Relational Contracts in Global Sourcing: Evidence from the U.S.[*]

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Abstract

This paper studies both theoretically and empirically the role of relational contracts (repeated interactions) in facilitating global sourcing. Using unique importer-exporter matched data from the U.S. Census that cover the universe of U.S. import transactions, we provide the first piece of evidence about how long-term relationships shape world trade, above and beyond intra-firm trade that has been the focus of the literature on the organizational structure of global sourcing. We document several stylized facts in regards to the long-term relationships in U.S. trade. The (weighted) average age of the relationships between a U.S. importer and a foreign exporter ranges from 1 to 8 years across countries and from 3 to 5 years across sectors (HS2). We find that across sectors, the share of long-term relational imports is increasing in the importance of relationship-specific investments in production and the degree of product quality differentiation. Within an importer-exporter pair, the transaction volume is increasing in the age of the pair, more so in sectors in which relationship-specific investment is more important. Within sectors, long-term relational imports are more prevalent from countries that are more capital and skill abundant, as well as from those that have better rule of law and financial market development, suggesting that relational contracts could be complements rather than substitutes for formal contracts. Our findings show that firms use relational contracts as an alternative to vertical integration to alleviate hold-up costs and uncertainty in world trade. The findings of the prevalence of long-term relationships in trade also shed light on various puzzles in international trade.

Key Words: Relational contracts, importer-exporter matches, reputation

JEL Classification Numbers: F14, F23, L14

"One doesn't run to lawyers if he wants to stay in business because one must behave decently"
Stewart Macaulay (1963).

1   Introduction

Contracts are often hard to enforce, especially in international commerce that involve business practices and contracting institutions that vary across countries. This reality has inspired researchers, starting with Antràs (2003), to study how the difficulities and depenences in contract enforcement shape the pattern and structure of world trade across industries and countries. The key prediction of the literature is that when firms face potential hold-up by foreign trading partners, vertical integration serves as an optimal response to reduce the associated efficiency loss.

Compared to vertical integration, a potentially less costly and more commonly used solution to hold-up problems is to rely on the value of future relationships relationships, or relational contracts, to sustain appropriate behaviors of foreign partners (Greif, 1989, 1993; Baker, Gibbons, Murphy, 2002; MacLeod, 2007).[1] This channel has been overlooked in the literature as an important determinant of the pattern of global sourcing and trade, in part because it is based on informal agreements, which are often unobservable. In addition, the lack of data on inter-firm repeated interactions also restricts researchers to study their dynamics and effects on the value of transactions. In this paper, we provide the first piece of evidence about the role of relational contracts (long-term relationships) in shaping world trade, using unique and confidential importer-exporter matched data that cover the universe of U.S. import transactions over the period of 1992-2010.

We first document several stylized facts in regards to the prevalence of long-term relationships in U.S. trade. The (weighted) average age of the relationship between a U.S. importer and a foreign exporter ranges between 1 and 8 years across countries and 3-5 years across sectors (HS2). Relational trade (defined as any bilateral trade relationships that last for at least 3 years) accounted for on average 44% of global trade across sectors, compared to 31% that belong to intra-firm (related-party) trade. We find that across sectors, the share of relational imports is increasing in the importance of relationship-specific investments in production, measured conventionally as capital intensity, skill intensity, and contract dependence, as well as the degree of product quality differentiation of the sector. Within an importer-exporter pair, the transaction volume is increasing in the age of the pair, more so in sectors in which relationship-specific investment is more important in driving output. Within sectors, long-term relational imports are more prevalent from countries that are more capital and skill abundant, as well as from those that have better rule of law and financial market development. These results suggest that relational contracts may serve as complements rather than substitutes for formal contracts. Our findings show that firms use relational contracts as an alternative to vertical integration to deal with hold-up and uncertainty in world trade, which provide new lens to study how contract enforcement and imperfections affect the pattern of global

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[1]Formal contracts always require substantial ex-ante legal fees and ex-post verification costs. Moreover, outcomes are observable but not verifiable in courts, while relational contracts involve only observable outcomes with punishment implicitly built in the relationships, which often does not require a third-party court for enforcement.

sourcing.

To guide our empirical analysis, we develop a model that incorporates Bayesian updating by importers about the credibility of foreign suppliers in an otherwise standard Antràs-Helpman (2004) model that features incomplete contracting. The idea is that buyers learn about the type of the foreign suppliers through repeated interactions over time. Conditional on survival, the probability that a foreign supplier is a credible type (one that can honor the a commitment) should be increasing in the age of the relationship. If expected trade volume is increasing in the probability that the seller is a credible one, it should also be increasing in the age of the relationship. In an environment that sectors differ in the intensity of headquarter (importer) inputs, hold-up by the supplier will be intensified in the more headquarter-intensive sectors. As such, the "age" effect on trade volume will be more pronounced in the more headquarter-intensive (capital-intensive, skill-intensive, and those that are more contract-dependent) industries. When quality differentiation is incorporated into the model, the "age" effect on trade volume will also be stronger for vertically differentiated inputs.

Our paper relates to several strands of studies. First, it is related to the literature on the determinants of arm's-length trade versus vertical integration in global sourcing. Antràs (2003), Yeaple (2006), Bernard, Jensen, Redding and Schott (2008), and Nunn and Trefler (2011) are important precursors in this literature. They examine the effects of headquarter inputs, productivity dispersion and contractibility of inputs on intra-firm imports as a share of total imports in the U.S. Bernard et al. (2008) use a new measure of product contractibility based on the importance of intermediaries in international trade. Nunn and Trefler (2011) explore the varying degree of relationship specificity of different kinds of physical capital, and use new data to take into account U.S. intra-firm imports that are shipped from foreign parents of U.S. subsidiaries. Recent studies use firm-level data to examine empirically the theory of intra-firm trade. Defever and Toubal (2007) and Corcos et al. (2008) provide evidence from France, while Kohler and Smolka (2009) provide evidence from Spain. These studies find empirical support for the predictions of productivity ranking across production modes that involve different ownership arrangements.

Second, our paper relates to the large literature on relational contracts. On the empirical front, our results complement those by McMillan and Woodruff (1999) and Banerjee and Duflo (2000) who show the importance of long-term relationship in facilitating transactions between firms in developing countries. In particular, by considering a world without formal contracts, McMillan and Woodruff (1999) find evidence consistent with long term informal relationships facilitating trade credit. Banerjee and Duflo (2000) infer the importance of reputation by showing that a firm's age strongly correlates with contractual forms in the Indian software industry. We take this framework to examine how relational contract may matter for international trade. We conduct two sets of regression analysis. Across sectors, we examine whether sector characteristics that proxy for the severity of hold-up, such as capital intensity, skill intensity, and R&D intensity may be correlated with the average duration of importer-exporter trade relationships. Then we explore the differential effects of the age of a trade relationship on the volume and the share of trade within a firm pair

across sectors (HS2). On the theoretical front, our paper provides empirical support to a series of papers on relational contracts (see Macleod for a review).

Regarding the role of relational contracts in shaping trade flows, Antràs and Foley (2015) and Macchiavello (2010) are two closely related studies. Antras and Foley (2015) study the use of prepayment to alleviate the risk of default by the importer. Using data from a U.S. based exporter of frozen and refrigerated food products they find that prepayment is more common at the beginning of a relationship and with importers located in countries with a weaker institutional environment. Macchiavello (2010), instead, focuses on the implications of learning about new suppliers in the context of Chilean wine exports.

[To be completed]

2   A Simple Model

[the theoretical framework is incomplete but will be substantially updated in the next version of the paper.]

To guide our empirical analysis, we develop a heterogeneous-firm model that features repeated interactions and the importance of reputation-building. There are two types of sellers: good or bad. The good type can complete 100% of the outsourced output, while the bad type can complete only $\theta < 1$ fraction of output. θ can also be considered as the quality of output. The buyer holds an initial prior about the seller's type, and expects that with probability μ the seller is a good type; while with probability $1 - \mu$ the seller is a bad one. In other words, in the first year of the relationship, the buyer expects $\mu + (1 - \mu)\theta < 1$ unit of output produced per unit of outsourced task.

Through repeated interactions, the buyer updates its belief about the seller's type over time. Bayes rule implies the following (subjective) probability of the seller being a good type at period t:

$$\mu_t = \frac{\mu}{\mu + (1 - \mu)\theta^t}.$$

Conditional on survival, when the age of the relationship t converges to infinity, given that $\theta < 1$, μ_t converges to 1. In this sense, the volume of a buyer-seller transaction is increasing in the age of the relationship.

Moreover, we should expect a larger "age" impact on the volume of the trade in sectors where the credibility of the foreign supplier is more important. To illustrate this point more theoretically, we add more structure to the model. Consider now that production requires non-cooperative investments by the final-good producer (H) in the North and the foreign supplier (S) in the South, as in Antras and Helpman (2004). The final-goods market in the North is characterized by monopolistic competition so that H faces its own demand curve. The production of final goods requires the combination of material inputs m from the South and headquarter services h from the North,

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according to the following production function:

$$q = a \left(\frac{m}{\eta}\right)^{1-\eta} \left(\frac{h}{\eta}\right)^{\eta},$$

where a is firm productivity.[2] $\eta \in (0,1)$ is a sector-specific parameter, capturing the intensity of the use of foreign inputs in production. Monopolistic competition with an underlying constant-elasticity-of-substitution (CES) utility implies the following joint-production unit's revenue:[3]

$$R = D^{1-\alpha} a^{\alpha} \left(\frac{m}{\eta^m}\right)^{\alpha(1-\eta)} \left(\frac{h}{\eta^h}\right)^{\alpha\eta},$$

where D is a sector-specific demand shifter and $\alpha = 1 - \sigma^{-1}$ is increasing in the sector's elasticity of substitution, σ, across products.

The importance of the "age" effect can be illustrated by the expected revenue as follows:

$$E\left[R|\theta, t\right] = D^{1-\alpha} a^{\alpha} \left[\frac{(\mu_t(1-\theta) + \theta)m}{\eta^m}\right]^{\alpha(1-\eta)} \left(\frac{h}{\eta^h}\right)^{\alpha\eta}.$$

It is obvious that the effect on the expected revenue is increasing in μ_t, the probability that the supplier belongs to the good type. Since μ_t is increasing in t, $E\left[R|\theta, t\right]$ is also. Thus, we obtain the testable first hypothesis of this paper.

Hypothesis 1 *The volume of a trade transaction is increasing in the age of the relationship between an importer and an exporter, more so in the more headquarter-intensive sectors.*

How is it related to the sectoral characteristics? Notice that at first sight, the "age" effect is decreasing in η, the headquarter intensity. However, according to Antras and Helpman (2004), it all depends on how much stake the producer has in the relationship. If investment by the final-good producer (i.e., headquarter) is more important, the producer would prefer to have less uncertainty about the credibility of the foreign supplier. Intuitively, the problem is similar to the model about positive assortative matching – an efficient producer prefers to have a good and low-risk supplier *[an equilibrium sorting decisions needs to be more seriously developed here.]*

(When completed) Our theoretical model delivers the following hypotheses, which we will test using U.S. importer-exporter matched transaction-level data.

Hypothesis 2 *The share of long-term relationship imports is increasing in the importance of relationship-specific investment (or headquarter intensity) in production across sectors*

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[2] One can think of m and h as quality-adjusted effect units of inputs, with all quantities normalized to 1.

[3] The underlying CES utility behind this revenue function is $U = \left[\int_{\omega \in \Omega} (c(\omega))^{\frac{\sigma-1}{\sigma}} d\omega\right]^{\frac{\sigma}{\sigma-1}}$, where $c(\omega)$ is the consumption of a variety ω produced by a firm, $\sigma > 1$ is the elasticity of substitution between varieties.

$(1 - \theta)$ can be interpreted as the quality ladder, in the way defined by Khandelwal (2010). If the downfall in the quality of the supplier's output is large, i.e., higher $1 - \theta$, the importer will be more concerned about the credibility of the foreign supplier. Thus, we can test the following hypothesis as well

Hypothesis 3 *The share of long-term relationship imports is increasing in the quality differentiation of the products across sectors. The "age" effect on the volume of transaction is also increasing in the quality differentiation of the foreign inputs.*

3   Data

The data for this study are drawn from the Linked/Longitudinal Foreign Trade Transactions Database (LFTTD) from the United States Bureau of the Census. The LFTTD is a confidential transaction-firm linked database linking individual trade transactions, both exports and imports, to all U.S. firms that make them. The dataset contains detailed information for the universe of all trade transactions at the ten-digit Harmonized Commodity Description and Coding System (commonly called Harmonized System or simply HS). Information at the product level includes the value, quantity, and date of the transaction. The novel feature of the LFTTD data set is that it also contains information about the foreign party involved for each trade transaction. In particular, U.S. Customs Border Protection (CBP) requires importers in the U.S. to report information about their foreign exporters, which can be producers or intermediaries, such as wholesalers or trading companies. The exporter is uniquely identified by the "Manufacturer ID" (MID), a required field on Form 7501, the form U.S. importers are required to fill out by the U.S. CBP.

The LFTTD data cover the universe of all U.S. import transactions (LFTTD-IMP) that occurred between 1992 and 2010. For this study, at least at the preliminary stage, we focus on the cross section of import transactions into the U.S. in 2005.

[More summary statistics will be provided once we got approval by the U.S. Census.]

4   Empirical Analysis

4.1   Empirical Specification

To test the hypotheses outlined in Section 2, we estimate several linear specifications with fixed effects. Before using observations at the buyer-seller pair level for analysis, we provide suggestive empirical analysis at the sector-country level. The first set of regressions explore the correlations between the share of transactions that belong to long-term buyer-seller relationships and a host of sector characteristics. Specifically, we estimate the following linear specification:

$$\frac{M_{cs}^{LT}}{M_{cs}} = \alpha + \beta \ln(K_s) + F_c + \xi_{cs}, \tag{1}$$

where c and s stand for exporting country and sector (HS2), respectively. $\frac{M_s^{LT}}{M_s}$ is the share of long-term relationship imports in total imports in sector s. α is a constant and K_s is a measure of sector characteristics that proxy for the importance of relationship-specific investment, such as capital, skill, and R&D intensities. F_c is country fixed effect.

The objective is to examine whether international trade in sectors that are more vulnerable to hold-up or contractual frictions tend to be conducted between firms that have established long-term relationships. The theoretical underpinning is similar to the property-rights approach, a la. Antras and Helpman (2004) and subsequent studies, that studies firms' optimal choices of production modes in response to distortion arising from hold-up when complete contracts are not available. Specifically, in both the property-rights approach and our conceptual framework, hold-up and contractual frictions can be partially resolved either by vertical integration or repeated interactions. Thus, we should expect a positive correlation between the intensity of relationship-specific investments in production and the share of relationship trade.

After studying the correlation at the sector and country levels, we explore the correlation between the relationship's age and the trade volume at the importer-exporter pair level as follows:

$$\ln\left(M_{ijs}\right) = \alpha + \gamma_a age_{ij} + \gamma_m \ln\left(M_{is}^{related}\right) + \mathbf{Z}_s\Gamma + F_i + F_j + \varepsilon_{ijp}, \qquad (2)$$

where i stands for an importing firm in the U.S., j a foreign exporting firm, s a sector category (at the HS2 level). $\mathbf{Z}_s$ is a vector of characteristics of sector s. F_i and F_j are importer and exporter (firm) fixed effects, respectively. According to Hypothesis 1 γ_a is expected to be positive, even after controlling for importer and exporter fixed effects.

Also according to Hypothesis 1, the "age" effect should be more pronounced in sectors in which relationship-specific investment is more important. To verify this prediction, we simply estimate specification (2) by including an interaction term between the relationship age and one of the measures of sector characteristic, such as sector-level capital intensity.

$$\frac{M_{ijs}}{M_{is}} = \alpha + \gamma_a age_{ij} + \gamma_m \ln\left(M_{is}^{related}\right) + \mathbf{Z}_s\Gamma + F_i + F_j + \varepsilon_{ijp}, \qquad (3)$$

Although we have a panel data set, most of our hypothesis could be verified using a cross-section data set. We thus estimate eq (2), at least in the preliminary draft, using the sample for 2005. We have repeated the same exercises for other years and the results remain robust.

4.2   Results

Table 1 shows the average age, both weighed by import share and unweighted, of the relationships between a U.S. importer and a foreign exporter for top 10 and bottom 10 countries. The countries that have the longest trade relationship with U.S. firms on average are Liberia, Saudi Arabia, and Gambia. The (weighted) average of the relationship's age is all above 8 years. These are oil-producing countries, suggesting that capital intensity in production could be an important determinant of long trade relationships. While one may be concerned that oil is a driver of the

long relationships, the fact that Japan ranks the 4th and Ireland ranks the 6th in terms of the average age of the relationship suggests that it is not all about oil. Japan and Ireland specialize in exports of electronics and computers, both inputs and final products. Both of these products are sophisticated as measured by capital and R&D intensity, suggesting that the consequence of hold-up can be severe and requires repeated interactions, beside vertical integration, to enhance production efficiency.

The bottom 10 countries are either island countries or developing nations in Sub-Sahara Africa, which are not surprising given their relatively recent participation in global trade and foreign sourcing.

Next we present the average age of trade relationships across sectors. As shown in Table 2, the top 10 sectors have the (weighted) average relationships ranging from 6 to 8 years..There is a variety of sectors that make it to top 10, including "Vehicles and parts"; "Aircraft, spacecraft, and parts", as well as "Meat and edible meat offal" as being the top 3. Not surprisingly, these are sophisticated products that are vulnerable to mis-coordination between different parties. For aircrafts, the classic example is the "O-ring" theory, which hypothesizes that one defect input would make the entire final product non-functional.

Table 3 shows the regression results that the share of relationship imports is increasing in the importance of relationship-specific investment (or headquarter intensity) in production across sectors. We use several measures of headquarter intensity, which includes (log) capital, skill, and R&D intensity. We define our dependent variable, the share of relationship trade, by using different year cutoffs as criteria for whether a transaction is considered long-term or not. For simplicity, we use 3, 5, 7, or 9 years as cutoffs, respectively. The coefficients on the headquarter intensity measures should be positive, and increasing in the year cutoff used to define long-term relationship.

As reported in column (1), there is a positive and significant correlation between capital (and skill) intensity and the share of relationship trade. There is correlation between the share and Nunn's (2007) measure of contract dependence of the sector is also positive and robust. These results support Hypothesis 2. Moreover, the magnitude of the coefficients on these three measures of "hold-up" are increasing when we define long-term relationships using more stringent criteria. For instance, the coefficient on (log) capital intensity is 0.0645 when long-term relationship is defined as transactions that have at least 3 years of relationship, while it is 0.142 when "at least 9 year" is used as the criteria.

Table 4 shows results for the regressions that explore the correlation between country characteristics and relationship trade. The unit of observation is at the country-sector level. Sector fixed effects are always included. The shares of relational trade, defined as trade that belongs to the importer-exporter matches that last for 3, 5, 7, or 9 years, are all positively correlated with the exporting countries' capital abundance, skill abundance, rule of law, and financial market development. The first two positive correlations confirm the hold-up hypothesis that capital and skill-abundant countries specialize in relationship-specific (capital-intensive) exports that would be more efficiently produced in joint production units that have established long-term relationships.

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The last two positive correlations are more difficult to explain. To the extent the better rule of law and financial market development suggest a more complete contracting environment, we should expect a lower dependence on relational trade. However, whether formal and informal contracts are substitutes or complements is after all, an empirical question. See Baker, et al. (2002) for a more in-depth discussion.

Table 5 uses importer-exporter pair data to empirically examine Hypothesis 1, which postulates a positive relationship between the age of the buyer-seller relationship and the volume of trade. The unit of observation is at the pair-sector level. Controlling for sector characteristics and buyer and seller fixed effects, we find a positive and significant relationship between the relationship's age and the (log) import volume between the pair, as well as the seller's share in the importer's total imports. These results remain robust when we control for the related party imports by the same importer. Table 6 further explores the differential "age" effects, as spelled out by Hypothesis 1. We find that the positive "age" effect on import volumes and shares is particularly strong in skill and R&D-intensive sectors. All these results are robust to the exclusion of U.S. import intermediaries in the sample.

[To be completed]

5   Conclusion

In international trade, many transactions involve long-term relationships. In this paper, we study the role of relational contracts (repeated interactions) in shaping global sourcing. Using unique importer-exporter matched data from the U.S. Census that cover the universe of import transactions for the U.S., we provide the first piece of evidence about how long-term relationship shapes world trade, above and beyond intra-firm trade that has been the focus of the literature on the organizational structure of global sourcing.

We document several stylized facts in regards to the long-term relationships in U.S. trade. We find that across sectors, the share of long-term relationship imports is increasing in the importance of relationship-specific investments in production and the degree of product quality differentiation. Within an importer-exporter pair, the transaction volume is increasing in the age of the pair, more so in sectors in which relationship-specific investment is more important. Within sectors, relationship imports are more prevalent from countries that are more capital and skill abundant, as well as those that have better rule of law and financial market development, suggesting that relational contracts could be complement rather than substitutes for formal contracts.

Our findings show that firms use relational contracts as an alternative to vertical integration to deal with hold-up and uncertainty in world trade. The findings of the prevalence of long-term relationships in trade can also shed light on various puzzles in international trade.

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Table 1: Average Duration of Importer-exporter Relationships by Country

Country	Weighted Avg Relationship's Age	Unweighted Avg Relationship's Age
Top 10 in terms of the weighted average age of relationship		
Liberia	8.66	2.84
Saudi Arabia	8.54	1.78
Gambia	8.10	3.72
Japan	8.09	2.19
Barbados	7.93	1.95
Uzbekistan	7.62	2.28
Ireland	7.60	2.24
Canada	7.02	1.83
Marshall Islands	6.93	2.31
Mexico	6.82	1.82
Bottom 10 in terms of the weighted average age of relationship		
French Guiana	1.94	2.61
Senegal	1.92	2.92
British Indian Ocean Territory	1.83	4.65
Congo, Republic of the Congo	1.80	3.53
Saint Vincent and the Grenadines	1.77	1.86
Holy See (Vatican City)	1.64	3.96
Martinique	1.59	1.74
Curacao	1.28	1.95
Montserrat	1.19	4.35
New Caledonia	0.84	3.85

Source: Authors' computation based on the U.S. Linked/Longitudinal Foreign Trade Transactions Database .

Table 2: Average Duration of Importer-exporter Relationships by Sector

HS2	Name	Weighted Avg Relationship's Age	Unweighted Avg Relationship's Age
Top 10 in terms of the weighted average age of relationship			
87	Vehicles other than railway or tramway rolling stock, and parts and accessories thereof	7.95	2.50
88	Aircraft, spacecraft, and parts thereof	7.21	2.64
2	Meat and edible meat offal	6.65	2.13
37	Photographic or cinematographic goods	6.65	2.34
22	Beverages, spirits and vinegar	6.64	2.24
84	Nuclear reactors, boilers, machinery and mechanical appliances; parts thereof	6.47	2.21
83	Miscellaneous articles of base metal	6.43	3.06
30	Pharmaceutical products	6.26	2.49
92	Musical instruments; parts and accessories of such articles	6.14	2.53
59	Impregnated, coated, covered or laminated textile fabrics; textile articles of a kind suitable for industrial use	6.13	3.10
40	Rubber and articles thereof	6.13	3.12
Bottom 10 in terms of the weighted average age of relationship			
61	Articles of apparel and clothing accessories, knitted or crocheted	4.64	1.80
81	Other base metals; cermets; articles thereof	4.63	2.66
72	Iron and steel	4.54	2.46
97	Works of art, collectors' pieces and antiques	4.52	1.67
78	Lead and articles thereof	4.50	3.32
17	Sugars and sugar confectionery	4.47	2.49
3	Fish and crustacenas	4.44	1.80
18	Cocoa and cocoa preparations	4.34	2.28
60	Knitted or crocheted fabrics	4.23	2.08
89	Ships, boats and floating structures	3.52	2.26

Source: Authors' computation based on the U.S. Linked/Longitudinal Foreign Trade Transactions Database
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Table 3: Relation between Sector Characteristics and the Share of Relational Trade

Dep Var: Share of Buyer-seller relations that last for	>=3 years		>=5 years		>=7 years		>=9 years	
ln(K/L)	0.0645***	0.0268***	0.106***	0.0413***	0.131***	0.0532***	0.142***	0.0595***
	(0.012)	(0.009)	(0.015)	(0.012)	(0.016)	(0.013)	(0.017)	(0.013)
ln(H/L)	0.0341***	0.0390***	0.0611***	0.0730***	0.0892***	0.105***	0.113***	0.129***
	(0.010)	(0.010)	(0.012)	(0.013)	(0.013)	(0.014)	(0.014)	(0.014)
ln(R&D/PY)	-0.0024	0.00579	-0.0044	0.00963*	-0.0029	0.0140**	-0.0056	0.0121*
	(0.004)	(0.004)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
Nunn's Contract Dependence	0.188***		0.306***		0.357***			
	(0.031)		(0.040)		(0.043)			
Khandelwal's Quality Ladder		0.0305**		0.0259*		0.0268	0.377***	0.0334*
		(0.012)		(0.015)		(0.017)	(0.044)	(0.017)
Nb. of Obs	1251	1181	1251	1181	1251	1181	1251	1181
adj. R-sq	0.23	0.22	0.33	0.30	0.37	0.34	0.39	0.36

Note: The unit of observation is at the country-sector(HS2) level. Country fixed effects are always included. t-statistics based on standard errors clustered at the 2-digit HS industry are reported in the parentheses. *** indicate significance at the 1% levels.

Table 4: The relation between Exporting Country Characteristics and the Share of Relational Trade

Indep. Var.	ln(K/L)	Rule of Law	Private credit/ GDP	Average Yr Schooling
Dep. Var. = Share of Relational Trade, where relationship lasts for >=3 years				
Coefficient	0.0405***	0.0384***	0.0005***	0.0136***
	(0.004)	(0.005)	(0.000)	(0.002)
Dep. Var. = Share of Relational Trade, where relationship lasts for >=5 years				
Coefficient	0.0714***	0.0727***	0.0008***	0.0248***
	(0.006)	(0.006)	(0.000)	(0.003)
Dep. Var. = Share of Relational Trade, where relationship lasts for >=7 years				
Coefficient	0.0852***	0.0847***	0.0009***	0.0298***
	(0.006)	(0.007)	(0.000)	(0.003)
Dep. Var. = Share of Relational Trade, where relationship lasts for >=9 years				
Coefficient	0.0898***	0.0900***	0.0009***	0.0316***
	(0.006)	(0.007)	(0.000)	(0.003)
Nb. of Obs	1292	1295	1254	1293

Note: The unit of observation is at the country-sector(HS2) level. Each entry corresponds to a regression with the share of buyer-seller relational trade used as the dependent variable. Sector fixed effects are always included. t-statistics based on standard errors clustered at the 2-digit HS industry are reported in the parentheses. *** indicate significance at the 1% levels.

Table 5: Age and export values

Sample			Excl Intermed			Excl Intermed
Dep Var		ln(M_ijp)			ln(M_ijp/M_ip)	
	(2)	(2)	(3)	(4)	(5)	(6)
ln(R&D/Sales)	0.007***	-0.0403***	-0.00649**	-0.0176***	0.0131***	0.0103***
	(0.002)	(0.002)	(0.003)	(0.000)	(0.000)	(0.000)
ln(H/L)	0.834***	0.646***	0.879***	-0.0480***	0.0728***	0.0901***
	(0.008)	(0.008)	(0.010)	(0.001)	(0.001)	(0.001)
ln(K/L)	-0.111***	-0.0190***	-0.0636***	0.0576***	-0.00167***	-0.00409***
	(0.003)	(0.003)	(0.005)	(0.001)	(0.000)	(0.000)
Relationahip's Age	0.176***	0.160***	0.164***	0.00609***	0.00442***	0.000122
	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)
ln(related party imports)		0.0921***	0.0535***		-0.0592***	-0.0534***
		(0.000)	(0.001)		(0.000)	(0.000)
Observations	1201324	1201324	768647	1201324	1201324	768647
Adjusted R-squared	0.06	0.09	0.08	0.02	0.45	0.46

Notes: Observations are at the buyer-seller-se+A1ctor pair level. The sample for the year 2005 is used. All regressions included country fixed effects. t-statistics based on standard errors clustered at the 2-digit HS industry are reported in the parentheses. *** indicate significance at the 1% levels.

Table 6: Age and export values (Differential Effects)

Sample			Excl Intermed			Excl Intermed
Dep Var		ln(M_ijp)			ln(M_ijp/M_ip)	
	(1)	(2)	(3)	(4)	(5)	(6)
ln(R&D/Sales)	-0.00588*	-0.0550***	-0.0402***	-0.0190***	0.0126***	0.00968***
	(0.003)	(0.003)	(0.004)	(0.001)	(0.000)	(0.000)
ln(H/L)	0.721***	0.551***	0.842***	-0.0377***	0.0719***	0.0878***
	(0.012)	(0.012)	(0.015)	(0.002)	(0.001)	(0.002)
ln(K/L)	-0.00858*	0.0823***	0.0686***	0.0662***	0.00766***	0.00314***
	(0.005)	(0.005)	(0.007)	(0.001)	(0.001)	(0.001)
Relationahip's Age	0.475***	0.451***	0.512***	0.00980***	0.0252***	0.0168***
	(0.011)	(0.011)	(0.013)	(0.002)	(0.001)	(0.001)
Age X ln(R&D/Sales)	0.00583***	0.00650***	0.0139***	0.0006***	0.0002	0.0003**
	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)
Age x ln(H/L)	0.0448***	0.0374***	0.0107**	-0.00464***	0.00010	0.0007
	(0.004)	(0.004)	(0.004)	(0.001)	(0.000)	(0.000)
Age X ln(K/L)	-0.0454***	-0.0449***	-0.0558***	-0.00396***	-0.00424***	-0.00309***
	(0.002)	(0.002)	(0.002)	(0.000)	(0.000)	(0.000)
ln(related party trade)		0.0921***	0.0535***		-0.0592***	-0.0534***
		(0.000)	(0.001)		(0.000)	(0.000)
Observations	1201324	1201324	768647	1201324	1201324	768647
Adjusted R-squared	0.07	0.09	0.08	0.02	0.45	0.46

Notes: Observations are at the buyer-seller pair level. The sample for the year 2005 is used. All regressions included country fixed effects. t-statistics based on standard errors clustered at the 2-digit HS industry are reported in the parentheses. *** indicate significance at the 1% levels.