Quantitative Impact of African Continent Free Trade Area (AfCFTA) on African Economies

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Background

- The volume of trade has been increasing over time, but the share of intra-regional African trade has remained below 10%.
- The implementation of the African Continent Free Trade Area (AfCFTA) to enhance intra-regional trade in Africa.
- This paper attempt to quantify potential gains from the AfCFTA while accounting that African countries mostly produce and export natural resources or lower values-added goods and import of final goods, mostly from non-African countries (>90%).

Literature Review

- Eaton and Kortum (2002).
- However, no consensus has been reached regarding the impact of trade agreements.
- Positive impacts: Dollar (1992), Sachs and Warner (1995), Edwards (1998), Frankel and Romer (1999), Dollar and Kraay (2004), and Ganelli and Tervala (2015).
- No confirmation of positive impacts: Harrison (1996), Rodriguez and Rodrik (2000), Rodrik, Subramanian, and Trebbi (2004), and Wacziarg and Welch (2008)
- Hur and Park (2012) and Caliendo and Parro (2015) (negative effects on CAN) reveal uneven impacts of trade agreements.

Literature review: Drivers of trade agreements' impacts

- Physical infrastructure or production structure and regulatory reforms (Portugal-Perez and Wilson (2011); Caliendo and Parro (2015));
- Deregulations of businesses, financial development, better education or the rule of law, and flexibility in labor markets (Freund and Bolaky (2008) and Chang, Kaltani, and Loayza (2009))
- However, we could not come across a paper analyzing the impacts of lower interconnection between African countries and potential gains from the AfCFTA.

What do we do?

- We use a three-country DSGE model that accounts for African households' particularity (real rigidities: two types of households (Ricardian and non-Ricardian)) and the structure of African Economies.
- We use two African countries and the rest of the world represented by China, India, the European Union, the USA, and other major non-African partners.
- Our setting maintains the tariff on goods from the rest of the world.
- We measure output by value-added and total product approach.

What do we find?

- Our results depend on the measure of output.
- In the short run, following elimination of tariffs, output increases, terms of trade ameliorate, consumption increases, trade increases, appreciation of currencies, and the value of trade liberation small.
- However, most of the impacts vanish very quickly (about 5 quarters), except for the appreciation of currencies in AfCFTA members.

Our Model

- Three countries (2 African and the rest of the World); three types of goods (Traded goods, non-traded goods, and natural resources); Four main economic agents: The government, producers, households (2 types), and the Rest of the World.
- Two Households: Ricardian and non-Ricardian Households
- The lifetime utility function:

$$U(C_t, \frac{M_t}{P_t}, N_t) = E_t \sum_{t=0}^{\infty} \beta^t \left[logC_t + log(\frac{Mn_t}{P_t}) - \frac{1}{1-\gamma_N} N_t^{1+\gamma_N} \right] \quad (1)$$

Households: Ricardian and non-Ricardian

The Ricardian Households are entrepreneurs and workers, the non-Ricardian are workers.

$$\begin{bmatrix} PC_{kt}C^R_{kt} + P^I_{kt}I_{kt} + \left(\frac{Mn^R_{kt}}{P_{kt}}\right) \\ +S_tB^W_{kt} + D_{kt} = W_{kt}N^R_{kt} + \left(\frac{Mn^R_{kt-1}}{P_{kt}}\right) + S_t\varphi_{t-1}R^W_{t-1}B^W_{kt-1} \\ +R_{kt-1}D_{kt-1} + Tr_{kt} + \Omega^T_{kt} + \Omega^N_{kt} - T_{kt} \end{bmatrix} \quad (2)$$

$$K_{kt} = (1-\delta)K_{kt-1} + I_{kt} \quad (3)$$

$$PC_{kt}C^{NR}_{kt} + Mn^{NR}_{kt} = W_{kt}N^{NR}_{kt} + Mn^{NR}_{kt-1} - T_{kt} + Tr_{kt}. \quad (4)$$

Production and Price Index

$$C_{kt} = \left[(\alpha^C)^{\frac{1}{\nu^C}} (C_{kt}^N)^{\frac{\nu^C - 1}{\nu^C}} + (1 - \alpha^C)^{\frac{1}{\nu^C}} (C_{kt}^T)^{\frac{\nu^C - 1}{\nu^C}} \right] \tag{5}$$

$$PC_{kt} = \frac{PC_{kt}^N C_{kt}^N + PC_{kt}^T C_{kt}^T}{C_{kt}} \tag{6}$$

$$C_{kt}^N = \alpha^c \left(\frac{PC_{kt}^N}{PC_{kt}} \right) C_{kt} \tag{7}$$

$$C_{kt}^T = (1 - \alpha^c) \left(\frac{PC_{kt}^T}{PC_{kt}} \right) C_{kt}. \tag{8}$$

Intermediate goods producing firms

$$\frac{W_{kt}}{P^T_{kt}} = \frac{\gamma^{NT} MC^T y^T_{kt}}{N^T_{kt}} \tag{9}$$

$$\frac{PC_{kt}}{P^T_{kt}} R^K_{kt} = \frac{\gamma^{KT} MC^T y^T_{kt}}{K^T_{kt}} \tag{10}$$

$$\frac{(1+\tau^m_t) S_{kt} PO_t}{P^T_{kt}} = \frac{\gamma^{OT} MC^T y^T_{kt}}{O^T_{kt}} \tag{11}$$

Aggregate Equilibrium

$$\frac{RL_{kt}}{S_t P_t^*} = \frac{\gamma^{LD} MC^D y_{kt}^D}{L_{kt}} \tag{12}$$

$$\frac{PC_{kt}}{S_t P_t^*} R_{kt}^K = \frac{\gamma^{KD} MC^D y_{kt}^D}{K_{kt}^D} \tag{13}$$

$$\frac{(1+\tau_t^m) S_{kt} PO_t}{S_t P_t^*} = \frac{\gamma^{OT} MC^D y_{kt}^D}{O_{kt}^D} \tag{14}$$

Government sector

$$D_{kt} = R_{kt-1} D_{kt-1} + P^N_{kt} G_{kt} + PC_{kt} Tr_{kt} - T_{kt} \tag{15}$$

where Tax_{kt} is the lamp sum tax and

$$T_{kt} = Tax_{kt} + \tau^m_t (S_{kt} P^{WC}_t c_{Wt} + S_t PO_t (O^T_{kt} + O^N_{kt} + O^D_{kt}) + S_{kt} P^{IW}_t I^{IW}_{kt}) \tag{16}$$

Rest of the World

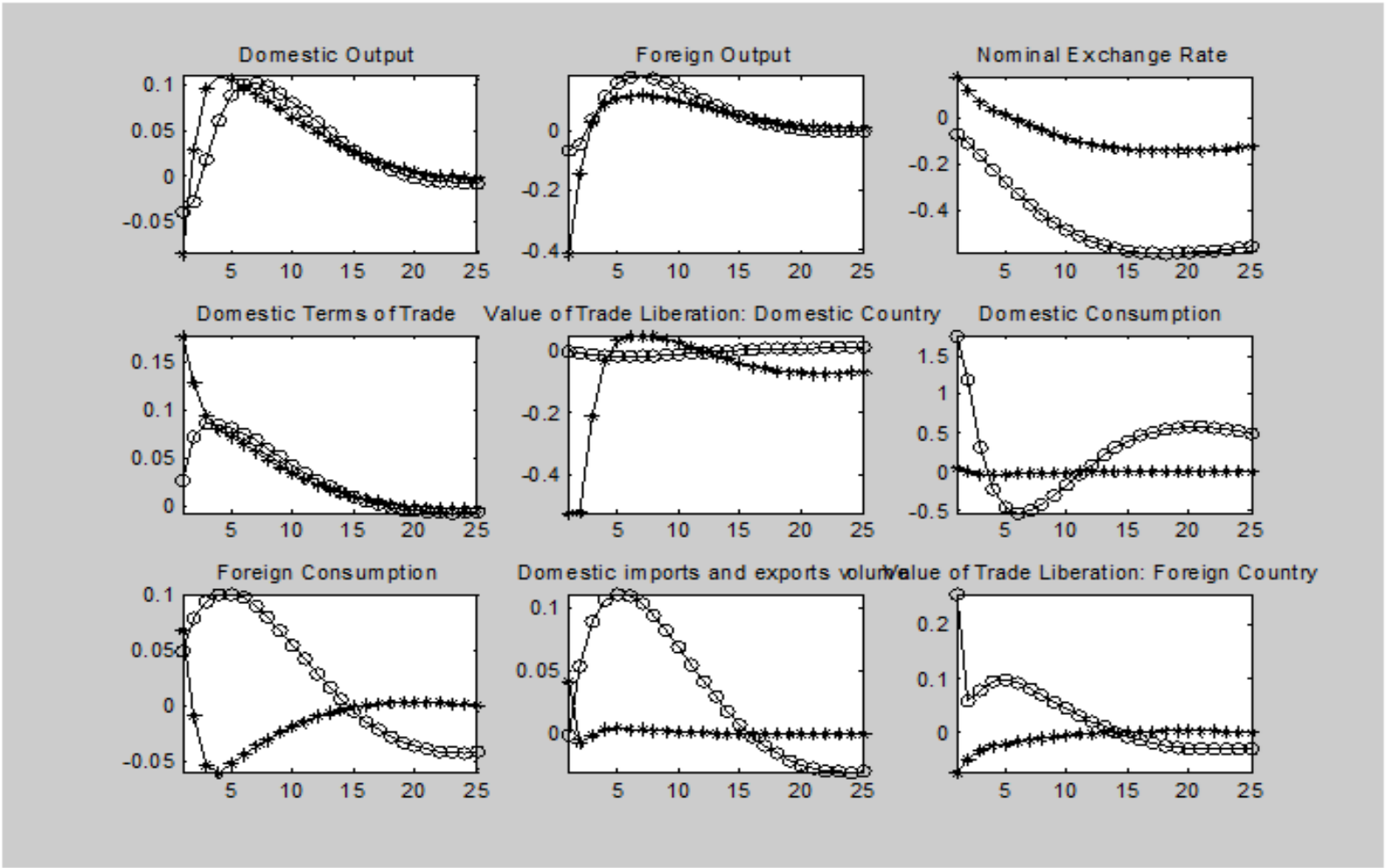
The rest of the world bloc consists of a budget constraint for the representative household, demand functions for domestic and imported goods, a production technology (uses labor, capital, domestic intermediate goods, and imported intermediate goods from African countries), a Taylor rule type of monetary policy, and a New Keynesian Phillips curve.

Calibration

Table 1: Calibration

β	$= 0.99$	Discount factor
σ	$= 1.39$	Relative Risk Aversion
δ	$= 0.025$	Depreciation rate of capital stock
γ^{KT}	$= 0.24$	capital share
α_c	$= 0.74$	Share of traded consumption goods in total consumption goods
α^{HC}	$= 0.26$	Share of home produced consumption goods in total traded consumption goods
α^{FC}	$= 0.08$	Share of foreign produced consumption goods in total traded consumption goods
α^{WC}	$= 0.66$	Share of rest of the world produced consumption goods in total traded consumption goods
ν^c	$= 0.74$	Elasticity of substitution between traded and non-traded consumption goods
α_I	$= 0.90$	Import share on investment
θ	$= 6$	Indexation of prices
η_c	$= 11.952$	Elasticity of substitution between import and domestic consumption goods
η_I	$= 2.056$	Elasticity of substitution between import and domestic investment goods
η_f	$= 3.809$	Share of domestic export goods in foreign output
G_{ss}	$= 0.1$	Steady state value of Government spending
L_{ss}	$= 1/3$	Steady state value of hours worked
$\frac{C_{ss}}{Y_{ss}}$	$= 0.60$	Steady state consumption/GDP
$\frac{I_{ss}}{Y_{ss}}$	$= 0.22$	Steady state investment/GDP
$\frac{G_{ss}}{Y_{ss}}$	$= 0.18$	Steady state Government spending/GDP
$\frac{T_{ss}}{Y_{ss}}$	$= 0.19$	Steady state lum sum tax/GDP

Results


Domestic Output
Foreign Output
Nominal Exchange Rate
Domestic Terms of Trade
Value of Trade Liberation: Domestic Country
Domestic Consumption
Foreign Consumption
Domestic imports and exports volume
Value of Trade Liberation: Foreign Country

Findings and Policy recommendations

- In the short run, following elimination of tariffs, output increases, terms of trade ameliorate, consumption increases, trade increases, appreciation of currencies, and the value of trade liberation is small.
- However, most of the impacts vanish very quickly, except for the appreciation of currencies in AfCFTA members.
- We recommend the implementation of initiative to enhance manufacturing sectors and boost trade between the African countries that relatively depend more on non-African countries.
- Promote African capital ownership in natural resource sector.

Thank you

Thank You
Questions / Comments