

Title: Diversification and sophistication of livestock products: the case of African countries

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ABSTRACT:

Most African countries produce and export livestock and livestock commodities. In 2011, the continent accounted for more than 987 million heads of cattle. The five largest producers are Nigeria (12%), Ethiopia (11%), Sudan (11%), Kenya (7%), and South Africa (5%). On average, between 1995-2012, Africa's exports represent about 1.30% of the world exports with South Africa (25%), Egypt (10%), and Nigeria (9%) being the largest exporters on the continent. The objective of this study is to assess the level of sophistication of livestock products by evaluating their technology intensity and their economic complexity.

Firstly, following Lall (2000) and Lall et al. (2005), we classified livestock commodities exports according to their technology intensity. We used trade data from the United Nations Conference on Trade and Development (UNCTAD) from 1995-2012. The results show that 22% of African livestock commodity exports are manufactured using low technology and the rest is raw materials which do not require any technology.

Secondly, following the literature recently introduced by Hidalgo et al. (2007), Hidalgo and Hausmann (2009), and Hausmann et al. (2011), we used the method of reflection to compute the economic complexity of export products in order to better assess the livestock export basket of African countries. The product complexity index (PCI) is computed for 255 different kinds of export commodities following UNCTAD classification, but for this study, we focused mainly on livestock commodities. This index is defined based on the revealed comparative advantage of countries for a given product.

Results showed that livestock commodities in general are not highly complex since their average PCI is -0.398, which is relatively small compared with very complex products such as sophisticated machineries ($PCI > 2$). The most complex livestock products are in the category of meat, edible meat offal, salted, or dried with a PCI of 0.424 and are ranked 96/255. The ten most complex livestock commodities represent about 34% of African livestock total exports while the world level is almost double at 60%. Countries that export the most complex commodities are: South Africa (30%), Egypt (20%), Morocco (8%), Swaziland (7%), and Tunisia (4%) which (excluding South Africa) are not among the five largest livestock producers in Africa. These countries are also among the most complex economies in Africa. The least complex products are in the category of raw hides and skins (except furskins) with a PCI of -1.173 and are ranked 223/255. Our results are in line as those of Felipe et al. (2012) who also classified products according to their economic complexity.

The results imply that for Africa, there is an opportunity cost of about 27% of its total livestock exports when exporting non-complex products instead of complex products as the rest of the world does. How can African countries reverse this situation? This can be done by developing livestock value chains which start from the producers to the local or international consumers. To achieve that, countries need to develop their productive capabilities to support these value chains. For instance, it is crucial to know if livestock producers have the capabilities to regularly supply adequate stock for the processing and/or the manufacturing plants of the value chains. Previous studies, i.e.: Rodriguez (1985) and Jefferis (2007) showed that, in the short term, livestock producers may not be willing to sell their livestock since short term supply is inelastic: Botswana cattle: 0.3; Swaziland cattle: -1.1; and Zimbabwe beef: -0.3 to -0.6; while long term elasticities are often larger: Botswana and Zimbabwe: 2.6. Yet, with appropriate incentives, the supply could be elastic: i.e.: in Botswana, after government interventions, cattle supply short term and long term elasticities were respectively 1.51 and 1.01 in 2012 (Gosalamanga et al., 2012).

Keywords: technology intensity, sophistication, economic complexity, product complexity index, livestock, value-chain

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