

UNCTAD Multi-year Expert Meeting on  
**TRADE, SERVICES AND DEVELOPMENT**  
Enhancing productive capacity through services  
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**The relationship between services and productive capacity;  
The “Servicification” of manufacturing**

by

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# The relationship between services and productive capacity: The «Servicification» of Manufacturing

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The main source for slides:

Murat A. Yülek

# HOW NATIONS SUCCEED

MANUFACTURING, TRADE,  
INDUSTRIAL POLICY,  
& ECONOMIC DEVELOPMENT



# Summary

## **The relationship between services and productive capacity**

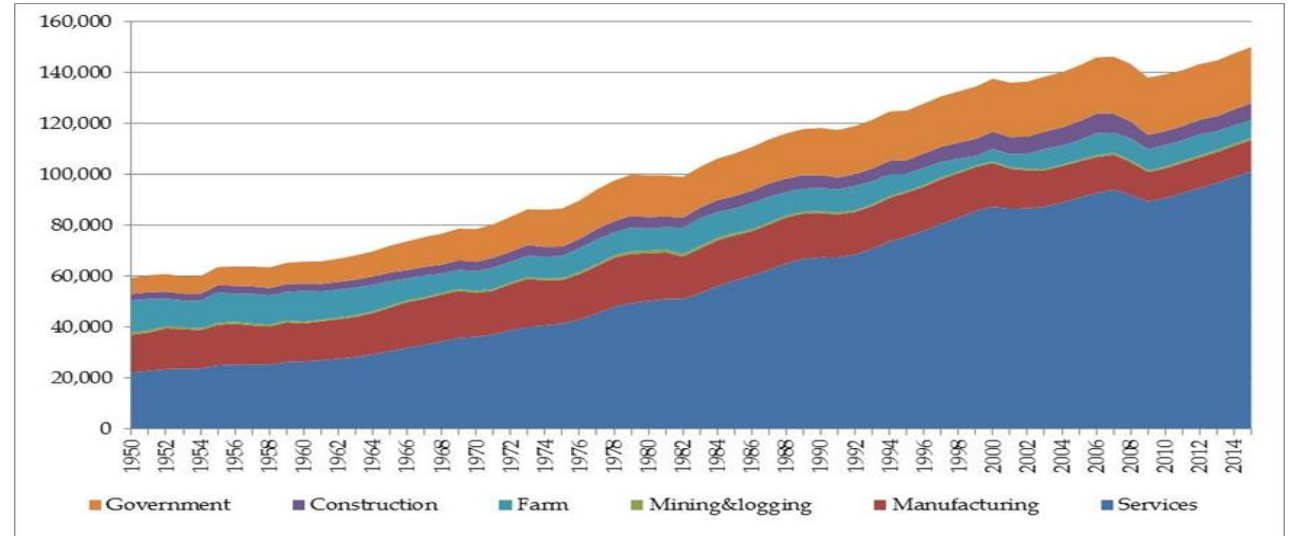
- What is the relationship between services and productive capacity in a country? Is there a linkage between actual services development and enhancement of productive capacity?
- How can services support building key industrial capabilities, including the creative industry?
- How can services help SMEs enhance productive capacity? What could be done by governments to support SMEs?

# Background: Services vs industry

- Services: the hotbed of employment

- Manufacturing: the hotbed of innovation and productivity

Sectoral Employment in the USA



Source: BLS

Productivity in non-farm services and manufacturing sectors in the USA

	Services sector	Manufacturing sector
1990-2000	2.2	4.1
2000-2007	2.6	4.7
2007-2016	1.1	1.7*
*2007-2015		

Source: Bureau of Labor Statistics <https://www.bls.gov/lpc/prodybar.htm>

# Background: Services vs industry

- Services: the hotbed of employment
- Manufacturing: the hot bed of innovation and productivity

Employment and output by major sectors in the USA (2015)

	Employment (million)	Output (\$ thousand)	Output/employee (\$ thousand)
Manufacturing	12.4	2,170	175.60
Services	101.3	12,293	121.41
Agriculture	6.9	175	25.23
Government	22.1	2,338	105.80
Mining	0.7	328	441.18
Construction	6.6	732	110.46
Total	150.0	18,037	120.22

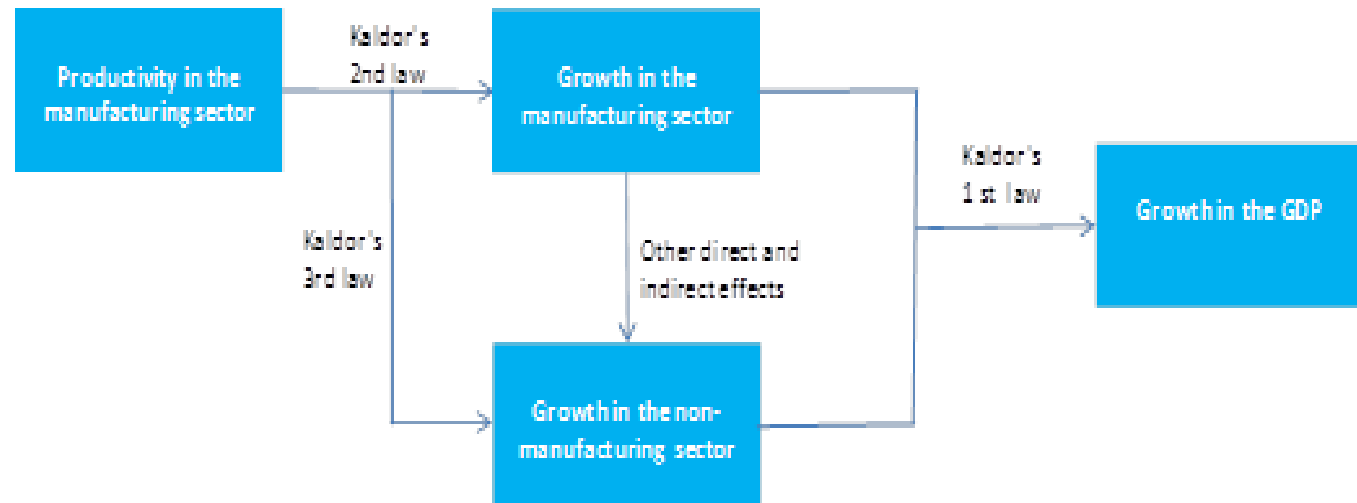
Source: Bureau of Economic Analysis, Bureau of Labour Statistics and the author's calculations

# Background: What did Kaldor say?

**The second law of Kaldor:** Productivity drives the growth of the manufacturing sector (also known as Verdoorn's law)

**The third law of Kaldor:** Productivity of the non-manufacturing sector is positively related to the growth of the manufacturing sector.

**The first law of Kaldor:** The manufacturing sector is the engine of GDP growth.



Background:  
World trade  
primarily  
consists of  
manufactures

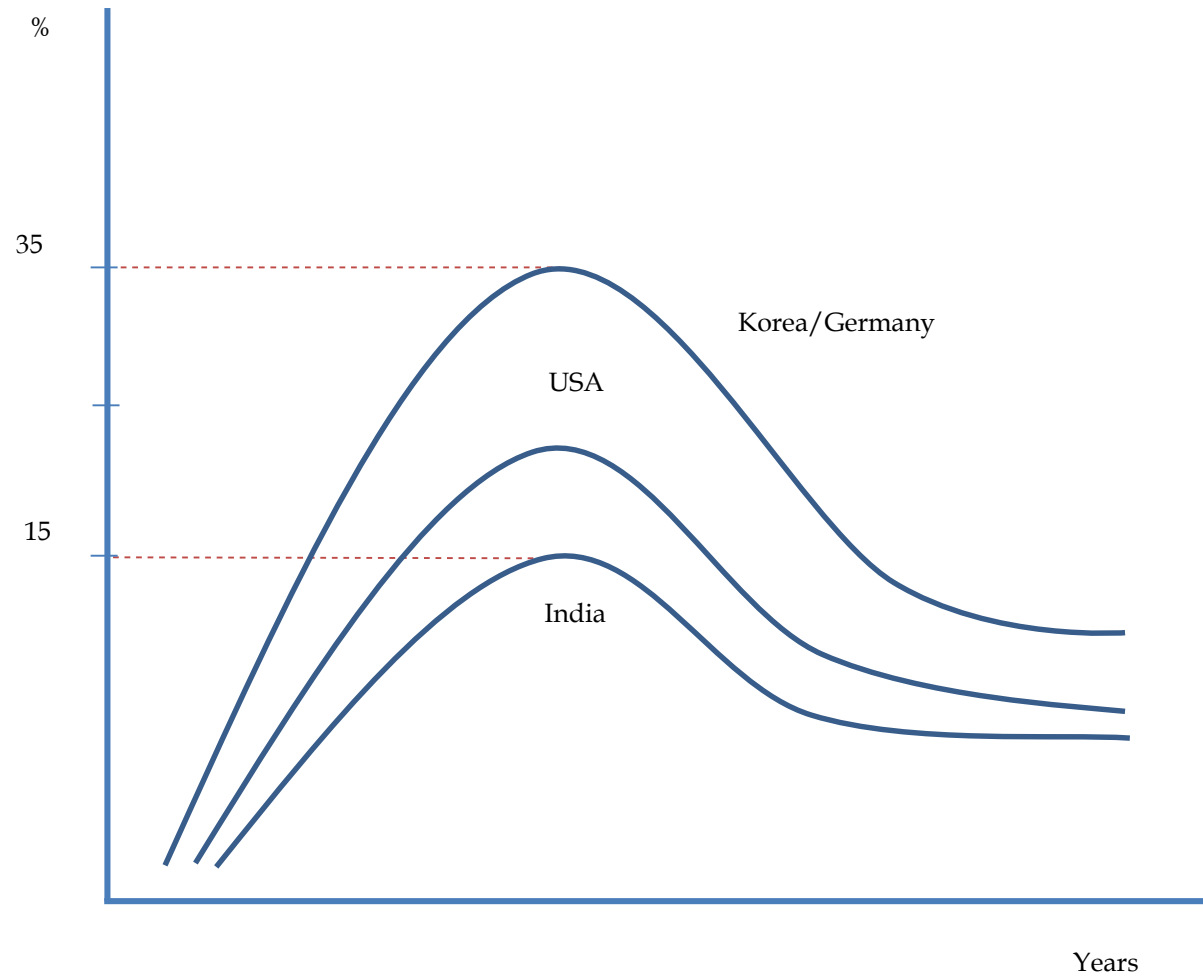
### Composition of world exports (2015)

	Value (\$ billion)	%
Merchandise	15,464	76
<i>of which</i> manufactured goods	11,289	55
Services	4,808	24
Total world exports	20,272	100

\* Excluding intro - EU exports  
Source: WTO (World Trade Statistical Review 2017)

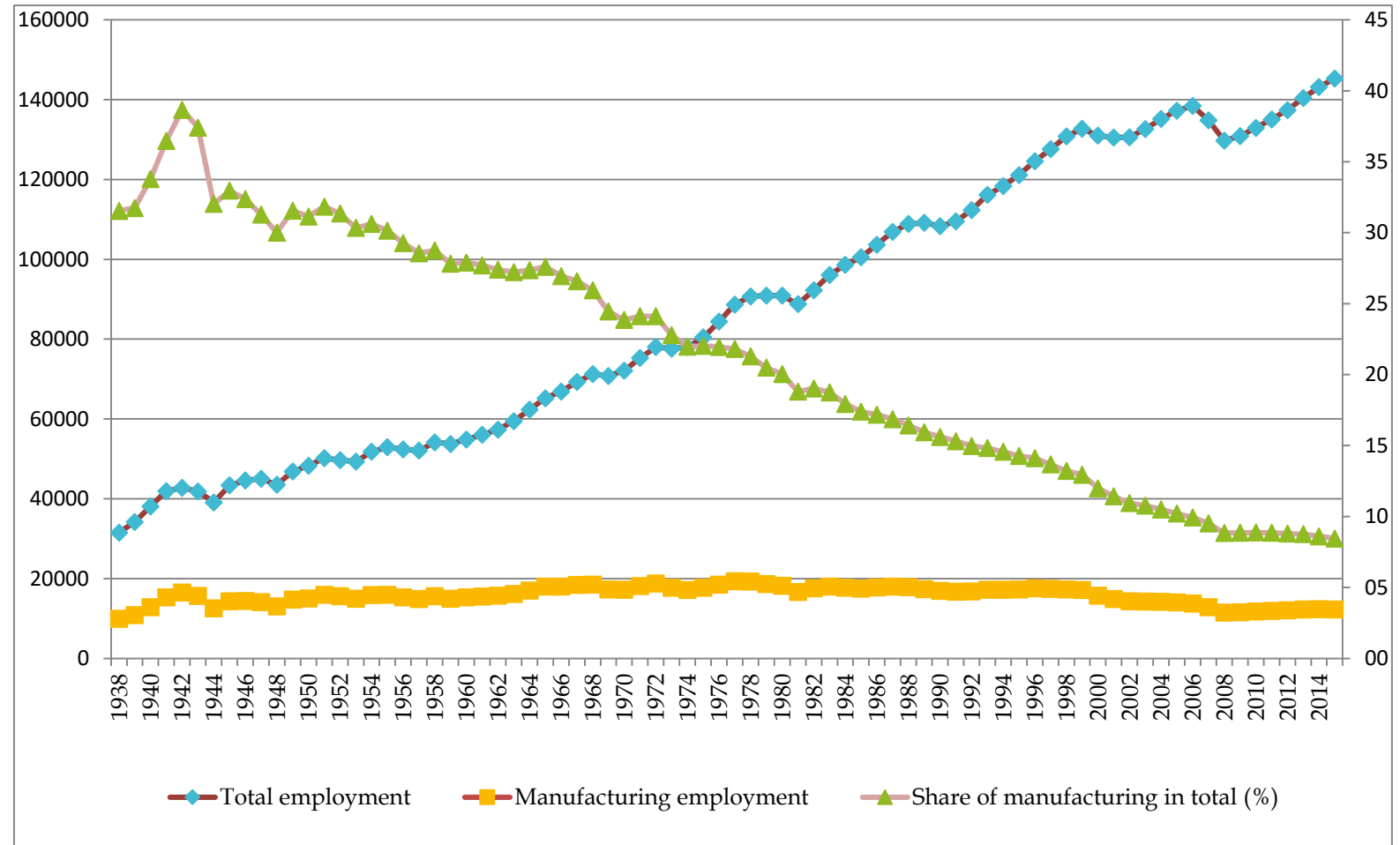


Background:  
Patterns of  
industrialization,  
de-industrialization  
and premature de-  
industrialization  
But why?



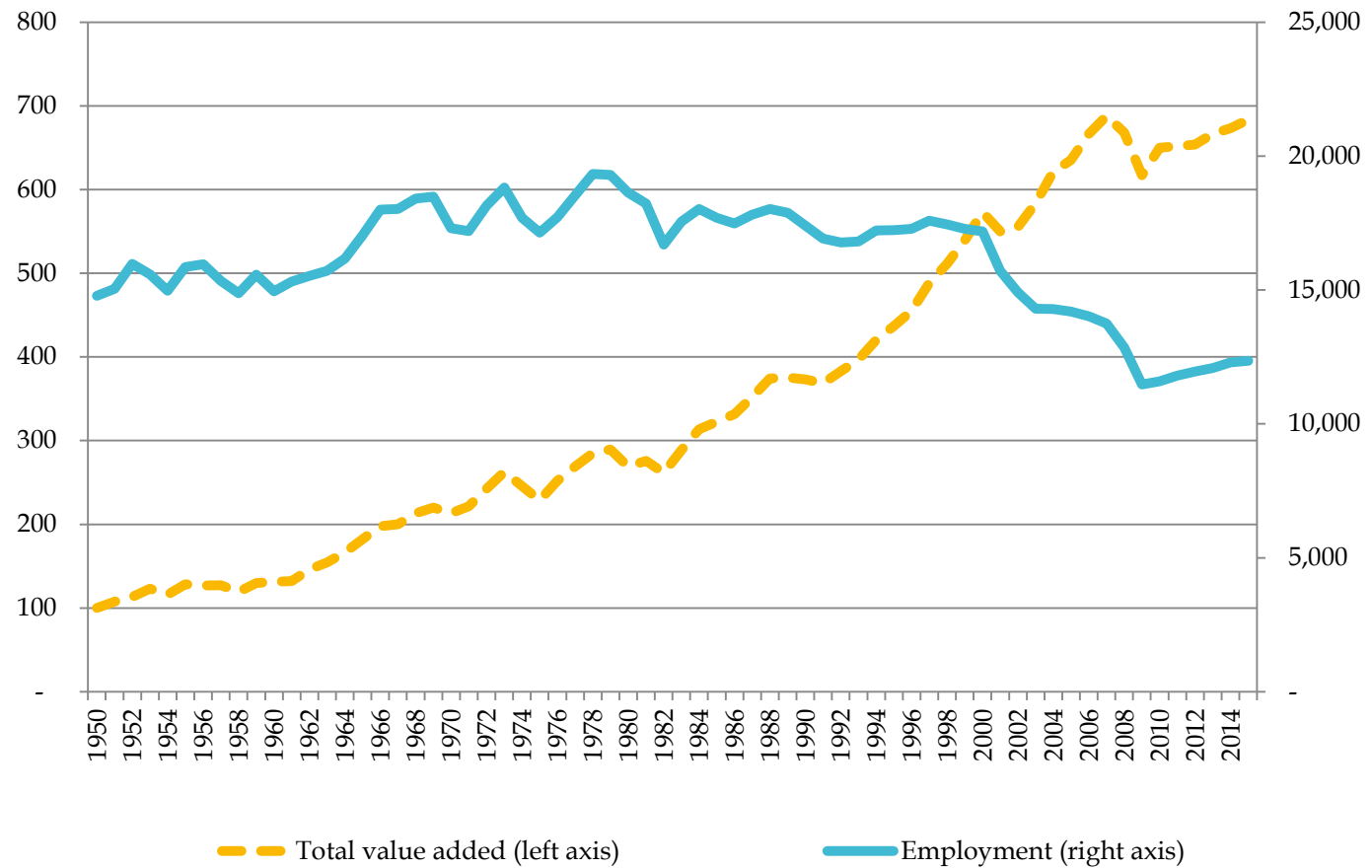
# Background: The paradox of manufacturing?

## Manufacturing and total employment in the USA



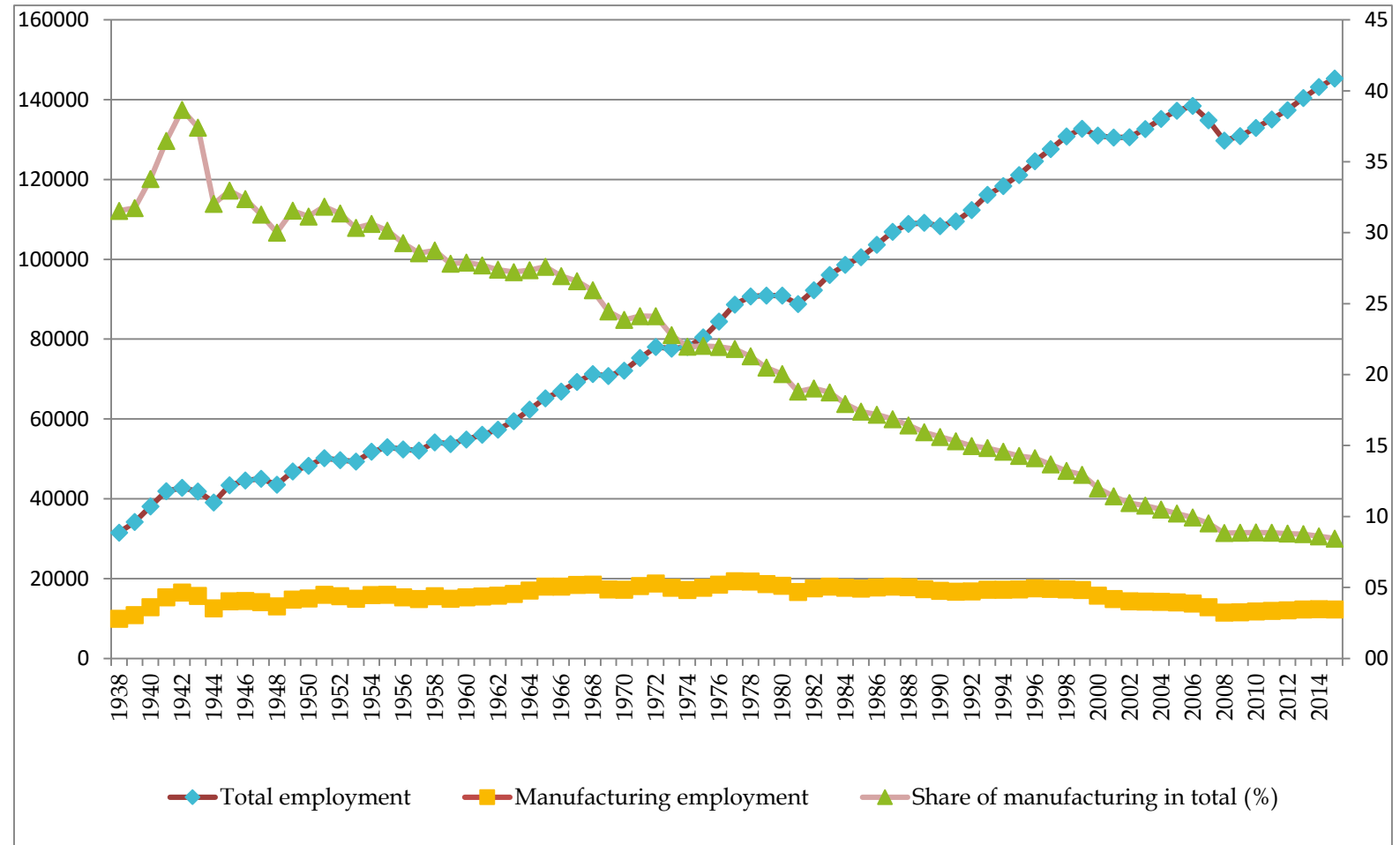
Background:  
The paradox of  
manufacturing?  
No paradox

Manufacturing employment vs manufacturing value-added in the USA



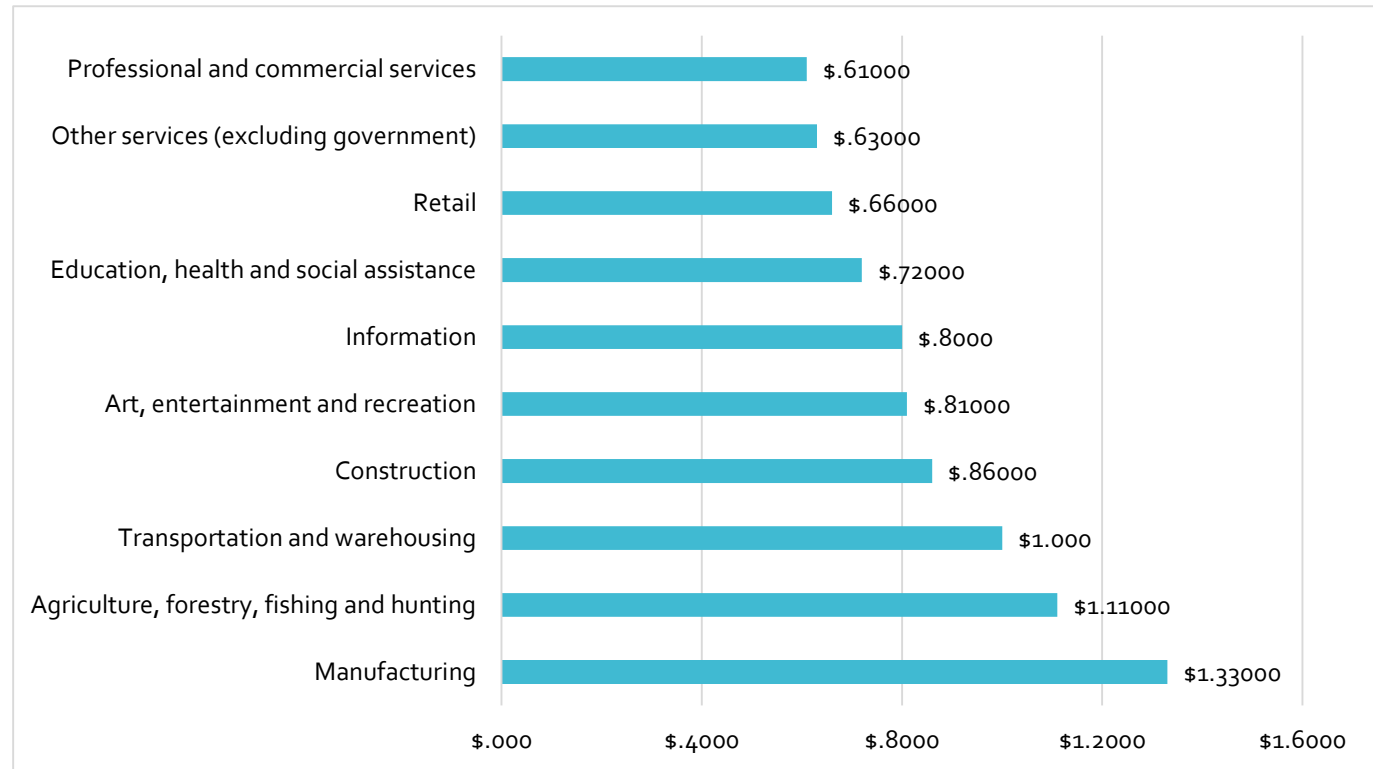
# Background: The paradox of manufacturing?

## Manufacturing and total employment in the USA



# Background: Industry multipliers (USA, 2012)

Change in the total output in response to a one-dollar change  
in final demand for the product of the sector



Source: U.S. Bureau of Economic Analysis, Annual Input-Output Tables, Manufacturing Institute

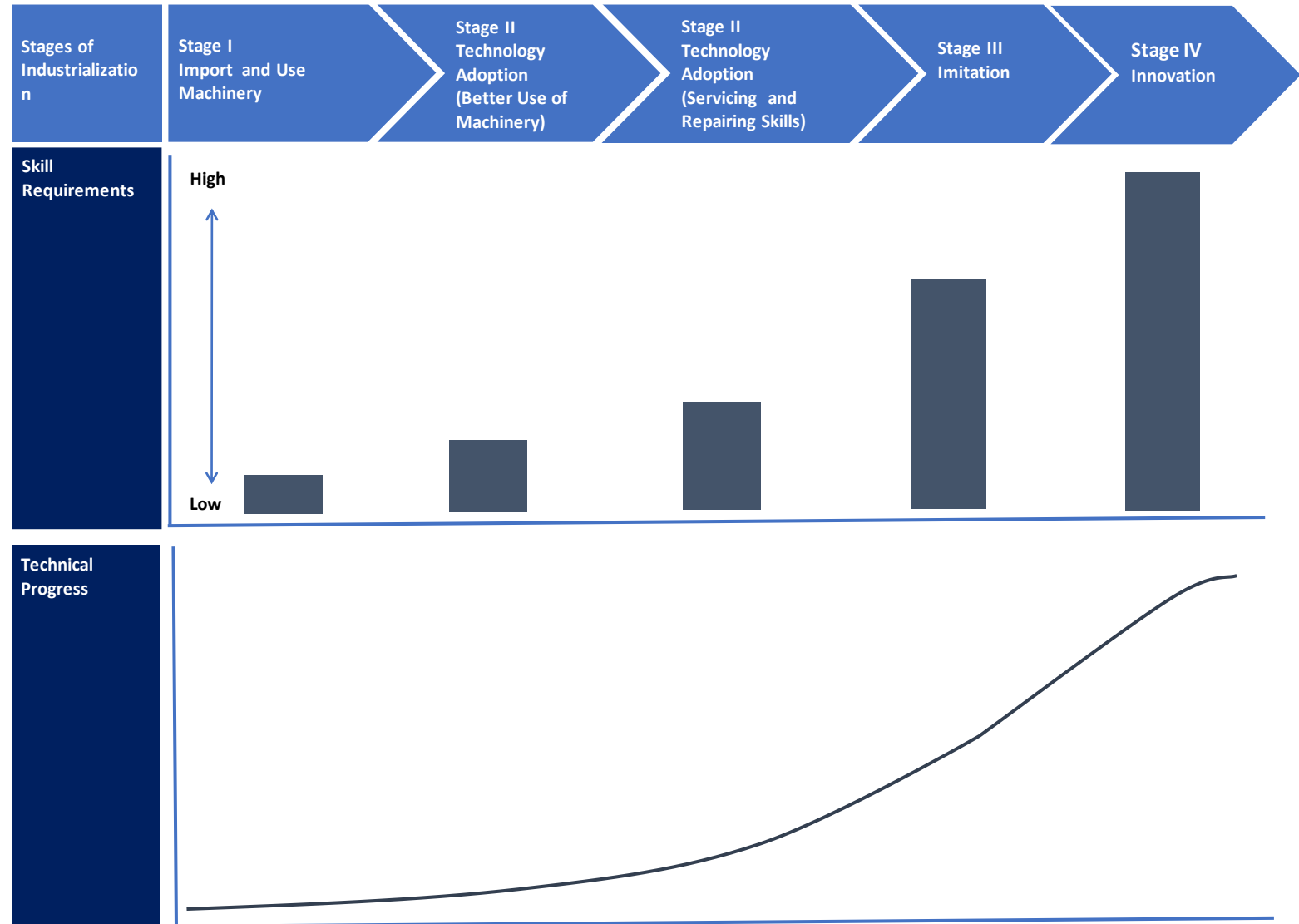
# Background: What is industrialization?

- Many factories = industrialization?
- Ecological degradation?
- ...

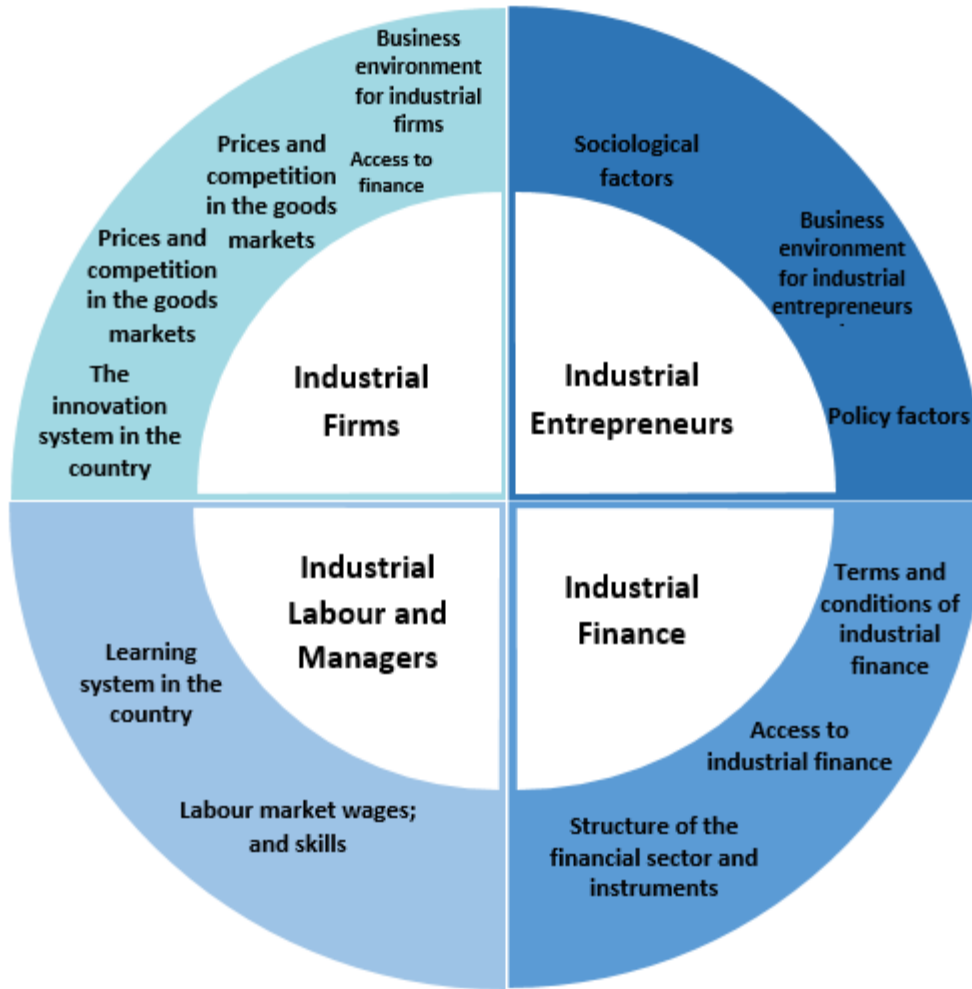
Industrialization = A capacity building process

- Capacity of the industrial layer (not only industrial firms)
- Policy (state) capacity

# Background: Stages of industrialization, skills and technical progress

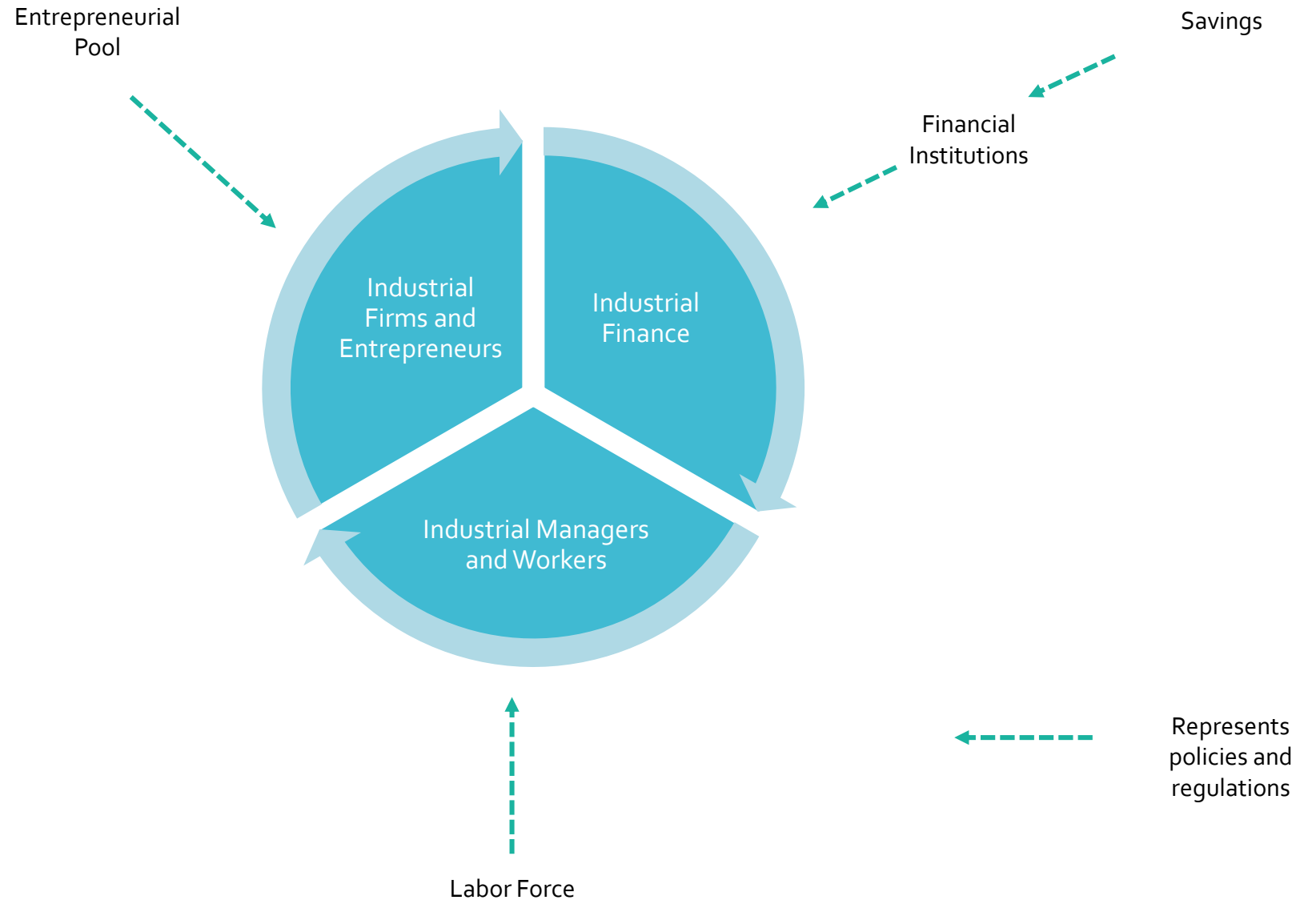


# Background: The Industrial Layer





Background:  
Industrial  
Layer is  
affected by  
policies and  
regulations



# On the relationship between services and productive capacity in a country?

**What is the relationship between services and productive capacity in a country? Is there a linkage between actual services development and enhancement of productive capacity?**

- A lot of services are directly linked to productive capacity and manufacturing:
  - Finance
  - Transportation
  - Professional services
  - Domestic and international trading
  - Education and training
  - R&D
  - ...

# On the relationship between services and productive capacity in a country?

**What is the relationship between services and productive capacity in a country? Is there a linkage between actual services development and enhancement of productive capacity?**

- Thus there is a direct link between those services and productive capacity
  - Efficiency gains
  - Market access
  - Access to finance
  - Access to skilled manpower
  - Access to strategic and related (e.g. legal) services

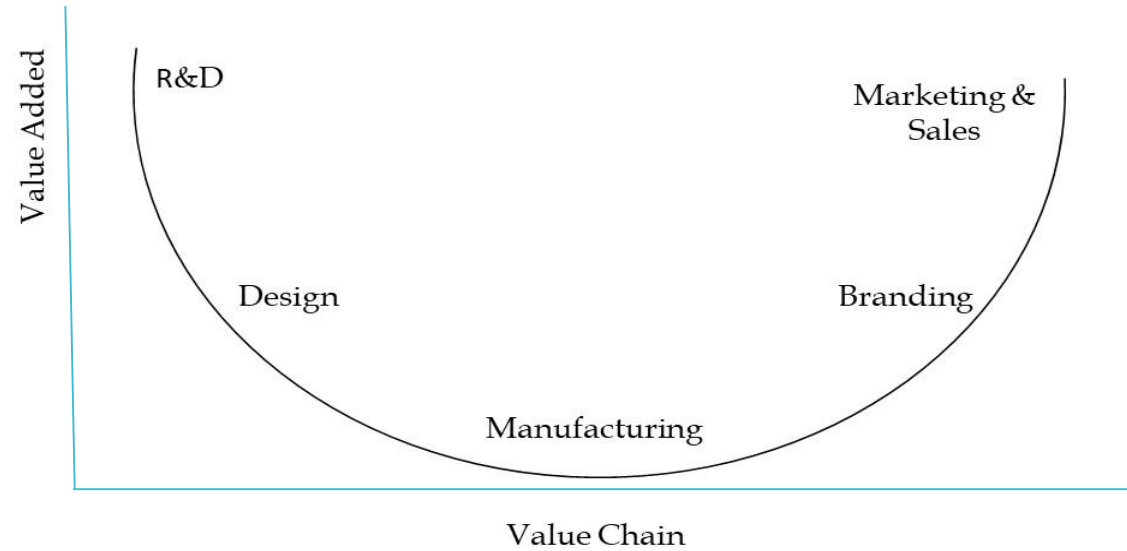
# On the relationship between services and productive capacity in a country? Cont'd

**What is the relationship between services and productive capacity in a country? Is there a linkage between actual services development and enhancement of productive capacity?**

- Thus, development of services sector has direct & positive implications on the productive capacity.
- However, a more important link has emerged between the two through the process of «servicification of manufacturing»

Smile curve =  
servicification of  
manufacturing

## The Smile Curve



Smile curve =  
servicification of  
manufacturing

Does all  
manufacturing  
always make  
money?

## The Smile Curve

**Table 5.10** Manufacturing costs of Apple iPhone 6s 16GB NAND flash memory

<i>Component</i>	<i>\$</i>	<i>% of bill of materials</i>	<i>% of launching price</i>
NAND Flash + DRAM	15	7.0	2.0
Display and touchscreen	52.5	24.4	7.0
Processor-AP	20	9.3	2.7
Camera(s)	12.5	5.8	1.7
Wireless section – BB/RF/PA	33	15.3	4.4
User interface and sensors	22	10.2	2.9
BT/WLAN	4.5	2.1	0.6
Power management	7	3.2	0.9
Battery	4.6	2.1	0.6
Mechanical/Electro-mechanical	35	16.2	4.7
Box contents	5	2.3	0.7
Manufacturing cost	4.5	2.1	0.6
Total manufacturing cost	215.6	100.0	28.8

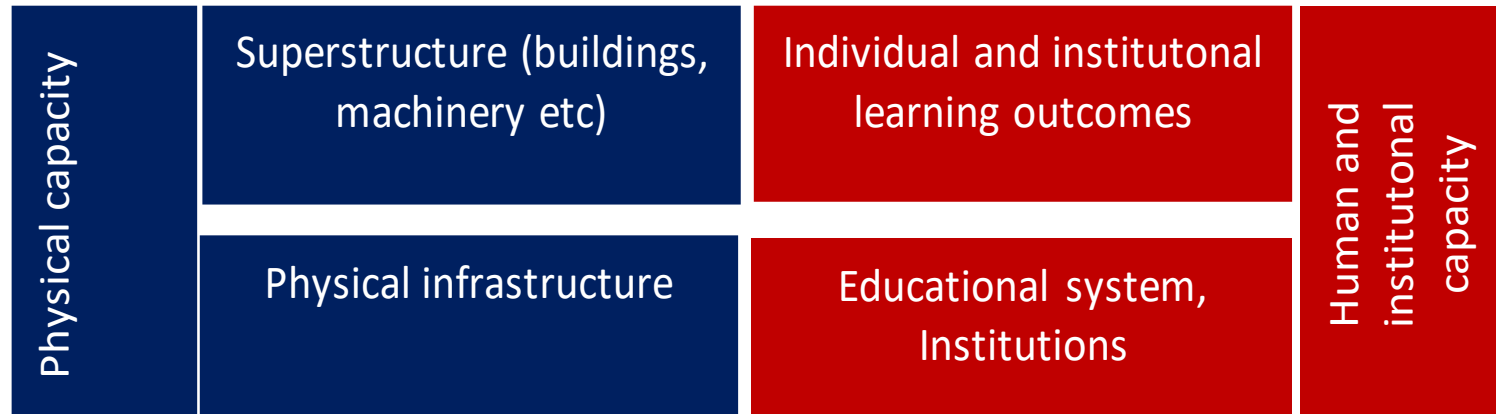
Source: Calculations based on data from Macdailynews.com (2014)

# Services and key industrial capabilities

## How can services support building key industrial capabilities, including the creative industry?

- Services is now a highly integrated part of manufacturing.
- So development of services (especially creative industries – design, branding, ...) will support industrial capabilities

### Components of industrial capacity



# Services and key industrial capabilities

## How can services help SMEs enhance productive capacity? What could be done by governments to support SMEs?

- SMEs are at a disadvantaged in many respects
  - Access to resources
  - Small production scale
  - Access to finance
  - Unproportionate damage from bad business environment
- Governments provide a lot of tools and programs to support SMEs but often the rate of success is low primarily because of low access to market, among others.
- A major tool is development-based public procurement covering set-asides for SMEs
- A second related tool (practiced nowhere) is regulation to force large retail chains to put SME products on their shelves. There are different ways to do this.



Thank you

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