Investment and Take-up Costs of Alternative Modes of Transport: Implications for Intra-Africa Trade

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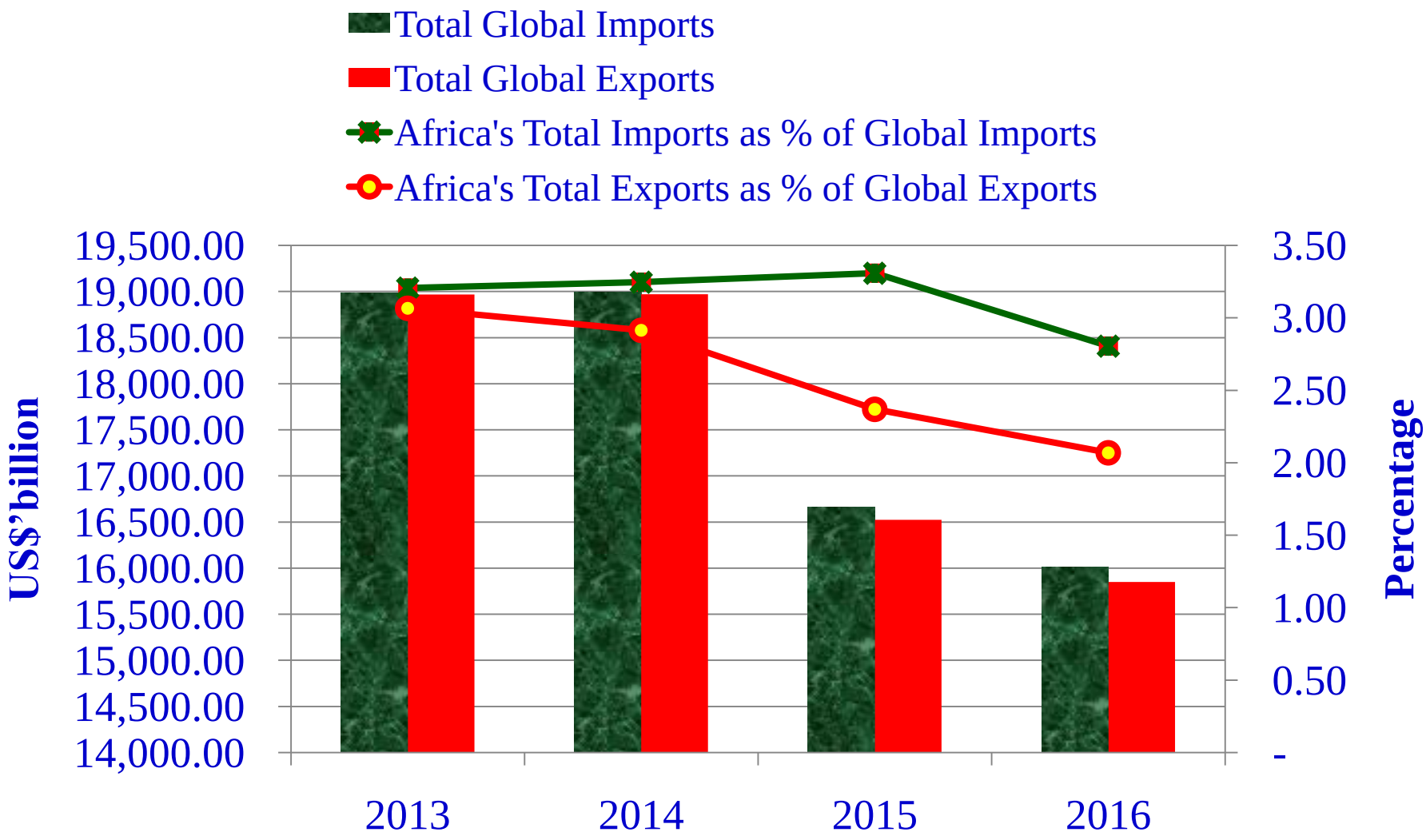
Motivation
Global Trade and Africa

- African countries contribute very little to global trade (goods and services alike).
- Global imports of about US$18,982.69 billion in 2013,
  - Africa's total imports of about US$608.38 billion – 3.20 percent
- Global exports of about US$18,968.54 billion in 2013,
  - Africa's total exports of about US$581.52 billion – 3.07 percent
- Global imports of about US$16,014.20 billion in 2016
  - Africa's total imports of about US$449.20 billion – 2.81 percent
- Global exports of about US$15,849.04 billion in 2016,
  - Africa's total exports of about US$327.90 billion – 2.07 percent

Motivation

Global Trade and Africa



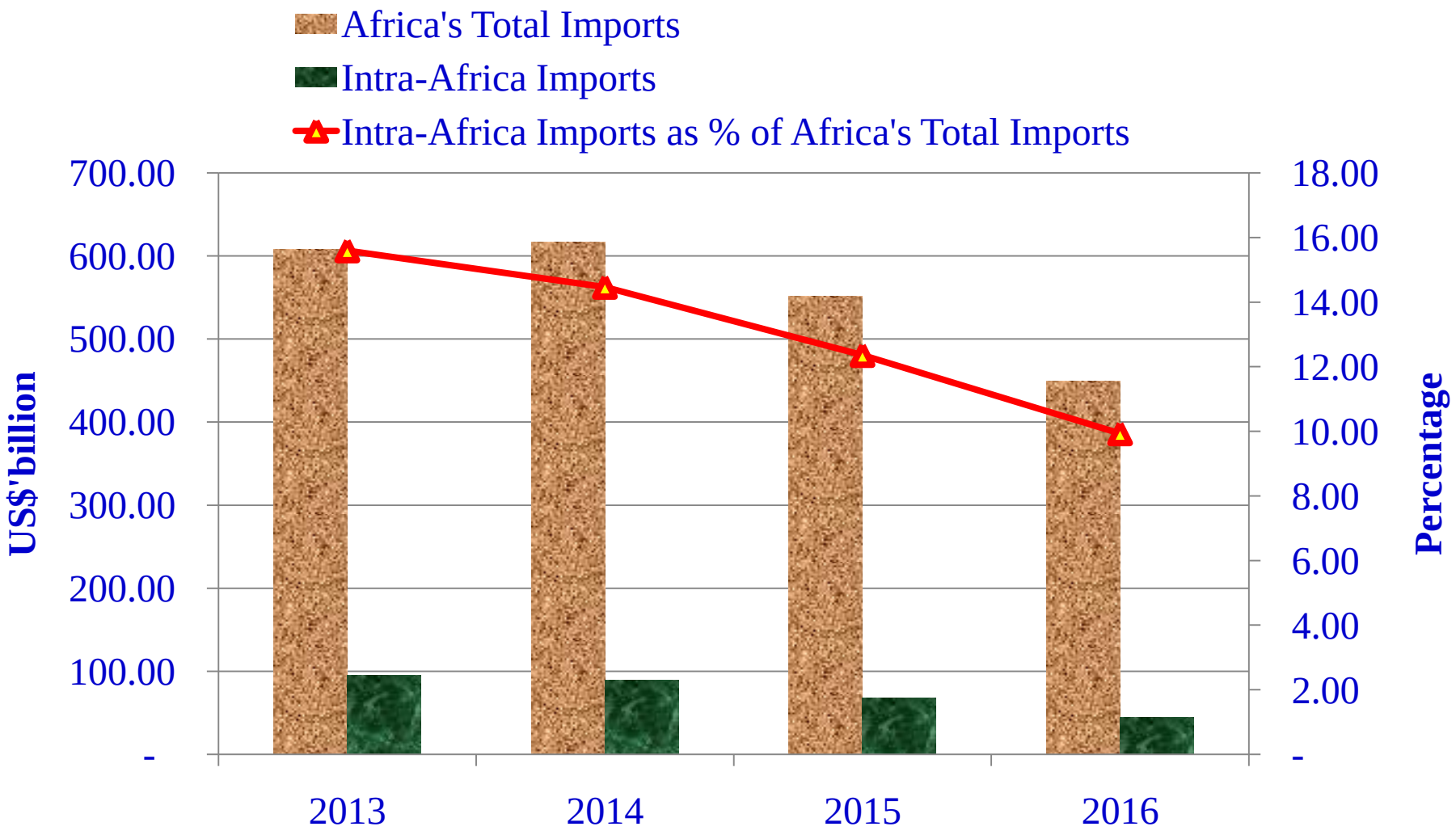
Motivation

Total & Intra-Group Imports of Africa

- The proportion of intra-Africa imports in Africa's total imports remains consistently low over recent time.
- Africa's total imports in 2013 – US$608.38 billion
  - Intra-Africa imports in 2013 – US$94.87 billion (15.59 percent)
- Africa's total imports in 2014 – US$616.59 billion
  - Intra-Africa imports in 2014 – US$89.20 billion (14.47 percent)
- Africa's total imports in 2015 – US$551.23 billion
  - Intra-Africa imports in 2015 – US$68.12 billion (12.36 percent)
- Africa's total imports in 2016 – US$449.20 billion
  - Intra-Africa imports in 2016 – US$44.63 billion (9.94 percent)

Motivation

Total & Intra-Group Imports of Africa



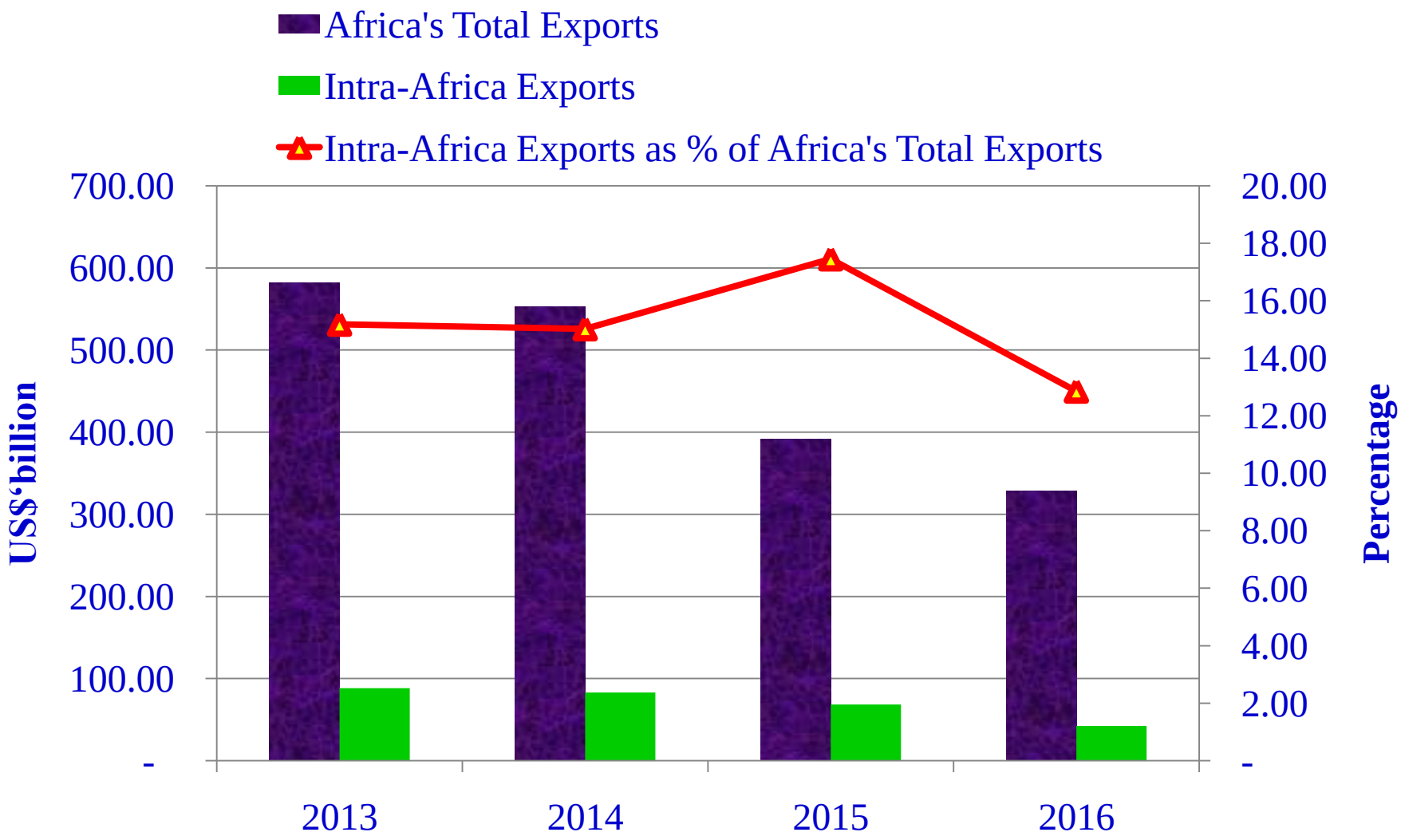
Motivation

Total & Intra-Group Exports of Africa

- The proportion of intra-Africa exports in Africa's total imports also remains consistently low over recent time.
- Africa's total exports in 2013 – US$581.52 billion
  - Intra-Africa exports in 2013 – US$88.29 billion (15.18 percent)
- Africa's total exports in 2014 – US$552.80 billion
  - Intra-Africa exports in 2014 – US$83.04 billion (15.02 percent)
- Africa's total exports in 2015 – US$391.53 billion
  - Intra-Africa exports in 2015 – US$68.34 billion (17.45 percent)
- Africa's total exports in 2016 – US$327.90 billion
  - Intra-Africa exports in 2016 – US$42.15 billion (12.86 percent)

Motivation

Total & Intra-Group Exports of Africa



Motivation

❖The gravity model of international trade postulates that the volume of international trade reacts inversely to distance between the two countries involved in trade.

❖Consistently low proportions of intra-Africa trade in Africa's total trade present contradictions to the postulations of gravity model of international trade.

❖Major trade partners of most African countries remain countries of the global North

❖The only exceptions are some of the North African countries that trade more among themselves.

Hypotheses

- Distance as used in the postulations of the gravity model of international trade may not only represent kilometres and mileage.
- Distance may also imply cost of moving goods from one place to the other.
- If distance also represents freight costs, then the postulations of the gravity model may be correct in the case of Africa's total trade as well as intra-Africa trade.
- Freight costs is a function of the mode of transportation used.
- Some modes of transportation may be the optimal modes within a particular location.

Research Questions

- Are the currently promoted modes of transport encouraging intra-Africa trade by making it less costly to trade among African countries than with the rest of the world?

- Which of the modes of transports (land, air, rail, and sea) is the most cost effective mode of transport both in terms of the cost of investment, costs of usage and the benefits to be derived?

- Which mode of transport will be of the greatest benefits to each of the sub-regions in Africa (COMESA, ECOWAS, SADC, CEMAC, etc)?

Research Objectives

❖Evaluate the effects of the current transport investments on intra-Africa trade.

❖Identify the most efficient modes of transport infrastructures that will facilitate intra-Africa trade in the long run, bearing in mind the level of capital needed to be invested in such mode of transportation.

❖Based on some peculiar features of each of the sub-regional blocs, identify the most efficient modes of transport infrastructures that will facilitate intra-Africa trade in the long run in each of the sub-regional blocs.

Analytical Approach and Data

- Descriptive statistic adopted in the analysis:
  - Tables
  - Charts and figures
  - Content analysis
- Data sourced from:
  - Publications of African Development Bank (AfDB)
  - Trade Statistics and Database of Trademap
  - Published studies that adopt survey data
- Years of focus:
  - 2000 – 2016

Preliminary Findings

Investment Costs – Road Infrastructure

Countries	Cost of 1 km of Road with Asphalt overlays of 40-59mm in 2005 – 2006 (2000 US$'000)
Burkina Faso	48.0
Nigeria	73.0
Rwanda	90.6
Cameroon	76.8
Tanzania	111.7
Ghana	52.7
Average	**75.467**

Source: *Collier et al (2013)*

Preliminary Findings

Investment Costs – Road Infrastructure

Type of Road Infrastructure Investment	Average Cost of 1 km Road in Africa (2006 US$'000)	
	for <100 km lane	for ≥100 km lane
Regravelling/ Periodic Maintenance of Unpaved Roads	9.60	11.30
Periodic Maintenance of Paved Roads	N/A	64.60
Rehabilitation of Paved Roads	180.30	84.40
Construction and Upgrading of Paved Roads	227.80	147.10

Source: *AfDB (2014)*

Preliminary Findings

Investment Costs – Rail Infrastructure

Countries	Cost of 1 km Standard Gauge Rail Track 2010 – 2016 (US$'million)
Zambia-Angola: Chingola-Benguela railway line	1.98
Ethiopia: Mieso-Djibouti border railway line	3.53
Northern Uganda Rail line	2.00
Angola: Luanda to Malanje	1.28
Average	**2.20**

Source: *AfDB (2015)*

Preliminary Findings

Investment Costs – Rail Infrastructure

Type of Road Infrastructure Investment	Average Cost of 1 km Rail Track in East Africa as at 2009 (US$'million)	
	Current Gauge in East Africa	Standard Gauge in East Africa
Rehabilitation	0.18	N/A
Refurbishing	0.49	1.50
Entirely New Construction	2.60	3.25

Source: *AfDB (2015)*

Preliminary Findings

Investment Costs – Road & Rail Compared

- On the average, 1 km of road takes US$227,800 to be completed
- On the average, 1 km of rail track takes US$2,200,000 to be completed
- On the average, the cost of 1 km of rail track can complete about 10 km of paved road.
  - Likelihood of most African governments to focus on the road infrastructure as against rail infrastructure due to cost.
  - Such tendencies only considers the investment cost, without considering the investment long term benefits and sustainability.
  - It may take little to construct a paved road especially when compared with cost of rail tracks, while roads require more regular maintenance than rail.
  - This may pose a great challenge on sustainability and long run costs.

Preliminary Findings

Take-up Costs – Road & Rail Compared

- On the average, rail freight costs are significantly lower than road freight costs.
  - This applies to passengers and goods alike.
- For the purpose of durability, heavy goods should be transported on railways.
- There are only about 59,634 km of rail tracks in SSA.
  - Some of the rail tracks have become moribund since the late 1990s.
  - Functional rail tracks may be less than 75 percent of the 59,634 km of rail tracks in SSA.
  - Available railways not sufficient for effective movement of goods within Africa.

Preliminary Findings

The Missing Modes of Transport in Intra-Africa Trade

- Passengers and goods can be moved from one place to the other by any of these modes of transport – air, land, rail, and sea.
- The discussion of the findings of this study focuses on and even compared land and rail.
  - The other two modes are usually considered as secondary in Africa.
- It is a fact that it is cheaper to travel by air to Europe from many African countries than to travel by air within Africa.
  - It is even worse within some sub-regions of Africa – e.g. The West African coast.
  - The only exceptions are Ethiopia, Kenya and South Africa that have leading national carriers in SSA.

Preliminary Findings

The Missing Modes of Transport in Intra-Africa Trade

- Africa has several coastal countries that could be interlinked with well-developed sea route.
  - This remains a potential and not actually done or implemented.
  - Making the African coasts usable for intra-Africa trade has not become a priority for any of the African governments.
- Several trans-national highways are currently being proposed and executed by regional trade blocs in Africa.
- Little or no attention is drawn to investment in transnational rail line projects within Africa.
- Making the African coasts usable for intra-Africa trade has not become a priority for any of the African governments.

Preliminary Findings

The Missing Modes of Transport in Intra-Africa Trade

- Undeveloped waterways increase the cost of shipping in Africa.
  - Shipping a car from Japan to Abidjan costs US$ 1,500, while shipping that same vehicle from Addis Ababa to Abidjan would cost US$ 5,000 (ECA, 2010)
- Apart from the Oceans, several waterways can be developed and put in use within the continent in order to encourage intra-Africa trade.
- Moribund railways can be resuscitated in order to increase the number of functional rail lines

Implications of Preliminary Findings

- Shortage of transport infrastructures in Africa may be responsible for very low intra-Africa trade.
- Most African countries trade more with countries of the global north.
- Road infrastructure may be the cheapest of the other modes in terms of investment cost, may not be the optimal mode in the long run.
- Freight cost of road transport can increase the cost of goods.
  - Just it is cheaper to deliver a car from Japan to Abidjan (about 13,960km) than delivering the same car from Addis Ababa to Abidjan (about 4,730 km)
- Road infrastructures also raise the concern for sustainability, durability and maintenance costs.

Implications of Preliminary Findings

- Most sub-regional blocs in Africa have planned for, or are currently executing transnational highway projects.
  - These may be cheaper alternatives in terms of investment costs.
  - These may not be cheap alternatives in terms of movement of goods and passengers within the regional blocs.
- Need to redefine the essence of these infrastructural projects:
  - Why the projects?
  - For who?
  - For how long?
  - Are there better alternatives?
- The redefinition of the essence of these projects may come with additional investment costs, but can be recouped in the long run.

Thank you!

Comments and suggestions can as well be sent to:

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