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**MEASURING THE OPPORTUNITY COSTS  
OF TRADE-RELATED CAPACITY  
DEVELOPMENT IN SUB-SAHARAN  
AFRICA**



# PROBLEM:

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## Background/Introduction

- Africa lags behind in development compared to the rest of the world.
- Africa marginalised from the multilateral trading system.
- Africa's share of world trade has declined over the past years.
- Various arguments have been put forward:
  - Foreign policies/market access issues
  - Domestic policy barriers
  - Lack of economic growth
- Major challenge has been to take action which would rapidly integrate Africa in the mainstream of world economy.
- Repeated failures of past policies to increase economic growth and reduce poverty in poor countries
  - New policy focus "Aid for Trade"



# AID FOR TRADE

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- World Trade Organization, Doha Declarations (paragraphs 38, 39, 40, and 41) recognized trade-related technical assistance and capacity building as a core element of the development dimension of the multilateral trading system and set out commitments in those areas.
- Since the WTO Doha Ministerial Declaration in 2001: 50% increase in resources allocated to TRCB (WTO/OECD Joint Report).
- **Broad objective of TRCB:** integrating developing countries into the multilateral trading system



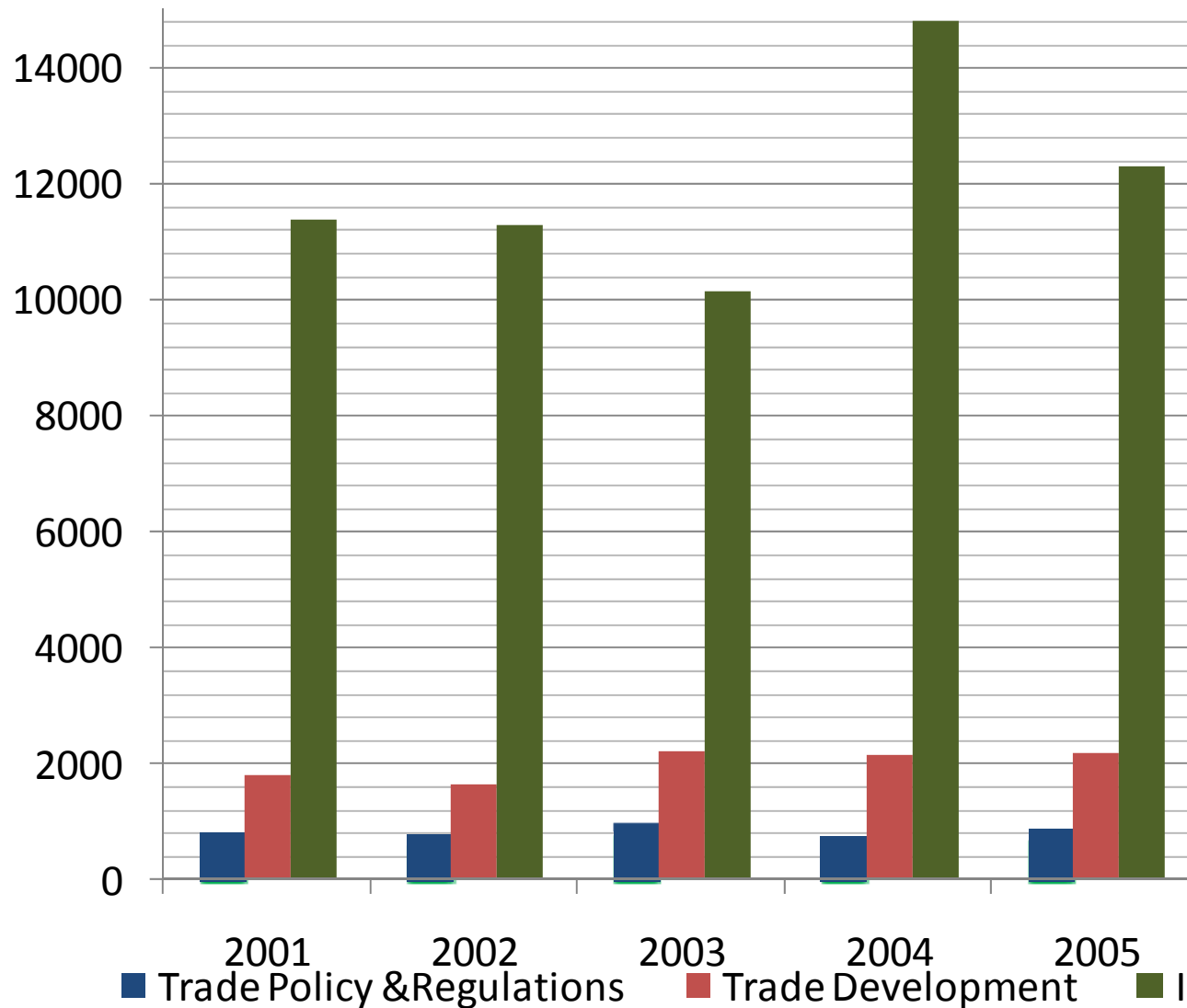
# DEFINITION

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- **Definition of TRCB:** coherent set of activities by donors and partner countries designed to improve trade performance through institutional, human capacity and infrastructural development.



# Total Commitment to TRCB and Infrastructure US\$ million



## US' Trade Capacity Building Assistance by Category (As a % of Total TRCB)

<i>TRCB Category</i>	<i>2001</i>	<i>2002</i>	<i>2003</i>	<i>2004</i>	<i>2005</i>	<i>2006</i>
Human Capacity	52.44	56.77	51.55	47.87	36.99	26.58
Institutions	38.69	36.64	39.04	36.64	34.11	34.12
Infrastructure	8.87	6.59	9.41	15.49	28.90	39.30
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>



# RESEARCH QUESTIONS

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- Are the weights assigned to different components of trade-related capacity activities in existing TRCB programmes justified?
- Given the fact that more resources on TRCB imply less on other development priorities, what is the opportunity cost of investing resources in one particular TRCB approach as opposed to another?



# JUSTIFICATION

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- Little research that has been done to evaluate the opportunity cost of different TRCB policy mixes.
- Previous studies:
  - restricted their analysis to a specific TRCB initiative,
  - narrowly defined TRCB to cover border issues only (trade facilitation)
  - limited coverage of African countries.
- Use gravity model to evaluate TRCB
- Extend Wilson et. Al (2005) to widen coverage of African countries



# THREE INDICES OF TRCB

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## Institutions

- University/Industry research collaboration: (WEF).
- Property rights (WEF)
- Presence of demanding regulatory standards: (WEF)
- Financial market sophistication: (WEF).
- Number of administrative procedures required to start a business (Doing Business Report)
- Number of documents required for exports: (Doing Business Report)
- Number of procedures required to enforce a contract: (Doing Business Report).



# THREE INDICES OF TRCB (Contd)

## **Human Capacity**

- Tertiary enrolment. (WDI)
- Extent of staff Training (WEF)
- Quality of management schools (WEF)
- Local availability of specialised research and training services (WEF)
- Brain drain: (WEF)



# THREE INDICES OF TRCB (Contd)

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## Infrastructure

- Ports (WEF).
- Air transport infrastructure quality (WEF)
- Railroad infrastructure development (WEF)
- Telephones/fax infrastructure quality (WEF)
- Quality of electricity supply (WEF)
- Quality of competition among ISPs (WEF)
- Extent of business use of the Internet (WEF)



# CONSTRUCTION OF THE INDICES

*Following Wilson et. Al (2005)*

- **Step 1:**                    **Normalising the data**

$$X_{in} = \frac{x_{in}}{\left( \frac{\sum_{n=1}^N x_{in}}{N} \right)}$$

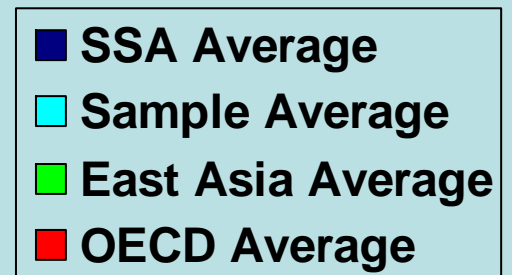
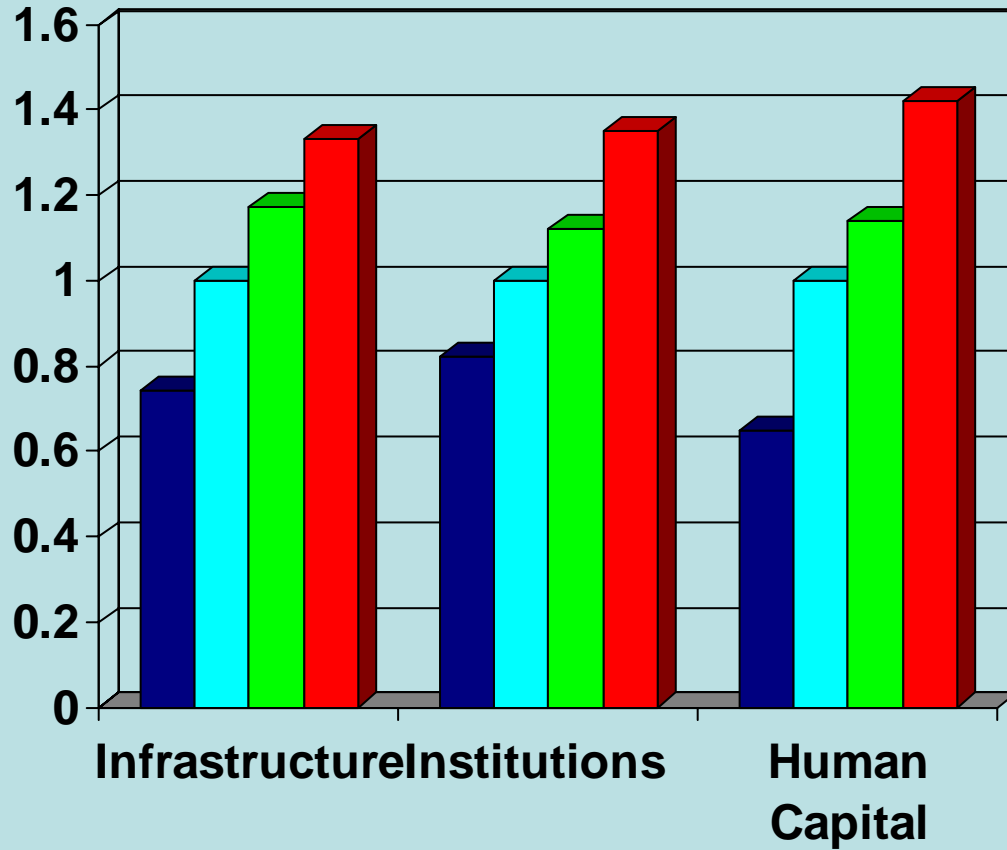
- **Step 2:**                    **Composite TRCB indicator**

$$\overline{X}_{kn}$$

the composite indicator (where k = F, I, or H) for each TRCB indicator in country n is calculated as a simple average of the sub-indices



# DATA ANALYSIS



# MODEL

- We use the gravity model:

$$\begin{aligned} \ln(T_{ij}) = & \alpha_0 + b_1 \ln(GDP_i) + b_2 \ln(GDP_j) + b_3 \ln(POP_i) + b_4 \ln(POP_j) + b_5 \ln(1 + TARIFA_i) \\ & + b_6 \ln(1 + TARIFB_j) + b_7 \ln(DIST_{ij}) + b_8 \ln(Human_i) + b_9 \ln(Infra_i) + b_{10} \ln(Inst_i) \\ & + b_{11} \ln(Human_j) + b_{12} \ln(Infra_j) + b_{13} \ln(Inst_j) + b'_{14} D + b_{15} ST + \varepsilon_{ij} \end{aligned}$$

Dummies for SSA, RTA, border, landlocked, language and colonial-ties



T1

Literature has shown that a country will export more not only due to its trade reforms but due to reforms undertaken by its trading partners; hence the inclusion of both importer and exporter' TRCB variables  
muzondo, 05/26/2007

# MODEL (cont'd)

Two likely problems associated with the estimation of the standard gravity equation:

- Mis-specification due to omission of Anderson-Van Wincoop multilateral resistance terms

Measures that have been used to address the problem:

- fixed effects for both exporting and importing countries
- Remoteness variable

- Sample selection problem due to zero trade flows.

Measures adopted to deal with the problem:

- Drop the pairs with zero trade from the data set;
- Estimated the model using  $\ln(T_{ij}+1)$  as the dependent variable instead of  $\ln(T_{ij})$ .
- Use the Tobit estimator,
- Use the two-step procedure as proposed by Heckman(1979); approach used by Helpman (2006)



# ESTIMATION RESULTS

## Dependant Variable: log total exports

Variables	Standard equation	Residuals	OLS-Non-zero sample	Remoteness term	Importer Fixed Effects	Exporter Fixed Effects	TRCB Averages
<b>logtrade</b>							
Loggdp_imp	0.664***	0.877 (41.34)	0.698*** (21.85)	0.69*** (20.48)	0.787*** (8.55)	0.678** (21.51)	1.39*** (6.87)
Loggdp_exp	0.581***	1.212 (55.50)	0.60 (18.47)	0.60*** (17.99)	0.539*** (16.33)	1.075*** (15.97)	1.47*** (12.13)
logdist	-1.162**	-1.162 (-33.37)	-1.187 (-36.75)	-1.23*** (-39.20)	-1.146*** (-30.40)	-1.362*** (-38.65)	-1.43*** (-35.59)
Loginst_imp	0.088	0.090 (0.52)	0.194 (1.17)	0.16 (0.93)		-0.032 (-0.21)	-10.49*** (-6.15)
Loginst_exp	-0.524***	-0.521 (-2.79)	-0.404 (-2.29)	-0.43*** (-2.28)	-0.385** (-2.06)		
Loghuman_imp	-0.518***	-0.521** (-2.59)	-0.509 (-2.61)	-0.56*** (-2.78)		-0.342* (-1.84)	1.10*** (0.77)
Loghuman_exp	1.439***	1.437*** (7.35)	1.513 (7.97)	1.41*** (7.27)	1.362*** (7.06)		
Loginfra_imp	1.956***	1.96*** (9.63)	1.916 (9.67)	2.08*** (10.26)		2.012*** (10.77)	4.96*** (2.46)
Loginfra_exp	2.864***	2.868*** (13.48)	2.907 (14.10)	2.99*** (14.05)	2.701*** (12.90)		
dssa	-0.323***	-0.33*** (-5.19)	-0.33 (-5.83)	-0.44*** (-6.80)	-0.497*** (-6.37)	0.083 (-1.15)	-0.12 (-0.68)



# ESTIMATION RESULTS

Variables	Standard equation	Manufactured exports	Primary exports	SSA
logtrade				
Loggdp_imp	0.664***	0.597*** (17.27)	0.713*** (16.61)	0.901*** (6.96)
Loggdp_exp	0.581***	0.649*** (18.74)	0.516*** (11.92)	0.392*** (3.40)
logdist	-1.162**	-1.277*** (-35.32)	-1.242*** (-27.84)	-1.973*** (-9.94)
Loginst_imp	0.088	1.141*** (6.28)	-0.286 (-1.27)	0.786 (1.19)
Loginst_exp	-0.524***	-0.149 (-0.77)	0.815*** (3.43)	-0.208 (-0.22)
Loghuman_imp	-0.518***	-1.216*** (-5.79)	-0.007 (-0.03)	-1.811** (-2.54)
Loghuman_exp	1.439***	1.183*** (5.80)	1.975*** (7.83)	1.704*** (2.20)
Loginfra_imp	1.956***	1.546*** (7.24)	2.245*** (8.44)	4.655*** (6.55)
Loginfra_exp	2.864***	4.081*** (18.20)	0.068 (0.24)	4.983*** (4.78)
dssa	-0.323***	-0.817*** (-12.35)	-0.293*** (-3.61)	



## ANALYSIS OF RESULTS

- TRCB matter in determining trade flows.
- Finding on institutions counterintuitive – given emphasis placed on the issue. Ineffective institutions blamed for repeated failures of development policies in developing countries.
- Institutional homogeneity - reduce transactional cost between trading partners and hence increases trade flows,
- Improvement of human capital reduces imports and increases exports (overall trade flows increase).
- Infrastructure consistently positive; most important of all TRCB indicators.
- Controlling for human capital only result in greatest reduction of the estimated coefficient on SSA dummy.



# ***POLICY SIMULATIONS***

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- The impact of bringing all the below-average countries halfway to the world average level.
  - Human Capital , Institutions and Infrastructure
- The impact of improving one TRCB indicator at a time halfway to the world average (while holding other indicators constant, at their current level).
- The impact of improving two TRCB indicators at a time, raising them halfway to the world's average level.
  - Human Capital and Institutions;
  - Human Capital and Infrastructure;
  - Institutions and Infrastructure; and



## Benefits of Bringing All Below Average Countries Halfway up to the World Average (In US \$ Billions)

		Exporters	Importers	Total
Human Capital	SSA	28.5(29.6%)	-6.8(-10.4%)	21.7
	Other	109(1.2%)	-36(0.4%)	73
Infrastructure	SSA	38.0(39.4%)	17.3(26.5%)	55.3
	Other	84.1(0.94%)	58.3(0.65)	142.4
Institutions	SSA	-4.36(-4.5%)	1.0(1.5%)	-3.39
	Other	-58.8(-0.66)	25.9(0.28%)	-32.9



## BILATERAL TRADE BENEFITS FROM COMPLEMENTARY TRCB POLICIES IN US\$ BILLIONS

		Exporters	Importers	Total
Human Capital & Institutions	SSA	39.5 <sub>(41%)</sub>	11.3 <sub>(17%)</sub>	50.8
	Other	214	112	326
Infrastructure & Institutions	SSA	32.8 <sub>(34%)</sub>	14.8 <sub>(23%)</sub>	47.6
	Other	178	156	334
Human Capital & Infrastructure	SSA	63 <sub>(65%)</sub>	15.6 <sub>(24%)</sub>	78.6
	Other	180	61.9	241.9
Institutions, Human & Infrastructure	SSA	48.4 <sub>(50%)</sub>	3.8 <sub>(6%)</sub>	52.2



# Conclusions

- TRCB will have large impact on trade flows in SSA.
- A complementary policy mix that targets improvement of human capital and infrastructure provides the greatest boost to trade flows in SSA.
- For non-SSA countries greatest boost to trade flows comes from complementing institutions and infrastructure.
- Different TRCB needs between regions; non-SSA countries benefiting most from infrastructure and institutions.
- Implication of our findings is that universalism approach to TRCB will not work.
- Findings points towards TRCB policy in SSA which emphasizes infrastructural and human development.



***THE END***



## AVERAGES OF THE THREE COMPOSITE TRCB INDICES PER INCOME GROUP

		Non-SSA	SSA
Low income	Infrastructure	0.778	0.703
	Institutions	0.756	0.813
	Human Capital	0.720	0.645
Lower middle income	Infrastructure	0.881	0.739
	Institutions	0.855	0.752
	Human Capital	0.835	0.623
Upper middle income	Infrastructure	1.03	0.973
	Institutions	0.973	1.019
	Human Capital	1.069	0.842

