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Institutional Quality and Trade: Which Institutions? Which Trade?

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Abstract

Using a panel of countries over 1920–2000, this paper examines the extent to which different dimensions of the institutional framework affect exports of total, manufactured, and non-manufactured goods. It is observed that exports of manufactured goods are positively affected by the control of corruption, the rule of law, government effectiveness, and the lack of political violence. This result does not hold for non-manufactured and total exports. Instrumental variable regressions finally confirm that the control of corruption, but not the other dimensions of governance, robustly cause manufactured exports.

Introduction

The contention that "institutions rule" has become a core belief among both scholars and practitioners of economic development. This consensus results from a wide body of evidence suggesting that a country's overall economic performance is affected by its institutional framework.[1] It has been observed that ailing institutions are associated with slower growth, for instance by Mauro (1995) or Knack and Keefer (1995), lower total factor productivity, by Hall and Jones (1999), lower TFP growth, by Olson et al. (2000), or lower per capita income, by Acemoglu et al. (2001). Thanks to different instrumental variables, Hall and Jones (1999) and Acemoglu et al. (2001) convincingly argued that the causality ran from institutions to economic performance.

The debate now focuses on the channels through which institutions affect overall economic performance. Capital accumulation first appeared as the most likely culprit, and this is why the institutional determinants of investment have been closely scrutinized. Accordingly, the quality of institutions has been found to affect total investment, among others by Mauro (1995) or Knack and Keefer (1995), public investment, by Mauro (1998), and foreign direct investment, by Wei (2000). These results explain the impact of governance on capital accumulation but only incidentally address its impact on productivity. This is where integration in world trade comes to the fore, due to its observed relationship to total factor productivity, for instance as documented by Edwards (1998).

Strikingly however, the impact of institutions on the trade of goods has received little attention so far. This is puzzling in view of the key role that integration in world trade plays in development, and the fact that many developing countries either remain on the periphery of world trade or are stuck with exporting primary products. This observation is allegedly one of the main puzzles of international economics, since relative factor endowments should result in substantial North-South trade. To date, the main explanation of that puzzle has been to

1. In the literature, the concepts of "institutions" or "institutional framework" broadly refer to the activities of the state. They are synonymous with "governance." In what follows, we shall use these expressions interchangeably so as to remain as general as possible. However, whenever possible we will also focus on more specific dimensions of governance, such as corruption or the rule of law, which will be defined below.

blame developing countries' restrictive trade policies. Thus, Sachs and Warner (1995a) found that economies that adjust more slowly from primary-intensive to manufactured-intensive exports were those whose trade was less liberalized.

However, recent research suggests that for countries to fully benefit from openness strategies, institutions might be crucial. Anderson (2005) thus suggested that the risk of predation and imperfect enforcement of contracts impairs foreign trade because it increases both the costs and risks of trading abroad. Anderson and Marcouiller (2002) accordingly observed that bad opaque public policies and an ineffective legal system reduce the volume of trade. Dollar and Kraay (2003) also report a positive correlation between openness and the rule of law, although they argue that the causality between the two variables may be bi-directional. In a similar vein, Giavazzi and Tabellini (2004) observed that political liberalizations were associated with trade liberalizations. The former moreover tended to lead rather than follow the latter, which suggests that political liberalizations at least partly cause trade liberalizations.

However, trade is not homogenous, and the volume of trade is only one dimension of a country's integration in the world economy. Moreover, all exports are not equivalent in terms of development and growth. The development economics literature suggests that manufactured exports are more likely to lead to development than non-manufactured exports. The empirical support for this is based on the observations that countries with more diversified exports seem to do better, and that growth tends to be positively correlated with growth in manufactured production and exports. To highlight the reason for such a relationship, some authors stress the importance of "forward and backward linkages" in creating higher positive externalities coming from manufacturing than from natural resource sectors (e.g. Hirschman, 1958; Seers, 1964). Matsuyama (1992) underlined the importance of learning-by-doing in manufacturing and its implication for the rate of human capital accumulation. Other arguments hinge on the Dutch Disease. Natural resources have more volatile world prices than manufacturing and this induces greater uncertainty for primary commodity

producers, which extends to other sectors. Uncertainty is known to be detrimental to factor accumulation and hence to growth (e.g. Sachs and Warner, 1995b).

There is another reason to distinguish manufactured and non-manufactured exports. The impact of institutional quality on exports of primary products is likely to differ from its effect on manufactured exports. Endowments of natural resources create natural rents that are usually controlled by the administration and generate corrupt competition over their distribution as Ades and di Tella (1999) suggest. In such a context, exports of non-manufactured goods may be positively rather than negatively associated with the lack of quality of institutions. Distinguishing exports of manufactured goods from exports of non-manufactured goods may, therefore, lead to a better specification of export regressions, hence more reliable estimates of the impact of institutions on trade.

Moreover, the current debate over the relationship between institutions and trade remains fairly vague on what is meant by institutions. Governance is indeed a multi-faceted concept. It ranges from the rule of law to the degree of democracy of the country. Unsurprisingly, there exists a wide choice of indicators, each aiming to assess one dimension of the wider phenomenon. Unfortunately, most indicators have been developed separately, thus producing a lacunal picture of countries' overall institutional environment. As a result, if each dimension of governance has been independently studied, attempts to compare the impact of different facets of the institutional framework remain scarce. The lack of comparability of the various dimensions of the institutional framework was remedied by Kaufmann et al. (1999a) who synthesized existing indicators to provide a distinct and consistent assessment of the main dimensions of governance. They constructed six governance indices devoted to six dimensions of the institutional framework. A second contribution of this paper is to take advantage of Kaufmann et al.'s (1999) set of indicators to compare the effects of several dimensions of institutional quality on trade flows. An important implication of that exercise is that it may allow us to point out which institutional reforms may be the most promising in economic terms.

We thus observe a positive impact of the quality of institutions on the manufactured exports ratio. This impact shows mostly for the control of corruption and the rule of law, and to a lesser extent for government effectiveness and the lack of political violence. When using instrumental variables techniques to check the robustness of those results and investigate causality, we find a positive impact of the exogenous component of institutions on exports of manufactures. However, the control of corruption appears to be the only robust dimension of the institutional framework to be significantly correlated with exports of manufactures at usual levels of confidence.

To reach those results, the rest of the paper is organized as follows: The next section surveys the reasons that may explain why a country's manufactured exports are affected by its domestic institutional framework. The following section examines the impact of six different dimensions of governance and compares their capacity to account for cross-country differences in exports performance. Section 4 uses an instrumental variables approach as a robustness check for the causality from institutions to trade. Section 5 concludes.

The Expected Impact of Institutions on Trade

The study of the relationship between institutions and trade is still in its infancy, hence the relative scarcity of theoretical arguments linking trade and governance. However, there are reasons to contend that formal as well as informal institutions may affect trade both directly and indirectly.[2] They can directly affect the willingness of agents to trade abroad or affect economic variables that may in turn lower the propensity of agents to trade. Moreover, there is ground to believe that aggregating manufactured and non-manufactured exports may be misleading.

The Direct Impact of Institutions on Trade. The direct impact of institutions on the propensity to trade runs through the reduction of the expected return of trading abroad. Thus, faulty institutions may act as a tax on trade flows. Moreover, cumbersome regulations and nit-picking bureaucracies have often been used as non-tariff barriers to trade. Rodrik (2002) points out that the main impediment to international trade may indeed be the problem of contract enforcement, which is of particular relevance in international transactions since they confront traders in countries whose legal and political jurisdictions differ. Needless to say, these differences may also be accompanied and magnified by differences in the quality of institutions and in the rule of law in particular.

A first theoretical illustration of the consequences of imperfect contract enforcement on trade is provided by Anderson and Young (1999) who find that lack of enforcement of contracts may act as a tariff on risk-neutral traders and therefore reduce trade.[3] In a related contribution, Anderson and Marcouiller (2002) incorporate the impact of the quality of institutions in a gravity model by assuming that a country with weak institutions incurs a positive mark-up on the price of its exports that reduces foreign demand. They therefore find that a deterioration of the quality of a country's institutions should result in a reduction of its exports.

2. Note that some authors argue that the causality between institutions and trade may run in the other direction (Rodrik, 2002, or Treisman, 2000). Empirical evidence suggests, however, that such a relationship is statistically fragile and may in large part be due to a sample selection bias (Knack and Azfar, 2003). We abstract from this issue in this section but will address it in Section 4 thanks to instrumental variables.

3. Contract enforcement becomes crucial when traders incur significant sunk costs resulting in a hold-up problem. Robert and Tybout (1997) document that such costs may be large and have dramatic consequences on trade.

The impact of institutions on trade may also result from their effect on the risks associated with international transactions. This point is made by Anderson and Marcouiller (1997) in a theoretical contribution. The authors develop a model of trade between two regions whose inhabitants may either specialize according to their comparative advantage or opt for a career in predation. They then show that insecurity may prevent trade even though it offers potential mutual gains. In their framework, not only does predation reduce trade because it is a direct deduction on the flow of traded goods, but also because it diverts resources from their productive allocation towards the defense of property rights. It follows that good institutions may help bar predation and thus foster trade.

Defective institutions may also impact the geographic structure of trade. Thus, Lambsdorff (1998) observes that some countries, like Belgium, France, Italy, the Netherlands, and South Korea, are persistently over-represented in the imports of corrupt countries. He observes on the other hand that countries like Sweden and Malaysia tend to trade less with corrupt importers. Lambsdorff (1998) concludes that those differences may be due to the differences in the propensity of exporters to offer backhanders.

The Indirect Impact of Institutions on Trade. In addition to their direct effect, institutions may also indirectly affect trade through their impact on other variables that determine trade flows. There are at least two such variables that come to mind. The first is investment and the other productivity.

Thus the literature suggests a relationship between the investment ratio and the quality of institutions. In a comprehensive study, Brunetti and Weder (1998) show that nearly all facets of governance, ranging from political stability to the control of graft, tend to be positively associated with investment. Other studies, like Mauro (1995) or Knack and Keefer (1995), obtain similar results. At the same time, investment has been found to affect trade. That observation was for instance made by Rodrik (1995). One may therefore envisage an indirect impact of institutions on trade. Precisely, a deterioration of the quality of institutions results in a lower investment ratio that in turn shows on lower trade.

Bad institutions have also been found to impact productivity. Hall and Jones (1999) thus observed that bad institutions reduce aggregate productivity, while Olson et al. (2000) found that they are also associated with slower productivity growth. As lower productivity is an impediment to competitiveness on world markets, one may reasonably expect that countries whose institutions result in low productivity will likely have difficulties in exporting and trading abroad.

However, it must be stressed that the above arguments may not be relevant to all kinds of exports. They may in particular be more directly relevant to exports of manufactured goods than to exports of non-manufactured goods, and raw materials in particular. The next sub-section explains why.

Non-manufactured Exports as an Exception. Indeed, the relationship between institutional quality and the volume of non-manufactured goods may differ from the relationship expected for other exports. That difference may hinge on both the direct and the indirect channels that lead from institutions to trade.

Thus, the direct impact of institutions on exports may first be reversed. This would in particular be the case in sectors where firms are more prone to make corrupt deals. In those sectors, greater corruption of the administration of the exporting country would ease rather than hamper exports. In that respect, the fact that the construction sector and the oil and gas sector rank first and third in Transparency International's 2002 bribe payer survey is evocative.[4]

Moreover, the indirect effect of institutions may not affect all industries alike. Thus, in a sector where endowments determine comparative advantages, the impact of governance on productivity and infrastructure may be of secondary importance. In a nutshell, if there is a resource to be exploited, it will be, even though other sectors suffer from a lack of infrastructure.

A comparable argument deals with the determinants of a country's comparative advantage in the production and exports of manufactured goods versus the production and exports of non-manufactured goods. If ailing institutions are associated with lower investment in education, as Mauro (1998) remarks, hence with lower literacy, which Kaufmann et al. (1999b) observe, then bad governance

4. The oil and gas sector is only preceded by the arms and defense sector in that survey.

will distort production away form manufactured goods and towards non-manufactured goods. This argument is due to the contention that the production of manufactured goods is relatively more skill-intensive than the production of non-manufactured goods. The same mechanism would therefore imply both a positive relationship between institutional quality and exports of manufactured goods, and a negative relationship between institutional quality and exports of non-manufactured goods.

Overall, one may conclude that the relationship between the quality of institutions and the volume of manufactured exports should be positive. This result may not extend to exports of non-manufactured goods, whose relationship with institutional quality is more ambiguous but may well be negative. The next section empirically tests those presumptions.

A Comparison of Different Dimensions of the Institutional Framework

Before providing the results of our estimations, this section first presents the econometric strategy that is used to study the relationship between governance and exports of various kinds, and describes the data employed in our regressions.

Econometric Specification. To study the relationship between trade ratios, which vary over time, and institutional indices, for which we only have one observation, we separate explanatory variables into two subsets: those that vary over time (first subset) and those that do not (or almost not). As Kaufmann et al.'s (1999a) indices are still only available on a time-span that is too limited to feature meaningful variations; we only use their first vintage and include it in the second subset of variables. We then apply a two-step procedure. The first step consists in estimating a model where the explanatory variables are those included in the first sub-set and country fixed effects. In the second step the estimated fixed-effects coefficients are used as dependent variables to be explained by governance indicators, and the other time invariant variables.

To apply that two-step procedure, we start from a specification that was used by Sekkat and Varoudakis (2000), and accordingly assume that exports of manufactures are explained by the following relationship:

$$\log(X_{it}) = \alpha_{0i} + \alpha_1.\log(E_{it}) + \alpha_2.RYP_{it} + \alpha_3.log(I_{it-1}) + \mu_{it} \qquad (1)$$

Where:

- X_{it} relevant ratio of exports to GDP for year t (total exports, manufactured exports and non-manufactured exports);
- α_{0i} is country i's fixed effect;
- E_{it} is country i's real effective exchange rate for year t, where an increase in E_{it} stands for an appreciation of the exporter's currency;
- RYP_{it} is the GDP growth rates of country i's partners;
- I_{it-1} is years t-1's investment in the relevant sector over GDP;[5]
- μ_{it} is the error term.

5. It therefore measures investment in the manufactured goods sector when the dependent variable is the exports of manufactures ratio, and stands for investment in other sectors when the left-hand variable is the ratio of other exports to GDP. When the dependent variable is total exports, Ĩit1 stands for the total investment ratio.

We scaled down exports by GDP to correct for the differences in countries' sizes. The control variables are standard in the literature and all have a well-defined expected impact on manufactured exports. The coefficient of exchange should be negative because an increase in E_{it} means an appreciation of the exporter's currency. We expect a positive coefficient for the growth rates of a country's partners. If a country's partners grow faster, they will increase their demands for goods produced in that country, thereby raising its exports. Finally, we complement our set of control variables by the ratio of investment in the relevant sector to GDP. This is based on the presumption that investment in a sector should raise its capacity, resulting in greater supply of goods and services hence higher exports. We accordingly expect the exports ratio to be positively correlated with investment.

Once expression (1) is estimated, countries' fixed effects are regressed on the set of time-invariant variables. The exact specification of that second estimation is:

$$\alpha_{0i} = \eta_0 + \eta_1.log(Pot_i) + \eta_2.log(Inst_i) + \varepsilon_i \qquad (2)$$

Where:

α_{0i} is country i's fixed effect as estimated in expression (1);

Pot_i measures country i's market potential;

$Inst_i$ is an index of the quality of country i's institutions;

ε_i is the error term.

We used countries' market potential as a control variable in the exports regressions. That variable is defined as the distance-weighted average of a country's partners' GDP's. It therefore measures how close a country is to other markets. Our presumption is that the closer a country to rich economies the more it may export. We therefore expect the market potential variable to be positively correlated with a country's exports of manufactures ratio.[6]

6. We also used other control variables in that step, such as country size and human capital, but the results were unaffected.

Data Sources. All non-institutional variables are drawn from the World Development Indicators database. The only exception is market potential. This variable was computed by the Centre d'Etudes Prospectives et d'Informations Internationales (CEPII) and was downloaded from its website.

Of course, the explanatory variables of interest are the institutional variables. We consider all six governance indices developed by Kaufmann et al. (1999a, b). Kaufmann et al. (1999a, b) classified available indicators of governance into six independent clusters and aggregated them into as many composite indices. Each composite indicator refers to a different dimension of governance. It ranges from –2.5 to +2.5, higher values signaling better governance. To allow for the estimation of elasticities in expression (2), we added 3.5 to those indices, so as to be able to compute logarithms. Their summary statistics are displayed in the appendix in table A2. Since the composition of the six indicators is reported in Kaufmann et al. (1999b), we simply recall their definitions here. They all measure a different dimension of the institutional framework but can be presented as three pairs of indices.

The first pair of indicators provided by Kaufmann et al. (1999a, b) assesses the soundness of a country's policies and the efficiency of the administration that implements them. Unsurprisingly, the indicator named "government effectiveness" (Goveff), is defined as an assessment of the "perceptions of the quality of public service provision, the quality of the bureaucracy, the competence of the civil servants, the independence of the civil service from political pressures, and the credibility of the government's commitment to policies." The indicator labeled "regulatory burden" (Reg) was constructed to gauge "the incidence of market unfriendly policies such as price controls or inadequate bank supervision, as well as perceptions of the burden imposed by excessive regulation." This indicator measures dimensions of governance related to what Easton and Walker (1997) refer to as economic freedom.

The second pair of indicators was built to assess the degree to which a country's citizens feel bound by the legal framework embodied in their country's institutions. Thus, the "rule of law" index gauges "the extent to which agents have confidence in and abide by the rules of society" (Rulelaw). This cluster is the focus of Dollar and Kraay (2003). Kaufmann et al.'s (1999a, b) last index is labeled "(control of) graft" or "probity". Graft, or corruption, is commonly defined in the literature as the misuse of public power for private benefits. Since Mauro (1995)'s seminal paper, it has been the focus of a blooming empirical literature and its impact on the structure of trade was studied by Lambsdorff (1998).

The last pair of indicators refers to the process of selection of the authority. It therefore measures aspects of governance that have been the focus of the literature devoted to the impact of democracy and political stability. More precisely, Kaufmann et al.'s (1999a, b) first indicator, called "voice and accountability" (Voice), measures "the extent to which citizens of a country are able to participate in the selection of governments." It is therefore a measure of the openness of the political system, that is its degree of democracy, whose relationship with economic performance was for instance studied by Barro (1996). The "lack of political violence" (Lackviol) indicator "measures perceptions of the likelihood that the government in power will be destabilized or overthrown by possibly unconstitutional and/or violent means." This indicator therefore provides an assessment of the political risk associated with a country.

One must bear in mind that those indicators were built to describe different dimensions of the quality of the institutional framework, as opposed to being different proxies for the same phenomenon. Using them in turn as explanatory variables of the same dependent variable should therefore not be seen chiefly as a robustness check. On the contrary, it is a way to determine which aspect of the institutional framework really matters for a country's openness to trade.

Overall, we could assemble a sample that includes annual data over the period (1990-2000) and covers between 38 and 60 countries.[7]

7. The list of countries included in the estimation is reported in the appendix.

Empirical Results. Tables 1a, 1b, and 1c report the result of the second stage of the analysis, namely the result of the estimation of expression (2), for various dimensions of governance. The results of the first stage are reported in the appendix. We use panel data econometric methodology. Tests of fixed and random effects are conducted to select the most adequate models. The fixed effects and the random effects tests support the focus on the fixed effects model. The estimates are heteroskedastic consistent.

The results of the first stage of the estimation conform to standard intuition. Namely, an appreciation of the exchange rate significantly reduces all kinds of exports, which are also positively associated with growth in partner countries. The impact of investment only appears significantly in the regression with total exports as the dependent variable. That variable does not significantly appear in the other two estimations. This may be due to the size of the sample that dramatically shrinks when exports are split between manufactured and non-manufactured goods.

The regressions of interest are, however, those of the second stage, which estimate expression (2). The results of the estimation of that expression show marked differences between the various components of total exports. The first such difference can be found in the overall quality of fit of the estimated relationships. Namely, with an adjusted R^2 ranging from 28% to 45%, the quality of fit for manufactured exports can be considered satisfactory, given that the sample is only a cross-section in the second step of the regression. The same conclusion does not apply to non-manufactured exports. Unsurprisingly therefore, the quality of fit of the relationship whose dependent variable is the sum of the two previous variables (i.e. total exports) is also disappointing.

8. One may remark that, as we scale down all exports by GDP, for reasons that have been underlined above, we may well underestimate the impact of institutions on trade. Namely, institutions also have a direct effect on GDP. A variation of institutional quality therefore affects both the numerator and the denominator of all exports ratios in the same direction, which minimizes its absolute impact on the volume of exports.

The second difference between various exports lies in the significance of independent variables. It thus appears that the proximity of large markets has a significantly positive impact on exports of manufactured goods, since market potential exhibits a positive and significant coefficient in all regressions that involved that variable. This result, however, does not hold for non-manufactured exports, which are never significantly associated with that variable. This result is consistent with the presumption that exports of non-manufactured goods are mainly determined by the availability of resources rather than by the proximity to other markets. As a consequence, the relationship between a country's market potential and its total exports ratio, though intuitive, appears fairly weak.

Table 1a Regression results with fixed effects models:
Respect for the institutional framework

	Probity			Rule of law		
Dependent	Xtot	Xman	Xother	Xtot	Xman	Xother
Constant	–1.45 (1.39)	–9.03 (4.82) ***	4.93 (2.84) ***	–1.48 (1.47)	–9.02 (4.35) ***	4.8 (2.99) ***
Market potential	0.2 (1.49)	0.59 (2.40) **	–0.361 (1.50)	0.208 (1.61)	0.629 (2.03) *	–0.315 (1.58)
Institutional quality	0.0393 (0.144)	2.44 (3.41) ***	0.223 (0.395)	0.055E-2 (0.179)	2.19 (2.11) **	0.0203 (0.039)
N Adj. R^2	60 0.034	38 0.455	40 0.034	60 0.033	38 0.422	40 0.030

Table 1b Regression results with fixed effects models:
Government action

	Government effectiveness			Regulatory framework		
Dependent	Xtot	Xman	Xother	Xtot	Xman	Xother
Constant	–1.53 (1.53)	–9.12 (4.61) ***	4.84 (2.90) ***	–1.49 (1.43)	–11.35 (3.62) ***	4.77 (2.7) **
Market potential	0.226 (1.77)	0.65 (2.18) **	–0.33 (1.49)	0.209 (1.87) *	0.944 (3.44) ***	–0.311 (1.54)
Institutional quality	–0.075 (0.26)	2.16 (2.24) **	0.094 (0.163)	0.0107 (0.029)	1.83 (0.76)	0.0195 (0.021)
N Adj. R^2	60 0.035	38 0.427	40 0.031	60 0.033	38 0.312	40 0.0301

Table 1c Regression results with fixed effects models**:**
Selection of the authority

	Voice and accountability			Lack of political violence		
Dependent	Xtot	Xman	Xother	Xtot	Xman	Xother
Constant	–1.59 (1.63)	–9.66 (4.1) ***	4.70 (2.95) ***	–1.29 (1.32)	–9.34 (4.45) ***	4.80 (3.00) ***
Market potential	0.267 (2.23) **	0.935 (3.73) ***	–0.157 (0.863)	0.137 (1.09)	0.749 (2.78) ***	–0.319 (1.68)
Institutional quality	–0.297 (1.07)	0.681 (0.669)	–0.928 (2.46) **	0.346 (0.984)	1.698 (1.74) *	0.0438 (0.081)
N Adj. R^2	60 0.047	38 0.279	40 0.102	60 0.049	38 0.35	40 0.0303

Note: Absolute *t*-statistics are displayed in parentheses under the coefficient estimates. *: test-statistic is significant at the 10% level ; **: significant at the 5% level ; ***: significant at the 1% level. The estimates are heteroskedastic consistent.

However, the main difference between the various kinds of exports has to be found in the key variables of interest, namely government variables. First, we observe that governance indices in general exhibit positive and significant coefficients in estimations involving exports of manufactures. Accordingly, better institutional quality should be associated with larger exports of manufactured goods. By contrast, we observe that exports of non-manufactured goods are in general not significantly associated with governance. However, an interesting exception appears in table 1c. In that table, the "voice and accountability" index exhibits a negative sign. This means that less democratic countries tend to export more non-manufactured goods, which is consistent with the arguments put forward in the previous section. What is even more striking still is the fact that the same index is precisely one that does not seem to affect exports of manufactured goods. This result further emphasizes the difference between the two types of exports.

Here again, the discrepancies in the reaction of the various types of exports to institutional quality blur its impact on total exports. Indeed, whereas the coefficient of institutional quality is in general intuitive in the relationships involving the total exports ratio, it always fails to be significant at usual levels of confidence.[8]

As all indices are measured in the same way, one can also comment on the significance and the relative sizes of the estimated coefficients. This only makes sense for exports of manufactured goods, since "voice and accountability" is the only index that is significantly associated with exports of non-manufactured goods. It thus appears that the two dimensions of governance that stand out both appear in table 1a, which is devoted to the "respect for the institutional framework" variables. The magnitude of the coefficient is larger for the probity index.

Among the "government action" variables reported in table 1b, the government effectiveness indicator exhibits a coefficient that is as significant and of a similar magnitude as the coefficient that affects the "rule of law" index. On the other hand, the "quality of the regulatory framework" index does not pass the ten percent test of significance.

8. One may remark that, as we scale down all exports by GDP, for reasons that have been underlined above, we may well underestimate the impact of institutions on trade. Namely, institutions also have a direct effect on GDP. A variation of institutional quality therefore affects both the numerator and the denominator of all exports ratios in the same direction, which minimizes its absolute impact on the volume of exports.

Finally, the results of table 1c, which is devoted to the "selection of the authority" variables, are even less robust. Thus, the lack of political violence index is only significant at the ten percent level, and the "voice and accountability" index does not even pass that test.

Overall, tables 1a, 1b, and 1c suggest a ranking of the dimensions of governance that affect trade. Thus, the respect for the institutional framework, be it the absence of corruption or a strong rule of law, appears to be the most important dimension of trade, followed by government effectiveness. The lack of political violence can also enhance trade of manufactures. However, the degree of democracy is not a chief determinant of exports, nor is the quality of the regulatory framework.

These results should, however, be considered as tentative because they may in fact be affected by a simultaneity bias. Namely, institutions are as likely to affect trade as they are to be affected by it. The aim of the next section is precisely to address that bias.

Robustness and Instrumental Variable Estimations

As mentioned above, the direction of causality between trade and institutions is ambiguous, which may result in a simultaneity bias in our estimations. Fortunately, solutions to that issue have been suggested in the recent literature on the empirics of institutions. They consist of using instrumental variables for institutional quality. That solution not only allows to provide for better quantitative estimates but also to tackle the issue of causality.

The subsequent question is then that of the instrument that we use. Several instrumental variables have been used so far, ranging from measures of ethnic and linguistic fractionalization by Mauro (1995), to distance to the equator by Hall and Jones (1999). To maximize the predictive power of our instrument, we chose to use a combination of those variables to instrument for institutional quality. Namely, we replaced each governance indicator by its value predicted by a relationship involving ethnolinguistic fractionalization, which was already used by Mauro (1995), distance to the equator, as in Hall and Jones (1999), and legal origin as independent variables. We observed that the fit of the relationship spectacularly increased when the square of the ethnic fractionalization index was included among the regressors in addition to the level of that index. Both were therefore included among instruments. As those variables are predetermined, they are reasonable instruments and moreover allow causality to be determined. We finally re-ran all the previous section's second stage regressions simply replacing governance indicators by their fitted values. The results of our estimations are displayed in tables 2a, 2b, and 2c.

A cursory glance at tables 2a, 2b, and 2c reveals that the previous section's main conclusions survive to the instrumentation of institutional quality. Thus, the observed differences between the three exports ratios remain. More precisely, the quality of fit remains quite satisfactory for manufactured exports but very low for non-manufactured exports and total exports.

As regards the association of the three kinds of exports with their explanatory variables, the results are even more striking than before. In a nutshell, exports of manufactured goods are the only kind of exports that exhibit a significant association either with market potential or the quality of institutions. As before, the coefficients affecting those variables are intuitively signed. Thus, the exports-of-manufactures ratio tends to increase with market potential and with institutional quality.

When it comes to analyzing separately the impact of the different dimensions of governance, the picture provided by instrumental variable regressions differs somewhat from the previous section's. Indeed, probity is the only institutional variable whose exogenous component is significantly associated with exports of manufactured goods at conventional levels of confidence. However, the quality of the regulatory framework and the rule of law indices are only marginally rejected at the ten percent level of confidence. This is encouraging since some observations were lost due to the unavailability of some instruments, and the size of the sample is therefore limited. The other dimensions of governance are finally farther from the ten percent threshold.

Overall, these results suggest a positive and causal relationship between probity and exports of manufactured goods. Due to the rather small size of the sample, this does not rule out the possibility that other dimensions of governance may be influential, but suggests the key role of corruption. Thus a country that would improve its control of corruption is likely to increase its exports of manufactured goods ratio.

Table 2a IV regression results with fixed effects models: Respect for the institutional framework variables

	Probity			Rule of law		
Dependent	Xtot	Xman	Xother	Xtot	Xman	Xother
Constant	–0.581 (0.42)	–9.56 (4.47) ***	5.28 (2.61) **	–0.721 (0.548)	–9.43 (4.26) ***	5.10 (2.65) **
Market potential	0.146 (0.662)	0.708 (2.96) ***	–0.304 (0.92)	0.227 (1.15)	0.737 (3.00) ***	–0.20 (0.72)
Institutional quality	–0.257 (0.406)	2.039 (2.18) **	–0.383 (0.468)	–0.668 (1.13)	1.768 (1.62)	–0.909 (1.34)
N Adj. R^2	33 –0.0467	34 0.354	33 0.0612	33 –0.0196	34 0.323	33 0.0893

Table 2b IV regression results with fixed effects models: Government action variables

	Government effectiveness			Regulatory framework		
Dependent	Xtot	Xman	Xother	Xtot	Xman	Xother
Constant	–0.604 (0.443)	–9.71 (4.27) ***	5.29 (2.64) **	0.37 (0.231)	–13.91 (3.38) ***	6.10 (3.05) ***
Market potential	0.213 (0.895)	0.748 (2.95) ***	–0.255 (0.717)	0.159 (0.697)	0.803 (3.58) ***	–0.326 (0.903)
Institutional quality	–0.659 (0.848)	1.9 (1.49)	–0.693 (0.68)	–1.00 (0.545)	4.51 (1.63)	–0.82 (0.29)
N Adj. R^2	33 –0.238	34 0.324	33 0.0723	33 –0.04	34 0.326	33 0.0585

Table 2c IV regression results with fixed effects models: Selection of the authority variables

	Voice and accountability			Lack of political violence		
Dependent	Xtot	Xman	Xother	Xtot	Xman	Xother
Constant	–0.494 (1.03)	–9.882 (4.24) ***	5.40 (2.89) ***	–0.604 (0.47)	–9.716 (4.21) ***	5.27 (2.82) ***
Market potential	0.28 (1.09)	0.765 (2.28) **	–0.178 (0.524)	0.269 (1.25)	0.768 (2.73) **	–0.166 (0.58)
Institutional quality	–1.158 (1.03)	1.908 (1.00)	–1.261 (0.52)	–1.053 (1.23)	1.842 (1.22)	–1.29 (1.39)
N Adj. R^2	33 0.64.E-2	34 0.304	33 0.095	33 0.14.E-2	34 0.306	33 0.101

Note: Absolute *t*-statistics are displayed in parentheses under the coefficient estimates. *: test-statistic is significant at the 10% level ; **: significant at the 5% level ; ***: significant at the 1% level. The estimates are heteroskedastic consistent.

These findings are consistent with those of Anderson and Marcouiller (2002), who reported a positive relationship between institutional quality and total exports. They, however, probe deeper in that relationship by showing that it is mainly driven by the impact of governance on exports of manufactured goods. This result is important since manufactured exports are admittedly the component of exports that is the most likely to drive growth. At the same time, they also suggest that corruption may be, of all the dimensions of the institutional framework, the costliest one. This is reminiscent of the results of Méon and Sekkat (2005), who found that corruption was detrimental to growth everywhere but chiefly in countries where the rest of the institutional framework is defective. Both suggest that curbing corruption should be high on the agenda of institutional reform programs.

To get a clearer picture of the meaning of our results, however, it is useful to complement the insights of tables 2a, 2b, and 2c with a quantitative assessment of the impact of corruption on a country's exports of manufactured items ratio. Let us, for instance, assume that Romania, whose rescaled corruption score amounts to 1.11, could improve its control of corruption up to the level of Jordan, whose corruption score of 1.29 is the median of our sample. This would amount to a 16.2% improvement in Romania's corruption score. According to our point estimate of the elasticity of the exports of manufactured goods ratio to the variations of the corruption index, that improvement in the control of corruption would result in a $2.039 \times 16.2 \approx 33\%$ increase of Romania's exports of manufactured goods index, which would then exceed 21%. That increase would bring Romania's export ratio close to Israel's, and be equivalent to one fourth of the standard deviation of that variable. Our estimated relationship therefore seems to be not only statistically but also economically significant.

Conclusion

The impact of institutions on the economy is pervasive. The present paper more precisely emphasizes that they can affect a country's integration in international trade. To do so, it distinguishes manufactured and non-manufactured exports, and six dimensions of the institutional framework. The results suggest that defective institutions chiefly hurt a country's capacity to export manufactured goods. The use of instrumental variables techniques moreover suggests that the causality runs from institutions to exports. Accordingly, an improvement in institutional quality would result in an increase of manufactured exports.

On the other hand, exports of non-manufactured goods do not seem related to institutional quality in our sample. We even found evidence of a negative relationship between democracy and the exports of non-manufactured ratio. That differentiated relationship of institutions with the two kinds of exports that were scrutinized results in an insignificant relationship between institutional quality and the total exports ratio.

A second finding of the present analysis is that the various facets of governance may not play the same role in affecting exports of manufactured goods. On the whole, our estimations suggest that the control of corruption is the facet of governance that is the most robustly associated with manufactured exports. Other dimensions of the institutional framework, like the rule of law or government effectiveness, may also have an influence, but their relationship with manufactured exports is less robust.

Taken at face value, these findings have straightforward policy implications. They suggest that improving a country's institutional framework may be instrumental in improving that country's integration in international trade. By allowing it to re-orientate its trade towards exports that are more favorable to growth, it may also improve its development prospects. This paper's findings also suggest that all dimensions of the institutional framework are not equal in affecting trade. It thus appears that the control of corruption, and more generally the respect for institutions, should receive high priority.

One may nevertheless remain cautious in drawing implications from this paper's findings. Further investigations into the relationship between trade and institutions are warranted. Despite our attempt to take advantage of the panel dimension of our dataset, the estimated impact of institutions on trade stills rests on a cross-section regression. This is due to the limitations of the governance indices that we used, which still lack a long enough time-dimension. However, research is progressing quickly in that field, and it may soon allow applying panel data techniques to study the trade-institutions nexus. This strand of research may greatly enhance our knowledge of the impact of institutions, not only on trade but also on general economic performance.

Appendix

Table A1 Countries in the regressions

Total exports	Manufactured exports	Non-manufactured exports
Armenia		
Australia	Australia	Australia
Austria	Austria	Austria
Belgium		Belgium
Bolivia	Bolivia	Bolivia
Bulgaria		
Cameroon		Cameroon
Canada	Canada	Canada
Chile	Chile	Chile
China		
Colombia	Colombia	Colombia
Costa Rica		
Cote d'Ivoire		
Croatia	Croatia	Croatia
Czech Republic		
Denmark	Denmark	Denmark
Ecuador	Ecuador	Ecuador
Egypt, Arab Rep.	Egypt, Arab Rep.	Egypt, Arab Rep.
Finland	Finland	Finland
France	France	France
Georgia		
Germany		
Ghana		
Greece	Greece	Greece
Hungary	Hungary	Hungary
Iceland		
Ireland	Ireland	Ireland
Israel	Israel	Israel
Italy	Italy	Italy
Japan	Japan	Japan
Jordan	Jordan	Jordan
Macedonia, FYR		
Malawi	Malawi	Malawi
Malaysia	Malaysia	Malaysia
Moldova		
Morocco	Morocco	Morocco
Netherlands	Netherlands	Netherlands
Nicaragua		
Nigeria	Nigeria	Nigeria
Norway	Norway	Norway
Pakistan		Pakistan
Paraguay		
Philippines	Philippines	Philippines
Poland	Poland	
Portugal	Portugal	Portugal
Romania	Romania	Romania
Singapore	Singapore	Singapore
Slovak Republic		
South Africa	South Africa	South Africa
Spain	Spain	Spain
Sweden		
Switzerland		
Tunisia	Tunisia	Tunisia
Uganda		
Ukraine		
United Kingdom	United Kingdom	United Kingdom
United States	United States	United States
Uruguay	Uruguay	Uruguay
Venezuela, RB	Venezuela, RB	Venezuela, RB
Zambia		

Table A2 Summary statistics of the governance variables

	Respect for the institutional framework		Government action		Selection of the authority	
	Probity	Rule of law	Government efficiency	Regulatory framework	Voice and accountability	Lack of political violence
Mean	1.34	1.35	1.34	1.36	1.38	1.33
Median	1.34	1.40	1.40	1.39	1.41	1.37
Standard deviation	0.25	0.23	0.25	0.15	0.22	0.21
Minimum	0.25	0.23	0.25	0.15	0.22	0.21
Maximum	1.73	1.70	1.72	1.56	1.65	1.65

Table A3 Summary statistics of the openness ratios

	Total exports/GDP	Manufactured exports/GDP	Non-manufactured exports/GDP
Mean	35.40	16.31	19.72
Median	31.88	12.64	18.87
Standard deviation	21.90	17.98	10.96
Minimum	10.08	0.61	1.33
Maximum	160.12	110.94	63.11

Table A4 Results of the estimation of expression (1)

Dependent	Xtot	Xman	Xother
Exchange rate	–0.399 (7.06) ***	–0.552 (1.93) *	–0.764 (4.97) ***
Partners' growth	0.0285 (5.09) ***	0.0452 (1.67) *	0.0309 (2.02) **
Investment in the relevant sector	0.0696 (1.88) *	–0.137 (0.019)	–0.113 (1.24)
N Adj. R2	653 0.91	292 0.84	273 0.90

Note: Individual fixed effects are not reported to save on space. Absolute *t*-statistics are displayed in parentheses under the coefficient estimates. *: test-statistic is significant at the 10% level ; **: significant at the 5% level ; ***: significant at the 1% level. The estimates are heteroskedastic consistent.

References

Acemoglu, D., S. Johnson, and J.A. Robinson. 2001. The colonial origins of comparative development: an empirical investigation. *American Economic Review* 91, no. 5:1369–1401.

Ades A. and R. Di-Tella. 1999. Rents, competition, and corruption. *American Economic Review* 89, no. 4: 982–93.

Anderson, J. E. and D. Marcouiller. 1997. Trade and Security, I: Anarchy. NBER Working Paper No. 6223.

Anderson J.E. and L. Young. 1999. Trade and contract enforcement. Boston College, mimeo.

Anderson J.E. and D. Marcouiller. 2002. Insecurity and the pattern of trade: an empirical investigation. *Review of Economics and Statistics* 84, no. 2: 342–52.

Anderson J.E. 2005. Trade and informal institutions. In E.K. Choi and J.C. Hartigan (eds). *Handbook of international trade: Economic and legal analysis of laws and institutions*. Oxford: Basil Blackwell, 279–93.

Barro R.J. 1996. Democracy and growth. *Journal of Economic Growth* 1, no. 1: 1–27.

Brunetti A. and B. Weder. 1998. Investment and institutional uncertainty: A comparative study of different uncertainty measures. *Weltwirtschaftliches Archiv* 134, no. 3: 513–33.

Dollar D. and A. Kraay. 2003. Institutions, trade and growth. *Journal of Monetary Economics* 50, no. 1: 133–62.

Easton S.T. and M.A. Walker. 1997. Income, Growth, and Economic Freedom. *American Economic Review* 87, no. 2: 328–32.

Edwards, S. 1998. Openness, productivity and growth: what do we really know? *Economic Journal* 108, no. 447: 383–98.

Giavazzi F. and G. Tabellini. 2004. Economic and Political Liberalizations. NBER Working Paper n°10657.

Hall R. and C.I. Jones. 1999. Why do some countries produce so much more output per worker than others? *Quarterly Journal of Economics* 114, no. 1: 83–116.

Hirschman, A. O. 1958. *The strategy of economic development.* New Haven CT: Yale University Press.

Kaufmann D., A. Kraay, and P. Zoido-Lobaton.1999a. Aggregating governance indicators. World Bank, Working Paper no. 2195.

_____. 1999b. Governance matters. World Bank, Working Paper no. 2196.

Knack P. and S. Keefer. 1995. Institutions and economic performance: Cross-country tests using alternative institutional measures. *Economics and Politics* 7, no. 3: 207–27.

Knack S. and O. Azfar. 2003. Trade intensity, country size and corruption. *Economics of Governance* 4, no. 1: 1–18.

Lambsdorff J. Graf. 1998. An Empirical investigation of bribery in international trade. *European Journal of Development Research* 10, no. 1: 40–59.

Matsuyama, K. 1992. Agricultural Productivity, Comparative Advantage, and Economic Growth. *Journal of Economic Theory* 58: 317–34.

Mauro P. 1995. Corruption and growth. *Quarterly Journal of Economics* 110, no. 3: 681–712.

_____. 1998 . Corruption and the composition of government expenditure. *Journal of Public Economics* 69, no. 2: 263–79.

Méon P.-G. and K. Sekkat. 2005. Does corruption grease or sand the wheels of growth? *Public Choice* 122, no. 1-2: 69–97.

Olson M., N. Sarna and A.V. Svamy. 2000. Governance and growth: A simple hypothesis explaining cross-country differences in productivity growth. *Public Choice* 102, no. 3-4: 341–64.

Robert M.J. and J.R. Tybout. 1997. The decision to export in Columbia: an empirical model of entry with sunk costs. *American Economic Review* 87, no. 4: 545–64.

Rodrik D. 1995. Getting interventions right: How South Korea and Taiwan grew rich. *Economic Policy*, no. 20: 53–97.

_____. 2002. Trade policy reform as institutional reform. In B. M. Hoekman, P. English, and A. Mattoo (eds). *Development, Trade, and the WTO: A Handbook*. World Bank, Washington, 3–10.

Rodrik D.A. Subramanian, and F. Trebbi. 2004. Institutions rule: the primacy of institutions over geography and integration in economic development. *Journal of Economic Growth* 9, no. 2: 131–65.

Sachs J.D. and A. Warner. 1995a. Economic reform and the process of global integration. *Brookings Papers on Economic Activity* 1, 1–118.

_____. 1995b. Natural Resources Abundance and Economic Growth. HIID Development Discussion Paper #517a, October.

Seers D. 1964. The Mechanism of an Open Petroleum Economy. *Social and Economic Studies* 13: 233–42.

Sekkat K. and A. Varoudakis. 2000. Exchange rate management and manufactured exports in Sub-Saharan Africa. *Journal of Development Economics* 61, no. 1: 237–53.

Treisman D. 2000. The causes of corruption: a cross-national study. *Journal of Public Economics* 76, no. 3: 399–457.

UNCTAD. 1998. *World Investment Report*.

Wei S.-J. 2000. How Taxing Is Corruption on International Investors? *Review of Economics and Statistics* 82, no. 1: 1–11.