

The economic and social implications of the African pharmaceutical manufacturing agenda on trade and welfare in Africa¹

Extended Outline: Not for Quotation

Background

The Covid-19 pandemic and its related economic, health and social implications have significantly impacted Africa vision for pharmaceutical manufacturing. This is mainly due to the uneven distribution of medicines and vaccines across the world during the outbreak and the high concentration of the global pharmaceutical industry in some handful countries.

The development of the pharmaceutical sector in Africa has not only the potential to enhance the health security but also to foster trade, economic growth, and welfare in the continent. These premises can help Africa catch up on the delay in the implementation of the 2030 Agenda for Sustainable Development occasioned by the Covid-19 pandemic.

More concretely, the continent shall develop the supply chain for manufacturing and distributing of pharmaceutical products. By doing so, Africa can leverage on its existing regional infrastructure of labs and manufacturers. The development of pharmaceutical manufacturing sites requires also new supply chains to provide them with raw materials, sufficient inputs, ancillary supplies, and capital equipment

Africa produces only 2 per cent of its medicines while it imports around 70 per cent of its needs from outside the continent². The implementation of the African Continental Free Trade Area (AfCFTA) is part of a wider strategy to ensure global access, equity and opportunity in Africa. It is expected also that this agreement shall support the pharmaceutical regional value chains and develop local pharmaceutical production through effective manufacturing plans. According to ECA (2019), the health care and wellness sector is projected to be worth \$259 billion by 2030 and has the potential to create 16 million decent jobs³.

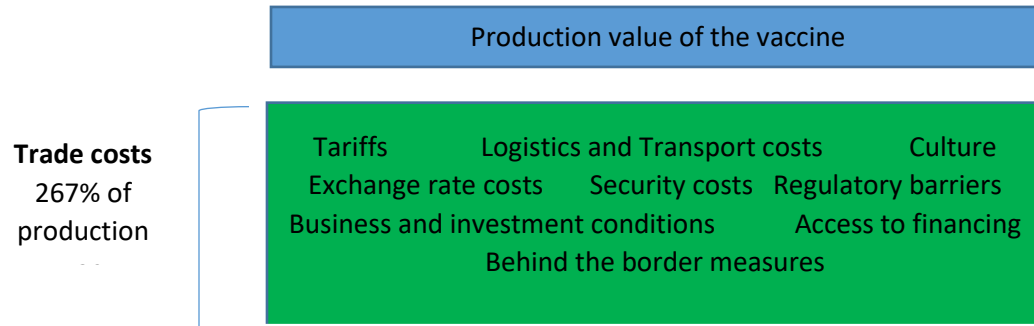
The development of pharmaceutical sector in Africa will imply the reduction of the trade cost namely the expense linked to transport, handling, insurance, and customs. The cost of the manufactured medicines includes the production value of the medicines and the estimated trade cost to supply the African market. (Figure 1).

¹ The views expressed in this paper are the authors own and do not reflect the position of their institution. Any mistakes or omissions are the sole responsibility of the authors.

² <https://hdl.handle.net/10855/43729>

³ “United Nations. Economic Commission for Africa (2019-02). Healthcare and economic growth in Africa. Addis Ababa. © UN. ECA. <https://hdl.handle.net/10855/43118>”

Figure 1: Composition of the Covid-19 vaccine cost in Africa: estimation of the trade cost in Africa: Example of the Covid-19 vaccines



Source Authors calculation based on data from ESCAP World Bank: International Trade Costs and adapted from WTO (2015)

We estimated the trade cost using the World Bank UNESCAP Trade Costs Database⁴ which includes trade costs by trade partner. So, we can simulate various scenarios based on the vaccine' country provider. The Database provides estimates of bilateral trade costs in manufactured goods during the period (1995-2018).

The bilateral trade costs are computed using the Inverse Gravity Framework of Novy (2009) which used the bilateral trade and gross national output to calculate the geometric average bilateral trade cost.

The geometric average bilateral trade cost ($\varphi_{i jkt}$) between country i and country j in sector k at time t , as the product of country i 's intra-national trade (x_{ii}) and country j 's intra-national trade (x_{jj}) divided by the product of country i 's trade flows to country j , (x_{ij}), and country j 's trade flows to country i , (x_{ji}), scaled by a sector specific elasticity of substitution between sectors⁵.

Hence, trade costs are estimated as higher when one country trade more domestically than it does internationally, and lower when it trades more internationally than it does domestically. The rationale is that the decrease of trade costs vis-à-vis another country will imply that the production which was consumed locally will be distributed abroad.

Equation 1: Formula of the geometric average bilateral trade cost

$$\varphi_{i jkt} = \left(\frac{x_{iikt} x_{jjkt}}{x_{ijkt} x_{jikt}} \right)^{\frac{1}{2(\sigma_k - 1)}} - 1$$

The average trade cost is the mean average of trade costs between African countries and their trade partners (Equation 2). By average costs, we incorporate logistics and transports costs, exchange

⁴ <https://databank.worldbank.org/source/escap-world-bank-international-trade-costs>

⁵ For more details on the model, please refer to ESCAP (2015)

rate costs, security costs, regulatory barriers, business and investment conditions, access to finance and all behind the border barriers.

Equation 2: Calculation Average trade cost in Africa

$$\text{Average trade cost}_{Africa} = \text{mean}(\text{trade cost}_{i,j})$$

i: African countries and j = International Trade partner

Using the World Bank UNESCAP Trade Costs Database, we calculate in a first step the African average trade costs in manufacturing sector. We found that the average trade costs in Africa is 267 % of the production value comparing to 199 % in Asia and 162% in Europe in 2018. On average, the trade costs are higher for African countries relatively to other developing countries⁶. This performance could be partially explained by the high transportation costs, business non-friendly climate and poor trade logistics services⁷.

The international trade costs vary widely within and across African countries as we can see from our calculations. On average the top 10 African countries with the lowest international trade costs in Manufacturing sector are: Algeria, Egypt, Ghana, Libya, Mauritania, Morocco, Mozambique, Seychelles, South Africa and Tunisia. The highest trade costs in the manufacturing sector are observed in Benin, Botswana, Burundi, Chad, Eswatini, Lesotho, Malawi, Rwanda, Sudan and Zimbabwe (Figure 2)

Given the high trade cost of pharmaceutical, African countries are more incline to produce, finance and distribute medicines within the continent to improve health security while minimizing the medicines trade cost.

Additional contribution of the paper

In this paper, we propose in a second step to simulate the impact of the reduction in trade costs on trade, economic growth and welfare in Africa using the GTAP computable general equilibrium model. Indeed, the trade costs make international trade more expensive and reduce trade flows and the production of pharmaceutical is expected to significantly reduce the trade cost of medicines in Africa.

Methodology

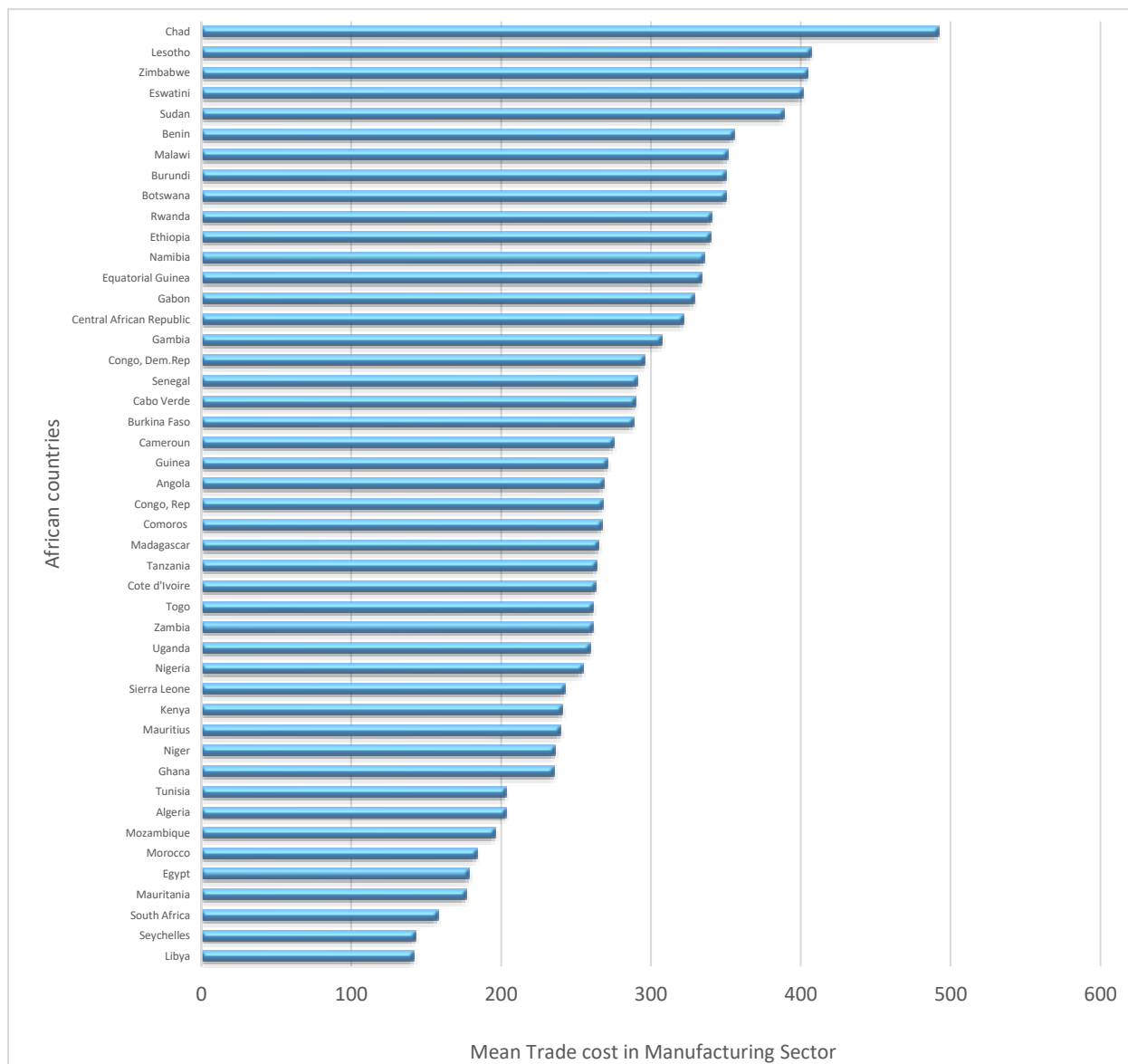
In this paper, we propose to investigate the impact of the reduction of the trade cost of the Sector “Manufacture of pharmaceuticals, medicinal chemical and botanical products” on African

⁶ Alberto and Wilson (2008)

⁷ Balchin and al. (2016)

economies. Using GTAP version 10, we endogenize the reduction of African trade cost on trade, GDP growth and welfare in Africa that we estimated.

Figure 1: Trade costs in African countries



Source UNECA calculation based on the World Bank UNESCAP Trade Costs Database (2020)