

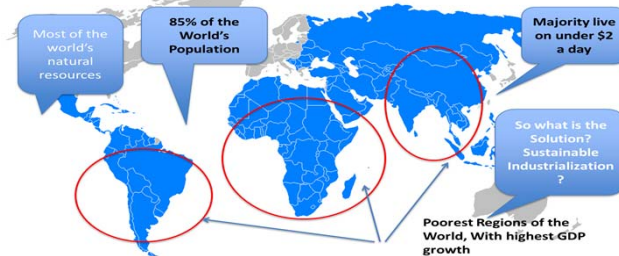
Appropriate Technology for Manufacturing Productivity in Developing Economies



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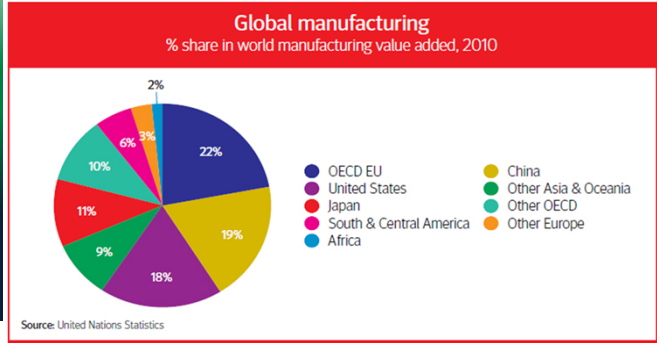
Motivation

- Developing Countries constitute the world's poorest population
- Increasing Manufacturing Productivity of Developing Countries could increase their GDP and quicken their transition to becoming Developed Economies

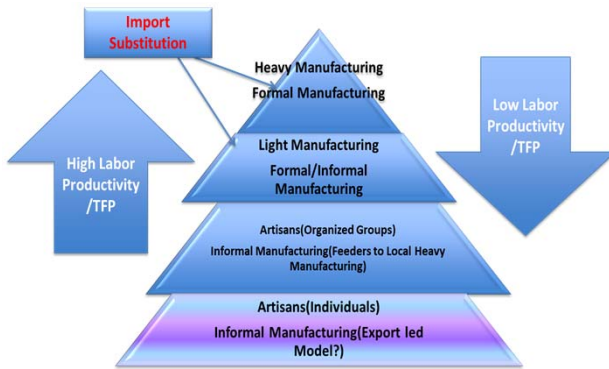


The Gap in Global Manufacturing

- About two-thirds of the world manufacturing is from developed economies, and only a third from developing economies.



Manufacturing in Developing Economies



Measures of Manufacturing Productivity

$$\text{Production} = \text{Output} / \text{Input}$$

Labor Productivity

Labor Productivity measures the amount of real Gross Domestic Product (GDP) or Gross Value Added (GVA) produced by an hour of labor. Increasing labor productivity depends on three main factors: investment and saving in physical capital, new technology and human capital.

Total Factor Productivity

Total Factor Productivity (TFP) is based on the Cobb-Douglas Production Function and is a measure of technological growth and efficiency.

$$Y = A \times K^\alpha \times L^\beta$$

Y=Output; A= TFP; K=Capital; L= Labor (α and β are the capital input share of contribution for K and L respectively)

Manufacturing in Selected South East Asian Countries

Country	Trade/Economic Region	High Tech Exports(\$\$)	% of GDP from Exports	Manufacturing Sector
Indonesia	ASEAN	4.962billion	24%(2013)	Automotive, Electronics, Textiles
Philippines	ASEAN	20.8billion	21%(2013)	Wearing Apparel, Plastic Products
Thailand	ASEAN	33.77billion	33%(2013)	Automotive, Apparel
Vietnam	ASEAN	9.11billion	17%(2013)	Electronics
Malaysia	ASEAN	61.22billion	24%(2013)	Electronics
U.S.A	NA	148.8billion	13%(2013)	Advanced Manufacturing
China	NA	505billion	32%(2013)	Electronics, Automotive

Manufacturing in Selected African Countries

Country	Trade/Economic Region	High Tech Exports(\$\$)	%GDP from Manufacturing	Manufacturing Sector
Nigeria	ECOWAS	77.19million	7%(2013)	Textiles, Foods & Beverages, Ship
Ghana	ECOWAS	72.65million	6%(2013)	Metals, Textiles, Electronics, Automotive, Ship
Cameroon	CEMAC	14.79million	No Data	Textiles
Congo, Rep of	CEMAC	78.78million	4%(2011)	Textiles, Foods & Beverages
Uganda	EAC	165.7million	9%(2013)	Textiles, Foods & Beverages, Electronics
Kenya	EAC	99.9million	10%(2012)	Textiles, Foods & Beverages
South Africa	SADC	1.952billion	12%(2013)	Textiles, Foods & Beverages, Ship
Zambia	SADC	221.5million	8%(2013)	Textiles, Foods & Beverages

Conclusion

Ad-Hoc Informal Artisanship and Light Manufacturing dominates the Manufacturing sector in Developing Economies.

Transitioning to Formal Industrial Clusters could increase manufacturing productivity. Technologies to facilitate this are needed.



Total Factor Productivity is the most appropriate productivity measure to inform Manufacturing Technological Capacity Building in Developing Economies.

Future Work

- Case Study Evaluation of Manufacturing in Selected Countries by Manufacturing Sectors
- Investigate Total Factor Productivity (TFP) and its effect on the Appropriate Technology Model
- Investigate mechanism for developing economies to become "high value adders" in the global production value added chain.
- Investigate how efficient global supply chains may offer opportunities for developing economies to increase productivity?
- Design and Develop Mobile Technology to increase Manufacturing Productivity in Selected Developing Countries.

Support Information

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