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How institutions affect export quality in developing countries

Hasan A. Faruq

Department of Economics

Xavier University

3800 Victory Parkway, Cincinnati

OH 45207, USA

Email: faruqh@xavier.edu

Phone: (513) 745-3054

Fax : (513) 745-3064

Abstract

This article examines the relationship between the institutional environment in developing countries and the quality of their exports. Factors such as widespread corruption, inefficient bureaucracy, and a high risk of expropriation of private property by the government can create uncertainty among producers and discourage them from investing and innovating over the long term. This can limit the ability of producers to improve the quality of their exports in the future. We find evidence consistent with this hypothesis using both OLS and IV analyses. We observe that institutions appear to have a positive effect on export quality among most industries in our sample, but the magnitudes of these effects vary considerably by industry.

Keywords: Product Quality, Trade, Heckscher-Ohlin, Property Rights, Institutions

1. Introduction

A recent survey among international business managers suggests that product quality is one of the most important determinants of export performance (Lages et al. 2004). Improvements in export quality allow exporters to increase their profits, reduce competition from lower quality rivals, and improve their long term export performance. Therefore, it comes as no surprise that exporters such as Hyundai have significantly expanded their research and development (R&D) budget in recent years to improve the quality of their vehicles. Policymakers in some developing countries have also attempted to help improve the quality of their exports. For example, the Chinese government has recently offered various subsidies and direct market interventions to help Chinese automobile manufacturers such as Chery QQ become more competitive in the export market. Thus, identifying the determinants of export quality is important from both a managerial and a policy perspective.

The empirical literature on the determinants of export quality is relatively new. Most studies in this area find that countries that export higher quality products usually have higher per capita income and capital stock (Hummels and Klenow 2005, Schott 2004, Mora 2002). In addition, some studies also find evidence of a linkage between export quality and technological innovation resulting from R&D activities and inflows of foreign investment (Faruq 2010). These results are consistent with the idea that production of higher quality product requires more resource endowment and technological innovation. However, one issue which has not been addressed in this literature is the potential impact of social and political institutions (e.g. property rights, corruption, bureaucracy, etc.) on export quality. It is well-known that institutions matter a great deal for economic performance (North 1990, Acemoglu et al. 2002). Factors such as widespread corruption, inefficient bureaucracy, and a high risk of expropriation of private property by the government can create uncertainty among producers and discourage them from investing and innovating over the long term. Therefore, it is natural to think that these

malfunctioning social and political institutions can limit the ability of producers to improve the quality of their exports in the future by discouraging innovation and investment.

The objective of this article is to examine how the effectiveness and quality of institutions impact the ability of exporters to upgrade quality. Unlike previous studies on export quality, we mainly focus on developing countries since they tend to have weaker institutions than industrialized countries. These institutional weaknesses can affect the ability of producers in developing countries to invest, innovate, and remain competitive in the export market. Focusing on developing countries is also justified since they are increasingly becoming important in world trade (Balassa 1991). By examining the effect of their institutional environment on the quality of their exports, we can gain additional insights on the limitations and opportunities faced by these exporters.

Our empirical strategy builds on the methodology used in several previous studies on trade and product quality (Schott 2004, Khandelwal 2009). These studies usually calculate a price index for each exporter as a proxy for export quality and regress it against a vector of variables such as per capita income. We augment these models by including various measures of institutional quality. One such measure is the property rights indicator obtained from the *Index of Economic Freedom* annually published by the Heritage Foundation. The property rights indicator takes into account both the protection of private property rights laws and the likelihood that private property will be expropriated by the government. We also calculate a composite index of institutional quality based on the average ratings of indicators for property rights law, business freedom (e.g. the time, cost, and number of procedures needed to start and close a business), and corruption. These indicators are also obtained from the *Index of Economic Freedom*.

One concern with including institutions and economic variables in the same model is that these variables may be jointly determined. In other words, institutions may influence economic outcomes, while economic outcomes may also influence the quality of institutions. Therefore, our OLS estimates may be biased in the presence of this type of endogeneity. To handle this issue, we

use an index of ethnolinguistic fractionalization, which measures the likelihood that two persons drawn randomly from a country's population will not belong to the same ethnolinguistic group. This variable is likely to be strongly correlated with institutional variables such as corruption and risk of expropriation, but not directly related to economic variables (Mauro 1995).

As proxy for export quality, we calculate unit values for each product exported by 33 developing countries to the United States in 1996. These unit values are exclusive of insurance or freight transportation charges added and are defined at the 10-digit level of the Standard International Trade Classification (SITC) system. Following Hallak (2005), we calculate price indices for each country and 3 digit SITC sector, based on cross-country differences in these unit values. The reason price indices are generally used in the trade literature as a proxy for quality is that trade data does not contain information on product attributes. This makes it difficult to draw inferences about quality directly. To address this issue, trade economists generally assume that higher price signals higher quality within a narrowly defined product category (Schott 2004, Hallak 2005). Thus, if men's cotton *t*-shirts from Japan are roughly four times as expensive as those originating from Thailand, the inference is that Japan produces better quality *t*-shirts than Thailand.² We focus mainly on data on differentiated products since these products are characterized by quality differentiation, but we also include data on homogeneous products to provide a basis for comparison. Differentiated and homogeneous products are defined according to the classification used in Rauch (1999).

Our analysis confirms that weak institutions in developing countries are associated with lower export prices (and hence, lower export quality). Regardless of the measure of institutions used, we find that an improvement in the quality of institutions by one percent is associated with an increase in the quality of differentiated products by approximately 0.1 percent. These effects are larger when we use instrumental variables. When we analyze these dynamics at a more disaggregate level, we observe that impact of institutions is strongest in the machinery industry (SITC 7) and weakest in the manufacturing industry (SITC 6).). This may be due to differences

in the composition of products in these industries. We also observe a positive relationship between institutional quality and export prices of homogeneous products. However, the magnitude of this relationship is weaker compared to the magnitude of the relationship between institutional quality and export prices of differentiated products. This may be explained by the fact that homogeneous products, by definition, are not quality differentiated.

Our results contribute to two important literatures. The first literature is related to the determinants of export quality. As mentioned earlier, several studies have examined the determinants of export quality empirically (Hummels and Klenow 2005, Schott 2004, Mora 2002, Faruq 2010). However, to the best of our knowledge, no study has previously examined the nature or the magnitude of the impact of institutions on export quality. This article attempts to fill this gap in the literature. The second literature is related to the role of institutions in developing countries. Most well-known studies in this area examine the relationship between institutions and macroeconomic indicators of economic performance such as economic growth (North 1990, Acemoglu et al. 2002, Mauro 1995). In recent years, some studies have focused on the relationship between aggregate trade volume and institutions (e.g. Levchenko 2007, Dollar and Kray 2002). However, we have not come across any studies that directly examine the impact of institutions on disaggregate patterns of exports such as product quality, product variety, etc. This article attempts to expand this literature and offer a new explanation for differences in product quality across different exporters.

The rest of this article is organized as follows. We outline our methodology in section 2. We discuss the data and results in sections 3 and 4 respectively. We summarize our findings and make some concluding remarks in section 5.

2. Methodology

Our empirical analysis builds on Schott (2004), who examine the relationship between export quality and factor endowments as follows:

$$\ln(p_{js}) = \alpha_0 + \alpha_1 \ln\left(\frac{Y_j}{L_j}\right) + \varepsilon_j, \quad (1)$$

In (1), p_{js} refers to the unit value in product category s exported by country j while Y_j and L_j refer to the GDP and labor force of country j respectively. The idea is to examine how countries specialize in different products. The Heckscher-Ohlin theory of international trade suggests that countries specialize in the production of goods which uses their abundant factors intensively. Therefore, if production of high quality products requires greater capital intensity, it follows that countries with larger factor endowments (such as physical capital, human capital, etc.) will specialize in the production of high quality products. Since rich countries typically have relatively greater physical and human capital stock than poor countries, rich countries are expected to specialize in higher quality products. Therefore, the relationship between GDP per capita (Y_j/L_j) and quality (proxied by p_{js}) is expected to be positive. GDP per capita also accounts for the fact that rich countries are more likely to innovate as they specialize in R&D intensive production activities (compared to poor countries) and are more likely to attract foreign investment, which is another source of technology transfer (Faruq 2010). There is some evidence in the literature that technological innovation is an important determinant of export quality (Faruq 2010). Therefore, the inclusion of GDP per capita allows us to take into account the role that technology plays in quality upgrading. The reason price or unit value (i.e. value divided by quantity) is used in this model as an indicator of quality is simply that trade data does not usually contain information on product characteristics. Therefore, the standard assumption in the trade literature is that higher prices are associated with higher quality of products within a narrowly defined product category.

To examine the impact of institutional quality on export quality, we take the model in (1) and augment it by including measures of institutional quality Z_j .

$$\ln(p_{js}) = \beta_0 + \beta_1 \ln\left(\frac{Y_j}{L_j}\right) + \beta_2 \ln Z_j + u_j, \quad (2)$$

It is well-known that institutions matter a great deal for economic performance (North 1990). They are also likely to matter for export quality. For example, low security of property rights and high risk of expropriation of private properties by government officials may reduce the incentive of producers to invest and innovate. These investments often take several years to yield the desired returns. If producers are uncertain about the security of property rights, they may view these investments as risky and may be reluctant to invest. This may limit the ability of producers to upgrade quality over the long run. Likewise, corruption and inefficiency within government bureaucracy may slow down the distribution of necessary permits and licenses and delay the acquisition of new capital and technology. Thus, uncertainty about other aspects of the institutional environment such as corruption and inefficiency within the bureaucracy may discourage producers from committing to long term investments which can help them improve the quality of their products in the future. Of course, it can be argued that corruption can actually help producers circumvent unnecessary bureaucratic delays, especially if the bureaucracy is very slow and inefficient. While this is certainly possible, Mauro (1995) provides robust empirical evidence that corruption decreases private investment, even in countries with inefficient bureaucracies.

One concern with the model specified in (2) is that institutions and GDP per capita are endogenously determined. That is, institutions may influence GDP per capita, while GDP per capita may also influence institutions. As a result, estimating (2) via OLS may yield biased estimates. To mitigate this concern, we will also estimate (2) via instrumental variable (IV) method. As an instrument for institutions, we use the index of ethnolinguistic fractionalization (ELF) used by Mauro (1995). The ELF measures the likelihood that two persons drawn randomly from a country's population will not belong to the same ethnolinguistic group. The presence of various ethnolinguistic groups maybe associated with political tensions between these groups. This may lead to higher risk of expropriation as well as more corruption and unnecessary regulations by bureaucrats to favor their own ethnolinguistic groups. However, ELF is not

expected to be directly related to GDP per capita, which makes the ELF a reasonable instrument for institutional quality.

As we will discuss in the data section of this article, all countries in our dataset export to the same destination market – the United States. This allows us to hold importer demand constant while allowing product quality to vary by each exporter. We do not include proxies for trade costs, such as common language, common border, or trade agreements, since the United States shares these ties with only a few countries. To control for unobserved heterogeneities, we include dummy variables for each 3 digit SITC industry in the empirical implementation.

One concern with using unit values of products at a very disaggregate level is that there may be substantial variation at this level of aggregation due to underlying product heterogeneity and classification errors (for example, inaccurate recording of units and misclassification of goods at the port of entry). Therefore, some studies on trade and product quality have used a more aggregate price index as proxy for quality (Hallak 2005, Hummels and Klenow 2005). Following these studies, we calculate a Fisher price index for each exporter and each 3-digit SITC industry and use them as the dependent variable in equation (2). Although this type of price index is commonly used in the literature, it has some limitations. For example, if a category includes different products, differences in prices may not only reflect differences in quality, but also reflect differences in the composition of products within that category. To minimize these issues, we first calculate the unit values at the highly disaggregate 10 digit level in the Harmonized System. Then, we use these unit values to construct the Fisher price index for each 3 digit sector.

The Fisher price index is constructed as a geometric average of two indices. The first index relies on each country's own export quantities to weigh market-categories. The second index relies on world export quantities to weigh market-categories. Thus, the Fisher price index captures the gap between an exporter's prices and other prices in the same market category. This ensures, for example, that a country will not be assigned a higher price index if it only produces high price products in a limited number of categories.

Let v_{jis} , x_{jis} , and p_{jis} ($= v_{jis}/x_{jis}$) denote the total value, quantity, and price of exports from country j to country i in SITC category s , and v_{Wis} , x_{Wis} , and p_{Wis} ($= v_{Wis}/x_{Wis}$) denote the total value, quantity and price of world exports to country i in SITC category s . Then, the Fisher price index is:

$$\left[\frac{\sum_{i \neq j} \sum_{s \in X_{jis}} P_{jis} x_{jis}}{\sum_{i \neq j} \sum_{s \in X_{jis}} P_{Wis} x_{jis}} \right]^{1/2} \left[\frac{\sum_{i \neq j} \sum_{s \in X_{jis}} P_{jis} x_{Wis}}{\sum_{i \neq j} \sum_{s \in X_{jis}} P_{Wis} x_{Wis}} \right]^{1/2}$$

3. Data

We obtain data on trade flows from Feenstra (2000). This dataset contains information on unit values (value/quantity) of U.S. imports from 33 middle and low income countries (defined according to the *World Bank's Income Group Classification*) in 1996. In other words, we have information on the exports of 33 middle and low income countries to the U.S. Using cross-country differences in these unit values at the 10-digit SITC level, we construct the Fisher price index for each exporter and each 3-digit SITC sector. This approach is similar to Hallak (2005), who also use the Fisher price index as a proxy for product quality.

An issue that arises when working with U.S. import data is that it has significant measurement errors due to misclassification and inaccurate recording at the port of entry. To identify and remove erroneous observations, we adopt the following strategy. First, we calculate the geometric mean of the unit values within each product category for all countries in our sample. To remove outliers, we exclude observations with extreme unit values (four times above or below the category mean) and observations with very low quantity (below the lower of 50 units or a quarter of the category mean quantity). Since some countries may be active in only a few SITC 10-digit categories, the results can be potentially sensitive to measurement errors. Therefore, we define a country as “active” in a 10 digit category if it has a non-missing observation, and as “active” in a 3-digit sector if it has at least two active categories. Otherwise,

we assign a missing value to the unit value at the sectoral level. Finally, we exclude those products for which the country of origin may differ from the country of shipment. As value may be added at the country of shipment, this may bias the prices upward and provide inaccurate estimates about the quality of the products.

In our empirical analysis, we mainly use data on differentiated products in the manufacturing sector (SITC 1 = 5-8) since these products tend to be quality differentiated. To provide a basis for comparison, we also use data on homogeneous products (e.g. wheat), which are mostly found in non-manufacturing industries (SITC 1 = 1-4). However, we do not expect to observe much quality differentiation in these sectors. We classify differentiated and homogeneous products according to Rauch's (1999) classification. Rauch uses both a "liberal" and a "conservative" standard in his classification. Following Hallak (2005), we use the liberal standard in this article since it uses a more strict classification of differentiated products.

When selecting the sample, it is important to minimize any bias that can result from zero-trade observations in the sample. Since smaller countries are more likely to report zero trade, we focus on relatively large countries. Countries are considered large enough to be included in our sample if they have population greater than 3 million and import more than \$1 million worth of products from the U.S. According to Hallak (2005), Hungary has poor quality data at the sector level, so we drop it from our sample. In addition, we drop Algeria, Iran, and Libya due to lack of information on their export unit values in our data.

We use two measures of institutional quality. The first measure is the property rights indicator obtained from the *Index of Economic Freedom* annually published by the Heritage Foundation. This measure is based on information obtained from the U.S. Department of Commerce on the status of property rights situation in different countries. The property rights indicator takes into account both the protection of private property rights laws and the likelihood that private property will be expropriated by the government. The maximum possible score in this

category is 100. Higher score represents greater legal protection of property and lower likelihood of expropriation of private property by the government.

As a robustness check, we use a second measure of institution that we call the “institution index.” We calculate this index as an average of three indicators obtained from the *Index of Economic Freedom*: (1) property rights, (2) business freedom and (3) freedom from corruption. The indicator for business freedom is calculated using data from the World Bank’s *Doing Business* study and factors in the time, cost, and number of procedures to start or close a business in different countries. This indicator thus represents the overall burden of regulation as well as the efficiency of bureaucracy in different countries. The indicator for freedom from corruption measures the level of government corruption and is based on the *Corruption Perceptions Index* published by Transparency International annually. It is likely that the three indicators for property rights, business freedom, and corruption are highly correlated. For example, when property rights are weak and risk of expropriation is high, corruption is more likely to be prevalent (Heilbrunn 1999). An inefficient and excessively large bureaucracy may also force some individuals to bribe government officials to avoid unnecessary regulations. Given these relationships, it will be difficult to separate the true effect of each of these variables on export quality. Therefore, we combine these variables into a composite index for institutional quality. Lastly, we obtain data on ethnolinguistic fractionalization from Roeder (2001). Data on GDP per capita comes from the *World Development Indicator*, which is annually published by the World Bank.

4. Results

We observe two basic patterns in the data. The first pattern we observe is that export prices of differentiated products are positively associated with the institution index. To illustrate this, we plot the export prices of several differentiated products against the institution index in Figures 1(a)-1(d) respectively. These products are: medicinal and pharmaceutical products (SITC 3 digit classification code = 541), cutlery (SITC 3 digit classification code = 696), TV image and

sound recorders (SITC 3 digit classification code = 763) and women's coats, jackets, suits, etc. (SITC 3 digit classification code = 843). The positive correlations between export prices and institution index is consistent with the idea that producers are more likely to be able to specialize in better quality products under a stable and strong institutional environment. The second pattern we observe is that the price-institution relationships exhibit quite a bit of variation. Again, this can be seen from Figures 1(a)-1(d) respectively. To examine this variation further, we calculate the coefficients of variation based on the means and standard deviations in Table 1. The resulting coefficients of variation are 0.12 for the export price of differentiated products, 0.25 for property rights indicator and 0.26 for the institution index respectively. This gives us some variation in the institutional variables with which we can attempt to explain variation in export prices.

Table 2 reports our preliminary results. These estimates are for differentiated products only. Like Schott (2004), we regress export price index (as a proxy for export quality) against per capita GDP using OLS and summarize these results in column 1. While the analysis in Schott (2004) focuses on both high income and low income countries, we do not include high income countries in our analysis. Nonetheless, we observe similar pattern in our data, namely that rich countries export more expensive products, which is consistent with these countries specializing in higher quality products. In columns 2 and 3, we include the property rights indicator and the institution index respectively to account for the role of institutions. In both cases, we find that institutions have a strong impact on export quality. An increase in the property rights indicator and the institution index by one percent is associated with an increase in exporter price by approximately 0.1 percent. These effects are significant at the one percent level of statistical significance. Next, we address the potential endogeneity between institutions and GDP per capita. We use ELF as an instrument for property rights and institution index in columns 4 and 5 respectively. After accounting for potential endogeneity by using ELF as an instrumental variable, we find that the effect of institutions on exporter quality is even stronger than before. An improvement in the property rights indicator by one percent is associated with an improvement in

exporter price by 0.2 percent (compared to 0.1 percent under OLS), while an improvement in the institution index by one percent is associated with an increase in export price by as much as 0.7 percent.¹

To examine whether institutions have different effects on different industries, we estimate the model in (2) separately for each SITC 1-digit manufacturing industry. Table 3 presents the results. All regressions use the property rights indicator as proxy for institutional quality. To deal with potential endogeneity concerns, all regressions are estimated via the IV method using ELF as an instrument. Across the manufacturing (SITC 6), machinery (SITC 7) and miscellaneous manufacturing (SITC 8) industries, we find that a one percent improvement in the property rights indicator leads to an increase in export prices between 0.1 and 0.4 percent. These results are significant at the one percent level of statistical significance. Interestingly, neither an improvement in the property rights indicator nor an increase in GDP per capita has a statistically significant effect on export prices in the chemicals industry (SITC 5). Although we do not report the results here, the results do not change when we use OLS or use the institution index instead of the indicator for property rights. It is not clear why none of the explanatory variables are statistically significant in the chemical industry, but one possibility is that this is due to data limitations. More specifically, the size of our sample for the chemical industry is much smaller than the sample size for the other industries.

On comparing the magnitudes of the coefficients of the property rights indicators across columns 1-4 in Table 3, we find that an improvement in property rights has the biggest effect on export quality in the machinery industry (SITC 7) and perhaps the weakest (and statistically significant) effect in the manufacturing sector (SITC 5). This may be due to differences in the composition of products in these industries. The machinery industry consists of technology and capital intensive products such as TV receivers, computers, automobiles, etc., while the

¹ According to Sribney et al. (2005), R-square has no statistical meaning in the context of IV regressions. Therefore, we do not report R-square in our IV regressions.

manufacturing industry consists of products such as rubber products, paper products, iron and other metals, etc. Given the nature of these two industries, we are perhaps more likely to see greater quality differentiation in the machinery industry than in the manufacturing industry.

So far, we have examined the relationship between institutions and the prices of differentiated products. To provide a basis for comparison, we now estimate (2) using the prices of homogeneous products. These results are summarized in Table 4. Both the OLS estimates in column 1 and the IV estimates in column 2 suggests that an improvement in the property rights indicator has a positive and statistically significant impact on the export price of homogeneous products. However, the magnitude of the relationship between institutions and export price seem to be generally weaker among homogeneous products in Table 4 than they are among differentiated products in Table 2. This may be explained by the fact that homogeneous products (e.g. coffee, spices, etc.) are not quality differentiated and may not rely on technological innovation and investment as much as differentiated products. As in previous tables, we also observe that GDP per capita affects export prices.

Next, we carry out several robustness checks to check the validity of our results. The results are summarized in Table 5. All regressions use the property rights indicator as proxy for institutional quality and are estimated via the IV method. In column 1, we consider the possibility that export prices may be biased due to exchange rate fluctuations. We therefore deflate export prices using the GDP deflator. The results are similar to those shown in Table 2: both property rights and GDP per capita have positive and statistically significant effects on export prices. In columns 2 and 3, we remove observations with the top and bottom ten percentiles of export categories. This allows us to check whether movements in export prices are occurring due to the presence of unobserved product varieties rather than product quality. Again, we observe that institutional quality has a positive and statistically significant effect on export quality. Finally, in column 4, we remove from our sample several countries which had missing information in at least 50 percent of the SITC 3-digit sectors. This allows us to address any concerns about the

reliability of data for countries with poorer data collection capacities. Despite restricting our sample in this manner, our previous results remain unchanged. Finally, we ran all of these regressions using the institution index (rather than the property rights indicator) as a measure of institutional quality. The results, not reported here, are similar to the results reported in table 5.

5. Conclusions

Economists view quality upgrading as an important catalyst for development (Khandelwal 2009). The literature has identified several determinants of export quality such as factor endowments and technological innovation. So far, we have not come across any studies that investigate the effects of institutional quality in developing countries on the quality of their exports. This article is a first step towards extending this literature. Our OLS estimates suggest that institutions are at least as important a determinant of export prices as factor endowments. When we address potential endogeneity between institutions and GDP per capita, the magnitude of the effect of institutions on export quality appears to be even bigger. Institutions appear to have a positive effect on export quality among most industries in our sample, but the magnitudes of these effects vary considerably by industry. Unfortunately, due to data limitations, we cannot identify the effect of the institutional environment on the investment decisions of producers and how these investment decisions influence their ability to upgrade the quality of their products in the future. Nonetheless, our findings provide a partial explanation for why different countries export different qualities of products. For future work, it will be interesting to explore the specific channels through which institutions impact different quality and variety aspects of trade. We leave this research for future investigations.

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Table 1: Summary Statistics

	Mean	Standard Deviation	Minimum	Maximum
A. DEPENDENT VARIABLES				
Fisher price (differentiated products)				
	1.07	0.13	0.77	1.58
Fisher price (homogeneous products)	1.04	0.09	0.87	1.60
B. EXPLANATORY VARIABLES				
Property rights (out of 100)	72.69	18.98	10	90
Institution Index (average of property rights, freedom from corruption, and business freedom ratings; out of 100)	70.49	18.23	20	93.33
GDP per capita (constant 2000 \$)	5,360.54	2,414.37	845.01	11,756.62

Table 2: The Effect of Institutional Quality on Export Prices (Differentiated Products only)

	<u>OLS</u>			<u>IV</u>	
	(1)	(2)	(3)	(4)	(5)
GDP per capita	0.11*** (0.00)	0.08*** (0.00)	0.07*** (0.00)	0.05*** (0.01)	0.13*** (0.02)
Property rights		0.11*** (0.01)		0.21*** (0.02)	
Institution Index			0.12*** (0.01)		0.70*** (0.05)
Constant	-0.89*** (0.03)	-1.06*** (0.03)	-1.01*** (0.03)	-1.19*** (0.04)	-1.61*** (0.07)
Observations	26,240	26,240	26,240	26,240	26,240
R-squared	0.20	0.21	0.21		

NOTES: All variables are in log. Column 1 reports the results of estimating equation (1) via OLS. Columns 2 and 3 report the results of estimating equation (21) via OLS. Columns 4 and 5 report the results of estimating equation (2) via IV methods. Ethnolinguistic fractionalization is used as the instrument in columns 4 and 5. Dependent variable in all regressions is exporter price index (based on f.o.b. unit values at the 10-digit level). Industry dummy variables are included but not reported. Standard errors are in parentheses and are heteroskedasticity robust. The notations ***, **, and * denote statistical significance at the 1%, 5%, and 10% level, respectively.

Table 3: Industry Analysis

	(1) Chemicals SITC 5	(2) Manufacturing SITC 6	(3) Machinery SITC 7	(4) Miscellaneous Manufacturing SITC 8
GDP per capita	-0.014 (0.039)	0.03** (0.01)	-0.01 (0.02)	0.08*** (0.01)
Property rights	0.14 (0.12)	0.14*** (0.04)	0.38*** (0.04)	0.18*** (0.02)
Constant	-0.51* (0.30)	-0.75*** (0.10)	-1.40*** (0.12)	-1.38*** (0.04)
Observations	886	7,133	3,939	14,282

NOTES: Table reports the results of estimating equation (2) separately for each SITC 1-digit manufacturing industry via IV method. Ethnolinguistic fractionalization is used as the instrument in all regressions. Dependent variable is exporter price index (based on f.o.b. unit values at the 10-digit level). Property rights indicators from the Heritage Foundation's Index of Economic Freedom are used as measures of institutional quality. Industries are classified according to the SITC classification. Industry dummy variables are included but not reported. Standard errors are in parentheses and are heteroskedasticity robust. The notations ***, **, and * denote statistical significance at the 1%, 5%, and 10% level, respectively.

Table 4: The Effect of Institutional Quality on Export Prices (Homogeneous Products only)

	(1) OLS	(2) IV
GDP per capita	0.01*** (0.00)	0.04*** (0.00)
Property rights	0.01*** (0.00)	0.11*** (0.00)
Constant	-0.06*** (0.01)	0.16*** (0.01)
Observations	26,240	26,240

NOTES: Table reports the results of estimating equation (2) for homogeneous products only. Column 1 reports the OLS results, while column 2 reports the IV results. In column 2, ethnolinguistic fractionalization is used as the instrument. Dependent variable is exporter price index (based on f.o.b. unit values at the 10-digit level). Property rights indicators from the Heritage Foundation's Index of Economic Freedom are used as measures of institutional quality. Homogeneous products are classified according to the definitions in Rauch (1999). Industry dummy variables are included but not reported. Standard errors are in parentheses and are heteroskedasticity robust. The notations ***, **, and * denote statistical significance at the 1%, 5%, and 10% level, respectively

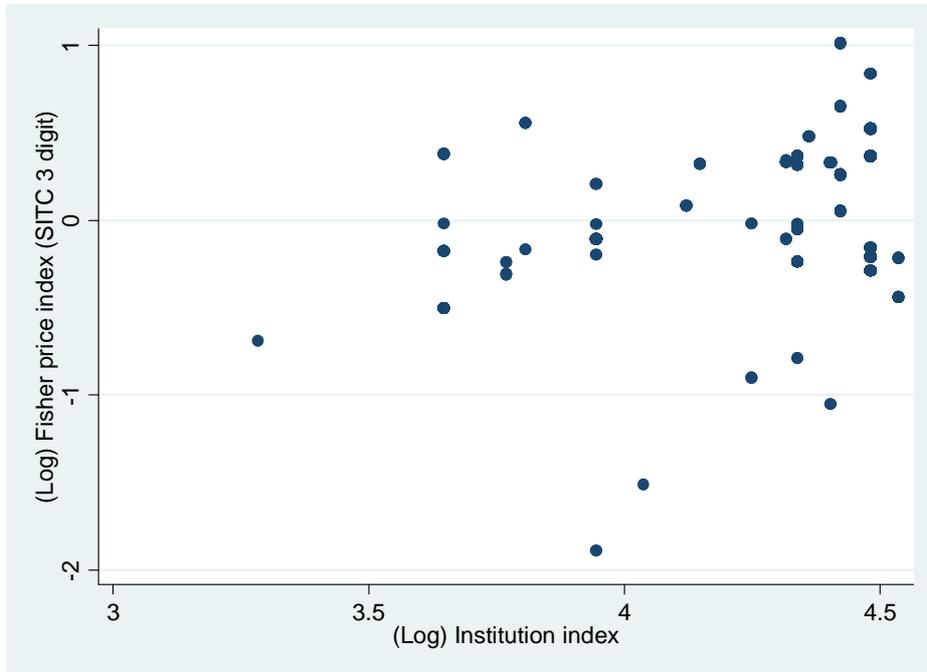
Table 5: Robustness Checks

	(1) GDP Deflator Adjusted Prices	(2) Top 10% categories excluded	(3) Bottom 10% categories excluded	(4) Frequently missing observations excluded
Property rights	0.43*** (0.03)	0.15*** (0.02)	0.23*** (0.01)	0.22*** (0.02)
GDP per capita	0.29*** (0.02)	0.09*** (0.01)	0.02*** (0.00)	0.05*** (0.01)
Constant	0.41*** (0.07)	-1.32*** (0.04)	-1.08*** (0.04)	-1.28*** (0.04)
Observations	26,240	22,141	20,537	25,804

NOTES: Table reports the results of performing robustness checks on equation (2). All regressions are estimated using the IV method. In these regressions, ethnolinguistic fractionalization is used as the instrument. Dependent variable in column (1) is GDP deflator adjusted exporter price index (based on f.o.b. unit values at the 10-digit level). Dependent variable in columns (2)–(4) is the unadjusted exporter price index (based on f.o.b. unit values at the 10-digit level). Industry dummy variables are included but not reported. Standard errors are in parentheses and are heteroskedasticity robust. The notations ***, **, and * denote statistical significance at the 1%, 5%, and 10% level, respectively.

Figure 1: Relationship between Price Index (Differentiated Products) and the Institution Index

(a) SITC 3 = 541: Medicinal and pharmaceutical products



(b) SITC 3 = 696: Cutlery

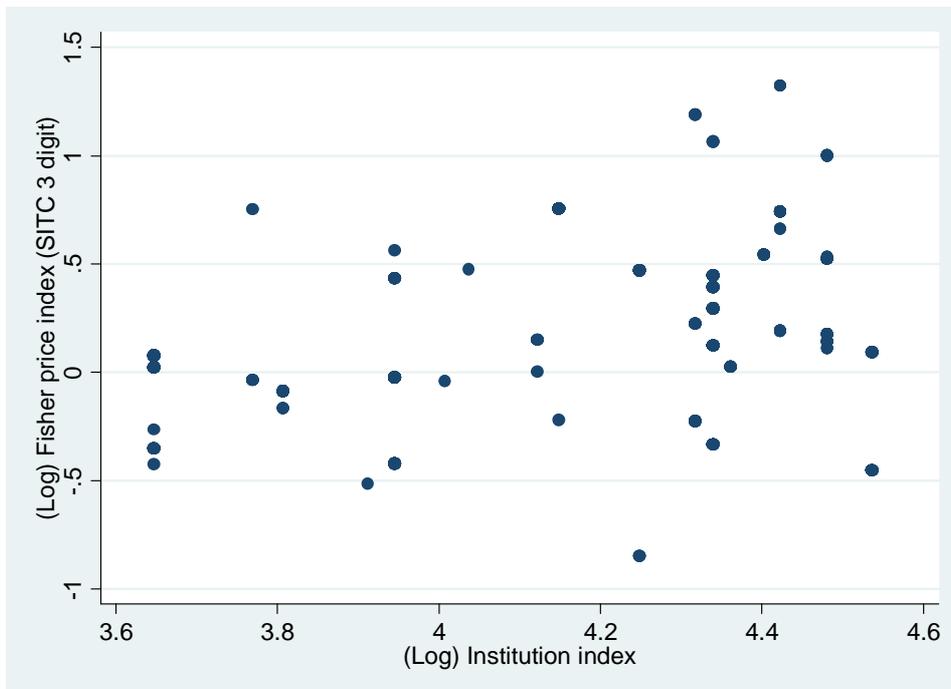
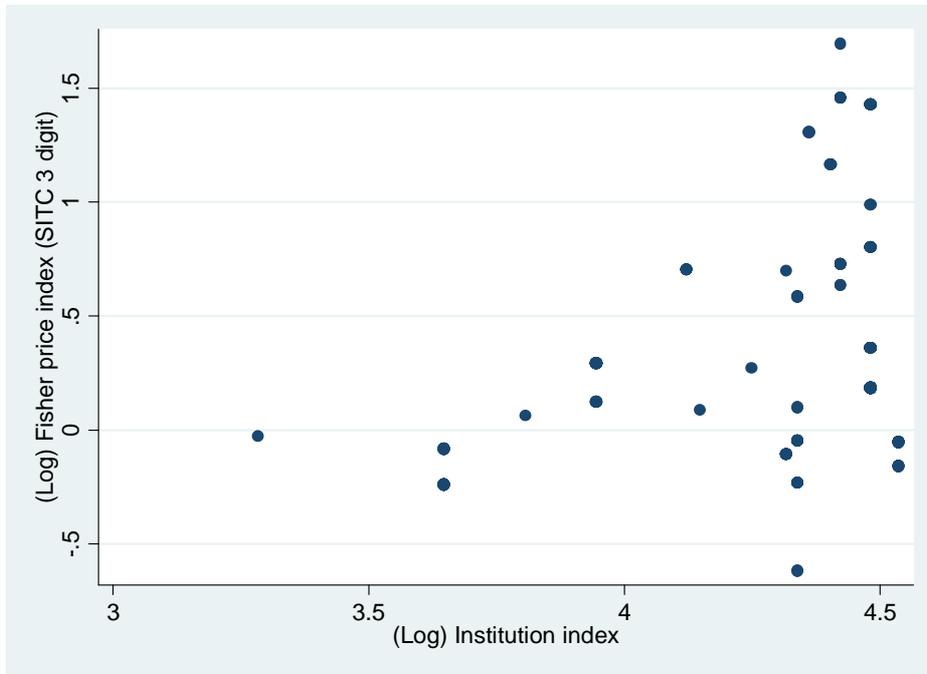


Figure 1: Relationship between Price Index (Differentiated Products) and the Institution Index (Continued)

(c) SITC 3 = 763: TV image and sound recorders



(d) SITC 3 = 843: Women's coats, jackets, suits, etc. and similar articles of textile fabrics

