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Integrating Landlocked Developing Countries into international trading system through trade facilitation

By

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Executive summary

This study empirically investigates how the quality of trade facilitation (both on-the-border and behind-the-border factors) in landlocked developing countries (LLDCs) and in their transit countries impacts LLDC trade. It uses an augmented gravity model incorporating trade facilitation variables. Two sets of gravity models are estimated, one to explain LLDC exports and the other to explain LLDC imports. The main contribution of this study is the consideration of trade facilitation environment in both LLDCs and transit countries.

Two sets of trade facilitation variables are used: the logistics performance index (LPI) and its six indicators; and two aggregate governance indicators combining, respectively, all and three of the six governance indicators developed by Daniel Kaufmann, Aart Kraay and Massimo Mastruzzi for the World Bank.

The results are partly in line with a priori expectations and partly contrary to the same. The study finds that besides traditional gravity variables such as distance, contiguity and economic size, colonial relationship, existence of common colonizer and common official language, and tariff—all of which have expected sign and are significant—logistics performance in LLDC and in their transit gateway countries also significantly affect LLDC exports. The distance coefficient ranges from -1.41 to -1.6, which is higher than in most gravity studies, while the tariff coefficient ranges from -2.33 to -2.65. This indicates that despite the reduction in transportation costs due to technological advancements and the global fall in tariff barriers, distance and tariffs still matter for LLDC exports.

The results suggest that improvement in the logistics performance in LLDCs and their transit gateway countries can boost LLDC exports. Where significant, transit-country coefficients are lower than exporter coefficients for LPI and its sub-components, implying that improvement in LLDCs' own logistics performance in its various dimensions is as critical as improvement in transit-country logistics performance. A one percent improvement in the LPI score of an LLDC is associated with, on average, ceteris paribus, a 2.84 percent to 3.27 percent increase in its exports, while the corresponding impact of the same improvement in the LPI score of transit country(ies) ranges from 1.10 percent to 1.20 percent. Improvement in the competence of the local logistics industry in LLDCs is found to have the biggest impact on LLDC exports. A particularly interesting finding is that improving the efficiency of clearance at the customs/border in LLDCs is more important than doing the same in transit countries as far as boosting LLDC exports is concerned. But non-customs-related aspects of trade facilitation in transit countries, such as ease and affordability of arranging international shipments and transport and information technology infrastructure, remain important areas needing reform to help increase LLDC exports.

However, aggregate governance performance in LLDCs is found to have an impact on LLDC exports out of line with a priori expectations—a result that needs to be investigated in future studies.

An important policy implication flowing from the results is that international assistance for improving the trade performance of LLDCs, as envisaged by the Almaty Programme of

Action, endorsed by the United Nations General Assembly, should focus on improving the trade facilitation environment in both the LLDCs and their transit neighbours. The local logistics industry in LLDCs, and the ease and affordability of arranging international shipments and logistics-related transport and information technology infrastructure in transit countries should receive high priority. International and regional development agencies should scale up support for the creation and implementation of efficient transit transport regimes at the regional level based on global good practices for a meaningful integration of LLDCs into the global economy. Along with improvements on the trade facilitation front, as tariffs maintained by LLDC trade partners are found to be a barrier to LLDC exports, ways need to be also explored to reduce tariffs on products of export interest to LLDCs.

In the models explaining LLDC imports, geographic and cultural variables, economic mass and colonial ties are found significant, as is tariff. In fact, tariff is found to have a greater impact on imports relative to exports (though at a lower level of statistical significance). Distance, contiguity, and official language have a greater impact on imports than on exports of LLDCs, whereas the reverse is true for the variables economic mass, colonial relationship and common colonizer. One policy implication is that LLDCs should rationalize their tariff structures, which will help bring about a more efficient resource allocation, leading to increased specialization and export competitiveness. In contrast, the impact of LLDC trade facilitation, as measured by improvements in LPI and its sub-components, on LLDC imports is found to be insignificant, mostly. While this result merits further investigation, one can hypothesize that it may be explained by the import structure of LLDCs, dominated by products such as necessities and certain luxury items that not much sensitive to trade costs. If this is the case, then improvements in LLDC trade facilitation environment would imply improved trade balance of LLDCs, as exports would increase. However, the study shows transit-country logistics performance and aggregate governance performance to impact LLDC imports in a direction opposite to a priori expectations. This remains an issue for further investigation.

Introduction

The 31 landlocked developing countries (LLDCs) are widely dispersed around the globe¹. Despite their location on four continents, all 31 LLDCs share common problems of geographical remoteness and high transport costs in international trade transactions. But they also have a common goal, namely the integration of their economies into the global trading system in a way that would enable them to reap more benefits from international trade (UNCTAD 2005).

According to the United Nations (UN), LLDCs, as a group, are among the poorest developing countries. They face tremendous challenges to growth and development due to a wide range of factors, including weak institutional and productive capacities, small domestic markets, and high vulnerability to external shocks, as well as poor physical infrastructure and remoteness from world markets (UNCTAD 2005). Sixteen of the LLDCs, or more than half, also belong to the category of least-developed countries (LDCs). Lack of territorial access to the sea, remoteness and isolation from world markets result in substantially higher transportation costs for LLDCs and reduce their competitiveness in international trade².

Since tariffs have been lowered in several rounds of multilateral trade negotiations, the simplification and the harmonization of international trade procedures are of even greater importance to LLDCs than to other countries, because of their need to pass much of their merchandise trade through at least one transit country. The trade-hindering effect of long distances is compounded by an inadequate transport infrastructure, both in the LLDCs and in their neighbouring transit countries. A low density of roads and railway lines, and congested ports and generally weak infrastructure maintenance in LLDCs and many of their transit partners are serious obstacles to efficient trade transactions (UNCTAD 2005).

Chowdhury and Erdenebileg (2006), describing why geography matters and LLDCs are at a disadvantage vis-à-vis coastal countries, argue that a lack of direct access to the sea, isolation from major economic centres, inadequate transport infrastructure and cumbersome transit procedures combine to hamper the ability of LLDCs to grow successfully, especially through the well-worn path of international trade. They contend that high transport costs discourage trade in goods and services, and LLDC transport costs are high because of remoteness and isolation from major markets, lack of direct access to the sea, infrastructure deficiencies within LLDCs, and use of multimodal transportation. An important factor contributing to high CIF/FOB margins for LLDCs is the greater economic and political risks they face, considering their absolute dependence on transit neighbours for trade flows; the uncertainty of inland road conditions and customs clearance inevitably means higher insurance premiums in addition to basic transport costs (Chowdhury and Erdenebileg 2006).

¹ 15 are located in Africa, 12 in Asia, 2 in Latin America and 2 in Central and Eastern Europe.

² *Ad valorem* trade costs, covering freight and insurance costs for exports, are higher in LLDCs (12.9 percent) than in other developing countries (8.1 percent) and developed countries (5.8 per cent), owing to high transit costs and risks associated with exports from LLDCs. See UNCTAD (2003).

Faye *et al.* (2004) identify four types of dependence of LLDCs on transit neighbours that are important in explaining the poor development and trade performance of LLDCs: dependence on neighbours' infrastructure; dependence on sound cross-border political relations; dependence on neighbours' peace and stability; and dependence on neighbours' administrative practices.

Gravity model has become the workhorse for estimating and explaining trade flows. However, use of trade facilitation variables is still limited, and gravity model-based research explaining LLDCs' trade flows particularly using trade facilitation variables is rarer still.

Limão and Venables (1999) show that that improving an LLDC's own infrastructure and the transit country's infrastructure from the median to the twenty-fifth percentile would reduce the cost penalty of landlockedness from 46 percent to 32 percent and 36 percent respectively. If both countries' infrastructure is enhanced at the same time, then the penalty drops even further, to 26 percent. Such improvements and cost reductions would raise the LLDC's volume of trade considerably — by 8 percent with improvements in its own infrastructure; by 2 percent with improvements in transit country infrastructure; and by 11 percent in the event of a simultaneous improvement.

Assessing the benefits of trade facilitation, Wilson, Mann and Otsuki (2005) develop four measures of trade facilitation—port efficiency, customs environment, regulatory environment and service sector infrastructure (proxied by the Internet and e-commerce use by business)—and use them in a gravity model to show that increased trade in manufacturing goods from trade facilitation improvements in all four areas yields increases in both exports and imports. Improvement in all four forms of trade facilitation of the 'below-average' countries 'halfway' to global average yields an increase in global trade of US\$377 billion. The gains are largely through export expansion and the most important ingredient in achieving these gains, particularly to the OECD market, is a country's own trade facilitation reform efforts. Comparing South-South trade with South-North trade, the former is more affected by tariffs than the latter. The customs environment of importing country, the regulatory environment of both exporting country and importing country and the service sector infrastructure of exporting country are important factors influencing South-South trade. The study also showed that for landlocked countries, ports are as important for both import and export as in non-landlocked countries while for island countries, ports are more important for their import and less important for their export compared to non-island countries.

Djankov, Freund and Pham (2006) found that each additional day that a product is delayed prior to being shipped reduces trade by more than one percent—or each day is equivalent to a country distancing itself from its trade partners by about 70 km on average. They also control potential endogeneity using a sample of landlocked countries and instrument for time delays with export times that occur in neighboring countries—showing that a one percent increase in export times in landlocked countries reduces trade by about one percent. They also find that delays have an even greater impact on exports of time-sensitive goods, such as perishable agricultural products.

Persson (2007) assessed the potential benefits from trade facilitation in terms of increased trade flows on average and specifically for the six regional groups of ACP countries negotiating

Economic Partnership Agreements with the EU. Their results suggest that time delays on the part of the exporter and the importer generally significantly decrease trade flows, but also that this effect is not constant, in the sense that the elasticity of trade with respect to border delays declines at higher levels of time requirements. On average, lowering border delays in the exporting country by one day from the sample mean would yield an export-increasing effect of about 1 percent, while the same reduction in the importing country would increase imports by about 0.5 percent. Significant negative effects are also found of both export and import transaction costs for most EPA groups, and the effects tend to be at least as large as the average or larger.

Duval and Utoktham (2009) analyze the impact of behind the border business performance on trade flows among 37 countries, i.e., countries from Southeast, South, North, and Northeast Asia, OECD countries, as well as Brazil, Russia and South-Africa, through gravity models, using two sets of indicators to capture behind-the-border business performance—average of each country's rank in nine of the 10 areas of Doing Business (excluding trading across borders); and values of three Doing Business Indicators, namely Getting Credit (credit information index), Protecting Investors (disclosure index), and Enforcing Contracts (number of procedures). They also use the cost of import/export from factory to seaport (available in the Doing Business Report) as an explanatory variable in their models. They confirm that measures aimed at reducing the behind and at-the-border cost of exporting, such as reductions in customs and port fees and charges, and improvements in transport infrastructure and logistics services, can be expected to have a significant impact on trade. They find that a 5 percent reduction in the cost of moving goods from the factory floor to the deck of a ship at the nearest port is found to increase exports by 4 percent or more. However, their study also reveals that improving the domestic business (investment) environment may have an impact on export competitiveness of a magnitude similar to the trade and transport facilitation measures. In particular, they find that simplifying domestic contract enforcement procedures in Asian developing countries to the OECD average may increase exports by up to 27 percent. Similar improvements in credit market information in Asia may increase exports by up to 16 percent. The study also finds evidence that achieving similar performance levels across the range of trade and business facilitation areas, i.e., having a more integrated approach to trade and business facilitation, could significantly increase trade competitiveness. Gains from improvements in business regulatory coherence in Asia could generate an additional 3 percent average increase in bilateral exports for countries of the region.

Weerahewa (2009), using a gravity model to estimate the gains that can be acquired from improving trade facilitation in South Asia, focusing on exports of food and agricultural commodities, finds that trade facilitation variables have significant effects on exports of different products, in varying degrees, depending upon the proxy used – Logistics Performance Index (LPI) and trade costs (Doing Business Report). The study finds that LPI has large positive effects on the value of exports of all the product categories. The estimates for trade costs are negative and significant. Improving trade costs and logistics performance in South Asian countries up to the average values of the best performer in South Asia brings down trade costs by over 17 percent, resulting in an increase in the value of agricultural trade of 18 percent and 27 percent respectively.

Our study seeks to empirically investigate how the quality of trade facilitation (both on-the-border and behind-the-border factors) in LLDCs and in their transit countries impacts LLDC trade. We use an augmented gravity model incorporating trade facilitation variables.

Methodology and data

Gravity models are being used extensively to explain trade flows between countries. Drawing an analogy with Newton's theory of gravity, the basic, traditional gravity model argues that bilateral trade flows increase with the product of economic sizes and decreases with geographical distance. One of the most commonly used gravity model derived from solid micro-foundations is the model due to Anderson and Van Wincoop (2003 and 2004). Besides physical distance and economic mass, factors affecting trade costs (e.g., tariffs, trade facilitation indicators, non-tariff barriers, colonial ties, common language, etc) are also used as other determinants of bilateral trade flows.

We estimate two sets of gravity models, one for LLDC exports and the other for LLDC imports.

Equation 1

$$\begin{aligned} \ln X_{ij} = & \alpha + \beta_1 \ln(1 + \text{Tariff} / 100) + \beta_2 \ln(\text{GDP}_i * \text{GDP}_j) + \beta_3 \ln(\text{dist}_{ij}) \\ & + \beta_4 \text{Dcontig} + \beta_5 \text{Dcomcol} + \beta_6 \text{Dcol} + \beta_7 \text{Dcomlang} + \beta_8 \text{TF}_i + \varepsilon_{ij} \end{aligned}$$

Equation 2

$$\begin{aligned} \ln M_{ij} = & \alpha + \beta_1 \ln(1 + \text{Tariff} / 100) + \beta_2 \ln(\text{GDP}_i * \text{GDP}_j) + \beta_3 \ln(\text{dist}_{ij}) \\ & + \beta_4 \text{Dcontig} + \beta_5 \text{Dcomcol} + \beta_6 \text{Dcol} + \beta_7 \text{Dcomlang} + \beta_8 \text{TF}_j + \varepsilon_{ij} \end{aligned}$$

The dependent variable is natural logarithm of merchandise exports or imports of LLDCs. Trade value is in current US\$ for the year 2008. Trade data are sourced from UNCOMTRADE through the World Integrated Trade Solution (WITS). As direct export/import data are not available for all LLDCs, mirror data are used instead for all of them—that is, imports (exports) of partner countries from (to) an LLDC are considered as that LLDC's exports (imports).

We consider only positive trade flows. There are 2,628 bilateral pairs with positive

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