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## The Logistics Performance Effect in International Trade

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### ABSTRACT

The continuous growth in world trade depends on the efficiency of trade support structures such as the logistics services. Despite logistics integral role in supporting commercial activities, there has generally been a low level of analysis and trade policy research focus from trade practitioners. This paper explores the effect of logistics performance in international trade. The analysis draws on overall logistics performance as well as disaggregated measures of logistics specificities data for a large sample of countries. The empirical analysis involved the estimation of standard export and import equations incorporating measures of logistics performance. The findings show that the overall logistics performance is positively and statistically significantly correlated with exports and imports. The analysis is also extended by investigating if logistics specificities mattered for international trade. The findings reveal that several dimensions capturing logistics performance have statistically significant and positive effect, mostly on exports. The main policy implication is that continuous investment in logistics infrastructure and services can positively impact international trade.

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### 1. Introduction

Transport and logistics services facilitate international trade and play an important role in the growth and development of the local economy. The quality and efficiency of logistics services can matter for international trade as a weak logistics infrastructure and operational processes can be a major obstacle to global trade integration (Devlin and Yee, 2005). On the contrary, an improved trade related logistics, combined with a liberalized economic environment, can increase trade volume and economies of scale and scope in distribution and production activities (Lakshman et al. 2001).

Logistics services provide sectoral connections within the local

economy. It also connects the domestic economy to the international economy. The connectivity of various inter-dependent production sectors (agriculture, manufacturing, agri-food, tourism, amongst others) of the domestic economy is strengthened through an efficient transport and logistics systems as one of the motives of producers is to securely transport their goods to consumers in a cost-effective way with minimal time lags. Song and Yeo (2017) provided a comprehensive analysis of air transport network of 1060 airports in 173 countries. This is one important study that unfolded an in-depth understanding of the connectivity in the

air transport sector. Similarly, the domestic producer's ability to participate and reap the benefits of the growing global value chains, GVCs, (factories locating various stages of production processes in most efficient locations and combined with integrated use of technologies (containerization, air freight, telecommunications and informatics)) depends on efficient and reliable transport and logistics systems that can support their international linkages. A recent study by Banga (2014) revealed that 67 percent of global value created under GVC accrued to the Organisation for Economic Co-operation and Development (OECD) countries. Banga (2014) also noted that the share of Newly Industrialised Countries (NICs) and five major emerging economies (Brazil, Russia, India, China and South Africa (BRICs)) were 25 and 8 percent respectively. Thus, a better connectivity can lead to direct development outcomes in terms of facilitating the achievement of vital social development goals such as the creation of employment; the distribution of food and medicines (Pasadilla and Shepherd, 2012 and OECD/World Trade Organisation (WTO), 2013); and improving incomes (Porto et al., 2011).

Although, logistics contribution to the national output in a country may not be as competitive as other sectors, the role that logistics plays in supporting the activities within an economy cannot be undermined or overlooked. One well-known connection between transport and logistics and national development is the facilitation of international trade, which, under appropriate circumstances, delivers several other beneficial economic and social outcomes (OECD/WTO, 2013). The transport and logistic sector is an integral part in terms of facilitating international trade as it allows firms to effectively complete imports and exports of goods and services and associated transactions.

The continuing rise of world trade and the desire by many countries to speed up the pace of integration within the global trading system will depend not only on maintaining an open global economic system but improving the quantity and efficiency of the support structures such as the logistics services. Poor logistics services such as limited co-ordination among countries on border procedures; inefficiency of customs clearance process at the ports; fragmented and poor quality of transportation related infrastructure; costly and infrequent shipping (with long and indirect shipping routes); delays in tracking and tracing consignments; delays in terminal handling and clearance of goods; absence of cool storage facilities at ports; and the inability to certify product quality; amongst others; can cause significant hindrance to international trade.

The forces of trade liberalisation will continue to drive countries around the world to achieve greater participation in, and reap the benefits of the globalising world that offers growing market opportunities. It is the level of development in the domestic as well as international logistics services that can be a critical element in terms of allowing countries to trade without many constraints and at lower costs. While improved overall logistics services can be an important step towards shaping long-term trade facilitation, whether the level of logistics services facilitates more trade is an important empirical question. This issue deserves further investigation as empirical studies from this perspective are rare.

Despite logistics integral role in supporting commercial activities, there is generally a low level of analysis as well as trade policy research focus from an applied economics perspective. Available literature points to the fact that there is little detailed empirical work on the effects of logistics on trade performance. One likely cause of this deficiency is the absence of numerical measures capturing logistics performance on a consistent and timely basis with large country coverage and sector specificity (Shepherd, 2011). While trade researchers have provided some qualitative assessment

of the developments in logistics services at country level, an empirical investigation of the impact of logistics on trade could also provide an additional useful guide to trade policy makers as well as logistics operators.

The purpose of this paper is to empirically examine the effect of logistics on international trade. Using regression analysis, the analytical framework in this study uses logistics data from sixty countries, pooled for years 2007, 2010, 2012, and 2014. It estimates an export and an import equation. The analysis is also extended by investigating if the specific dimensions of logistics performance (logistics specificities) matter for traders. In doing so, the paper while complementing past studies on logistics-trade relationship, sheds some new light on the importance of logistics achievements in facilitating international trade. The rest of the paper is structured as follows. Section two reviews the literature. Section three presents the analytical framework. Section four presents the findings. Section five concludes and discusses the policy implications.

## 2. Literature Review

### 2.1. Logistics Performance: An Overview

Globally, the size of the logistics sector is not clearly known. Shepherd's (2011) analysis of logistics data, covering 45 countries, revealed that, on average, the logistics sector accounts for about 5 percent of the gross domestic product (GDP), with a range of 2 percent to 12 percent. Given the pace at which the world trade has been increasing since 2000 (noted below), the contribution of the logistics sector to the national output in many countries is likely to accelerate as the pace of trade liberalisation strengthens and countries become more and more outward oriented.

Data constraints have made research on logistics formidable. Recent initiatives by the World Bank in terms of compiling the Logistics Performance Index (LPI) for several countries across the globe have made it possible to get a reasonable understanding of achievements in logistics at the national level for several countries around the world. The World Bank has been producing some measures of the LPI annually since 2007. To-date, published data measuring logistic performance in the World Bank member countries are available for years 2007, 2010, 2012, 2014 and 2016. The World Bank's Overall Logistics Performance Index is measured on a scale of 1 (low) to 5 (high). This measure is the weighted average of the country scores covering six sub-dimensions of logistics performance. These sub-dimensions include: the ability to track and trace consignments; the competence and quality of logistics services; the ease of arranging competitively priced shipments; the efficiency of customs clearance process; the frequency with which shipments reach consignee within scheduled or expected time; and the quality of trade and transport-related infrastructure. All these sub-dimensions are also measured on a scale of 1 (low) to 5 (high). The LPI measures on-the-ground trade logistics performance, helping national leaders, key policymakers, and private sector traders understand the challenges they and their trading partners face in reducing logistical barriers to international commerce.

The quality of logistics performance can be gauged from the World Bank data to give a modest indication of logistics performance across countries around the world at different levels of development. Figure 1 depicts the average overall logistics performance index by income category of countries around the world. According to Figure 1, logistics achievements differ markedly across income category of countries. There

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