

**Development Policy**

**Industrialization Strategies**

***Import-Substitution v. Export Promotion***

James Riedel

# Industrialization Strategy circa 1960

## Major themes of the Import-Substitution Strategy

1. Leading role for the state
2. The “Big Push” / “Balanced Growth” strategy
3. The Big Push / Unbalanced growth strategy
4. Big push of foreign aid to “take off”
5. Export pessimism

# Industrialization Strategy circa 1960

## Why the state and not the market?

1. Influence of the great depression
2. Keynesianism
3. Success of planning during WWII
4. Apparent success of the Soviet Union
5. De-colonialism

# Industrialization Strategy circa 1960

## Why industrialization & capital accumulation?

1. Lewis (1954) model of the dual economy
2. Lewis' diagnosis (1955) of too much labor, too little capital
3. Emphasis on the rate investment, not on the efficiency of investment
4. Illustrated in the Harrod-Domar model

# The Argument for a Big Push / Balanced Growth Strategy

- A premise was that industrial production exhibits increasing returns to scale due to high fixed costs.
- If the domestic market is small (export pessimism, another premise, ruled out trade) a profitable scale of production cannot be realized, hence industrial investment will not occur on its own. The country is caught in a low-level equilibrium trap from which only that the government can provide an escape.
- If many industrial investments are made simultaneously, as part of a government financed Big Push / Balanced Growth strategy, each investment will create a demand for the output of other investments, allowing them all to achieve a profitable scale of production.
- The low-level equilibrium trap is the result of “pecuniary externalities” which the government can internalize by promoting (subsidizing) coordinated investments across many sectors (i.e. implementing a “big push,” “balanced growth” strategy).

*The strategy was first proposed by Rosenstein-Rodan (1943) and formalized by Murphy, Shleifer and Vishny (1989)*

# What is a Low-Level Equilibrium Trap?

There are two stable equilibria,  $k^*_{\min}$  and  $k^*_{\text{high}}$  and the non-stable threshold equilibrium  $k^*_{\text{mid}}$ . The trap is broken by a big push balanced growth investment strategy subsidized and coordinated by the government.

Assumptions:

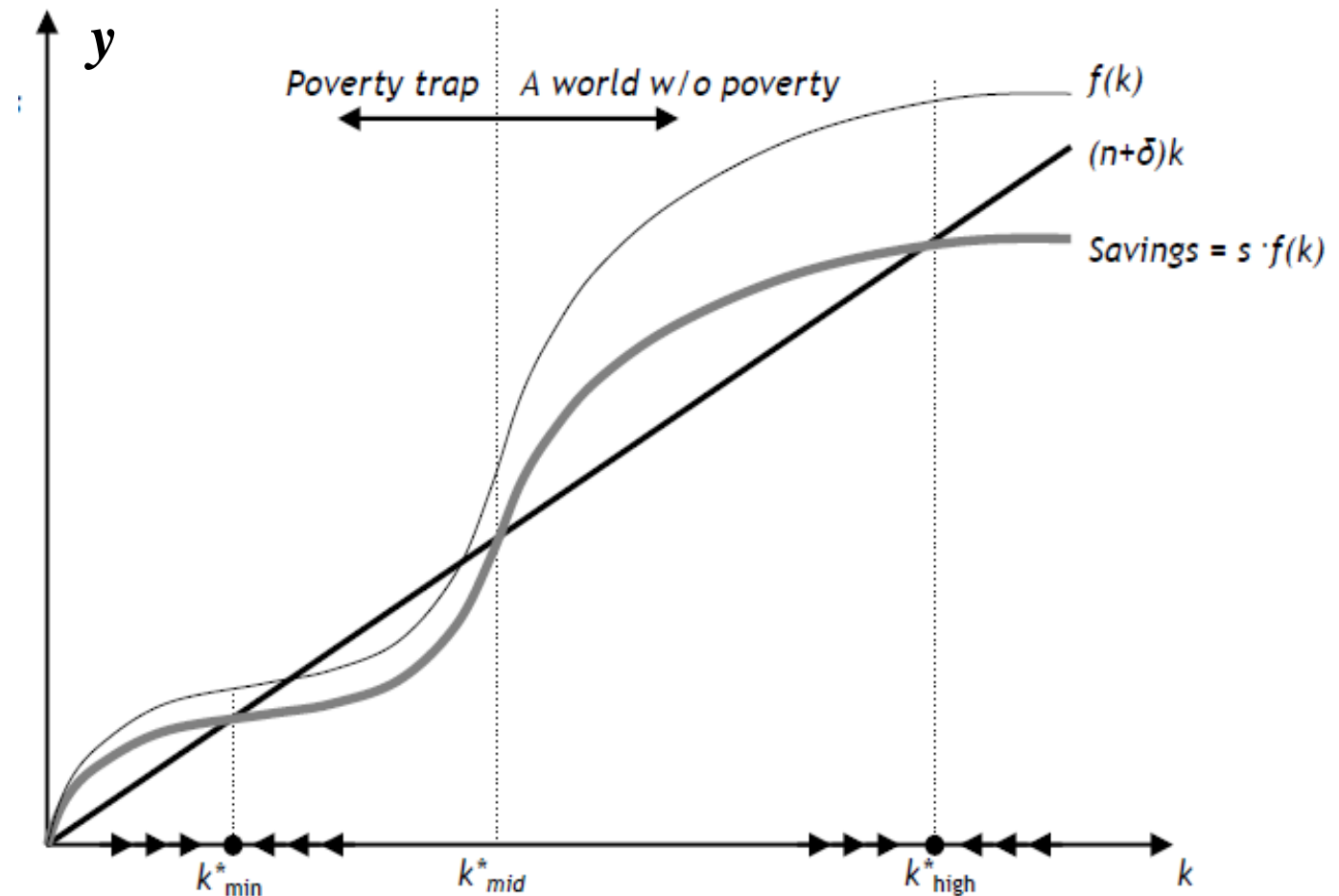
$$y = f(k)$$

$$y' > 0$$

$$y'' < 0 \text{ for } k < k^*_{\min}$$

$$y'' > 0 \text{ for } k^*_{\min} < k < k^*_{\text{mid}}$$

$$y'' < 0 \text{ for } k^*_{\text{mid}} < k < k^*_{\text{high}}$$



# The Argument for a Big Push / Unbalanced Growth Strategy

- The case for an unbalanced growth strategy put forward by Hirschman (1958) was based on the premise that economic development is constrained by a shortage of decision-making ability, particularly with respect to decisions to invest.
- The appropriate development strategy then is to induce autonomous investment decisions by promoting industries with strong backward and forward linkages to other sectors.
- Investment in industries with strong linkages creates that reveal investment opportunities and attract investors that would not otherwise be able to identify these investments.
- What is needed to set priorities for planned investment is a national input-output table from which planners can determine the relative strength of backward and forward linkages in different industries.

Priority for investment	Backward linkage	Forward linkage
<i>First</i>	High	High
<i>Second</i>	High	Low
<i>Third</i>	Low	High
<i>Fourth</i>	Low	Low

# What are Backward and Forward Linkages and How are they Measured?

Sector	1	2	3	F
1	$X_{11}$	$X_{12}$	$X_{13}$	$F_1$
2	$X_{21}$	$X_{22}$	$X_{23}$	$F_2$
3	$X_{31}$	$X_{32}$	$X_{33}$	$F_3$
V	$V_1$	$V_2$	$V_3$	$\Sigma V_i = \Sigma F_i$
X	$X_1$	$X_2$	$X_3$	$\Sigma X_i$

## Transaction Matrix

$X_{ij}$  = input of i in sector j

$X_i$  = total output of j

$F_j$  = final demand for i

$V$  = value added in j

$\Sigma V_i = \Sigma F_i = \text{GDP}$

Sector	1	2	3	$L_{Fi}$
1	$a_{11}$	$a_{12}$	$a_{13}$	$\Sigma a_{1j}$
2	$a_{21}$	$a_{22}$	$a_{23}$	$\Sigma a_{2j}$
3	$a_{31}$	$a_{32}$	$a_{33}$	$\Sigma a_{3j}$
$L_{Bj}$	$\Sigma a_{i1}$	$\Sigma a_{i2}$	$\Sigma a_{i3}$	

Leontief Matrix:  $A = \{a_{ij}\}$  where  $a_{ij} = \frac{X_{ij}}{X_j}$

$L_{Bj}$  = measures backward linkages in sector j

$L_{Fi}$  = measures forward linkages in sector i

Sector	1	2	3
1	$r_{11}$	$r_{12}$	$r_{13}$
2	$r_{21}$	$r_{22}$	$r_{23}$
3	$r_{31}$	$r_{32}$	$r_{33}$
$L_{Tj}$	$\Sigma r_{i1}$	$\Sigma r_{i2}$	$\Sigma r_{i3}$

Inverse Leontief Matrix:  $[I - A]^{-1} = \{r_{ij}\}$

$$XI - AX = F \Rightarrow X = [I - A]^{-1}F$$

The elements of the Inverse Leontief Matrix  $\{r_{ij}\}$  measure the direct indirect input requirement and therefore a measure of total linkages is  $L_{Tj}$



## Yotopolous and Nugent's (YN) Famous Test of the Hirschman Hypothesis (QJE 1974)

YN constructed a Hirschman Compliance Index ( $\rho_j$ ) derived by correlating sector growth rates ( $g_i$ ) with the measure of total linkages ( $\sum r_{ij}$ ) for many countries. They then correlate the Hirschman Compliance Index with overall growth of these countries, which if statistically significantly confirms the Hypothesis.

Small problem with their test: Riedel (QJE 1976) pointed out that many countries in their sample relied heavily on imported (not domestically produced) intermediate inputs, which means that  $\sum r_{ij}$  did not measure backward linkages. Sorry!

When countries import intermediate inputs they are, in effect, substituting the production of export products for the production of intermediate inputs to capture resource efficiency gains. Riedel (RESTAT 1975) showed that Taiwan, for example, saved about NT\$ 59,000 in resource cost per \$1 million of intermediate inputs by exporting labor-intensive manufactures rather than producing capital intensive intermediate inputs domestically.

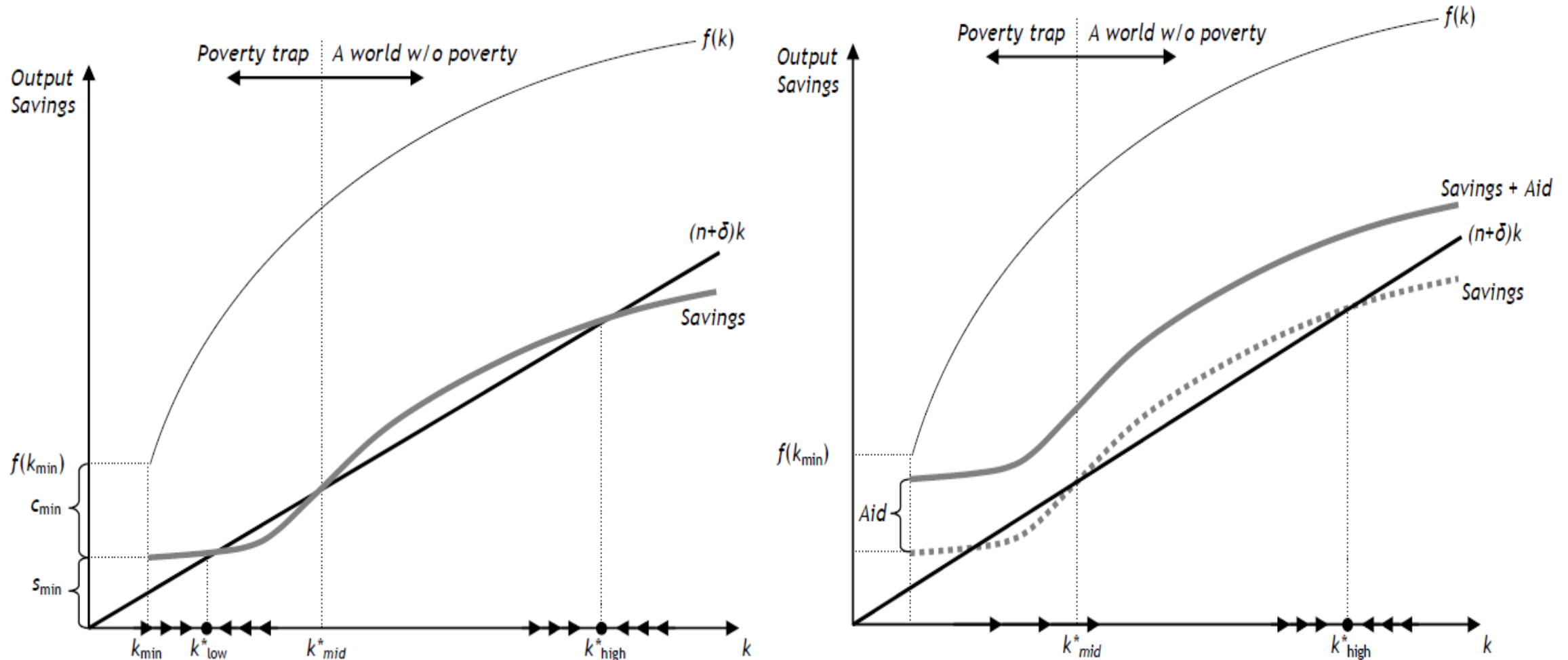
P. A. Yotopoulos and J.B Nugent, "A Balanced-Growth Version of the Linkage Hypothesis," *Quarterly Journal of Economics*, 87 (May 1973, 157-71

James Riedel. "Factor Proportions, Linkages and the Open Developing Economy", *Review of Economics and Statistics*, Vol. 57,, 487-494. Reprinted in *Readings in Input-Output Analysis* (Oxford, 1986)

James Riedel. "A Balanced Growth Version of the Linkage Hypothesis," *Quarterly Journal of Economics*, Vol. 90, May 1976, 319-322. Reprinted in *Input-Output Analysis*, London (2003)

# Foreign Aid and the Big Push Strategy

Aid offers a way to escape a low-level saving trap.  $k_{\min}$  is  $k$  required to maintain subsistence.  $k_{\text{low}}$  is a stable low-level equilibrium. To get past  $k_{\text{mid}}$  and converge to  $k_{\text{high}}$  the country needs a big push from foreign saving (aid).



# Evidence on the Role of Aid in Breaking the Poverty Trap

Easterly (2006) tested the poverty trap hypothesis and found:

- “Poverty traps in the sense of zero growth for low income countries are rejected by the data for the period 1950-2001 and for all sub-periods except 1985-2001.
- Dividing the bottom 20% into two sub-groups—those that got less than average aid and those that more than average (2 to 5 times more)—no statistically significant difference in growth rates between the two groups of countries is found.
- Take-offs are not explained by aid, according to Easterly, but instead by the quality of institutions. In fact, aid played a small role in those few countries that experience a sustained take-off (*see figure below*).
- The data reject the notion that well governed nations that are poor can get caught in a poverty trap (*see figure below*).

# Evidence on the Role of Aid in Breaking the Poverty Trap

In those countries that experienced “take-off” aid play a relatively small role (Easterly, 2005)

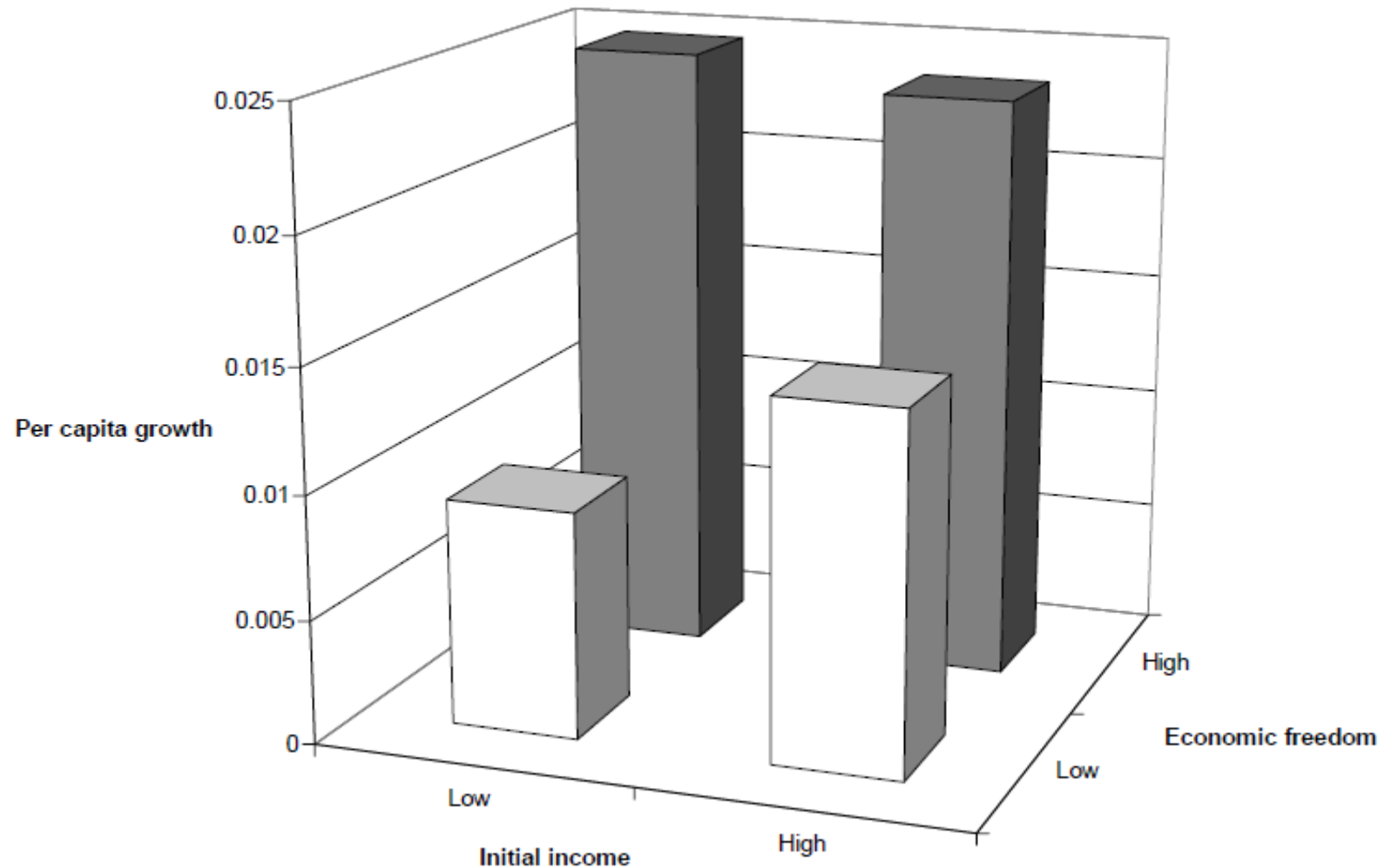
Country Name	Foreign aid as a percent of Gross National Income, 1960-75 except where noted
China	0.00
Hong Kong	0.11
India	1.82
Indonesia	3.93
Korea, Rep./1	8.39
Singapore	0.46
Taiwan, China/1	3.75
Thailand	0.90
<i>Median for whole sample</i>	<i>2.78</i>

Source: World Bank World Development Indicators

/1 Data refer to average 1953-75

# More Evidence on the Role of Aid in Breaking the Poverty Trap

What explains growth performance is the quality of economic institutions not whether countries have low or middle income (Easterly, 2005)



# Evidence on the Export Pessimism Premise of the Big Push Strategy

This topic we discussed at length in the Trade course, so I present here only the main points:

- The argument of Nurkse (1954) that trade was the engine of growth in the 2<sup>nd</sup> half of the 19<sup>th</sup> century in the countries of recent settlement (North and South American, Australia and New Zealand), but couldn't serve the same role for developing countries in the 2<sup>nd</sup> half of the 20<sup>th</sup> century. This argument, which provided intellectual justification for the ISI Strategy was refuted by Kravis (EJ 1970), who show that trade was the "handmaiden," not the engine, of growth in the 19<sup>th</sup> century and that the trade prospects for developing countries in the 20<sup>th</sup> century were even stronger than in the 19<sup>th</sup> century.
- The argument of Lewis (AER 1980) was that trade was the engine of growth for developing countries in the first three decades after WWII, but could not be counted on to play the same role any longer because of economic slowdown in advanced economies. This argument was refuted by Riedel (EJ 1984), who offered evidence that trade facilitated but was not an engine of growth of LDCs in recent decades of the 20<sup>th</sup> centuries.
- The econometric evidence of low price elasticities of demand for developing countries' exports, which is contradicted by casual evidence (and some econometric evidence) that developing countries are in fact price-takers in world markets.

## Export Pessimism: Theory versus Practice

These projections were made in the 1960s by Hollis Chenery (Harvard Professor and Chief Economist of the World Bank) on the premise that large countries could achieve economies of scale. There was little hope for small economies that would have to rely on the broken engine of trade.

	1960s projection of per capita income in 1976		1960 estimate of GDP growth rates 1962-75		Per capita income in 1990
	Estimate	Realized	Estimate	Realized	
India	213	65	5.3	3.4	340
Pakistan	174	75	5.3	6.0	370
Sri Lanka	289	46	5.0	4.2	430
Taiwan	258	316	7.0	9.4	8,000
Hong Kong	488	324			10,350
South Korea	250	201	5.0	10.1	4,400
Singapore	859	268			10,450

Source: World Bank, World Development Report, 1991.

**OOPS!**

# Trade and Industrialization Strategy circa 1990

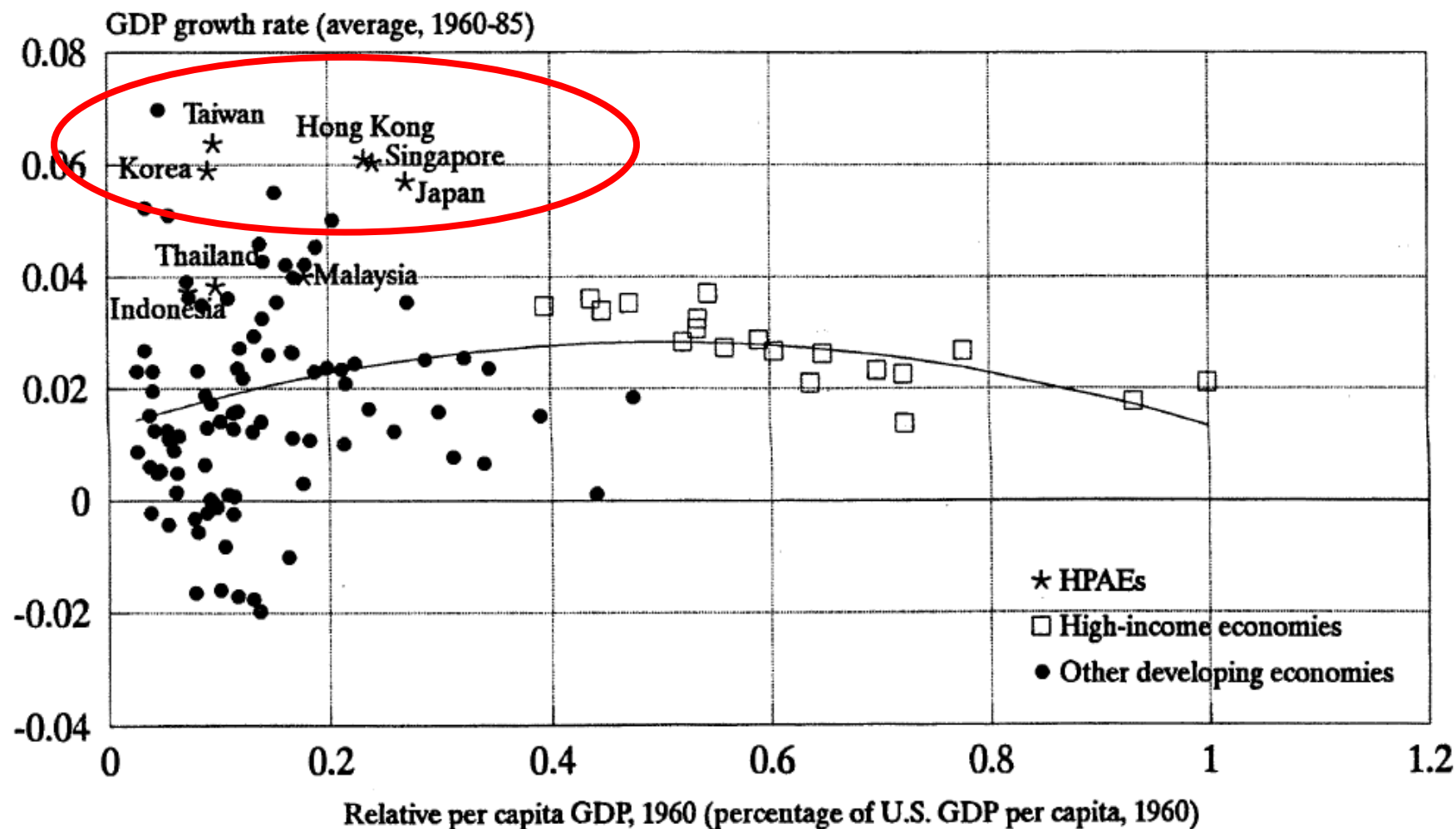
## Major themes:

- Export promotion strategy replaces ISI as the orthodox view
- Total Factor Productivity Growth replaces capital accumulation as strategic focus
- “Getting prices right” becomes the slogan of the day
- SOEs must be privatized
- FDI is good, foreign indirect investment is dangerous (Latin Debt Crisis)
- Foreign aid should be used to promote reform, not build infrastructure
- The “Washington consensus” is born



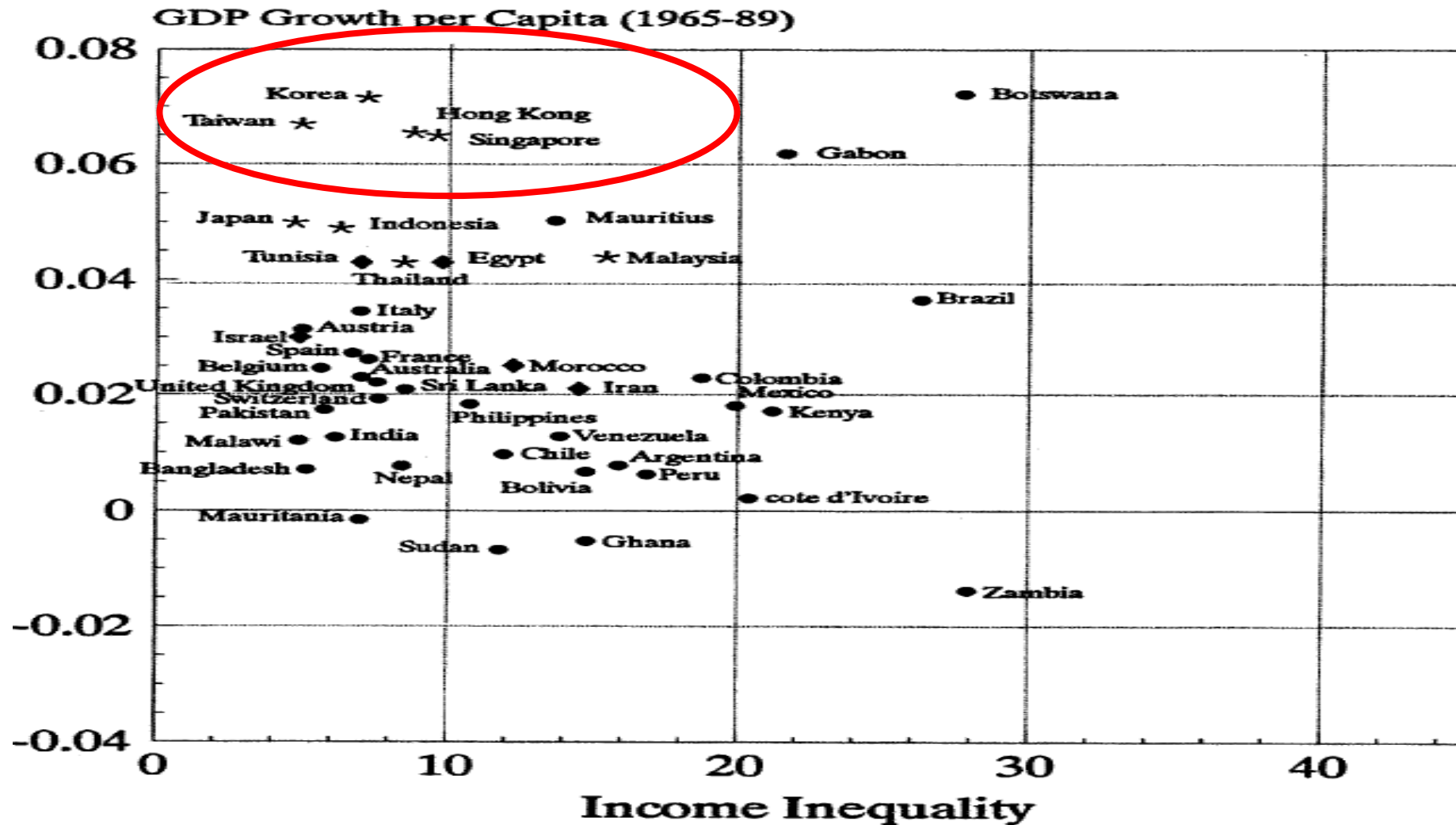
## The Origins of the EOI strategy: The Asian Tigers

The ISI strategy was born in theory, but the EOI strategy was born in practice—the experience of the Four Asian Tigers



# The Origins of the EOI strategy: The Asian Tigers

EOI produced not only fast growth, but also an equitable income distribution.



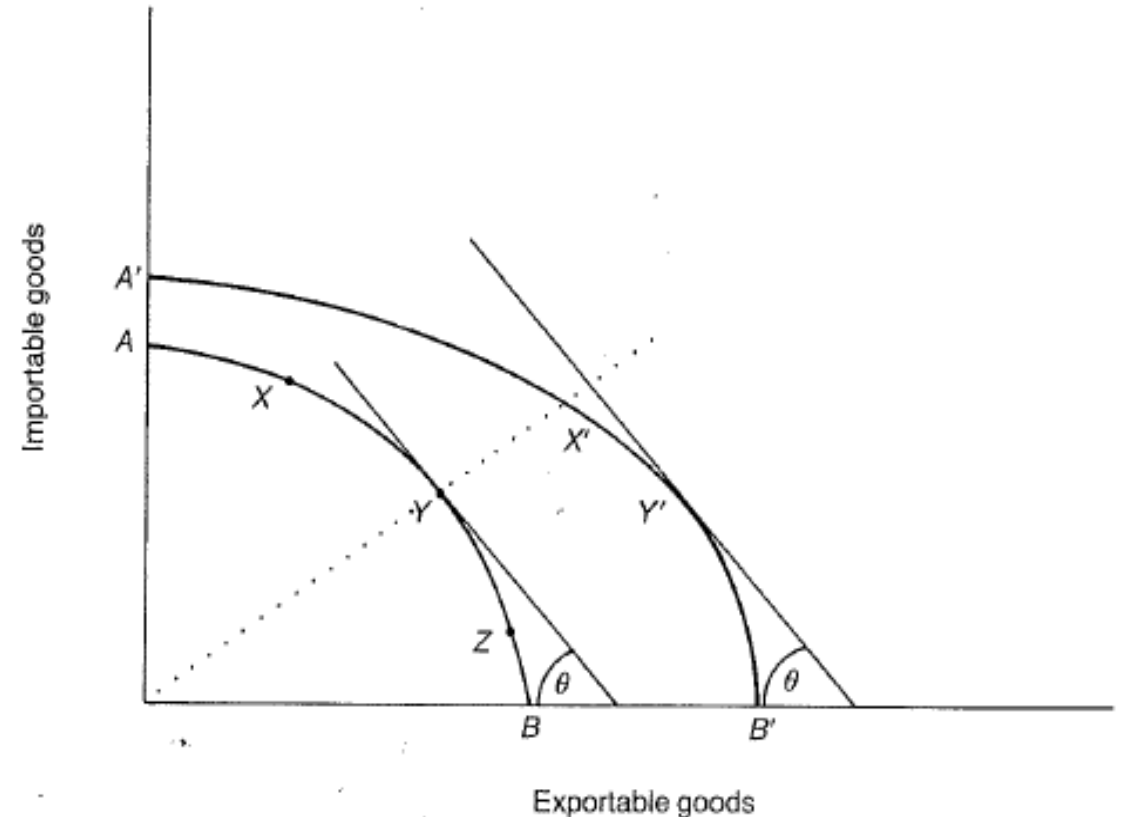
# What is (and what is not) EOI?

Definition: average  $EER_X$  = average  $EER_M$  (export promotion strategy, shown by point Y))  
average  $EER_X < \text{average } EER_M$  (import substitution strategy, shown by point X)  
average  $EER_X > \text{average } EER_M$  (ultra export promotion strategy, shown by point Z)

Bhagwati (1988): “average  $EER_X$  and average  $EER_M$  can and do conceal very substantial variations among different exports and among different imports”

Why not free trade (shown by PPF  $A'B'$ )?

The case EP is grounded on experience, not on theory. The theory was provided to show that what works in practice also works in theory!



James Riedel, “Strategy Wars: The State of Debate on Trade and Industrialization in Developing Countries,” in Charles S. Pearson and James Riedel, eds. *The Direction of Trade Policy*, (Oxford: Basil Blackwell Ltd., 1990) 130-150

## Revisionist Interpretation of EOI and the Asian Tigers

**Some quotes from Paul Krugman "The Myth of Asia's Miracle," *Foreign Affairs*, 11/12, 1994**

"The newly industrializing countries of Asia, like the Soviet Union of the 1950s, have achieved rapid growth in large part through an astonishing mobilization of resources... rather than by gains in efficiency."

"The hypothesis that there has been no technical progress in the East Asian Newly Industrialized Countries (NICs) cannot be rejected."

"Popular enthusiasm about Asia's boom deserves to have some cold water thrown on it...future prospects for that growth are more limited than almost anyone now imagines."

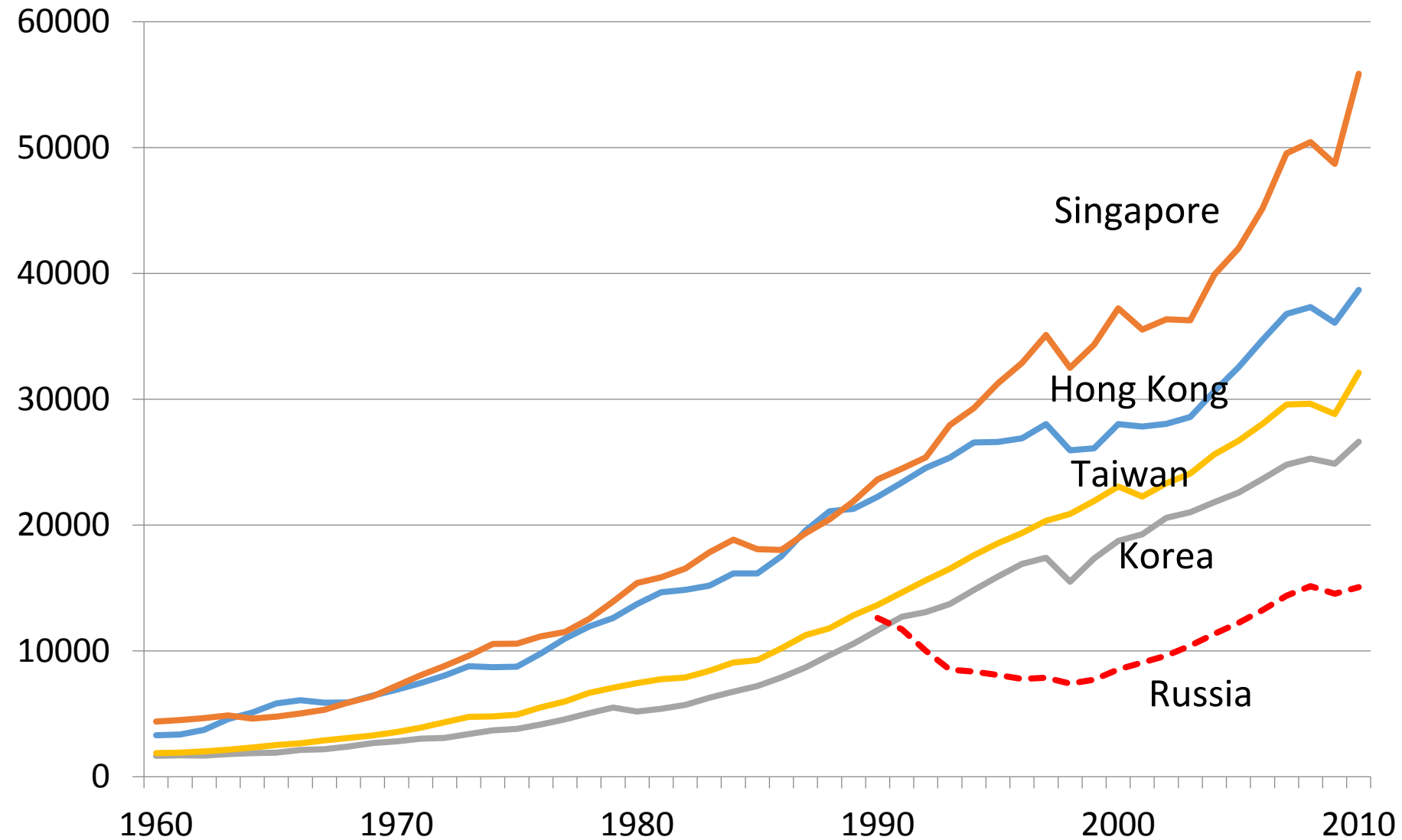
Young (1995) more poetically notes that once one allows for their rapid growth of inputs, the productivity performance of the "Tigers" falls "from the heights of Olympus to the plains of Thessaly."

Alwyn Young. "The Tyranny of Numbers: Confronting the Statistical Reality of East Asian Growth," *Quarterly Journal of Economics*, 110 (Aug. 1995), 641-680

James Riedel. "The Tyranny of Numbers or the Tyranny of Methodology: Explaining the East Asian Growth Experience," *Annals of Economics and Finance*, 8 (2007) 385-396.

# The “tyranny of numbers” strikes back!

Real 2005 PPP dollars



# Revisionist Interpretation of EOI and the Asian Tigers

The ISI strategy was born in theory and died in practice!

The EOI strategy was born in practice, but is still being attacked by theory.

Export-oriented industrialization and the principle of comparative advantage on which it is founded are still being debated on theoretical and empirical grounds...which is the topic for the next lecture!

