Intra-African Trade Obstacles: The Role of Business Environment

Bruno Powo Fosso*

April 29, 2008

Abstract

This paper analyzes the relationship between business environment and trade in Africa. The business environment indicators include the number of documents (days) to export and import; number of procedures (days) to starting a business, registering a property, enforcing contract; investor's protection index; ports efficiency; and services infrastructure. We estimate a modified gravity equation, controlling for heterogeneity and shocks. The results suggest that both imports and exports for a country would increase with the improvements of the investor's protection and the reduction of the number of days to starting a business, enforcing a contract and registering a property. But the required number of procedures to starting a business, enforcing a contract, and registering a property would reduce trade. The results also show that the required number of documents (days) to export and import has a negative effect on trade. Ports efficiency and services infrastructure for the exporter and importer countries are positively related to trade.

JEL Classification Codes : F10; F15.

Keywords: Trade, Africa, Regional Integration, Business Environment.

*York University, Glendon Campus, Department of International Studies, 2275 Bayview Ave. Toronto (ON) M4N 3M6, Canada. Tel.: (416) 736-2100 Ext. 88576. E-mail: bpowofosso@glendon.yorku.ca. The author acknowledges financial support from the International Lawyers and Economists Against Poverty (ILEAP).

1 Introduction

The benefits, costs, and risks associated with doing business in a country are function of the country 's political, economic, and legal systems. The political, economic, and legal systems of a country have strong implications for the practice of international business. The political, economic, and legal environment of a country clearly influences the attractiveness of that country as a market and/or investment site (Hill, 2006, p. 78). The business environment can be defined as the nexus of policies, institutions, physical infrastructure, human resources, and geographical features that influence the efficiency with which different firms and industries operate (Eifert et al., 2005).

Despite its improved economic performance in recent years, Africa is still lagging on trade. Africa 's share in world trade has fallen from 4 percent in the 1970s to 2 percent today. Its trade openness has grow more slowly than that of any other major developing region (Gupta and Yang, 2006; World Bank, 2002). The roots of Africa 's poor trade performance are traditionally associated with growth, economic risk, political instability, institutions, customs environment and services infrastructure.

Economic risk in Africa is high, credit is expensive or unavailable, skilled labor is relatively expensive, and domestic markets are very small. These factors present significant problems for manufacturers in Africa (Bistern and Söderbom, 2006).

The cost of political risk is also very high in Africa. As illustration, Fosu (2003) shows that *coups d'état* have an adverse effect on African export growth which is higher than their effect on GDP. Longo and Sekkat (2004) also find that political instability in Africa has a negative effect on trade. Moreover, ineffective judiciary systems and corruption push the cost of doing business in Africa 20-40% above that of other developing regions (World Bank, Doing Business, 2006a)

Rodrik (1998) finds that the trade/GDP ratios of Sub-Saharan Africa countries are comparable to those of countries of similar size and income, and that Africa's marginalization in world trade is mainly due to low income growth. Clarke (2005) finds that African manufacturing enterprises are likely to export in countries with restrictive trade and customs

regulation and poor customs administration.

Longo and Sekkat (2004) examine the possibility of expanding intra-African trade with a gravity model, but also paid attention to obstacles to intra-regional trade. They show that insufficient infrastructures, mismanagement of economic policies and internal political tensions are the main obstacles to trade in African countries. Limao and Venables (2001) also show that poor infrastructure accounts for 40 percent of predicted transport costs for coastal countries and up to 60 percent for landlocked countries. In the case of Sub-Saharan Africa (SSA), Limao and Venables conclude that intra-SSA trade costs are substantially higher and trade volumes substantially lower than those for non-SSA countries.

Eifert et al. (2005) show that high indirect costs (transport, logistics, telecommunications, water, electricity, land and buildings, marketing, accounting, security, and bribes) reduce the productivity and competitiveness of manufacturers across Africa. Another survey of the World Bank called "Doing Business" places Africa low on business climate indicators and as a laggard in reform relative to other continents in 2005.

However, these studies don't take in account all the business environment indicators to analyze intra-African trade. The aim of this paper is to analyze the role of the business environment on intra-African trade. To do this, we extend the gravity model to identify possible obstacles on intra-African trade. Following the literature on trade facilitation studies (see Wilson et al 2003a, 2003b, 2004; Clark et al 2004; and OCDE, 2007), we will focus on the role of port efficiency; the number of documents (days) to export and import; the number of procedures (days) to starting a business, registering a property, enforcing contract; the investor's protection index; and the services infrastructure, as indicators of business environment.

Using a panel data that cover years 2004 and 2005, on a sample of 76 countries, which includes 43 African countries, we find that port efficiency, services infrastructure, and the protection of investors have a positive impact on African trade. But the number of documents (days) to export and import, and the number of procedures to starting a business, registering a property, enforcing contract are the main factors that lower intra-African trade.

The rest of this paper is organized as follows. Section 2 presents the review of literature.

Section 3 describes the data and estimation framework. Section 4 discusses the results. Section 5 concludes.

2 Previous studies

The previous studies mainly focus on trade facilitation indicators such as port efficiency, customs environment, regulatory environment and services infrastructure. For example, Clark et al. (2004) find that improving port efficiency from the 25th to 75th percentiles reduces shipping costs by more than 12%. Wilson et al. (2003a, 2003b, 2004) show that port efficiency of both the importer and the exporter is positively associated with trade. Moreover, comparing the effect of port efficiency on imports versus exports, they find that the coefficient is higher for exporter than importer, which implies that global trade flows get a bigger boost when the exporter's port efficiency improve. For landlocked countries, Wilson, Mann and Otsuki (2003a) show that the ports are as important for both import and export as in non-landlocked countries. For island countries, it appears that ports are more important for their import and less important for their export compared to non-island countries. This result was also found by Limao and Venables (2001).

Wilson and al. (2003a, 2003b, 2004) show that customs environment has a significantly positive effect on trade of the importing country. Moreover, they argue that trade facilitation is a possible avenue for reducing the cost of imports through customs improvements even as tariffs remain where they are. OCDE (2007) uses a metrics of customs and administrative procedure from the World Bank "Doing Business" survey (2005) to estimate a gravity model. The study concludes that all countries can benefit from more efficient customs and administrative procedures, with the greatest beneficits accruing to those countries with the least efficient customs and administrative procedures.

Wilson et al (2003a, 2003b, 2004) find that improving the regulatory environment of the importer and exporter has a positive and significant association with trade. De Groot et al. (2003) also show that a better quality of formal institutions tend to increase trade. Rodrik et al (2002) conclude that the quality of institutions has a significant and positive effect on

country's total trade flows. François and Manchin (2006) also find that exports performance depend on institutional quality.

Wilson et al (2003a, 2003b, 2004) use the percentage of companies that use the internet for e-commerce, effect of internet on business, and speed and cost of internet access. They conclude that E-business usage has a positive and significant effect on trade. Freund and Weinhold (2000) show that an increasing by 10% in the relative number of web host in one country could increase by 1% her trade flow. Choi (2003) shows that when the number of the internet hosts or users in a host country increased by 10%, the foreign direct investment inflows increased by more than 2%. François and Manchin (2006) also find that exports performance depend on communications infrastructure.

However, these studies didn't analyze the role of business environment on African trade. Studies on role of business environment in African trade are recent. Using Investment Climate survey of the World Bank, Eifert et al. (2005) show that high indirect costs (transport, logistics, telecommunications, water, electricity, land and buildings, marketing, accounting, security, and bribes) reduce the productivity and competitiveness of manufacturers across Africa. Longo and Sekkat (2004) suggest that improvements in the transport infrastructure indicators (length road per capita and number of telephone per capita) by 1% in one country can boost intra-African trade by about 2%. Using a gravity model, Limao and Venables show that poor infrastructure accounts for 40 percent of predicted transport costs for coastal countries and up to 60 percent for landlocked countries. In the case of Sub-Saharan Africa (SSA), Limao and Venables conclude that intra-SSA trade costs are substantially higher and trade volumes substantially lower than those for non-SSA countries. Clarke (2005) shows that African manufacturing enterprises are likely to export in countries with restrictive trade and customs regulation and poor customs administration.

In this paper, we will use the gravity model of bilateral trade between African countries and their partners and we will include a set of business environment indicators (port efficiency, number of documents (days) to export and import; number of procedures (days) to starting a business, registering a property, enforcing contract; the investor's protection index; and services infrastructure) as well as incorporate regional trade agreements to see

which of these factors might have a greater effect on intra-African trade flows.

3 Methodology

3.1 Rationale for business environment measures

The main task in the quantitative analysis of business environment is to develop measures of business environment. In the case of trade facilitation, Wilson, Mann and Otsuki (2003a, 2003b, 2004) present four distinct approaches that meet policymaker 's needs for specificity on how to measure trade facilitation. They are: (i) port efficiency, (ii) customs environment, (iii) regulatory environment, and (iv) services sector infrastructure.

Port efficiency (PE) is designed to measure the quality of infrastructure of maritime and air ports. Customs environment (CE) is aimed at measuring direct customs costs as well as administrative transparency of customs and border crossings. Regulatory environment (RE) is designed to measure the economy's approach to regulations. Services infrastructure sector (SI) is designed to measure the extent to which an economy has the necessary domestic infrastructure (e.g., telecommunications, financial intermediaries, and logistic firms) and is using networked information to improve efficiency and to transform activities to enhance economic activity.

Besides the observation that these categories match areas for policy-maker attention, these trade facilitation measures also match several GATT articles and appear in the list of Singapore issues in the Doha Development Agenda, and therefore have salience for WTO negotiations. The *port efficiency* measure has been constructed in accordance to GATT article V (freedom of transit). This article says that freedom of movement is to be assured for goods, which should be allowed to move via most convenient route, should be exempt from customs or transit duties, and should be free from unnecessary delays or restrictions. Custom environment here consists of components that have their basis in the GATT article VIII. GATT article VIII states that in order to minimize impediments to trade due to customs procedures, fees charged by customs officials must be limited to the approximate

cost of customs services. Also, there should not be substantial penalties for minor breaches of customs regulations such as clerical errors. *Regulatory environment* issues are contained in GATT article X which discusses Publication and Administration of Trade Regulations. This article comes from the basic transparency obligation that requires prompt publication of laws and regulations affecting imports and exports so that foreign governments and traders may clearly understand them.

If the trade facilitation indicators are closed to the business environment measures, they are different in the sense that the indicators used to measure trade facilitation are not related directly to business. That is why we use the survey called "Doing Business" and World Development Indicators, both produced by the World Bank, to generate the business environment indicators. The advantage of Doing Business database compared to other database such as the Global Competitiveness Report of the World Economic Forum, is that, it covers more than 175 countries which include almost all African countries.

3.2 How to construct the business environment indicators?

Contrary to Wilson, Mann and Otsuki (2004) (thereafter WMO) who used three survey (Kaufmann, Kraay,and Zoido-Lobaton (2002), World Economic Forum Global Competitiveness Report 2001-2002, and IMD Lausanne, World Competitiveness Yearbook 2002) to quantify trade facilitation indicators, in this paper, to quantify the business environment, we will use Doing Business survey and the World Development Indicators produced by the World Bank.

The World Bank's *Doing Business* (DB) database provides objective measures of business regulations and their enforcement. The DB indicators are comparable across 175 economies in 2007. They indicate the regulatory costs of business and can be used to analyze specific regulations that enhance or constrain investment, productivity, and growth. The DB data are collected in a standardized way. The survey uses a simple business case to ensure comparability across countries and over time – with assumptions about the legal form of the business, its size, its location and the nature of its operations. Surveys are administered

through more than 5,000 local experts, including lawyers, business consultants, accountants, government officials and other professionals routinely administering or advising on legal and regulatory requirements.

DB survey develops six indicators for customs and administrative procedures. These indicators are the time spent at the border of the exporter and the importer, the number of signatures necessary to export or import products, and the number of documents needed to cross the border of the importer and exporter.

DB survey also develops indicators for regulatory environment. Indicators on enforcing contracts measure the efficiency of the judicial system in resolving a commercial dispute. The data are built by following the step-by-step evolution of a payment dispute before local courts. The data are collected through study of the codes of civil procedure and other court regulations as well as surveys completed by local litigation lawyers (and, in a quarter of the countries, by judges as well). DB records all procedures that are officially required for an entrepreneur to start up and formally operate an industrial or commercial business. These include obtaining all necessary licenses and permits and completing any required notifications, verifications or inscriptions for the company and employees with relevant authorities. DB survey records the full sequence of procedures necessary when a business purchases land and a building to transfer the property title from the seller to the buyer. Every required procedure is included. DB survey also measures the strength of minority shareholder protections against directors' misuse of corporate assets for personal gain. The indicators distinguish three dimensions of investor protection: transparency of transactions (extent of disclosure index), liability for self-dealing (extent of director liability index) and shareholders' ability to sue officers and directors for misconduct (ease of shareholder suits index).

World Development Indicators (WDI) is the World Bank database which provides information on the country development data. WDI covers more than 600 indicators and 208 economies.

The WDI develops indicators for the port efficiency and the services infrastructure. The indicators for the port efficiency are, for example, the air transport freight, the quantity of goods transported by railways and/or road. The indicators for services infrastructure are, for

example, the number of fixed line and mobile phone subscribers and the number of internet users.

To create the business environment indicators, we collect the DB and WDI data into four specific business environment measures (port efficiency, customs environment, regulatory environment, and services infrastructure). A simple average of variables —excepted the protection of investors which is an index (range from 0 to 10)— is used for transparency of method, and also because there is no specific argument (theoretical of statistical) to choose a different aggregation method. We use interpolation for the year where data are not available[1]. Therefore:

■ The Port efficiency for each country is the average of three variables from WDI:

◊ Air transport freight, in million of tons per km

◊ Railways goods transported, in million of tons per km

◊ Road goods transported, in million of tons per km

■ The customs environment for each country is the average of two types of variables from DB[2]:

◊ The number of documents to export

◊ The number of documents to import

or

◊ The number of days to export

◊ The number of days to import

■ The Regulatory environment for each country is constructed as the average of three types of variables from DB:

◊ The number of procedures for starting a business

◊ The number of procedures for registering a property

[1] Due to the fact that there is little change over two years in the customs environment in the data, ceteris paribus, we use the year 2005 data for year 2004, and year 2006 data for year 2005 for our estimations.

[2] We assume that all traded goods satisfy the Standard International Trade Classification (SITC) Revision 3.

◊ The number of procedures for enforcing contracts

or

◊ The number of days for starting a business

◊ The number of days for registering a property

◊ The number of days for enforcing contracts

We also consider the protection of investors as a regulatory variable which is different of the previous.

◊ Protecting investors index (0 = worst investor protection; 10 = better investor protection)

■ Services sector infrastructure for each country is the average of two variables from WDI:

◊ The number of fixed and mobile telephone subscribers (per 1000 people)

◊ The number of internet users (per 1000 people)

Tables 1 present, for the business environment indicators, the mean, standard deviation, minimum and maximum values. The statistics show that, in the regulatory environment, an African exporter needed to produce more than 18 documents and it takes him 226 days to satisfy all the conditions. In the importer countries, the exporter must produce 17 documents and he needed 198 days to satisfy all the conditions. For the customs environment, the table 1 shows that African exporter need to produce 10 documents for exporting and it takes him 43 days to satisfy all the conditions. In the importer countries, the exporter must produce 8 documents and he needed 32 days to satisfy all the conditions. The protection of investors is weak in Africa compare to the rest of the world. The index of protection in Africa is 4.5 compare to 5 in the importer countries.

Tables 2 and 3 present the correlations between the main variables. We find that services infrastructure indicators are highly correlated with port efficiency (0.51), number of documents to produce in customs (-0.44), number of days to export (-0.61), and per capita GDP (0.83). Port efficiency is highly correlated with GDP (0.78) and per capita GDP (0.51).

Moreover, per capita GDP is highly correlated with number of documents to produce in customs (-0.50) and number of days to export (-0.58).

Port efficiency, customs environment, services infrastructure and regulatory environment may induce reforms that improve with a country's import and export flows and the estimated coefficients for these variable would be biased if the endogeneity is present due to high correlations between business environment indicators and income. But WMO (2003a, 2003b) find weak evidence that endogeneity is not too large when using trade facilitation.

3.3 Other variables

The bilateral trade flows are the exports of goods and services obtained from the Direction of Trade and Statistics of the International Monetary Fund (IMF). We use export data as it is likely to be more reliable than import for developing countries (see Longo and Sekkat, 2004) . We deflate the trade flow with world import index taken from International Financial Statistics of the IMF.

Real gross domestic product (GDP) and real GDP per capita data are taken from the WDI database.

Geographic data, together with dummies for same language and colonial links are extracted from the Centre d'Études Prospectives et d'Informations Internationales (CEPII) database.[3] The distance data are calculated following the great circle formula, which uses latitudes and longitudes of the relevant capital cities.

3.4 The empirical model

The gravity model has traditionally been estimated by ordinary least square (OLS) using cross-sectional data to modeling bilateral trade flows. The gravity model of international trade has been developed independently by Tinbergen (1962) and Pöyhönen (1963). The gravity model is a kind of short-hand representation of supply and demand forces in which the amount of trade between countries is assumed to be increasing in their sizes (as measured

[3]http://cepii.fr/anglaisgraph/bdd/distance.htm

by their national incomes), and decreasing in the cost of transportation between them (as measured by the distance between their economic centers).

By assuming first Cobb-Douglas preferences and then CES preferences, Anderson (1979) was the first to derive the gravity equations from models that assumed product differentiation. In the both cases, he made the Armington assumption that products were differentiated by country of origin. Anderson modeled preferences over only trade goods. Deardoff (1995) uses the same preferences like Anderson (1979) but assumes that preferences hold on all goods. Bergstrand (1985) also uses CES preferences over Armington differentiated goods to derive a reduced form equation for bilateral trade involving prices indices. Anderson and Wincoop (2003) develop a method that consistently and efficiently estimated a theoretical gravity equation, and correctly calculates the comparative static of trade frictions. Anderson and Wincoop (2004) introduce the border costs as premium on the export prices.

In the so called augmented gravity models, most authors (e.g. Carrere, 2004; Musila, 2005; Frankel and al., 1995; Glick and Rose, 2002; Frankel and Rose, 2002; Rose, 2001; Rose and Engel, 2002; Longo and Sekkat 2004; Wilson et al., 2003a, 2003b, 2004) add a few variables such as income per capita, adjacency, common language, common currency, or colonial links.

The augmented gravity model of trade has also been used widely as a baseline model for estimating the impact of a variety of policy issues including, regional trading groups (Carrere, 2004; Musila, 2005, Longo and Sekkat 2004), political blocs (Frankel et al, 1995), currency unions (Glick and Rose, 2002; Frankel and Rose, 2002; Rose, 2001; Rose and Engel, 2002; Carrere, 2004), and trade facilitation (Limao and Venable, 2001; Wilson et al, 2003a, 2003b, 2004; Clark et al, 2004). Business environment can be introduced in the equation through a variety of measures, such as, port efficiency, customs environment (number of documents or number of days to export and import), regulatory environment (number of procedures or number of days to starting a business, enforcing a contract, and registering a property; and protection of investors), and services infrastructure.

In our sample, zero or missing bilateral trade observations reaches 34% of the total. Since the dependant variable is truncated at zero, estimation with OLS will produce biaised results.

The appropriate estimator is Tobit. Longo and Sekkat (2004) also used this approach. The extended gravity model to take account the business environment indicators is described as:

$$\begin{aligned}\ln(1+F_{ij}^t) &= \beta_0+\beta_i+\beta_t++\beta_1\ln PE_i^t+\beta_2\ln CE_i^t+\beta_3\ln RE_i^t+\beta_4\ln SI_i^t+\\ &\beta_5\ln PE_j^t+\beta_6\ln CE_j^t+\beta_7\ln RE_j^t+\beta_8\ln SI_j^t+\beta_9\ln(GDP_i^t)+\beta_{10}\ln(GDP_j^t)+\\ &\beta_{11}\ln(GDPPC_i^t)+\beta_{12}\ln(GNIPC_j^t)+\beta_{13}\ln(DIST_{ij}^t)+\beta_{14}D_{ADJ}+\beta_{15}D_{AMU}+\\ &\beta_{16}D_{CEMAC}+\beta_{17}D_{COMESA}+\beta_{18}D_{ECOWAS}+\beta_{19}D_{SADC}+\beta_{20}D_{UEMOA}+\beta_{21}D_{Colony}\\ &\beta_{22}D_{ENG}+\beta_{23}D_{FRC}+\beta_{24}D_{SPN}+\beta_{25}D_{ARB}+\beta_{26}D_{POR}+\varepsilon_{ij}^t,\end{aligned}$$

where i and j stand for exporter and importer respectively, and t is trading year (t=2004, 2005). F_{ij} denotes the exports from country i to country j. The terms PE, CE, RE, and SI denote country's indicators of port efficiency, customs environment, regulatory environment, and service infrastructures. The term GDP denotes the gross domestic product and GDPPC denotes per capita GDP. Dummy variables are included in the model to capture the effect of preferential trade agreements, colonial links, language similarity and adjacency. The trade arrangements dummies (see table 8 for the definitions of different trade arrangements) include AMU (D_{AMU}), CEMAC (D_{CEMAC}), COMESA (D_{COMESA}), ECOWAS(D_{ECOWAS}), SDAC(D_{SDAC}), UEMOA(D_{UEMOA}). The language dummies include English (D_{ENG}),French (D_{FRC}),Spanish (D_{SPN}), Arabic (D_{ARB}), and Portuguese (D_{POR}). The adjacency dummy D_{ADJ} takes the value one if country i is adjacent to country j and zero otherwise. The variable colony, D_{Colony}, takes the value of 1 if the exporting country i was a colony of the partner country j. Geographical distance between capital cities i and j is denoted $DIST_{ij}$. β_0 is the intercept, β_t is a dummy for year t (t = 2004). This dummy is included in the model to control for time-specific shocks. β_i is a country-specific effect when a country is an importer. Parameter $\beta's$ are the coefficients. ε_{ij}^t is the error term that is assumed to be normally distributed with mean zero.

In the literature, it has been found that poorly-performing ports can strongly reduce trade volumes and may have a greater dampening effect on trade for small, less-developed

countries than many other trade frictions (Wilson et al, 2003a, 2003b, 2004; Clark et al, 2004). Thus we may expect that improvement of port infrastructure affects positively the trade flows.

Customs is a mandatory element in the movement of goods across borders and the procedures apply to these goods significantly influence the role of national industry in international trade and their contribution to the national economy. Effective and efficient clearance of goods increases the participation of national industry in the world marketplace and contributes to economic competitiveness of nations, encourages investment and development of industry, and increases the small and medium enterprises in international trade (World Customs Organization).

Well developed institutions are likely to decrease the transaction costs for market participants and thus increase the efficiency of markets. They can do this through three channels (World Bank, 2002). (i) They decrease information asymmetries as they channel information about market conditions, participants and goods; (ii) They reduce risk as they define and enforce property rights and contracts, determining who gets what and when, and (iii) They increase competition in markets or decrease it. The improvements of the regulatory environment will affect the trade positively.

Services infrastructure sector (SI) is designed to measure the extent to which an economy has the necessary domestic infrastructure (e.g., telecommunications, financial intermediaries, and logistic firms) and is using networked information to improve efficiency and to transform activities to enhance economic activity. For example, the Internet can improve the productivity in three ways. (i) Internet can lower prices by lowering search costs; (ii) Internet use can cut the cost of holding inventories by allowing large suppliers to bypass retailers and contact customers directly; and (iii) Internet usage can improve the transparency of the host countries and make it comfortable to do business. It is expected that the improvement of SI will have a positive impact on the trade.

Because trade flows are expected to be positively related to national incomes, and negatively related to distance, β_9 and β_{10} are expected to be positive and β_{13} is expected to be negative. Trade flows are also expected to be positively associated with regional integration,

language, colony, and adjacency.

In contrast to cross-section data, panel data permit more general types of heterogeneity. For a single cross-section, these controls can only depend on observed country-pair attributes such as common language, and estimates can thus be biased if there is additionally an observed component to the country-pair propensity to trade. With panel data, such heterogeneity can be controlled for by means of a country-pair fixed effect. In this paper, we use country-specific effect when a country is an importer. With this specification, distance, adjacency, and language are eliminated because they are fixed over time[4].

4 The Results

In this paper, African countries are reporter and partner. The countries outside Africa are partner only. In this section, we present the robust ordinary least squares (OLS) and the Tobit estimations. The robust OLS estimations use Huber/White robust standard error.

In all OLS regressions and Tobit regressions, the traditional variables (GDP, distance, language, colony, adjacency) of gravity equation have almost all the expected sign. The GDP per capita is negative and significantly related to trade. This result was also found by Rodrik (1998) who shows that in developing countries, GDP per capita was negatively correlated to trade.

Estimations results for variables of interest are reported in tables 4, 5, 6, and 7. OLS estimates are reported in tables 4 and 5, and Tobit estimates are reported in tables 6 and 7.

In table 4, we present the OLS regression results using the average number of documents to export and export, and the average number of procedures to starting a business, enforcing contract and registering a property. The first column of table 4 represents the pooled cross-section regression. Column 2 and column 3 represents, respectively, the year 2004 fixed effect and the importer fixed effect. The first column of table 4 shows that the number of documents to export and import, and the number of procedures to starting a business,

[4]See Cheng and Wall (2005) for the various specifications to controlling for heterogeneity in the gravity models of trade.

enforcing contract and registering a property have a negative effect on trade. In the case of number of documents to export and export, the impact is more important in the exporter country (-2.08) than in the importer country (-1.31). When we consider the number of procedures to starting a business, enforcing contract and registering, the effect is higher in importer country (-3.07) than in exporter country (-1.04). The protection of investor is positive and significantly related to trade in exporter country only. The port efficiency is positive and significantly associated to trade in both exporter and importer countries. Comparing the effect of port efficiency on import vs. exports, we see that the coefficient is higher for exporter (0.290) than importer (0.09). As expected, the services infrastructure has a positive and significant effect on trade in both the exporter and importer countries. But the coefficient is higher for exporter (1.41) than importer (0.62).

Column 2 of table 4 presents the year 2004 fixed effect. For the exporter, the average number of procedures to starting a business, enforcing contract and registering is now positive and significantly associated to trade. In the case of services infrastructure, the coefficient is only positive and significant in the exporter country. The sign of other variables remain the same but we observe that the year fixed effect increases the absolute value of the coefficients. When we use the year fixed effect, all African regional agreements become significant and positively related to trade.

Column 3 of table 4 presents the importer fixed effect. For the exporter country, the average number of procedures to starting a business, enforcing contract and registering has not effect on trade. Compare to pooled cross-section regression, the sign of other variables remain the same but the importer fixed effect increases the absolute value of the coefficients. When we use the importer fixed effect, all African regional agreements also become significant and positively related to trade.

In table 5, we present the results using the average number of days to export and import, and the average number of day to starting a business, enforcing contract and registering a property. The first column of table 5 represents the pooled cross-section regression. Column 2 and column 3 represents, respectively, the year 2004 fixed effect and the importer fixed effect. The first column of table 5 shows that the number of days to export and import has a

negative effect on trade. The impact is more important in the importer country (-2.33) than in the exporter country (-1.89). The average number of days to starting a business, enforcing contract and registering a property has a positive and significant effect on trade. The effect is higher in exporter country (0.58) than in importer country (0.09). Port efficiency is positive and significantly associated to trade in only exporter country. Services infrastructure are positive and significantly related to trade in both exporter and importer countries. But the effect is higher in exporter (1.19) than in importer country (0.54). The investor's protection has not effect on trade.

Column 2 of table 5 presents the year 2004 fixed effect. For the exporter, the average number of days to starting a business, enforcing contract and registering is now positive and significantly associated to trade in both exporter and importer countries. But the impact is higher in exporter country (1.23) than in importer country (0.50). Investor's protection variable is now positive and significantly related to trade in only exporter country (1.15). In the case of services infrastructure, the coefficient is only positive and significant in the exporter country (1.18). The sign of other variables remain the same but we observe that the year fixed effect increases the absolute value of the coefficients. When we use the year fixed effect, all African regional agreements become significant and positively related to trade.

Column 3 of table 5 presents the importer fixed effect. Compare to year fixed effect, the sign of variables remain the same but the importer fixed effect increases the absolute value of the coefficients. When we use the importer fixed effect, all African regional agreements become also significant and positively related to trade.

In table 6, we present the Tobit regression results using the average number of documents to export and export, and the average number of procedures to starting a business, enforcing contract and registering a property. The first column of table 6 represents the pooled cross-section regression. Column 2 and column 3 represent, respectively, the year 2004 fixed effect and the importer fixed effect. The first column of table 6 shows that the number of documents to export and import, and the number of procedures to starting a business, enforcing contract and registering a property have a negative effect on trade. In the case of number of documents to export and export, the impact is more important in the exporter

country (-2.99) than in the importer country (-1.87). When we consider the number of procedures to starting a business, enforcing contract and registering, the effect is higher in importer country (-4.36) than in exporter country (-2.05). The protection of investor is positive and significantly related to trade in both exporter and importer countries. The port efficiency is positive and significantly associated to trade in exporter country only. As expected, the services infrastructure has a positive and significant effect on trade in both the exporter and importer countries. But the coefficient is higher for exporter (2.06) than importer (1.27). Compare to OLS estimates, we see that the coefficients are higher in Tobit regression than in OLS regression in absolute value.

Column 2 of table 6 presents the year 2004 fixed effect. Only the average number of procedures to starting a business, enforcing contract and registering of importer is now negative and significantly associated to trade. In the case of services infrastructure, the coefficient is only positive and significant in the exporter country. The sign of other variables remain the same but we observe that the year fixed effect reduces (number of days to export and increase) or increases the absolute value of the coefficients. When we use the year fixed effect, all African regional agreements become significant and positively related to trade. Compare to OLS estimates, we see that the coefficients are higher in Tobit regression than in OLS regression in absolute value.

Column 3 of table 6 presents the importer fixed effect. The investor's protection is now positive and significant in exporter country only. The sign of other variables remain the same as in the year fixed effect. Compare to year fixed effect, we observe that the importer fixed effect reduces the absolute value of the coefficients. But compare to OLS estimates, the coefficients are higher in Tobit regression than in OLS regression in absolute value.

In table 7, we present the Tobit estimates using the average number of days to export and import, and the average number of day to starting a business, enforcing contract and registering a property. The first column of table 7 represents the pooled cross-section regression. Column 2 and column 3 represent, respectively, the year 2004 fixed effect and the importer fixed effect. The first column of table 7 shows that the number of days to export and import

has a negative effect on trade. The impact is more important in the importer country (-3.18) than in the exporter country (-2.54). The average number of days to starting a business, enforcing contract and registering a property has a positive and significant effect on trade in exporter country only (0.90). Port efficiency is positive and significantly associated to trade in only exporter country. Services infrastructure are positive and significantly related to trade in both exporter and importer countries. But the effect is higher in exporter (1.82) than in importer country (1.11). The investor's protection has also positive effect on trade in both exporter and importer countries. But the effect is higher in exporter (0.93) than in importer country (0.60). Compare to OLS estimates, the coefficients are higher in Tobit regression than in OLS regression in absolute value.

Column 2 of table 7 presents the year 2004 fixed effect. For the exporter, the average number of days to starting a business, enforcing contract and registering is now positive and significantly associated to trade in both exporter and importer countries. But the impact is higher in exporter country (1.82) than in importer country (0.79). In the case of services infrastructure, the coefficient is only positive and significant in the exporter country (1.81). The sign of other variables remain the same but we observe that the year fixed effect increases the absolute value of the coefficients. Compare to OLS estimates, the coefficients are higher in Tobit regression than in OLS regression in absolute value.

Column 3 of table 7 presents the importer fixed effect. Compare to year fixed effect, the sign of variables remain the same but the importer fixed effect increases the absolute value of the coefficients. Compare to OLS estimates, the coefficients are higher in Tobit regression than in OLS regression in absolute value.

5 Conclusion

The objective of this paper was to examine the effects of business environment on intra-African trade. Port efficiency; number of documents and number of days to export and import; number of procedures and number of days to starting a business, registering a property, enforcing contract; investor's protection; and services infrastructure are the indicators

of business environment used. We find that port efficiency, services infrastructure, and the protection of investors have a positive impact on African trade. But the number of documents (days) to export and import, and the number of procedures to starting a business, registering a property, enforcing contract are the main factors that lower intra-African trade.

The above results suggest some policy implications for Africa. First, in the customs environment, number of documents and number of days to export and import are key factors for accelerating trade among countries. Improvement of African countries' customs can generate positive spillovers. Second, in regulatory environment, the number of procedures and number of days to starting a business, registering a property, enforcing contract; and investor 's protection are best indicators for doing business in a country. Improvement of these indicators can attract foreign direct investment and facilitates the trade. Finally, African countries must continue to develop their ports and services infrastructure to boost their exports.

Appendix A: Data sources and definitions

The yearly data are constructed for 76 countries and 6 African regional trade agreements (see table 8) spanning from 2004 to 2005. These data are computed from the Doing Business (DB) and World Development Indicators (WDI) published by the World Bank, the International Financial Statistics (IFS) and Direction of Trade and Statistics (DOTS) released by the International Monetary Fund (IMF) .

A.1 GDP

For all countries, the GDP is in million of U.S. dollar (constant 2000) (source: WDI).

A.2 GDP per capita

For all countries, the GDP per capita is in U.S. dollar (constant 2000) (source: WDI).

A.3 Business environment Indicators

A.3.1 Port efficiency

The Port efficiency for each country is the average of three variables from WDI:

- Air transport freight, in million of tons per km
- Railways goods transported, in million of tons per km
- Road goods transported, in million of tons per km

A.3.2 Customs environment

The customs environment for each country is the average of two types of variables from DB (see annex 1):

- The number of documents to export
- The number of documents to import

or

- The number of days to export
- The number of days to import

A.3.3 Regulatory environment

The Regulatory environment for each country is constructed as the average of three types of variables from DB (see annex 2, 3 and 4):

■ The number of procedures for starting a business

■ The number of procedures for registering a property

■ The number of procedures for enforcing contracts

or

■ The number of days for starting a business

■ The number of days for registering a property

■ The number of days for enforcing contracts

or

■ Protecting investors index (0 = worst investor protection; 10 = better investor protection) (see annex 5)

A.3.4 Services sector infrastructure

Services sector infrastructure for each country is the average of two variables from WDI:

■ The number of fixed line and mobile phone subscribers, per 1000 people

■ The number of internet users, per 1000 people

A.4 Trade Flows

The bilateral trade flows are the exports of goods and services obtained from the DOTS. We deflate the trade flow with world import index taken from IFS.

A.5 Adjacency, language, colony, and distance

Geographic data, together language and colonial links are extracted from the Centre d'Études Prospectives et d'Informations Internationales (CEPII) database (see www.cepii.fr). Distance data are calculated following the great circle formula, which uses latitudes and longitudes of the relevant capital cities.

Appendix B: Annex

Annex 1 : World Bank *Doing Business* on trading across borders (Source: World Bank, 2006)

To make the data comparable across countries, several assumptions about the business and the trade goods are made:

■ The business

- Has 100 or more employees.

- Is located in the country's most populous city.

- Is a private, limited liability company, formally registered and operating under commercial laws and regulations of the country. It does not operate within an export processing zone or an industrial estate with special export or import privileges.

- Is domestically owned with no foreign ownership.

■ The traded product travels in a dry-cargo, 20-foot, full container load. The product :

- Is not hazardous nor does it include military arms or equipment.

- Does not require refrigeration or any other special environment.

- Does not require any special phytosanitary or environmental safety standards other than accepted international standards.

The following Standard International Trade Classification ((SITC) Revision 3 categories are considered by the respondents:

- STIC 65: textile yarn, fabrics, made-up articles.

- SITC 84: articles of apparel and clothing accessories.

- SITC 07: coffee, tea, cocoa, spices and manufactures thereof.

Annex 2 : World Bank *Doing Business* on starting a business

To make the data comparable across countries, several assumptions about the business and the procedures are used:

■ The business

- Is a limited liability company. If there is more than one type of limited liability company in the country, the most popular limited liability form among domestic firms is chosen. Information on the most popular form is obtained from incorporation lawyers or the statistical

office.

- Operates in the country's most populous city.

- Is 100% domestically owned and has 5 owners, none of whom is a legal entity.

- Has start-up capital of 10 times income per capital at the end of 2004, paid in cash.

- Performs general industrial or commercial activities, such as the production or sale of products or services to the public. It does not perform foreign trade activities and does not handle products subject to a special tax regime, for example, liquor or tobacco. The business is not using heavily polluting production processes.

- Leases the commercial plant and offices and is not a proprietor of real estate.

- Does not qualify for investment incentives or any special benefits.

- Has up to 50 employees 1 month after the commencement of operations, all least 100 times incomes per capita.

- Has a company deed 10 pages long.

■ The procedures

- A procedure is defined as any interaction of the company founded with external parties (government agencies, lawyers, auditors, notaries). Interactions between company founded or company officers and employees are not considered separate procedures.

- The founders complete all procedures themselves, without middlemen, facilitators, accountants or lawyers, unless the use of such a third party is mandates by law.

- Procedures that are not required by law for starting a business are ignored. For example, obtaining exclusive rights over the company name is not counted in a country where businesses may use a number as identification.

- Shortcuts are counted only if they fulfill 3 criteria: they are legal, they are available to the general public, and avoiding them causes substantial de lays.

- Only procedures required of all business are covered. Industry-specific procedures are excluded. For example, procedures to comply with environmental regulations are included only when they apply to all businesses.

- Procedures that the company undergoes to connect to electricity, water, gas and waste disposal services are not includes unless they entail inspections required before starting

operations.

Annex 3 : World Bank *Doing Business* on registering property (Source: World Bank, 2006)

To make the data comparable across countries, several assumptions about the business, the property and the procedures are used:

■ The business

- Is a limited liability company.

- Is located in a periurban area of the country's most populous city.

- Is 100% domestically and privately owned (no foreign or state ownership) .

- Has 50 employees, all of whom are nationals.

- Performs general commercial activities

■ The property

- has a value of 50 times income per capita.

- Is fully owned by another domestic limited liability company.

- Has no mortgages attached and has been under the same ownership for the past 10 years.

- Is adequately measured and filed in the cadastre, registered in the land register and free of title disputes.

- Is located in a periurban commercial zone, and no rezoning is required.

-Consists of land and a building. The land area is 6,000 square feet (557.4 square meters). A warehouse of 10,000 square feet (929 square meters) is located on the land. The warehouse is 10 years old, is in good condition and complies with all safety standards, building codes and other legal requirements.

- Will not be subject to renovations or additional building following the purchase.

- Has no trees, natural water sources, natural reserves or historical monuments of any kind.

-Will not be used for special purposes, and no special permits, such as for residential use, industrial plants, waste storage or certain types of agricultural activities, are required.

- Has no occupants (legal or illegal), and no other party holds a legal interest in it.

■ The procedures

- A procedure is defined as any interaction of the buyer or the seller, their agents (if the agent is required by law) or the property with external parties, including government agencies, inspectors, notaries, and lawyers. Interactions between company officers and employees are not considered.

- All procedures that are legally required for registering property are recorded, even if they may be avoided in exceptional cases.

- It is assumed that the buyer follows may fastest legal option available.

- Although the business may use lawyers or other professionals where necessary in the registration process, it is assumed that it does not employ an outside facilitator in the registration process unless required to by law.

Annex 4 : World Bank *Doing Business* on enforcing contracts (Source: World Bank, 2006)

To make the case comparable across countries, 10 assumptions are used:

■ The case

- The debt value equals 200% of the county's income per capita.

- The plaintiff has fully complied with the contract (that is, the plaintiff is 100% right).

- The case represents a lawful transaction between businesses residing in the county's most populous city.

- The bank refuses payment for lack of funds in the debtor's account.

- The plaintiff attempts to recover the debt by filing a lawsuit or going through an administrative process but it is finally accomplished.

- The debtor attempts to delay service of process but it is finally accomplished

- The debtor opposes the complaint (default judgment is not an option).

- The judge decides every motion for the plaintiff.

- The plaintiff attempts to introduce documentary evidence and to call one witness. The debtor attempts to call one witness. Neither party presents objections.

- The judgment is in favor of the plaintiff.

Annex 5 : **World Bank *Doing Business* on protecting investors (**Source: World Bank, 2006)

To make the data comparable across countries, several assumptions about the business and the transaction are used:

■ The business (Buyer)

- Is a publicly traded corporation listed on the country's most important stock exchange. If there are no publicly traded companies in the country, it is assumed that Buyer is a large private company with multiple shareholders.

- Has a board of directors and a chief executive officer (CEO) who has the legal capacity to act on behalf of Buyer where permitted, even if this is not specifically required by law.

- Has only national shareholders.

- Has invested only in the country and has no subsidiaries or operations abroad.

- Is a food manufacturer.

- Has its own distribution network.

■ The transactions

- Mr. James is buyer's controlling shareholder and a member of buyer's board of directors. He owns 60% of buyer and elected 2 directors to buyer's 5-member board of directors.

- Mr. James also owns 90% of seller, a company that operates a chain of retail hardware stores. Seller recently shut a large number of its stores.

- Mr. James proposes to buyer that buyer purchase Seller's unused fleet of trucks to expand Buyer's distribution of its food products, Buyer agrees. The price is equal to 10% of Buyer's assets.

- The proposal transaction is part of the company's ordinary course of business and is not outside the authority of the company.

- Beyer enters into the transaction. All required approvals were obtained, and all required disclosures made.

- The transaction is unfair to buyer. Shareholders sue the interested parties and the members of the board of directors.

References

Anderson, J.E. (1979). "A Theoretical Foundation for the Gravity Equation." *American Economic Review*, Vol. 69 (1): 106-116.

Anderson, J.E and E.V. Wincoop (2004). "Trade Costs." *Journal of Economic Literature*, Vol. 42, 691-751.

Anderson, J.E and E.V. Wincoop (2003). "Gravity with Gravitas: A Solution to the Border Puzzle." *American Economic Review*, Vol. 91 (1): 170-192.

Bersgtrand, J.H. (1985). "The Gravity Equation in International Trade: Some Microeconomic Foundations and Empirical Evidence." *Review of Economics and Statistics*, Vol. 67 (3): 474-481.

Bigsten, A. and M. Söderbom (2006). "What Have We Learned from a Decade of Manufacturing Enterprise Surveys in Africa." *World Bank Reseach Observer*, Vol. 21 (2): 241-265.

Carrere, C. (2004). "African Regional Agreements: Impact on Trade with or without Currency Union." *Journal of African Economies*, 13(2): 199-239.

Cheng, I.H.and H.J. Wall (2005). "Controlling for Heterogeneity in Gravity Models of Trade and Integration" *Federal Reserve Bank of St-Louis Review*, 87(1): 49-63.

Choi, C. (2003). "Does the Internet Stimulate Inward Foreign Direct Investment?" *Journal of Policy Modeling*, 25(2003): 319-326.

Clarke, G.R.G (2005). "Beyond Tariffs and Quotas: Why Don't African Manufacturers Export More?" World Bank Working Paper No. 3617, Washington D.C.

Clark, X., D. Dollar, and A. Micco (2004). "Port Efficiency, Maritime Transport Cost and Bilateral Trade." *NBER Working Paper,* No. 10353.

Deardorff, A. V. (1995). "Determinants of Bilateral Trade: Does Gravity Works in a Classical World?" *NBER Working Paper* No. 5377.

De Groot, H.L.F., G.J., Linders, P. Rietveld and U. Subramanian (2003). "The Institutional Determinants of Bilateral Trade Patterns" Tinbergen Institute Discussion Paper, TI 2003-044/3.

Eifert B., A. Gelb and V. Ramachandran (2005). "Business Environment and Comparative Advantage in Africa: Evidence from the Investment Climate Data." Working Paper No. 56, Center for Global Development.

Fosu, A.K. (2003). "Political Instability and Export Performance in Sub-Saharan Africa." *Journal of Development Studies,* 39(4): 68-82.

François, J. and M. Manchin (2006). "Institutional Quality, Infrastructure and the Propensity to Export." Mimeo.

Frankel, J.A and A.K. Rose (2002). "An Estimate of the Effect of Common Currencies on Trade and Income." *Quarterly Journal of Economic*, 117(2): 437-66.

Frankel, J., E. Stein and S-J. Wei (1995). "Trading Blocs and the Americas: The Natural, the Unnatural, and the Super-Natural." *Journal of Development Economics*, 47: 61-95.

Freund, C. and D. Weinhold (2000). "On the Effect of the Internet on International Trade." International Finance Discussion Papers, Board of Governors of the Federal Reserve System.

Glick, R. and A.K. Rose (2002). "Does a Currency Unions Affect Trade? The Time Series Evidence." *European Economic Review*, 46: 1125-1151.

Gupta A. and Y. Yang (2006). "Unblocking Trade." *Finance & Development*, December, Vol. 43 (4).

Hill, C.W.L. *International Business*. Sixth Edition. New-York: McGraw-Hill. 2007.

Limao, N. and A.J. Venables (2001). "Infrastructure, Geographical Disadvantage, Transport Costs, and Trade." *World Bank Economic Review*, 15(3):451-479.

Longo R. and K. Serkkat (2004). "Economic Obstacles to Expanding Intra-African Trade." *World Development*, 32(8): 1309-1321.

Musila, J.W. (2005). "The intensity of Trade Creation and Trade Diversion in COMESA, ECCAS and ECOWAS: A Comparative Analysis." *Journal of African Economies*, 14(1): 117-141.

OCDE (2007). "Examing the Trade Effect of Certain Customs and Administrative Procedures." OCDE Trade Policy Working paper No. 42.

Pöyhönen, P. (1963). "A Tentative Model for the Volume of Trade between Countries." Weltwirtschaftliches Archiv, 90(1): 93-100.

Rodrik, D. (1998). "Trade Policy and Economic Performance in Sub-Saharan Africa." *NBER Working* Paper No. 6562.

Rodrik, D., A. Subramanian, and F. Trebbi (2002). "Institutions Rule: The Primacy of Institutions on Integration and Geography in Development Economics." IMF Working Paper, WP/02/189.

Rose, A.K (2001). "Currency Unions and Trade: The Effect is Large." *Economic Policy*, 16(33): 433-62.

Rose, A.K and C. Engel (2002). "Currency Unions and International Integration", J*ournal of Money, Credit, and Banking*, 34(4): 1067-1089.

Tinbergen, Jan. *Shaping the World Economy: Suggestions for an International Economic Policy.* New York: The Twentieth Century Fund, 1962.

Wilson, J.S., C.L. Mann and T. Otsuki (2004). "Assessing the Potential Benefit of Trade Facilitation: A Global Perspective." World Bank Working Paper 3224, Washington, D.C.

——— (2003a). "Trade Facilitation and Economic Development: Measuring the Impact." World Bank Working Paper 2988, Washington, D.C.

——— (2003b). "Trade Facilitation and Economic Development: A New Approach to Quantifying the Impact." *World Bank Economic Review*, 17(3): 367-389.

World Bank (2002). "Building Institutions for Market." *World Development Report* 2002, Washington, D.C.: The World Bank.

——— (2003). "Africa Region Trade Progress Note." Washington, D.C.: The World Bank.

——— (2006a). "Doing Business in 2006." At http://www.doingbusiness.org. Retrieved on February 2007.

——— (2006b). *World Development Indicators*. 2006. Available online at http://www.worldbank.org. Retrieved on Mars 2007.

Table 1: Summary Statistics for the Business Environment Indicators

Variables	Mean	Std. Deviation	Min	Max
CEDOC Exporter	10.076	2.997	6	17.5
CEDOC Importer	8.776	3.269	0	17.5
REDOC Exporter	18.756	4.232	11	27.667
REDOC Importer	17.066	4.886	0	27.667
CEDAY Exporter	43.709	20.956	16	102
CEDAY Importer	32.749	21.320	0	102
REDAY Exporter	226.802	77.221	29.075	376
REDAY Importer	198.159	81.249	0	376
PROINV Exporter	4.584	1.479	0	8
PROINV Importer	5.069	1.658	0	9.3

Notes: CEDOC is the average number of documents to export and import; REDOC is the average number of procedures to starting a business, enforcing Contract, and registering a property; CEDAY is the average number of days to export and import; REDAY is the average number of days to starting a business, enforcing contract, and registering a property; PROINV is investor's protection index.
Source: Authors' computations based on World Bank *Doing Business*.

Table 2: Correlations

	Trade	PE	REDOC	CEDOC	PROINV	SI	GDP	GDPPC	Distance
Trade	1								
PE	0.23	1							
REDOC	-0.07	-0.10	1						
CEDOC	-0.08	-0.12	0.02	1					
PROINV	0.14	0.27	-0.098	-0.099	1				
SI	0.20	0.51	-0.30	-0.44	0.13	1			
GDP	0.23	0.78	-0.12	-0.00	0.33	0.38	1		
GDPPC	0.12	0.51	-0.08	-0.50	0.27	0.83	0.35	1	
Distance	-0.08	0.05	-0.03	-0.03	0.03	0.05	0.00	0.06	1

Note: All variables are in logs. CEDOC is the average number of documents to export and import; REDOC is the average number of procedures to starting a business, enforcing contract, and registering a property; CEDAY is the average number of days to export and import; REDAY is the average number of days to starting a business, enforcing contract, and registering a property; PROINV is investor's protection index.
Source: Authors' computations based on World Bank *Doing Business* for business environment, World Bank *World Development Indicators* for GDP, port efficiency and services, International Monetary Fund *Direction of Trade and Statistics* for trade, and CEPII database for the distance.

Table 3: Correlations

	Trade	**PE**	**REDAY**	**CEDAY**	**PROINV**	**SI**	**GDP**	**GDPPC**	**Distance**
Trade	1								
PE	0.23	1							
REDAY	0.08	-0.11	1						
CEDAY	-0.15	-0.30	0.07	1					
PROINV	0.14	0.27	0.18	-0.16	1				
SI	0.20	0.51	0.09	-0.61	0.13	1			
GDP	0.23	0.78	-0.00	-0.01	0.33	0.38	1		
GDPPC	0.12	0.51	-0.00	-0.58	0.27	0.83	0.35	1	
Distance	-0.08	0.05	-0.059	-0.056	0.03	0.05	0.00	0.06	1

Note: All variables are in logs. CEDOC is the average number of documents to export and import; REDOC is the average number of procedures to starting a business, enforcing contract, and registering a property; CEDAY is the average number of days to export and import; REDAY is the average number of days to starting a business, enforcing contract, and registering a property; PROINV is investor's protection index.

Source: Authors' computations based on World Bank *Doing Business* for business environment, World Bank *World Development Indicators* for GDP, port efficiency and services, International Monetary Fund *Direction of Trade and Statistics* for trade, and CEPII database for the distance.

Table 4: Robust OLS Estimates

	Pooled Cross-Section		Year 2004 Fixed Effect		Exporter Fixed Effect	
	Coeff.	Std. Error	Coeff.	Std. Error	Coeff.	Std. Error
Constant	-5.82*	3.10	-8.80**	3.16	-7.16**	3.38
Ports Exporter	0.290***	0.04	0.36***	0.05	0.38***	0.05
Ports Importer	0.09**	0.03	0.18***	0.04	0.18***	0.04
REDOC Exporter	-1.04***	0.40	1.19**	0.52	0.78	0.59
REDOC Importer	-3.07***	0.34	-4.15***	0.38	-4.17***	0.38
CEDOC Exporter	-2.08***	0.30	-1.67***	0.32	-1.67***	0.32
CEDOC Importer	-1.31***	0.31	-0.73**	0.36	-0.71**	0.36
PROINV Exporter	0.96***	0.19	1.92***	0.24	1.90***	0.25
PROINV Importer	0.19	0.22	0.21	0.26	0.20	0.26
Services Exporter	1.41***	0.12	1.87***	0.15	1.83***	0.15
Services Importer	0.62***	0.13	-0.02	0.14	-0.04	0.14
GDP Exporter	0.85***	0.08	0.41***	0.12	0.41***	0.12
GDP Importer	1.27***	0.07	1.05***	0.08	1.05***	0.08
GDPPC Exporter	-1.47***	0.14	-1.96**	0.17	-1.94***	0.17
GDPPC Importer	-0.67***	0.13	-0.40**	0.16	-0.38**	0.15
Distance	-1.59***	0.15	-	-	-	-
Adjacency	9.79***	0.58	-	-	-	-
Colony	5.23***	0.68	-	-	-	-
AMU	-1.09	1.42	6.85***	0.46	6.88***	0.46
CEMAC	0.58**	0.29	2.69	1.78	2.68	1.77
COMESA	0.62*	0.35	2.69***	0.41	2.71***	0.41
ECOWAS	1.01**	0.47	3.01***	0.47	3.02***	0.47
SADC	0.34	0.50	3.28***	0.54	3.32***	0.55
UEMOA	0.72	0.68	4.31***	0.60	4.28***	0.60
English	1.71***	0.25	-	-	-	-
French	1.60***	0.20	-	-	-	-
Spanish	-2.62**	1.14	-	-	-	-
Arab	0.37	0.52	-	-	-	-
Portuguese	1.71**	0.70	-		-	-
Observations	6360		6360		6360	
R^2	0.4635		0.3060		0.3061	

Notes: All non-dummy variables are in logs. The notations "*", "**", and "***" denote significance at 10, 5 and 1 percent levels, respectively.

CEDOC is the average number of documents to export and import; REDOC is the average number of procedures to starting a business, enforcing contract, and registering a property; CEDAY is the average number of days to export and import; REDAY is the average number of days to starting a business, enforcing contract, and registering a property; PROINV is investor's protection index.

Source: Authors' computations based on World Bank *Doing Business* for business environment, World Bank *World Development Indicators* for GDP, port efficiency and services, International Monetary Fund *Direction of Trade and Statistics* for trade, and CEPII database for the language and geographical variables.

Table 5: Robust OLS Estimates

	Pooled Cross-Section		Year 2004 Fixed Effect		Exporter Fixed Effect	
	Coeff.	Std. Error	Coeff.	Std. Error	Coeff.	Std. Error
Constant	-18.40***	2.89	-26.40***	3.22	-25.68***	3.26
Ports Exporter	0.19***	0.05	0.29***	0.05	0.31***	0.05
Ports Importer	0.001	0. 04	0.13**	0.05	0.13**	0.05
REDAY Exporter	0.58***	0.15	1.23***	0.17	1.27***	0.17
REDAY Importer	0.09	0.13	0.50***	0.15	0.51***	0.15
CEDAY Exporter	-1.89***	0.22	-2.03***	0.25	-2.07***	0.25
CEDAY Importer	-2.33***	0.20	-1.71***	0.24	-1.71***	0.24
PROINV Exporter	0.60	0.19	1.15***	0.23	1.19***	0.23
PROINV Importer	0.15	0.22	0.29	0.26	0.28	0.26
Services Exporter	1.19***	0.11	1.18***	0.12	1.22***	0.12
Services Importer	0.54***	0.13	-0.13	0.14	-0.14	0.14
GDP Exporter	1.08***	0.09	0.68***	0.12	0.68***	0.11
GDP Importer	1.51***	0.07	1.23***	0.08	1.23***	0.08
GDPPC Exporter	-1.42***	0.13	-1.57***	0.15	-1.67***	0.15
GDPPC Importer	-0.96***	0.14	-0.42**	0.16	-0.42**	0.16
Distance	-1.85***	0.15	-	-	-	-
Adjacency	9.36***	0.59	-	-	-	-
Colony	5.51***	0.65	-	-	-	-
AMU	-1.07	1.59	6.26***	0.47	6.28***	0.47
CEMAC	0.57**	0.29	2.68	1.72	2.62	1.68
COMESA	0.84**	0.35	3.27***	0.41	3.31***	0.41
ECOWAS	0.19	0.47	2.37***	0.48	2.34***	0.48
SADC	1.33**	0.49	4.27***	0.55	4.43***	0.56
UEMOA	1.14*	0.65	4.93***	0.59	4.90***	0.59
English	2.01***	0.24	-	-	-	-
French	1.71***	0.19	-	-	-	-
Spanish	-2.39**	1.09	-	-	-	-
Arab	-0.38	0.53	-	-	-	-
Portuguese	1.47**	0.74	-	-	-	-
Observations	6360		6360		6360	
R^2	0.4642		0.3006		0.3019	

Notes: All non-dummy variables are in logs. The notations "*", "**", and "***" denote significance at 10, 5 and 1 percent levels, respectively.

CEDOC is the average number of documents to export and import; REDOC is the average number of procedures to starting a business, enforcing contract, and registering a property; CEDAY is the average number of days to export and import; REDAY is the average number of days to starting a business, enforcing contract, and registering a property; PROINV is investor's protection index.

Source: Authors' computations based on World Bank *Doing Business* for business environment, World Bank *World Development Indicators* for GDP, port efficiency and services, International Monetary Fund *Direction of Trade and Statistics* for trade, and CEPII database for the language and geographical variables.

Table 6: Tobit Estimates

	Pooled Cross-Section		Year 2004 Fixed Effect		Importer Fixed Effect	
	Coeff.	Std. Error	Coeff.	Std. Error	Coeff.	Std. Error
Constant	-13.66**	4.57	-18.96***	4.77	-15.92***	5.03
Ports Exporter	0.34***	0.07	0.43***	0.07	0.46***	0.07
Ports Importer	0.09	0.06	0.23***	0.06	0.24***	0.06
REDOC Exporter	-2.05***	0.57	0.79	0.63	0.03	0.74
REDOC Importer	-4.36***	0.50	-6.02***	0.55	-6.04***	0.55
CEDOC Exporter	-2.99***	0.49	-2.47***	0.55	-2.50***	0.55
CEDOC Importer	-1.87***	0.47	-1.11**	0.54	-1.07**	0.54
PROINV Exporter	1.41***	0.30	2.63***	0.34	2.59***	0.33
PROINV Importer	0.62*	0.34	0.63*	0.38	0.61	0.38
Services Exporter	2.06***	0.18	2.69***	0.20	2.60***	0.21
Services Importer	1.27***	0.19	0.31	0.21	0.26	0.21
GDP Exporter	1.31***	0.12	0.76***	0.13	0.76***	0.13
GDP Importer	1.90***	0.10	1.56***	0.11	1.55***	0.11
GDPPC Exporter	-2.24***	0.22	-2.89***	0.25	-2.85***	0.24
GDPPC Importer	-1.39***	0.20	-0.99***	0.22	-0.95***	0.22
Distance	-2.38***	0.19	-	-	-	-
Adjacency	11.70***	0.48	-	-	-	-
Colony	5.32***	0.73	-	-	-	-
AMU	-2.03	1.80	8.51***	1.87	8.56***	1.87
CEMAC	0.59	0.39	3.19***	0.44	3.17***	0.44
COMESA	0.91**	0.45	3.71***	0.49	3.73***	0.49
ECOWAS	1.23*	0.68	4.22***	0.72	4.23***	0.72
SADC	0.35	0.80	4.31***	0.90	4.37***	0.90
UEMOA	1.00	1.00	6.04***	1.10	6.01***	1.10
English	2.29***	0.36	-	-	-	-
French	2.70***	0.31	-	-	-	-
Spanish	-5.13**	2.18	-	-	-	-
Arab	0.48	0.78	-	-	-	-
Portuguese	2.98**	1.36	-	-	-	-
Observations	6360		6360		6360	
Log likelihood	-16335.4		-16979.4		-16979.01	
Pseudo R^2	0.096		0.0609		0.0609	

Notes: All non-dummy variables are in logs. The notations "*", "**", and "***" denote significance at 10, 5 and 1 percent levels, respectively.

CEDOC is the average number of documents to export and import; REDOC is the average number of procedures to starting a business, enforcing contract, and registering a property; CEDAY is the average number of days to export and import; REDAY is the average number of days to starting a business, enforcing contract, and registering a property; PROINV is investor's protection index.

Source: Authors' computations based on World Bank *Doing Business* for business environment, World Bank *World Development Indicators* for GDP, port efficiency and services, International Monetary Fund *Direction of Trade and Statistics* for trade, and CEPII database for the language and geographical variables.

Table 7: Tobit Estimates

	Pooled Cross-Section		Year 2004 Fixed Effect		Importer Fixed Effect	
	Coeff.	Std. Error	Coeff.	Std. Error	Coeff.	Std. Error
Constant	-34.02***	4.31	-48.17***	4.34	-47.33***	4.34
Ports Exporter	0.22***	0.07	0.34***	0.08	0.36***	0.08
Ports Importer	-0.01	0.06	0.18**	0.06	0.18**	0.06
REDAY Exporter	0.90***	0.25	1.82***	0.28	1.87***	0.28
REDAY Importer	0.19	0.20	0.79***	0.22	0.80***	0.22
CEDAY Exporter	-2.54***	0.34	-2.85***	0.39	-2.88***	0.39
CEDAY Importer	-3.18***	0.31	-2.41***	0.34	-2.41***	0.35
PROINV Exporter	0.93**	0.31	1.59***	0.35	1.61***	0.35
PROINV Importer	0.60*	0.34	0.82**	0.39	0.79**	0.39
Services Exporter	1.82***	0.18	1.81***	0.21	1.86***	0.21
Services Importer	1.11***	0.19	0.13	0.21	0.09	0.21
GDP Exporter	1.58***	0.13	1.14***	0.15	1.13***	0.15
GDP Importer	2.17***	0.10	1.78***	0.12	1.78***	0.12
GDPPC Exporter	-2.20***	0.21	-2.42***	0.23	-2.52***	0.23
GDPPC Importer	-1.70***	0.21	-0.93***	0.22	-0.90***	0.23
Distance	-2.68***	0.19	-	-	-	-
Adjacency	11.03***	0.48	-	-	-	-
Colony	5.63***	0.72	-	-	-	-
AMU	-1.85	1.80	7.76***	1.88	7.78***	1.88
CEMAC	0.54	0.39	3.11***	0.44	3.06***	0.44
COMESA	1.24**	0.45	4.56***	0.49	4.61***	0.49
ECOWAS	0.22	0.70	3.36***	0.73	3.34***	0.73
SADC	1.82**	0.80	5.84***	0.90	6.04***	0.90
UEMOA	1.63	1.01	6.92***	1.11	6.89***	1.10
English	2.79***	0.36	-	-	-	-
French	2.79***	0.31	-	-	-	-
Spanish	-4.86**	2.19	-	-	-	-
Arab	-0.52	0.78	-	-	-	-
Portuguese	2.60**	1.36	-	-	-	-
Observations	6360		6360		6360	
Log likelihood	-16335.44		-17001.79		-16998.85	
Pseudo R^2	0.0965		0.0596		0.0598	

Note: All non-dummy variables are in logs. The notations "*", "**", and "***" denote significance at 10, 5 and 1 percent levels, respectively.

CEDOC is the average number of documents to export and import; REDOC is the average number of procedures to starting a business, enforcing contract, and registering a property; CEDAY is the average number of days to export and import; REDAY is the average number of days to starting a business, enforcing contract, and registering a property; PROINV is investor's protection index.

Source: Authors' computations based on World Bank *Doing Business* for business environment, World Bank *World Development Indicators* for GDP, port efficiency and services, International Monetary Fund *Direction of Trade and Statistics* for trade, and CEPII database for the language and geographical variables.

Table 8: Sample and Definition of the Regional Trade Blocs

Regional Trade Blocs	**Countries Members**	**Main dates***
CEMAC (Economic and Monetary Community of Central Africa)	Cameroon, Central African Republic, Chad, Congo, Equatorial Guinea, Gabon	1962, creation of the UDE (Equatorial Customs Union); 1964, revision and creation of the UDEAC (Central African Customs and Economic Union); 1973, revision of the UDEAC; end of the 1980s, failure of the compensation funds; 1994, revision and creation of the CEMAC
ECOWAS (Economic Community of West African States)	Benin, Burkina Faso, Cape Verde, Côte d'Ivoire, Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone, Togo	1975, creation of the ECOWAS; 1990, start of a more general scheme of intra-regional liberalization
UEMOA (West African Economic and Monetary Union)	Benin, Burkina Faso, Côte d'Ivoire, Guinea-Bissau, Mali, Niger, Senegal, Togo	1994, creation
COMESA (Common Market for Eastern and Southern Africa)	Angola, Burundi, Comoros, Djibouti, Ethiopia, Kenya, Madagascar, Malawi, Mauritius, Mozambique, Rwanda, Seychelles, Sudan, Uganda, Zambia, Zimbabwe	1981, creation of the PTA (Eastern and Southern African Preferential Trade Area); end of 1980s, first reduction in the customs tariffs on intra-regional trade; 1993, revision and creation of the COMESA
SADC (Southern African Development Community)	Angola, Malawi, Mauritius, Mozambique, South Africa, Tanzania, Zambia, Zimbabwe	1980, creation of the SADCC (Southern African Development Coordination Conference); 1992, revision and creation of the SADC
AMU (Arab Maghreb Union)	Algeria, Mauritania, Morocco, Tunisia	1989, creation
Other Countries	Canada, Mexico, United States of America, Bolivia, Chile, Colombia, Ecuador, Peru, Venezuela, Argentina, Brazil, Paraguay, Uruguay, Indonesia, Malaysia, Philippines, Singapore, Thailand, Austria, Belgium, Denmark, Germany, Greece, Italia, Ireland, France, Finland, Luxembourg, Netherlands, Portugal, Spain, Sweden, United Kingdom	

*The dates for CEMAC, ECOWAS, COMESA and SADC are drawn from Carrère (2004).

Note: African countries are reporter & partner. The countries outside Africa are partner only.