ is small enough.

2.2.4 Discussion and Potential Extensions

Our model is evidently simple, but we believe it contains the central ingredients for the forces we want to highlight. It can also be extended in numerous ways. We suggest here alternative interpretations of two key assumptions of the model—that distributors' types are defined by their discount factors and that distributors pay producers only after receiving the goods. We also discuss the implications of relaxing the assumption that a producer and a distributor can only participate in one partnership at a time, and the assumptions that lead to a slow process of reputation building but a quick process of reputation loss.[14]

Distributors' Types We define the type of a distributor by her discount factor, but this is not essential for our results. As long as distributors have unobservable characteristics that separate them into two groups, a group that defaults whenever possible and a group that never defaults, Proposition 1 holds.

Consider an environment that is exactly as before except that all distributors have the same discount factor $\delta > 0$ but vary in terms of their abilities to distribute goods, an attribute that is unobservable to producers. Specifically, let a fraction $1 - \widehat{\theta}$ of distributors be able to distribute goods at zero cost, whereas a fraction $\widehat{\theta}$ of distributors needs to incur a cost $e > 0$ to distribute goods. In every partnership, events unfold as follows. First, a distributor observes if she has an opportunity to default on the contract. After that, she chooses whether to distribute the goods. If she does, she also decides whether to return the revenue to the producer. If she does not distribute the goods, she keeps them and obtains a payoff of $\gamma R(q)$, where $\gamma \leq 1$.

It is immediate to see that, as long as the discount factor is not too small, an "able" distributor will choose to always distribute the goods and return the revenue to the producer. The reasoning is the same as in the original model. Consider now the problem of an "unable" distributor. If there is no opportunity to default on the contract, she must distribute the goods, incurring cost e and returning $R(Q)$ to the producer. If there is an opportunity to default, a large enough cost e will make it optimal for the distributor to simply consume the goods, even if this causes the end of the partnership. If the cost e is not so large as to prevent unable distributors from participating in partnerships, Proposition 1 holds essentially unchanged. The difference between these minimum and maximum levels of effort is necessarily positive as long as λ is not too high, so that an unable distributor would have a large enough probability to default on the contract and keep the goods without incurring extra costs.

[14] In an early background working paper of the model (Araujo and Ornelas 2007) we provide other formal extensions.

Payments We assume that distributors pay exporters only after receiving the goods. This is a straightforward way to allow for opportunistic behavior in the importing country (where in our dataset there is variation in terms of institutional quality), but is not essential for our results.[15] First, provided that distributors cannot pay in advance more than a myopic distributor expects to receive in a period—as this would permit the producer to easily screen types—the analysis would remain identical. But more generally, what is crucial is that distributors have the option to behave opportunistically in their relationships with exporters, and that this option is more available in countries with weaker contracting institutions. To make this point clear, we consider below two alternative scenarios in which the incentives of distributors to behave opportunistically vary with the institutional setting but are independent of the trade finance mode.

First consider a scenario where distributors have to sell the goods from Home but also to provide a service related to the goods (e.g. tailoring the goods to the clients' needs, or providing technical assistance). Such services can be offered at either high quality or low quality, the former being more costly for the distributor. When low-quality service is provided, future demand for the good drops, and the producer observes this fall in demand in the beginning of the subsequent period. Suppose that the extra cost of providing high-quality instead of low-quality service is small enough that it is optimal for the exporter to contractually specify high-quality service from the distributor. If the distributor is myopic, however, she will choose to provide a low-quality service whenever she believes she can do so without incurring in legal costs, an event that is more likely, the lower the country's institutional quality. It is easy to see that Proposition 1 would remain essentially unaltered under this setting.

Consider now an alternative scenario that relies on the idea that contracts with many contingencies are more difficult to enforce in countries with lower institutional quality. Specifically, assume that a complete contract has n dimensions (contingencies) but only the enforceable contingencies are written in a contract. Assume further that the number n_c of enforceable contingencies is increasing in λ. Now, let ε be a random variable that is uniformly distributed in $[0, n]$, and let $I(\varepsilon)$ be an indicator function such that $I(\varepsilon) = 0$ if $\varepsilon \in [0, n_c(\lambda))$ and $I(\varepsilon) = 1$ if $\varepsilon \in [n_c(\lambda), n]$. We can then describe the probability that a myopic distributor defaults with the probability that $\varepsilon \in [n_c(\lambda), n]$, which is given by $\frac{n-n_c(\lambda)}{n}$. Clearly, this probability is decreasing in Foreign's institutional quality.

[15] It is worth noting that, although such "open account" transactions are obviously not the only form of trade financing, they seem to be quite common in practice. We do not know for sure because, as Foley et al. (2010, p. 4) point out, "there is a dearth of data on the relative use of different arrangements" to finance international trade. But as they note, the more comprehensive industry surveys indicate that around 80% of the transactions are settled on an open account basis.

Again, it is easy to see that Proposition 1 would remain unaltered under this setting.

Partnerships The assumption that producers and distributors cannot participate in more than one partnership at a time is not particularly important for our results. First, consider that a producer participates in more than one partnership. Clearly, due to constant marginal cost of production, the behavior of the producer does not depend on the number of distributors he is paired with. Second, consider that a distributor is partner with more than one producer at a time. A natural assumption is that the actions of the distributor towards a particular producer are observed only by that producer. In that case, the behavior of the distributor does not depend on the number of producers he is paired with.

A richer environment emerges if we assume instead that the producer can observe the actions of his distributor in other partnerships, and that the probability that the distributor finds an opportunity to default is independent across partnerships. Consider for example the belief of a producer that is partner with a distributor that participates in n partnerships. If we let $\theta_{k,n}$ denote the posterior belief after k periods of observing no default, we obtain

$$\theta_{k,n} = \frac{\lambda^{kn}\theta_0}{\lambda^{kn}\theta_0 + 1 - \theta_0}.$$

Thus, the reputation of a distributor after a history of no defaults increases at a faster rate. Hence, the dynamics of the trade volume of an exporter would depend also on the size of his distributor—i.e. the number of partnerships in which she participates.

Acquisition and Loss of Reputation In our model reputations are acquired slowly over time, but are lost permanently in a single period. This asymmetry reflects our distinct modeling of "good" and "bad" outcomes: "bad outcomes" from the perspective of producers are always caused by opportunistic behavior of distributors, whereas "good outcomes" can be due either to the distributor's intention or to institutional constraints. As a result, the construction of a good reputation takes time, whereas a bad reputation is acquired in a single period. This feature of the model simplifies the analysis significantly, but is not essential.

Suppose that "bad outcomes" from the perspective of exporters could also be generated by factors other than the opportunistic behavior of distributors, e.g. negative but imperfectly observed demand shocks. In that case, a producer could choose to maintain his partnership even after observing a bad outcome, although his belief that the distributor is forward-looking would deteriorate after such an event. The properties of the equilibrium characterized in Proposition 1 would nevertheless remain essentially unchanged under such an alternative specification. In particular, the

optimal behavior of a producer would still involve the existence of a threshold (say θ') such that a partnership is terminated if and only if the posterior θ of the producer is higher than θ'. We show this formally in the online Appendix.

3 Institutional Quality, Trade Volume and Dynamics

We want to study how the institutional environment in Foreign affects Home's exports. Foreign's institutions shape both the level and the dynamics of trade relationships, as well as the structure of the steady state. Some of those effects are novel and can be evaluated empirically; we concentrate on them.[16]

3.1 Initial Exports

The institutional environment matters for the initial level of a producer's exports for two reasons. First, there is a direct effect from better institutions due to the increase in the probability that the producer will receive his revenue. As the exporter anticipates this higher probability, he chooses to export more. Second, under a higher λ the measure of active myopic distributors in steady state is higher; this lowers θ_0. This improved prior about the average quality of inactive distributors makes the new exporter more confident and therefore more willing to start a partnership with a higher volume.

Formally, note that (where Q_0 is the exported volume in the first period of a partnership)

$$\frac{\partial Q_0}{\partial \lambda} = -\frac{\left[\theta_0 - (1-\lambda)\frac{\partial \theta_0}{\partial \lambda}\right] R'(Q_0)}{\left[1-\theta_0(1-\lambda)\right] R''(Q_0)}.$$

The direct effect is obtained by setting $\frac{\partial \theta_0}{\partial \lambda} = 0$:

$$\frac{\partial Q_0}{\partial \lambda}\Big|_{\frac{\partial \theta_0}{\partial \lambda}=0} = -\frac{\theta_0 R'(Q_0)}{\left[1-\theta_0(1-\lambda)\right] R''(Q_0)} > 0.$$

But we also know that

$$\frac{\partial \theta_0}{\partial \lambda} = -\frac{\sigma x \theta_0 (1-\theta_0)}{(1-\sigma\lambda)\left[1-\sigma\lambda(1-x)\right]} < 0.$$

Calculating the total effect, we obtain

$$\frac{\partial Q_0}{\partial \lambda} = -\frac{\left[1 + \frac{(1-\lambda)(1-\theta_0)\sigma x}{(1-\sigma\lambda)[1-\sigma\lambda(1-x)]}\right] \theta_0 R'(Q_0)}{\left[1-\theta_0(1-\lambda)\right] R''(Q_0)} > 0.$$

This generates the following prediction:

[16] In our model, and in the predictions discussed below, we ignore selection issues, largely because selection effects on exporters are well known. Naturally, in the empirical analysis we seek to control for selection as best as we can.

Prediction 1 *All else equal, producers start their sales to a foreign country with a higher volume, the better is the institutional environment of the country.*

3.2 Survival

Survival is defined as the probability that a partnership will be active after k periods after its formation. The survival of a partnership also depends on the institutional environment in Foreign through two distinct channels. First, better institutional quality makes a default, and therefore an endogenous termination, less likely. Furthermore, it raises the quality of the pool of distributors available to start new partnerships. Both effects increase the probability that a partnership will still be active after k periods.

Formally, the probability S_k of survival after k periods can be expressed as

$$S_k = (\sigma\lambda)^k \theta_0 + \sigma^k (1 - \theta_0).$$

Thus,

$$\frac{\partial S_k}{\partial \lambda} = \sigma^k \left[k\lambda^{k-1}\theta_0 + (1 - \lambda^k)\frac{\partial \theta_0}{\partial \lambda} \right] > 0,$$

since both the direct effect (the first term in the square brackets) and the indirect effect (the second term in the square brackets) are positive. This yields a second theoretical prediction:

Prediction 2 *All else equal, a partnership is more likely to survive after k periods, the better is the institutional environment of the importing country.*

An implication of this result is that the age profile of active partnerships in Foreign will be more skewed towards older ones, the higher λ is. That is, in steady state a higher λ increases the measure of older partnerships relative to newer ones.

One can also show that the positive effect of better institutions on survival after $k+1$ periods conditional on having survived k periods decreases with k (and eventually vanishes) when k is large. Intuitively, for a long enough interaction, reputational forces overcome any institutional weaknesses, implying that a better institutional environment will have little effect on marginal survival rates for those old partnerships. For relatively low k, on the other hand, the effect of λ on the probability of survival from period k to period $k+1$ can either increase or decrease with k.

3.3 Export Growth

Our model also has clear predictions on how institutions affect the growth of surviving exporters. Crucially, institutional quality shapes the speed of the process of reputation building. As a result,

it also shapes export growth.

Let us start by describing how the volume of trade within a partnership evolves under the equilibrium characterized in Proposition 1. Note first that, although the type of a distributor is key to determine the probability that a partnership lasts, the actual volume of trade depends only on the distributor's reputation with her producer. Hence we can concentrate on the evolution of the export volume irrespective of the type of distributor the producer is paired with.

Note that there is a one-to-one correspondence between the distributor's reputation and the time span of a partnership. Therefore, we can obtain a clear relationship between the export volume and the age of a partnership. Consider a partnership formed at some date t that is still active after k periods. We know from the first-order condition for Q that

$$\frac{\partial Q_k}{\partial \theta_k} = \frac{(1-\lambda)R'(Q_k)}{[1-\theta_k(1-\lambda)]\,R''(Q_k)} < 0,$$

where Q_k is the export volume in the $(k+1)^{th}$ period of the partnership. That is, the optimal export quantity increases as the belief that the distributor is myopic decreases. But we also know from equation (1) that

$$\frac{\partial \theta_k}{\partial k} = \frac{\lambda^k \theta_0 (1-\theta_0)\ln(\lambda)}{(\lambda^k \theta_0 + 1 - \theta_0)^2} < 0,$$

so we have that

$$\frac{dQ_k}{dk} = \frac{\partial Q_k}{\partial \theta_k}\frac{\partial \theta_k}{\partial k} > 0.$$

Hence, in an ongoing partnership the volume of trade increases over time.

This result captures in a simple way the idea that trust is built over time, through repeated interactions. While a producer learns about the type of his partner, he exports less than he would if he were sure that the distributor were patient. Thus, in the first stages of a partnership relatively low quantities are exported; if the distributor proves to be reliable, the producer then progressively improves his foreign sales.[17] In the limiting case where this process continues until the producer becomes fully convinced that his distributor is patient, any lack of proper contract

[17] Our model delivers this point too strongly, making no concession for sales to come down except when the producer exits Foreign's market. It also yields the counterfactual prediction that producers exit the market at their pinnacle (we thank Costas Arkolakis for pointing this out to us). This is a direct implication of our simplifying assumption that "bad outcomes" from the perspective of the producers are always caused by distributors' intentions, unlike "good outcomes." Yet as discussed in the end of subsection 2.2.4, we develop in the online Appendix an extension that relaxes this asymmetry without altering the essential properties of our equilibrium. In that extension, after a "bad outcome" the producer's belief about the type of the distributor worsens but does not jump to $\theta = 1$), implying that the export volume falls but can remain strictly positive in the subsequent period. Thus, export volumes within an active partnership do not increase monotonically over time and a partnership is endogenously terminated only after quantities have decreased for some time.

enforcement becomes effectively inconsequential. Hence, sufficiently long-lasting partnerships overcome the problems created by informational frictions.

Now, while interesting for our understanding of firms' export dynamics, similar results have been generated in recent models and confirmed empirically.[18] What is novel in our model is that the speed of the process generating export growth conditional on survival depends on the country's institutional environment. To see that, define $\gamma \equiv \theta\lambda + 1 - \theta$. This is the likelihood with which the producer expects to receive the revenue. Since θ changes over time according to θ_k in equation (1), so does γ, starting at $\gamma_0 = \theta_0\lambda + 1 - \theta_0$ and reaching $\gamma_k = \theta_k\lambda + 1 - \theta_k$ after k periods in an active partnership. The change in this probability, $\gamma_k - \gamma_0 = -(\theta_k - \theta_0)(1 - \lambda)$, unambiguously decreases with λ.

Proposition 2 *The increase in the likelihood with which the exporter expects to receive his share of the revenue from period t to period $t + k$ is smaller, the greater is λ.*

The intuition for Proposition 2 can be conveyed as follows. As the reputation of the distributor improves, the producer becomes more confident that the contract will be honored. This improved reputation is reflected in the expression $-(\theta_k - \theta_0)$. However, this matters only when institutions fail, an event with probability $(1 - \lambda)$. Thus, a small increase in λ directly reduces the value of an improved reputation by $(\theta_k - \theta_0)$. Furthermore, a better institutional environment slows down the process of reputation building itself, because it makes it more difficult for a producer to discern, after a successful experience, whether the distributor has complied with the contract because she wanted to or because of the threat of a legal challenge. Or put differently, a better institutional setting in Foreign reduces the informational content of past experiences, thus lowering the future reputation of an active distributor, relative to what it would have been under a lower λ. These two effects can be expressed as

$$\frac{\partial(\gamma_k - \gamma_0)}{\partial\lambda} = \underbrace{(\theta_k - \theta_0)}_{\text{direct effect } <0} + \underbrace{(1-\lambda)\frac{\partial(\theta_0 - \theta_k)}{\partial\lambda}}_{\text{indirect effect } <0} < 0. \tag{9}$$

This has important implications for the export growth of active exporters. Let the demand function satisfy the following condition:

Condition 1 $\frac{R'(Q)}{QR''(Q)}$ *is non-decreasing in Q.*

[18] See Albornoz et al. (2010), Eaton et al. (2010) and Freund and Pierola (2010) for alternative views of why surviving exporters on average increase exports over time, especially after their first year as exporters.

Condition 1 requires the marginal revenue to not be much 'flatter' at higher levels of Q (that is, the rate at which marginal revenue falls with Q should not decrease too much with Q). The condition is quite general, being satisfied, for example, when demand is linear or CES. If Condition 1 holds (and it is only a sufficient condition), then we have that the export growth of individual active exporters to an economy is higher, the weaker the institutional quality in that economy.

Prediction 3 *All else equal, a producer's export growth rate to a country after k periods is higher, the lower the institutional environment of the country.*

An implication of Prediction 3 is that, if the partnership survives after one period, a clear-cut ranking of export volumes across destinations with different levels of institutional quality no longer exists. Because of the slower updating process, a producer's exports to a low-λ destination after a successful experience there may be higher (or not) than the exports of the same producer to a high-λ (but otherwise identical) country after a similarly successful experience.

4 Data

In what follows we use subscript i for firms, d for countries and t for years, while superscript k denotes the number of years after a partnership starts.

Micro Trade Data and Variables To test the predictions of our model, we use data on Belgian goods exports provided by the National Bank of Belgium (NBB). The data allows us to analyze exports at the firm level disaggregated by country over the period 1995-2008.

The trade data is very rich. Exports of each firm are recorded in current euros at the 8-digit CN product level by country of destination. The data are collected by the NBB from Intrastat (intra-EU trade) and Extrastat (extra-EU trade) declarations. The reliability of the trade declaration data builds upon firms' mandatory VAT returns. Sales and purchases involving a non-resident must be separately indicated in VAT returns due to the different treatment of those operations with respect to the VAT tax. This information is used by the NBB to identify firms involved in trade activities.

The data encompasses the universe of declared trade transactions. Extra-EU trade is virtually exhaustive, with the legal requirement for declaration being either a value above €1,000 or a weight above 1,000 kg. For intra-EU trade, the declaration threshold has changed over time, with firms having a legal obligation to declare exports if their total foreign sales are above €104,105 for the period 1993-1997, above €250,000 for the period 1998-2005, and above €1 million since 2006. Firms trading less than 1 million euros represent less than 1% of aggregate exports. Moreover,

firms often provide information about their European foreign sales even when they are below the threshold. Since it is unclear whether these threshold changes generate biases in our estimations, in our benchmark analysis we use all data available. In section 5.4 we show that adopting different treatments to deal with the changes in EU declaration thresholds does not change our qualitative results.

As Belgium is a key port of entry to and exit from the EU, Belgian data has the drawback of including a large amount of re-exports. Many official 'Belgian' firms thus trade exclusively with non-resident partners. We deal with this problem by building on information gathered by the NBB since 1995 and systematically exclude trade by firms identified as non-resident.[19]

In terms of value, Belgium's main export products are motor vehicles, diamonds and medicaments. Relative to the other EU-15 countries, Belgium's (HS 2-digit) sector strengths are in carpets, precious or semi-precious stones, articles of zinc and tin, and fertilizers.[20]

We use the micro trade data to construct the following variables: (i) a dummy $Entry_{idt}$ taking value 1 if firm i enters a new export destination d in year $t \in [1996, 1998]$; (ii) the log value of exports of firm i to country d at the time of entry, Exp^0_{idt}; (iii) a dummy $Survival^k_{idt}$ taking value 1 if firm i, which has entered market d in year t, still exports to d after k periods; (iv) the growth of firm i exports to country d between years t and $t+k$, $Growth^k_{idt}$; (v) the number of destinations served by firm i at time t, n_dest_{it}; (vi) four "extended gravity" variables described in subsection 5.3. We focus on the cohorts 1996-1998 so that we can follow new exporters to a destination for a long enough period (10 years).

We consider that a new partnership is created whenever a firm enters a new export market in a given year. We define firm i as entering a new export destination d in year t if the firm has positive exports to destination d in year t but no exports to d in $t-1$. Naturally, a firm may be a new exporter to country d in year t while being already an exporter to other destinations in $t-1$.[21]

[19] Non-resident firms are the main re-exporters in Belgium. They are identified by the NBB from VAT declarations. Firms with a Belgian VAT identifier that have a foreign legal address and firms offering fiscal representation services to foreign firms are considered as non-resident firms. Non-resident firms must report how much they trade with foreign parties (re-exports) in VAT declarations. Trade between non-residents firms and Belgian residents (domestic trade) is recovered from VAT-suppliers data. Non-residents firms are classified as 'pure' if they are not involved in any trade transaction with Belgian residents, and as 'mixed' otherwise. Non-resident firms account for about 26% of Belgian exports in 2008.

[20] We obtain this ranking by using a Balassa (Revealed Comparative Advantage) index defined as $\left(X^i_{Belgium}/X_{Belgium}\right) / \left(X^i_{EU\text{-}15}/X_{EU\text{-}15}\right)$, where X^i_j denotes exports of a 2-digit HS product i by j and X_j denotes total exports by j, $j = Belgium, EU\text{-}15$.

[21] We exclude from the analysis the firms we can identify as "re-entrants," which exit a market in a year and return in the next. In our case, this refers to firms that export to a destination in 1996 and 1998 but not in 1997. They correspond to around 2% of the new triples. Including them in the sample has virtually no effect on the results.

Table 1 reports the number of new firm-country-year triples during the period 1996-1998. There are in total 157,537 such triples, with roughly one third of them in each year. Table 1 also shows the number of firms and countries involved in this entry activity. Note that the total number of firms involved in entry during 1996-1998 is less than the sum of the entering firms in each year, as a firm can be a new exporter (in a different market) in more than one year. The same is true for the total number of countries experiencing entry of new Belgian firms.

Table 1: Firm Entry Into a New Export Market

Year	New Firm-Country-Year Triples	Number of Firms	Number of Countries
1996	55,903	23,500	204
1997	54,641	22,833	204
1998	46,993	19,955	205
Overall	157,537	41,060	211

The growth rate of exports after k years is defined as the difference between log export value after k years and log export value at entry: $Growth^k_{idt} \equiv Exp^k_{idt} - Exp^0_{idt}$. In constructing $Growth^k_{idt}$ we consider only exporters surviving k periods after entry, i.e. $Growth^k_{idt}$ is computed conditional on $Survival^k_{idt} = 1$. Table 2 reports the number of surviving triples and some descriptive statistics of the growth of exports k years after entry in a new destination for $k = 1, 2, 5, 10$. It shows that, out of the 157,537 new triples created during 1996-1998, only about 40% (63,970) are still ongoing after one year. The number of surviving triples decreases over time and, after 10 years, fewer than 8% of the initial pool (12,073) are still ongoing. Table 2 further indicates that, conditional upon survival, the growth of exports is on average positive. The mean 1-year growth rate is 30% ($=\exp^{0.2659} - 1$) and the 10-year growth reaches 268%; the median 1-year and 10-year growth rates are 25% and 244%, respectively.

Firm-Level Data and Variables Most firm-level variables are constructed using balance sheet data from the Business Registry covering the population of firms required to file their (unconsolidated) accounts to the NBB. The data combine annual accounts figures with data from the Crossroads bank on firms' main sector of activity and legal status. The large majority of firms registered in Belgium (i.e. those that exist as a separate legal entity and have limited liability) are required to file annual accounts.[22] There are two types of annual accounts: full and abbreviated.

[22] See Behrens et al. (2010) for details about this requirement.

Table 2: Firm Survival and Export Growth

Export Growth After	1 Year	2 Years	5 Years	10 Years
Mean	0.2659	0.4855	0.7606	1.3041
Median	0.2240	0.4116	0.6585	1.2368
Stand. dev.	1.6306	1.7928	2.0532	2.2952
5th percentile	-2.3717	-2.3670	-2.5085	-2.3651
95th percentile	2.9080	3.4781	4.2075	5.1145
Surviving Triples	63,970	40,010	24,059	12,073
Surviving Firms	19,452	12,757	8,220	4,159
Surviving Countries	198	194	181	168

Firms have to file a full annual account when they meet at least two of the following three criteria: (i) employ at least 50 employees; (ii) have an annual turnover of more than euros 7.3 million; (iii) report total assets of more than 3.65 million euros. We use all companies that filed either a full or an abbreviated balance sheet during the period 1996-1998 while reporting at least one employee.

We use firms' annualized balance sheets to construct the following firm control variables: (i) firm size, $size_{it}$ (log of full-time equivalent number of employees); (ii) labor productivity, $prod_{it}$ (log of value added per worker); (iii) capital intensity, cap_{it} (log of capital stock/employment); (i) (iv) average wage, $wage_{it}$ (log of total wage bill/employment); (v) and a full set of NACE rev1.1 2-digit sectoral dummies. Firm and trade data were merged using the VAT number, which uniquely identifies firms in Belgium.

Country-Level Data and Variables The key variable in our analysis is the "Rule of Law" index from Kaufmann et al. (2009), which we label as λ_{dt}. Ranging from -2.5 to 2.5, it corresponds to a weighted average of several variables that measure individuals' perceptions of the effectiveness and predictability of the judiciary and the enforcement of contracts in each destination d in year t. This is a fairly accurate description of our theoretical institutional variable. This measure, which is widely used, also has the important advantage of classifying a large number of countries (170). As institutions change only very slowly over time, almost all the variation in λ_{dt} is cross-sectional.[23] For simplicity of the interpretation we therefore consider the value of λ_{dt} for the destinations of the new triples in 1996-1998, but not the trifling changes in λ_d from period t to period $t+k$. In the online Appendix we show the list of all countries and their corresponding rule of law score in 1997. We provide results for alternative measures of λ_{dt} in subsection 5.4.

[23] For example, the correlation between λ_{dt} and $\lambda_{d,t+10}$ for the new triples in t =1996, 1997, 1998 is 0.97.

Other control variables at the country-level include the usual set of gravity equation covariates: the log of distance ($Distw_d$), an ex-colony dummy ($Colony_d$), a common language dummy ($Lang_d$), a common border dummy ($Border_d$), and the log of a country GDP in euros (GDP_{dt}). Except for GDP_{dt}, which we borrow from the World Outlook Database provided by the International Monetary Fund (IMF), these data are time-invariant and come from the Centre d'Etude Prospectives et d'Informations Internationales; full details can be found in Head and Mayer (2002).

To account for differences in trade patterns and their evolution over time that are related to membership to the WTO and/or to the integrated EU economic market, we use time-varying WTO (WTO_{dt}) and EU membership (EU_{dt}) dummies. To control for the level of development of export destination countries we also consider an OECD membership dummy ($OECD_{dt}$). In the analysis of export growth and survival we further include changes in the time-varying country variables as well as real exchange rate changes over the time interval $[t, t+k]$. Nominal Exchange rate data are obtained from the IMF's International Financial Statistics database while PPP conversion rate data come from the World Outlook Database.

5 Empirical Analysis

The empirical analysis is divided in two parts. In one we study a firm's choice of the initial value to export to a market, which depends on its prior decision to enter the market. In the other we study a firm's export growth in a country, which in turn depends on the firm's decision to keep exporting to that country. In each part of the empirical analysis we face, therefore, a potential selection bias. Furthermore, the usual problem of omitted variables arising in non-experimental settings might apply to our analysis. We deal with these issues in two different ways.

In subsection 5.2 we use firm-year fixed effects. The main advantage of this approach is that it allows us to control for both potentially observable (firm productivity, capital intensity etc.) and typically unobservable (e.g. the quality of a firm management and products) firm characteristics. Importantly, it also controls for arbitrarily correlated time-varying shocks to those characteristics, which simultaneously affect the firm's decision to enter/stay in a market and the firm's choice of how much to sell to that market. Bearing in mind that selection bias is a particular form of omitted variables bias, this approach allows us to effectively address both problems at the firm-time dimension, with the identifying variation stemming from the same firm entering/staying in at least two markets in the same year. This is rather demanding on the data, however, as it relies on firms entering in the same year in more than one destination and keeping serving multiple destinations.

After 10 years, for example, rather than the 12K surviving triples indicated in Table 2, we identify our parameters from around 8K surviving triples corresponding to firms that entered multiple destinations within a year and kept at least two of them after ten years.

In subsection 5.3 we adopt instead an alternative two-stage Heckman procedure where we model entry and survival more explicitly. With this approach we can address selection problems arising at the firm-country-year dimension. Furthermore, it allows us to exploit more variation in the data. The main cost is that we need to rely on economically sensible firm-year-country-specific exclusion variables. We do so by constructing our exclusion variables building on the idea of "extended gravity" forces proposed by Morales et al. (2011). We defer the details of this approach until subsection 5.3.

We describe in the next subsection the econometric model we use in our analysis along with the hypotheses needed for firm-year fixed effects and the Heckman two-stage procedure to provide consistent estimates.

5.1 Econometric Model

In the first part of our empirical analysis we consider both the probability of firm i entering a new export destination and its initial volume of exports. We consider firm entry into a new export destination in 1996, 1997 and 1998 and pool observations together. To estimate the entry probability, we define a binary dependent variable $Entry_{idt}$ taking value one when firm i enters a new export market d at time t. To construct $Entry_{idt}$, we first identify the firm-country (i, d) pairs appearing in the trade data in period $t-1$. We then fill in the country d dimension with zeros for all destinations to which firm i has zero exports in $t-1$. $Entry_{idt} = 1$ if in period t firm i serves a destination d that was in that group. Thus in each period a firm decides whether to enter into one or more new export destinations, with the set of countries to choose from given by the countries where the firm did not export to in the previous year.

If firm i enters destination d at time t, it also chooses how much to sell in d. The initial (log) export value Exp^0_{idt} is thus observed only when $Entry_{idt} = 1$, raising a selection issue that we model in the following way:

$$\begin{aligned} Entry_{idt} &= \mathbf{1}_{[Entry^*_{idt}>0]}, \\ Entry^*_{idt} &= constant + \beta 1 \lambda_{dt} + \mathbf{Z1}'_{idt}\boldsymbol{\gamma 1} + \zeta 1_{idt}; \end{aligned} \tag{10}$$

$$Exp^0_{idt} = constant + \beta 2 \lambda_{dt} + \mathbf{Z2}'_{idt}\boldsymbol{\gamma 2} + \zeta 2_{idt}, \tag{11}$$

where $Entry^{*}_{idt}$ is a latent variable measuring firm i profitability when serving country d as a new exporter in year t, λ_{dt} is our key variable of interest, $\mathbf{Z1}_{idt}$ and $\mathbf{Z2}_{idt}$ are vectors of firm-country-time controls, and $\zeta 1_{idt}$ and $\zeta 2_{idt}$ are residual terms.

Even if standard omitted variables were not an issue, as when $\zeta 1_{idt}$ and $\zeta 2_{idt}$ are uncorrelated with λ_{dt}, $\mathbf{Z1}_{idt}$ and $\mathbf{Z2}_{idt}$, selection bias arises as long as $\zeta 1_{idt}$ and $\zeta 2_{idt}$ are correlated between each other. In subsection 5.2 we use firm-year fixed effects to deal with endogeneity by making the following assumptions. First, we consider that $\zeta 1_{idt}$=$f1_{it}$+$\upsilon 1_{idt}$ and $\zeta 2_{idt}$=$f2_{it}$+$\upsilon 2_{idt}$. Second, we assume $\upsilon 1_{idt}$ and $\upsilon 2_{idt}$ to be uncorrelated with each other as well as with $f1_{it}$, $f2_{it}$ and covariates. Leaving the correlation between $f1_{it}$, $f2_{it}$ and covariates unconstrained, our set of assumptions is sufficient (along with standard regularity conditions on the distribution of $\upsilon 1_{idt}$ and $\upsilon 2_{idt}$) for parameters in (10) and (11) to be separately and consistently estimated. In particular, marginal effects of (10) around the mean of covariates can be consistently estimated using a linear probability model and applying the within transformation to get rid of the firm-time fixed effects $f1_{it}$. A simple linear panel regression with firm-time fixed effects does the same for (11).

In subsection 5.3 we tackle the issue of selection bias arising at the firm-country-year dimension. While compromising on firm-time omitted variables by using a large battery of covariates instead of firm-year fixed effects, we allow $\zeta 1_{idt}$ and $\zeta 2_{idt}$ to be correlated also along the country dimension. Assuming normality of residuals (along with standard regularity conditions), parameters of (10) and (11) can be consistently estimated with a two-stage Heckman procedure. In this case, convincing identification relies on economically sensible exclusion variables, i.e. covariates which are in $\mathbf{Z1}_{idt}$ but not in $\mathbf{Z2}_{idt}$.

In the second part of our analysis we turn to the study of survival and export growth in a new export destination. We consider firms that have entered market d as a new exporter (in 1996, 1997 and 1998) and are still selling to d after k years. We carry out a survival analysis of length $k = 1, 2, 5, 10$, thus requiring the full time coverage (1995-2008) of our trade data. We apply the same econometric model, assumptions, and tools described above while replacing entry with survival and the initial value of exports with export growth. Specifically, we consider a binary dependent variable $Survival^{k}_{idt}$ taking value 1 if firm i, which entered market d in year t, is still exporting to d after k periods.[24] Conditional upon survival in country d after k periods (i.e. $Survival^{k}_{idt} = 1$), firm i also chooses how much (in logs) to sell in d, Exp^{k}_{idt}. Combined with the initial (log) amount

[24] One could, alternatively, estimate a parameterized hazard function to study survival. However, such an alternative has two main drawbacks. First, a hazard function would impose more restrictions on the time profile of survival than what we do by estimating a probit or a linear probability model for every k. Second, to the best of our knowledge, a duration model featuring unobserved heterogeneity and Heckman-type selection does not exist.

of exports, this determines export growth from period 0 to period k, $Growth^k_{idt}$.

5.2 Estimation with Firm-Year Fixed Effects

5.2.1 Firms' Entry into a New Market and the Initial Value of Exports

When using firm-year fixed effects, the vectors of controls $\mathbf{Z1}_{idt}$ and $\mathbf{Z2}_{idt}$ include all the country and country-time variables discussed in section 4. Table 4 reports the results of the within estimator applied to the linear probability model (10) and the linear regression (11). Note that the number of observations in the estimation of (11) does not correspond to the number of triples in Table 1 because about 2% of observations is lost due to the lack of country-time covariates. We provide standard errors adjusted for two-way clustering at the firm and country levels.

Insert Table 4 around here

In the fist two columns we do not include covariates; in columns 3 and 4 we include all country and country-year controls. The estimates of the covariates' coefficients in both the entry and the level regressions are largely consistent with existing studies. The sign and significance of the λ_{dt} coefficient in the initial exports regression confirms Prediction 1: all else equal, a firm enters into a new export market with higher sales, the higher is the effectiveness of contracting institutions in the country. This result suggests that λ_{dt} can be partially understood as a proxy for lower variable costs. The effect is non-trivial. For example, considering the point estimate in column 4 of Table 4, if Brazil ($\lambda = -.21$) had institutions like Chile ($\lambda = 1.22$), exporters to Brazil would start their sales there with a 4.6% higher initial export value.[25]

5.2.2 Firms' Survival in a New Market and the Growth Rate of Exports

The vector of controls in the case of survival and export growth in a new export destination includes the same set of country and country-time variables used in Table 4 plus other variables needed when considering these features. First, as emphasized by Arkolakis (2010) and Eaton et al. (2010), among others, the initial value of exports is crucial to understand firms' export growth in a market. Second, we account for the *changes* in some country controls between periods t and $t + k$

[25] The sign and significance of the λ_{dt} coefficient in the entry regression indicates that, ceteris paribus, it is easier to enter markets characterized by good institutions. While probably intuitive, this result does not follow from our model because of countervailing effects. On one hand, a higher λ implies a larger extensive margin; on the other hand, it induces a lower turnover rate. The model is silent about the net effect stemming from those two contrasting forces. This helps to explain the (statistically significant but) economically small impact of λ on entry. The small magnitude is however virtually inevitable, as entry by a firm in a specific market in a specific year is a very rare event.

(in addition to the levels of those variables). Specifically, we add the change in the EU membership ($\Delta^k EU_{dt}$), the change in OECD membership ($\Delta^k OECD_{dt}$), and the change in WTO membership ($\Delta^k WTO_{dt}$) experienced by some countries during our sample period. We also introduce the % change of the real exchange rate of country d with respect to the euro ($\Delta^k exrate_{dt}$) and the change in the GDP of country d in current euros ($\Delta^k GDP_{dt}$). All those variables are likely to affect export growth and may be correlated with our main independent variable.[26] Table 5 shows the results of our within estimations. We report standard errors adjusted for two-way clustering at the firm and country levels.

Insert Table 5 around here

The sign and significance of the λ_{dt} coefficient in the survival analysis after k years confirm Prediction 2: the likelihood that an exporter to a new destination market will still serve that market after k years increases with the effectiveness of the contracting institutions of the country. This result indicates that λ_{dt} has not only static but also dynamic effects on firms exporting to d. The magnitude of the effect is sizeable. For example, using the unconditional probability of survival as reference, if China ($\lambda = -0.25$) had institutions like those in Singapore ($\lambda = 1.74$), the probability of survival of an exporter to China after one year would increase by 5.8% ($1.99 \times 0.0119/0.4089$). After 10 years, the effects is over 13% ($1.99 \times 0.0052/0.0776$).

The sign and significance of the λ_{dt} coefficient in the export growth analysis after k years confirm Prediction 3: a firm's export growth to a market in its first k years is lower, the greater the effectiveness of the country's contracting institutions. This result further confirms the dynamic implications of λ_{dt}, which cannot be rationalized in frameworks where λ_{dt} is taken simply as a proxy for fixed, sunk or variable costs. The magnitude of the effect is remarkably sizeable: if China had institutions like those in Singapore, export growth of individual firms to China would be around 5.3% lower after one year, and almost 25% lower after 10 years.

Interestingly, by combining the previously estimated positive effect of λ_{dt} on the initial level of exports (0.0312) with the negative effect of λ_{dt} on growth after k years, one finds that, if all else were kept constant, after two years the average level of exports would already be higher to countries with lower λ_{dt}, with the difference increasing at longer horizons. Of course, this effect is for surviving exporters, and needs to be weighted against the finding that survival rates increase with λ_{dt}. It nevertheless highlights the nuanced role that contracting institutions play in international trade.

[26] Several of these additional controls are indeed statistically significant. We report their estimates in the online Appendix.

5.3 Estimation with Heckman 2-step Procedure

Firm-year fixed effects allow us to control for a wide range of both potentially observable and typically unobservable time-varying firm characteristics that simultaneously affect entry, survival, the initial level of exports and export growth. However, that strategy has two drawbacks. First, there might be market-specific unobservable characteristics affecting entry and selection that we are unable to capture with our covariates. Second, the identifying variation comes from a rather specific sample: firms entering in the same year in two or more destinations and experiencing different survival and export growth patterns.

To account for these concerns we estimate, building on the assumption laid down in subsection 5.1, two separate two-stage Heckman procedures: one for entry and the initial level of exports, and one for survival and export growth. In both cases, we need exclusion variables that directly affect the likelihood of entry and survival into a new destination market while, conditional on entry and on survival, do not affect the initial value of exports and export growth. We follow Morales et al. (2011) and use information about the trade history of a firm to construct "extended gravity" measures that proxy for market-firm-year-specific sunk entry costs. Specifically, we construct four variables that capture the "proximity" between the set of countries a firm was already exporting to in year $t-1$ and the new potential markets where a firm could start exporting to in t. Proximity is measured in terms of both geographical/cultural distance (contiguity, presence in the same continent, and sharing of the same official language) and income similarities (quartiles of the distribution of GDP per capita in US dollars across countries in 2008).[27] Intuitively, once a firm exports to a market, it acquires knowledge of that market, and such a knowledge could be useful when entering other destinations that share similar characteristics with the initial one.

To the extent that the four extended gravity variables capture mostly firm-market-year-specific sunk costs, they represent valid exclusion variables, directly affecting entry and survival into a new export destination but, conditional on entry and survival, not influencing export level and growth. Morales et al. (2011) find that extended gravity variables are indeed important determinants of firms' sunk entry cost into a market, but not of firms' fixed cost to exporting to a market. Although they do not study firms' variable cost of exporting, their finding that extended gravity variables do not affect firms' fixed cost of exporting suggests that these factors—unlike "regular" gravity variables—are unrelated to firms' operating profits in foreign markets, hence valid exclusion restrictions.[28]

[27] See Morales et al. (2011) for details on the construction of those four variables.

[28] Indeed, in a related analysis Lawless (2011) finds that exporting to a country facilitates entry in countries

The cost of implementing the Heckman procedure is that we cannot be as general in terms of the firm-year characteristics affecting entry, survival, export value and growth. However, by using balance sheet information we can consider a wide range of time-varying firm characteristics that proxy for heterogeneity in marginal costs: firm size, productivity, capital intensity, average wage, as well as a full set of NACE rev1.1 2-digit sectoral dummies. Furthermore, to capture how well a firm is established in international markets, we introduce the number of destinations served by firm i at time t, n_dest_{it}. The requirement of balance sheet information reduces the number of observations available for estimation by roughly one third, however. We include time dummies, cluster standard errors at the country level and provide marginal effects for the first-stage probit.

5.3.1 Estimation Results

Tables 6 and 7 report the results. They reveal that our predictions about the impact of a country's contracting institutions on the value of foreign firms' initial sales, survival and sales growth are overall very robust to this alternative specification. Reassuringly, the extended gravity variables are all highly significant, confirming that firm entry is indeed more likely in markets similar/close to the markets previously served by that firm. Furthermore, the significance of the Inverse Mill ratio (IM) indicates that selection on unobservables $\zeta 1_{idt}$ and $\zeta 2_{idt}$, as captured by our extended gravity variables, is indeed at work.

Insert Tables 6 and 7 around here

The impact of λ_{dt} on initial exports, as Table 6 shows, is very similar to that obtained with firm-year fixed effects (Table 4). In turn, Table 7 shows that the impact of λ_{dt} on survival after one year is over 3 times higher than the one obtained with firm-year fixed effects (Table 5), although the difference between the point estimates with the two approaches decreases for longer periods. For export growth, the effect of λ_{dt} under the Heckman procedure is higher than under the firm-year fixed effects for longer horizons ($k = 5, 10$), but lower for shorter horizons ($k = 1, 2$). Interestingly, the role of the extended gravity variables on survival is often but not always positive. This is probably the net effect of two opposing forces: more familiarity with a market can increase survival there, but it also represents a lower sunk cost to assess the market, which implies a higher likelihood of exit following a negative shock.

To get a general view of the economic magnitude of our results, we use our point estimates

contiguous to the original destination, but that contiguity has no statistically significant effect on the volume of sales to the new destination.

under each specification to compare the effects of (a one standard deviation increase in) the rule of law measure on our variables of interest with the effects of (a one standard deviation increase in) GDP and of (a one standard deviation decrease in) distance, the two variables often believed to be the main determinants of aggregate bilateral trade flows. Table 3 displays the results.

Table 3: % change associated to a one standard deviation change in λ, GDP and Distance

		Firm-year FEs	Heckman two-stage
	λ:	3.2%	2.9%
on Exp^0:	GDP:	16.0%	23.5%
	Distance:	8.5%	14.3%
	λ:	6.7%	8.5%
on $Survival^{10}$:	GDP:	4.6%	0.5%
	Distance:	20.4%	3.6%
	λ:	-12.6%	-22.6%
on $Growth^{10}$:	GDP:	106.4%	79.5%
	Distance:	20.3%	17.5%

Institutional quality pales next to GDP in terms of their effects on firms' initial export sales and 10-year export growth. On the other hand, it has a bigger effect than GDP on firms' survival rates. Relative to distance, the impact of institutions is smaller on initial export sales but roughly equivalent on survival and export growth. Overall, then, our results indicate that the magnitude of the impact of institutional quality on firm export dynamics are far from trivial.

5.4 Robustness: Export Thresholds, Alternative Measures of λ, Excluding Exp^0

As indicated above, the declaration threshold requirements has changed for exports to EU countries during our sample period, reaching €1 million per year in 2006. To investigate whether these changes bias our results, we re-run all of our specifications restricting the sample. Specifically, we consider only triples corresponding to firms that export at least €1 million per year to either the group of EU countries, or the group of non-EU countries, or to both groups.[29]

We also check whether our results are sensitive to different measures of institutional strength. We consider both a measure of the quality of the legal system provided by Gwartney and Lawson

[29] In the online Appendix we deal with the changes in the declaration requirements in two additional ways. First, we restrict the sample to 1998 to 2005, a period where the requirements did not change. The cost of that approach is that we can look at survival and growth after at most six years after entry and for one cohort only. Second, we restrict the sample to non-EU exports to completely sidestep the problem created by the change in thresholds. The cost of that approach is the loss of significant variation in the data, as most of Belgium's exports go to other EU countries.

(2003) and the cost of enforcing a contract as a percent of the debt value from the World Bank's 2011 Doing Business database.

Finally, we re-run our original regressions for survival and export growth without controlling for the initial quantity. As we pointed out above, many researchers deem a firm's initial export level to a market key to understand the firm's future performance in that market. Our model (and our estimates) indicate, however, that the initial exports also capture the effects of the institutional environment of the country. Having the initial exports in those regressions therefore should neutralize part of the effect of λ on survival and export growth. We check here the effect of dropping Exp^0_{idt} as a control in those regressions.

Results using firm-year fixed effects and the two-step Heckman procedure are displayed in Tables 8 and 9. To save space, we show only the estimates and standard errors of λ_{dt}. Overall, the broad picture is qualitatively fairly similar to the one obtained with all export triples, with the rule of law measure for institutions, and with initial exports as a control in the survival and growth regressions.

Insert Tables 8 and 9 around here

5.5 Differential Results: Different Goods, Firms and Export Modes

Our empirical results provide consistent support for the three firm-level predictions of our model. The most surprising of them is the result on export growth: surviving exporters expand their foreign sales faster in countries with weaker institutions. The explanation our model offers is that exporters learn through experience about the quality of their matches, a process that is faster in economies whose institutions impose relatively lax constraints on agents' behavior. This differential learning across destinations is, however, likely to be heterogeneous across different types of firms. First, firms with different characteristics, or that sell different types of products, are likely to be affected differently. Second, some firms may actively take actions to mitigate those informational problems. In this sense, our results capture only a lower bound for their consequences for firms' export dynamics, or the residual consequences once countervailing actions by the firms that otherwise would be more affected are factored in. To investigate these possibilities, we run additional export growth estimations interacting our institutional variable with other variables that could affect the scope for learning from previous experiences.[30]

First, we interact λ with a dummy variable that indicates whether firm i has an affiliate and/or

[30] In the online Appendix we show further robustness checks where we include in all the main regressions controls for the presence of parents/affiliates and indexes for the complexity of products. Qualitative results are very similar.

a parent company in country d in year t.[31] If uncertainty about the reliability of trading partners is significant, firms may consider acquiring the partners so that they can monitor their actions more effectively. This would tend to mitigate the impact of institutions on export growth. On the other hand, foreign direct investment brings its own types of institutionally related issues, such as the risk of expropriation and property rights uncertainty, which may be even worse than dealing with unreliable distributors, in particular because FDI typically requires large initial outlays.

Second, we interact λ with a measure of the good's "complexity," as defined and developed by Nunn (2007).[32] If the actions/services that importers have to provide are more numerous and/or less verifiable for more complex goods, which seems likely, then there will be more scope for opportunistic behavior when dealing with exporters of complex goods. If so, the negative impact of institutional quality on firms' export growth would tend to be magnified for more complex goods.

Third, we interact λ with measures of "firm experience," which we proxy with the number of foreign markets served and, alternatively, with the size of the firm (measured by total employment), as larger firms are usually older and more established. Intuitively, if experienced firms are more able to screen reliable from non-reliable distributors, the impact of institutional quality on export growth would tend to be played down for those firms.

Finally, we interact λ with a dummy for "wholesalers".[33] The new but fast-growing literature on the choice between direct and indirect exporting finds that wholesalers help to overcome fixed costs of exporting (see e.g. Bernard et al. 2011). As Feenstra and Hanson (2004) argue, informational frictions constitute an important element of those fixed costs.[34] But as our model indicates, informational frictions can affect also the dynamic pattern of exporters in institutionally weak countries. Thus, the same reasons that are associated with a stronger impact of institutions on firms' export growth also favor indirect exporting. Unless choosing to export through wholesalers neutralizes

[31] The dummy is constructed based on the inward and outward micro foreign direct investment (FDI) data collected by the NBB. An affiliate relationship arises whenever firm i owns, either directly or indirectly, at least 10% of the equity of a firm registered in another country. A parent relationship arises whenever at least 10% of the equity of firm i is owned by a firm registered in another country.

[32] Specifically, we match Nunn's (2007) data to the CN 8-digit nomenclature and construct the weighted average of the complexity of the CN 8-digit products sold by firm i when entering a new market d at time t using the export shares of such products as weights.

[33] Wholesalers are defined as firms whose main NACE rev1.1 2-digit sector of activity is either 50 or 51. Manufacturing firms are instead those whose main activity NACE code is between [15, 37]. Firms with other NACE codes are classified as others. In the regressions we take manufacturing firms as the reference category and include dummies for wholesalers and others, along with an interaction term between each of the two dummies and λ.

[34] Feenstra and Hanson (2004) associate greater informational frictions with more product differentiation. Tang and Zhang (2011) show that the association is actually more subtle. While horizontally differentiated products, on which Feenstra and Hanson focus, tend to be exported through intermediaries, vertically differentiated products, for which quality considerations play an important role, tend to be exported directly.

completely the effects of information frictions, we should then observe a stronger impact of λ on export growth for wholesalers than for manufacturers.

In all these exercises, we use our two benchmark specifications added by an extra variable and its interaction with λ. For brevity, we report only the coefficients and standard errors of the interaction term.[35]

Table 10 shows the results. We do not find any statistically significant differential effect of institutional quality on export growth for firms with related parties in the foreign countries they export to. This may seem surprising at first, but most likely it simply reflects the endogeneity of FDI decisions: as in many other developed countries, multinational activities in Belgium are overwhelmingly concentrated in institutionally strong economies.[36] We would need an extended model that takes into account FDI decisions to guide an empirical strategy that allows for a complete examination of this issue, but this first look at the data does not point to FDI as a widely used "remedy" for institutional uncertainty in foreign markets.

Insert Table 10 around here

We find, on the other hand, some evidence that the impact of institutions on firms' export growth is larger if the firm is exporting more complex goods, consistent with the view that information frictions and the scope for learning are greater for exports of relatively complex goods.

By contrast, we find strong evidence that institutions matter significantly less for export growth for experienced (both larger and more diversified geographically) firms. Presumably, those firms are more able to assess the reliability of distributors before forming a match, and therefore they have less to learn about their partners over time.

We also find that the effect of institutional quality on export growth is higher for wholesalers than for manufacturers. This is consistent with the view that indirect exporting tends to be pre-

[35] Evidently, these are not the only ways in which exporting firms try to limit profit-damaging opportunistic actions of foreign partners, only the ones we can address with our data. A dimension we do not explore, for example, is the choice of financing modes (e.g. between cash in advance, open accounts and letters of credit). Antràs and Foley (2011) study precisely that, including the evolution of financing modes over time within partnerships. Data that allow such types of analysis are rare. Indeed, Antràs and Foley use data from a single exporting firm in their study (although their firm is as close to the perfect specimen for their analysis as possible, as it has multiple partners in various destinations over several years). They find that cash in advance is more likely to be used in countries with weak institutions than open accounts despite higher financing costs there, but that such a difference disappears over time among surviving partnerships. This is akin to our result that exports start lower but grow faster in countries with weak institutions than in countries with strong institutions. There are also other factors that can matter for the dynamics of exporting firms but that are not present in Belgium. For example, Fernandes and Tang (2011) show that the existence of export processing firms in China increases the survival rates of *other*, regular exporting firms from the same city and in the same sector.

[36] Out of the 157,537 initial export triples, the exporting firm has a parent/subsidiary link in only 432. Of those links, 86% correspond to exports to OECD member countries. This fraction reaches 95% ten years after entry.

ferred when informational barriers are relatively important. An alternative interpretation is that manufacturers have a better technology to assess the type of a match before starting a relationship, whereas wholesalers have a better technology to find (but not to screen) importers. A full rationalization of this finding, which would require endogenizing the choice of export mode, is however beyond the scope of this paper.

6 Concluding Remarks

Recent research has highlighted the significant changes exporting firms go through in their foreign destinations—e.g. entry and exit rates are both high, and swings in destination-specific sales are large—but which had for a long time been eclipsed by the relative stability of aggregate trade flows. We know very little, however, about the economic factors that affect this dynamic pattern. A separate line of research has showed that countries' contracting institutions matter for the level and structure of aggregate trade flows. There have not been, however, attempts at understanding how, or whether, institutions shape the dynamics of exporting firms. In this paper we do precisely that, in a way merging and extending the insights of those distinct literatures. We show that, comparing two otherwise identical countries, a firm exporting to them will tend to start with higher volumes and serve for a longer period the country with better institutions. However, if the firm kept serving both destinations, its export growth will be higher to the country with *worse* institutions. Thus, (weak) contracting institutions represent not simply a type of fixed or sunk costs for exporting firms, as the literature on institutions and aggregate trade may suggest.[37] They also affect the dynamics of exporting firms in fundamental ways—as if firms' marginal cost of exporting changed overtime depending on their export experience and at different speeds in different markets.

We generate these predictions in the context of a very simple model designed to highlight the essential features of the mechanism we want to study. In particular, the model relies on the simple idea that, in countries with weak institutions, opportunistic behavior is relatively unconstrained. This can prevent economic relationships from arising and tends to depress the initial size of those that form. On the other hand, it also provides agents with a more fertile environment where they can build private reputations within their relationships. We develop this logic to study the relationships exporters to a country need to have with local importers in order to reach final consumers there. We test our predictions using a rich firm-destination-level panel of Belgian exporters serving virtually all countries in the world over 14 years. We identify our parameters using two alternative methods.

[37] This is the interpretation of, among others, Do and Levchenko (2009).

In one we use firm-year fixed effects, which allow us to control for all firm-level characteristics, including those that change over time and/or are typically unobservable. In the other we model more explicitly firms' choices of markets to enter and stay, relying on exclusion restrictions based on the concept of "extended gravity" forces. We find support for our predictions from both approaches.

Understanding this dynamic behavior is central to fully comprehending the welfare implications of international trade flows. After all, as for example Eaton et al. (2008) show for Colombian firms, new exporters generally contribute little to aggregate exports and display high failure rates. However, over several years the successful new exporters account for almost half of total export growth. But as our analysis makes clear, this dynamic pattern is very different across markets, implying potentially important consequences for aggregate trade flows, as well as for similar trade policies implemented in different countries.

Now, our model and its predictions are about a general problem that tends to arise when firms seek to serve a different foreign market. Naturally, they should apply differently to different sectors and firms. Furthermore, when the problem is serious enough, it should also prompt the affected firms to take actions to mitigate it. What we observe is therefore only the "net effect" after such actions are implemented, and in that sense our main estimates provide only a lower bound for its severity. We do provide additional empirical results highlighting the circumstances where the learning of firms about their foreign relationships—as reflected in their destination-specific export growth—are likely to be more or less important, by looking at differential effects for more experienced firms, for firms that have a parent/subsidiary in the destination country, for exports that take place through wholesalers, and for firms that export more complex goods. This is just a first step, however. A much closer scrutiny is necessary to give us a fuller view of how weak institutions affect the dynamics of different firms in foreign markets and the actions firms take (or not) to mitigate that difficulty. Given the flexible structure of our model, it is amenable to several extensions aimed at a closer look at this question, in ways that would possibly be testable with existing firm-level datasets. We look forward to future research in this direction.

Appendix

Proof of Lemma 1. First, since $Q(\theta;\lambda,c)$ maximizes $\pi(q,\theta;\lambda,c,\kappa)$, it must be the quantity established in any contract.

Now fix some date and consider a producer who is not in a partnership and finds a business opportunity. If he decides to take this opportunity, he obtains (where "0" denotes the event "no

default" and $v(\theta)$ is the value function of a producer in a partnership with a distributor with reputation $1-\theta$)

$$v(\theta_0) = \pi(\theta_0) + \beta_e \Pr(0 \mid \theta_0) v(\theta_1). \tag{12}$$

We can rewrite $v(\theta_0)$ as

$$v(\theta_0) = \pi(\theta_0) + \sum_{i=1}^{\infty} (\beta_e)^i \prod_{j=0}^{i-1} \Pr(0 \mid \theta_j) \pi(\theta_i). \tag{13}$$

Since

$$\prod_{j=0}^{i-1} \Pr(0 \mid \theta_j) = \prod_{j=0}^{i-1} (1 - \theta_j + \theta_j \lambda) = \prod_{j=0}^{i-1} \left(\frac{1 - \theta_0 + \lambda^{j+1} \theta_0}{1 - \theta_0 + \lambda^j \theta_0} \right) = 1 - \left(1 - \lambda^i\right) \theta_0,$$

we can rewrite (13) as

$$v(\theta_0) = \pi(\theta_0) + \sum_{i=1}^{\infty} (\beta_e)^i \left[1 - \left(1 - \lambda^i\right) \theta_0\right] \pi \left(\frac{\lambda^i \theta_0}{\lambda^i \theta_0 + 1 - \theta_0} \right).$$

Note that

$$v(0) = \frac{\pi(0)}{1 - \beta_e} > 0$$

and

$$v(1) = \frac{\pi(1)}{1 - \beta_e \lambda} < 0.$$

We now show that $\frac{\partial v(\theta_0)}{\partial \theta_0} < 0$. First note that, for all periods $i \in \{0, 1, 2, ...\}$, (1) and (4) imply

$$\frac{\partial \pi \left(\frac{\lambda^i \theta_0}{\lambda^i \theta_0 + 1 - \theta_0} \right)}{\partial \theta_0} = \frac{\partial \pi}{\partial \frac{\lambda^i \theta_0}{\lambda^i \theta_0 + 1 - \theta_0}} \frac{\partial \frac{\lambda^i \theta_0}{\lambda^i \theta_0 + 1 - \theta_0}}{\partial \theta_0} = \frac{-(1-\lambda) R[Q(\frac{\lambda^i \theta_0}{\lambda^i \theta_0 + 1 - \theta_0}; \lambda, c, \kappa)] \lambda^i}{(1 - \theta_0 + \lambda^i \theta_0)^2} < 0.$$

Since, for all $i \in \{0, 1, 2, ...\}$, $\left[1 - \left(1 - \lambda^i\right) \theta_0\right]$ is decreasing in θ_0, it must be that $\frac{\partial v(\theta_0)}{\partial \theta_0} < 0$. As a result, there exists a unique $\overline{\theta} \in (0, 1)$ such that $v(\overline{\theta}) = 0$. Thus, if $\theta_0 < \overline{\theta}$ we have that $v(\theta_0) > 0$ and it is optimal to enter a partnership. Otherwise, it is not. Finally, if a producer observes a default, his posterior belief becomes 1; since $v(1) < 0$, he terminates the partnership. If the producer does not observe a default, he increases the belief that the distributor is patient; since $v(.)$ is strictly decreasing, he continues in the partnership. ■

Proof of Lemma 2. Since the producer pays the cost of production, it is always optimal for the distributor to participate in a partnership. Moreover, since an unmatched distributor faces a stationary problem, she wants to form a partnership with the first producer she meets. Consider then an ongoing partnership that has lasted for k periods. The distributor follows the prescribed strategy and does not default even if he has the opportunity to do so if and only if

$$\frac{\kappa}{1 - \beta_d} \geq \kappa + R\left[Q\left(\theta_k; \lambda, c\right)\right],$$

which can be rewritten as

$$\frac{\beta_d}{1-\beta_d}\kappa \geq R\left[Q\left(\theta_k;\lambda,c\right)\right]. \tag{14}$$

A sufficient condition for (14) is

$$\frac{\beta_d}{1-\beta_d}\kappa \geq R\left[Q\left(0;\lambda,c\right)\right].$$

Now note that a sufficient condition ensuring that a distributor always has an incentive to default is

$$\frac{\beta_d}{1-\beta_d}\kappa \leq R\left[Q\left(1;\lambda,c\right)\right].$$

Thus, there is a unique value $\underline{\beta_d} \in \left(\frac{R[Q(1;\lambda,c)]}{R[Q(1;\lambda,c)]+\kappa}, \frac{R[Q(0;\lambda,c)]}{R[Q(0;\lambda,c)]+\kappa}\right)$ such that a patient distributor never defaults if and only if $\beta_d \geq \underline{\beta_d}$. ■

Lemma 3 *m_{t+1} and p_{t+1} strictly decrease over time and converge, respectively, to $m = \frac{(1-\sigma\lambda)\widehat{\theta}}{1-\sigma\lambda(1-x)}$ and $p = \frac{(1-\sigma)(1-\widehat{\theta})}{1-\sigma(1-x)}$.*

Proof. Let

$$\widehat{\theta}_t = \frac{m_t}{m_t + p_t},$$

where m_t and p_t satisfy

$$m_{t+1} = (1-x\sigma\lambda)m_t + (1-\sigma\lambda)(\widehat{\theta} - m_t), \tag{15}$$

$$p_{t+1} = (1-x\sigma)p_t + (1-\sigma)(1-\widehat{\theta} - p_t). \tag{16}$$

We will prove that $\widehat{\theta}_{t+1} \geq \widehat{\theta}_t$ by induction. First, since $m_0 = \widehat{\theta}$ and $p_0 = 1-\widehat{\theta}$, we have that $\widehat{\theta}_1 \geq \widehat{\theta}_0$ as long as

$$m_1(1-\widehat{\theta}) \geq p_1\widehat{\theta}.$$

Substituting for m_1 and p_1 using m_{t+1} and p_{t+1} above, we find that this inequality is always true, since $\lambda < 1$. Now assume that $\widehat{\theta}_t \geq \widehat{\theta}_{t-1}$. If we substitute for m_t and p_t, we can rewrite this inequality as

$$(1-\lambda\sigma)\widehat{\theta}p_t \geq (1-\lambda)p_t m_t + \lambda(1-\sigma)(1-\widehat{\theta})m_t. \tag{17}$$

We need to show that (17) implies $\widehat{\theta}_{t+1} \geq \widehat{\theta}_t$, which is equivalent to

$$(1-\lambda\sigma)\widehat{\theta}p_t \geq (1-x)(1-\lambda)\sigma p_t m_t + (1-\sigma)(1-\widehat{\theta})m_t. \tag{18}$$

Therefore, a sufficient condition for (18) to hold is that

$$(1-\lambda)p_t m_t + \lambda(1-\sigma)(1-\widehat{\theta})m_t \geq (1-x)(1-\lambda)\sigma p_t m_t + (1-\sigma)(1-\widehat{\theta})m_t,$$

which simplifies to

$$[1-\sigma(1-x)]p_t \geq (1-\sigma)(1-\widehat{\theta}).$$

Since p_t is a strictly decreasing sequence, it is sufficient to show that

$$[1-\sigma(1-x)]p \geq (1-\sigma)(1-\widehat{\theta}),$$

which is true, given the expression for p in (8). ■

Proof of Proposition 2. We have to show that inequality (9) holds. Since $\theta_k < \theta_0$, the direct effect is negative. In what follows we prove that the indirect effect is also negative:

$$\frac{\partial\left(\theta_0-\theta_k\right)}{\partial\lambda} < 0. \tag{19}$$

First, after some algebraic manipulation, we obtain

$$\frac{\partial\theta_k}{\partial\lambda} = \frac{\partial\theta_k}{\partial\lambda}\,|_{\theta_0} \;+ \frac{\partial\theta_k}{\partial\theta_0}\frac{\partial\theta_0}{\partial\lambda} = \frac{k\lambda^{k-1}\theta_0\left(1-\theta_0\right)}{(\lambda^k\theta_0+1-\theta_0)^2} + \frac{\lambda^k}{(\lambda^k\theta_0+1-\theta_0)^2}\frac{\partial\theta_0}{\partial\lambda}. \tag{20}$$

Substituting (20) in (19), we have

$$\left[1-\frac{\lambda^k}{(\lambda^k\theta_0+1-\theta_0)^2}\right]\frac{\partial\theta_0}{\partial\lambda} - \frac{k\lambda^{k-1}\theta_0\left(1-\theta_0\right)}{(\lambda^k\theta_0+1-\theta_0)^2} < 0. \tag{21}$$

Since

$$\frac{\partial\theta_0}{\partial\lambda} = -\frac{\sigma x}{\left(1-\sigma\lambda\right)\left(1-\sigma\lambda+\sigma\lambda x\right)}\theta_0(1-\theta_0),$$

we can rewrite (21) as

$$-\left[(1-(1-\lambda^k)\theta_0)^2-\lambda^k\right]\frac{\sigma x}{\left(1-\sigma\lambda\right)\left(1-\sigma\lambda+\sigma\lambda x\right)} - k\lambda^{k-1} < 0. \tag{22}$$

If $\left[(1-(1-\lambda^k)\theta_0)^2-\lambda^k\right] \geq 0$, then it is immediate that (22) is negative. Hence, we only need to consider the case where $\left[(1-(1-\lambda^k)\theta_0)^2-\lambda^k\right] < 0$. We need to show that

$$\frac{k\lambda^{k-1}}{\lambda^k-(1-(1-\lambda^k)\theta_0)^2} > \frac{\sigma x}{\left(1-\sigma\lambda\right)\left(1-\sigma\lambda+\sigma\lambda x\right)}. \tag{23}$$

Since the left-hand side of (23) is decreasing in θ_0, it suffices to consider the case where $\theta_0 = 1$:

$$\frac{k}{1-\lambda^k} > \frac{\sigma\lambda x}{\left(1-\sigma\lambda\right)\left(1-\sigma\lambda+\sigma\lambda x\right)}. \tag{24}$$

It is straightforward to show that the left-hand side of (24) is increasing in k. Thus, we only need to evaluate this inequality at $k = 1$:

$$\frac{1}{1-\lambda} > \frac{\sigma\lambda x}{\left(1-\sigma\lambda\right)\left(1-\sigma\lambda+\sigma\lambda x\right)}.$$

After some manipulation, we can rewrite this inequality as

$$(1-\sigma\lambda)^2+\sigma\lambda^2 x\,(1-\sigma)>0,$$

concluding the proof. ■

Proof of Prediction 3. We can express export growth from period t to period $t+k$ as $(\ln Q_k - \ln Q_0)$. It is affected by λ as follows:

$$\frac{\partial\,(\ln Q_k-\ln Q_0)}{\partial\lambda}=-\frac{R'(Q_k)\frac{\partial\gamma_k}{\partial\lambda}}{R''(Q_k)Q_k\gamma_k}+\frac{R'(Q_0)\frac{\partial\gamma_0}{\partial\lambda}}{R''(Q_0)Q_0\gamma_0}.$$

This expression is negative if and only if

$$\frac{\frac{\partial\gamma_k}{\partial\lambda}\frac{1}{\gamma_k}}{\frac{\partial\gamma_0}{\partial\lambda}\frac{1}{\gamma_0}}<\frac{R'(Q_0)R''(Q_k)Q_k}{R'(Q_k)R''(Q_0)Q_0}. \tag{25}$$

If Condition 1 holds, the right-hand side of (25) is greater than or equal to 1 and inequality (25) is always satisfied if

$$\frac{\partial\gamma_k}{\partial\lambda}\frac{1}{\gamma_k}<\frac{\partial\gamma_0}{\partial\lambda}\frac{1}{\gamma_0}.$$

Since $\gamma_k>\gamma_0$, it suffices to show that

$$\frac{\partial\gamma_k}{\partial\lambda}-\frac{\partial\gamma_0}{\partial\lambda}<0,$$

which is true from Proposition 2. ■

References

Acemoglu, Daron, Pol Antràs and Elhanan Helpman (2007). "Contracts and Technology Adoption." *American Economic Review* 97(3), 916-943.

Aeberhardt, R., I. Buono and H. Fadinger (2011). "Learning, Incomplete Contracts and Export Dynamics: Theory and Evidence from French Firms." Mimeo.

Ahn, JaeBin, Amit Khandelwal and Shang-Jin Wei (2011). "The role of intermediaries in facilitating trade." *Journal of International Economics* 84, 73-85.

Albornoz, F., H. Calvo-Pardo, G. Corcos and E. Ornelas, (2010). "Sequential Exporting." CEPR Discussion Paper 8103.

Anderson, James and Douglas Marcouiller (2002). "Insecurity and the Pattern of Trade: An Empirical Investigation." *Review of Economics and Statistics* 84(2), 342-352.

Antràs, Pol (2005). "Incomplete Contracts and the Product Cycle." *American Economic Review* 95(4), 1054-1073.

Antràs, Pol and C. Fritz Foley (2011). "Poultry in Motion: A Study of International Trade Finance Practices." Mimeo.

Antràs, Pol and Esteban Rossi-Hansberg (2009). "Organizations and Trade." *Annual Review of Economics* 1, 43-64.

Araujo, L. and E. Ornelas (2007). "Trust-Based Trade." CEP Discussion Paper 820.

Arkolakis, Costas (2010). "Market Penetration Costs and the New Consumers Margin in International Trade." *Journal of Political Economy* 118(6), 1151-1199.

Behrens, K., G. Corcos and G. Mion (2010). "Trade Crisis? What Trade Crisis?" CEPR Discussion Paper 7956.

Bernard, A., B. Jensen, S. Redding and P. Schott (2010a). "Intra-firm Trade and Product Contractibility." *American Economic Review P&P* 100(2), 444-448.

Bernard, A., B. Jensen, S. Redding and P. Schott (2010b). "Wholesalers and Retailers in U.S. Trade." *American Economic Review P&P* 100(2), 408-413.

Bernard, A., M. Grazzi and C. Tomasi (2011). "Intermediaries in International Trade: direct versus indirect modes of export." Mimeo.

Besedes, Tibor and Thomas Prusa (2006). "Ins, Outs, and the Duration of Trade." *Canadian Journal of Economics* 39(1), 266-295.

Besedes, Tibor, Byung-Cheol Kim and Volodymyr Lugovskyy (2011). "Export Growth and Credit Constraints." Mimeo.

Corcos, G., D. Irac, G. Mion and T. Verdier (2009). "The Determinants of Intrafirm Trade" CEPR Discussion Paper 7530.

Costinot, Arnaud (2009). "On the origins of comparative advantage." *Journal of International Economics* 77, 255-264.

Cuñat, Alejandro and Marc J. Melitz (2011). "Volatility, Labor Market Flexibility, and the Pattern of Comparative Advantage." *Journal of the European Economic Association*, forthcoming.

Do, Quy-Toan and Andrei Levchenko (2009). "Trade, inequality, and the political economy of institutions." *Journal of Economic Theory* 144, 1489-1520.

Eaton, J., M. Eslava, M. Kugler and J. Tybout (2008). "The Margins of Entry into Export Markets: Evidence from Colombia." In E. Helpman, D. Marin and T. Verdier (eds.), *The Organization of Firms in a Global Economy*, Cambridge, MA: Harvard University Press.

Eaton, J., M. Eslava, C. Krizan, M. Kugler and J. Tybout (2010). "A Search and Learning Model of Export Dynamics." Mimeo.

Feenstra, Robert and Gordon Hanson (2004). "Intermediaries in Entrepot Trade: Hong Kong Re-Exports of Chinese Goods." *Journal of Economics & Management Strategy* 13(1), 3-35.

Felbermayr, Gabriel and Benjamin Jung (2011). "Trade Intermediation and the Organization of Exporters." *Review of International Economics*, forthcoming.

Fernandes, Ana and Heiwai Tang (2011). "Learning from Offshored Production: Evidence from Exporters' Performance." Mimeo.

Foley, C. Fritz, Matthew Johnson and David Lane (2010). "Note on International Trade Finance." Harvard Business School Note 9-211-007.

Freund, Caroline and Martha Pierola (2010). "Export Entrepreneurs: Evidence from Peru." World Bank Policy Research Working Paper 5407.

Greif, Avner (1993). "Contract Enforceability and Economic Institutions in Early Trade: The Maghribi Traders' Coalition." *American Economic Review* 83(3), 525-48.

Gwartney, James and Robert Lawson (2003). "The concept and measurement of economic freedom." *European Journal of Political Economy* 19(3), 405-430.

Head, K. and T. Mayer (2002). "Illusory Border Effects: Distance Mismeasurement Inflates Estimates of Home Bias in Trade." CEPII Working Paper 2002-01.

Kaufmann, D., A. Kraay and M. Mastruzzi (2009). "Governance Matters VIII: Aggregate and Individual Governance Indicators 1996–2008." World Bank Working Paper 4978.

Lawless, Martina (2011). "Marginal Distance: Does Export Experience Reduce Firm Trade Costs?" Mimeo.

Levchenko, Andrei (2007). "Institutional Quality and International Trade." *Review of Economic Studies* 74(3), 791-819.

McLaren, John (1999). "Supplier Relations and the Market Context: A theory of handshakes." *Journal of International Economics* 48, 121-138.

McMillan, John and Christopher Woodruff (1999). "Interfirm Relationships and Informal Credit in Vietnam." *Quarterly Journal of Economics* 114, 1285-1320.

Melitz, M. (2003). "The Impact Of Trade On Intra-Industry Reallocations And Aggregate Industry Productivity." *Econometrica* 71, 1695-1725.

Morales, Eduardo, Gloria Sheu and Andres Zahler (2011). "Gravity and Extended Gravity: Estimating a Structural Model of Export Entry." Mimeo.

Nunn, Nathan (2007). "Relationship-Specificity, Incomplete Contracts, and the Pattern of Trade." *Quarterly Journal of Economics* 122(2), 569-600.

Ranjan, Priya and Jae Young Lee (2007). "Contract Enforcement and the Volume of International Trade in Different Types of Goods." *Economics and Politics* 19(2), 191-218.

Rauch, James and Joel Watson (2003). "Starting Small in an Unfamiliar Environment." *International Journal of Industrial Organization* 21, 1021-1042.

Tang, Heiwai and Yifan Zhang (2011). "Quality Differentiation and Trade Intermediation." Mimeo.

Tirole, Jean (1996). "A Theory of Collective Reputations (with applications to the persistence of corruption and to firm quality)." *Review of Economic Studies* 63, 1-22.

Turrini, Alessandro and Tanguy van Ypersele (2010). "Traders, courts, and the border effect puzzle." *Regional Science and Urban Economics* 40, 81-91.

Table 4: Entry Into a New Export Market and the Initial Value of Exports

Dependent Variable	Entry	Value	Entry	Value
Type	Binary	Continuous	Binary	Continuous
Probability of Entry	0.0140	–	0.0146	–
		The Role of Institutions		
λ_{dt}	0.0100^{a}	0.1413^{a}	0.0003^{a}	0.0312^{a}
	(0.0001)	(0.0107)	(0.0001)	(0.0077)
		Controls		
	None		**d and dt**	
$Distw_{d}$			-0.0085^{a}	-0.0933^{a}
			(0.0001)	(0.0074)
$Lang_{d}$			0.0072^{a}	-0.1860^{a}
			(0.0001)	(0.0125)
$Colony_{d}$			0.0202^{a}	0.0551^{b}
			(0.0004)	(0.0278)
$Border_{d}$			0.0791^{a}	1.0344^{a}
			(0.0011)	(0.0250)
GDP_{dt}			0.0035^{a}	0.0629^{a}
			(0.0000)	(0.0044)
EU_{dt}			-0.0021^{a}	-0.0712^{a}
			(0.0004)	(0.0218)
$OECD_{dt}$			0.0089^{a}	-0.0664^{a}
			(0.0002)	(0.0187)
WTO_{dt}			0.0019^{a}	-0.0774^{a}
			(0.0001)	(0.0130)
Firm-Year fixed effects	YES	YES	YES	YES
Observations	11,118,379	155,694	10,575,194	154,882
R^2	0.0071	0.0064	0.0296	0.0595

Two-way clustered (country firm) standard errors in parentheses. ^{abc} indicate the significance of the coefficient, ^{a} p<0.01, ^{b} p<0.05, ^{c} p<0.1.

Table 5: Survival in a New Export Market and the Growth Rate of Exports

Dependent Variable	Market Survival	Export Growth	Market Survival	Export Growth	Market Survival	Export Growth	Market Survival	Export Growth
Type	Binary	Continuous	Binary	Continuous	Binary	Continuous	Binary	Continuous
Years After Entry$\equiv k$	**k = 1 Year**		**k = 2 Years**		**k = 5 Years**		**k = 10 Years**	
Prob. of Survival Upon Entry	0.4089	–	0.2562	–	0.1544	–	0.0776	–
	The Role of Institutions							
λ_{dt}	0.0119^{b}	-0.0271^{c}	0.0135^{a}	-0.0600^{a}	0.0101^{b}	-0.1268^{a}	0.0052^{c}	-0.1344^{b}
	(0.0047)	(0.0165)	(0.0050)	(0.0230)	(0.0043)	(0.0364)	(0.0031)	(0.0531)
	idt, d, and dt Controls							
exp^{0}_{idt}	0.0725^{a}	-0.4394^{a}	0.0692^{a}	-0.5043^{a}	0.0520^{a}	-0.6038^{a}	0.0313^{a}	-0.7302^{a}
	(0.0023)	(0.0217)	(0.0019)	(0.0246)	(0.0024)	(0.0295)	(0.0022)	(0.0300)
$Distw_{d}$	-0.0285^{a}	-0.1089^{a}	-0.0276^{a}	-0.1365^{a}	-0.0234^{a}	-0.2024^{a}	-0.0182^{a}	-0.2127^{a}
	(0.0043)	(0.0190)	(0.0041)	(0.0231)	(0.0036)	(0.0370)	(0.0032)	(0.0579)
$Lang_{d}$	0.0058	-0.0814^{a}	-0.0091	-0.0254	-0.0146	-0.1073^{c}	-0.0106	0.1006
	(0.0141)	(0.0279)	(0.0157)	(0.0375)	(0.0139)	(0.0559)	(0.0101)	(0.0679)
$Colony_{d}$	0.0619^{b}	0.0126	0.0588^{a}	-0.0307	0.0488^{a}	0.1160	0.0418^{a}	0.4457
	(0.0278)	(0.0806)	(0.0210)	(0.1104)	(0.0157)	(0.2256)	(0.0108)	(0.2727)
$Border_{d}$	0.0584^{c}	0.3442^{a}	0.0635^{c}	0.3360^{a}	0.0820^{b}	0.4051^{a}	0.0457^{b}	0.4727^{a}
	(0.0307)	(0.0574)	(0.0359)	(0.0847)	(0.0322)	(0.1180)	(0.0220)	(0.1538)
GDP_{dt}	0.0085^{b}	0.0906^{a}	0.0025	0.1388^{a}	-0.0000	0.2099^{a}	0.0015	0.3071^{a}
	(0.0038)	(0.0114)	(0.0042)	(0.0133)	(0.0039)	(0.0200)	(0.0026)	(0.0258)
EU_{dt}	0.0589^{a}	0.0587^{c}	0.0580^{a}	0.1308^{b}	0.0521^{a}	0.0834	0.0332^{a}	0.2235^{b}
	(0.0093)	(0.0348)	(0.0103)	(0.0611)	(0.0088)	(0.0710)	(0.0091)	(0.1008)
$OECD_{dt}$	0.0237^{b}	-0.0447	0.0372^{a}	-0.0303	0.0368^{a}	0.0196	0.0233^{a}	-0.1731
	(0.0110)	(0.0425)	(0.0115)	(0.0564)	(0.0089)	(0.0878)	(0.0065)	(0.1252)
WTO_{dt}	0.0289^{a}	0.0163	0.0344^{a}	-0.0003	0.0353^{a}	0.0576	0.0251^{a}	0.0420
	(0.0096)	(0.0295)	(0.0091)	(0.0440)	(0.0083)	(0.0868)	(0.0059)	(0.1568)
	Changes k years after Entry of dt controls are also included in estimations, along with real exchange rate changes							
Firm-Year fixed effects	YES	YES	YES	YES	YES	YES	YES	YES
Observations	154,882	63,330	154,882	39,679	154,882	23,918	154,791	12,019
R^2	0.0934	0.1763	0.1086	0.2164	0.1069	0.2605	0.0743	0.3414

Two-way clustered (country firm) standard errors in parentheses. ^{abc} indicate the significance of the coefficient, ^{a} p<0.01, ^{b} p<0.05, ^{c} p<0.1.

Table 6: Entry Into a New Export Market and the Initial Value of Exports: Heckman two-stage procedure

Heckman procedure	First step	Second step
Dependent Variable	Entry	Value
Type	Binary	Continuous
Probability of Entry	0.0167	–
	The Role of Institutions	
λ_{dt}	0.0005^{a}	0.0290^{a}
	(0.0001)	(0.0089)
	Excluded Variables and Inverse Mill Ratio	
$EXTG\_Lang_{idt}$	0.0013^{a}	–
	(0.0001)	
$EXTG\_Border_{idt}$	0.0061^{a}	–
	(0.0002)	
$EXTG\_Continent_{idt}$	0.0031^{a}	–
	(0.0002)	
$EXTG\_GDP_{idt}$	0.0007^{a}	–
	(0.0002)	
IM	–	0.2749^{c}
		(0.1541)
	it Controls	
n_dest_{it}	0.0004^{a}	0.0151^{a}
	(0.0000)	(0.0043)
$prod_{it}$	0.0004^{a}	0.3590^{a}
	(0.0001)	(0.0242)
$size_{it}$	0.0006^{a}	0.1140^{a}
	(0.0001)	(0.0200)
cap_{it}	-0.0000	0.0240^{a}
	(0.0000)	(0.0088)
$wage_{it}$	-0.0007^{a}	-0.0462
	(0.0001)	(0.0300)
	d and dt Controls	
$Distw_{d}$	-0.0049^{a}	-0.1533^{a}
	(0.0001)	(0.0419)
$Lang_{d}$	0.0017^{a}	-0.2342^{a}
	(0.0001)	(0.0203)
$Colony_{d}$	0.0411^{a}	0.0888
	(0.0011)	(0.1231)
$Border_{d}$	0.0100^{a}	1.0144^{a}
	(0.0003)	(0.0360)
GDP_{dt}	0.0027^{a}	0.0894^{a}
	(0.0000)	(0.0243)
EU_{dt}	-0.0009^{a}	-0.1482^{a}
	(0.0001)	(0.0208)
$OECD_{dt}$	-0.0003^{a}	-0.1205^{a}
	(0.0001)	(0.0207)
WTO_{dt}	0.0019^{a}	-0.0535^{b}
	(0.0001)	(0.0243)
Industry and Time Dummies	YES	YES
Observations	5,737,534	95,788
R^2	0.2186	0.1288

Marginal effects are reported for the first step of the Heckman procedure. Country-clustered standard errors in parentheses. ^{abc} indicate the significance of the coefficient, ^{a} p<0.01, ^{b} p<0.05, ^{c} p<0.1.

Table 7: Survival in a New Export Market and the Growth Rate of Exports: Heckman two-stage procedure

Heckman procedure	First step	Second step	First step	Second step	First step	Second step	First step	Second step
Dependent Variable	Market Survival	Export Growth	Market Survival	Export Growth	Market Survival	Export Growth	Market Survival	Export Growth
Type	Binary	Continuous	Binary	Continuous	Binary	Continuous	Binary	Continuous
Years After Entry$\equiv k$	**k = 1 Year**		**k = 2 Years**		**k = 5 Years**		**k = 10 Years**	
Prob. of Survival Upon Entry	0.4505	–	0.2969	–	0.1875	–	0.1000	–
	The Role of Institutions							
λ_{dt}	0.0398^a	-0.0073	0.0385^a	-0.0078	0.0257^a	-0.1421^a	0.0085^a	-0.2552^a
	(0.0043)	(0.0133)	(0.0028)	(0.0184)	(0.0022)	(0.0293)	(0.0012)	(0.0446)
	Excluded Variables and Inverse Mill Ratio							
$EXTG\_Lang_{idt}$	0.0123	–	0.0060	–	-0.0033	–	-0.0029^c	–
	(0.0108)		(0.0053)		(0.0035)		(0.0015)	
$EXTG\_Border_{idt}$	0.0244^a	–	0.0218^a	–	0.0177^a	–	0.0048^a	–
	(0.0078)		(0.0045)		(0.0032)		(0.0016)	
$EXTG\_Continent_{idt}$	0.0751^a	–	0.0200^a	–	0.0030	–	-0.0082^a	–
	(0.0119)		(0.0068)		(0.0049)		(0.0021)	
$EXTG\_GDP_{idt}$	0.1195^a	–	0.0278^a	–	0.0098^c	–	0.0010	–
	(0.0124)		(0.0074)		(0.0055)		(0.0024)	
IM	–	0.0005	–	0.1930^a	–	0.2116^c	–	-0.0097
		(0.0385)		(0.0653)		(0.1264)		(0.2452)
	idt and it Controls							
exp^0_{idt}	0.0762^a	-0.3472^a	0.0548^a	-0.4098^a	0.0319^a	-0.5119^a	0.0116^a	-0.6478^a
	(0.0023)	(0.0067)	(0.0014)	(0.0106)	(0.0009)	(0.0190)	(0.0005)	(0.0342)
n_dest_{it}	0.0261^a	0.0037^a	0.0063^a	0.0051^a	0.0035^a	0.0075^a	0.0016^a	0.0007
	(0.0017)	(0.0008)	(0.0006)	(0.0010)	(0.0003)	(0.0028)	(0.0001)	(0.0044)
$prod_{it}$	0.0150^b	0.2179^a	0.0148^a	0.2969^a	0.0096^a	0.3389^a	0.0079^a	0.4021^a
	(0.0069)	(0.0207)	(0.0042)	(0.0310)	(0.0035)	(0.0465)	(0.0020)	(0.0698)
$size_{it}$	0.0060	0.0803^a	0.0158^a	0.1187^a	0.0107^a	0.1114^b	0.0079^a	0.0991
	(0.0056)	(0.0228)	(0.0040)	(0.0333)	(0.0036)	(0.0514)	(0.0020)	(0.0668)
cap_{it}	-0.0074^a	0.0352^a	-0.0028^c	0.0470^a	-0.0016	0.0482^a	0.0000	0.0879^a
	(0.0022)	(0.0079)	(0.0016)	(0.0115)	(0.0013)	(0.0161)	(0.0008)	(0.0233)
$wage_{it}$	-0.0402^a	-0.0509^c	-0.0320^a	-0.0594	-0.0206^a	0.0318	-0.0112^a	0.1144
	(0.0082)	(0.0302)	(0.0057)	(0.0428)	(0.0051)	(0.0688)	(0.0028)	(0.0864)
	d and dt Controls							
$Distw_d$	-0.0051	-0.0822^a	-0.0071^a	-0.1339^a	-0.0048^a	-0.1950^a	-0.0041^a	-0.1855^a
	(0.0037)	(0.0117)	(0.0023)	(0.0151)	(0.0016)	(0.0226)	(0.0009)	(0.0377)
$Lang_d$	-0.0464^a	-0.0783^a	-0.0457^a	-0.0723^a	-0.0261^a	-0.0683	-0.0093^a	0.1409^b
	(0.0057)	(0.0198)	(0.0037)	(0.0266)	(0.0027)	(0.0430)	(0.0014)	(0.0608)
$Colony_d$	0.0986^a	-0.0242	0.0923^a	0.0423	0.0801^a	-0.1256	0.0436^a	-0.1869
	(0.0167)	(0.0604)	(0.0160)	(0.0989)	(0.0164)	(0.1829)	(0.0135)	(0.3300)
$Border_d$	0.0937^a	0.1991^a	0.0460^a	0.2516^a	0.0411^a	0.3427^a	0.0116^a	0.3819^a
	(0.0104)	(0.0314)	(0.0064)	(0.0401)	(0.0050)	(0.0571)	(0.0025)	(0.0804)
GDP_{dt}	-0.0281^a	0.0681^a	-0.0129^a	0.1158^a	-0.0052^a	0.1677^a	0.0002	0.2478^a
	(0.0018)	(0.0061)	(0.0011)	(0.0082)	(0.0008)	(0.0116)	(0.0004)	(0.0168)
EU_{dt}	0.0351^a	0.0104	0.0350^a	0.0655^c	0.0284^a	0.1425^a	0.0094^a	0.3528^a
	(0.0081)	(0.0271)	(0.0049)	(0.0351)	(0.0036)	(0.0493)	(0.0020)	(0.0820)
$OECD_{dt}$	0.0603^a	-0.0424	0.0413^a	-0.0816^b	0.0256^a	0.0500	0.0078^a	-0.0866
	(0.0113)	(0.0298)	(0.0063)	(0.0400)	(0.0046)	(0.0592)	(0.0024)	(0.0952)
WTO_{dt}	-0.0089	0.0038	0.0078	0.0032	0.0132^a	0.0027	0.0106^a	0.0393
	(0.0096)	(0.0265)	(0.0060)	(0.0366)	(0.0049)	(0.0612)	(0.0026)	(0.1227)
	Changes k years after Entry of it and dt controls are also included in estimations, along with real exchange rate changes							
Industry and Time Dummies	YES	YES	YES	YES	YES	YES	YES	YES
Observations	95,788	43,154	95,708	28,419	95,654	17,932	95,572	9,555
R^2	0.6058	0.1551	0.4414	0.2142	0.4129	0.2762	0.4123	0.3452

Marginal effects are reported for the first step of the Heckman procedure. Country-clustered standard errors in parentheses. ^{abc} indicate the significance of the coefficient, ^{a} p<0.01, ^{b} p<0.05, ^{c} p<0.1.

Table 8: Entry into a New Export Market and the Initial Value of Exports: only exporters selling over €1 million; alternative measures of λ_{dt}

Dependent Variable	Entry	Value
Type	Binary	Continuous
	Estimations restricted to exporters selling over €1 million	
	Firm-time fixed effects:	
λ_{dt}	0.0052^a	0.0410^a
	(0.0002)	(0.0115)
	Heckman procedure:	
λ_{dt}	0.0033^a	0.0125
	(0.0001)	(0.0252)
	Alternative measures of λ_{dt}	
	Quality of the legal system Gwartney and Lawson (2003)	
	Firm-time fixed effects:	
λ_{dt}	0.0003^a	0.0391^a
	(0.0000)	(0.0045)
	Heckman procedure:	
λ_{dt}	0.0002^a	0.0269^a
	(0.0000)	(0.0050)
	6 - log(cost) of enforcing a contract (as % of debt value) World Bank's Doing Business 2011	
	Firm-time fixed effects:	
λ_{dt}	0.0001^a	0.0418^a
	(0.0000)	(0.0113)
	Heckman procedure:	
λ_{dt}	0.0007^a	0.0647^a
	(0.0000)	(0.0133)

The three sets of estimations include, for the firm-year fixed effects specification, the d, and dt controls listed in Table 4 with two-way clustered (country firm) standard errors in parentheses. The Heckman specification includes the it, d, and dt controls listed in Table 6 with country-clustered standard errors. ^{abc} indicate the significance of the coefficient, ^{a} p<0.01, ^{b} p<0.05, ^{c} p<0.1.

Table 9: Survival in a New Export Market and the Growth Rate of Exports: only exporters selling over €1 million; no control for exp^0_{idt}; alternative measures of λ_{dt}

Dependent Variable	Market Survival	Export Growth	Market Survival	Export Growth	Market Survival	Export Growth	Market Survival	Export Growth
Type	Binary	Continuous	Binary	Continuous	Binary	Continuous	Binary	Continuous
Years After Entry$\equiv k$	**k = 1 Year**		**k = 2 Years**		**k = 5 Years**		**k = 10 Years**	
	Estimations restricted to exporters selling over €1 million							
	Firm-time fixed effects:							
λ_{dt}	0.0276^a	-0.0096	0.0283^a	-0.0715^b	0.0207^a	-0.1141^a	0.0109^a	-0.1156^c
	(0.0055)	(0.0229)	(0.0059)	(0.0280)	(0.0048)	(0.0425)	(0.0039)	(0.0648)
	Heckman procedure:							
λ_{dt}	0.0147^c	0.0008	0.0450^a	0.0276	0.0260^a	-0.1007^a	0.0075^b	-0.1886^a
	(0.0089)	(0.0203)	(0.0063)	(0.0267)	(0.0052)	(0.0389)	(0.0033)	(0.0531)
	Excluding exp^0_{idt} from controls							
	Firm-time fixed effects:							
λ_{dt}	0.0096^c	-0.0093	0.0116^b	-0.0375	0.0089^c	-0.1107^a	0.0045	-0.1078^c
	(0.0054)	(0.0166)	(0.0058)	(0.0255)	(0.0049)	(0.0403)	(0.0034)	(0.0580)
	Heckman procedure:							
λ_{dt}	0.0398^a	0.0065	0.0392^a	-0.0072	0.0268^a	-0.1713^a	0.0085^a	-0.2362^a
	(0.0042)	(0.0142)	(0.0028)	(0.0206)	(0.0023)	(0.0330)	(0.0013)	(0.0493)
	Alternative measures of λ_{dt}							
	Quality of the legal system, Gwartney and Lawson (2003)							
	Firm-time fixed effects:							
λ_{dt}	0.0051^b	-0.0274^b	0.0044^c	-0.0478^a	0.0014	-0.0837^a	0.0008	-0.0534^c
	(0.0025)	(0.0108)	(0.0024)	(0.0168)	(0.0020)	(0.0229)	(0.0014)	(0.0279)
	Heckman procedure:							
λ_{dt}	0.0167^a	-0.0087	0.0135^a	-0.0152	0.0071^a	-0.0626^a	0.0021^a	-0.0901^a
	(0.0024)	(0.0077)	(0.0014)	(0.0102)	(0.0010)	(0.0150)	(0.0006)	(0.0225)
	6 - log(cost) of enforcing a contract (as % of debt value), World Bank's Doing Business 2011							
	Firm-time fixed effects:							
λ_{dt}	0.0227^a	-0.0288	0.0182^b	-0.0978^a	0.0134^c	-0.0774	0.0102^b	-0.0926
	(0.0088)	(0.0282)	(0.0086)	(0.0374)	(0.0075)	(0.0508)	(0.0052)	(0.0692)
	Heckman procedure:							
λ_{dt}	0.0712^a	-0.0206	0.0517^a	-0.0784^a	0.0237^a	-0.1319^a	0.0082^a	-0.1929^a
	(0.0071)	(0.0212)	(0.0041)	(0.0280)	(0.0028)	(0.0417)	(0.0014)	(0.0697)

The four sets of estimations include, for the firm-year fixed effects specification, the idt (except when excluding exp^0_{idt}), d, dt controls and their changes k years after entry listed in Table 5 with two-way clustered (country firm) standard errors in parentheses. The Heckman specification includes the idt (except when excluding exp^0_{idt}), it, d, dt controls and their changes k years after entry listed in Table 7 with country-clustered standard errors. ^{abc} indicate the significance of the coefficient, ^{a} p<0.01, ^{b} p<0.05, ^{c} p<0.1.

Table 10: Additional results on the Growth Rate of Exports

Dependent Variable	Export Growth			
Years After Entry$\equiv k$	**k = 1 Year**	**k = 2 Years**	**k = 5 Years**	**k = 10 Years**
	Interaction between λ_{dt} and a dummy indicating the presence of an affiliate and/or a parent company in country d at time t			
	Firm-time fixed effects:			
inter	-0.0239	0.4085	0.4057	0.6574
	(0.1824)	(0.3662)	(0.4996)	(0.6645)
	Heckman procedure:			
inter	-0.0080	0.0872	0.1804	0.4523
	(0.2100)	(0.3019)	(0.3920)	(0.4448)
	Interaction between λ_{dt} and the measure of product complexity developed by Nunn(2007)			
	Firm-time fixed effects:			
inter	-0.1414^{a}	0.0207	-0.1944^{c}	-0.3870^{b}
	(0.0471)	(0.0583)	(0.0997)	(0.1652)
	Heckman procedure:			
inter	-0.0213	0.0850^{c}	-0.1710^{b}	0.0136
	(0.0352)	(0.0491)	(0.0770)	(0.1180)
	Interaction between λ_{dt} and firm "experience": number of served destinations and employment size			
	Firm-time fixed effects:			
inter with n_dest_{it}	0.0024^{a}	0.0022^{a}	0.0028^{a}	0.0014
	(0.0006)	(0.0007)	(0.0009)	(0.0020)
inter with $size_{it}$	0.0501^{a}	0.0611^{a}	0.0715^{a}	0.0726^{b}
	(0.0094)	(0.0133)	(0.0185)	(0.0290)
	Heckman procedure:			
inter with n_dest_{it}	0.0029^{a}	0.0024^{a}	0.0019^{b}	-0.0005
	(0.0004)	(0.0006)	(0.0009)	(0.0015)
inter with $size_{it}$	0.0401^{a}	0.0505^{a}	0.0745^{a}	0.0617^{a}
	(0.0059)	(0.0082)	(0.0116)	(0.0201)
	Interaction between λ_{dt} and a dummy for wholesalers			
	Firm-time fixed effects:			
inter	-0.0742^{b}	-0.0781^{c}	-0.1259^{c}	-0.1551
	(0.0354)	(0.0438)	(0.0728)	(0.1087)
	Heckman procedure:			
inter	-0.0576^{a}	-0.0254	-0.0710^{b}	-0.0769
	(0.0173)	(0.0258)	(0.0354)	(0.0564)

The five sets of estimations include, for the firm-year fixed effects specification, the idt, d, dt controls and their changes k years after entry listed in Table 5 with two-way clustered (country firm) standard errors in parentheses. The Heckman specification includes the idt, it, d, dt controls and their changes k years after entry listed in Table 7 with country-clustered standard errors. ^{abc} indicate the significance of the coefficient, ^{a} p<0.01, ^{b} p<0.05, ^{c} p<0.1.