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LDCR 2014

Growth with Structural Transformation: A post-2015 development agenda

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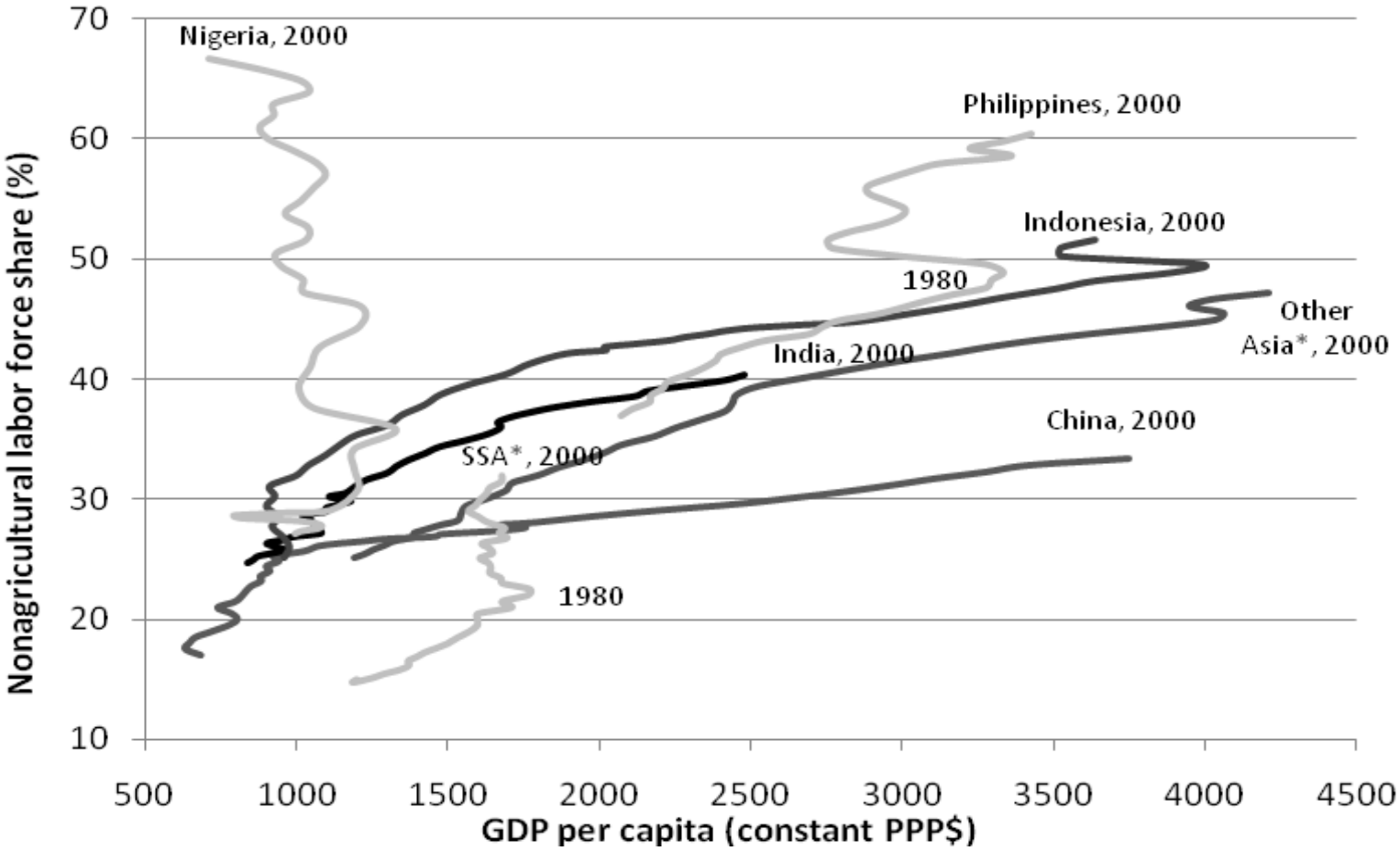
- Structural change, narrowly defined here as the reallocation of labor across sectors, featured prominently in earlier analyses of economic growth
  (Kuznets, 1966; Chenery et al. 1986)

- It is receiving renewed attention
  (Timmer and de Vries, 2009; IADB 2010; McMillan and Rodrik, 2011; De Vries et al. 2014)

- LDCR 2014 first comprehensive study on structural change in LDCs


Nigeria, 2000
Philippines, 2000
Indonesia, 2000
1980
Other Asia*, 2000
India, 2000
China, 2000
SSA*, 2000
1980
Nonagricultural labor force share (%)
70
60
50
40
30
20
10
500
1000
1500
2000
2500
3000
3500
4000
4500
GDP per capita (constant PPP$)

- Data
- The dynamics of structural change
- …looking ahead

Manufacturing employment shares, GGDC and UNIDO datasets, 1990

(percent)

	year	UNIDO	GGDC	ratio
BWA	2008	3.6	6.4	56%
ETH	2008	0.3	5.3	6%
GHA	2003	1.0	11.2	9%
KEN	2007	1.5	12.9	12%
MUS	2008	16.3	21.5	76%
MWI	2008	0.7	4.3	16%
NGA	1996	1.4	6.6	21%
SEN	2002	0.5	8.9	6%
TZA	2007	0.5	2.3	22%
ZAF	2008	7.0	13.1	53%
ZMB	1994	1.5	2.9	52%

Difference in coverage between two data sets: GGDC (which covers informal employment) and UNIDO (which is mostly formal, registered firms)

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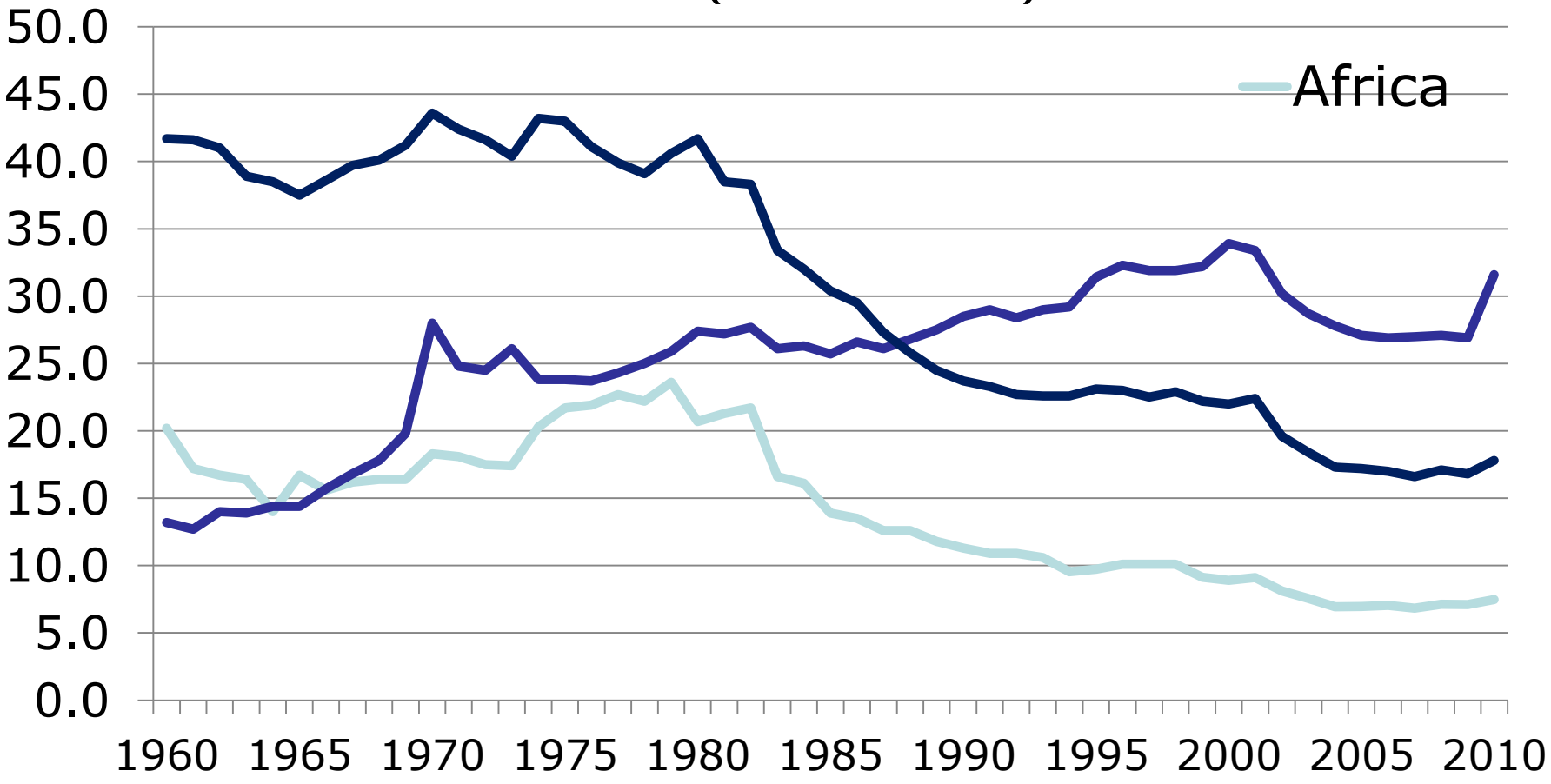
Groningen Growth and Development Centre

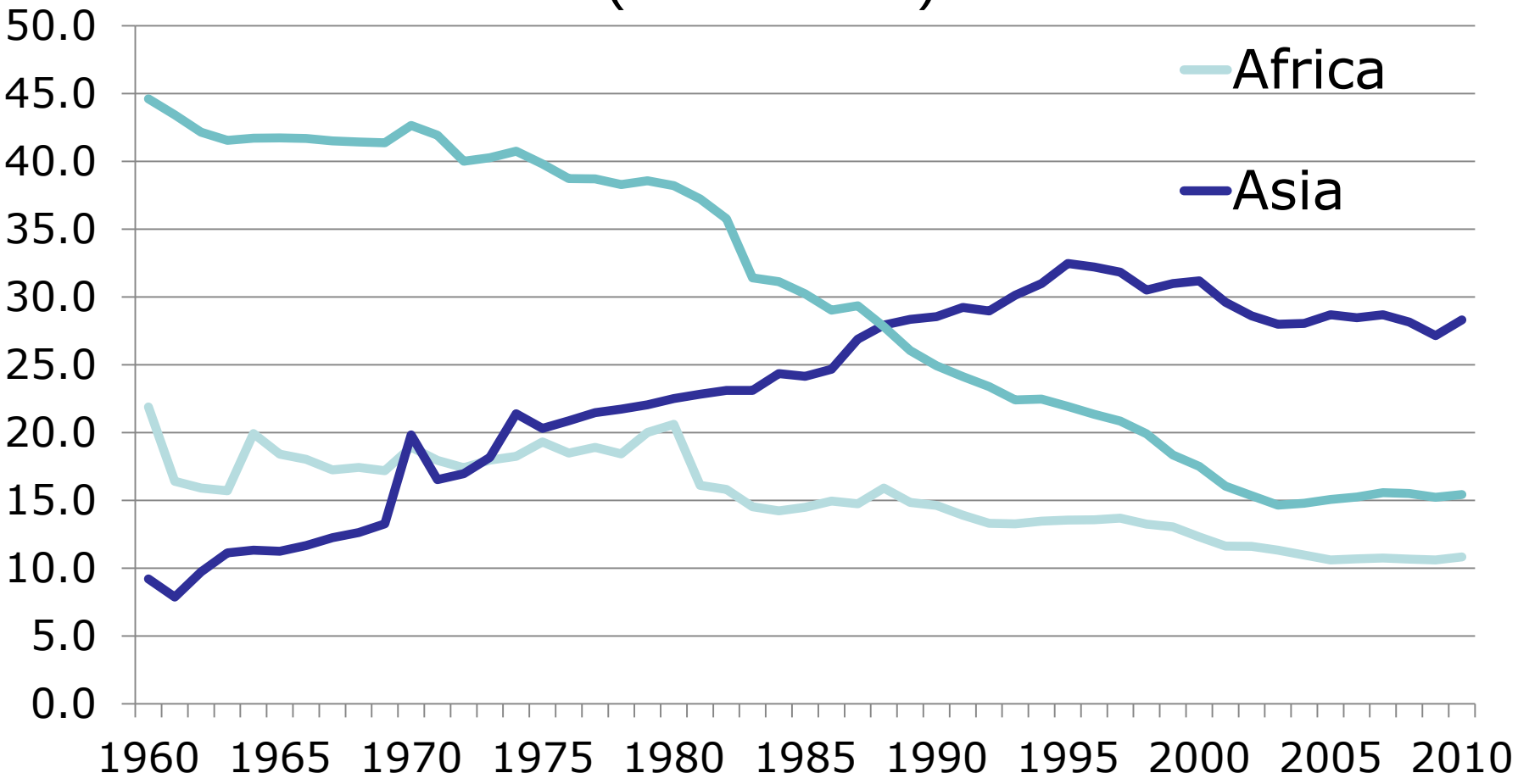
- Compiles comprehensive databases on indicators of growth and development and maintains them on a regular basis

- Amongst others:
  - Penn World Tables (since v. 8.0)
  - World Input-Output Database
  - GGDC 10 Sector Database
    - Africa Sector Database (funded by ESRC/DFID, spring 2012 – spring 2014)

Productivity trend in manufacturing (USA is 100)



Productivity trend in market services (USA is 100)



Manufacturing expanded between 1960 and 1975. After 1990 market services activities expanded

Employment shares				
	1960	1975	1990	2010
Agriculture	72.9	66.4	62.1	50.8
Manufacturing	4.7	7.8	8.8	7.5
Other industries	4.6	5.2	5.3	5.1
Market services	8.7	10.2	12.8	23.4
Non-market services	9.1	10.4	11.0	13.3
All sectors	100	100	100	100

Notes: Figures are unweighted averages across eleven African countries.

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Reallocation and growth

- Shift-share decomposition method to measure the contribution to growth from the reallocation of workers across sectors

- Method decomposes the aggregate change in labor productivity into within and between effects

> $\Delta P = \Sigma_i$ within effects + Σ_i between effects

Decomposition methods

1. McMillan and Rodrik (2011):

$$\Delta P = \sum_i (P_i^T - P_i^0)\, S_i^0 + \sum_i (S_i^T - S_i^0)\, P_i^T$$

2. Opposite base and end years:

$$\Delta P = \sum_i (P_i^T - P_i^0)\, S_i^T + \sum_i (S_i^T - S_i^0)\, P_i^0$$

3. Period averages:

$$\Delta P = \sum_i (P_i^T - P_i^0)\bar{S}_i + \sum_i (S_i^T - S_i^0)\bar{P}_i$$

4. If growth and levels are not correlated, a more appropriate decomposition is:

$$\Delta P = \sum_i (P_i^T - P_i^0)\, S_i^0 + \sum_i (S_i^T - S_i^0)\, P_i^0 + \sum_i (P_i^T - P_i^0) * (S_i^T - S_i^0)$$

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Decomposition results, 1960-2010

Decomposition equation used:	Labour productivity growth	Component due to:		
		Within	Between	
			Static	Dynamic
(1)	1.4	0.8	0.6	
(2)	1.4	-0.1	1.5	
(3)	1.4	0.3	1.1	
(4)	1.4	0.8	1.5	-0.8

Notes: Figures are unweighted averages across eleven African countries. Numbers may not sum due to rounding.

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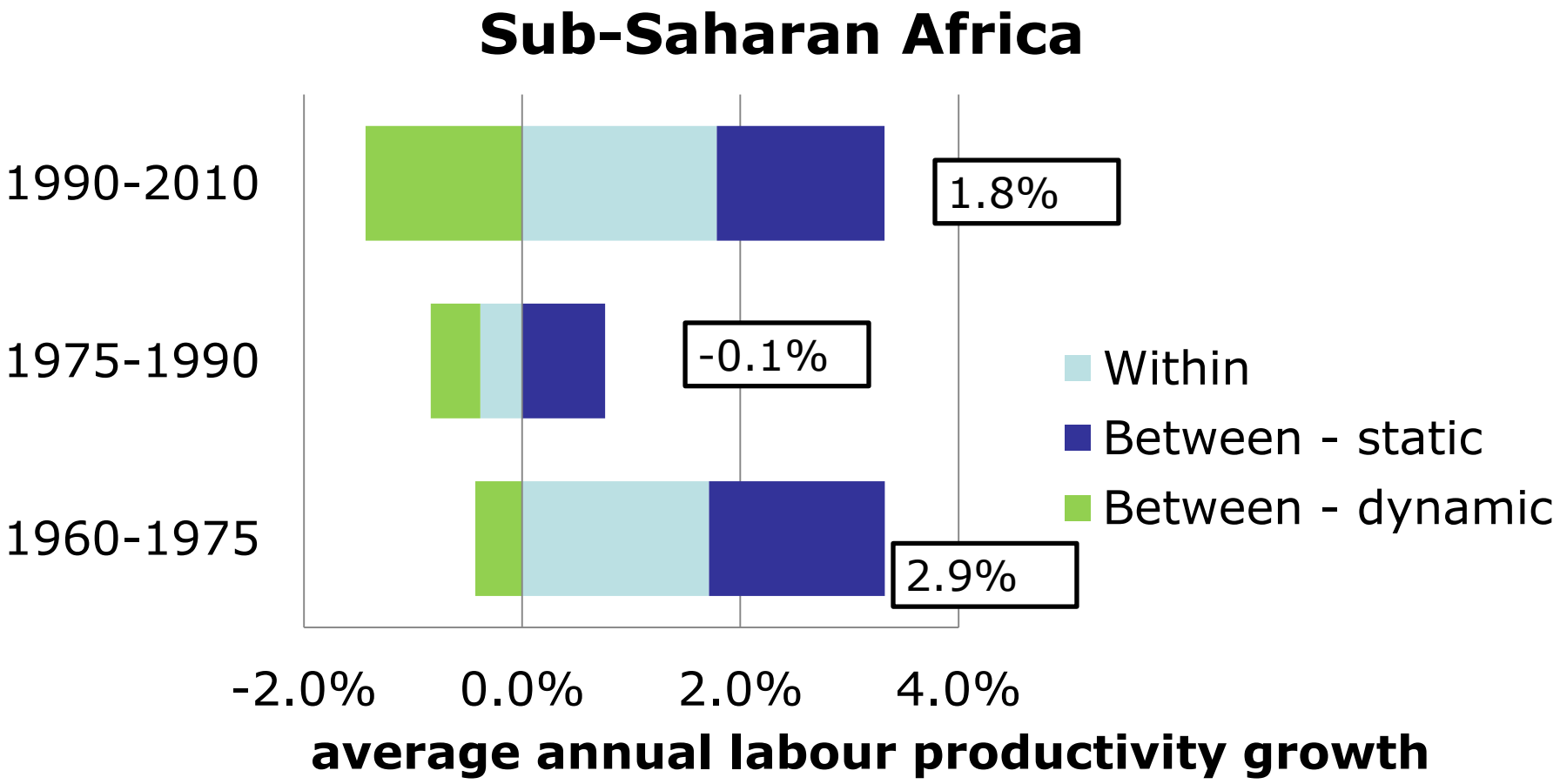
Decomposition results by period



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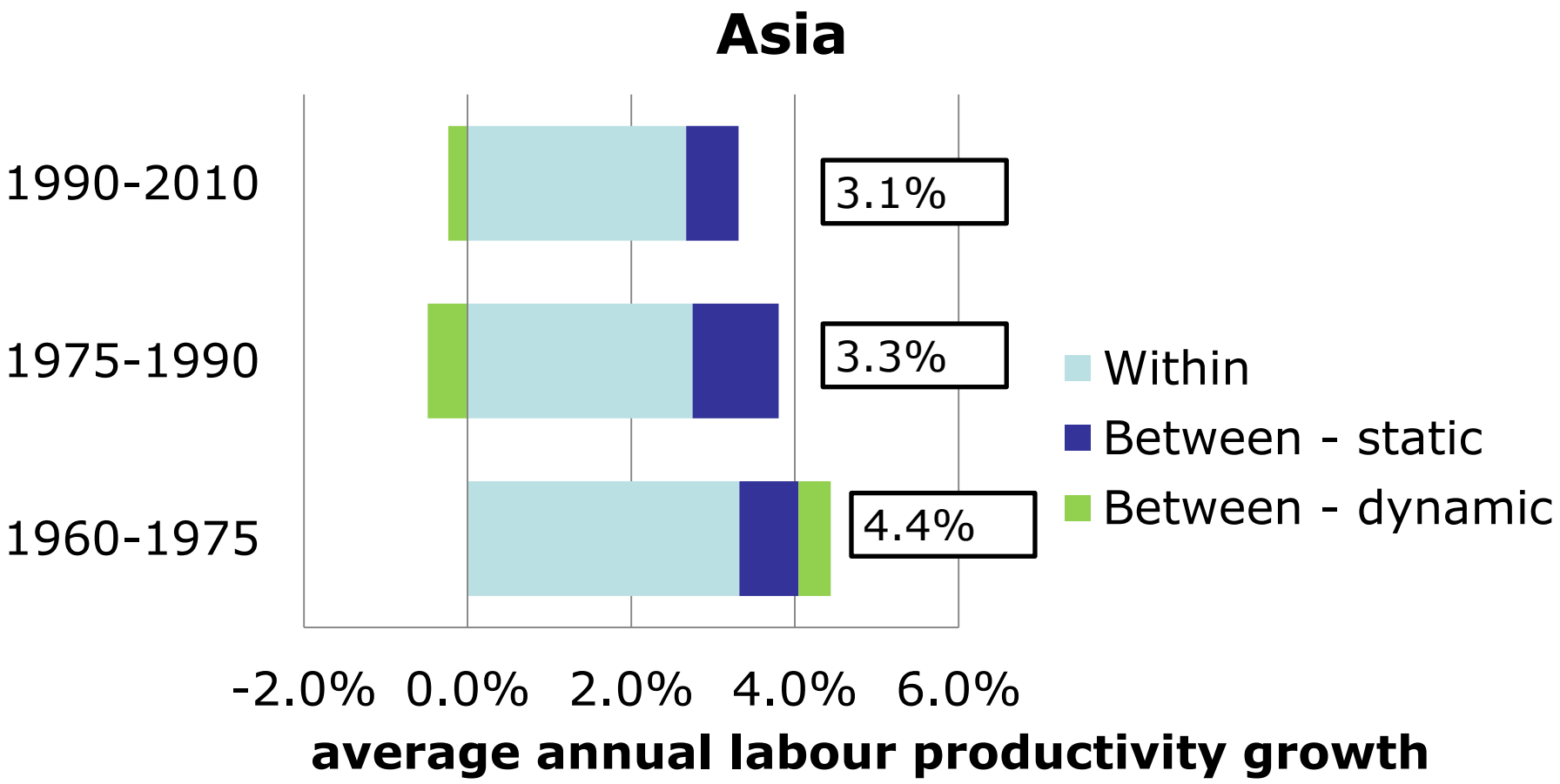
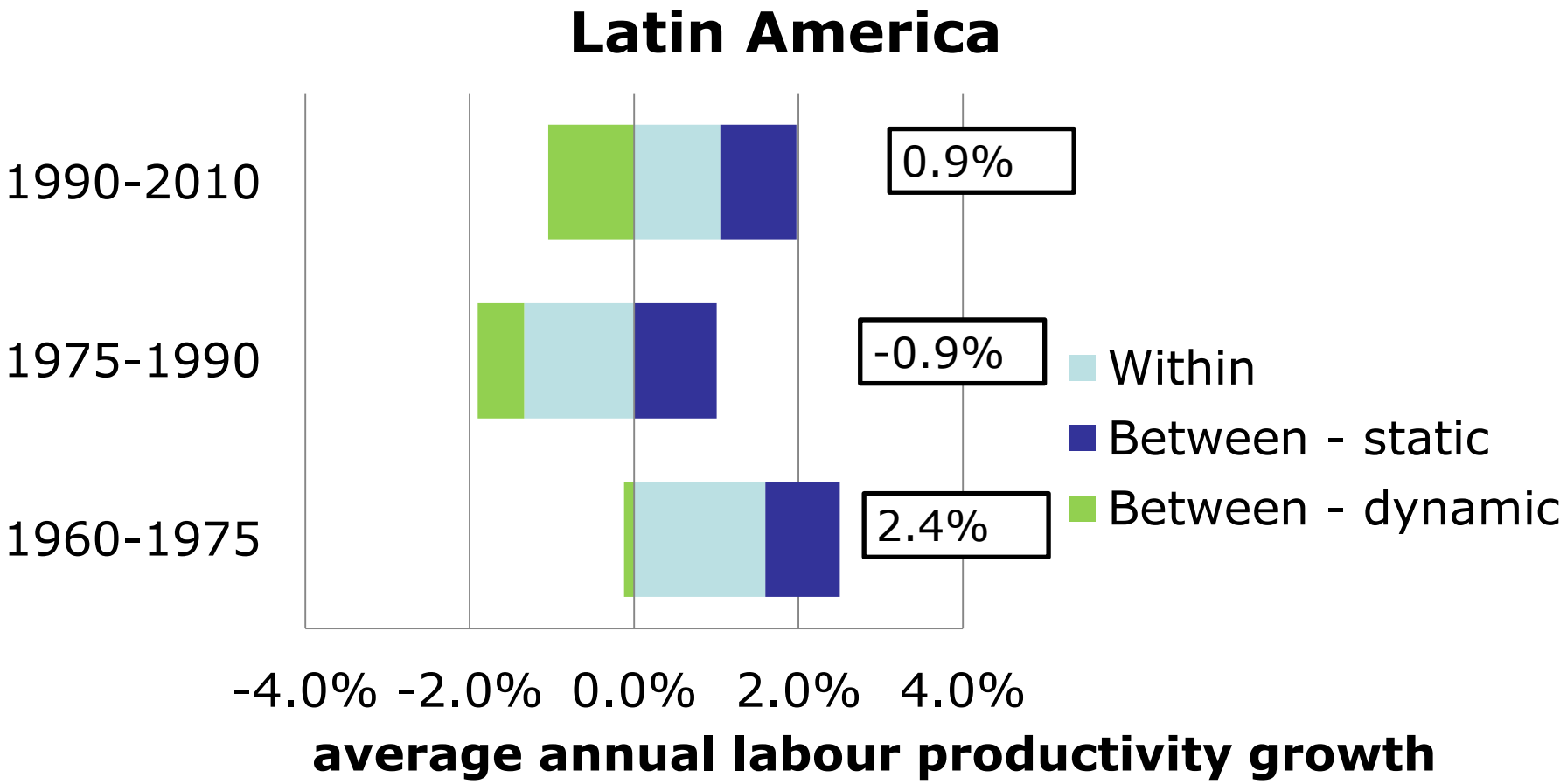
Decomposition results by period



Decomposition results by period



What has been the role of sectors in explaining these aggregate patterns?

- Requires adjusting the decomposition method

- In current decomposition methods, all expanding sectors contribute positively to changes in aggregate productivity even when they have below-average productivity levels or growth rates

Adjusted decomposition method

- The decomposition in equation (4) is modified as follows

$$\Delta P = \sum_i^I (P_i^T - P_i^0) S_i^0 + \sum_j^J (S_j^T - S_j^0)(P_j^0 - P^{0*}) + \sum_j^J \left((P_j^T - P_j^0) - (P^{T*} - P^{0*}) \right) (S_j^T - S_j^0)$$

where J is the set of expanding sectors, and K is the set of shrinking sectors, and average labour productivity of shrinking sectors at time T and 0 is given by

$$P^{0*} = \sum_k^K (S_k^T - S_k^0) P_k^0 \Big/ \sum_k^K (S_k^T - S_k^0)$$

$$P^{T*} = \sum_k^K (S_k^T - S_k^0) P_k^T \Big/ \sum_k^K (S_k^T - S_k^0)$$

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Decomposition results, 1990-2010

	Labor productivity growth	Component due to:		
			Between	
		Within	Static	Dynamic
Agriculture		0.7%	0.0%	0.0%
Manufacturing		0.2%	0.1%	-0.1%
Other industries		0.6%	0.5%	-0.4%
Market services		0.1%	1.1%	-1.1%
Non-market services		0.2%	0.1%	-0.2%
All sectors	1.9%	1.8%	1.8%	-1.7%

Notes: Figures are unweighted averages across eleven African countries. Numbers may not sum due to rounding.

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Looking ahead

DEMAND

- changes in *demand patterns* due to different income elasticity of demand for agricultural products (low), manufactured goods (median), services (high) => 'Engel's Law'
- changes in *composition of trade*

SUPPLY

- changes in *composition of production factors* (land, mineral resources, labor, physical capital)

POLICIES

- LDCR 2014: resource mobilization, industry and sector policies, macroeconomic policies

… No single development path

Thank you for your attention

Dr. Gaaitzen de Vries

www.ggdc.net
www.wiod.org