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Diversification and sophistication of livestock products: The case of African countries ☆

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ABSTRACT

This study assesses the level of sophistication of livestock products in Africa by evaluating technology intensity and economic complexity of each product. Using trade data from 1995 to 2012, livestock commodity exports are classified based on technology intensity. Employing a method of reflection in computing the economic complexity of export products, we find that one fifth of African livestock commodity exports are manufactured with low technology while the rest is composed of raw materials. The results also show that the ten most complex livestock commodities represent about a third of African livestock total exports while the world level is almost double this figure. Yet African countries spend a huge share of their wealth on importing complex products. The results imply that by exporting non-complex products Africa loses nearly a third of the total value of its livestock exports. To boost the value of livestock products, African countries should exploit their untapped potential while securing the domestic market to achieve import substitution. This can be done by integrating with global value chains or developing niche markets at the regional or international markets and improving productive capabilities.

Introduction

Africa has a sizable livestock population, and almost all African countries produce livestock. The sector provides a large spectrum of benefits spanning cash income, food, manure, draft and transport power, savings, insurance, and social prestige (Pica-Ciamarra et al., 2014). Notwithstanding the importance of the livestock sector, Africa has not been able to transform its vast livestock potential into value added products that can generate higher income and well-paying jobs. Traditional herding is especially predominant and many livestock producers do not see livestock as a commercial activity nor do they possess the technical capability to expand to economies of scale. In addition, local markets for livestock are constrained by lack of investment in infrastructure and the absence of a supportive and regulatory environment (McDermott et al., 2010). This has generally translated into low productivity and competitiveness of the sector in comparison to major livestock producing regions such as Latin America and Asia (Bahta and Malope, 2014).

The structure of the export basket of a country is an indicator of its productive structure. According to Lall (2000), products that require highly advanced technology are produced and exported by countries endowed with the appropriate human and physical capital and technological and institutional capabilities. Countries that exhibit complex or advanced productive structures are able to produce goods that other countries cannot, and these capabilities are not available everywhere. Conversely, countries with weak productive structure cannot produce sophisticated goods. According to the recent literature on economic complexity by Hidalgo and Hausmann (2009) and Hausmann et al. (2011), rich countries tend to export complex or sophisticated products while poor countries tend to export standard products or primary goods.

We apply recent methodology on product sophistication and complexity to the livestock sector by examining specifically the question: what quality of livestock products do African countries export and import? To answer this and related questions, we analyze the degree of sophistication of livestock commodity exports of African countries using the classification of Lall (2000). We also assess the degree of complexity of livestock products that African countries export and import. We use the method of reflection to compute the product economic complexity index. This uses the revealed comparative advantage (RCA) (Balassa, 1965) to define countries' diversity and product ubiquity (Hausmann et al., 2011) using country level and world export data.

☆ The views expressed in this paper are those of the authors and not of the African Development Bank Group or its Board of Directors.

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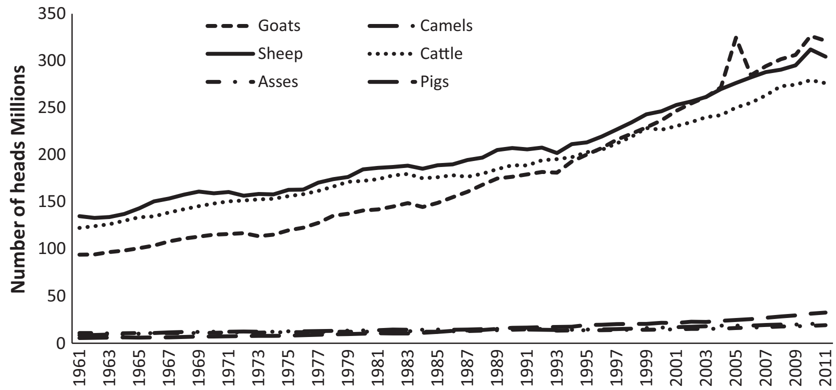

Fig. 1. Trend in African livestock production from 1961 to 2011. *Source:* Data collected from FAO, 2013.

The objective of this study is to analyze the structure of livestock commodity trade of African countries. Specifically, we look at technology intensity of these exports, their complexity, and the remaining untapped potential. The rest of the paper is organized as follows: Materials and methods discusses livestock production and exports in Africa; Results and discussion presents method used to assess the technology-intensity of exports and their comparative advantage which is then used to analyze the economic complexity of livestock commodities. Section 4 is a discussion of results, the need to strengthen livestock value chains, and the role of livestock producers. Conclusions and policy recommendations provides concluding remarks and policy recommendations.

Materials and methods

Livestock production and trade in Africa

Livestock population distribution in Africa

Africa's livestock population has shown steady growth since 1960.[1] The major species of livestock in Africa are cattle, sheep, and goats. Between 1995 and 2011, the goat population more than tripled while that of cattle more than doubled. During the last five years, we observe increasing predominance in the production of goats and sheep across the continent. Other livestock species raised on the continent include donkeys, pigs, camels, buffaloes, chicken, turkeys and others, but with the exception of poultry, these are of much less importance than cattle, goats and sheep (Figs. 1 and 2).

Expressed as tropical livestock units (TLU), the biggest producers of livestock in Africa in 2011 were Ethiopia (16% of Africa's total) followed by (former) Sudan (11.3%), Nigeria (8%), Kenya (7%), Tanzania (6%), and South Africa, Somalia, Niger, Mali and Burkina Faso (3–4% each). These ten countries account for about two thirds 2/3 of the continent's livestock.

In North Africa, Egypt, Morocco and Algeria are notable livestock producers, ranking 11th, 15th and 17th, respectively. Egypt has specialized in the herding of buffaloes, with a population estimated at 3.8 million heads in 2011. The major donkey herds are found in Ethiopia, followed by Egypt, Niger, Nigeria and Burkina Faso. The five leading producers of pigs are Nigeria, Uganda, Burkina Faso, Malawi and Angola. Somalia accounts for the largest camel population, followed by Sudan, Kenya, Niger and Chad. The major horse herders are Sudan and Senegal. It is interesting to see that each of the 54 African countries produces at least one of these livestock species, and this demonstrates Africa's potential in terms of livestock production.

Live animals and livestock products (raw materials or processed products) can be consumed in the domestic markets or exported to regional or international markets. In the following sections, we focus mainly on livestock commodity exports and imports of African countries.

African livestock commodity trade partners

African intra-regional trade of livestock products is minimal.[2] Using UNCTAD trade data 1995–2012, we found that on average, intra-regional trade accounts for 29% of total exports and 15% of total imports (Table 1). As with other types of commodities, African countries' livestock trade is oriented towards the rest of the world rather than within Africa.

At the regional level, the situation is quite striking and shows broad variations. Southern and West Africa lead in intra-region livestock trade, but trade is smaller in other regions. In West Africa, the share of intra-regional livestock trade is 45% of total exports conducted within the region but less than 8% of total imports are oriented inwards to the region. A little more than a third of exports and about a quarter of imports are traded within the Southern Africa region. However, the region has a negative trade balance with the rest of the world: 60% of its livestock commodities' exports go to that destination, which in turn is the origin of 72% of its imports.

Trade in other regions is low. For instance, Central Africa's intra-regional exports and imports account for 9% and 3%, respectively and a small share of that trade is oriented to the rest of the continent: less than 2% of their total exports and 9% of imports. In contrast, 89% of total trade in Central Africa is with the rest of the world. Intra-regional trade in Eastern Africa is equally small, with an average of 13% of their total livestock products traded within the region. A small proportion of 3% each, of their livestock production is exported to the Southern African and North African countries, respectively. About 80% of their trade is conducted with countries outside the continent. Intra-regional livestock trade in North Africa follows similar trend with other regions. Nearly 80% of total exports and 96% of total imports is with the rest of the world, especially the European countries and the Middle East region. About 15% of their exports and only 3% of imports are traded within the region. Livestock trade between North African countries and the rest of the continent is virtually non-existent on the import side. These results show that there is an opportunity

[1] In this study, we analyzed only the population of livestock which includes: goats, sheep, cattle, camels, asses, horses, mules, pigs, and buffaloes. But livestock can be extended to poultry, birds or other kinds of animals.

[2] Although informal trade is significant amongst African countries, it has not been considered in this analysis due to a lack of data.