



DEVELOPMENT POLICY
RESEARCH UNIT

The African Manufacturing Malaise: Nature and Determinants

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The Quality of Growth in Sub-Saharan Africa

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Outline

- The Case for Africa's Manufacturing Malaise
- Product Space and Economic Complexity: A Framework for Structural Transformation in Africa
- Evidence of Structural Transformation in Africa: Economic Complexity, Product Space and Opportunity Value
- Estimating the Determinants of Africa's Manufacturing Performance

The African Manufacturing Malaise:

Sectoral Composition of Growth In Africa, By Region: 1980-2000s

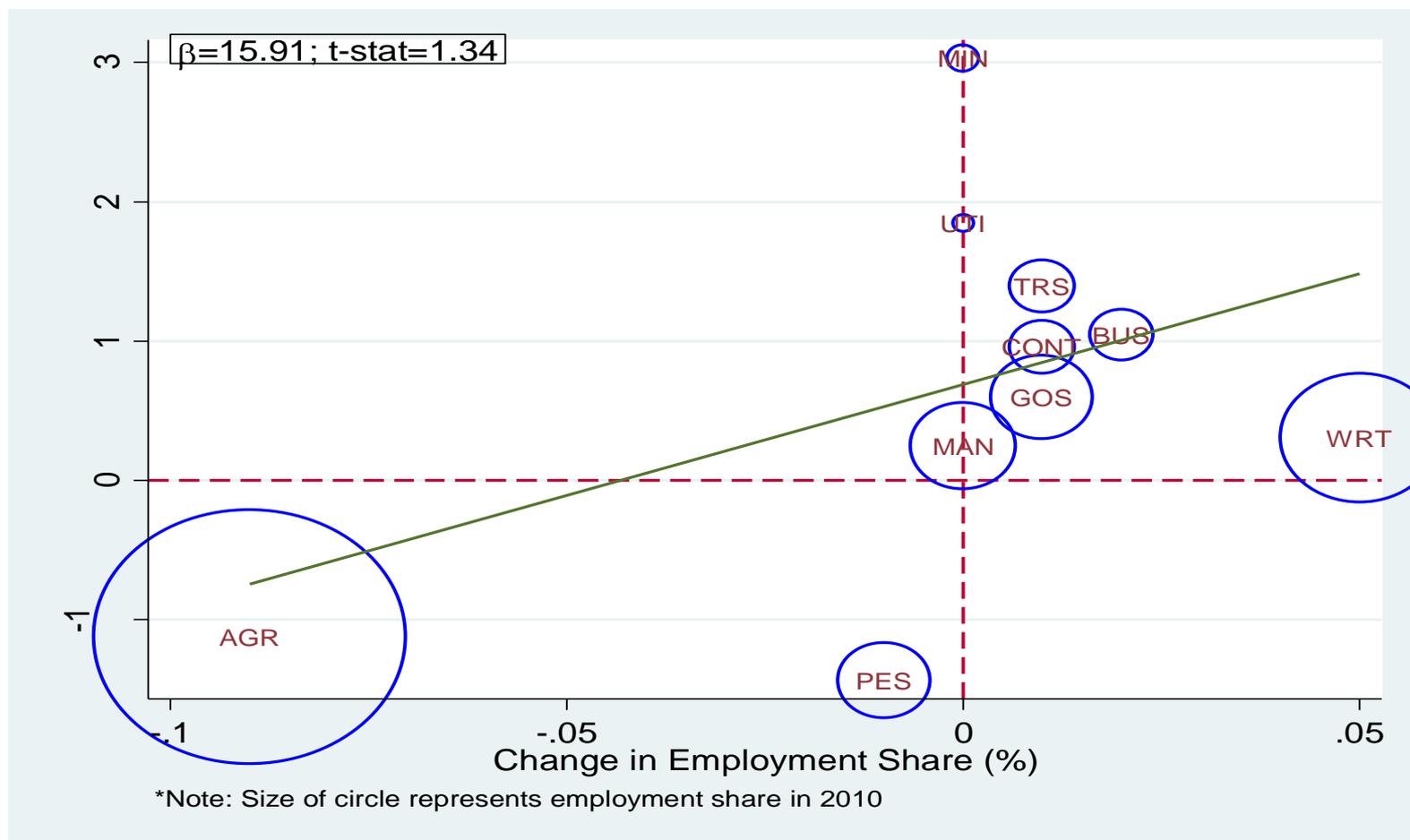
Share of GDP	1980s	1990s	2000s	1980s-2000s % Change
Agriculture	27.4	27.5	23.4	-4.0
Industry	26.8	26.7	28.1	1.3
Of which: Manufacturing	11.3	11.9	10.6	-0.8
Services	45.8	45.8	48.2	2.4

Source: World Development Indicators (WDI) 2015 and own calculations.

Notes: 1. Columns 3, 4 and 5 represent the average sector share of GDP for the 1980s (1980-1989), the 1990s (1990-1999) and 2000s (2000-2013), respectively. 2. Due to missing data, not all African countries are included in calculations. This is done in order to provide a consistent set of countries over time and so as not to bias the sector shares by the inclusion of new countries as data becomes available. The following countries are excluded: Angola, Cote D'Ivoire, Eritrea, Equatorial Guinea, Gambia, Guinea-Bissau, Libya, Liberia, Mozambique, Somalia, South Sudan, Sao Tome & Principe, and Tanzania. 3. Industry corresponds to ISIC divisions 10-45 and includes manufacturing (ISIC divisions 15-37). It comprises value added in mining, manufacturing (also reported as a separate subgroup), construction, electricity, water, and gas.

The African Manufacturing Malaise

Sectoral Productivity and Employment Shifts, 1975-2010

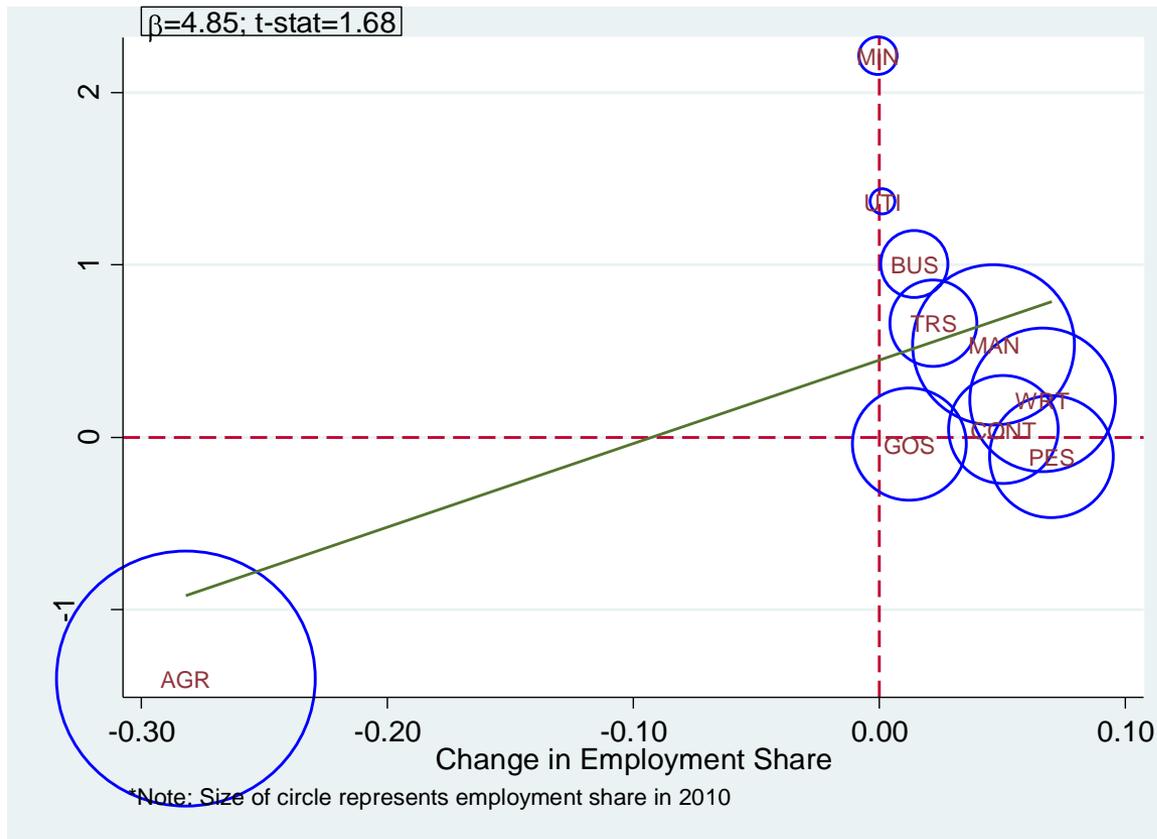


Source: Own calculations using Groningen Growth and Development Centre 10-sector database (Timmer et al., 2014)

Notes: 1. African countries included: Botswana, Ethiopia, Ghana, Kenya, Malawi, Mauritius, Nigeria, Senegal, South Africa, Tanzania and Zambia. 2. AGR = Agriculture; MIN = Mining; MAN = Manufacturing; UTI = Utilities; CONT = Construction; WRT = Trade Services; TRS = Transport Services; BUS = Business Services; GOS = Government Services; PES = Personal Services.

The African Manufacturing Malaise

Sectoral Productivity and Employment Shifts in Asia, 1975-2010



Source: Own calculations using Groningen Growth and Development Centre 10-sector database (Timmer et al., 2014)

Notes: 1. AGR = Agriculture; MIN = Mining; MAN = Manufacturing; UTI = Utilities; CONT = Construction; WRT = Trade Services; TRS = Transport Services; BUS = Business Services; GOS = Government Services; PES = Personal Services. 2. The estimated regression line, measuring the relationship between productivity and changes in employment share by sector, is not statistically significant.

The African Manufacturing Malaise: Asia Versus Africa

- Both regions have experienced growth inducing structural transformation since the 1970s.
- *Asian Experience*: Shift from low productivity agricultural sector to high productivity manufacturing sector.
- *African Experience*: Shift from low productivity agricultural sector (although, to a lesser degree than in Asia) to services. In particular, a shift to wholesale and retail trade services (dominated by the informal sector).

The African Manufacturing Malaise

Product Space and Economic Complexity

- Hausmann & Klinger (2006); Hidalgo et al. (2007); Hausmann & Hidalgo (2011).
- Structural transformation influenced by current production
- Shifting production toward a new product: How proximate are assets & capabilities embodied in existing prodtn. structure to those for new product?
- *Product space mapping* of Hidalgo et al. (2007)

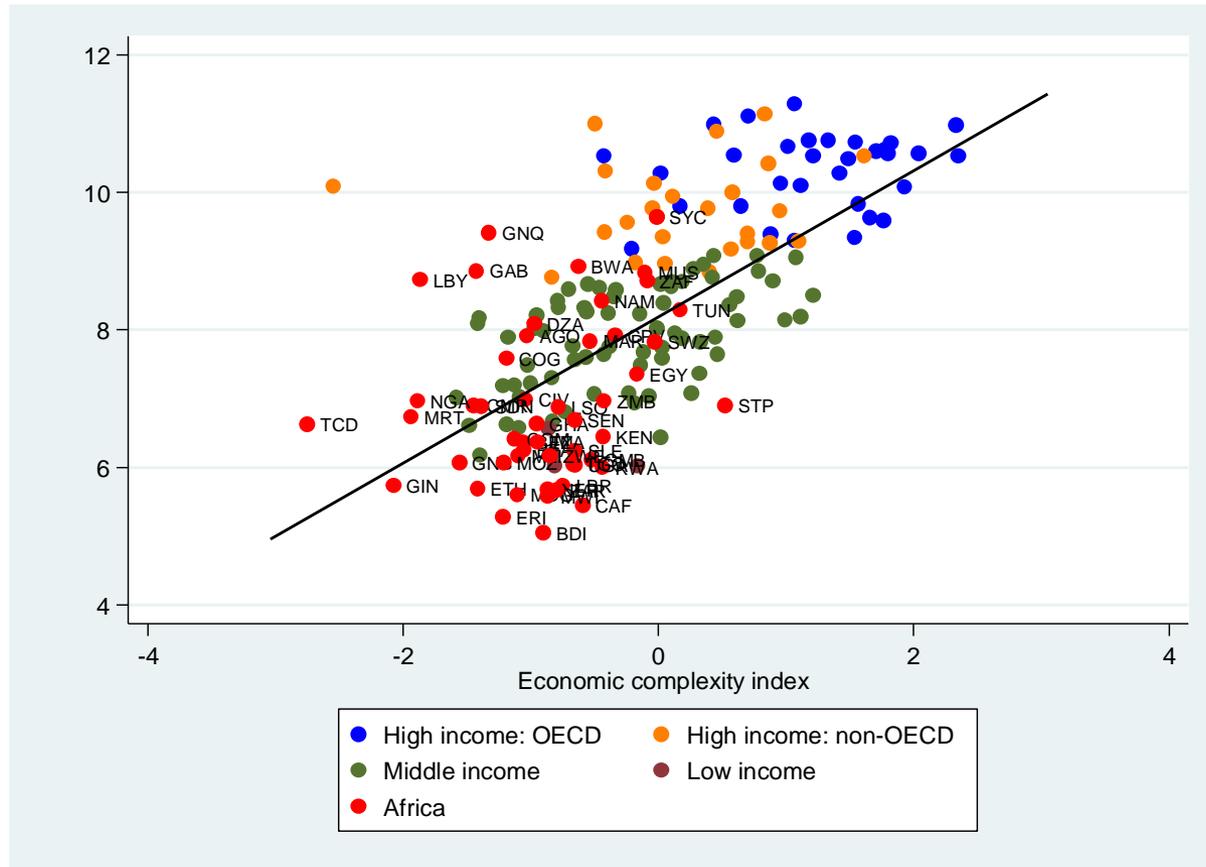
III: The African Manufacturing Malaise: Determinants and Attributes:

Product Space, Economic Complexity and Opportunity Value

- **Economic Complexity Index (ECI):**
 - Products in core (periphery) of product space manufactured (resource-based) products
 - Distance betw. products *within core* of product space < distance betw. core & peripheral products.
 - Shifting prodn. toward manuf. Products easier if country already has manufacturing sector.
 - Shifting toward manuf. when mainly producing peripheral products much harder
- **Opportunity Value Index (OVI) Builds on ECI by combining the product distance from the core with the production knowledge (PCI) required for each product.**
 - *“A measure of how many different products are near a country’s current set of productive capabilities. Countries with a high opportunity value have an abundance of nearby products due to the make-up of their current export basket. These countries will therefore find it easier to develop new industries and acquire the necessary missing capabilities (productive knowledge) to do so. Countries with a low opportunity value have few nearby products and will find it difficult to acquire new capabilities (productive knowledge) and increase their economic complexity.” (Hausmann et al, 2011)*

The African Manufacturing Malaise

Economic Complexity (ECI) & GDP p.c., 2013



Source: Own calculation using data from The Economic Complexity Observatory (Simoes & Hidalgo, 2011)

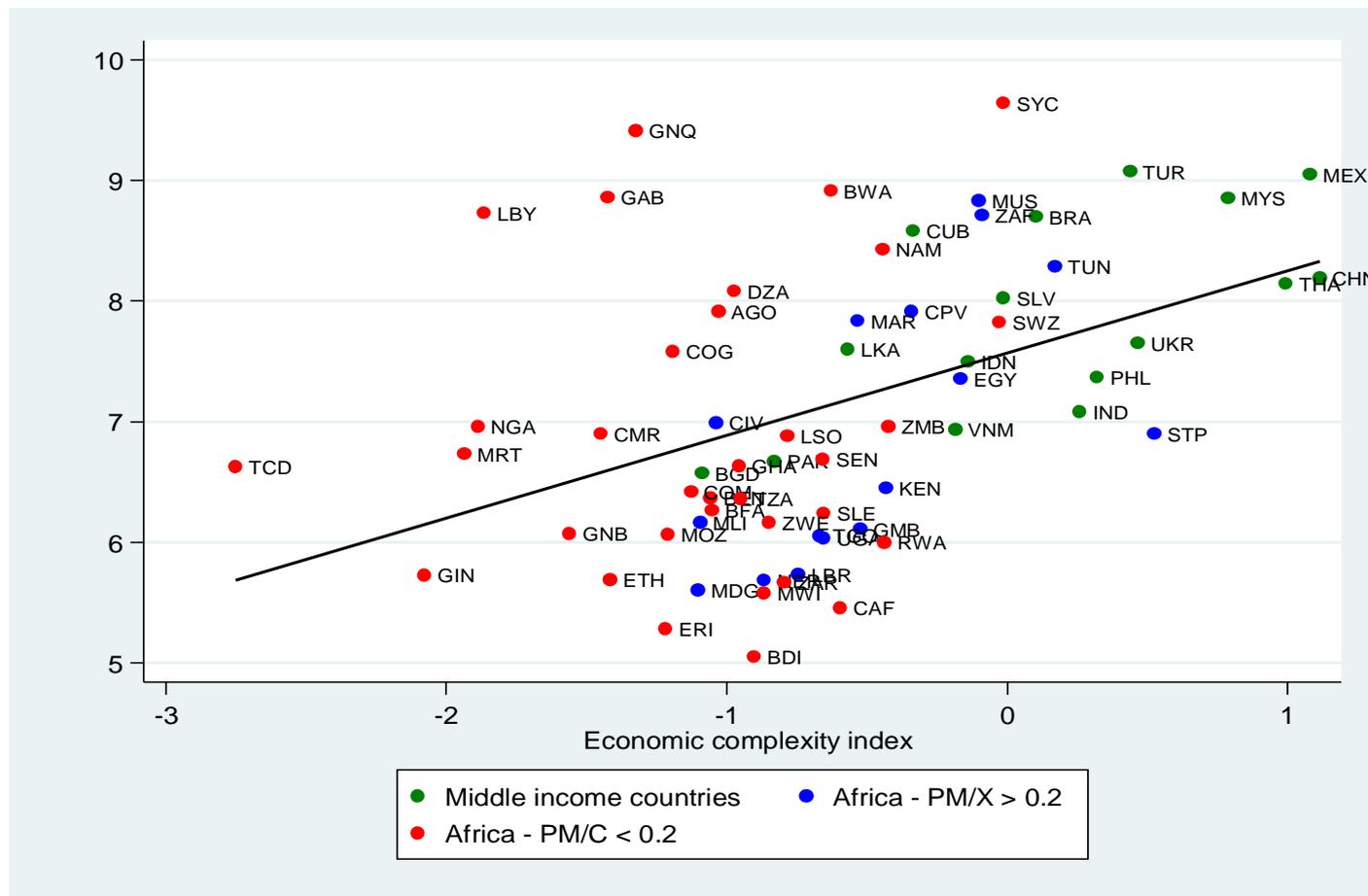
The African Manufacturing Malaise

Economic Complexity Results For Africa

- African economies are associated with lower levels of economic complexity and thus lower levels of economic development.
- Crucial: African context is heterogeneous.
 - Cluster of African countries associated with low levels of economic complexity and
 - a few African countries associated with higher levels of economic complexity and economic development.

The African Manufacturing Malaise

Economic Complexity (ECI) & GDP p.c. MIC Sample only ,2013



Source: Own calculation using data from The Economic Complexity Observatory (Simoes & Hidalgo, 2011)

Notes: 1. The middle income country groups, depicted by the green markers refers to a sample of non-African middle income countries. 2. The blue markers refer to African countries whose pure manufacturing exports as a share of total exports exceeds 20 percent. 3. The red markers refer to African countries whose pure manufacturing exports as a share of total exports is less than 20 percent.

The African Manufacturing Malaise

Economic Complexity Results For Africa

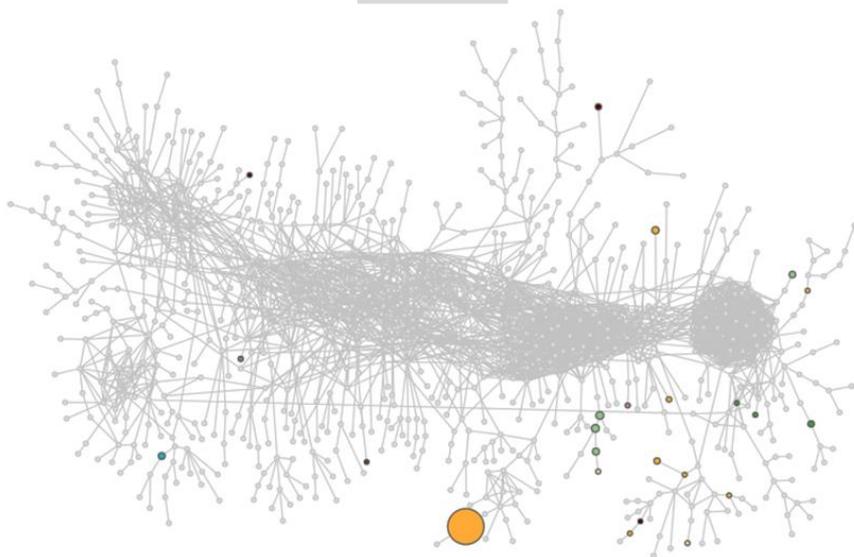
- ‘Substantial African Manufacturing Exporters’ (blue markers) are Mauritius, South Africa, Tunisia, Morocco and Egypt - have higher levels of economic complexity.
- Group of African countries ‘substantial exporters’ of manufactures, but lower levels of econ. Dev. (blue markers) – Cote d’Ivoire, Kenya, Uganda, Togo, Malawi and Madagascar.
- Relative to top-performing emerging market countries, Africa’s top manufacturing exporters have lower levels of economic complexity and hence lower levels of productive knowledge.
- Number of African countries have relatively high levels of economic development, measured in real GDP per capita, but low levels of economic complexity – Libya, Gabon, Equatorial-Guinea. [‘The Resource Curse’?]

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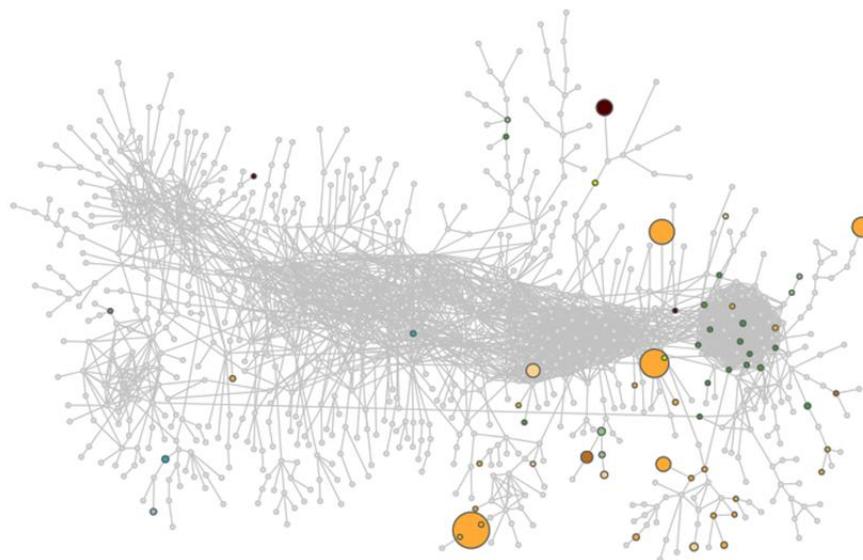
Product Space Analysis

Ethiopia, 1995 and 2013

1995



2013

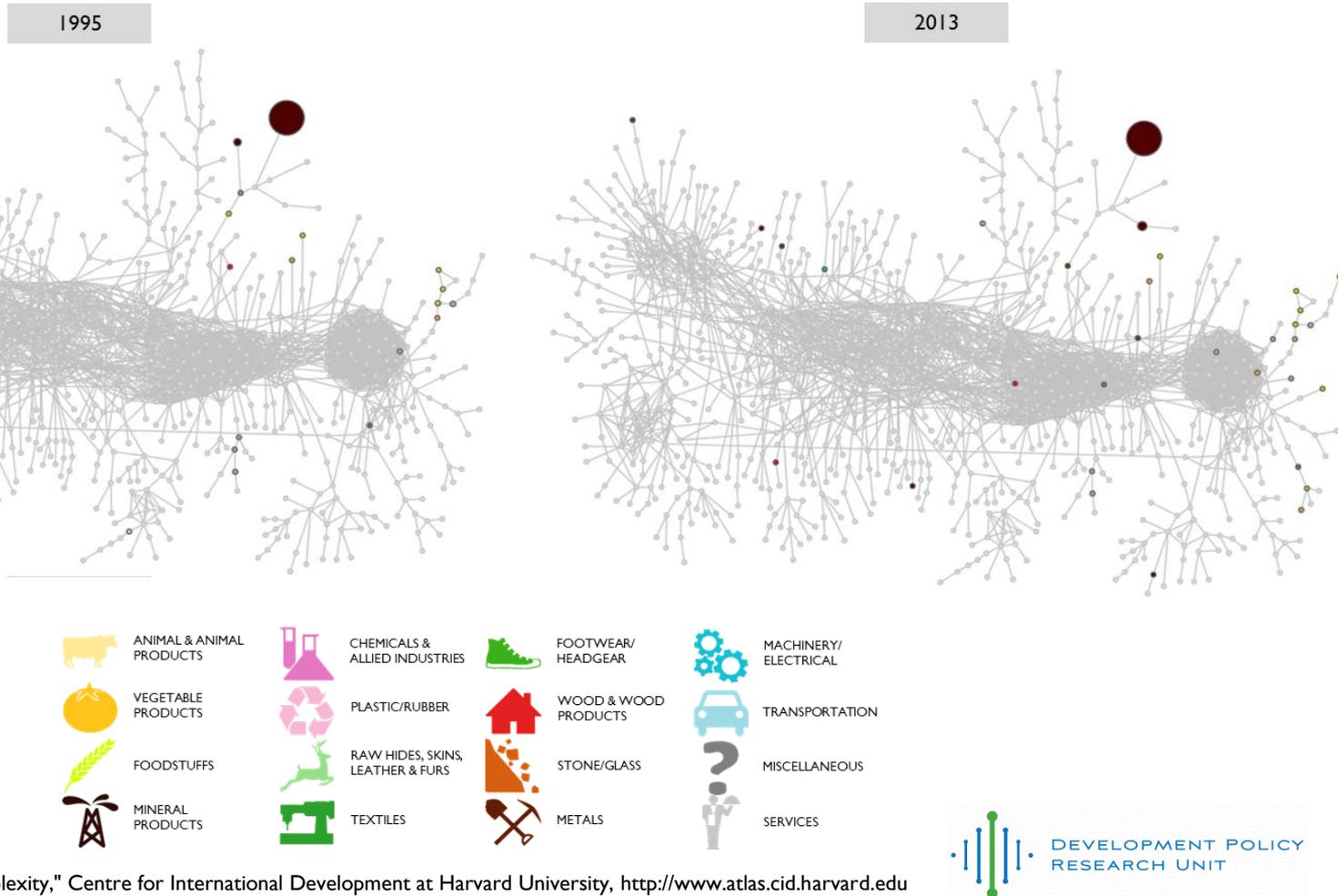


Source: The Atlas of Economic Complexity," Centre for International Development at Harvard University, <http://www.atlas.cid.harvard.edu>

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Product Space Analysis

Nigeria, 1995 and 2013



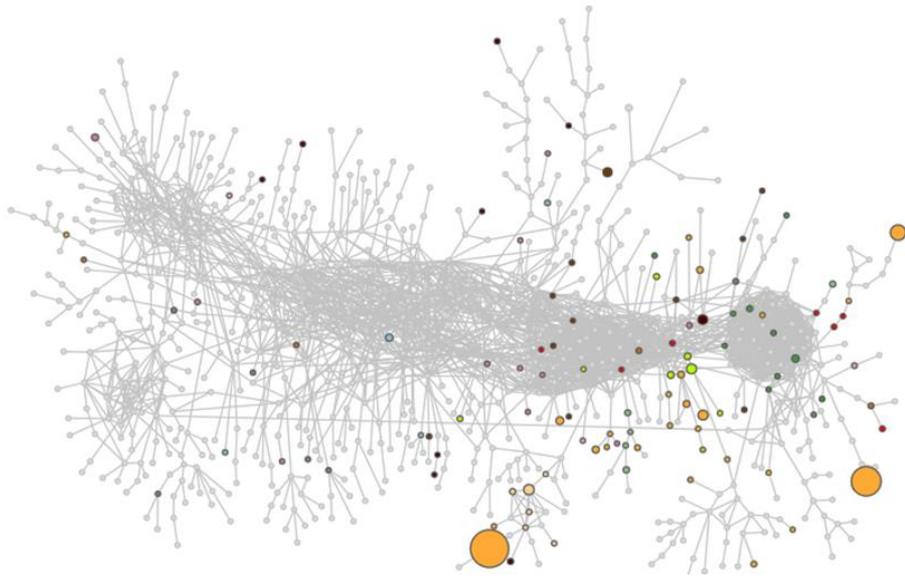
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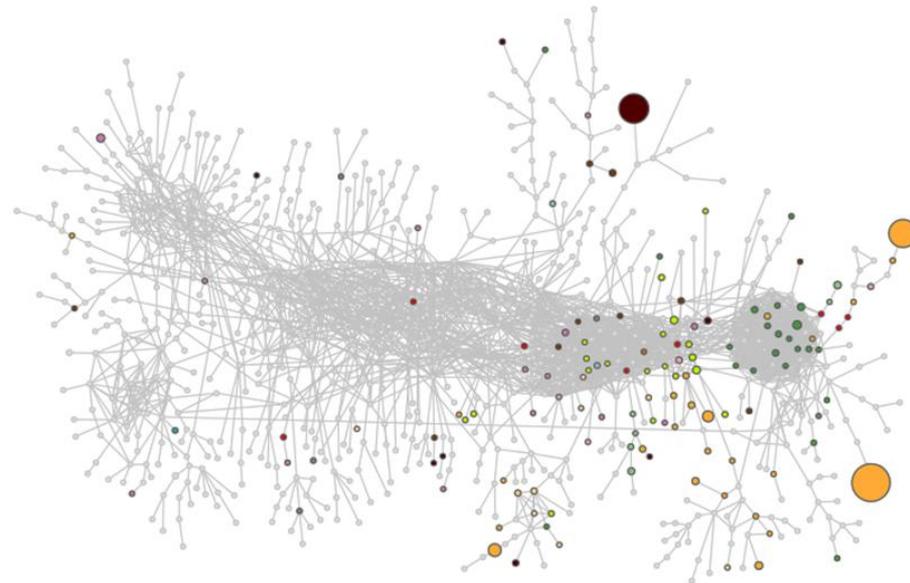
Product Space Analysis

Kenya, 1995 and 2013

1995



2013

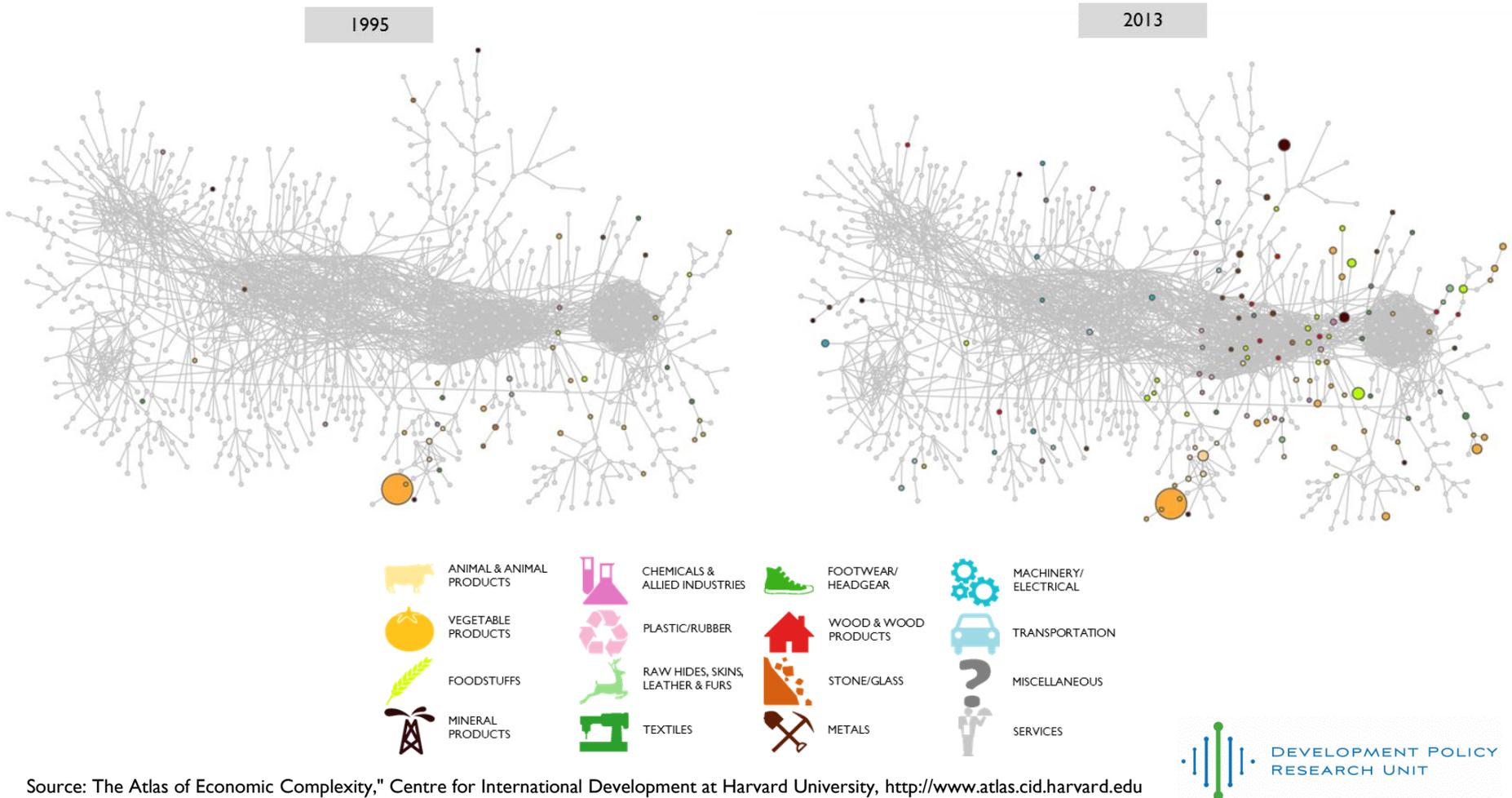


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Product Space Analysis

Uganda, 1995 and 2013

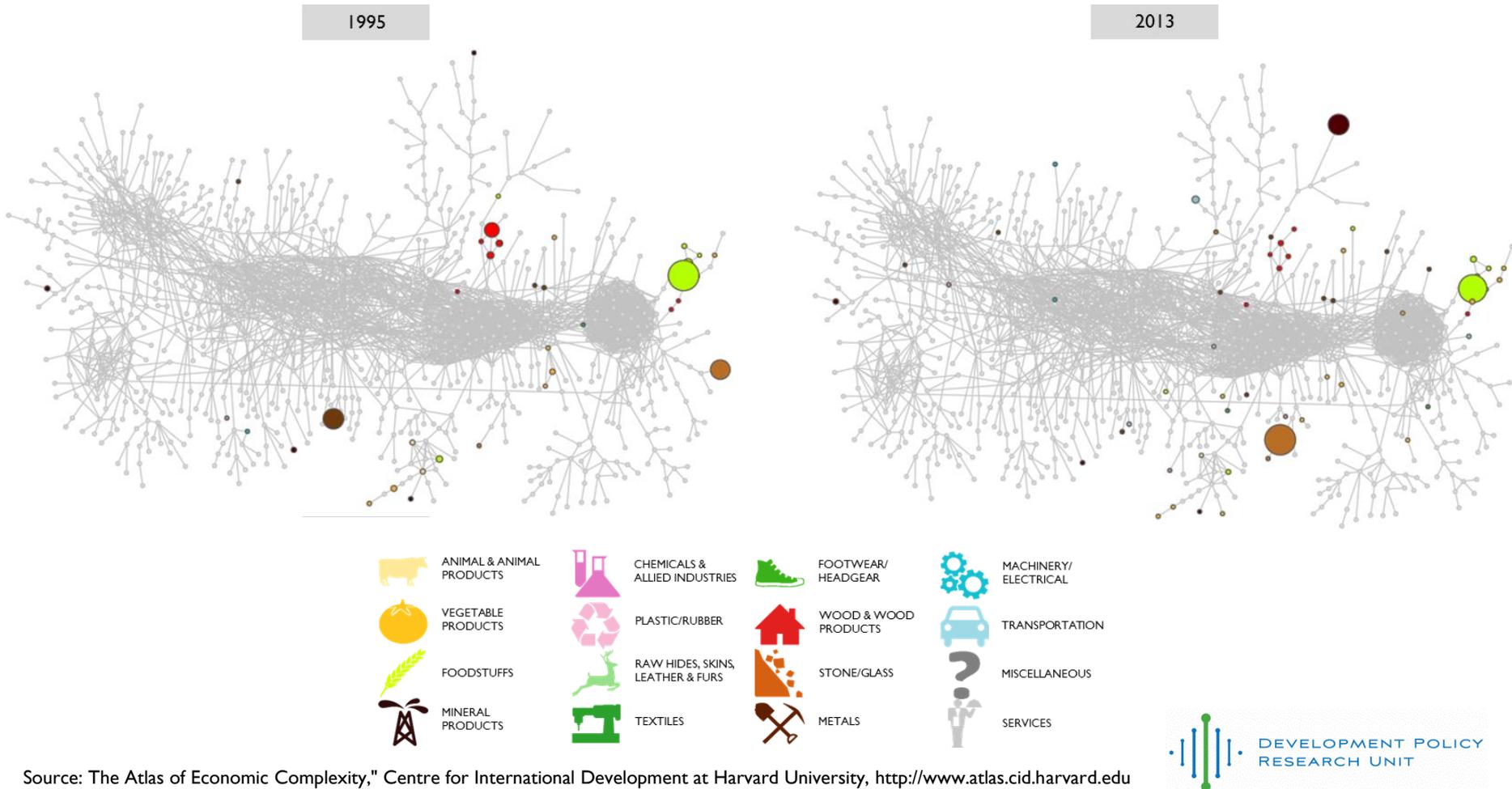


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Product Space Analysis

Ghana, 1995 and 2013



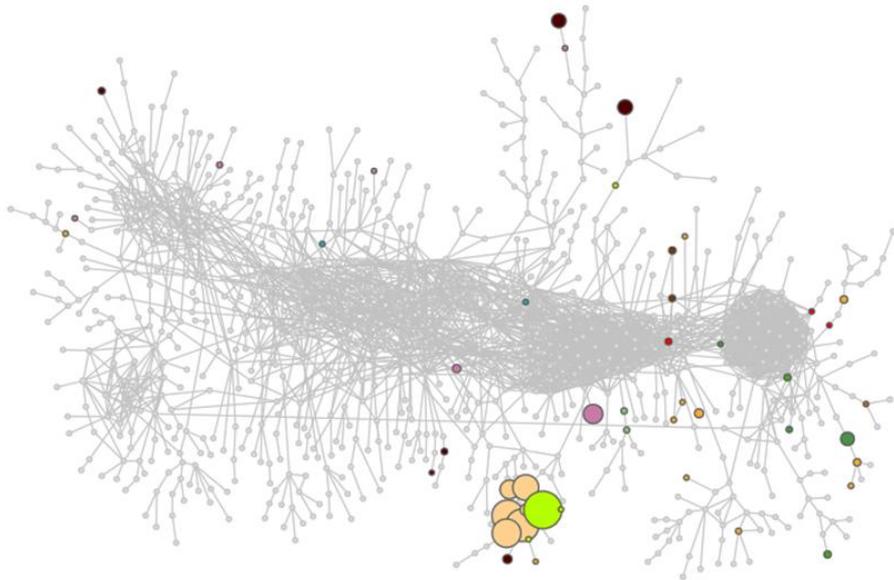
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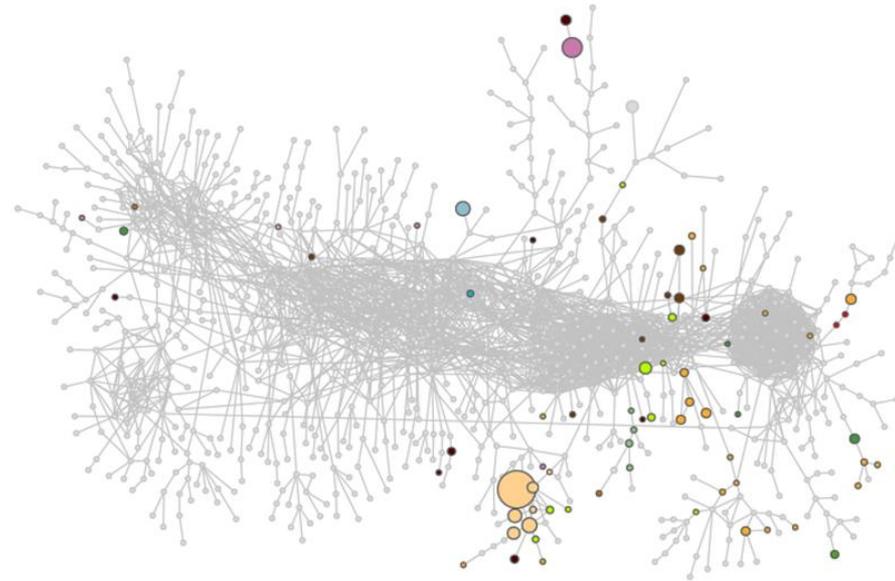
Product Space Analysis

Senegal, 1995 and 2013

1995



2013



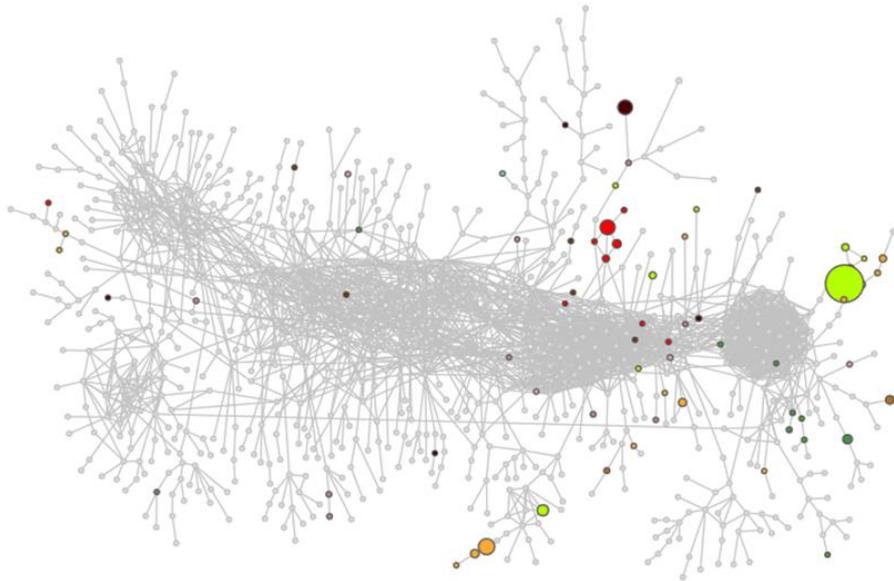
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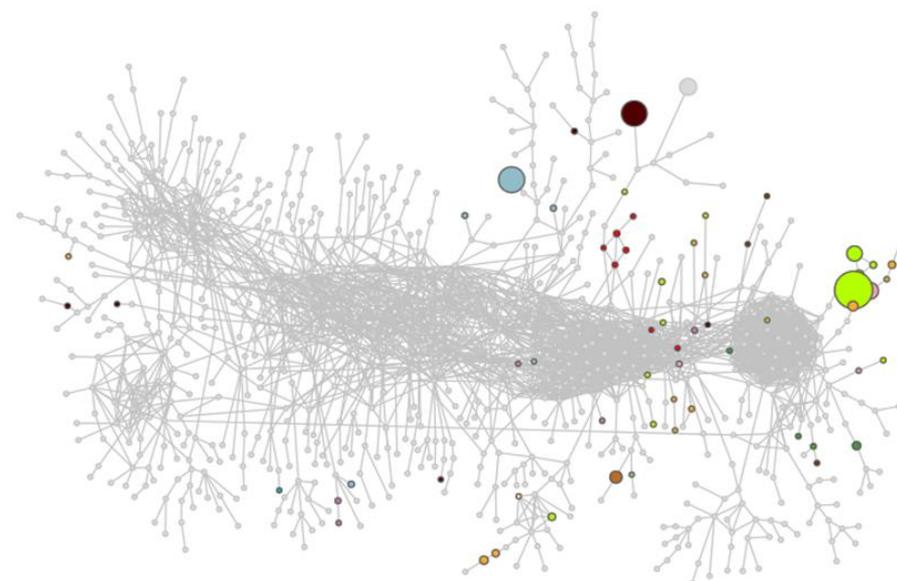
Product Space Analysis

Cote d'Ivoire, 1995 and 2013

1995



2013



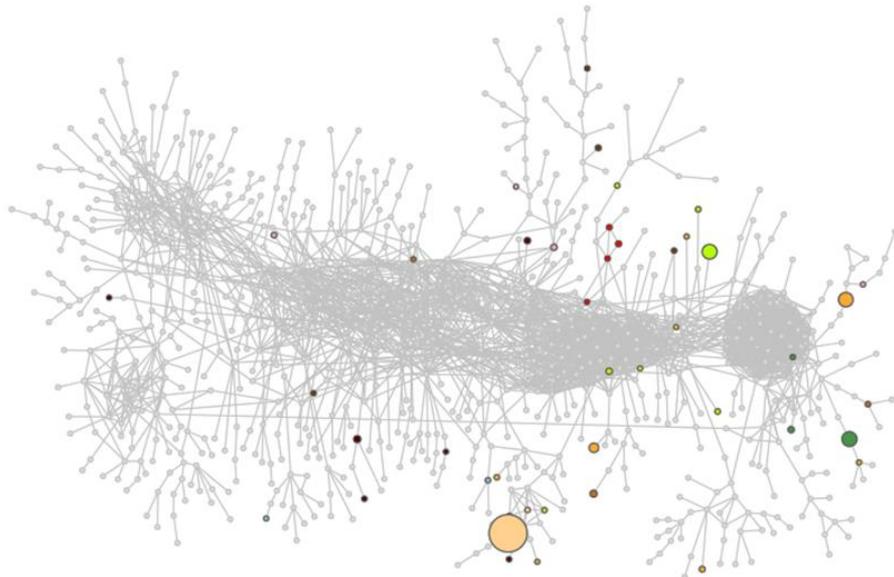
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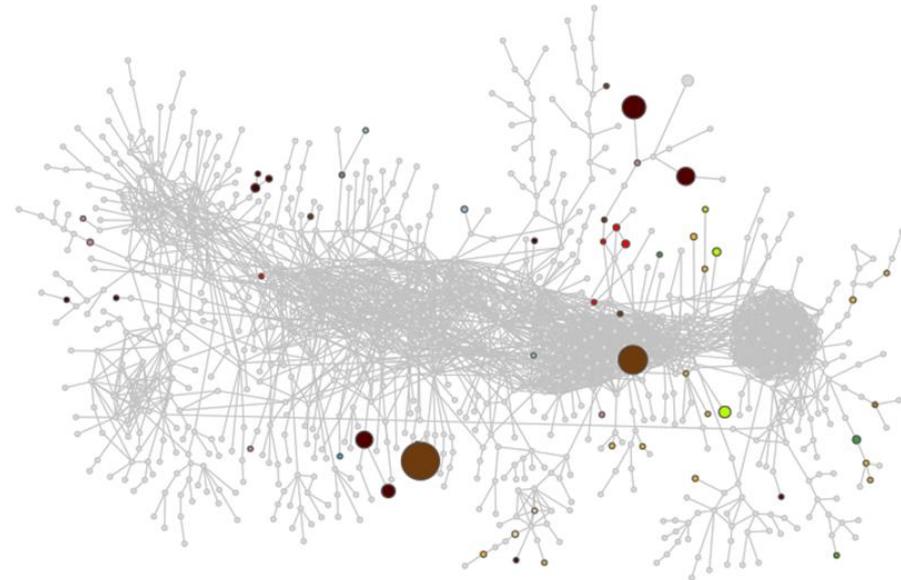
Product Space Analysis

Mozambique, 1995 and 2013

1995



2013



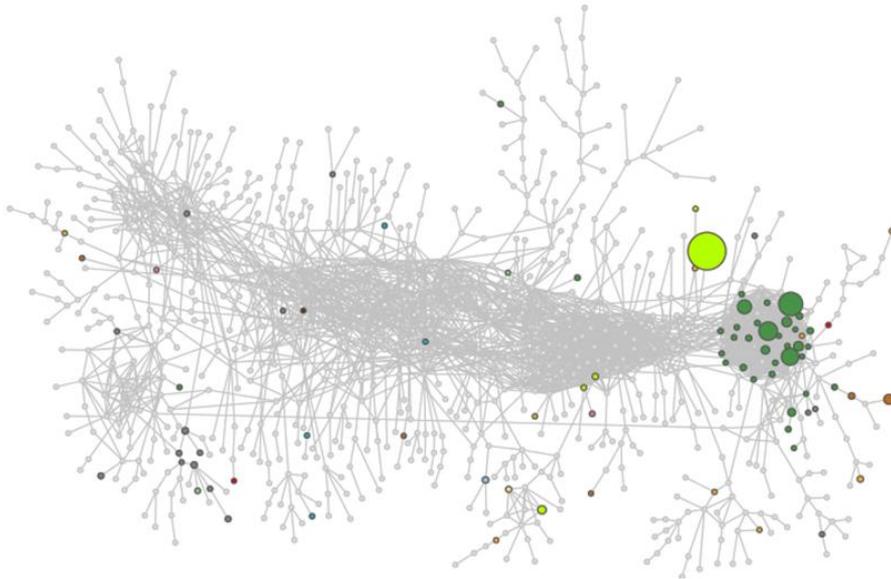
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The African Manufacturing Malaise

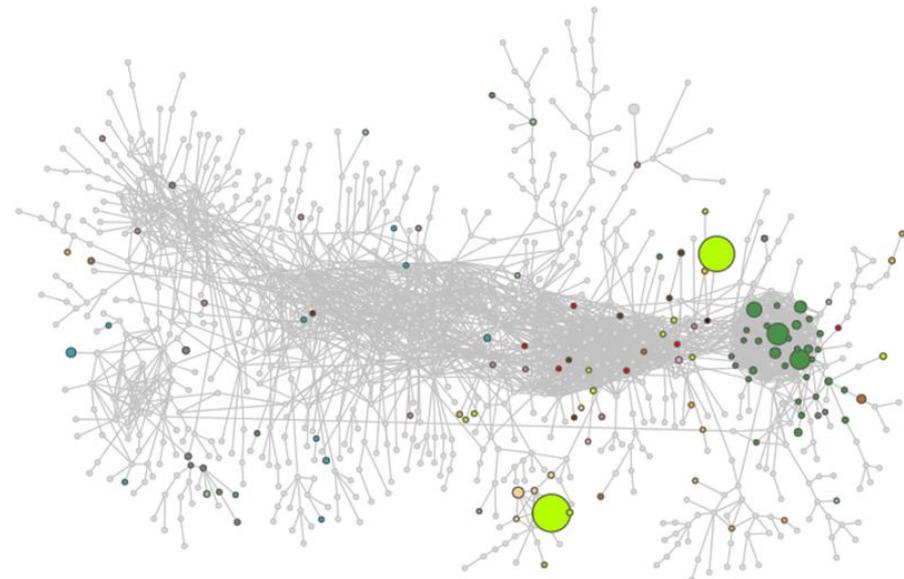
Product Space Analysis

Mauritius, 1995 and 2013

1995



2013



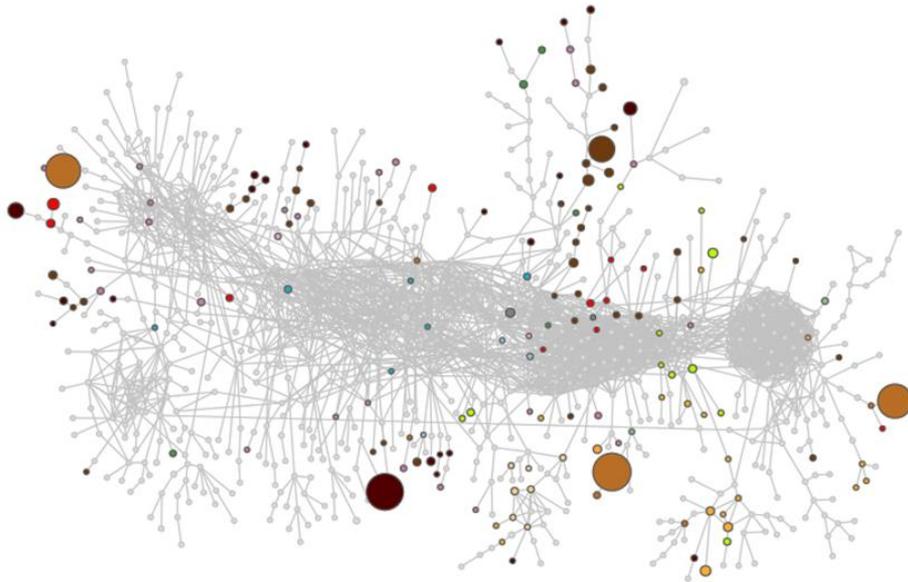
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The African Manufacturing Malaise

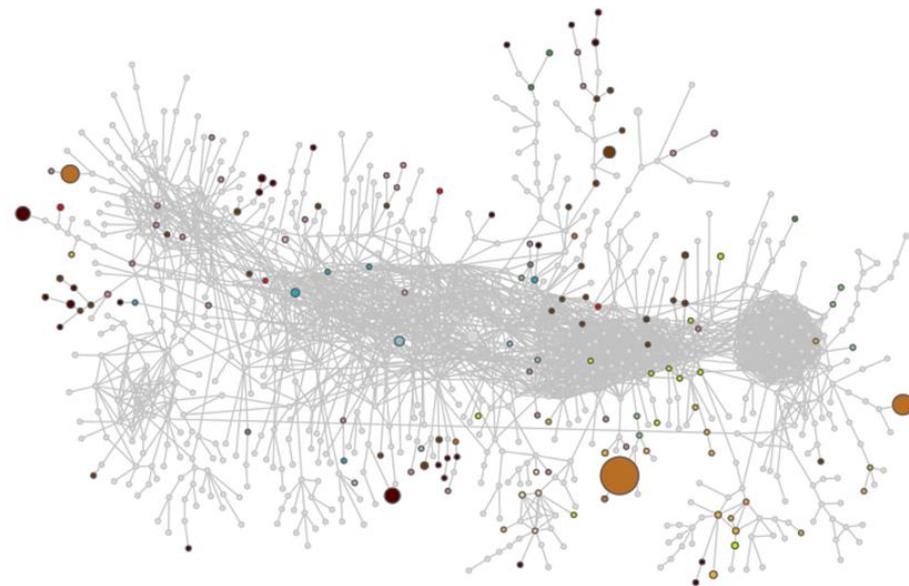
Product Space Analysis

South Africa, 1995 and 2013

1995



2013



Source: The Atlas of Economic Complexity," Centre for International Development at Harvard University, <http://www.atlas.cid.harvard.edu>

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Product Space Outcomes: Key Results

- In general over 1995-2013, relatively little change in the productive structures of these African economies.
- The ‘average African’ productive structure is peripheral but
 - Evidence of heterogeneity
 - Ethiopia, Uganda, and Mauritius are examples of manufacturing success stories. In each of these cases
 - The number of occupied nodes within the core of the product space has increased.
- Stagnation evident in a number of economies, such as South Africa and Nigeria.

III: Africa's Manufacturing Malaise: Econometric Results

DV: Log of product count of Total Manufacturing exports	Neo-Classical Model	Hausmann Model	Expanded (Hausmann) Model
Log of fixed capital per worker	0.255***	0.261***	0.247***
Total factor productivity	0.131	0.152*	0.190**
Nat. Resources rents (% of GDP)	0.002	0.003	0.002
Africa	-0.392*	-0.272	-0.266
Economic complexity index		-0.026	-0.044
Opportunity value index		0.151***	
OVI*LIC			0.361
OVI*MIC			0.227***
OVI* HI-OECD			0.095***
OVI* HI-non OECD			0.139*

The African Manufacturing Malaise

Conclusion

- A '*Growth sans Manufacturing*' experience in Africa, is significantly different from growth trajectory in Asia.
- Product space , economic complexity and opportunity methodologies reinforce extent of manufacturing malaise.
 - Increased economic complexity, greater move to core of product space critical for long-run economic growth in Africa.
 - Country evidence suggests significant heterogeneity in product space architecture, economic complexity and opportunity value.
 - Resource curse strongly evident in concentration around periphery.
- Need to improve the level and sophistication of manufacturing output, key to sustaining longer run process of structural transformation in Africa.