

**Lecture of Two Parts:**  
**Part 1: Understanding Cooperation**  
**Part TWO: Inclusion and Development**  
**Progeria**  
**by**

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# **A Little Game Theory: Towards an Understanding of Coherent Communities**

**by**

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# A Little Game Theory

- **“All Life is a Game”**
- **John Nash: Nobel Memorial Prize Winner**
- **“A Beautiful Mind” (Book)**
- **Nash Equilibrium**

# A Little Game Theory

- **Every Game involves**
  - **players**
  - **strategies or actions allowed the players**
  - **payoffs they play for**
  - **rules they play by**
- **Strategic Game and Interdependence: payoff of one depends upon ones action and the action of others**
- **Players are strictly rational: they prefer more to less**

# A Little Game Theory

## The Fishing Game

- **The Fishing Game: Two fishermen, Ambo and Berto (for short A and B) fish in a lake. Their strategies consist of either of two actions: Fish with a Net (N) or Fish with Dynamite (D).**
- **Rule: A and B cannot coordinate their actions.**

# A Little Game Theory

## The Fishing Game

Table 1. Payoff Matrix: The Fishing Game

		B	
		N	D
A	N	10, 10	2, 12
	D	12, 2	3, 3

# A Little Game Theory

- Ambo A is the row player, Berto B is the column player
- Ambo can either play N or D, likewise Berto.
- There are four boxes each with two numbers. In each box are two numbers; the first is payoff to A, the second is payoff to B: say  $(2, 12)$ , 2 is A's payoff, 12 is B's payoff if A plays N and B plays D.
- Which strategies will each play?

# A Little Game Theory

## The Fishing Game

1. **Nash Equilibrium as Solution: the combination of actions by A and B from which deviation is punished**
2. **(D,D) giving (3,3): no one has no incentive to deviate. If A plays N, he gets  $2 < 3$ . If B plays D, he gets  $2 < 3$ . So (D, D) is a Nash Equilibrium solution!**
3. **(N, N) gives each (10, 10) so each player is better off. But A can get  $12 > 10$  if he defects, so he defects. B does the same. So (N, N) is not Nash Equilibrium!**



# A Little Game Theory

1. Welfare at (D, D) (Nash Equilibrium) = 6 (3+3)
2. Welfare higher at (N, N) = 20 (10 + 10). But not NE.
3. Market Failure in Econ: The Fishing Game is a Market Failure. The outcome (10,10) is better for both players than (3,3). But they will not attain it.
4. Social Dilemma Game: When each player seeking his highest payoff, will receive less than they could receive if they cooperate. Also called Prisoner's Dilemma Game.

# A Little Game theory

- **Solution:** Suppose there is a government/community-based management which wants the better outcome for A and B.
- The community-based management passes a rule saying that
  - (a) whoever plays D will be penalized  $p$ ;
  - (b) but the players must pay  $c$  to defray the expense of enforcement.
- The *intervention* is  $(p, c)$ .
- Suppose that the government is very effective in enforcement. Every violation is punished.
- The intervention changes the payoffs of the game.

# A Little Game Theory

## With Government Intervention $(p,c)$

Table 2. Payoff Matrix: The Fishing Game with Intervention  $(p,c)$

		B	
		N	D
A	N	$10-c, 10-c$	$2-c, 12-c-p$
	D	$12-c-p, 2-c$	$3-c-p, 3-c-p$

# A Little Game Theory

## The Fishing Game

1.  $p$  = penalty imposed for dynamite fishing.
2.  $c$  = tax on each player to pay the cost of enforcement;
3.  $(p, c)$  is the state intervention pair
4. Consider the intervention pair  $(5, 2)$ .

# A Little Game Theory

## The Fishing Game

Table 3. Payoff Matrix: The Fishing Game with Intervention  $(p,c) = (5,2)$

		B	
		N	D
A	N	10-2, 10-2	2-2, 12- 2-5
	D	12-2- 5,2-2	3-2-5,3- 2-5

# A Little Game Theory

## The Fishing Game

Table 4. Payoff Matrix: The Fishing Game with Intervention  $(p,c) = (5,2)$

		B	
		N	D
A	N	8, 8	0, 5
	D	5, 0	-4, -4

# A Little Game Theory

## The Fishing Game

1. There is a new Nash Equilibrium:  $(N,N)$  giving  $(8,8)$ .
2. Post-intervention welfare (sum) : 16
3. Pre-intervention welfare: 6
4. Community Management  $(5,2)$  a Success: It managed to change behavior to  $(N, N)$ .

# APO and Sumilon MPAs

- **What Dr Alcala's Team did: taught fisherman to think and act differently – think as one family**
- **The harvest of cooperation is bumper.**
- **They formed a resource management system run by fishermen themselves.**
- **Prevented the “Tragedy of the commons”**
- **The entry of politics and greed almost destroyed the project.**



# A Little Game Theory

## The Fishing Game

- Consider an intervention  $(p,c) = (5, 1)$

Table 5. Payoff Matrix: The Fishing Game with Intervention  $(p,c) = (5,2)$

		B	
		N	D
A	N	5, 5	-3, 6
	D	6, -3	-4, -4

# A Little Game Theory

## The Fishing Game with Intervention (2,5)

1. Two Nash Equilibria or Solutions: (D,N) and (N,D) giving (6,-3) and (-3,6): both are bad equilibrium. Why?
2. Post-intervention welfare (sum) = 3
3. Pre-intervention welfare (sum) = 6

# Second Part



The Asia Foundation



**USAID**  
FROM THE AMERICAN PEOPLE

# **Tax Reform and Inclusion (TRAIN): The Role and Meaning of Inclusion**

**Raul V. Fabella**

# **TRAIN: Meaning of Inclusion**

- **Acceleration and INCLUSION**
- **Acceleration: rapid growth in per capita income**
- **Inclusion: reduced income inequality and/or reduced poverty incidence**
- **A policy change like TRAIN can affect inclusion differently**
- **Problem: Suppose it raises income inequality and but reduces poverty incidence.**

# Income Inequality vs Poverty Reduction

- **TRAIN intends to raise enough revenue to bankroll BUILDx3 and GCA of 8%.**
- **Fuel tax, sugary beverage tax, vehicle tax, VAT loopholes closures.**
- **Cost of Adjustment: every meaningful reform extracts some pain; no pain no gain**
- **Has tax reduction for the middle class and cash givebacks for the most affected.**

# Senate Bill 1592

- Retains 37 of the 70 loopholes
- Reduces the tax take on proposed tax adjustments
- Reduces drastically the Tax Revenue gain
- Explodes the number of earmarks
- Inclusion as reduced Income equality at the expense of acceleration and poverty reduction.
-

But is Income Inequality the real enemy  
in LDCs?  
Or is it Abject Poverty?

The MDGs and SDGs think  
it is Abject Poverty (<\$1.25 per day):  
Halved and Zeroed



**Why was our poverty reduction record  
very poor?**

**Move to Slide 33**

# Slow Poverty Reduction

- In the MDG era, poverty incidence in PHL moved from 36% in 1990 to 26% in 2015
- We failed our MDG target of 17%.
- China moved from 60% to 5% in those years.
- The question is why?

# Abject Poverty in MDGs

- Since 1990, the world has successfully halved the incidence of abject poverty
- $\frac{3}{4}$  of global poverty reduction from China; 64% 1990 to 4% in 2015
- The Philippines: one of the few to fail: 34 % in 1990, 26% in 2015
- Gini index (2013): PHL 43 vs. 42 for PRC and 46 for Malaysia
- If it's abject poverty reduction, it's China!

# **Income Inequality vs Poverty Reduction**

- **Is income distribution sacrosanct? Even at the expense of poverty reduction?**
- **Let us look at the example of the**

**People's Republic of China (PRC)**

## II. Enter the Dragon: PRC, Mao and Deng

- A natural experiment: Mao-Deng Dummy
- Mao Zedong: enshrined Socialism in PRC in 1949
- Socialism's genotype: Central planning; No free enterprise; No private property; No profit seeking
- Ideological test: tools and outcomes must exhibit socialist purity
- Mao's dictum: "It doesn't matter that the train is late as long as it is socialist!"

# Deng Xiaoping

- Deng Xiaoping: sent by Mao to limit the damage of “The Great Leap Forward”
- Deng’s prescription: “Let the peasants play the market” → some farmers became rich: Oops!
- Hounded as a “capitalist roader,” stripped of power and banished. Survived Mao (luck!).
- Introduced “Socialism with Chinese Characteristics” after Mao’s death (1976)

# Deng Xiaoping: Tools vs. Outcomes

- Deng's Heresy: Socialism is about outcomes not about instruments!
- Deng's Pragmatism: "It doesn't matter what color the cat as long as it catches the mouse."
- Embraced free enterprise, profit seeking and foreign investment and finally private property (2004): the genome of Capitalism.
- Likewise instruments towards a socialist outcome.

# Deng Xiaoping Socialist Outcomes

- Outcome of Deng's Pragmatic Socialism:
  - (a) 600m Chinese crossed the poverty line; poverty incidence fell from 88% in 1980 to 6.5% in 2014.
  - (b) the greatest social transformation in human history to 2nd largest economy in the world.
  - (c) Gini rose from 31% to 43%; *Fortune's* Chinese dollar-billionaires! Fair bargain?
- Marx and Engels: whirling in their graves!



- **BUILDx3 means to Raise the investment rate to 25-28% of GDP.**
- **The Philippines over the last 30 years had investment rate o 20%**
- **The Result of low investment rate is the next topic.**
- **Move ahead to slide 75: Development Progeria**

# Development Progeria

# Development Progeria

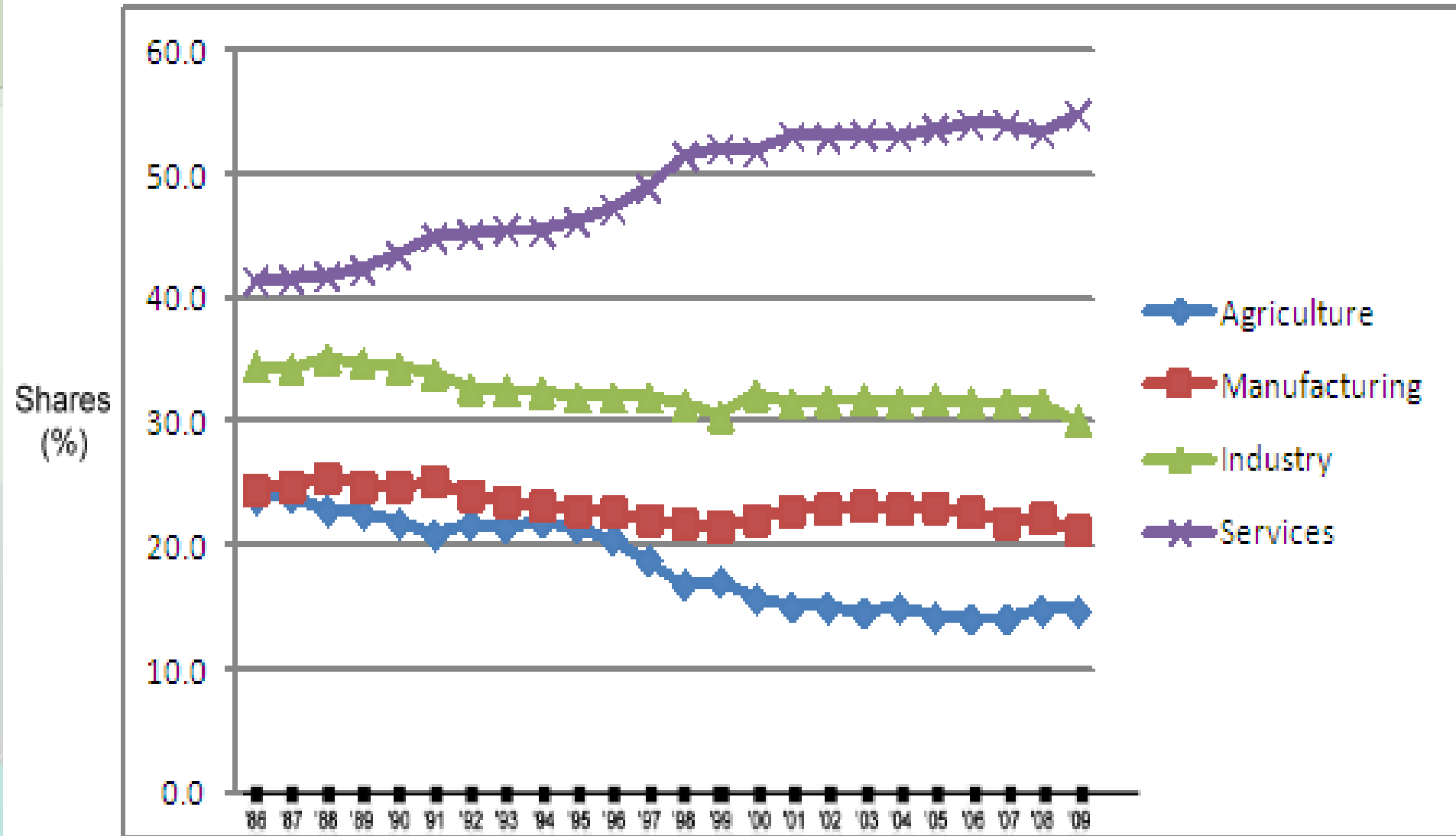
- Development Progeria: When growth of Manufacturing lags behind that of Services in a “low income economy”
- Abnormal for low income economies, though normal for mature high income economies
- In fast growing catch-up economies: Manufacturing grows faster than Services
- Services now about 58% of PHL GDP

# The Malady

## Development Progeria

**Progeria** is a genetic malfunction where children 3 years of age display the physical features of a person of 60.





**Figure 1. Trajectory of Philippine Value-Added by Industry as % Shares of GDP, 1986-2009**

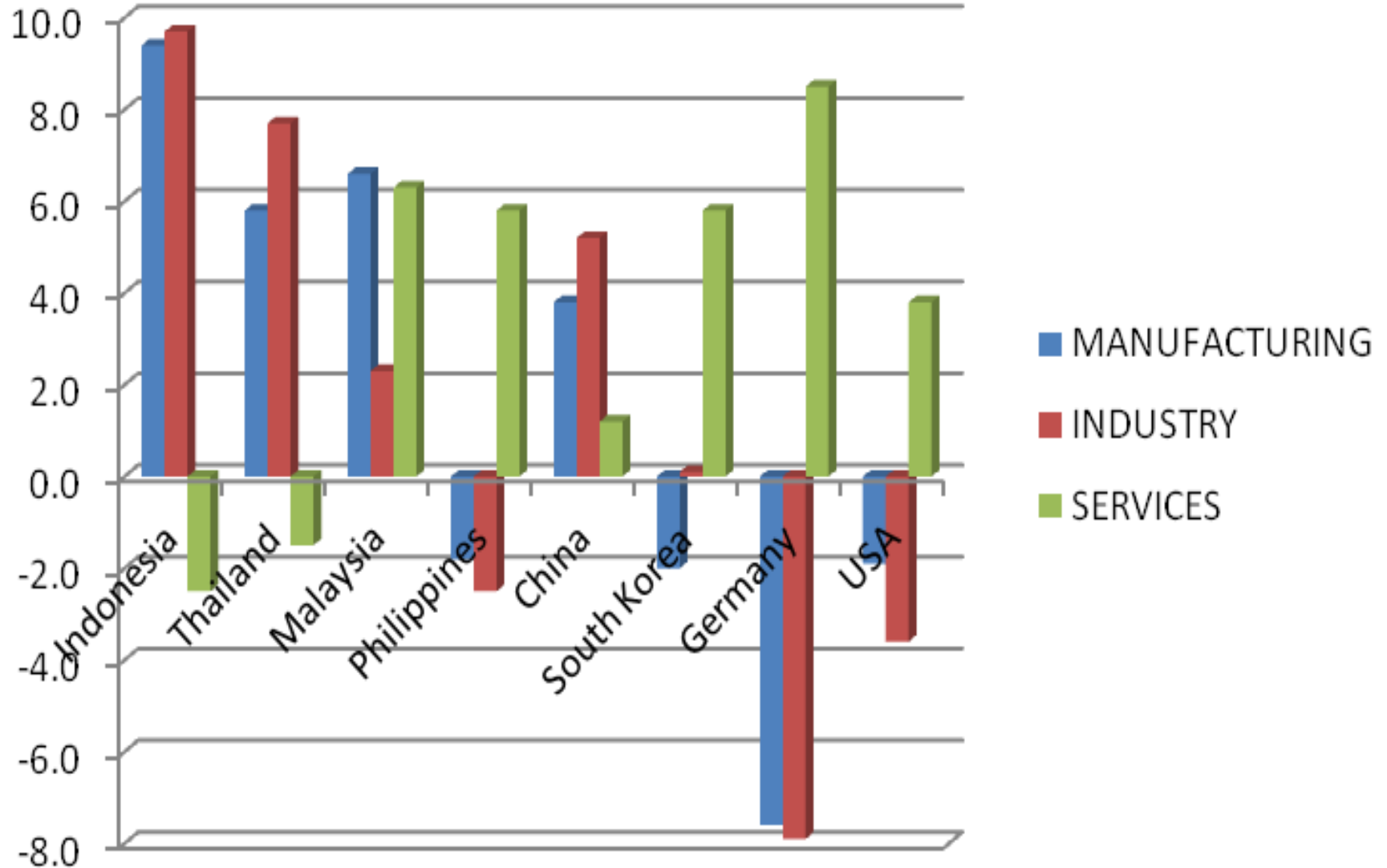


Figure 2. Change in % Industry Shares 1986 to 1996

# Poverty Reduction: PHL, PRC, Vietnam

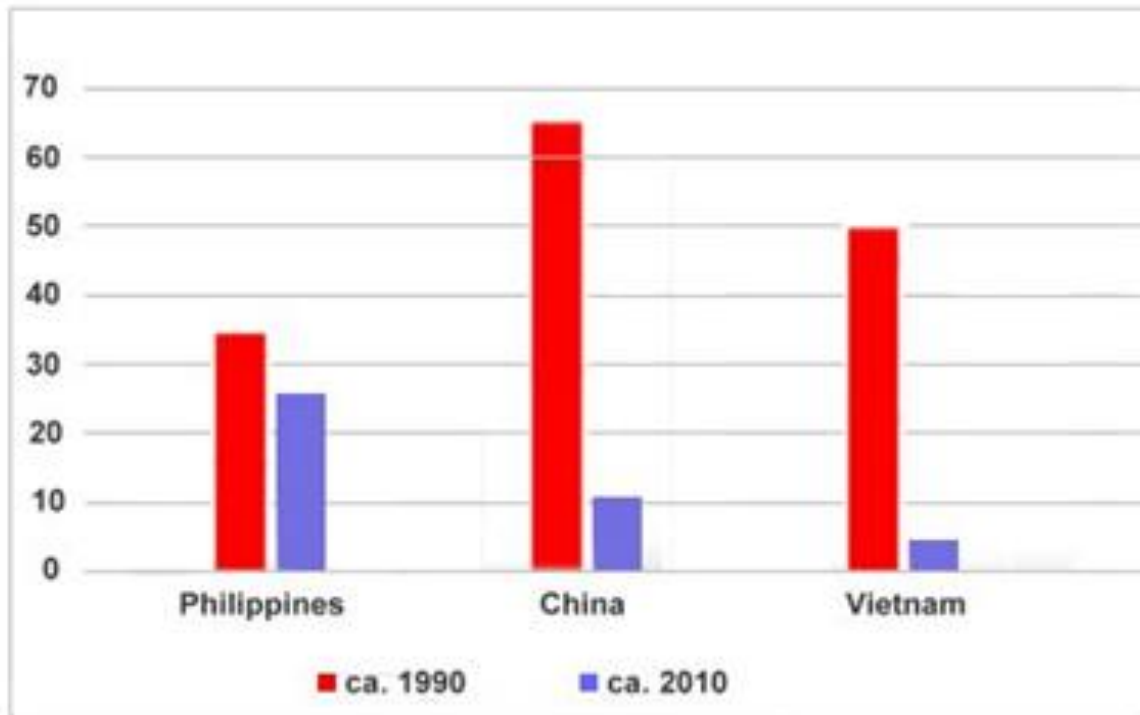
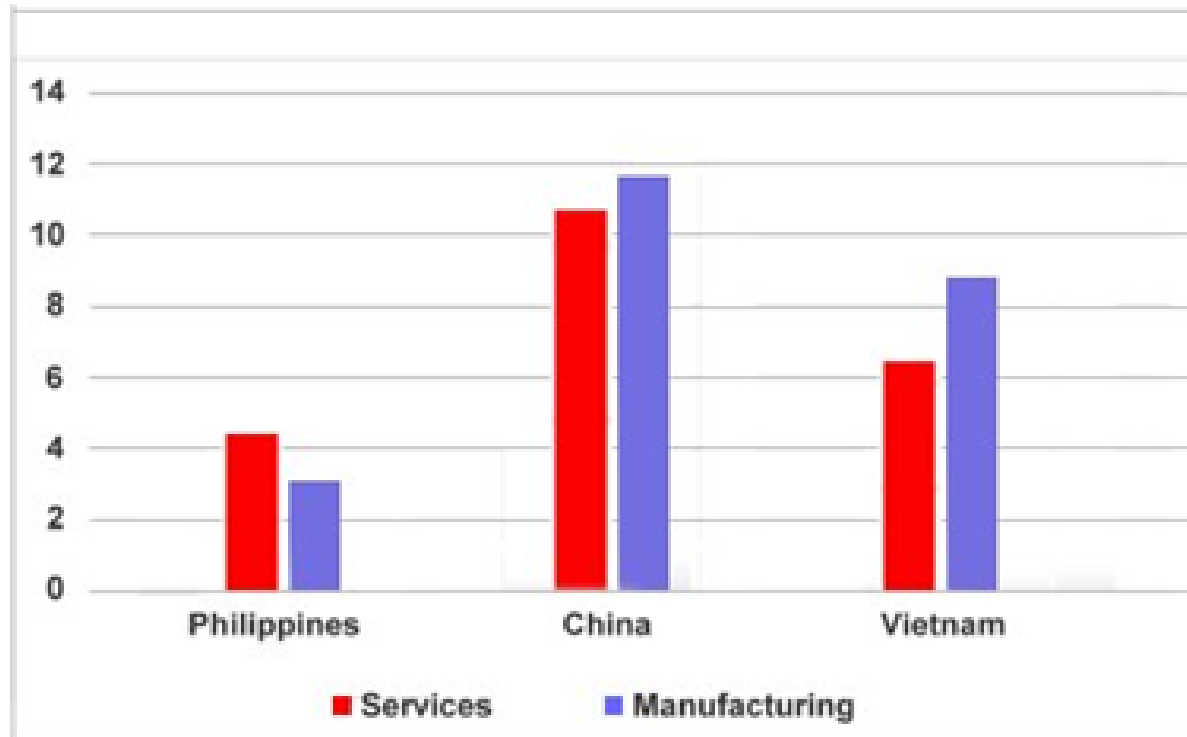


Figure 2. Poverty Reduction: 1990 - 2010

# Manufacturing vs Services: Ave Growth



**Figure 1. Manufacturing and Services  
Average Growth: 1990 - 2010**



# Exiting Development Progeria

- *Progeria* is an incurable genetic disease; it kills the body slowly but surely
- *Development Progeria* is an epigenetic disease; ravages the spirit but is curable.
- Epigenotypes exhibit plasticity: they change with the policy environment.
- Institutional and policy changes can defang Development Progeria (The British Disease and Thatcher)

# Exiting Development Progeria

- Decompress and redirect Investment:
  - (a) Sustainability: Embrace rather than fear a weak peso to sustain investment-led growth
  - (b) Scale up quantity and quality of PHL infrastructure: BUILDx3
  - (c) Lower the cost of power, viz.,
    - (1) Shift Fit in and other charges from Manufacturing to Services
    - (2) Build the Viz-Mindanao connection to complete the One PHL Power Grid

# Exiting Development Progeria

- Pass PSA Amendments Bill and lift the constitutional limits to foreign ownership.
- Continue the strategic retreat of government to its core competence: e.g., privatize MRT, privatize NAIA 1 and 3, RCOAize the ECs; .
- Learning from Foxconn: “Slipstream Industrialization”: facilitate local firms’ entry into the slipstream of global manufacturing behemoths.

**Thank You!**