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Institutional Change and Product Composition: Does the Initial Quality of Institutions Matter?

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Institutional Change and Product Composition: Does the Initial Quality of Institutions Matter?

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Abstract

We argue that the quality of institutions that enforce contracts and protect property rights influences the costs of producing high-value added (complex) versus low-value added (simple) products. Since data is hardly available for domestic transactions, we generate predictions about the relationship between the quality of institutions and product composition with an international trade model and use a rich international trade data set for empirical tests. We find that improvements in institutional quality increase the share and volume of a country's complex product exports. However, the initial quality of institutions is important, since in countries with the least developed institutions, the share of complex products in exports is generally small and, institutional reform has almost no influence on simple product exports. These findings cast doubts on the efficacy of institutional reform in countries with underdeveloped institutions.

Keywords: Complex and simple products, volume effect of institutions, compositional effect of institutions
JEL codes: F14, K33, O24, P14

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1. Introduction

Intuitively, we would expect that the quality of institutions that protect property rights and enforce contracts should matter for firm-level-production choice. When these institutions are bad, producers expect that input suppliers will breach contracts (or that such contracts are meaningless and should not even be drawn up) and that buyers and predators can easily steal their shipments. When these institutions are good, however, producers are more confident that detailed contracts for products that involve multiple suppliers of highly differentiated products will be enforced and that stealing will be deterred. Thus, when institutions are bad, producers tend to vertically integrate their production processes and are forced to produce simple products that can be produced in-house. When institutions are good, producers tend to outsource using multiple input suppliers and can produce, relatively cheaply, high value-added differentiated products. Consequently, we ask the following questions: How does the quality of institutions influence the composition of production within a country? And, does this vary by the level of development?

Since transaction data within countries is hard to obtain, we use a rich international trade data set to understand the relationship between quality of institutions and production structure. We therefore analyze how institutions influence both a country's comparative advantage in complex versus simple products and its international transaction costs. We build on a Ricardian model developed in Berkowitz, Moenius and Pistor (2003) that draws a distinction between the influence of institutions on comparative advantage and on international transaction costs. The quality of institutions affects the international transaction costs of both exporters and importers: Exporters face the risk of not getting paid, but this risk can typically be offset by contractual

methods such as letters of credit[1] or even pre-payment agreements. Importers, however, are at risk of losing a share of their order when it is crossing its border because of predation, piracy and corruption. As noted by Anderson and Marcouiller (2001), this risk is lower the more effective are the institutions in the importer's country in protecting property rights and enforcing contracts. Thus, when an importer's institutions improve, its border predation risk is lower and its international transaction costs fall. Importers also are at risk of receiving a substandard product. This risk is particularly problematic in the case of complex products because they have more characteristics that require verification than simple products. Better institutions in the exporter's country increase the probability that the importer can be compensated in the event of breach of contract, and therefore also increase the exporter's incentive to make a good faith effort to fulfill its contract with the importer. Hence, an improvement in an exporter's institutions lowers the international transaction costs that might have to be borne by its importers because it lowers that importer's potential losses should she receive a substandard product.

Institutions also influence a country's comparative advantage in complex products. Because complex products typically have more production stages, they tend to require more outsourcing and contractual relationships and therefore depend more on legal institutions than simple products. Thus, a country that has bad institutions tends to be at a comparative disadvantage in producing complex products. In what is perhaps an abuse of technical language, we will call this national transaction cost effect a *production cost effect*, since it is observationally equivalent to relative efficiency in the production of complex versus simple goods.

The Ricardian model delivers three predictions about the impact of institutional reform of interest to us: First, because a country reaps a gain in both comparative advantage and a lowering

[1] See Ronald Mann (2000) for a detailed analysis of how exporters and banks ensure payment with letters of credit.

of its international transaction cost following an institutional reform, it will increase its volume of complex product goods exports. Second, it also shifts export volumes from simple to complex products. Finally, the reduction in international transaction costs allows it to export a wider variety of complex products. We will refer to the first effect as the *volume effect* of institutions, and to the latter two as the *compositional effect* of institutions.

We estimate various specifications implied by the model to learn about the relative strength of those two effects for countries with bad versus good institutions. For herein, we refer to countries with bad (good) institutions as under-developed (developed).[2] We find both volume effects and compositional effects to be present whether institutions are good or bad. However, the volume effects for complex products are considerably smaller for countries with bad institutions. We also find no measurable effect of institutional reform on simple product exports, which represent a large share of developing countries' exports overall. This suggests that the efficacy of institutions based development strategies depends on the initial quality of institutions – there likely is no "one size fits all". Combining our empirical results with the predictions of the model suggests that institutional reform in countries with bad institutions is effective largely because it lowers international transaction costs, while it is effective in the more developed countries because of its influence on comparative advantage.

There is currently a small but growing literature analyzing the impact of institutions on international trade. Anderson and Marcoulier (2001) conduct theoretical and empirical work showing how bad institutions in the importer's country can deter trade. Berkowitz, Moenius and Pistor (2003) show that the institutions in the exporters' country and importers' country have similar effects on transaction costs, but opposite effects on comparative advantage in simple and

[2] GDP per capita is typically used to distinguish between under-developed and developed economies. However, Acemoglu et al (2001) show that the quality of institutions has a strong causal effect on cross-country GDP per capita.

complex products. Svaleryd and Vlachos (2001) show how good financial institutions enable a country to be open to international trade; Subramanian, Rodrik and Trebbi (2002) show that institutions in fact cause trade; recent work by Rauch (1999) and Casella and Rauch (2003) highlights the role of informal networks. We add to this literature in two ways: (1) we offer an explanation of the precise mechanism how institutions affects export composition (2) we show how initial institutional quality is important for the effectiveness of institutional reform.

In the next section of this paper we provide a description of the Ricardian model of institutions and trade; we then provide a description of the data and estimation; the fourth section provides a summary of results; and section five concludes.

2. The Model

2.1 Institutions and international transaction costs

Anderson (2001) argues that crossing an international border imposes substantial costs because it generally is the location where formal taxes are imposed and where informal groups extort bribes. Drawing on this idea, Anderson and Marcouiller (2001), for herein denoted A&M, show how high quality importer institutions can limit the expected gains from piracy and bribes and thereby reduce transaction costs. A&M assume that costs imposed by predators do not depend upon product complexity. Incorporating their results in a reduced form, define $s(I^{imp})$ as the expected share of goods that survives predation, where I^{imp} is the quality of importer legal institutions, and $s \in [0,1)$ is increasing in I^{imp}. Let $\tau(\cdot)$ denote the expected share of an order that survives for standard reasons including distance, differences in trading blocs, etc (see Rauch (1999)). Let $r(\cdot)$ denote the expected share of an order that an importer believes will comply with her specifications (after netting out losses from piracy and other transaction costs). Then

$\varphi(I^{imp}, \cdot) = r(\cdot)s(I^{imp})\tau(\cdot) \in [0,1]$ is the overall share of products that survives and is received by the importer, and $1 - \varphi(I^{imp}, \cdot)$ denotes international transaction costs.

Berkowitz, Moenius and Pistor (2003), for herein denoted BMP, derive the properties of *r*, where

$$r(\cdot) = \delta(\cdot) + (1 - \delta(\cdot))[\pi(\cdot) - (1 - \pi(\cdot))\psi] \qquad (1)$$

$\delta(\cdot)$ is the probability that the importer is satisfied with the shipment, $\pi(\cdot)$ is the probability that the importer is compensated if there is a breach of contract, and ψ denotes legal costs (normalized as the share of the importer's costs of the overall shipment) the importer must pay if she decides to take the exporter to court for breach of contract.

Consider first how institutions impact the importer's transaction costs. In a trading relation, the importer is at risk of receiving an inadequate shipment. If the exporter does not fulfil the terms of the contract and the importer decides to take the exporter to court, the importer typically must make an advance payment to the court or arbitration tribunal to start the process. If the court or arbitration tribunal rules against the importer, the importer foregoes her advance payment; if the importer wins, then she is reimbursed her pre-payment and is fully compensated for the value of shipment. Then $\pi(\cdot)$ is the importer's expected gain from taking legal action when she wins, $-(1 - \pi(\cdot))\psi$ is the importer's expected loss if she loses. Therefore, at the time of the order, the importer's expected compensation (as a share of the initial order) if there is a breach of contract is $(1 - \delta(\cdot))[\pi(\cdot) - (1 - \pi(\cdot))\psi]$ and $\delta(\cdot)$ otherwise.

The exporter has a greater incentive to make a good faith effort when he believes the probability he will be punished for breach of contract is high. A good faith effort from the exporter, in turn, increases the probability that the importer is satisfied. As complexity of an order increases, it becomes more difficult to specify every detail and it becomes more likely that

the importer will be dissatisfied even when the exporter makes a good faith effort. Therefore, the probability that the importer is satisfied with the shipment, $\delta(\cdot)$, depends upon enforcement, $\pi(\cdot)$, and product complexity, c. In summary,

$$\delta = \delta(\pi, c): \ \partial\delta/\partial\pi > 0, \ \partial\delta/\partial c < 0 \ for \ \delta, \pi \in [0,1) \qquad (2)$$

Regarding the role of institutions as a determinant of enforcement, our basic premise is that the institutions in the exporter's country are critical. If there is a breach of contract and the importer takes the exporter to court, then the case can be solved in courts in the importer's country, the exporter's country, or in a third country by court or arbitration tribunal. However, because exporters generally hold the bulk of their immobile assets in their home country and because only the domestic courts can seize these assets in peacetime, then legal institutions (courts and their complementary enforcement agencies) in the exporter's country are the last resort for solving the exporter's disputes with the importer no matter where the hearing is held.

Product complexity also determines the probability of enforcement. Complex products, such as custom-made machines or even mass-produced machines, contain many characteristics. These characteristics are numerous, often subjective (as in the case of user-friendliness of a particular machine) and highly differentiated across otherwise similar products. As the number and subjectivity of these characteristics increases, product complexity increases and it becomes more difficult for the court to verify whether the character of the exporter's shipment fulfills the letter and spirit of the contract. Thus, the probability of enforcement is decreasing in product complexity. Summarizing the discussion, then

$$\pi = \pi(I^{\exp}, c): \ \partial\pi/\partial I^{\exp} > 0, \ \partial\pi/\partial c < 0 \ for \ \pi \in [0,1) \qquad (3)$$

where I^{exp} denotes the quality of exporter institutions.

Substituting equations (2) and (3) into (1) and differentiating, then

$$\partial r / \partial I^{\exp} = (1+\psi) * \partial \pi / \partial I^{\exp} (\partial \delta / \partial \pi * (1-\pi) + (1-\delta)) > 0 \qquad (4)$$

$$\partial r / \partial c = (1+\psi)[\ (1-\pi)(\partial \delta / \partial \pi * \partial \pi / \partial c + \partial \delta / \partial c) + (1-\delta)\partial \pi / \partial c\ ) < 0 \quad (5)$$

Equations (4) and (5) summarize the impact of exporter institutions and product complexity on international transaction costs.[3] An improvement in institutions in the exporter country causes π to increase, which then raises the probability that the exporter makes a good faith effort. This raises the probability that the importer is satisfied, and that the importer is compensated if there is a breach of contract, which then leads to an increase in *r* (a decrease in international transaction costs). An increase in product complexity directly lowers the probability that the importer is satisfied, and also lowers the probability that the importer is compensated if there is a breach of contract. This provides an exporter with a greater incentive to shirk, and consequently lowers the probability that the importer is satisfied. Thus, overall, an increase in product complexity lowers *r*. Third, better institutions in the exporter country dampen the marginal negative impact of complexity on *r*: $\partial^2 r / \partial I^{\exp} \partial c > 0$. Finally, the share of surviving products, $\varphi(c, I^{\exp}, I^{imp}, \cdot) = r(c, I^{\exp}) \cdot s(I^{imp}) \cdot \tau(\cdot) \in [0,1)$, has all three of these properties established and, following A&M, is increasing in the quality of institutions in the importer's country. That is, an improvement in importer institutions lowers international transaction costs because it reduces predation at the importer's border.

2.2 Institutions and Comparative Advantage

In order to generate predictions about the impact of institutions on trade, we incorporate international transaction and domestic production costs into a general equilibrium model based

[3] Importer institutions, as previously noted, also are important because of their impact on predation at the importer's border. Importer institutions influence overall transaction costs, but do not influence *r*, the share of an order that the importer expects to comply with the contract.

upon the Ricardian model of Dornbusch, Fisher and Samuelson (1977). There are two countries (home and foreign); two simple products denoted S and S^* that can be produced only by the home and foreign country, and a continuum of equally complex products distributed on $z \in [0,1]$. The labor and institutional endowments in the home and foreign country are (L, I) and (L^*,I^*). Because competitive outsourcing of parts production on the domestic market requires low domestic transaction costs, high transaction costs enforce potentially inefficient in-house production. Therefore, this is denoted the *production cost effect* of legal institutions. Good domestic institutions discourage predators and also offset domestic suppliers' incentive to shirk. Because the cost of predation does not depend upon product complexity, while shirking is more lucrative for complex products, an improvement in domestic institutions lowers production costs of complex relative to simple products and, thereby, increases a country's comparative advantage in complex products. To capture this, we assume that producing either simple product requires one labor unit. Furthermore, let $a(z)/I$ and $a^*(z)/I^*$ denote production (unit labor costs) for complex product z in the domestic and foreign country. Thus, better domestic institutions lower the relative production cost of complex products.

Complex products are sorted by comparative advantage and the home country has a falling comparative advantage:

$$\begin{aligned} &A(z,I,I^*) \equiv a^*(z)I / a(z)I^*, \text{ where } \partial A/\partial z < 0; \\ &\partial A/\partial I = A/I;\ \partial A/\partial I^* = -A/I^* \end{aligned} \tag{6}$$

The representative agents in each country have the same utility function

$$U(S,S^*,x(z)) = (1-\beta)\ln(S^{\rho} + S^{*\rho}) + \beta \ln \textstyle\int_0^1 \ln x(z)dz \tag{7}$$

where $\{\beta, 1-\beta\} \in (0, 1)$ are shares of income spent on simple and complex products,

$\rho = 1 - (1/\sigma)$, σ is the elasticity of substitution within simple products, and the elasticity of substitution across complex products is one. It is assumed that *S* and *S** are relatively closer substitutes than complex products:

$$\sigma > 1 \qquad (8)$$

Thus, in complex product markets consumers buy the entire continuum and spend the same amount of money on each product. However, in simple product markets consumers spend less on *S* and more on *S** as the price of *S* relative to *S** increases.

Solving under the standard assumption of full employment, labor-immobility and two-way trade in both product categories, the impact of exporter and importer institutions on trade in simple and complex products can be decomposed into their respective production and international transaction costs effects. Consider first complex products. Following an improvement in exporter institutions, the importer country's comparative advantage in complex products falls because the exporter can manufacture complex products relatively more cheaply. Furthermore, transaction costs also fall because the importer country's risk of receiving shoddy complex products from an exporter with better institutions is lower. Thus, by both the production and transaction cost effects complex imports increase. Following an improvement in domestic institutions, the importer country's comparative advantage in complex products increases, and its transaction cost fall because better domestic institutions lower its predation risk at its border. Thus, complex goods imports decrease by the production cost effect, but increase by the international transaction cost effect, and the overall impact of an improvement in importer institutions is ambiguous. Furthermore, the overall effect of importer institutions on complex product imports is negative if and only if their production cost effect dominates their trade cost effect. Letting $M^{complex}$, I^{imp} and I^{exp} denote the equilibrium quantity of complex imports,

importer and exporter institutions, then the import elasticity of complex products with respect to own institutions and exporter institutions can be decomposed:

$$\partial \log M^{complex} / \partial \log I^{imp} = \partial \log M^{complex} / \partial \log I^{imp}{}_{production} + \partial \log M^{complex} / \partial \log I^{imp}{}_{transaction} = ?$$

where

$$\partial \log M^{complex} / \partial \log I^{imp}{}_{production} < 0; \ \partial \log M^{complex} / \partial \log I^{imp}{}_{transaction} > 0 \qquad (9)$$

and

$$\partial \log M^{complex} / \partial \log I^{\exp} = \partial \log M^{complex} / \partial \log I^{\exp}_{production} + \partial \log M^{complex} / \partial \log I^{\exp}_{transaction} > 0$$

where

$$\partial \log M^{complex} / \partial \log I^{\exp}_{production} > 0; \ \partial \log M^{complex} / \partial \log I^{\exp}_{transaction} > 0 \qquad (10)$$

Because a gain in comparative advantage in the complex goods sector implies growing comparative disadvantage in the simple sector, the production cost effects of exporter and importer institutions for simple products have the opposite sign in their impact on complex product markets. The effect of legal institutions on transaction costs is ambiguous in simple product markets. However, under general conditions (available upon request), the overall effect of importer institutions on simple product imports is positive, while the overall effect of exporter institutions is ambiguous.

Similar to results derived in other Ricardian models (see Dornbusch et al, 1997; Flam and Helpman, 1987) the model also predicts that the percentage fall in complex imports following a one-percent increase in the quality of its own institutions is entirely offset by the percentage increase in complex goods imports following a one-percent increase in the quality of exporter institutions. A similar result holds in complex product markets:

$$\partial \log M^{i} / \partial \log I^{imp}_{production} + \partial \log M_{*}^{\ i} / \partial \log I^{\exp}_{production} = 0: \qquad (11)$$

$i = simple, complex.$

Combining equations (9)-(11), then the model predicts that the overall elasticity of complex trade with respect to institutions equals the pure impact of institutions on complex trade via their impact on transaction costs:

$$\partial \log M^{complex} / \partial \log I^{imp} + \partial \log M^{complex} / \partial \log I^{\exp} = \partial \log M^{complex} / \partial \log I^{imp}_{transaction} + \partial \log M^{complex} / \partial \log I^{\exp}_{transaction} > 0 \quad (12)^4$$

This pure transactions costs effect is strictly positive for two reasons: an improvement in domestic institutions makes importing complex products (as well as simple products) cheaper because it lowers the extent of predation at the domestic border; and, an improvement in institutions in some foreign country also lowers the cost of importing complex products because it lowers the home country's risk of importing shoddy complex products from this foreign country.

The model does not make sharp predictions about how this pure international transactions cost effect depends upon the level of development; nor does it make sharp predictions about the levels of development at which the transactions cost effect or comparative advantage dominate**.** Clearly, the less-developed economies are more flexible in adjusting their production structure than developed economies. Therefore, one might suspect that the comparative advantage effect should dominate in less-developed countries. However, the international trade cost effect will already benefit existing trading relationships, while the comparative advantage effect requires setting up new trading relations. Setting up these new relations requires a stock of substantial trust that, arguably, is relatively scarce in less-developed economies. For these reasons (which are outside of our model), comparative advantage effects should be stronger in developed

[4] A similar result holds for trade in simple products, but it is not important for the empirical work that follows.

economies. Just which effect dominates in the less developed and the developed economies is, then, an empirical question and will be resolved in the next sections.

3. Estimation

3.1 Data

In order to test the predictions of this model, we collected data from the following sources. The national accounts data is taken from the IMF Financial Statistical Yearbook, and the gravity controls are the same as in Rauch (1999). We use the 1990 values throughout.[5] Data on the quality of institutions comes from the International Country Risk Guide, where the quality of institutions is measured using the survey data approach advocated by Knack and Keefer (1994) and Kaufmann et al (1999). This data is constructed as an annual index from a simple average of quality ratings of institutions by country. Each rating ranges from one to ten with ten representing the highest quality. For our purposes, we include in these ratings an average of indices of the rule of law, expropriation risk, corruption in government, and bureaucratic quality.[6] We do not include repudiation of government contracts and ethnic tensions, since those dimensions do not fit the concept of legal quality we introduced.[7] Consistent with our model in which institutions are exogenous and GDP per capita is endogenous, we use the quality of these institutions as the metric of development, and define the most underdeveloped countries as the countries in the bottom quartile on this dimension of our sample. Summary statistics for the average index number we used in the estimation are provided in Table 1a. Trade data is obtained from the World Trade Database compiled by Statistics Canada. To categorize the products into

[5] This only poses a problem for the language variable, since in some countries with large immigration activities, these numbers may not be constant. However, we think the variations are generally small enough to not change the results in any significant way.

[6] Source is the International Country Risk Guide used by La Porta et al. (1997, 1998) and Kaufmann (1999). We thank Stephen Knack for providing this data. All six of the indices are highly correlated and could also be aggregated using principal components.

[7] However, it should be noted that all results are robust with the inclusion of these two dimensions.

different degrees of complexity, we employ the classification developed by Rauch (1999). Since complexity cannot be determined directly, he sorts four digit SITC industries into trading categories: those goods that are predominantly traded on organized exchanges (metals, pork), those that are reference priced (chemicals, fertilizers) and those that neither have reference prices nor are traded on organized exchanges (e.g., shoes, cars and machinery). We reinterpret this classification in terms of product complexity, where "organized exchange" denotes low complexity (simple) and "neither" captures high complexity.[8] In Table 1b, we report summary statistics of the relative importance of simple versus complex products. There are 55 countries (see Table 1c) in the data set, and all variables are either fixed or reported on an annual basis from 1982 to 1992.

3.2 Estimation

As Eaton and Kortum (2002) have shown, the Ricardian Model of Dornbusch et al. (1977) in a multi-country setting leads to a gravity specification of bilateral trade-flows. Our set-up differs from theirs in two important aspects. First, we differentiate by the types of goods, since we introduce both a simple and a complex products sector. We assume that each national economy is fully described by these two sectors: only the complex goods sector is identical to the Dornbusch et al. (1977) specification. Second, we utilize a mechanism that influences both domestic production and international transaction costs.[9] We therefore estimate the empirical model:

$$IM_{ijtk} = \alpha_i + \alpha_j + \beta_k X_{ijt} + \gamma_k I_{it} + \delta_k I_{jt} + \varepsilon_{ijtk} \qquad (13)$$

[8] All results for "reference priced", which one might interpret as mid-complexity, are generally consistent with the model we present and are available upon request.

[9] These two differences require changes in the estimation equation relative to theirs, as well as in the interpretation of the coefficients, since changes in the quality of legal institutions cannot be interpreted as being similar to a national technology effect.

where IM_{ijtk} denotes the dollar value of imports originating from country j and shipped to country i in year t and industry group k, where k can only assume two values: complex or simple. Similarly, X_{ijt} contains the standard gravity variables including GDP and GDP per capita for each country[10], distance between the two countries, and whether or not the countries share a common border, have colonial ties, or share languages. The coefficients α_i and α_j are associated with country dummy variables. Whenever a country is part of a bilateral trading relationship, this dummy variable assumes a value of 1; the variable is zero otherwise. This guarantees that country-specific effects for both exporters and importers, which can be assumed constant over our eleven-year period (such as geography and infrastructure in general), are absorbed. Our variables of interest are I_{it} and I_{jt}, which denote the quality level of exporter and importer legal institutions, hereafter referred to simply as institutions.[11] To study the effect of institutions at different levels of development, we interact the latter two variables with dummy-variables D_{qm}, D_{qe} that assume the value of one if a country falls into a certain quartile of the quality of legal institutions, where m stands for importer and e for exporter, while q is the quartile of development (quality of institutions). This changes the estimation equation to:

$$IM_{ijtk} = \alpha_i + \alpha_j + \beta_k X_{ijt} + \gamma_k I_{it} + \sum_{q=2}^{4} \gamma_{qk} D_{qm} \cdot I_{it} + \delta_k I_{jt} + \sum_{q=2}^{4} \delta_{qk} D_{qe} \cdot I_{jt} + \varepsilon_{ijtk} \quad (14)$$

We also add the D_{qm} and D_{qe} dummy-variables separately to our regressions to control for potential bias in our results. This will allow us to study the volume effects by level of institutions (table 3 in the appendix). In order to learn about the compositional effects, we repeat the exercise

[10] It is important to note that GDP and GDP per capita were entered separately in the regression, since the quality of legal institutions is highly correlated with GDP per capita (ρ=0.82)

[11] This specification simplifies the Eaton and Kortum (2002) specification because it excludes the effect of changes in all other countries' legal qualities on a particular country-pair's bilateral imports. This, however, will only cause omitted variable bias if there is correlation between the importer's quality of legal institutions and all other countries' quality of institutions *corrected by distance and other impediments to trade*. This bias, however, seems negligible.

in three different ways: we replace imports on the left hand side with net imports, imports of complex goods relative to simple goods as well as the counts of industries by category. For example, if Germany has positive imports to France in 150 four-digit SITC industries in the complex goods sector in a particular year, this variable assumes the value 150. As discussed above, this variable allows us to test for the prediction of the DFS-model that a reduction in international trade costs should lead to more types of goods within a category traded.

Finally, a feature of the gravity model regressions, which is problematic for calculating standard errors, is that the same country's characteristics will be represented on the right hand side repeatedly. Defining these repetitions as groups, error terms within those groups are likely to be correlated with each other, while error terms across groups should not correlate. In order to account for this grouping effect, we replace the traditional Huber-White errors (White, 1980) with robust standard errors that additionally account for within-group correlation. As a result, our standard errors are considerably higher than those normally reported, and this hurts the statistical significance of our estimates. However, we include this adjustment in an effort to produce the most cautious estimates.

4. Results

Table 3 columns report results for estimation of the effect of institutions on trade volumes. In the first two columns we present results for the effect of exporter and importer institutions on complex and simple imports when there is no distinction drawn between countries with good and bad institutions. In the case of complex products, all of the predictions of the model are confirmed; the impact of exporter institutions is positive and the effect of importer

institutions is negative and exporter institutions have the greatest absolute impact.[12] The negative coefficient on the quality of importer institutions suggests that the production cost effect actually dominates the transaction cost effect. In simple product markets, the results are also consistent with the predictions derived from the model. The overall effect of importer institutions is positive and the effect of exporter institutions is negative. This again suggests that production costs dominate transaction costs.

In columns 3-4, we draw a distinction between the impact of institutions in relatively less-developed and developed countries.[13] The baseline is an estimate of the impact of legal institutions in countries in the lowest institutions quartile; the coefficients for "separate for second quartile legal quality countries," "separate for third quartile legal quality countries," and "separate for fourth quartile legal quality countries," provides estimates of the incremental impact of an improvement of institution in countries in the second, third and fourth legal quality quartiles relative to the countries in the lowest quartile.

The results can be summarized as follows: with the exception of their effect on complex goods exports, improvements in the quality of legal institutions do not have any measurable effect on trade for the least developed countries. This does not change dramatically in the second quartile of development either, so that one could reasonably argue that improvements of the quality of legal institutions only have a positive effect on complex goods exports for the lower half of the distribution and exhibit rich general equilibrium effects for the upper half of the distribution, and all the measurable effects are stronger for the latter group. The robustness-

[12] These results are identical with the first two columns of table 4 in BMP (2003).
[13] We use the quality of institutions rather than GDP per capita as the metric of development following Acemgolu et al (2001), institutions for the most part cause GDP per capita. If, following the World Bank (2001), we were to use GDP per capita as the metric of development, our empirical results would be quite similar in pattern but very different in magnitude than what we present in this paper. For the theoretical implications of measuring development using GDP per capita on trade, see Murphy and Shleifer, 1997.

checks in columns 5 and 6 generally confirm the findings for exporter institutions, while the results for importer institutions are weaker. The overall predictions, however, remain unchanged. In the context of our model, these results can be interpreted as follows: In the least developed countries, an improvement in the quality of legal institutions improves their comparative advantage in producing complex products and at the same time reduces their international transaction costs. However, this latter effect seems to wash out the production cost effect on the importer side: we do not see any effect of importer legal institutions at all. At later stages of development, the production cost effect seems to dominate, and we see general equilibrium effects in both the complex as well as the simple goods markets.

Taking our model literally, one could go one step further: we can calculate the overall transaction cost effect from both exporter and importer institutions, and we can also calculate the range of values for the production cost effect that our estimates support. These calculations are shown in table 3a and figure 1: at lower stages of development, legal institutions primarily reduce international transactions costs, while at higher stages, they mostly promote comparative advantage. While we find this result striking, a few caveats have to be raised: first, we do not want to put too much stress on the absolute size of our coefficients,[14] but maintain that the relative strength of the effects is valid as confirmed by our robustness-checks in consecutive tables. Moreover, these calculations are based on our point-estimates, not taking any confidence-levels into account. Second, the lack of bite of legal institutions for the least developed may result from factors outside of our model: this is a general equilibrium model that assumes full employment and production at the technological frontier enforced by perfect competition, all of

[14] This is especially important to note in the light of the criticism raised by Anderson and Van Wincoop (2003). While the country-dummies in our regression take partially care of their concerns, it does not do so in full, since we cannot allow for country-year dummies and still identify our model. However, in our robustness-checks below, we introduce a specification that allows for country-pair-year effects, which fully absorbs the issues of their concern, and our results are robust to that change in specification.

which are very likely violated in developing countries. For example, initial production structures and high unemployment may lead to large movements from farm to factory, driving those countries closer to their production possibility frontier and thereby increasing complex exports. Moreover, asymmetric tariffs and non-tariff measures may prevent institutions to take effect: be it import quotas for cars in developing countries or farm subsidies in developed ones.[15]

Shifts in comparative advantage by product category should be most easily visible from *net exports*: if our predictions hold, we should see improvements in exporter institutions to be directly linked to increases in net exports of complex versus simple products. We estimate this claim modifying (14) where we replace the left hand side variable with net exports by country and product category. The results can be found in table 3b. Column 1 and 2 state the baseline results. Again, our findings are consistent with the model's predictions: not only do complex product exports volumes increase following an institutional improvements, they also increase on net. Moreover, we find this net effect to be fairly constant across all levels of development. The general equilibrium effect, which predicts increases in net imports is only present for the more developed economies: less developed countries do not need to fear that they will lose their production base in simple products right away by an improvement of the quality of their institutions. These results are again confirmed with our robustness-checks in columns 5 and 6.[16]

While net-exports account for changes in comparative advantage relative to other countries within the same sector, relative exports, that is exports in the complex sector relative to the simple sector measure changes in production structure across sectors. We repeat the exercise

[15] We are able to control for these factors down to a 2-digit industry level by country-pair and year in our robustness-checks in table five.

[16] It should be noted that this regression cannot be as easily derived directly from the original gravity specification as the other results in this paper. Consequently, we caution to interpret the absolute size of the coefficients. However, as stated before, we are confident about the relative size of coefficients.

in equation (14), but now replace the left-hand side variable with relative exports. The effects are again in the predicted directions and strongest for higher levels of development.

The idea that international transaction cost effects may dominate can be tested with an additional feature of our model, since it predicts that lowering international transaction costs increases the number of complex products imported and exported, while changes in comparative advantage result in a shift of the number of products traded in favor of the country that improves its institutions relatively more. In table 4, we replace our dependent variable with the number of four digit SITC industries that are imported within each category. In column one, we present the overall effects for complex products. We again see the same pattern established in table 3: better exporter institutions lead to an increase in the number of exported complex products, and, better importer institutions lead to a decrease in the number of imported complex products, and the first effect dominates. We repeat the exercise by development quartile and confirm the results from table 3 again: better institutions increase the number of complex products that a particular country exports, and does so at an increasing rate as its institutions improve. It does not import goods from fewer industries as the model would predict if it is in the lowest category, if anything, it is the opposite. This is consistent with the view that international transaction costs effects dominate comparative advantage effects in the lowest development quartile. Without any theoretical backup from our model, we repeat the exercise for the simple sector. The striking news here is that there seems to be a positive effect on the number of industries that countries export when they improve the quality of their legal institutions, despite the fact that they reduce the volumes of exports in simple goods, and this effect is roughly equally strong across all development quartiles. Moreover, improvements of the quality of importer institutions do not seem to decrease the numbers of simple goods industries from which a country imports. While

our model does not directly predict this result, we think of these results as additional evidence that is consistent with the ideas about the relative effects of institutions on international transaction costs versus production costs.

We repeat the empirical exercise from table 3c with the number of industry links. As stated before, strictly speaking the model only delivers predictions for the complex sector. However, from an empirical point of view it is interesting at which stage of development the compositional change of industries resulting from a change in institutional quality is the strongest. The results are as follows: The higher the exporter's quality of institutions, the more complex goods – relative to simple goods – industries a country imports from. The higher the importer country's quality of institutions, the more simple goods industries – relative to complex goods – a country will import from a trading partner. This implies again that comparative advantage effects are strong. And again, as column 2 reveals, they are stronger again for the more developed economies.

If our results are correct, then two final predictions from our model can be taken to the data. First, the role of institutions should be more important with increasing complexity of products. Second, the comparative advantage effect of institutions should be stronger for larger countries, since those have more opportunity to outsource within its own borders. Since the former prediction cannot be achieved within the scope of equation (14), we amend (14) in a way that allows us to exploit the full information that is available to us in our dataset, and which also allows us to check the validity of our argument and the robustness of our results We replace our dependent variable with the four-digit SITC import-flows and interact our legal variables with dummy-variables for complex products by development, where, for tractability, we analyze only below and above median quality of institutions (development).We therefore introduce the

following dummy variables. The dummy variable for complex goods, D_C, assumes a value of 1 whenever an industry on the left hand side of our regression falls into the complex goods category and zero otherwise. The dummy variable for above median quality of institutions, D_{qm} for the importer and D_{qe} for the exporter, assume a value of one whenever the importer or exporter, respectively, are located in a country whose institutions are above the median quality level and zero otherwise. Our basic regression equation changes to:

$$IM_{ijtk} = F_{ijt} + \beta D_C \cdot X_{i,jt} + \gamma_k D_C \cdot I_{it} + \gamma_{qk} D_C \cdot D_{qm} \cdot I_{it} + \delta_k D_C \cdot I_{jt} + \delta_{qk} D_C \cdot D_{qe} \cdot I_{jt} + \varepsilon_{ijtk}$$

With this procedure, we are no longer able to distinguish the effects of legal institutions separately for complex versus simple products; all we can do is identify the relative effect. In all cases, we also include per capita GDP separately for complex goods as well as all relevant direct effects as represented by $X_{i,jt}$. Additional interaction terms are added to this equation to study the two predictions stated above. All results are presented in a two step fashion: First, we present the overall results, controlling for GDP per capita, direct effects as well as all country-pair specific effects that vary over time; for example factor endowments, country-specific technology levels, exchange rates and country-pair specific transport costs. Second, we present the results by level of development, where we distinguish only two categories: above or below the median level of development. In the second set of regressions we also replace the country-pair-year fixed effects with country-pair-year-two-digit industry effects to control for additional price effects on the industry level. The results with the country-pair year effects are quite similar and are available from the authors on request. The results are presented in table 5. In column one, we estimate the direct effects of the quality of legal institutions on complex relative to simple goods imports. The results reconfirm our previous findings: exporter institutions have a positive effect on complex relative to simple exports, and this effect is the stronger when institutions are developed. On the

other hand, importer institutions have a negative effect on complex relative to simple goods imports, and, consistent with previous results, this effect is increasing in the development level.

As stated before, if our argument is correct, we should see the results to be stronger for "more complex" goods. We employ SITC-one-digit codes as a proxy for complexity (increasing SITC-codes are associated with increases in complexity). We interact this variable with our institutional quality variables. The results of these regressions are presented in column three and four of table five. We find a positive interaction effect overall as well as at both levels of development for exporter institutions, and this effect seems to drive most of the increase of the effect of legal institutions in the more developed countries. For importer institutions, we see a negative interaction effect, which is, however, smaller for higher levels of development.[17]

Finally, good institutions should benefit larger countries more than smaller countries, since they should be able to outsource more internally than smaller countries. We test this hypothesis by interacting our legal variables with the log of GDP for complex goods. The results are presented in column five and six. Despite the fact that the coefficient on the exporter-institutions variable is negative, the overall effect is positive even if the effect is evaluated on the minimum value of the log of GDP, both for the overall effect as well as the effect by level of development. The interaction effect for importer institutions is not as clear-cut: The overall effect is positive, while slightly negative when we distinguish different levels of development.

Overall, the findings are consistent both with our model as well as economic intuition and are robust to various changes in specification. The quality of legal institutions seems to exert strong effects on the trade of large developed countries, while smaller, less developed countries may not be able to draw as much from the benefits as one might hope.

[17] In this regression, we were only able to control for country-pair-year effects, since we would not know how to interpret the coefficient on interaction terms if we controlled for variations at the two-digit level while we investigated the effect of a variable on the one-digit level.

5. Conclusions

In this paper we argued that domestic production structure is reflected in a country's international production trade structure. In the absence of trade restrictions, a country's internationally competitive sectors will export and its less competitive sectors will import from other countries. Consequently, the mechanism of change in the production structure of developing economies from improvements in institutions can be uncovered through international trade flows. We argue that institutions lower both domestic as well as international transaction costs. Consequently improvements in the quality of institutions could help the less developed economies (and economies at all levels of development) shift into a more complex-intensive export structure by a national transaction cost effect, which influences comparative advantage, and an international trade cost effect. Our empirical findings support this finding; however, our results also show that, in terms of volumes, the less developed economies benefit less from domestic institutional reform than the rest of the world.

References

Acemoglu, Daron , Simon Johnson and A. James Robinson, 2001. "The Colonial Origins of Comparative Development: An Empirical Investigation," American Economic Review, 91(5): 1369-1401.

Anderson, James. 2001. Trade and Informal Institutions. Boston University (mimeo) (November).

Anderson, James, and Eric Van Wincoop, 2003. "Gravity with Gravitas: a Solution to the Border Puzzle", American Economic Review, 93(1): 170-92

Anderson, James, and Douglas Marcouiller. 2001. "Insecurity and the Pattern of Trade: An Empirical Investigation." Review of Economics and Statistics, 84 (2): 345-52.

Berkowitz, Daniel, Johannes Moenius and Katharina Pistor, 2003. "Trade, Law and Product Complexity." Mimeo and *Columbia Law and Economics Working Paper No. 230* http://papers.ssrn.com/sol3/papers.cfm?abstract_id=315969.

Dornbusch, Rudiger, Stanley Fisher, and Paul A. Samuelson,. 1977. "Comparative Advantage, Trade, and Payments in a Ricardian Model with a Continuum of Goods." American Economic Review, 67: 823-39.

Eaton, Jonathan, and Samuel Kortum. 2002. "Technology, Geography and Trade." Econometrica, 70(5): 1741-1779.

Flam, Harry and Elphanan Helpman. 1987. "Vertical Product Differentiation and North South Trade." American Economic Review 77: 810-822.

Kaufmann, Daniel, Aart Kraay, and Pablo Zoido-Lobaton. 1999. Aggregating Governance Indicators. Washington D.C.: The World Bank.

La Porta, Rafael, Florencio Lopez-de-Silanes, Andrei Shleifer, and Robert W. Vishny. 1997. "Legal Determinants of External Finance." Journal of Finance LII (3): 1131-1150.

La Porta, Rafael, Florencio Lopez-de-Silanes, Andrei Shleifer, and Robert W. Vishny. 1998. "Law and Finance." Journal of Political Economy 106 (6): 1113-1155.

Mann, Ronald. 2000. "The Role of Letters of Credit in Payment Transactions." University of Michigan Law Review 98(8): 2494-2536.

Murphy, Kevin and Andrei Shleifer. 1997. "Quality and Trade." Journal of Development Economics 53: 1-15.

Rauch, James E. 1999. "Networks Versus Markets in International Trade." Journal of International Economics 48(1): 7-35.

Subramanian, Arvind, Dani Rodrik and Francesco Trebbi. 2002. "Institutions Rule. The Primacy of Institutions over Geography and Integration in Economic Development." October. Unpublished manuscript.

Svaleryd, Helena and Janos Vlachos. 2001. "Financial Markets, the Pattern of Specialization and Comparative Advantage." Chapter 2 in Jonas Vlachos, Risk Matters: Studies in Finance, Trade and Politics. Doctoral Dissertation, Stockholm School of Economics, EFI, the Economics Research Institute.

White, Halbert L. 1980. "A Heteroskedasticity-Consistent Covariance Matrix Estimator and a Direct Test for Heteroskedasticity." Econometrica 48: 817-838.

World Bank. 2001. "World Development Report 2002: Building Institutions for Markets." Oxford University Press, New York.

Appendix

Table 1a: Summary Statistics Quality of Legal Institutions

	Statistics	Value (Index Number)	Countries close to value
Overall (year = 1990)	Average	4.59	Brazil, Chile, Malaysia
	Min	1	Iran, Bolivia, Indonesia, Nigeria
	Max	7	Switzerland, Belgium, Denmark
	Standard Deviation	1.65	
Change over Estimation Period 1982-1992	Decreasers	-55% -19% -15%	Ethiopia Hong Kong South Africa
	Increasers	208% 145% 157%	Iran Egypt Morocco

(From Berkowitz et. al 2003)

Table 1b: Complexity Intensiveness of Exports*

	Statistics	Value	Countries close to value
Overall (year = 1990)	Average	10.7	France, Ireland, Spain
	Min	0.02	Iran, Nigeria, Saudi-Arabia
	Max	165	Japan, Hong Kong, Switzerland
	Standard Deviation	24.5	
Change over Estimation Period 1982-1992	Decreasers	-64% -18% -16%	Ghana Hong Kong Paraguay
	Increasers	1,406% 3,185% 5,375%	Indonesia Mexico Venezuela

(From Berkowitz et. al 2003)

*Ratio (using US dollar values) of Complex Products to Simple Product Exports

Table 2a: Means, Standard Deviations and Frequencies of Export Volumes (in $ 1,000), 1990

Quartiles: Income per Capita	Quartiles: Quality of Legal Institutions				
	1	2	3	4	Total
1	138,327 (658,198) 553	406,404 (2,442,781) 147	- - 0	- - 0	194,623 (1,265,077) 700
2	245,674 (490,063) 154	235,381 (772,399) 369	267,267 (680,640) 157	- - 0	245,074 (695,743) 680
3	- (-) 0	623,145 (2,569,024) 157	1,250,658 (3,551,869) 377	497,586 (1,528,758) 162	933,823 (2,994,771) 696
4	5,249 (12,554) 43	907,416 (2,149,007) 49	3,501,571 (9,621,991) 270	2,097,532 (7,265,933) 432	2,388,220 (7,828,824) 794
Total	152,739 (609,528) 750	400,131 (1,813,974) 722	1,814,531 (6,211,780) 804	1,661,183 (6,286,041) 594	992,709 (4,521,687) 2870

Table 2b: Means, Standard Deviations and Frequencies of Industry Trading Relations*, 1990

Quartiles: Income per Capita	Quartiles: Quality of Legal Institutions				
	1	2	3	4	Total
1	39.9 (58.3) 553	69.6 (99.9) 147	- (-) 0	- (-) 0	46.1 (70.2) 700
2	66.5 (78.8) 154	66.2 (81.0) 369	96.6 (97.8) 157	- (-) 0	73.3 (85.6) 680
3	- (-) 0	92.4 (94.3) 157	182.2 (136.2) 377	128.2 (110.8) 162	149.4 (127.7) 696
4	4.2 (6.2) 43	35.8 (38.6) 49	240.4 (127.3) 270	187.2 (138.0) 432	186.2 (141.5) 794
Total	43.3 (63.1) 750	70.5 (87.1) 722	185.0 (136.1) 804	173.1 (134.3) 594	118.3 (126.2) 2870

* This is the number of industries that a country exports in to a particular other country

Table 2c: List of countries

Argentina	Ecuador	Indonesia	New Zealand	South Africa
Australia	Egypt	Iran	Nigeria	Spain
Austria	Ethiopia	Ireland	Norway	Sudan
Bel-Lux	Finland	Italy	Pakistan	Sweden
Bolivia	France	Japan	Paraguay	Switzerland
Brazil	Germany, FR	Kenya	Peru	Thailand
Canada	Ghana	Korea, Republic	Philippines	Turkey
Chile	Greece	Malaysia	Poland	United Kingdom
China	Hong Kong	Mexico	Portugal	United States
Colombia	Hungary	Morocco	Saudi Arabia	Uruguay
Denmark	India	Netherlands	Singapore	Venezuela

Table 3: Import Regressions (Dollar Values)
Pooled for 1982-1992, Complex vs. Simple Goods

Regression Column	1	2	3	4	5	6
	Complex	Simple	Complex	Simple	Complex	Simple
GDP importer	0.34 (1.65)	-1.50 (-4.59)	0.13 (0.58)	-1.32 (-3.87)	0.08 (0.37)	-1.27 (-3.61)
GDP exporter	0.58 (2.82)	-1.81 (-5.55)	0.37 (1.66)	-1.65 (-4.84)	0.33 (1.42)	-1.61 (-4.59)
GDP per capita importer	0.77 (3.16)	2.35 (6.05)	1.04 (3.94)	2.01 (4.97)	1.05 (3.83)	1.93 (4.59)
GDP per capita exporter	0.71 (2.92)	2.27 (5.77)	0.88 (3.36)	2.24 (5.49)	0.91 (3.39)	2.25 (5.34)
Distance	-0.98 (-24.90)	-1.26 (-22.76)	-0.98 (-25.00)	-1.27 (-23.17)	-0.98 (-25.07)	1.27 (-23.13)
Adjacent	0.44 (2.62)	0.27 (1.55)	0.43 (2.60)	0.26 (1.51)	0.43 (2.59)	0.26 (1.52)
Links	0.54 (5.11)	0.18 (1.21)	0.54 (5.10)	0.17 (1.16)	0.54 (5.10)	0.17 (1.16)
Language similarities	1.27 (6.73)	0.11 (0.41)	1.27 (6.76)	0.12 (0.46)	1.28 (6.80)	0.12 (0.47)
Quality of importer institutions - (baseline legal quality)	-0.51 (-5.18)	0.66 (4.54)	-0.05 (-0.40)	-0.17 (-0.99)	-0.06 (-0.49)	-0.11 (-0.58)
- separate for second quartile legal quality countries			-0.15 (-3.61)	0.11 (1.61)	-0.63 (-2.40)	0.34 (0.86)
- separate for third quartile legal quality countries			-0.34 (-5.88)	0.57 (6.46)	0.38 (0.12)	1.02 (2.08)
- separate for fourth quartile legal quality countries			-0.36 (-5.70)	0.58 (6.21)	0.11 (0.22)	3.40 (4.76)
Quality of exporter institutions - (baseline legal quality)	0.85 (7.92)	-0.53 (-3.66)	0.51 (3.90)	0.16 (0.87)	0.42 (2.99)	0.26 (1.36)
- separate for second quartile legal quality countries			0.11 (2.54)	-0.07 (-1.05)	1.13 (4.09)	-1.10 (-2.65)
- separate for third quartile legal quality countries			0.23 (3.82)	-0.47 (-5.42)	0.37 (1.14)	-1.47 (-2.96)
- separate for fourth quartile legal quality countries			0.17 (2.63)	-0.50 (-5.25)	1.12 (2.36)	-3.02 (-4.02)
Country-dummies	Yes	Yes	Yes	Yes	Yes	Yes
Quartile dummies*					Yes	Yes
Number of Clusters	2755	2550	2755	2550	2755	2550
adjusted R^2	0.79	0.50	0.80	0.51	0.80	0.51
Observations	22,669	18,948	22,669	18,948	22,669	18,948

T-statistics reported in parentheses are computed from robust standard errors that account for within-group correlation. Clusters are around country-pairs. * There are six additional dummies for the level of development by importing and exporting country corresponding to the additional quartile-coefficients in columns 3-6

Table 3a: Predicted effect on Production and Transaction Costs based on the Model for Complex Goods

Income Quartile	Total Transaction Costs	Bounds for Production Costs (PC)
Overall	0.34	0.85 > PC > 0.51
Low	0.46	0.51 > PC > 0.05
Mid-Low	0.42	0.62 > PC > 0.20
Mid-High	0.35	0.74 > PC > 0.39
High	0.27	0.68 > PC > 0.41

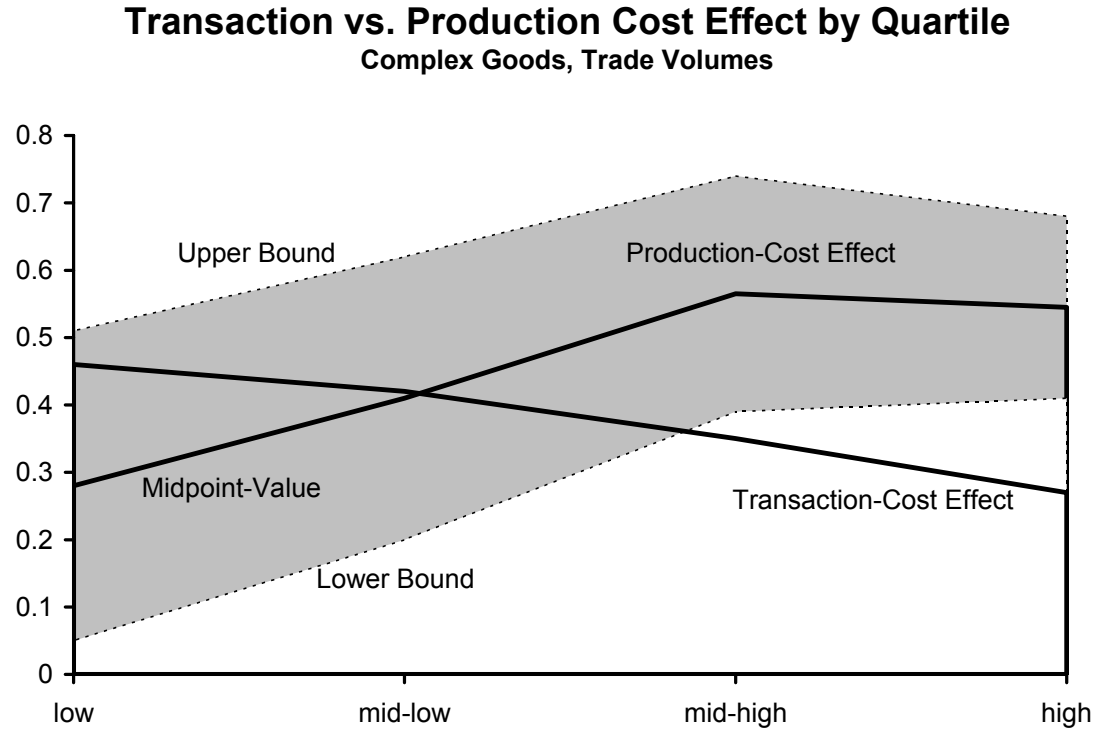

Table 3b: Net-Export Regressions (Dollar Values)
Pooled for 1982-1992, Complex vs. Simple Goods

Regression Column	1	2	3	4	5	6
	Complex	Simple	Complex	Simple	Complex	Simple
GDP importer	0.59 (2.08)	-1.25 (-3.04)	0.50 (1.59)	-1.18 (-2.71)	0.29 (0.91)	-1.05 (-2.33)
GDP exporter	0.73 (2.60)	-1.45 (-3.52)	0.64 (2.06)	-1.40 (-3.22)	0.44 (1.37)	-1.27 (-2.82)
GDP per capita importer	0.22 (0.91)	1.84 (3.69)	0.36 (0.96)	1.67 (3.15)	0.60 (1.58)	1.53 (2.76)
GDP per capita exporter	0.31 (0.65)	1.84 (3.70)	0.40 (1.07)	1.86 (3.57)	0.65 (1.69)	1.72 (3.17)
Distance	-0.72 (-14.04)	-0.92 (-14.21)	-0.73 (-14.03)	-0.93 (-14.53)	-0.73 (-14.03)	-0.93 (-14.54)
Adjacent	0.67 (2.85)	0.24 (1.12)	0.67 (2.83)	0.24 (1.12)	0.67 (2.82)	0.23 (1.08)
Links	0.58 (4.66)	0.40 (2.46)	0.58 (4.66)	0.37 (2.32)	0.58 (4.68)	0.37 (2.33)
Language similarities	1.00 (4.58)	0.23 (0.77)	1.02 (4.62)	0.29 (0.99)	1.02 (4.63)	0.30 (1.03)
Quality of importer institutions - (baseline legal quality)	-0.10 (-0.83)	0.54 (2.86)	0.11 (0.79)	0.09 (0.42)	0.09 (0.61)	0.16 (0.67)
- separate for second quartile legal quality countries			-0.07 (-1.59)	0.01 (0.16)	0.12 (0.43)	0.09 (0.18)
- separate for third quartile legal quality countries			-0.17 (-2.29)	0.31 (2.80)	-0.53 (-1.05)	0.25 (0.45)
- separate for fourth quartile legal quality countries			-0.19 (-2.15)	0.31 (2.63)	-0.76 (-1.05)	2.65 (3.06)
Quality of exporter institutions - (baseline legal quality)	0.87 (5.33)	-0.30 (-1.88)	0.59 (2.98)	0.10 (0.54)	0.51 (2.31)	0.16 (0.77)
- separate for second quartile legal quality countries			0.10 (1.51)	-0.05 (-0.83)	1.00 (2.41)	-1.22 (-2.66)
- separate for third quartile legal quality countries			0.16 (1.91)	-0.32 (-3.49)	-0.12 (-0.27)	0.02 (0.04)
- separate for fourth quartile legal quality countries			0.14 (0.79)	-0.33 (-3.07)	-0.03 (-0.04)	-1.07 (-1.19)
Country-dummies	Yes	Yes	Yes	Yes	Yes	Yes
Quartile dummies*					Yes	Yes
Number of Clusters	1993	1960	1993	1960	1993	1960
adjusted R^2	0.74	0.52	0.74	0.52	0.74	0.52
Observations	12,096	10,853	12,096	10,853	12,096	10,853

T-statistics reported in parentheses are computed from robust standard errors that account for within-group correlation. Clusters are around country-pairs. * There are six additional dummies for the level of development by importing and exporting country corresponding to the additional quartile-coefficients in columns 3-6

Table 3c: Relative-Export Regressions (Dollar Values)
Pooled for 1982-1992, Complex vs. Simple Goods

Regression Column	1	2	3
	Complex / simple	Complex / simple	Complex / simple
GDP importer	1.53 (3.87)	1.13 (2.65)	0.95 (2.22)
GDP exporter	2.12 (5.33)	1.73 (4.08)	1.57 (3.68)
GDP per capita importer	-1.21 (-2.58)	-0.57 (-1.14)	-0.39 (-0.78)
GDP per capita exporter	-1.23 (-2.54)	-0.99 (-1.95)	-0.88 (-1.71)
Distance	0.36 (5.52)	0.36 (5.69)	0.36 (5.70)
Adjacent	0.20 (0.94)	0.21 (1.00)	0.21 (1.00)
Links	0.38 (2.13)	0.39 (2.22)	0.39 (0.18)
Language similarities	0.88 (2.67)	0.87 (2.70)	0.87 (2.69)
Quality of importer institutions - (baseline legal quality)	-1.30 (-7.15)	0.02 (0.10)	-0.04 (-0.18)
- separate for second quartile legal quality countries		-0.23 (-2.87)	-1.15 (-2.40)
- separate for third quartile legal quality countries		-0.91 (-8.45)	-1.05 (-1.79)
- separate for fourth quartile legal quality countries		-0.94 (-8.16)	-4.10 (-4.57)
Quality of exporter institutions - (baseline legal quality)	1.32 (6.82)	0.24 (1.01)	-0.01 (-0.03)
- separate for second quartile legal quality countries		0.21 (2.69)	2.83 (5.25)
- separate for third quartile legal quality countries		0.72 (6.67)	1.72 (2.86)
- separate for fourth quartile legal quality countries		0.69 (5.84)	4.53 (4.72)
Country-dummies	Yes	Yes	Yes
Quartile dummies*			Yes
Number of Clusters	2492	2492	2492
adjusted R^2	0.37	0.39	0.39
Observations	18,393	18,393	18,393

T-statistics reported in parentheses are computed from robust standard errors that account for within-group correlation. Clusters are around country-pairs. * There are six additional dummies for the level of development by importing and exporting country corresponding to the additional quartile-coefficients in columns 3-6

Table 4: Import Regressions (Industry Links)
Pooled for 1982-1992, Complex vs. Simple Goods

Regression Column	1	2	3	4	5	6
	Complex	Simple	Complex	Simple	Complex	Simple
GDP importer	0.62 (5.50)	-0.14 (-1.69)	0.52 (4.23)	-0.21 (-2.28)	0.49 (3.97)	-0.18 (-1.88)
GDP exporter	0.90 (8.02)	-0.06 (-0.70)	0.80 (6.57)	-0.12 (-1.34)	0.78 (6.33)	-0.09 (-0.98)
GDP per capita importer	-0.41 (-3.07)	0.37 (3.56)	-0.26 (-1.81)	0.43 (3.94)	-0.28 (-1.92)	0.37 (3.25)
GDP per capita exporter	-0.40 (-2.97)	0.30 (2.97)	-0.33 (-2.31)	0.37 (3.49)	-0.31 (-2.14)	0.32 (2.91)
Distance	-0.50 (-17.38)	-0.56 (-28.71)	-0.50 (-17.46)	-0.56 (-28.75)	-0.50 (-17.64)	-0.56 (-28.75)
Adjacent	-0.04 (-0.27)	0.15 (2.11)	-0.04 (-0.28)	0.15 (2.10)	-0.04 (-0.29)	0.15 (2.10)
Links	0.39 (5.75)	0.22 (5.06)	0.39 (5.74)	0.22 (5.05)	0.39 (5.78)	0.22 (5.04)
Language similarities	0.78 (5.68)	0.10 (1.28)	0.79 (5.70)	0.10 (1.30)	0.79 (5.74)	0.11 (1.32)
Quality of importer institutions - (baseline: GDP per capita and legal quality)	-0.27 (-4.83)	0.03 (0.69)	0.08 (1.08)	0.06 (1.07)	0.02 (0.19)	0.03 (0.55)
- separate for second quartile legal quality countries			-0.12 (-5.07)	-0.04 (-1.87)	-0.22 (-1.39)	-0.002 (-0.01)
- separate for second quartile legal quality countries			-0.25 (-7.45)	-0.005 (-0.18)	0.63 (3.45)	0.30 (2.15)
- separate for second quartile legal quality countries			-0.27 (-7.40)	-0.03 (-1.11)	-0.61 (-2.13)	0.50 (2.57)
Quality of exporter institutions - (baseline: GDP per capita and legal quality)	0.79 (13.27)	0.25 (6.15)	0.51 (6.93)	0.29 (5.92)	0.48 (6.12)	0.27 (5.09)
- separate for second quartile legal quality countries			0.07 (2.85)	-0.001 (-0.07)	0.67 (4.48)	0.06 (0.55)
- separate for second quartile legal quality countries			0.18 (5.25)	-0.04 (-1.81)	-0.14 (-0.78)	0.13 (0.91)
- separate for second quartile legal quality countries			0.16 (4.30)	-0.04 (-1.36)	1.34 (4.58)	0.13 (0.64)
Country-dummies	Yes	Yes	Yes	Yes	Yes	Yes
Quartile dummies*					Yes	Yes
Number of Clusters	2755	2550	2755	2550	2755	2550
R^2	0.74	0.73	0.75	0.74	0.75	0.74
Observations	22,669	18,948	22,669	18,948	22,669	18,948

T-statistics reported in parentheses are computed from robust standard errors that account for within-group correlation. Clusters are around country-pairs.

Table 4c: Relative-Export Regressions (Industry Links)
Pooled for 1982-1992, Complex vs. Simple Goods

Regression Column	1	2	3
	Complex / simple	Complex / simple	Complex / simple
GDP importer	0.88 (6.52)	0.82 (5.74)	0.73 (4.99)
GDP exporter	1.07 (7.98)	1.01 (7.11)	0.93 (6.38)
GDP per capita importer	-0.90 (-5.62)	-0.80 (-4.75)	-0.74 (-4.26)
GDP per capita exporter	-0.91 (-5.68)	-0.88 (-5.21)	-0.76 (-4.37)
Distance	0.12 (4.83)	0.12 (4.92)	0.13 (5.02)
Adjacent	-0.19 (-1.96)	-0.18 (-1.92)	-0.18 (-1.90)
Links	0.15 (2.18)	0.15 (2.23)	0.15 (2.24)
Language similarities	0.50 (3.91)	0.50 (3.91)	0.50 (3.94)
Quality of importer institutions - (baseline legal quality)	-0.42 (-6.55)	-0.07 (-0.93)	-0.15 (-1.69)
- separate for second quartile legal quality countries		-0.10 (-3.59)	-0.07 (-0.41)
- separate for third quartile legal quality countries		-0.24 (-6.32)	0.53 (2.61)
- separate for fourth quartile legal quality countries		-0.22 (-5.54)	-1.03 (-3.36)
Quality of exporter institutions - (baseline legal quality)	0.60 (9.22)	0.29 (3.56)	0.28 (3.27)
- separate for second quartile legal quality countries		0.10 (3.63)	0.75 (4.28)
- separate for third quartile legal quality countries		0.22 (5.71)	-0.59 (-2.82)
- separate for fourth quartile legal quality countries		0.19 (4.43)	0.91 (2.63)
Country-dummies	Yes	Yes	Yes
Quartile dummies*			Yes
Number of Clusters	2492	2492	2492
adjusted R^2	0.36	0.37	0.39
Observations	18,393	18,393	18,393

T-statistics reported in parentheses are computed from robust standard errors that account for within-group correlation. Clusters are around country-pairs. * There are six additional dummies for the level of development by importing and exporting country corresponding to the additional quartile-coefficients in columns 3-6

Table 5: Import Regressions (Dollar Values)
Pooled for 1982-1992, Complex Relative to Simple Goods

Regression Column	1	2	3	4	5	6
	direct	direct	interacted* with SITC one-digit	interacted* with SITC one-digit	interacted with GNP	interacted with GNP
Quality of importer institutions - (baseline legal quality)	-0.25 (-3.46)	-0.07 (-0.86)	0.39 (5.25)	0.71 (9.11)	-0.56 (-4.94)	0.68 (4.14)
- separate for above median		-2.07 (-5.15)		-3.18 (-6.97)		-3.27 (-7.40)
Interaction Effect - (baseline importer leg. x header)			-0.10 (-28.64)	-0.14 (-23.96)	0.03 (4.36)	-0.06 (-5.06)
- separate for above median				0.06 (20.07)		0.03 (2.21)
Quality of exporter institutions - (baseline legal quality)	1.73 (20.65)	0.43 (4.65)	0.59 (7.22)	0.97 (10.91)	-0.26 (-2.35)	-0.63 (-3.51)
- separate for above median		2.85 (7.31)		-2.79 (-6.95)		4.67 (10.67)
Interaction Effect - (baseline exporter leg. x header)			0.18 (53.27)	0.12 (19.21)	0.18 (26.32)	0.08 (6.90)
- separate for above median				0.07 (23.21)		-0.03 (-2.15)
Controls:						
DCG (Dummy complex goods)	-11.12 (-40.21)	-4.26 (-12.41)	-11.29 (-40.36)	-8.77 (-26.14)	-9.46 (-35.76)	-4.27 (-12.36)
DCG x DH1 (Dummy high legal quality importer)		-4.74 (-6.80)		-8.16 (-12.06)		-5.05 (-6.97)
DCG x DH2 (Dummy high legal quality exporter)		0.45 (0.62)		3.81 (6.04)		1.26 (1.66)
DCG x GNP per capita importer	0.39 (12.02)	0.0 (-0.01)	0.40 (12.20)	0.06 (1.64)	0.36 (11.61)	0.02 (0.55)
DCG x DH1 x GNP per capita importer		0.94 (9.80)		1.46 (13.18)		1.13 (9.79)
DCG x GNP per capita exporter	0.67 (20.18)	0.40 (10.84)	0.67 (20.33)	0.67 (18.13)	0.44 (14.03)	0.39 (10.38)
DCG x DH2 x GNP per capita exporter		-0.60 (-6.35)		0.07 (0.74)		-0.96 (-8.43)
SITC One-digit-industry code			0.01 (3.31)	0.04 (11.87)		
Country-pair-year dummies	Yes		Yes	Yes	Yes	
Country-pair-year-2digit SITC dummies		Yes				Yes
Number of Clusters	24,470	775,652	24,470	24,470	24,470	775,652
adjusted R^2	0.41	0.60	0.42	0.43	0.42	0.60
Observations	2,991,088	2,991,088	2,991,088	2,991,088	2,991,088	2,991,088

T-statistics reported in parentheses are computed from robust standard errors that account for within-group correlation. Clusters are around the dummy variables in the control sets.

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