Available online at www.sciencedirect.com
ScienceDirect
Journal of African Trade xx (2017) xxx – xxx

Infrastructure, trade facilitation, and network connectivity in Sub-Saharan Africa☆,☆☆

Ben Shepherd

Developing Trade Consultants, United States

Received 13 March 2017; received in revised form 24 May 2017; accepted 26 May 2017

Abstract

This paper uses new measures of value added in exports in two sectors (textiles and clothing, and agriculture) to examine the linkages between trade facilitation and infrastructure on the one hand, and value chain participation on the other. It applies network analysis methods to derive a summary measure of value chain connectivity for 189 countries, including 44 in Sub-Saharan Africa. There is a statistically significant association between this measure and summary indicators of infrastructure development and trade facilitation performance. Moreover, it is not only a country's own performance that matters, but also that of its neighbors. The regional dimension of infrastructure and trade facilitation policies is an important determinant of particularly SSA countries' ability to connect to global value chains.

Keywords: Trade; Global value chains; Connectivity; Infrastructure; Trade facilitation; Sub-Saharan Africa

1. Introduction

Global and regional value chains (GVCs) are an important way of organizing production, trade, and investment in a wide variety of sectors. The term "value chain" refers to the full range of processes involved in the design, production, and distribution of a final product. It stretches from far upstream—activities like research and development—to downstream activities such as assembly, distribution, marketing, and after sales service. The distinctive property of GVCs is that these activities are spread across multiple countries, often in the same neighborhood, but sometimes also in

☆ Peer review under responsibility of Afreximbank.

☆☆ I am grateful to the following for helpful comments and suggestions: Douglas Brooks, Marie-Agnès Jouanjean, and Dirk Willem te Welde. Jakob Engel provided excellent research assistance.

E-mail address: ben@developing-trade.com.

http://dx.doi.org/10.1016/j.joat.2017.05.001

Please cite this article as: Shepherd, B., Infrastructure, trade facilitation, and network connectivity in Sub-Saharan Africa, Journal of African Trade (2017), http://dx.doi.org/10.1016/j.joat.2017.05.001

different parts of the world. Each firm that is part of a GVC specializes in a particular task, and the lead firm brings all the various tasks together through the supply of headquarters services, coordinating all inputs of goods and services to produce the final product and get it to the consumer.

The GVC paradigm potentially offers a new model to developing countries looking to build up their industrial base (e.g., Baldwin, 2013). In themselves, GVCs are neither wholly good nor wholly bad for development. On the positive side, they provide relatively low cost ways of linking to international trade networks, and allow countries to specialize in activities that are aligned with their comparative advantage. Developing countries can benefit through income and employment effects, even if they specialize in low value added activities, such as assembly. However, concerns have been expressed that GVCs run the risk of locking countries into those activities, and not promoting industrial or social upgrading over time. Clearly, the challenge of moving up a value chain into higher value added activities—which typically have important economic spillovers—looms large for many developing countries.

This paper does not seek to resolve the ongoing debate over the development merits of GVCs either generally, or in terms of their specific effects in a particular country or region. Instead, it starts from the position that GVCs can—under the right circumstances, including the presence of appropriate complementary policies—offer important economic and development benefits to developing countries. Against that background, the motivating question for this paper is as follows: how can traditionally marginalized countries in Sub-Saharan Africa (SSA) join GVCs, and improve their position in the global network of value added trade? In particular, what is the role of regional approaches to infrastructure and trade facilitation policies? These questions are important because of income-based linkages between trade and important economic and development outcomes, including poverty. This paper therefore focuses on one way in which regional infrastructure and trade facilitation can contribute to economic growth, development, and, as a consequence, poverty reduction, by examining the intermediate link to GVC participation.

There are good reasons to believe that trade costs are a key determinant of the pattern of trade and production under the GVC paradigm. For example, Saslavsky and Shepherd (2014) show that trade in parts and components—which typically takes place within GVCs—is more sensitive to improvements in logistics performance than is trade in final goods. Similarly, Ma et al. (2009) find that China's processing trade—a key part of its GVC participation—is linked to upstream and downstream trade costs. Infrastructure and trade facilitation are important components of trade costs (Arvis et al., 2013), so it is reasonable to expect that they would influence the ability of a country to connect with GVCs.

This paper makes a number of contributions with respect to the previous literature. First, it provides the first quantitative analysis of trade in value added—an indicator of GVC trade—for SSA. Existing work on value chains in SSA is typically qualitative, or limited to analyzing the ways in which value added is divided up among different actors in the chain. Quantitative work on value added trade has been limited to developed countries, and a small number of developing countries, mostly in Asia. This paper uses a new dataset to provide estimates of domestic value added content in exports for two sectors, textiles and clothing and agriculture, for 189 countries, including 44 in SSA.

Second, I build on recent applications of network analysis methods to economic phenomena (e.g., Acemoglu et al., 2012) to construct a measure of value chain connectivity in the two example sectors, again for 189 countries. The index is calculated for 1996, 2001, 2006, and 2011. Performance is compared across regions, and SSA's position in the global trade network is clearly put in perspective.

Third, I use national and regional measures of infrastructure and trade facilitation performance to analyze the ways in which value chain connectivity is determined by those two variables. There are strong indications in the data that interventions at both levels have considerable scope to improve value chain connectivity, particularly in textiles and clothing. Among the various types of infrastructure considered,

Please cite this article as: Shepherd, B., Infrastructure, trade facilitation, and network connectivity in Sub-Saharan Africa, Journal of African Trade (2017), http://dx.doi.org/10.1016/j.joat.2017.05.001