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Does trade openness improve the quality of domestic institutions? Evidence from Africa

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Keywords: *international trade; trade openness; quality of institutions; Arica; panel data models; socio-economic development*

Abstract

Research background: The research article deals with impacts of international trade openness on institutions in less developed economies, namely in Africa.

Purpose of the article: It investigates the impacts of international trade openness on institutional quality in Africa measured by twelve various variables.

Methods: It applies generalized methods of moments to a dynamic panel data of 34 African countries in the period of 1988–2012. Institutional quality data come from International Country Risk Guide, the rest from World Development Indicators and UNESCO databases.

Findings & value added: Our results indicate that in the case of Africa, trade openness seems to be a positive and significant determinant of institutional quality, however, it differs across various institutional variables. Trade openness brings a positive impact on government stability, bureaucracy and law and order, we also identify its conflict-mitigating effects. This happens, unfortunately, with an exemption for natural resources exports. Trade openness also positively influences security and socioeconomic conditions, although we find the link much weaker. Regarding our control variables, we find two interesting results. First, GDP per capita has a strong and positive association with institutional quality when measured by one bundled indicator, however, individual variables show different intensities. Second, we find a strong and positive association of net foreign direct investment inflows and government stability. The added value of this research lies

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not only in focus on the less researched relationship, i.e., how trade impacts the institutional quality, but dominantly in focus on many institutional variables at once and comparison of their effects. Other empirical studies usually focus on selected variables only, or on selected trade items (natural resources).

Introduction

The difference in quality of institutions plays a significant role in determining a country's institutional comparative advantage in international trade (Levchenko, 2007; Nicolini, 2011; Nunn & Trefler, 2014; Levchenko, 2016; Arshavskiy, 2019; Candau & Gbandi 2019; Kim & Park, 2020). Vast evidence of empirical research suggests that well-functioning institutions are associated with an increase in trade flows (de Groot, 2003; Levchenko, 2007; Álvarez *et al.*, 2018; Yushi & Borojo, 2019; Bah *et al.*, 2021), while low-quality institutions are associated with a degree of insecurity acting as a hidden tax on imports (Anderson & Marcoullier, 2002). Indeed, much less literature focuses on the reverse causality, i.e., how international trade exerts impacts on the quality of domestic institutions (Nunn & Trefler, 2014, p. 265).

This mechanism involves power and politics. International trade generates wealth, and this enriches specific groups of society. The more wealth they accumulate, the more economic power they have. Such power can translate then into political power and affect institutional change (Nunn & Trefler, 2014). Indeed, vast evidence exists from history. The law merchant, developed in Europe in the early 11th century, universally accepted as the foundation of modern commercial law (Berman, 1983), is one of the many. Foreign merchants were often subject to confiscation and other types of harassment, so there was a significant need to implement rules protecting them from local jurisdiction. We can also mention Thailand. The expansion of rice export in the 19th century caused that land became more valuable and land disputes more common. The demand for formal institutions such as registries increased (Islam & Montenegro, 2002).

Unfortunately, it is not necessarily the case that international trade opening results in institutional improvement (Levchenko, 2016). Indeed, vast evidence exists from Africa, which is in the focus of this article. Africa has experienced one of the most malign forms of resource extraction in history: slavery. Nunn and Wantchekon (2011) hypothesize that in such environment of incomplete insecurity, norms of mistrust have evolved and persist until today. Inikori (2002) argues that the specialization in human slaves, indeed, had a negative impact on African domestic institutions as it required insecurity of property rights and disrespect of human rights. Boxell

et al. (2019) argue that the slave trade increased conflict propensities in pre-colonial Africa and that this effect has persisted to the present. As a resource-rich continent, Africa serves today as a key supplier to the global economy. And while research from other regions on how the natural resources trade impacts the domestic institutions suggests that impacts can be positive (Acemoglu & Robinson, 2006; Ploeg, 2007; Osei *et al.*, 2019), in the case of Africa, these impacts are prevailingly negative (Robinson *et al.*, 2006; Sala-i-Martin & Subramanian, 2012; Epo & Faha, 2020).

This brings us to the research question if the continuous openness of the continent to the international trade impacts various aspects of the institutional quality in the same manner, i.e., negatively, or if there are some areas where we can identify positive impacts. This question seems to be the more appealing, considering the rather poor institutional setup in Africa which is believed to negatively impact the international trade and economic development of the region (Iheonu & Chigozie, 2017; Gori *et al.*, 2018; Wandeda *et al.*, 2021). The literature review below shows that research in this area is still rather unexplored.

This article works with a panel of 34 African countries for which the data are available for the period of 1988–2012 (see Table 1). It measures trade openness as a percentage of the sum of exports and imports of gross domestic product (GDP). For measuring the institutional quality, indicators defined by the International Country Risk Group (ICRG) are used (see discussion for selection in methodology). Since there is no one proxy which would represent the quality of institutions, we work with our own institutional quality indicator (IQI) produced by summing up twelve ICRG indicators used for political risk analysis (ICRG, 2022, p. 9). Since the interest is to differentiate the impact of international trade on various institutions, these twelve variables are also tested independently to assess the impact of trade openness on all of them individually. This provides a space for more robustness check. For better understanding, these variables are bundled into three groups — legal and political, security, and economic (see below for details). Furthermore, other potentially explanatory determinants of institutional quality such as development level, foreign investment, education, and natural resources exports are included. The system generalized method of moments (sys-GMM) estimation method is applied to a dynamic panel data model to evaluate the link between trade openness and the quality of domestic institutions.

The article is organized as follows: after a literature review on the effects of trade openness on the quality of institutions, and in Africa in particular, we introduce and discuss our econometric model, data, variables, and methods applied. In the last section, we present and discuss our results.

Literature review

Identification of determinants of institutional quality matters. It is crucial for the implementation of policies that aim at building better institutions and by doing this, have an impact on development. However, the evidence is still rather scarce. And there are reasons for it, mainly due to significant research limits: i) the concept of institutions itself and indicators measuring their quality, ii) a problem stemming from other independent variables, iii) collinearity among the potentially explanatory variables that prevent from considering them as independent, iv) the possibly omitted variables that can bias the results (Alonso & Garcimartín, 2013). Despite the difficulties, several studies have been carried out (Chong, 2001; Islam & Montenegro, 2002; Rodrik *et al.*, 2004; Alonso & Garcimartín, 2013; Levchenko, 2016; Álvarez *et al.*, 2018; Reale, 2019 etc.) which identified trade openness as one of the main determinants of institutional quality. We review here literature investigating the impacts of trade openness on various institutions, namely on legal and political, security and economic institutions. We pay special attention to Africa.

Literature review shows that trade openness may bring both positive and negative impacts on the institutional quality of legal and political institutions. For example, Usman (2011) confirms a direct, causal, positive, and significant relationship between trade openness and institutional quality, meaning that countries that open much to trade will eventually have better institutions. Usman concludes that one standard deviation increase in the log of trade to GDP ratio will improve the civil liberties index by 0.21 points, being quite substantial. López-Córdova and Meissner (2006) conclude that in the long-run there is a positive relationship between trade openness and *democracy*, however, with some regional discrepancies, like in Africa — a region of our focus — and the Middle East. They interpret this by saying that openness raises competition in the recruitment of executives, more open participation in choosing the executive, and more checks and balances against an executive.

Rigobon and Rodrik (2004) find more ambivalent results. According to them, trade openness is good for the *rule of law* but bad for *democracy*. Their estimated negative impact of trade on democracy is very significant, while their estimated positive impact on the rule of law is rather weak. For comparison, Frensch *et al.* (2021) confirm the positive effect on rule of law, too, but they argue that mostly specialization on institutionally intensive exports help countries to improve it. Additionally, Rigobon and Rodrik (2004) estimate that trade openness contributes very little to the determination of institutions (less than 10 percent). More recent research carried out

by Yang (2020) rather confirms this result, arguing that trade seems to be mostly ineffective in raising the quality of most aspects of the rule of law. Hochman *et al.* (2013) go even further when arguing that international trade leads to *weaker political institutions*. According to them, trade openness leads to more cronyism as the government attempts to lower the heightened tax burden on the politically connected companies.

Another area where research on the impacts of trade leads to ambivalent results is corruption. In general, it has been recognized that trade licensing is associated with costs, including the costs of competing for licenses, which opens space for informal competition such as corruption, bribery, smuggling, or black markets (Krueger, 1974). The concept of the so-called rent-seeking has been further explored in the literature and identified as one of the transmission channels between trade and corruption (Krueger, 1974; Kopperschmidt & Matutes, 1997; Gatti, 2004). Empirical evidence suggests that trade protectionism leads to increased corruption (Dutt, 2009) and trade openness leads, on the contrary, to a decrease in corruption (Suzuki & Gokcekus, 2013). However, the results are not fully convincing. Majeed (2014) argues that it is not just trade openness that reduces corruption, but there are complementary policy reforms that cause a decline in corruption. Only the combined effect of trade openness and high bureaucracy quality reduces corruption. Suzuki and Gokcekus (2013) investigate the effect of African trade with the EU on corruption in Africa. They assume that the asymmetric relationship between both partners (EU is more important for Africa than Africa is for the EU) will give the EU power to “convince” African countries to adopt better government practices. Their research shows that an increase in African trade with the EU reduced the level of corruption in Africa, however, not always the intensity of exports to the EU.

Their result brings us to another, for Africa a highly essential topic, and that is the impact of natural resources trade (dominant in African exports) on the quality of domestic institutions. The theory suggests that a natural resources boom may lead to both positive and negative impacts on domestic institutions (Acemoglu & Robinson, 2006; Ploeg, 2007; Epo & Faha, 2020). Empirical studies from Africa, unfortunately, show mostly negative impacts. For example, a study on Nigeria, one of Africa’s most wealthy countries in terms of natural resources, shows that natural resources have a negative impact on growth via their deleterious impact on institutional quality (Sala-i-Martin & Subramanian, 2012). This impact is especially strong for resources with concentrated production and thus massive rents such as fuels and minerals. The impact is non-linear, which means that the negative marginal impact on institutional quality depends on and increases

with their level. Robinson, Torvik and Verdier (2006) use copper dependent Zambia during the rule of President Kenneth Kaunda. They propose a model explaining how resource rents lower the quality of institutions. They explain this by inefficient redistribution by employing people in the public sector to influence the outcomes of elections.

Trade openness may also have both positive and negative impacts on domestic security, namely on conflicts. Bhattacharya and Thomakos (2007) argue that opening of Latin American economies to international trade from the mid-1980s induced a significant drop in domestic conflicts. However, they argue that over-reliance on primary commodity exports may enhance domestic conflicts, as happened in Africa. Garfinkel *et al.* (2008) find a reason for it. They distinguish between natural resources exporters and importers. For natural resources importers, opening to trade brings regular benefits of trade and reductions in conflict, but for natural resources exporters, trade can induce increased costs which would offset the trade gains.

Martin *et al.* (2008) support the argument that, in some cases, trade can even encourage conflicts. They argue that when war occurs, the probability of escalation is lower for countries that trade more bilaterally because of the opportunity cost associated with the loss of trade gains. However, countries that are more globally open have a higher probability of war escalation because multilateral trade openness decreases bilateral dependence to any country and the cost of a bilateral conflict.

Cali (2015) provides another explanation for the ambivalent results of trade openness impact on conflicts. Trade encourages the reallocation of resources. If they are allocated to more efficient activities, new opportunities, and jobs open. However, the change in relative prices because of trade may also destroy these opportunities in declining sectors, and people affected by this may turn into violence. According to Cali, these changes in real income are more important in fragile states having trade flows much larger than aid, remittance, or foreign investment. Interestingly, Cali also finds evidence for the so-called rapacity effect — the idea that valuable resources can provide incentives to fight over their control. An increase in the value of export of oil and minerals raises the risk of conflict by 2.2 percent across countries. These results are also consistent with another research from Africa (Maystadt *et al.*, 2014; Berman & Couttenier, 2014; Kamel, 2016; Boxel *et al.*, 2019).

Empirical evidence shows that trade openness may bring positive impacts on the socioeconomic conditions, however, it may also be ‘socially malign’ on several dimensions, such as poverty, and this especially among unskilled labor (Bhagwati & Srinivasan, 2002; Fauzel, 2019). Worsening socioeconomic conditions may then reflect in the quality of institutions as

they may fuel any potential conflicts or social unrest, or constraint government action. As Topalova (2007) identifies, trade may reduce real wages even in a labor-abundant country, and thereby widen the gap between the rich and poor. This research was done in rural Indian districts where industries exposed to liberalization were located. Based on the findings, impacts on poverty were substantial. Castilho *et al.* (2012) carried out research across Brazilian states and confirmed that trade openness contributes to poverty and inequality in urban areas, but may be linked to reductions in inequality in rural areas. Consequently, Lee (2014) confirms that globalization increases income inequality and poverty in general, but also shows thresholds effects associated with the level of education and growth.

Trade opening also affects the domestic business environment. The mechanism is clear. If traders can trust the local property rights or contract enforcement, transaction costs are reduced. This promotes new businesses, creates well-functioning markets, and contributes to higher efficiency (Borrmann *et al.*, 2006). Following the same logic, Rodrik *et al.* (2004) argue that property rights contracts and the rule of law are the most prominent institutions, which may influence the decision of investors to trade with a particular country. However, empirical research suggests that despite a rapid decline in trade costs, there has been no dramatic improvement in the security of contracts (Anderson, 2008). Anderson argues that contract enforcement is probable, but the probability depends on conditions. Cultures with high elasticity of supply tend to yield benefits of trade globalization to contract enforcement, but other cultures such as in Africa unfortunately do not.

Research methods

To analyze the effect of trade openness on institutional quality in Africa, we follow the methodology of similar studies (see, for instance, Asongu & Nwachukwu, 2016) and adapt the following dynamic panel data model:

$$INST_{it} = \alpha INST_{it-1} + \gamma Trade_{it} + X_{it} \beta + \mu_i + \varepsilon_{it} \quad (1)$$

where $INST_{it}$ is the institutional quality indicator, $INST_{it-1}$ is the one-year lag value of the institutional quality indicator. $Trade_{it}$ is the sum of exports and imports as a percentage of gross domestic product (GDP). X_{it} is the set of control variables.

Control variables

We work with four control variables: development level, foreign investment, education, and natural resources, and two dummies: geographical and legal. All of them have been selected based on a large body of literature identifying them as explanatory variables of institutional quality: development level (Islam & Montenegro, 2002), foreign investment (Gani, 2007; Nihal *et al.*, 2019), education (Alonso & Garcimartín, 2013); natural resources (Acemoglu & Robinson, 2006; Ploeg, 2007; Epo & Faha, 2020). We measure the development level by both static and dynamic variables (real GDP per capita and real GDP per capita growth), foreign investment as a net foreign direct investment (FDI) inflow, education by the enrolment rate for secondary education and natural resources exports are measured as a share of natural resources exports in goods trade. We include a set of geographical (landlocked, Sub-Saharan Africa) and legal colonial heritage (French, English) dummies to test any potential associations.

Institutional Quality Indicator (IQI)

Institutions are considered latent factors within the socio-economic system and therefore, it is hard to find one proxy which would suitably represent the quality of the institutional environment (Kunčič, 2014). Moreover, there is no consensus among scholars on which indicators of institutional quality to use (see, for instance, Alonso & Garcimartín, 2013, for more details). In addition, to make the use of variables more complicated, ideally, institutional quality indicators should be measured by objective variables comparable across countries and in time. However, such measures do not exist (Usman, 2011). Bearing in mind all these limits, we have chosen the variables of institutional quality defined by ICRG. They are collected and based on opinion polls and thus measure the perceived quality of institutions. We believe that for a panel data analysis, these indicators are more suitable than others such as World Governance Indicators. Our IQI is produced then by summing up twelve ICRG individual institutional quality indicators (ICRG, 2022, p. 9). Based on their nature, we bundle them into three groups — legal and political (law and order, government stability, democratic accountability, bureaucracy quality, corruption), security (internal conflict, external conflict, military in politics, ethnic tensions, religious tensions), and economic (socioeconomic conditions, investment profile).

Data

The model described above is estimated using a panel data of 34 African countries for the period 1988 to 2012. The selection of country and period is solely based on the availability of data. Data on trade openness, FDI inflow, real GDP per capita growth rate, GDP per capita, and natural resources exports are obtained from the World Development Indicators databank (WDI, 2020). Gross secondary school enrolment rate is obtained from the UNESCO Institute of Statistics (UIS, 2020). Data on institutional quality are obtained from ICRG (2020).

Estimation methods

We apply the system generalized method of moments (sys-GMM) estimation method to a dynamic panel data model to estimate the model described in equation (1). This choice of methodology is partly because some of the determinants of institutional quality, namely FDI inflows and GDP per capita growth, are expected to be endogenous and finding external instruments for them has been difficult. Panel data studies involving endogenous explanatory variables have increasingly been using the first difference generalized method of moments (diff-GMM) developed by Arellano and Bond (1991) which uses internal instruments generated from the lagged values of the variables to deal with endogeneity issues. These GMM estimates enable us to use endogenous variables, autocorrelation, heteroskedasticity, and unobserved fixed effects (Roodman, 2009). Bond *et al.* (2001) found that in the presence of time series, the first difference GMM (diff-GMM) performs poorly and provides weak instruments. The system-generalized method of moments (sys-GMM) uses additional instruments and provides efficient estimates (Blundell & Bond, 1998). All the models are estimated with Arellano-Bond type instruments of twice lagged level of the dependent variable, GDP growth per capita, FDI inflow and other explanatory variables.

Therefore, as inspired by similar studies (see, for instance, Bengoa & Sanchez-Robles, 2003; Gui-Diby, 2014; Feeny *et al.*, 2014; Adams & Opoku, 2015), this article adopts system GMM to estimate equation (1). We use STATA (version 14.0) XTABOND2 command developed by Roodman (2009) for estimation of system GMM regression. We perform the Hansen test of overidentifying restrictions to test for validity of the instruments and the results are provided in the tables for each regression. Similarly, for each regression, we perform the Arellano-Bond test of order two AR (2) to test for serial correlation. For robustness check, we estimate

8 different specifications of the combined institutional quality indicator (IQI) and 4 different model specifications for each of the institutional quality indicators. We estimate all the models with fixed effect techniques.

Results and discussion

In this section, we present and discuss our results. First, we present descriptive statistics of our variables (see Table 2 for details). Second, we present our impact estimations of trade openness on institutional quality measured by our IQI. And third, we present results of our impact estimations of trade openness on individual institutional quality variables bundled into three groups: legal and political, security, and economic.

Impact estimations of trade on institutional quality indicator (IQI)

Table 3 presents results of 8 different model specifications with the aggregate institutional quality indicator (IQI) as a dependent variable. In all models, trade openness is found to be a positive and significant determinant of institutional quality, although rather weak. The size of the coefficient is quite consistent across all specifications. The coefficients of control variables, such as GDP per capita and GDP per capita growth, are found to be positive and significant, log GDP per capita being very high. Net FDI inflows are also found to be positive, but two models do not show significant results. This indicates that when unbundled, results might be mixed. Enrolment shows a rather weak but positive impact on institutional quality, too, however, insignificant. Only natural resources exports are found to have a negative and significant impact on institutional quality. The size of coefficients is very consistent across all specifications.

The positive but rather weak impact of trade openness on institutional quality correlates with empirical research by Rigobon and Rodrik (2004), Usman (2011), or Frensch *et al.* (2021), although Rigobon and Rodrik (2014) estimate that trade openness is good for the *rule of law* but bad for *democracy*. We investigate this in the next section. The very strong association of GDP per capita was also anticipated as other empirical research suggests this (Islam & Montenegro, 2002; Alonso & Garcimartín, 2013). Similarly, for natural resources exports where the impact is found negative and consistent across all the models. This result affirms the idea of natural resource curse taking place in Africa through the channel worsening of institutional quality (see, for instance, Acemoglu & Robinson, 2006; Sala-i-Martin & Subramanian, 2012; Mulwa & Mariara, 2016; Kwakwa *et al.*,

2021; Mlambo & Borz, 2022). What came out as a rather interesting result is the case of FDI inflows which indicate that their impact on institutional quality is positive on one side, however, when measured by different variables, this might not be the same in all cases. We further explore this in the next section.

Impact estimations of trade on legal and political institutions

Now, we look in more detail at the impact of trade openness on legal and political institutions, or five indicators of institutional quality individually — government stability, bureaucracy, corruption, democratic accountability, and law and order. For each institutional quality indicator, we estimate 4 different model specifications. The results are presented in Table 4–5.

The coefficients of trade openness are positive and rather significant in the case of government stability, corruption and law and order, and positive but insignificant in case of bureaucracy and democratic accountability. However, in all cases, the sizes are very low. For control variables, the most interesting result is in case of the FDI inflows, where the impact is found statistically significant and strong in the case of government stability, and rather weak but still significant in the case of democratic accountability and law and order. In the case of bureaucracy, the impact is negative (and weak), in the case of corruption, the impact is also negative, however, insignificant. For other variables, the coefficient of GDP per capita growth shows, interestingly, a positive and significant impact in case of all variables, but the impact is rather weak. The coefficient of GDP per capita shows a strong, positive, and significant impact on law and order. For the rest, the results are also found positive; however, they do not show the same level of significance. Education shows a positive impact, however, not significant in all cases, and rather weak. Natural resources exports show a negative and, in most models, also significant impact on all variables, but compared to bundled IGI, the relationship is weaker.

For English dummies, the most interesting result is a strong and negative impact on government stability and a strong, but positive impact on bureaucracy. Interestingly, the French dummy shows reversed results on government stability. In other cases, results do not show any significance. The results on differences between the French and British legal systems correspond with findings by Alonso and Garcimartín (2013), arguing that the French system was designed to determine the ability of the state to organize social and economic life, i.e., for government stability. For the landlocked dummy, there is a positive and rather significant association with

law and order only. For Sub-Saharan dummy, the association with law and order is negative with results of the same level of significance. But interestingly, there is also a rather strong, positive, and significant association with democratic accountability and bureaucracy and rather significant, but negative, association with government stability. We can interpret this by claiming that in the case of bureaucracy and democratic accountability, the strongest positive impact brings being in Sub-Saharan Africa and not land-locked.

Our results regarding the impact of trade openness on legal and political institutions correspond with the findings by Chan (2002), Suzuki and Gokcekus (2013), or Frensch *et al.* (2021). Regarding the democratic accountability, our results indicate positive, however insignificant, impact. The existing literature presents rather a mixed picture. While López-Córdova and Meissner (2016) find trade openness to promote democracy in the long run, even with some regional discrepancies as in the case of Africa, Rigobon and Rodrik (2004) find trade openness to have a negative effect on democracy. Hochman *et al.* (2013) conclude that trade openness leads to weaker political institutions. These mixed results are expected, though, as circumstantial evidence suggests that while many open economies in South-East Asia (e.g., South Korea, or Taiwan) have become less authoritarian, in other countries (e.g. China, Singapore, Vietnam) there is hardly any proof of such evidence.

Impact estimations of trade on security institutions

Now, we estimate the impact of trade openness on security institutions, or five indicators of institutional quality respectively, such as internal conflicts, external conflicts, military in politics, religious, and ethnic tensions. The results are presented in table 6–7.

Our results suggest a positive and significant impact of trade openness on all indicators of security institutions, albeit weak. Surprisingly, for the control variable of GDP per capita, having strong, positive, and significant impact on the institutional quality as indicated by our IQI, a strong positive and significant impact is found in the military in politics only (meaning that the risk of military in politics is lowered). GDP per capita growth shows a positive and significant impact on internal and external conflict and ethnic tensions. Net FDI inflows show a positive and significant impact in internal conflict and ethnic tensions only, but rather weak. Enrolment rate shows a positive impact in all cases, however not significant. Natural resources exports show, on the contrary, a negative and significant impact in all cas-

es, with the exemption of external conflict, where the results are insignificant.

For the French dummy, the association is negative and significant only in the case of military in politics. The same applies for the English dummy, but the result is positive. This indicates again how different impact the British and French legal systems had left on institutions in Africa. Landlocked dummy coefficient shows a strong, positive, and significant impact for internal conflict, military in politics and ethnic tensions. Likewise, Sub-Saharan dummy for internal conflict, military in politics and religious (not ethnic as in case of landlocked) tensions. We can interpret this that being landlocked in Sub-Saharan Africa has the strongest association with positive impacts on internal conflicts and military in politics.

Our main results correspond with the literature suggesting rather positive conflict-mitigating effects of trade openness. Although we estimate a rather very weak impact, which in some specific cases (Kamel, 2016) has been even found as negative. Martin *et al.* (2008) argue that bilateral trade creates trade gain and increases the opportunity cost of trade conflicts thus reducing the risk of external conflict. Cali (2015) estimates that trade openness reduces ethnic and religious tensions. Similarly, Bhattacharya and Thomakos (2007) find that trade openness reduces both the chances and intensity of internal conflict. They argue though that over-reliance in some primary commodity exporting countries may enhance conflicts. For this reason, Cali (2015) comes with the rapacity effect of natural resources. Our results confirm this.

Impact estimations of trade on economic institutions

And last, we present and discuss our estimations of the impact of trade openness on economic institutions, or two indicators of institutional quality such as socioeconomic conditions and investor profile, respectively. Results are presented in Table 8.

Our results show that trade openness has a positive and rather significant impact on socioeconomic conditions, meaning that trade contributes to their improvement. However, the impact is very weak. Concerning the investor profile, the results show a positive impact, but very weak and insignificant. For the control variables, the strongest, positive, and significant impact on socioeconomic conditions is found in case of GDP per capita. For investor profile, the results are much weaker and less significant. Interestingly, in the case of GDP per capita growth, stronger positive impact is found on investor profile than on socioeconomic conditions. In all cases, the results are significant. In the case of enrolment rate, the impact on in-

vestor profile is stronger again. But in this case, the results of impact on socioeconomic conditions are rather not significant. Interestingly, different results are found also in the case of FDI inflows. Negative and significant impact is found in the case of socioeconomic conditions, while positive and significant in case of investor profile. Natural resources exports show negative and significant impact on both socioeconomic conditions and investor profile. And surprisingly, the sizes of coefficients are very consistent (and low) in both variables. English dummy coefficient is negative and significant in the case of socioeconomic conditions, while the French is positive and significant. Landlocked dummy does not show any significant results, but SSA dummy shows a positive and significant association with investor profile and negative and strong association with socioeconomic conditions.

Our main results indicating a positive and significant impact of trade openness on socioeconomic conditions are in line with the theories suggesting that trade brings gains to countries. However, the relationship is very weak. We also must stress here that our variables are measured as perceived, which means that for example in the case of measuring poverty, being one of the components of socioeconomic conditions, the impact can be diverse as suggested by empirical research (Bhagwati & Srinivasan, 2002; Topalova, 2007; Castilho *et al.*, 2012 etc.). To understand it better, a more detailed analysis would be needed, using other measures. Concerning the impact on the investor profile, our results rather correspond with the research by Anderson (2008), indicating that despite a rapid decline in trade costs induced by increased trade, there has been no dramatic improvement in the security of contracts. Anderson argues that cultures with high elasticity of supply tend to yield benefits of trade globalization to contract enforcement, but other cultures such as in Africa unfortunately do not. However, we cannot fully confirm it, since our results do not show to be significant.

Robustness test

Having discussed the results based on system-GMM estimation technique, we test the robustness of our results by estimating the same models and specifications with fixed effect estimation technique. The results show that the trade openness variable has consistently been a significant and positive determinant of institutional quality. The coefficient of the trade openness, however, varies slightly from our sys-GMM results (see Table 9). The rest of the results largely present a similar picture.

Conclusions

In this article, we were interested to know to what extent the continuous opening of Africa to international trade has brought an improvement in domestic institutions. Despite all the research limits, such as chosen indicators of institutional quality (based on opinion polls and thus measuring the perceived quality of institutions), noisiness in data on African countries, symmetric causality between trade openness and institutional quality, or possible collinearity among control variables which both may bias our results, our main conclusion is that trade openness is a positive and significant determinant of institutional quality in Africa, although we estimate a weak impact. When unbundling our institutional quality indicator, our results indicate a positive and rather significant impact of trade openness on government stability, corruption, law and order, all variables of security institutions, such as conflicts or religious tensions, and both variables socioeconomic conditions. However, the size of the coefficients differs.

GDP per capita, GDP per capita growth and net FDI inflows are significant and positive determinants of the institutional quality in Africa, too, GDP per capita being the strongest. GDP per capita has strong, positive, and significant associations with low risk of military in politics, internal conflict, and ethnic tensions. FDI inflows have a strong and positive association with government stability and a weak, but still positive and statistically significant, association with democratic accountability and law and order. Interestingly, the association of FDI inflows and bureaucracy and socioeconomic conditions is negative. Natural resources exports are found to be the only negative determinant of institutional quality in Africa. Unlike the above mentioned variables, when unbundled, this variable shows a significant and negative impact in all cases, even though in some of them (external conflict) the results were not significant. This affirms the idea that the natural resource curse takes place through the channel worsening of institutional quality in Africa. Our research does not confirm significant results for enrolment rate though.

We believe that our research can have some policy implications. Less developed countries such as in Africa very often rely on trade, but lack research of its implications for domestic actors, or institutions. From this perspective, we find the mixed results of impacts of trade and FDI inflows on various variables as an interesting field for policy mainly because these two (trade and investment) are usually correlated but they seem to have various impacts. Nevertheless, their positive and strong impact on government stability, as indicated by our research, can be something to build on better policies. We encourage further research to focus on various trade

items (e.g. the rapidly growing services sector) and analysis of their, hopefully more positive, impacts.

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Annex

Table 1. List of countries

Algeria	Gabon	Mali	Sudan
Angola	Ghana	Morocco	Tanzania
Botswana	Guinea	Mozambique	Togo
Burkina Faso	Guinea-Bissau	Namibia	Tunisia
Cameroon	Kenya	Niger	Uganda
Congo	Liberia	Nigeria	Zambia
Ivory Coast	Libya	Senegal	Zimbabwe
Egypt, Arab Rep.	Madagascar	Sierra Leone	
Ethiopia	Malawi	South Africa	

Table 2. Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
<i>Dependent variables</i>					
Trade openness	747	64.137	25.59	10.831	178.982
<i>Control variables</i>					
Net FDI Inflow	747	2.682	6.07	-8.589	91.007
GDP PC growth	747	1.428	4.951	-33.746	29.393
GDP PC	738	1096.434	1454.474	101.338	7865.254
Natural Resources	711	35.362	33.392	0	99.7
Exports					
Enrolment rate	732	36.363	24.428	4.797	111.181
<i>Institutional Quality Indicators</i>					
IQI	747	56.617	10.942	14.24	80.88
Socioeconomic conditions	747	4.263	1.565	.5	8
Bureaucracy quality	747	1.466	.882	0	4
Corruption	747	2.495	.969	0	5
Democratic accountability	747	2.963	1.182	0	5.5
Ethnic tension	747	3.355	1.206	0	6
External conflict	747	9.398	1.94	3	12
Government stability	747	7.907	2.237	1	11.58
Internal conflict	747	8.037	2.269	.25	12
Investor profile	747	6.732	2.041	0	11.5
Law and order	747	3.084	1.121	0	6
Military in politics	747	2.79	1.586	0	6
Religious tension	747	4.128	1.41	0	6

Table 3. Dependent variable: institutional quality indicator (IQI) — Sys-GMM Estimates

	model 1	model 2	model 3	model 4	model 5	model 6	model 7	model 8
GDP PC Growth	0.144*** (0.043)	0.139*** (0.042)	0.140*** (0.040)	0.092** (0.042)	0.110*** (0.040)	0.116*** (0.042)	0.100** (0.043)	0.143*** (0.039)
Trade Openness	0.168*** (0.042)	0.114*** (0.026)	0.110*** (0.024)	0.136*** (0.028)	0.139*** (0.028)	0.138*** (0.029)	0.134*** (0.026)	0.096*** (0.021)
FDI Inflow		0.056 (0.074)	0.028 (0.061)	0.432*** (0.098)	0.486*** (0.096)	0.490*** (0.107)	0.393*** (0.096)	0.421*** (0.094)
Ln (GDP PC)	3.200*** (0.998)	3.606*** (0.926)	2.229** (1.131)	3.549*** (1.018)	3.670*** (1.022)	3.235*** (1.092)	4.488*** (1.091)	3.504*** (1.078)
Enrolment rate			0.075 (0.051)	0.054 (0.039)	0.049 (0.039)	0.054 (0.043)	0.043 (0.040)	0.097** (0.044)
NR Exports				-0.131*** (0.015)	-0.128*** (0.015)	-0.129*** (0.016)	-0.132*** (0.015)	-0.124*** (0.018)
English dummy					-0.823 (1.188)			
French dummy						1.068 (1.152)		
Landlocked dummy							3.206* (1.878)	
SSA dummy								5.128 (3.442)
Constant	25.638*** (5.840)	26.667*** (5.677)	33.058*** (6.087)	27.223*** (5.831)	26.313*** (5.747)	28.757*** (5.752)	20.851*** (6.715)	24.231*** (7.608)
No. of Observations	701	701	693	659	659	659	659	659
No. of Countries	33	33	33	31	31	31	31	31
No. of Instruments	10	12	15	18	20	20	20	20
AB AR(2) p-value	0.821	0.509	0.509	0.648	0.634	0.630	0.550	0.388
Hansen test p-value	0.152	0.0909	0.216	0.303	0.273	0.178	0.277	0.135

Note: Standard errors in parentheses. All the regression models are estimated with the system generalized method of moments (SYS-GMM) with panel specific homocedasticity and autocorrelation-consistent robust standard errors. All the variables are used in levels except ln (GDP PC) which is a natural logarithm of GDP PC. The A-B AR (2) test has a null hypothesis of no second-order serial correlation in the residuals, while the Hansen test has the null hypothesis of joint exogeneity of the instruments set. Rejecting the null hypothesis of both tests provides support for the consistency of models. *** p<0.01, ** p<0.05, * p<0.1.

Table 4. Dependent variables: government stability and bureaucracy — Sys-GMM Estimates

VARIABLES	Bureaucracy				Government Stability			
	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4
GDP PC Growth	0.005** (0.002)	0.007*** (0.002)	0.004** (0.002)	0.004** (0.002)	0.057*** (0.012)	0.056*** (0.013)	0.052*** (0.013)	0.046*** (0.013)
Trade Openness	0.002 (0.002)	0.001 (0.002)	0.000 (0.002)	0.001 (0.002)	0.008** (0.004)	0.008** (0.003)	0.009*** (0.003)	0.011*** (0.004)
FDI Inflow	-0.045*** (0.014)	-0.029** (0.012)	-0.035*** (0.013)	-0.034*** (0.013)	0.182*** (0.027)	0.188*** (0.027)	0.176*** (0.026)	0.175*** (0.026)
Ln (GDP PC)	0.444*** (0.114)	0.358*** (0.135)	0.246* (0.132)	0.318*** (0.128)	0.305* (0.173)	0.224 (0.186)	0.303* (0.159)	0.347** (0.159)
Enrolment rate	0.007* (0.004)	0.003 (0.006)	0.003 (0.005)	0.007 (0.006)	0.017** (0.008)	0.020** (0.009)	0.013* (0.007)	0.007 (0.008)
NR Exports	-0.003** (0.002)	-0.004*** (0.002)	-0.003** (0.002)	-0.003* (0.002)	-0.008*** (0.003)	-0.007*** (0.003)	-0.007** (0.004)	-0.008** (0.003)
English dummy	0.528*** (0.159)				-0.445* (0.243)			
French dummy		-0.229 (0.140)				0.568*** (0.194)		
Landlocked dummy			-0.171 (0.160)				-0.216 (0.249)	
SSA dummy				0.414** (0.162)				-0.632** (0.280)
Constant	1.203** (0.593)	0.403 (0.653)	0.004 (0.710)	0.898 (0.609)	4.748*** (0.732)	4.643*** (0.737)	4.696*** (0.682)	4.972*** (0.670)
No. of Observations	659	659	659	659	659	659	659	659
No. of Countries	31	31	31	31	31	31	31	31
No. of Instruments	20	20	20	20	20	20	20	20
AB AR(2) p-value	0.421	0.520	0.475	0.528	0.220	0.237	0.238	0.251
Hansen test p-value	0.104	0.103	0.513	0.477	0.183	0.1328	0.1360	0.125

Note: Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1.

Table 5. Dependent variables: corruption, democratic accountability and law and order — Sys-GMM Estimates

	Corruption				Democratic Accountability				Law and Order			
	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4
GDP PC	0.010***	0.010***	0.011***	0.010***	0.007*	0.007**	0.007**	0.010***	0.017***	0.018***	0.018***	0.015***
Growth	(0.003)	(0.003)	(0.004)	(0.004)	(0.003)	(0.003)	(0.004)	(0.004)	(0.005)	(0.005)	(0.005)	(0.005)
Trade Openness	0.002**	0.003**	0.003*	0.003**	0.002	0.002	0.003	0.003	0.004**	0.004*	0.003**	0.007***
	(0.002)	(0.003)	(0.003)	(0.002)	(0.003)	(0.003)	(0.003)	(0.003)	(0.002)	(0.002)	(0.001)	(0.002)
FDI Inflow	-0.006	-0.009	-0.005	-0.004	0.045***	0.047**	0.046***	0.051***	0.044***	0.034**	0.041***	0.035**
	(0.010)	(0.009)	(0.009)	(0.009)	(0.010)	(0.011)	(0.011)	(0.012)	(0.015)	(0.015)	(0.013)	(0.014)
In(GDP PC)	0.244	0.284*	0.194	0.240	0.156	0.068	0.114	0.192*	0.542***	0.478***	0.493***	0.510***
	(0.166)	(0.166)	(0.168)	(0.164)	(0.133)	(0.150)	(0.122)	(0.114)	(0.157)	(0.152)	(0.140)	(0.135)
Enrolment rate	0.009*	0.010*	0.008	0.010*	0.008	0.012*	0.010	0.014**	0.009	0.008	0.007	0.011*
	(0.005)	(0.005)	(0.005)	(0.005)	(0.007)	(0.007)	(0.007)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
NR Exports	-0.004**	-0.004*	-0.004*	-0.004**	-0.005**	-0.005**	-0.005**	-0.003**	-0.009***	-0.010***	-0.007***	-0.011***
	(0.002)	(0.002)	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
English dummy	0.036				0.083				0.122			
	(0.196)				(0.193)				(0.190)			
French dummy	-0.182				0.162							
	(0.168)				(0.250)							
Landlocked			-0.114									
			(0.218)									
SSA dummy				-0.167								
				(0.244)								
Constant	1.536*	1.487*	1.929**	1.823**	1.612**	2.033***	1.972***	1.310***	0.128	0.458	0.018	-0.498*
	(0.867)	(0.798)	(0.909)	(0.942)	(0.691)	(0.684)	(0.717)	(0.321)	(0.820)	(0.728)	(0.708)	(0.264)
No. of Obs.	659	659	659	659	659	659	659	659	659	659	659	659
No. of Countries	31	31	31	31	31	31	31	31	31	31	31	31
No. of Instrument	20	20	20	20	20	20	20	20	20	20	20	20
AB AR(2) p-value	0.404	0.379	0.396	0.397	0.0663	0.163	0.162	0.158	0.916	0.836	0.997	0.810
Hansen test p-value	0.184	0.228	0.153	0.174	0.401	0.462	0.432	0.382	0.195	0.273	0.168	0.172

Note: Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1.

Table 6. Dependent variables: internal conflict and external conflict — Sys-GMM Estimates

VARIABLES	Internal Conflict				External Conflict			
	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4
GDP PC Growth	0.036*** (0.007)	0.036*** (0.008)	0.032*** (0.008)	0.041*** (0.008)	0.014** (0.007)	0.016** (0.007)	0.013** (0.007)	0.015** (0.007)
Trade Openness	0.042*** (0.006)	0.042*** (0.006)	0.036*** (0.005)	0.037*** (0.004)	0.027*** (0.004)	0.024*** (0.004)	0.024*** (0.004)	0.026*** (0.004)
FDI Inflow	0.038** (0.016)	0.045*** (0.016)	0.029* (0.016)	0.047*** (0.017)	0.027 (0.023)	0.032 (0.026)	0.029 (0.025)	0.029 (0.023)
ln(GDP PC)	0.380** (0.155)	0.323 (0.199)	0.667*** (0.132)	0.543*** (0.156)	0.080 (0.186)	-0.108 (0.213)	-0.110 (0.159)	-0.065 (0.145)
Enrolment rate	0.008 (0.006)	0.006 (0.008)	0.000 (0.006)	0.010 (0.007)	0.007 (0.007)	0.015** (0.008)	0.012* (0.006)	0.014** (0.006)
NR Exports	-0.015*** (0.004)	-0.014*** (0.004)	-0.018*** (0.004)	-0.015*** (0.005)	-0.002 (0.003)	-0.002 (0.003)	-0.001 (0.003)	-0.001 (0.003)
English dummy	-0.244 (0.258)				0.353 (0.277)			
French dummy		0.335 (0.259)				0.147 (0.256)		
Landlocked dummy			0.777** (0.336)				-0.289 (0.311)	
SSA dummy				0.909** (0.401)				-0.037 (0.224)
Constant	3.213*** (0.724)	3.339*** (0.697)	1.852** (0.753)	1.581** (0.684)	6.970*** (1.206)	8.140*** (1.080)	8.411*** (0.982)	7.846*** (0.929)
No. of Observations	659	659	659	659	659	659	659	659
No. of Countries	31	31	31	31	31	31	31	31
No. of Instruments	20	20	20	20	20	20	20	20
AB AR(2) p-value	0.134	0.147	0.125	0.0835	0.177	0.174	0.187	0.172
Hansen test p-value	0.301	0.411	0.253	0.331	0.220	0.206	0.159	0.217

Note: Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1.

Table 7. Dependent variables: military in politics, religious and ethnic tensions — Sys-GMM Estimates

VARIABLES	Military in Politics			Religious Tensions			Ethnic Tensions					
	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4
GDP PC	0.009** (0.005)	0.012*** (0.004)	0.009*** (0.004)	0.004 (0.003)	0.010*** (0.004)	0.007 (0.005)	0.006 (0.006)	0.002 (0.004)	0.011*** (0.004)	0.010** (0.004)	0.010*** (0.004)	0.010*** (0.004)
Growth	0.012*** (0.003)	0.012*** (0.003)	0.010*** (0.003)	0.005 (0.003)	0.026*** (0.004)	0.025*** (0.003)	0.024*** (0.004)	0.020*** (0.003)	0.005* (0.004)	0.007** (0.005)	0.007* (0.003)	0.008** (0.004)
Trade	0.013 (0.010)	0.009 (0.009)	0.026** (0.012)	0.031** (0.013)	0.000 (0.008)	-0.004 (0.007)	0.008 (0.008)	0.008 (0.007)	0.022*** (0.007)	0.023*** (0.007)	0.025*** (0.008)	0.023*** (0.007)
Openness	1.154*** (0.190)	1.116*** (0.198)	1.125*** (0.193)	1.268*** (0.263)	-0.284 (0.208)	-0.118 (0.210)	-0.242 (0.208)	-0.184 (0.174)	0.329*** (0.104)	0.281** (0.139)	0.534*** (0.155)	0.292** (0.124)
FDI Inflow	0.025*** (0.007)	0.026*** (0.007)	0.014* (0.007)	0.013 (0.008)	0.011 (0.009)	0.003 (0.009)	0.009 (0.008)	0.018*** (0.006)	0.003 (0.004)	0.003 (0.004)	0.003 (0.004)	0.000 (0.004)
Ln (GDP PC)	-0.014*** (0.002)	-0.016*** (0.002)	-0.016*** (0.002)	-0.015*** (0.003)	-0.011*** (0.003)	-0.012*** (0.002)	-0.012*** (0.003)	-0.010*** (0.003)	-0.011*** (0.002)	-0.010*** (0.002)	-0.010*** (0.002)	-0.011*** (0.002)
Enrolment rate	1.103*** (0.264)	-0.876*** (0.264)		-0.311 (0.293)	-0.343 (0.257)				-0.046 (0.232)	0.085 (0.216)		
NR Exports			0.742** (0.366)				0.025 (0.313)				1.064*** (0.260)	
English dummy												
French dummy												
Landlocked												
SSA dummy				1.289*** (0.409)				1.381*** (0.383)				
Constant	4.219*** (1.026)	3.012*** (1.119)	4.121*** (1.038)	5.557*** (1.491)	4.416*** (0.989)	3.872*** (1.019)	4.331*** (1.037)	2.656*** (1.013)	1.125* (0.595)	1.298* (0.718)	0.620 (0.903)	1.718* (0.996)
No. of Obs.	659	659	659	659	659	659	659	659	659	659	659	659
No. of Countries	31	31	31	31	31	31	31	31	31	31	31	31
No. of Instruments	20	20	20	20	20	20	20	20	20	20	20	20
AB AR(2) p-value	0.589	0.582	0.595	0.355	0.951	0.880	0.733	0.404	0.147	0.182	0.162	0.172
Hansen test p-value	0.741	0.735	0.740	0.687	0.172	0.306	0.341	0.315	0.134	0.0710	0.224	0.213

Note: Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 8. Dependent variables: socioeconomic conditions and investor profile — Sys-GMM Estimates

VARIABLES	Socioeconomic conditions				Investor profile			
	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4
GDP PC Growth	0.016*** (0.005)	0.014*** (0.004)	0.018*** (0.005)	0.021*** (0.005)	0.044*** (0.012)	0.045*** (0.012)	0.043*** (0.012)	0.046*** (0.013)
Trade Openness	0.007*** (0.003)	0.005** (0.003)	0.004** (0.003)	0.002* (0.003)	0.005 (0.005)	0.005 (0.005)	0.007 (0.005)	0.003 (0.005)
FDI Inflow	-0.043*** (0.012)	-0.037*** (0.011)	-0.051*** (0.013)	-0.053*** (0.013)	0.149*** (0.024)	0.152*** (0.024)	0.147*** (0.021)	0.147*** (0.021)
ln(GDP PC)	0.944*** (0.178)	0.925*** (0.195)	0.923*** (0.171)	0.938*** (0.165)	0.233** (0.131)	0.223* (0.121)	0.219* (0.130)	0.228 (0.148)
Enrolment rate	0.012* (0.007)	0.012 (0.007)	0.014** (0.007)	0.020*** (0.007)	0.020*** (0.005)	0.022*** (0.005)	0.024*** (0.006)	0.032*** (0.008)
NR Exports	-0.013*** (0.002)	-0.013*** (0.002)	-0.013*** (0.003)	-0.013*** (0.003)	-0.015*** (0.003)	-0.015*** (0.002)	-0.014*** (0.002)	-0.014*** (0.003)
English dummy	-0.457** (0.215)				-0.009 (0.203)			
French dummy		0.443*** (0.172)				0.028 (0.182)		
Landlocked dummy			-0.124 (0.198)				0.325 (0.241)	
SSA dummy				-0.683** (0.313)				0.818** (0.336)
Constant	0.041 (0.872)	0.321 (0.927)	0.024 (0.899)	0.553 (0.847)	4.473*** (0.614)	4.461*** (0.624)	4.162*** (0.619)	3.550*** (0.653)
No. of Observations	659	659	659	659	659	659	659	659
No. of Countries	31	31	31	31	31	31	31	31
No. of Instruments	20	20	20	20	20	20	20	20
AB AR(2) p-value	0.172	0.171	0.165	0.167	0.141	0.143	0.142	0.136
Hansen test p-value	0.168	0.166	0.160	0.161	0.156	0.169	0.182	0.173

Note: Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1.

Table 9. Dependent variables: institutional quality indicator (IQI) — Fixed Effects estimates

VARIABLES	model 1	model 2	model 3	model 4	model 5	model 6	model 7	model 8
GDP PC Growth	0.196*** (0.053)	0.229*** (0.055)	0.245*** (0.055)	0.176*** (0.060)	0.176*** (0.060)	0.176*** (0.060)	0.176*** (0.060)	0.176*** (0.060)
Trade Openness	0.058*** (0.018)	0.042*** (0.019)	0.038** (0.019)	0.044** (0.020)	0.044** (0.020)	0.044** (0.020)	0.044** (0.020)	0.044** (0.020)
FDI Inflow		0.142*** (0.054)	0.139*** (0.054)	0.219*** (0.082)	0.219*** (0.082)	0.219*** (0.082)	0.219*** (0.082)	0.219*** (0.082)
ln(GDP PC)	15.736*** (1.557)	15.204*** (1.564)	13.536*** (1.920)	14.357*** (1.956)	14.357*** (1.956)	14.357*** (1.956)	14.357*** (1.956)	14.357*** (1.956)
Enrollment rat			0.086** (0.041)	0.067 (0.041)	0.067 (0.041)	0.067 (0.041)	0.067 (0.041)	0.067 (0.041)
NR Exports				-0.044* (0.025)	-0.044* (0.025)	-0.044* (0.025)	-0.044* (0.025)	-0.044* (0.025)
Constant	46.992*** (9.753)	42.998*** (9.829)	35.127*** (11.358)	38.836*** (11.506)	38.836*** (11.506)	38.836*** (11.506)	38.836*** (11.506)	38.836*** (11.506)
Observations	738	738	729	693	693	693	693	693
R-squared	0.197	0.205	0.219	0.225	0.225	0.225	0.225	0.225
No of Countries	33	33	33	31	31	31	31	31

Note: Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1.