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World Trade Organization

Economic Research and Statistics Division

**DISTANCE, FORMAL AND INFORMAL INSTITUTIONS
IN INTERNATIONAL TRADE***

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Distance, Formal and Informal Institutions in International Trade*

Rainer Lanz[†] Woori Lee[‡] Victor Stolzenburg[†]

24 January 2019

Abstract

This paper brings together three strands of literature on the determinants of international trade – distance, formal, and informal institutions – to explain differences in export performance across countries. Using an augmented gravity model, we find that the importance of formal institutions (rule of law) for bilateral trade increases with distance. Similarly, the pro-trade effect of informal institutions (migrant networks) is larger for distant countries. After confirming that informal institutions can substitute for weak formal institutions in promoting trade, we finally show that this substitution effect does not decrease with distance. Our findings contribute to explaining the persistent negative effect of distance on the export performance of many developing countries despite reductions in trade costs, and provide guidance to policy makers in terms of trade reform, regional trade liberalization and export promotions strategies.

Keywords: International trade, Distance, Rule of law, Migrant networks

JEF classification: D23, F14, F22, L14, O43

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1 Introduction

What explains the missing exports of many developing countries? Despite their respective income levels and the fall in transportation costs over the last decades, the export performance of a wide array of countries remains frail. Evidence points to their relative remoteness and weak legal institutions as central factors behind this underperformance in trade. Building on this, we show in this paper that the interplay between these two factors places an additional burden on economies which helps explain observed differences in export performance across countries. We further argue that the presence of shared informal institutions can alleviate this burden.

Using an augmented gravity model, we first show that the distance of many developing countries to major markets and their relatively low ability to enforce contracts do not only individually contribute to low exports but also reinforce each other. That is, we find that the importance of formal institutions for bilateral exports increases with the distance between two countries. In fact, the interaction between distance and formal institutions accounts for a significant share of the effect of distance on trade. This finding contributes to explaining the so-called distance puzzle for low-income countries and is in line with literature arguing that the distance coefficient captures not only transportation costs but a broader set of transaction costs related to information asymmetries, bilateral trust, and cultural distance.

To provide guidance to countries that are most affected by this interaction between rule of law and distance, we then move on to show that informal institutions, proxied by migrant networks, can also lower distance-dependent transaction costs and thereby facilitate trade. In addition, we test explicitly to what extent migration networks can substitute for weak formal institutions. We find that migrant networks can indeed substitute for legal institutions, as they promote trade more in countries with weak rule of law. This substitution effect does not decline with distance.

By linking distance, formal institutions and informal institutions as determinants of international trade, our findings contribute to three different strands of literature. Firstly, we add to the large literature that highlights the role of legal institutions in international trade. Building on this literature, we are the first to show that the effect of legal institutions on international trade increases with geographic distance. Put differently, the distance elasticity is smaller for countries with stronger rule of law.

Secondly, we contribute to the literature that highlights the benefits of shared informal institutions, such as migrant networks, for international trade. As in the case of formal institutions, we add to this literature by showing that the pro-trade effect of migrant networks increases with distance. Furthermore, we show that the substitution effect between migrant networks and legal institutions is valid for global trade, and that this substitution effect does not decline with distance.

Thirdly, our results on the interdependence between formal and informal institutions on one hand, and distance on the other, present novel evidence on why distance remains central in explaining trade costs despite advances in transportation technology. While a number of studies have shown that the distance puzzle is reduced or vanishes when proper estimation techniques are used (Larch et al., 2016), the negative effect of distance on trade remains persistently high for low income countries. Accounting for intra-national trade flows, Borchert and Yotov (2017) find that, on average, the effect of distance on trade has fallen over time. While middle income countries have experienced the steepest fall in distance-related frictions, low income countries have not benefitted from similar reductions. Carrère et al. (2013) find that the distance puzzle only applies to low income countries, which exhibit a 18 percent rise in the distance effect on trade between 1970 and 2006. By observing that the distance elasticity of trade is significantly reduced by shared migrant networks and strong legal institutions, we can infer that transportation costs explain relatively less of the distance elasticity than trust, cultural barriers and information asymmetries. Hence, we help explain why the continuous fall in transportation costs has not translated into an equal decline of the distance coefficient for developing countries that suffer from weak institutions.

Our findings have important policy implications. They highlight that reliable contract enforcement institutions and an adherence to the rule of law more generally is particularly pertinent for remote countries. Countries close to major markets benefit from lower information asymmetries due to similar languages and cultures. Moreover, they can rely on the presence of additional shared informal institutions like migrant networks, which tend to be stronger regionally. As a consequence, weak contract enforcement abilities are a relatively smaller barrier for their exports. In contrast, remote economies need to provide in the absence of such informal institutions more formal guarantees to trade partners in order to overcome information asymmetries and uncertainty.

Remote countries are therefore likely to particularly benefit from trade reform at the multilateral and regional levels that strengthen their formal institutions. For instance, the World Trade Organization (WTO) accession process requires acceding governments to undertake significant domestic reforms. For many countries, particularly least developed countries, one of the main motivations for joining the WTO is to use the accession process to develop their institutional framework. Similarly, many regional trade agreements (RTAs) require sound institutions by going beyond simple market access commitments and covering areas such as competition, investment, labour markets and environment.

At the same time, the findings also point to the benefits of regional trade liberalization efforts such as the Continental Free Trade Area (CFTA) in Africa or the Regional Comprehensive Economic Partnership (RCEP) in Asia. Since we find that strong legal institutions are less important for trade between nearby countries, a reduction in trade costs at the regional level promises to be particularly trade promoting for developing economies. This positive effect of regional integration is reinforced by our finding that informal institutions, which tend to be more pronounced within regions, can help overcome cultural barriers and information asymmetries in a similar manner as formal legal institutions.

Finally, as perceptions of institutions tend to change slowly, our results suggest that in the short term export promotion and aid for trade policies should take into account informal institutions, both at home and abroad, when assessing market potential as they can substitute for formal institutions.

The remainder of this article is organized as follows. Section 2 explains how distance, formal and informal institutions are connected. Section 3 describes the empirical setup and the data before section 4 presents the results on formal institutions and distance. Section 5 introduces the role of informal institutions, followed by robustness analysis in section 6. Section 7 concludes.

2 Linking distance, formal and informal institutions

To understand how distance, formal and informal institutions are linked when it comes to their role in international trade, it is helpful to recall their re-

spective individual roles first. As is known since the early contribution by Tinbergen (1962), trade decreases with distance due to higher transportation costs. In addition, the literature has uncovered a series of other variables that are correlated with distance and hinder trade such as information asymmetries (Anderson and van Wincoop, 2004), cultural distance (Guiso et al., 2009; Felbermayr and Toubal, 2010), and unfamiliarity (Huang, 2007). The reason is that cultural differences tend to increase with distance, along with differences in perceptions of quality, timeliness, and various other factors that matter for transactions. Moreover, language barriers tend to rise and thus the costs of obtaining information on foreign distribution channels, rules and regulations increase. In fact, according to the US International Trade Commission (2010), US firms cite language and cultural barriers as one of the main impediments to engaging in global trade.

Legal institutions matter for international trade since they lower transaction and information costs by reducing uncertainty and the costs related to the writing, monitoring and enforcement of contracts. Legal institutions have been found to be an important determinant of comparative advantage in exports (Nunn, 2007; Levchenko, 2007). Countries with better legal institutions tend to specialize in contract-intensive sectors, which require more relationship-specific investment (Nunn, 2007) or are more complex (Berkowitz et al., 2006; Levchenko, 2007). Moreover, a number of papers have estimated gravity models finding evidence of a positive effect of institutions on bilateral trade (Anderson and Marcouiller, 2002; Groot, 2010; Francois and Manchin, 2013; Araujo et al., 2016; Beverelli et al., 2018).

Migrant networks, besides other informal institutions such as shared culture, can effectively fulfil similar roles as legal institutions for bilateral trade by providing enforcement mechanisms, facilitating information flows and building trust (Nunn and Treffer, 2014). An extensive literature exists on the relationship between migration networks and trade. Gould (1994) and Rauch and Trindade (2002) show how migrants boost bilateral trade by lowering information costs. Their networks can provide information on foreign firms' credibility, reputation or performance to domestic firms. In addition, Greif (1989, 1993) and Rauch (2001) highlight a channel whereby migrants enforce cooperative behaviour through the threat of being expelled from networks. Both channels can raise the confidence of domestic firms in the foreign trade partner even in the absence of formal institutions.¹ A number of studies have

¹Another channel through which migrants can affect bilateral trade is preferences and

found a pro-trade effect of migrant networks for particular countries, including the United States (Gould, 1994), Canada (Head and Ries, 1998), France (Combes et al., 2005; Briant et al., 2014), Italy (Bratti et al., 2014), Portugal (Bastos and Silva, 2012), and Vietnam (Parsons and Vézina, 2018). Studies have furthermore found a stronger pro-trade effect of migration networks for differentiated goods (Rauch and Trindade, 2002; Sgrignoli et al., 2015), high-skilled or business migrants (Felbermayr and Toubal, 2012; Aleksynska and Peri, 2013; Giovannetti and Lanati, 2016), and low income countries (Bratti et al., 2014; Ehrhart et al., 2014).

Describing the individual roles of distance, formal and informal institutions for international trade makes their interlinkages visible. As many of the distance-related frictions in international trade are related to the lack of information about remote trade partners and the ensuing uncertainty and mistrust, the hypothesis that the importance of formal and informal institutions for trade increases with distance arises naturally since these institutions facilitate the flow of information and reduce uncertainty. Taking a historical perspective, North (1991) describes how the development of long distance trade and complex transactions required effective, impersonal contract enforcement to mitigate increasing agency and contracting costs. Dixit (2003, 2009) shows that formal governance becomes more important when there is a large geographic or social spread between agents due to a decreasing willingness to be honest. A key question is then not only whether there is a relationship between distance and institutions but also how much of the distance coefficient this relationship can explain.

Similarly, as formal and informal institutions address similar frictions in international trade, it is natural to test whether they can serve as substitutes. While most existing studies only assess the direct effect of migration networks on trade flows, a small number of papers with a specific geographic focus assess empirically the substitutability between migration networks and formal institutions (Dunlevy, 2006; Briant et al., 2014; Ehrhart et al., 2014). Moreover, while it is reasonable to assume that shared informal institutions can alleviate information-related frictions and thus work as substitutes for formal institutions to some extent, it is not clear whether this still applies when the frictions become large. Do firms require formal guarantees once

demand towards goods from their home country. This however is not the focus of our paper, as we are interested in how the trade-promoting effect of migrant networks depends on distance and the quality of formal institutions, rather than the main effect.

the level of uncertainty reaches a certain threshold as could be the case for trade between distant economies? Put differently, does the substitutability of formal and informal institutions decrease with distance?

In this paper, we will address these questions on the linkages between distance, formal and informal institutions empirically. Since answering them has important implications for the understanding of trade patterns and trade policy, we hope that this can provide guidance to policy makers in countries that are remote or are perceived to have weak institutions.

3 Empirical setup and data

For our empirical setup, we rely on a standard gravity framework. We augment this framework by introducing interactions between distance, formal and informal institutions to examine how they interact in affecting bilateral trade. The general setup is as follows:

$$\ln Y_{ij} = \alpha + \beta'(X_1 \times X_2) + \gamma' Z_{ij} + \alpha_i + \alpha_j + \epsilon_{ij} \quad (1)$$

where Y_{ij} is total bilateral exports from country i to j , averaged for the period 2011 to 2015 to smoothen out cyclical effects.² Z_{ij} includes bilateral control variables such as dummy variables for the country pair having an RTA and/or a Bilateral Investment Treaty (BIT) and other standard gravity controls: distance, language, colonial history, and contiguity.³ α_i and α_j are country fixed effects that capture exporter- and importer-specific characteristics, such as multilateral resistance and size. We estimate all specifications using both OLS and Poisson Pseudo-Maximum Likelihood (PPML). For the latter we do not use the log of exports.

Our variables of interest are the interaction terms between distance, formal and informal institutions as captured by $(X_1 \times X_2)$. The included interaction terms will differ across specifications depending on the question we want to answer. For instance, when we want to analyse whether the impact of formal institutions on trade increases with distance, X_1 and X_2 will be replaced by distance and proxies of institutional quality. We will introduce the

²We do not use panel gravity due to the lack of time variation in the rule of law variable, as the quality of institutions does not change in the short-run.

³The inclusion of colonial history as a regressor allows us to control for the origins of legal systems, another institution that may affect trade flows.

exact specifications for each research question in the corresponding sections 4 and 5.

For our setup, we require data on bilateral trade flows, formal, and informal institutions, and a set of gravity controls including distance. For trade we use the OECD Bilateral Trade Database by Industry and End-Use (BTDIxE) database. BTDIxE is mainly drawn from the UNSD’s Comtrade Database and also uses historical data from the OECD’s International Trade by Commodity Statistics (ITCS).⁴ It covers bilateral trade flows reported by 159 countries. We use mirror data to construct our dependent variable, using imports from the destination country as a measure of exports from the origin country, due to the generally higher reliability of import data.⁵

To capture formal institutions, we rely on the widely used rule of law measure from the Worldwide Governance Indicators (WGI) (Kaufmann et al., 2010). This indicator records perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence. As a robustness check, we also use the rule of law index from the Heritage Foundation which is based on property rights (private property rights, independence of judiciary, and contract enforcement) and freedom from corruption.⁶

Our proxy for informal institutions is given by migrant stocks as reported in the Global Bilateral Migration Database (Özden et al., 2011) which provides bilateral migrant stocks for 1960-2000 and the Bilateral Migration Matrix for 2013, both from the World Bank. The extensive time coverage of this database allows us to address endogeneity concerns for migrant stocks. Migrant stocks are an optimal measure of informal institutions as they can address information asymmetries directly and, in addition, proxy for alternative measures of shared informal institutions like trust and common culture.

Other standard gravity variables — distance and dummy variables for common language, contiguity, colonial relationships, common colony, same country — are from CEPII’s distance database, and the dummy variables to control for RTAs and BITs are from de Sousa (2012) and UNCTAD, respec-

⁴This database is used as an input into the OECD’s Inter-Country Input-Output (ICIO) system – the principle source of the Trade in Value Added (TiVA) indicators developed by OECD and WTO.

⁵The results are robust to using exports data.

⁶The Heritage Foundation’s rule of law index is categorical, having 10 unique values (between 0.1 and 0.9) for all countries in the sample.

tively. Finally, GDP per capita is from World Bank’s World Development Indicators (WDI).

Putting these data sources together, we have 135 countries included in the baseline empirical analysis. Appendix Table A.5 provides the full list of countries and their rule of law index.⁷ Table 1 shows the descriptive statistics for the main variables.

Table 1: Descriptive statistics

| Variable | Mean | Std. Dev. | Min. | Max. | N |
|------------------------|-------|-----------|--------|--------|-------|
| $\ln(exports)$ | 8.338 | 4.363 | -6.215 | 19.949 | 17197 |
| <i>RoL</i> | 0.49 | 0.263 | 0 | 1 | 18090 |
| $\ln(1 + migr)$ | 2.097 | 2.847 | 0 | 15.975 | 18090 |
| $\ln dist$ | 8.684 | 0.803 | 4.088 | 9.894 | 18090 |
| <i>RTA</i> | 0.179 | 0.383 | 0 | 1 | 18090 |
| <i>BIT</i> | 0.205 | 0.404 | 0 | 1 | 18090 |
| <i>Contiguity</i> | 0.021 | 0.143 | 0 | 1 | 18090 |
| <i>SameLanguage</i> | 0.131 | 0.337 | 0 | 1 | 18090 |
| <i>Colony</i> | 0.014 | 0.119 | 0 | 1 | 18090 |
| <i>CommonColonizer</i> | 0.081 | 0.272 | 0 | 1 | 18090 |
| <i>Colony45</i> | 0.008 | 0.089 | 0 | 1 | 18090 |
| <i>SameCountry</i> | 0.01 | 0.1 | 0 | 1 | 18090 |
| $\ln GDPperCapita$ | 8.324 | 1.556 | 5.293 | 11.222 | 18090 |

RoL is normalized between 0 and 1.

4 Formal institutions and distance

We start by examining whether and how the effect of formal institutions (rule of law) on trade varies by distance. As outlined in section 2, trade relationships, like other business relationships, are inevitably contract-based, and contracts tend to be more incomplete when they are international. A country’s ability to guarantee contract enforcement can lower the corresponding contracting costs. In addition, as information asymmetries tend to increase with geographic distance, formal institutions can be expected to be more important for trade between distant countries by reducing uncertainty.

We thus adapt equation (1) with interaction terms between distance and a measure of formal institutions to capture the distance-dependent effect of

⁷Equivalent to 18,090 country pairs. We drop countries whose data on trade flows is limited (i.e. less than 50 recorded trade partners). Changing this threshold to 0 or 30 does not alter the main results. Also dropped are countries that do not have data on rule of law, migrant stocks, or GDP per capita.

institutions on exports from country i to j :

$$\begin{aligned} \ln Y_{ij} = & \beta_0 + \beta_1(\ln dist_{ij} \times RoL_i) + \beta_2(\ln dist_{ij} \times RoL_j) \\ & + \beta_3(\ln dist_{ij} \times \ln gdppc_i) + \beta_4(\ln dist_{ij} \times \ln gdppc_j) \\ & + \beta'_5 Z_{ij} + \alpha_i + \alpha_j + \epsilon_{ij}. \end{aligned} \quad (2)$$

Our variables of interest are the interaction terms $(\ln dist_{ij} \times RoL_i)$ and $(\ln dist_{ij} \times RoL_j)$. The respective coefficients β_1 and β_2 measure how the impact of rule of law in the exporting and importing countries depends on the distance between trade partners. Note that this specification does not allow us to identify the main effect of RoL because it is absorbed by the country fixed effects, α_i and α_j .⁸ Z_{ij} includes bilateral control variables such as dummy variables for the country pair having an RTA and/or a BIT and standard gravity controls: distance, language, colonial history, and contiguity.

To address concerns for potential endogeneity of rule of law, we use past values from 1996 (earliest available) as a proxy for formal institutions. One may also be concerned that a country's level of rule of law is likely to correlate with many other country characteristics linked to its development status. To ensure that the interaction terms correctly capture the distance-dependent effects of rule of law rather than high income, we include an interaction term with log GDP per capita as a control every time RoL is interacted with another variable.

The estimation results of equation (2), given in Table 2, show that formal institutions — in both the exporting and importing countries — play a larger role in promoting trade as the distance between the trading countries increases. That is, the negative effect of distance is moderated when the exporting country and/or the importing country has a strong rule of law. This implies that it is easier for countries with good formal institutions to trade with far away countries than for those with weak institutions. The importance of implementing a sound and reliable institutional framework is therefore paramount for remote economies.

The results are shown for OLS in columns (1) and (2) and PPML in columns (3) and (4) to account for zero trade flows and heteroskedasticity

⁸Even though we do not observe the coefficient on rule of law, there is abundant evidence in the literature that a strong rule of law promotes trade (see section 2).

(Santos Silva and Tenreyro, 2006). The coefficients of the interaction terms between distance and rule of law of the exporting and importing countries are positive and with one exception significant in columns (2) and (4). The interaction effect between distance and formal institutions is significantly larger in magnitude and more robust for exporting countries. The interaction for importer institutions is in fact insignificant in the PPML estimations (column (4)). We consider this intuitive since formal importer institutions matter mainly for guaranteeing full and timely payment. In case of weak contract enforcement, importers can circumvent this issue by paying upfront. In contrast, formal exporter institutions play a role for ensuring timely delivery, sufficient quality, and guarantee of products. Such issues cannot be addressed upfront.

Table 2: Distance and rule of law

| Dependent variable: | $\ln(exports_{ij})$ | | $exports_{ij}$ | |
|------------------------------|----------------------|----------------------|----------------------|----------------------|
| | (1) | (2) | (3) | (4) |
| $\ln dist_{ij}$ | -1.350*** (0.030) | -1.416*** (0.030) | -0.582*** (0.031) | -0.608*** (0.042) |
| $\ln dist_{ij} \times RoL_i$ | | 1.223*** (0.138) | | 1.009*** (0.190) |
| $\ln dist_{ij} \times RoL_j$ | | 0.229* (0.133) | | 0.225 (0.173) |
| Observations | 17,197 | 17,197 | 18,090 | 18,090 |
| R-squared | 0.824 | 0.829 | 0.879 | 0.901 |
| Estimation | OLS | OLS | PPML | PPML |

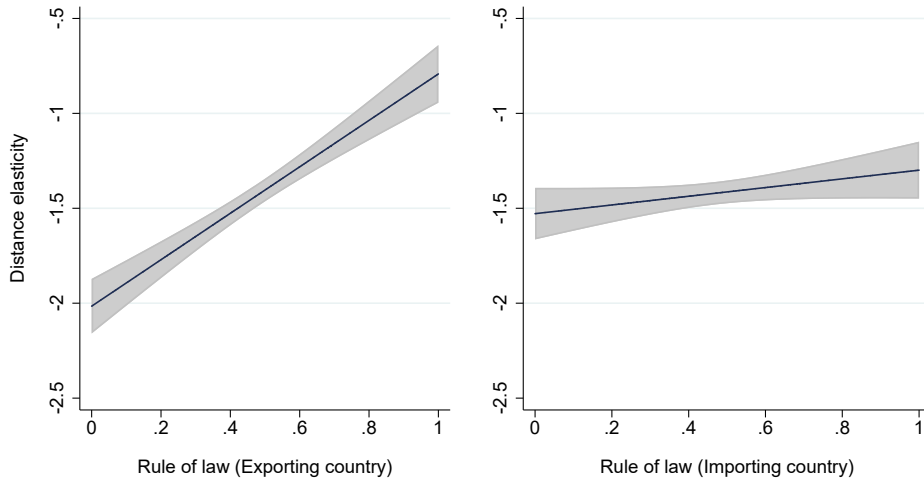
Robust standard errors in parentheses. $exports_{ij}$ is averaged between 2011-15. All specifications include exporter and importer fixed effects and standard gravity controls: dummy variables for RTA, BIT, contiguity, common language, and colonial relationships. Columns (2) and (4) additionally include $\ln dist \times \ln gdp_{pc}$ as controls (coefficients not reported for brevity). All interacted variables are centered. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Since we do not observe the coefficient for the main rule of law variables, it is not straightforward to quantify the differential effect of rule of law on trade flows. However, we can quantify how the distance elasticity depends on the trading countries' rule of law. In column (2), the coefficient -1.416 on $\ln dist$ is the distance elasticity for two countries that have average GDP per capita and the average rule of law.

Figure 1 plots the elasticity of distance for country pairs with average

incomes but different levels of rule of law for either the exporting or the importing country. Looking at the left-hand side chart, consider a country with a weak rule of law (25th percentile) exporting to an average country both in terms of per capita income and rule of law. The distance elasticity for this country pair would be -1.68 . On the other hand, if the exporting country's rule of law were strong (75th percentile), all else equal, the distance elasticity would be -1.17 . Hence, if a country improved its rule of law from the 25th to the 75th percentile, the negative distance elasticity would be reduced by 0.5 percentage points. For an importing country (see right-hand side chart), a change in rule of law from the 25th to 75th percentile is associated with a 0.1 point reduction in the distance elasticity for trade with an average exporter.⁹

Figure 1: Distance elasticity and rule of law



This plot is based on estimation results in column (2) of Table 2. Shaded area is the 95% confidence interval.

The finding that legal institutions affect the distance elasticity of trade contributes to explaining the distance puzzle. For many low-income countries, the negative effect of distance on trade has remained persistently high in spite of falling transportation costs. Our findings show that weak institutions can, at least partly, explain this phenomenon as they tend to aggravate the impact of distance on trade.

⁹In our sample, the country at the 25th percentile of rule of law is Belarus (0.27) or Papua New Guinea (0.28) and 75th percentile is Saint Kitts and Nevis (0.69) or South Korea (0.68). See Appendix table A.5 for the full list of countries and their rule of law. The country closest to the average $\ln(gdppc)$ is Iran.

Further insights can be gained from illustrating how the impact of a change in rule of law on bilateral trade differs for proximate and distant trading partners. Consider two countries with average income that are either far away (75th percentile in distance) or close by (25th percentile).¹⁰ A one standard deviation increase in the rule of law of the exporter (importer) will have a *differential* impact on its trade with far away and close by partners of 29.5 (5.5) percentage points.¹¹

It is worth re-emphasizing that all regressions include interactions terms between distance and GDP per capita. This control interaction term assures us that we are indeed capturing the interaction effects of rule of law, and not other country-specific characteristics that correlate with per capita income.

5 The role of informal institutions

5.1 Informal institutions and distance

We now assess whether informal institutions, as proxied by migrant networks, can play a similar role as formal institutions and facilitate trade more between remote countries than between proximate countries. As described in section 2, the intuition behind this is that informal institutions can potentially address similar distance-dependent frictions in international trade as formal institutions. To the extent that informal institutions can build trust and facilitate information flows between international trading partners, they can reassure both parties that the transaction will take place in the agreed-upon terms even in the absence of formal enforcement mechanisms.

Therefore, we adapt equation (1) with interaction terms between distance and our measure of informal institutions, migrant stocks, as follows:

$$\ln Y_{ij} = \beta_0 + \beta_1(\ln dist_{ij} * \ln migr_{ji}) + \beta_2(\ln dist_{ij} * \ln migr_{ij}) + \beta_3 \ln migr_{ji} + \beta_4 \ln migr_{ij} + \beta'_5 Z_{ij} + \alpha_i + \alpha_j + \epsilon_{ij}. \quad (3)$$

Again, our variables of interest are the interaction terms which capture

¹⁰For example, using United States as a benchmark, Republic of the Congo is “far” (75th percentile in distance) and Guyana is “close” (25th percentile). For Switzerland, Bolivia is “far” (75th percentile) and Mali is “close” (25th percentile).

¹¹These are large magnitudes, but a one standard deviation increase of rule of law in our sample is also quite large: equivalent to, for example, the change in the level of rule of law from that of Botswana to the United States, or from that of India to Portugal.

the distance-dependent effects of migrant networks in promoting bilateral trade. Unlike distance, migrant stocks are bilateral variables that are directional: we define $migr_{ij}$ as the stock of migrants from country i in country j . Also, we use past values of migrant stocks from 1960 to alleviate concerns for endogeneity, as common in the literature.¹²

Table 3 shows the results. In line with the existing literature, we find a pro-trade effect of migrant networks (columns (1) and (3)). The positive interaction terms in columns (2) and (4) confirm that migrant networks, like formal institutions, promote trade more when trading partners are far away. In other words, the negative effect of distance for bilateral trade is mitigated in the presence of strong migrant networks between the two countries.

Table 3: Distance and migrant stocks

| Dependent variable: | $\ln(exports_{ij})$ | | $exports_{ij}$ | |
|--------------------------------------|----------------------|----------------------|----------------------|----------------------|
| | (1) | (2) | (3) | (4) |
| $\ln dist_{ij}$ | -1.184*** (0.032) | -1.292*** (0.033) | -0.476*** (0.031) | -0.543*** (0.052) |
| $\ln migr_{ji}$ | 0.056*** (0.008) | 0.069*** (0.008) | 0.036*** (0.011) | 0.042*** (0.011) |
| $\ln migr_{ij}$ | 0.102*** (0.008) | 0.123*** (0.008) | 0.035*** (0.009) | 0.030*** (0.010) |
| $\ln dist_{ij} \times \ln migr_{ji}$ | | 0.037*** (0.006) | | 0.012* (0.006) |
| $\ln dist_{ij} \times \ln migr_{ij}$ | | 0.056*** (0.006) | | -0.002 (0.006) |
| Observations | 17,197 | 17,197 | 18,090 | 18,090 |
| R-squared | 0.827 | 0.829 | 0.887 | 0.891 |
| Estimation | OLS | OLS | PPML | PPML |

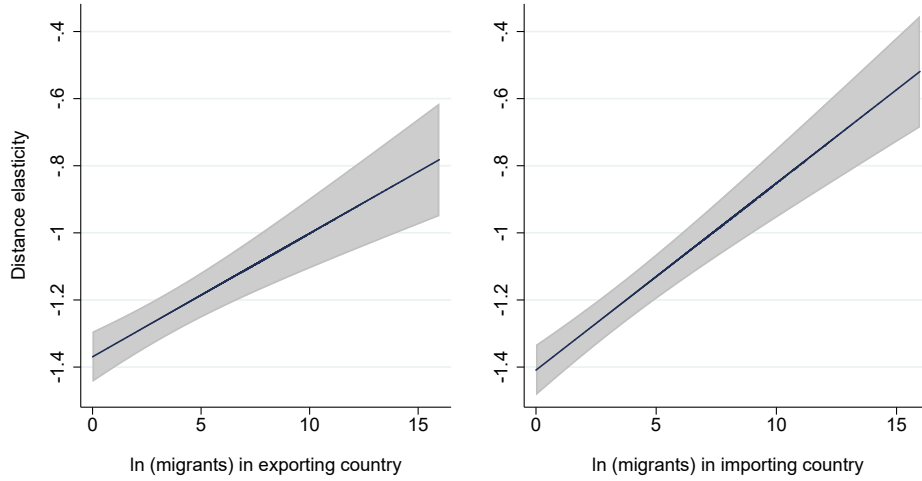
Robust standard errors in parentheses. The dependent variable is $\ln exports_{ij}$, averaged between 2011-15. All specifications include exporter and importer fixed effects and standard gravity controls: dummy variables for RTA, BIT, contiguity, common language, and colonial relationships (coefficients not reported for brevity). *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

As was the case for formal institutions, the coefficient -1.29 in column (2) on $\ln dist$ is the distance elasticity for two countries that have the average level of bilateral migrant stocks – migrants from the exporting country in the importing country, and vice versa. This distance elasticity is reduced in the prevalence of bilateral migrant networks: for an exporting country that

¹²See Section 6.1 for a detailed discussion on the endogeneity of migrant stocks.

has a large stock of migrants (75th percentile) from the importing country ($migr_{ji}$), the distance elasticity is -1.24 , while a smaller stock of migrants (25th percentile) is associated with a larger distance elasticity at -1.37 .¹³ Similarly for migrant stocks from the exporting country in the importing country ($migr_{ij}$), the distance elasticity gets smaller from -1.41 to -1.21 as migrant stocks increase from the 25th to 75th percentile. When migrant stocks in *both* directions increase from the 25th to 75th percentile, the distance elasticity reduces from -1.49 to -1.16 . Figure 2 illustrates how the distance elasticity is affected by increases in migrant stocks in each direction.

Figure 2: Distance elasticity and migrant stocks



This plot is based on estimation results in column (2) of Table 3. Shaded area is the 95% confidence interval.

5.2 Informal institutions as substitutes for formal institutions

Building on our finding that the trade effects of formal and informal institutions depend on distance in the same manner, we test whether the effect of formal and informal institutions on trade are interdependent, that is,

¹³This is a partial effect, holding the stock of migrants from the exporting country in the importing country ($migr_{ij}$) at the average level. Note that, unlike rule of law, we cannot simply assign the level of migrant stocks to the exporting or importing country, as migrant stocks are bilateral and directional by nature.

whether informal institutions can substitute for weak formal institutions and vice versa. We interact a country's rule of law with the log of migrant stocks in that country from the partner country. For instance, Chinese exports to the United States would be regressed on (Chinese migrants in the US) \times (rule of law in the US) and (US migrants in China) \times (rule of law in China). The intuition is that US migrants in China can act as a substitute for the rule of law in China (and vice versa), by providing informal mechanisms for the US firms to obtain information on Chinese firms and/or making sure that the contracts are enforced.¹⁴ Therefore, the estimating equation is:

$$\begin{aligned} \ln Y_{ij} = & \beta_0 + \beta_1(\ln migr_{ji} \times RoL_i) + \beta_2(\ln migr_{ij} \times RoL_j) \\ & + \beta_3 \ln migr_{ji} + \beta_4 \ln migr_{ij} + \beta_5' Z_{ij} + \alpha_i + \alpha_j + \epsilon_{ij}. \end{aligned} \quad (4)$$

Z_{ij} now includes the interactions terms between migrant stocks and GDP per capita ($\ln migr_{ji} \times \ln gdppc_i$ and $\ln migr_{ij} \times \ln gdppc_j$) as well as the standard gravity controls.

In a second step, we include the full set of interaction terms between distance and institutions to see whether our previous finding that formal institutions are less important for trade between nearby countries can be explained by a strong presence of informal institutions and its substitutive role to formal institutions. If we observe that the coefficient on $dist \times RoL$ becomes smaller in magnitude or insignificant by including the additional interaction terms between migrant stocks and rule of law, this suggests that our first finding on the varying effect of formal institutions by distance is to some extent driven by the prevalence of informal institutions in neighbouring countries. In other words, the trade-enhancing effect of formal institutions is smaller when country pairs have strong migrant networks, which have previ-

¹⁴We also run placebo tests using (US migrants in China) \times (rule of law in the US) and vice versa and find, as expected, no significant result, indicating that migrants are less able to bridge information and enforcement gaps related to legal institutions of their origin countries. In other words, it is more difficult for migrant networks to substitute for formal institutions in another country.

ously driven the result on distance. The estimating equation thus becomes:

$$\begin{aligned}
\ln Y_{ij} = & \beta_0 + \beta_1(\ln migr_{ji} \times RoL_i) + \beta_2(\ln migr_{ij} \times RoL_j) \\
& + \beta_3(\ln dist_{ij} \times RoL_i) + \beta_4(\ln dist_{ij} \times RoL_j) \\
& + \beta_5(\ln dist_{ij} * \ln migr_{ji}) + \beta_6(\ln dist_{ij} * \ln migr_{ij}) \\
& + \beta_7 \ln migr_{ji} + \beta_8 \ln migr_{ij} + \beta_9' Z_{ij} + \alpha_i + \alpha_j + \epsilon_{ij}.
\end{aligned} \tag{5}$$

To complete the analysis, we finally test if the substitution effect between formal and informal institutions depends on distance just as the individual interactions depend on distance. The intuition is that informal institutions might only substitute for formal institutions when information asymmetries and uncertainty are limited, that is when the distance between trading countries is small. If asymmetries and uncertainty are large, trade partners might not be satisfied anymore by the relatively less enforceable guarantees provided by informal institutions, in which case the substitutive role provided by them would decrease with distance. For this final question we add triple interactions as follows:

$$\begin{aligned}
\ln Y_{ij} = & \beta_0 + \beta_1(\ln migr_{ji} \times RoL_i) + \beta_2(\ln migr_{ij} \times RoL_j) \\
& + \beta_3(\ln dist_{ij} \times RoL_i) + \beta_4(\ln dist_{ij} \times RoL_j) \\
& + \beta_5(\ln dist_{ij} * \ln migr_{ji}) + \beta_6(\ln dist_{ij} * \ln migr_{ij}) \\
& + \beta_7(\ln dist_{ij} * \ln migr_{ji} \times RoL_i) + \beta_8(\ln dist_{ij} * \ln migr_{ij} \times RoL_j) \\
& + \beta_9 \ln migr_{ji} + \beta_{10} \ln migr_{ij} + \beta_{11}' Z_{ij} + \alpha_i + \alpha_j + \epsilon_{ij}.
\end{aligned} \tag{6}$$

Table 4 shows the results for our three conjectures regarding the substitutability between formal and informal institutions. Column (1) estimates the interaction term between formal and informal institutions (equation (4)). Column (2) includes the full set of interaction terms between distance and rule of law (equation (5)), and column (3) further includes triple interactions between distance, rule of law, and migrant stocks to see if the substitution effect depends on distance (equation (6)). Columns (4)–(6) repeat the exercise using PPML.¹⁵

The negative coefficients on the interaction terms between migrant stocks and rule of law means that formal institutions are less important for bilateral

¹⁵See Appendix Table A.3 and A.4 for estimation results using OLS (adding 1 to trade flows) and Gamma Pseudo-Maximum Likelihood (GPML).

Table 4: Distance, migrant stocks and rule of law

| Dependent variable: | $\ln(exports_{ij})$ | | | $exports_{ij}$ | | |
|---|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| $\ln dist_{ij}$ | -1.248*** (0.031) | -1.341*** (0.034) | -1.331*** (0.034) | -0.505*** (0.033) | -0.476*** (0.058) | -0.521*** (0.059) |
| $\ln migr_{ji}$ | 0.056*** (0.008) | 0.053*** (0.008) | 0.054*** (0.008) | 0.032*** (0.012) | 0.039*** (0.011) | 0.043*** (0.011) |
| $\ln migr_{ij}$ | 0.104*** (0.008) | 0.115*** (0.008) | 0.116*** (0.008) | 0.032*** (0.010) | 0.032*** (0.011) | 0.037*** (0.011) |
| $\ln migr_{ji} \times RoL_i$ | -0.359*** (0.037) | -0.263*** (0.040) | -0.287*** (0.040) | -0.135*** (0.039) | -0.078** (0.038) | -0.084** (0.041) |
| $\ln migr_{ij} \times RoL_j$ | -0.185*** (0.037) | -0.184*** (0.038) | -0.188*** (0.037) | -0.133*** (0.035) | -0.145*** (0.039) | -0.143*** (0.040) |
| $\ln dist_{ij} \times RoL_i$ | | 0.656*** (0.154) | 0.757*** (0.168) | | 0.718*** (0.183) | 0.758*** (0.229) |
| $\ln dist_{ij} \times RoL_j$ | | -0.208 (0.142) | -0.156 (0.156) | | -0.096 (0.170) | -0.084 (0.242) |
| $\ln dist_{ij} \times \ln migr_{ji}$ | | 0.023*** (0.006) | 0.023*** (0.007) | | 0.016** (0.007) | 0.023*** (0.009) |
| $\ln dist_{ij} \times \ln migr_{ij}$ | | 0.037*** (0.006) | 0.039*** (0.007) | | -0.009 (0.007) | -0.004 (0.008) |
| $\ln dist_{ij} \times \ln migr_{ji} \times RoL_i$ | | | -0.075** (0.035) | | | 0.001 (0.037) |
| $\ln dist_{ij} \times \ln migr_{ij} \times RoL_j$ | | | -0.010 (0.036) | | | 0.009 (0.040) |
| Observations | 17,197 | 17,197 | 17,197 | 18,090 | 18,090 | 18,090 |
| R-squared | 0.831 | 0.833 | 0.833 | 0.892 | 0.913 | 0.917 |
| Estimation | OLS | OLS | OLS | PPML | PPML | PPML |

Robust standard errors in parentheses. The dependent variable is $\ln exports_{ij}$, averaged between 2011-15. All specifications include exporter and importer fixed effects and standard gravity controls: dummy variables for RTA, BIT, contiguity, common language, and colonial relationships. Columns (1) and (4) include $\ln migr \times \ln gdppc$; columns (2) and (5) additionally include $\ln dist \times \ln gdppc$; and columns (3) and (6) add $\ln dist \times \ln migr \times \ln gdppc$ as controls (coefficients not reported for brevity). *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

trade when the country pair has strong migrant networks (columns (1) and (4)). In other words, the trade-promoting effect of migrants is stronger when the trading countries have weak formal institutions. This substitutive effect is consistently significant when the full set of interaction terms are included.

Comparing columns (2) and (5) to results shown in Table 2, it is interesting to note that the interaction effect between distance and formal institutions is less pronounced, once the substitution effects between formal and informal institutions is taken into account. The coefficient of the in-

teraction between distance and formal institutions in the exporting country ($\ln dist_{ij} \times RoL_i$) is smaller in size, while the interaction for the importing country ($\ln dist_{ij} \times RoL_j$) is no longer significant. Hence, the finding that formal institutions are less important for trade between nearby countries can, to a certain extent, be explained by the presence of strong informal institutions that promote trade when the rule of law is weak.

Finally, columns (3) and (6) test whether the substitution effect between formal and informal institutions varies by distance. The substitution effect does not diminish with distance, and even seems stronger for formal and informal institutions in the exporting country. This means that informal institutions can also substitute for weak formal institutions between distant countries where information asymmetry and uncertainty are high.

6 Robustness

6.1 Endogeneity of migrant stocks

Migrant stocks can suffer from two potential sources of endogeneity: omitted variables (that simultaneously affect trade flows as well as well migration) and reverse causality. Using stock variables for migration and flow variables for trade somewhat reduces both issues, and we use past values of migrant stocks to further address endogeneity concerns: baseline empirical specifications use migrant stocks from 1960 as a proxy for current migrant networks. Past values of migrant stocks have often been used in the literature to address the endogeneity of migration for trade (Combes et al., 2005; Bratti et al., 2014; Briant et al., 2014) as well as investment (Javorcik et al., 2011). The rationale is that past migrant settlements are likely to encourage future migration decisions due to the existence of social networks or family ties (Hanson and McIntosh, 2007), while reducing concerns for simultaneity or reverse causality.

We further argue that endogeneity is not biasing our result by comparing results using current and different lags of migrant stocks (1960, 1990, 2000, 2013).¹⁶ Table 5 shows that our main results are robust with different lags of migrant stocks. Since the determinants of migration 60 years ago are likely to be different from determinants today, the fact that the coefficients do not change much suggests that endogeneity is not a significant concern.

¹⁶See Table A.2 for correlations between different lags of migrant stocks.

Table 5: Different years' migrant stocks

| Dependent variable: | $\ln(exports_{ij})$ | | | |
|--------------------------------------|----------------------|----------------------|----------------------|----------------------|
| | (1) | (2) | (3) | (4) |
| $\ln dist_{ij}$ | -1.341*** (0.034) | -1.262*** (0.033) | -1.248*** (0.034) | -1.325*** (0.034) |
| $\ln migr_{ji}$ | 0.053*** (0.008) | 0.078*** (0.009) | 0.071*** (0.008) | 0.064*** (0.008) |
| $\ln migr_{ij}$ | 0.115*** (0.008) | 0.117*** (0.008) | 0.123*** (0.008) | 0.081*** (0.007) |
| $\ln migr_{ji} \times RoL_i$ | -0.263*** (0.040) | -0.197*** (0.038) | -0.171*** (0.038) | -0.311*** (0.035) |
| $\ln migr_{ij} \times RoL_j$ | -0.184*** (0.038) | -0.157*** (0.036) | -0.166*** (0.037) | -0.231*** (0.034) |
| $\ln dist_{ij} \times RoL_i$ | 0.656*** (0.154) | 0.737*** (0.154) | 0.815*** (0.152) | 0.662*** (0.153) |
| $\ln dist_{ij} \times RoL_j$ | -0.208 (0.142) | -0.197 (0.141) | -0.190 (0.140) | -0.258* (0.139) |
| $\ln dist_{ij} \times \ln migr_{ji}$ | 0.023*** (0.006) | 0.027*** (0.007) | 0.025*** (0.008) | 0.014* (0.007) |
| $\ln dist_{ij} \times \ln migr_{ij}$ | 0.037*** (0.006) | 0.032*** (0.007) | 0.033*** (0.008) | 0.032*** (0.007) |
| Observations | 17,197 | 17,197 | 17,197 | 17,197 |
| R-squared | 0.833 | 0.834 | 0.834 | 0.833 |
| Migrant stocks | 1960 | 1990 | 2000 | 2013 |
| Estimation | OLS | OLS | OLS | OLS |

Robust standard errors in parentheses. The dependent variable is the log of exports, averaged between 2011-15. All specifications include exporter and importer fixed effects, $\ln migr \times \ln gdppc$, $\ln dist \times \ln gdppc$, and standard gravity controls: dummy variables for RTA, BIT, contiguity, common language, and colonial relationships (coefficients not reported for brevity). *** p<0.01, ** p<0.05, * p<0.1

Finally, the fact that we are interested in the interaction terms between rule of law, migrant networks, and distance and not in their individual roles further alleviates concerns of endogeneity. Nizalova and Murtazashvili (2014) show that in evaluating heterogeneous effects of policy (“treatment”), the interaction effects can be consistently estimated if the source of heterogeneity (endogenous variable) and omitted variable are jointly independent of the policy. In our setup, this means that the estimated interaction effects between rule of law and migrant stocks are consistent as long as bilateral migrant stocks and other potential omitted variables (that makes migrant stocks endogenous to trade flows) are jointly independent of the exporting

or importing country's rule of law.

6.2 Different rule of law measure

As noted earlier, the rule of law index may be correlated with other country-specific variables that affect trade flows. We therefore control for GDP per capita to capture countries' development status in all specifications. As an additional test, we also use an alternative measure of rule of law from the Heritage Foundation (Table 6). The results are robust: the role of institutions in promoting trade increases with distance, migrant stocks can substitute for formal institutions regarding their trade-promoting impact, and this substitution effect does not depend on distance.

7 Conclusion

International trade has the potential to accelerate development significantly. Sectoral specialization, intra-industry reallocation of resources, and knowledge spillovers lead to significant increases in productivity and income. That is why understanding what is behind the weak export performance of selected developing economies is central for development policy.

This paper contributes to a better understanding of the differences in trade performance across countries by assessing the interdependence between distance, formal institutions and informal institution in shaping bilateral trade. We first show that remoteness and weak contract enforcement reinforce each other and reduce trade flows considerably. We argue that this is driven by decreases in trust and information between two countries as the distance between them increases. According to our estimates, a one standard deviation improvement in a country's rule of law will increase exports to distant countries by 29.5 percentage points more than exports to nearby countries. Hence, strong legal institutions are needed to facilitate bilateral trade and improving such institutions is of particular importance to remote countries.

In the same vein, we find that shared informal institutions can help countries mitigate distance-related transaction costs by showing that the pro-trade effect of migrant networks increases with distance. Furthermore, we find a substitution effect between migrant networks and rule of law, and that this substitution effect does not decline with distance. Shared informal in-

Table 6: Heritage Foundation rule of law

| Dependent variable: | $\ln(exports_{ij})$ | | |
|---|----------------------|----------------------|----------------------|
| | (1) | (2) | (3) |
| $\ln dist_{ij}$ | -1.185*** (0.032) | -1.274*** (0.035) | -1.263*** (0.036) |
| $\ln migr_{ji}$ | 0.066*** (0.008) | 0.061*** (0.009) | 0.061*** (0.009) |
| $\ln migr_{ij}$ | 0.102*** (0.008) | 0.112*** (0.008) | 0.114*** (0.008) |
| $\ln migr_{ji} \times RoL_i$ | -0.204*** (0.041) | -0.136*** (0.046) | -0.160*** (0.048) |
| $\ln migr_{ij} \times RoL_j$ | -0.221*** (0.038) | -0.181*** (0.042) | -0.166*** (0.042) |
| $\ln dist_{ij} \times RoL_i$ | | 0.548*** (0.156) | 0.606*** (0.166) |
| $\ln dist_{ij} \times RoL_j$ | | 0.140 (0.146) | 0.146 (0.157) |
| $\ln dist_{ij} \times \ln migr_{ji}$ | | 0.023*** (0.006) | 0.021*** (0.007) |
| $\ln dist_{ij} \times \ln migr_{ij}$ | | 0.033*** (0.006) | 0.038*** (0.007) |
| $\ln dist_{ij} \times \ln migr_{ji} \times RoL_i$ | | | -0.062 (0.038) |
| $\ln dist_{ij} \times \ln migr_{ij} \times RoL_j$ | | | 0.027 (0.034) |
| Observations | 15,412 | 15,412 | 15,412 |
| R-squared | 0.832 | 0.834 | 0.834 |
| Estimation | OLS | OLS | OLS |

Robust standard errors in parentheses. The dependent variable is $\ln exports_{ij}$, averaged between 2011-15. All specifications include exporter and importer fixed effects and standard gravity controls: dummy variables for RTA, BIT, contiguity, common language, and colonial relationships. Column (1) includes $\ln migr \times \ln gdppc$; column (2) additionally includes $\ln dist \times \ln gdppc$; and column (3) adds $\ln dist \times \ln migr \times \ln gdppc$ as controls (coefficients not reported for brevity). *** p<0.01, ** p<0.05, * p<0.1

stitutions can take the role of rule of law in reducing frictions in bilateral trade, and thereby improve the export performance of countries with weak contract enforcement.

The finding that weak formal and informal institutions increase the distance elasticity of trade also contributes to explain the persistent negative effect of distance on the export performance of many developing countries

despite reductions in trade costs.

Our research has important trade policy implications. Remote countries are expected to particularly benefit from multilateral and regional trade reform that strengthen their formal institutions. The WTO accession process and deep regional trade agreements are two examples of trade reforms that require Governments to strengthen their institutional frameworks.

At the same time, our findings point to the benefits of regional trade liberalization efforts such as the CFTA in Africa or the RCEP in Asia since strong legal institutions are less important to benefit from trade cost reductions at the regional level. Furthermore, shared informal institutions tend to be stronger within regions. By lowering intra-regional trade barriers, countries can maximize the potential of such informal institutions for trade and development.

Finally, our findings can inform export promotion and aid for trade strategies. Firms should preferably be guided towards markets where shared informal institutions exist. Similarly, infrastructure and connectivity projects should be focused on such destinations. As with trade agreements, this should amplify the potential of informal institutions for bilateral trade flows.

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A Appendix

Table A.1: Distance and migrant stocks correlation

| Variables | $\ln dist$ | $\ln(1 + migr_{ij})$ | $\ln(1 + migr_{ji})$ |
|----------------------|------------|----------------------|----------------------|
| $\ln dist$ | 1.000 | | |
| $\ln(1 + migr_{ij})$ | -0.375 | 1.000 | |
| $\ln(1 + migr_{ji})$ | -0.375 | 0.531 | 1.000 |

Table A.2: Cross-correlation table

| Variables | $\ln migr_{1960}$ | $\ln migr_{1990}$ | $\ln migr_{2000}$ | $\ln migr_{2013}$ |
|-------------------|-------------------|-------------------|-------------------|-------------------|
| $\ln migr_{1960}$ | 1.000 | | | |
| $\ln migr_{1990}$ | 0.844 | 1.000 | | |
| $\ln migr_{2000}$ | 0.802 | 0.913 | 1.000 | |
| $\ln migr_{2013}$ | 0.659 | 0.735 | 0.790 | 1.000 |

Table A.3: Accounting for zeros: OLS(+1)

| Dependent variable: | $\ln(exports_{ij} + 1)$ | | |
|---|-------------------------|----------------------|----------------------|
| | (1) | (2) | (3) |
| $\ln dist_{ij}$ | -1.258*** (0.032) | -1.346*** (0.034) | -1.330*** (0.034) |
| $\ln migr_{ji}$ | 0.055*** (0.009) | 0.052*** (0.009) | 0.053*** (0.009) |
| $\ln migr_{ij}$ | 0.107*** (0.008) | 0.114*** (0.008) | 0.116*** (0.008) |
| $\ln migr_{ji} \times RoL_i$ | -0.406*** (0.037) | -0.299*** (0.041) | -0.328*** (0.040) |
| $\ln migr_{ij} \times RoL_j$ | -0.243*** (0.037) | -0.243*** (0.039) | -0.261*** (0.038) |
| $\ln dist_{ij} \times RoL_i$ | | 0.731*** (0.155) | 0.855*** (0.165) |
| $\ln dist_{ij} \times RoL_j$ | | -0.217 (0.150) | -0.109 (0.161) |
| $\ln dist_{ij} \times \ln migr_{ji}$ | | 0.027*** (0.006) | 0.027*** (0.007) |
| $\ln dist_{ij} \times \ln migr_{ij}$ | | 0.030*** (0.006) | 0.033*** (0.007) |
| $\ln dist_{ij} \times \ln migr_{ji} \times RoL_i$ | | | -0.087** (0.035) |
| $\ln dist_{ij} \times \ln migr_{ji} \times RoL_i$ | | | -0.052 (0.037) |
| Observations | 18,090 | 18,090 | 18,090 |
| R-squared | 0.850 | 0.852 | 0.852 |

Robust standard errors in parentheses. The dependent variable is exports, averaged between 2011-15. All specifications include exporter and importer fixed effects and standard gravity controls: dummy variables for RTA, BIT, contiguity, common language, and colonial relationships. Column (1) includes $\ln migr \times \ln gdppc$; column (2) additionally includes $\ln dist \times \ln gdppc$; and column (3) adds $\ln dist \times \ln migr \times \ln gdppc$ as controls (coefficients not reported for brevity). *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table A.4: Distance, migrant stocks and rule of law: GPML

| Dependent variable: | <i>exports_{ij}</i> | | |
|---|-----------------------------|----------------------|----------------------|
| | (1) | (2) | (3) |
| $\ln dist_{ij}$ | -1.271*** (0.036) | -1.316*** (0.038) | -1.292*** (0.038) |
| $\ln migr_{ji}$ | 0.030*** (0.009) | 0.017* (0.009) | 0.019** (0.009) |
| $\ln migr_{ji}$ | 0.071*** (0.009) | 0.085*** (0.009) | 0.090*** (0.009) |
| $\ln migr_{ji} \times RoL_i$ | -0.092** (0.039) | -0.013 (0.042) | -0.051 (0.044) |
| $\ln migr_{ij} \times RoL_j$ | -0.172*** (0.038) | -0.174*** (0.043) | -0.176*** (0.042) |
| $\ln dist_{ij} \times RoL_i$ | | 0.593*** (0.159) | 0.812*** (0.173) |
| $\ln dist_{ij} \times RoL_j$ | | -0.225 (0.160) | -0.106 (0.173) |
| $\ln dist_{ij} \times \ln migr_{ji}$ | | 0.007 (0.006) | 0.010 (0.007) |
| $\ln dist_{ij} \times \ln migr_{ij}$ | | 0.029*** (0.007) | 0.037*** (0.007) |
| $\ln dist_{ij} \times \ln migr_{ji} \times RoL_i$ | | | -0.155*** (0.036) |
| $\ln dist_{ij} \times \ln migr_{ij} \times RoL_j$ | | | -0.024 (0.035) |
| Observations | 18,090 | 18,090 | 18,090 |
| Estimation | GPML | GPML | GPML |

Robust standard errors in parentheses. The dependent variable is exports, averaged between 2011-15. All specifications include exporter and importer fixed effects and standard gravity controls: dummy variables for RTA, BIT, contiguity, common language, and colonial relationships. Column (1) includes $\ln migr \times \ln gdppc$; column (2) additionally includes $\ln dist \times \ln gdppc$; and column (3) adds $\ln dist \times \ln migr \times \ln gdppc$ as controls (coefficients not reported for brevity). *** p<0.01, ** p<0.05, * p<0.1

Table A.5: List of countries and their rule of law (1996)

| Country | RoL | Country | RoL | Country | RoL |
|--------------------------|------|--------------------|------|----------------------------|------|
| Albania | 0.22 | Greece | 0.74 | Norway | 1.00 |
| Algeria | 0.15 | Guatemala | 0.15 | Oman | 0.67 |
| Argentina | 0.48 | Guyana | 0.38 | Pakistan | 0.29 |
| Australia | 0.93 | Honduras | 0.22 | Panama | 0.40 |
| Austria | 0.97 | Hong Kong | 0.68 | Papua New Guinea | 0.28 |
| Bahrain | 0.49 | Hungary | 0.70 | Paraguay | 0.26 |
| Bangladesh | 0.21 | Iceland | 0.91 | Peru | 0.30 |
| Belarus | 0.27 | India | 0.55 | Philippines | 0.47 |
| Belgium | 0.84 | Indonesia | 0.37 | Poland | 0.66 |
| Benin | 0.42 | Iran | 0.24 | Portugal | 0.81 |
| Bolivia | 0.39 | Ireland | 0.88 | Romania | 0.47 |
| Bosnia and Herzegovina | 0.40 | Israel | 0.82 | Russian Federation | 0.24 |
| Botswana | 0.61 | Italy | 0.75 | Rwanda | 0.00 |
| Brazil | 0.38 | Jamaica | 0.35 | Saint Kitts and Nevis | 0.69 |
| Bulgaria | 0.35 | Japan | 0.84 | St. Vincent and Grenadines | 0.69 |
| Burkina Faso | 0.19 | Jordan | 0.55 | Saudi Arabia | 0.54 |
| Burundi | 0.00 | Kazakhstan | 0.15 | Senegal | 0.41 |
| Cambodia | 0.16 | Korea, Rep. of | 0.68 | Seychelles | 0.68 |
| Cameroon | 0.07 | Kuwait | 0.64 | Singapore | 0.83 |
| Canada | 0.92 | Kyrgyzstan | 0.27 | Slovakia | 0.52 |
| Cape Verde | 0.69 | Latvia | 0.48 | Slovenia | 0.76 |
| Central African Republic | 0.06 | Lebanon | 0.41 | South Africa | 0.47 |
| Chile | 0.76 | Lithuania | 0.57 | Spain | 0.86 |
| China | 0.36 | Luxembourg | 0.94 | Sri Lanka | 0.52 |
| Colombia | 0.23 | Macao | 0.52 | Sudan | 0.03 |
| Congo (Brazzaville) | 0.11 | Macedonia, Rep. of | 0.36 | Suriname | 0.37 |
| Costa Rica | 0.62 | Madagascar | 0.33 | Sweden | 0.96 |
| Croatia | 0.31 | Malawi | 0.35 | Switzerland | 1.00 |
| Cyprus | 0.70 | Malaysia | 0.64 | Tanzania | 0.41 |
| Czech Republic | 0.71 | Mali | 0.33 | Thailand | 0.62 |
| Côte d'Ivoire | 0.25 | Malta | 0.77 | Togo | 0.27 |
| Denmark | 0.97 | Mauritania | 0.37 | Trinidad and Tobago | 0.60 |
| Dominican Republic | 0.34 | Mauritius | 0.71 | Tunisia | 0.42 |
| Ecuador | 0.33 | Mexico | 0.26 | Turkey | 0.43 |
| Egypt | 0.49 | Moldova | 0.42 | Uganda | 0.30 |
| El Salvador | 0.23 | Morocco | 0.54 | Ukraine | 0.22 |
| Estonia | 0.61 | Mozambique | 0.24 | United Arab Emirates | 0.66 |
| Ethiopia | 0.23 | Myanmar | 0.07 | United Kingdom | 0.91 |
| Fiji | 0.53 | Namibia | 0.53 | United States | 0.87 |
| Finland | 0.99 | Nepal | 0.42 | Uruguay | 0.60 |
| France | 0.87 | Netherlands | 0.93 | Venezuela | 0.23 |
| Gambia | 0.50 | New Zealand | 0.98 | Viet Nam | 0.36 |
| Georgia | 0.08 | Nicaragua | 0.31 | Yemen | 0.10 |
| Germany | 0.91 | Niger | 0.20 | Zambia | 0.30 |
| Ghana | 0.38 | Nigeria | 0.13 | Zimbabwe | 0.25 |