

# There Are No Growth Miracles\*

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\*Based on Bhalla, Surjit S., *Second Among Equals: The Middle Class Kingdoms of India and China*, forthcoming, IIE, 2007

# What determines growth?

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<b>Factors</b>	<b>Conventional wisdom of effect on growth</b>
<b>Geography/Climate</b> ( <i>Rainfall, Latitude, Temperature</i> ):	Some say large, some say small
<b>Catch-up:</b>	Important
<b>Factor Accumulation</b>	
<i>Physical capital:</i>	Important
<i>Human capital:</i>	Important, but empirical results mixed
<b>Other factors</b>	
<i>Demography:</i>	Some say significant
<i>Institutions:</i>	Institutions rule, assumed to be <b>the</b> determinant
<i>Policy:</i>	Old war horse, now discarded Policy that does have an effect - fiscal deficit [although effect is very small - each percentage point reduction leads to only an extra 0.1 percent of GDP growth]

## New Determinants of Growth

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### *Some “New” Important Factors*

- Middle Class as an important driver (values, entrepreneurship, level playing field, merit)
- Undervaluation of real exchange rate (very old determinant, previously called mercantilism); new because we find, contrary to earlier studies, a very strong and dominant effect on growth.

# Definition of Institutions

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## ➤ *Economic Institutions*

- Property rights
- Financial systems
- Legal Origins
- Corruption

## *Political Institutions*

- Democracy
- Law and Order
- Political & Civil Liberties

## Institutions: Micro and macro Evidence

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- Micro evidence provided by examination of performance of institutions (outcomes) within a country
- Macro-evidence via comparison across countries – cross country analysis.
- Both sets of evidence offered – micro evidence for performance of public institutions in India, macro evidence for the universe of countries for which data are available (time-period, data, from 1500 to 2006).

## Institutions in India: 1950-2006

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- Institutions likely better in India during the *low* growth period, 1950-1980.
- All indicators suggest no improvement in institutions, and sometimes a deterioration; but growth considerably higher in the “bad” institution period.
- How much higher? Less than 2 % (1.6%) per capita during 1950-1980, and in the 1980-2006 period, more than twice as high (4.0 % p.a.).

# Performance of Indian Institutions 1999/00

## *Rajiv Gandhi Index: % of expenditures reaching targetted beneficiaries*

<b>Government programs</b>	<b>Efficiency</b>
<i>Public distribution of food (as % of total consumption of poor)</i>	
<b>Rajiv Gandhi index, Rice (%)</b>	<b>11.3</b>
<b>Rajiv Gandhi index, Wheat (%)</b>	<b>5.7</b>
<i>Number of meals, Mid-day Meals program</i>	
Government claim of meals provided (in millions)	2376
Actual mid-day meals consumed - estimate from NSSO data	266
<b>Rajiv Gandhi Index (%)</b>	<b>11.2</b>
<i>Employment Guarantee Scheme (work days in crores)</i>	
Government claims of man days of work created and paid for	54.7
Employment in public works, rural poor (NSSO data)	7.8
<b>Rajiv Gandhi Index (%)</b>	<b>14.3</b>

## Institutions & Growth: Conventional Wisdom

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- Institutions *cause* economic growth to be higher
- “Institutions Rule” (in a horse race among the three important determinants of growth – geography, institutions and policy) Rodrik et. al. confirm that institutions matter the most for growth, and do so by an order of magnitude.
- Confirmed by several other analysts including the original authors Acemoglu et.al., Engerman-Sokoloff etc.
- World Bank, IMF Presidents echo & *recommend* institutions to all.

## Institutions & Growth - Evidence

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- Several institution variables have been examined in the literature:
  - ✓ ICRG (risk of expropriation), Heritage Foundation, political and civil liberties, Polity data, democracy and dictatorship, World Bank data on governance, data on economic freedom.
- Instruments – log settler mortality, legal origin, ethnic fragmentation, colonial origin.
- Geography variables: primarily latitude

## Governance: Corruption Increasing

	1983	2003
<b>China</b>	<b>5.1</b>	<b>3.4</b>
Hong Kong	7.4	8.1
Indonesia	0.2	2.1
Malaysia	6.3	5.0
Philippines	1.0	2.6
Singapore	8.4	9.3
South Korea	3.9	4.6
Taiwan	6.0	5.8
Thailand	2.4	3.5
Bangladesh	0.8	1.4
<b>India</b>	<b>3.7</b>	<b>2.9</b>
Pakistan	1.5	2.3
<b>Non Asian World</b>	<b>5.8</b>	<b>4.4</b>
<b>World</b>	<b>4.6</b>	<b>3.6</b>

Source: Transparency International; higher number indicates less corruption

## Fragility of Results on the Efficacy of Institutions

- Acemogulu, Johnson & Robinson trend setting model:
- Original formulation: (dependent variable is (log) per capita income; institution is proxied by “risk of expropriation” and instrumented by (log) settler mortality; sample size of 64 former colonial countries).
- Reproduction of AJR model: it fails when mean of temperature and minimum rainfall are added to the basic model

<b>Log per capita income in 1995</b>	=	1.86 (1.6)	+	0.95*Risk (5.4)			
	=	1.63 (1.1)	+	1.0*Risk (4.1)	-	0.007*Latitude (-0.5)	
<b>Addition of Mean Temperature and Rainfall</b>	=	-4.64 (-0.41)	+	1.84*Risk (1.18)	-	0.029*Latitude (-0.58)	+ 0.075*Temperature (0.64) - 0.025*Rain (-0.73)
	=	-2.97 (-0.43)	+	1.49*Risk (1.9)			+ 0.075*Temperature (0.75) - 0.017*Rain (-0.98)

# Experiments with Institutions

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- Several institutions such as “*political liberties*”, “*World Bank index of governance*”, “*Risk of expropriation*” were tried.
- Several instruments such as “settlers mortality”, “legal origin”, “middle class” were used
- Two different samples: set of countries considered by Acemoglu et. al. (2001) and all countries with population higher than one million and excluding oil exporting countries [results do not vary by sample selection].
- Four different models, using three different geography variables – latitude, mean temperature and minimum rainfall. log per capita income in 2005 as the dependent variable.
- Four different models with an alternative dependent variable: growth 1960-2005, with (log) per capita income in 1960 as an independent variable (catch-up).
- In all, 504 models were estimated.

## Success rate (%) of institution-growth models

	Without undervaluation			With undervaluation		
	Stage I	Stage I + II	Stage I + II + Over ID test (Hansen)	Stage I	Stage I + II	Stage I + II + Over ID test (Hansen)
<i>Institutions</i>						
World Bank composite index	75.1	67.6	52.9	53.8	22.4	15.6
Political liberties	54.5	45.7	35.5	34.2	8.2	6.6
Polity IV index	59.8	45.5	37.1	23.0	1.5	1.3
Risk of expropriation - AJR	69.4	55.3	33.9	52.6	25.5	20.9
<i>Instruments</i>						
Colonial heritage	65.0	42.5	32.9	53.1	31.3	18.8
Ethnic fragmentation	42.5	42.5	30.8	15.6	15.6	13.0
Legal origin	20.0	10.0	6.3	43.8	12.5	12.5
(Log) Settler mortality - AJR	67.5	67.5	46.7	6.3	3.1	2.6
(Log) population density	47.5	27.5	24.6	28.1	9.4	8.3
School Enrollment (around 1890)	97.5	82.5	60.8	78.1	12.5	9.9
Middle class	90.0	82.5	59.2	43.8	28.1	22.4
Proportion of white settlers (1900)	87.5	75.0	58.8	56.3	0.0	0.0
<b>Overall</b>	<b>64.7</b>	<b>53.5</b>	<b>39.9</b>	<b>40.9</b>	<b>14.4</b>	<b>11.1</b>

## Searching for clues to growth

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- If institutions do not explain growth differences, and if geography and demography are minor variables, then what explains differences in growth?
- Factor accumulation (investment) and *catch-up* are two important determinants, but these beg the question: why do some countries invest more, why in some countries is *catch-up* faster?
- There is a determinant which speeds up *catch-up*, induces more investment, results in higher productivity, and causes faster growth.

## Clue to faster growth - undervaluation

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- It is a determinant which a few economists (especially *Bela Balassa*) have *indirectly* emphasized via export led growth
- Also a determinant which has historically been important, but has a four letter word connotation: Mercantilism.
- It is also called undervaluation of the real exchange rate.

## How does one measure currency undervaluation ?

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- IMF formulation – select base year and adjust exchange rate by inflation differentials.

*Problem:* Assumes base year is “*correctly*” chosen and that the real exchange rate, RER, **is fixed over time**.

- Alternative formulation: Balassa – Samuelson (B-S).
- Acceptance of B-S means that the real exchange rate (RER) increases with per capita income (this effect is empirically large – about 1.1 % percent per annum for the last 15 years for China)

# Investment led derivation of the RER

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## *Model of investment*

Investment demand =  $f(\text{cost/productivity})$

Costs a GDP per capita measured in US\$ (costs faced by firm)

Productivity a GDP per capita measured in PPP\$ (productivity received by firm)

$$\text{Investment} = f[(\text{GDP}/ \text{US\$ ex. rate}) / (\text{GDP}/\text{PPP ex. rate})]$$

*Nominal GDP cancels out from both numerator and denominator*

$$\text{Investment} = F(\text{Real exchange rate}) = F[(\text{PPP ex. rate})/ (\text{US\$ ex. rate})]$$

*This is exactly the Balassa-Samuelson definition (but derived via demand for investment)*

## B-S RER Estimation: Linear and Non-linear Models

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- B-S formulation (including by Balassa, Kravis-Lipsey, David Dollar, Rogoff, Frankel) have all assumed (log) linearity in the relationship between the RER and per capita I.e.  $LRER = a + b * LY$  where LRER is the log exchange rate (ratio of PPP exchange rate vis-à-vis the US dollar) and LY is log per capita income
- We have estimated a non-linear model I.e.
- $RER = a * (1 - b^Y)$  (as income goes to infinity, the RER goes to a)

## RER as a fn. of Income - Estimates

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The following non-linear relationship is estimated (1996 to 2006, 1672 observations, 162 countries, 110 outliers (Hadi, 1992, 1994 technique) not considered).

*Non-linear model*

$$\text{RER} = 1.1857 * (1 - 0.974^Y); \text{ Adjusted R-square: } 0.88$$

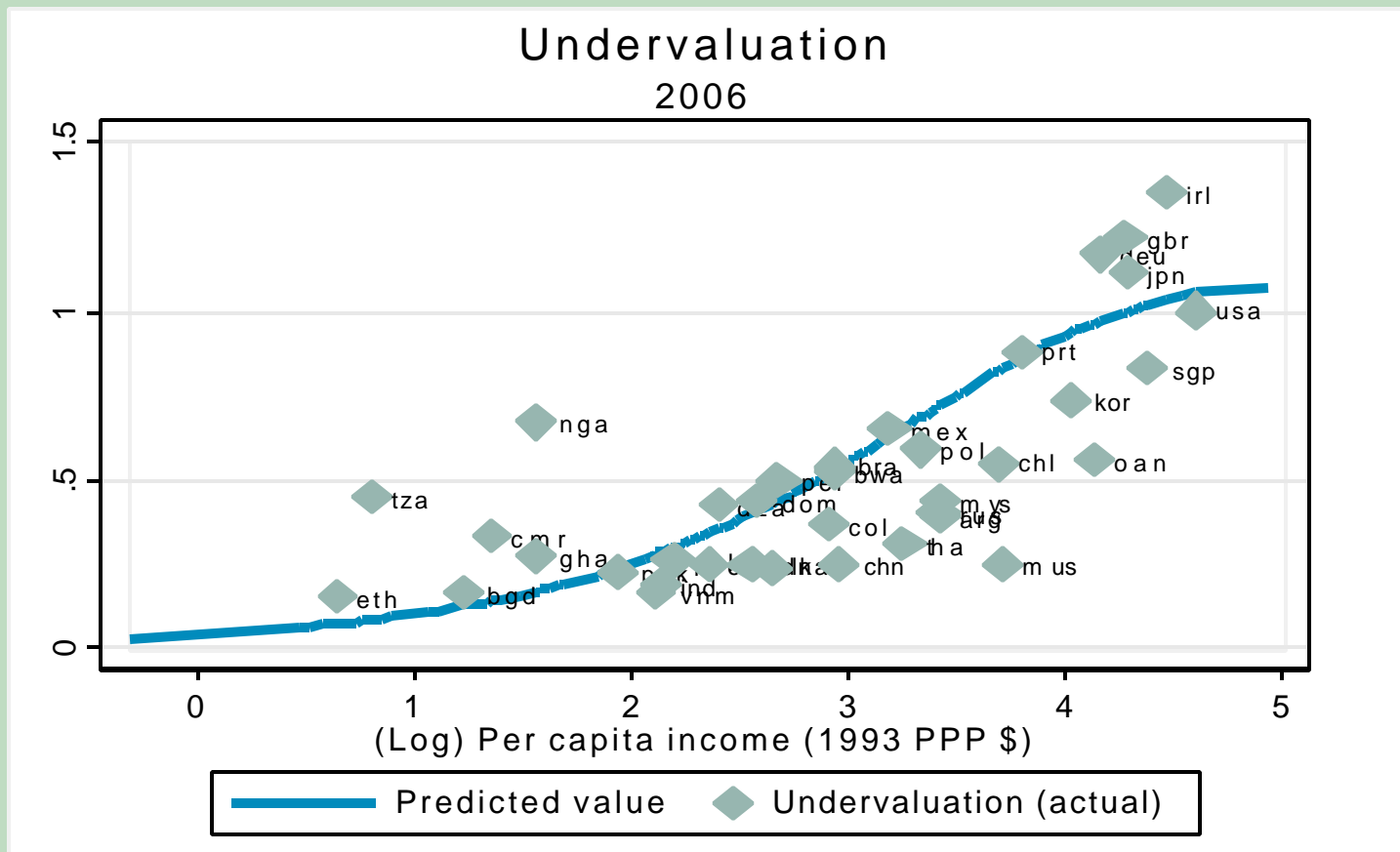
(0.031)      (0.00127)

*Traditional model*

$$\text{LRER} = -1.91 + 0.39 * \text{LY}; \text{ Adjusted R-square: } 0.54$$

(0.009)      (0.0265); [Standard errors in brackets]

# Undervaluation of Currency: the Balassa-Samuelson model



## Some Present Undervaluation Levels

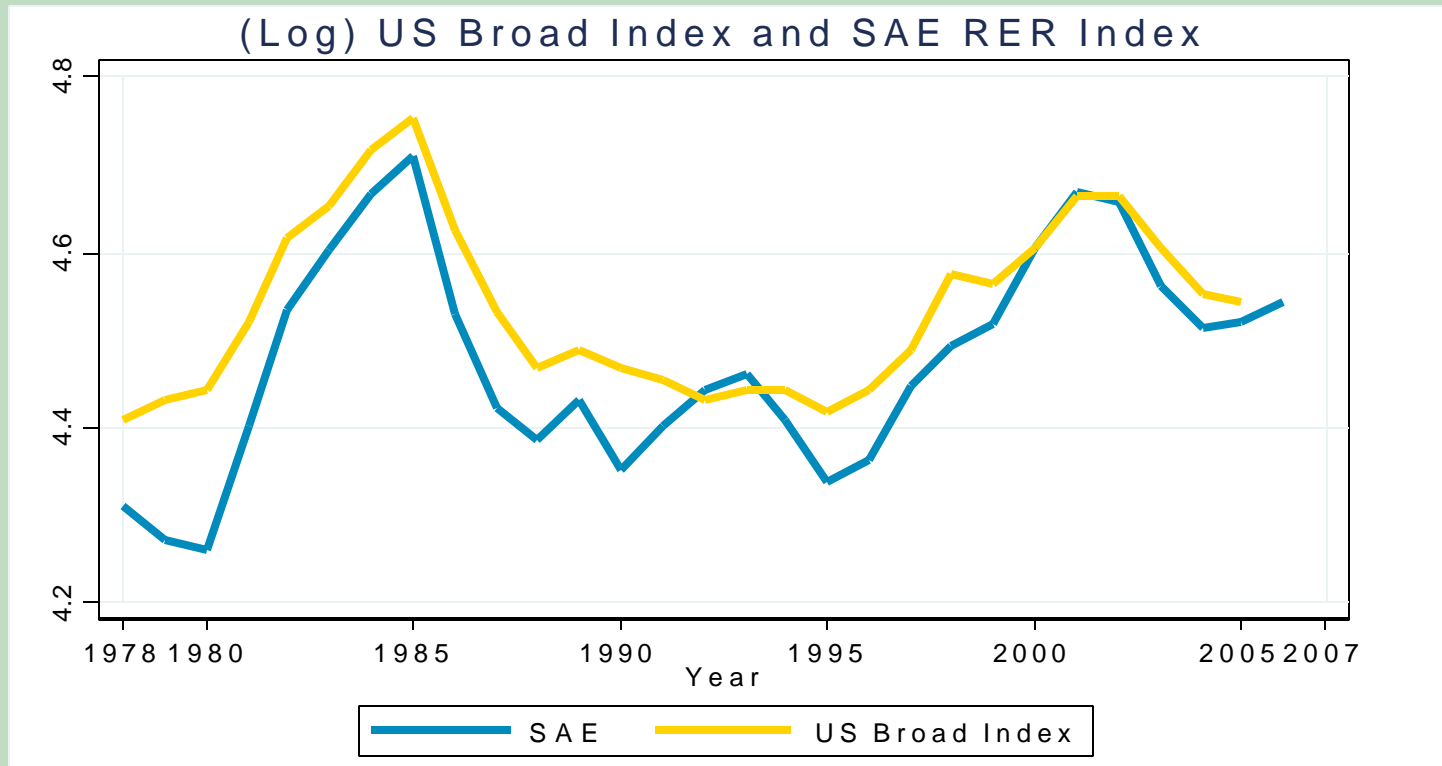
United Kingdom	-31.1	9.6	28.0
<b>Germany</b>	<b>-0.6</b>	<b>38.6</b>	<b>28.5</b>
<b>Japan</b>	<b>-6.9</b>	<b>61.9</b>	<b>19.1</b>
<b>United States</b>		<b>-19.0</b>	<b>-8.1</b>
China	195.1	-12.1	<b>-55.5</b>
Vietnam		31.4	<b>-25.0</b>
<b>India</b>	<b>143.2</b>	<b>39.9</b>	<b>-12.2</b>
Pakistan	152.2	46.3	21.5
Brazil	24.7	30.1	23.7
Mexico	12.6	24.6	23.5
Chile	21.8	-19.5	<b>-24.8</b>

## **Comparison of SAE RER rate for the US with the FED Broad index for the dollar**

<b>Year</b>	<b>US Broad index</b>	<b>SAE Undervaluation index</b>
1973	93.3	88.1
1985	117.1	110.9
1990	87.1	77.5
1995	82.8	76.6
2000	100.0	100.0
2005	93.5	92.1
2006	92.4	94.0

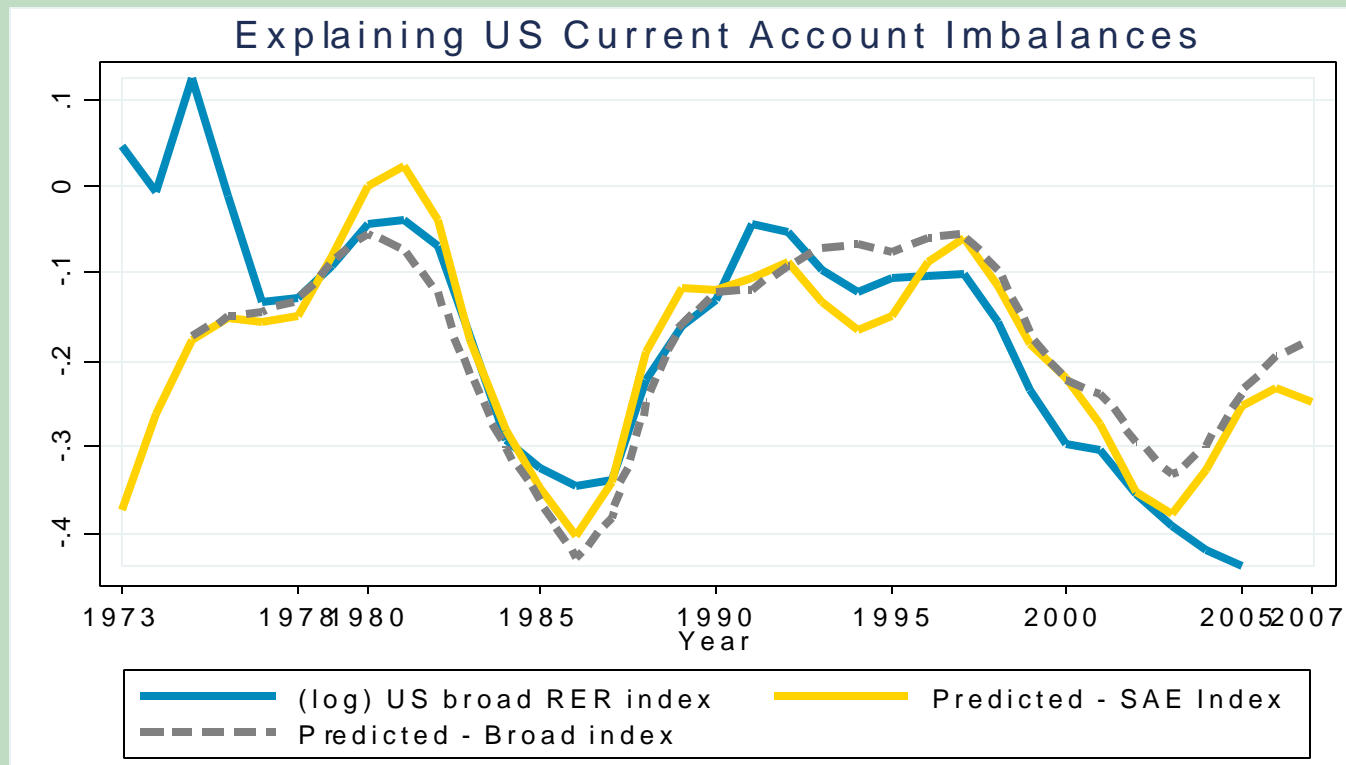
➤ **Correlation coefficient : .8975**

## Close correspondence – SAE and US FED (broad) index of real exchange rate



Note:

# Baily-Lawrence model of US current account



Note: Baily-Lawrence have the (log) export/import ratio as the dependent variable, and the exchange rate lagged 1 and 2 periods.

## Why Does Undervaluation Work

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- Cheaper currency, greater undervaluation, more incentives to invest, higher investment & higher growth rate
- May not lead to greater efficiency but does lead to higher investment, and therefore higher growth.

## Growth Accelerations Explained – by UV

	<b>Break Year</b>	<b>Under valuation, Beginning (%)</b>	<b>Under valuation, End (%)</b>	<b>Difference (%)</b>	<b>Effect on growth Acc. (%)</b>	<b>Acc. in growth (%)</b>
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>(4-3)</b>	<b>(4-3)*(-0.04)</b>	<b>7</b>
Canada	1962	15.6	1.9	-13.7	0.5	1.5
Japan	1958	21.6	0.2	-21.4	0.9	1.4
Spain	1959	32.5	17.7	-14.8	0.6	3.2
China	1978	173.4	166.3	-7.1	0.3	4.2
Malaysia	1970	94.8	72.4	-22.4	0.9	2.7
Singapore	1969	76.5	42.4	-34.1	1.4	2.3
South Korea	1962	138.6	59.2	-79.4	3.2	5.4
Taiwan	1961	158.9	82.3	-76.7	3.1	3.1
Argentina	1963	86.5	-13.2	-99.7	4.0	3.1
Brazil	1967	67.3	45.9	-21.4	0.9	4.8
Chile	1986	33.1	-13.0	-46.1	1.8	5.6
Egypt	1976	94.4	105.5	11.1	-0.4	2.2
India	1982	153.2	119.7	-33.5	1.3	1.5
Sri Lanka	1979	85.4	34.6	-50.8	2.0	1.4
Botswana	1969	177.5	165.7	-11.8	0.5	7.5
Mauritius	1971	-24.2	-23.2	1.0	0.0	9.5
Zimbabwe	1964	141.8	168.8	27.0	-1.1	5.0

Note: UV stands for undervaluation of currency measured by deviation from RER

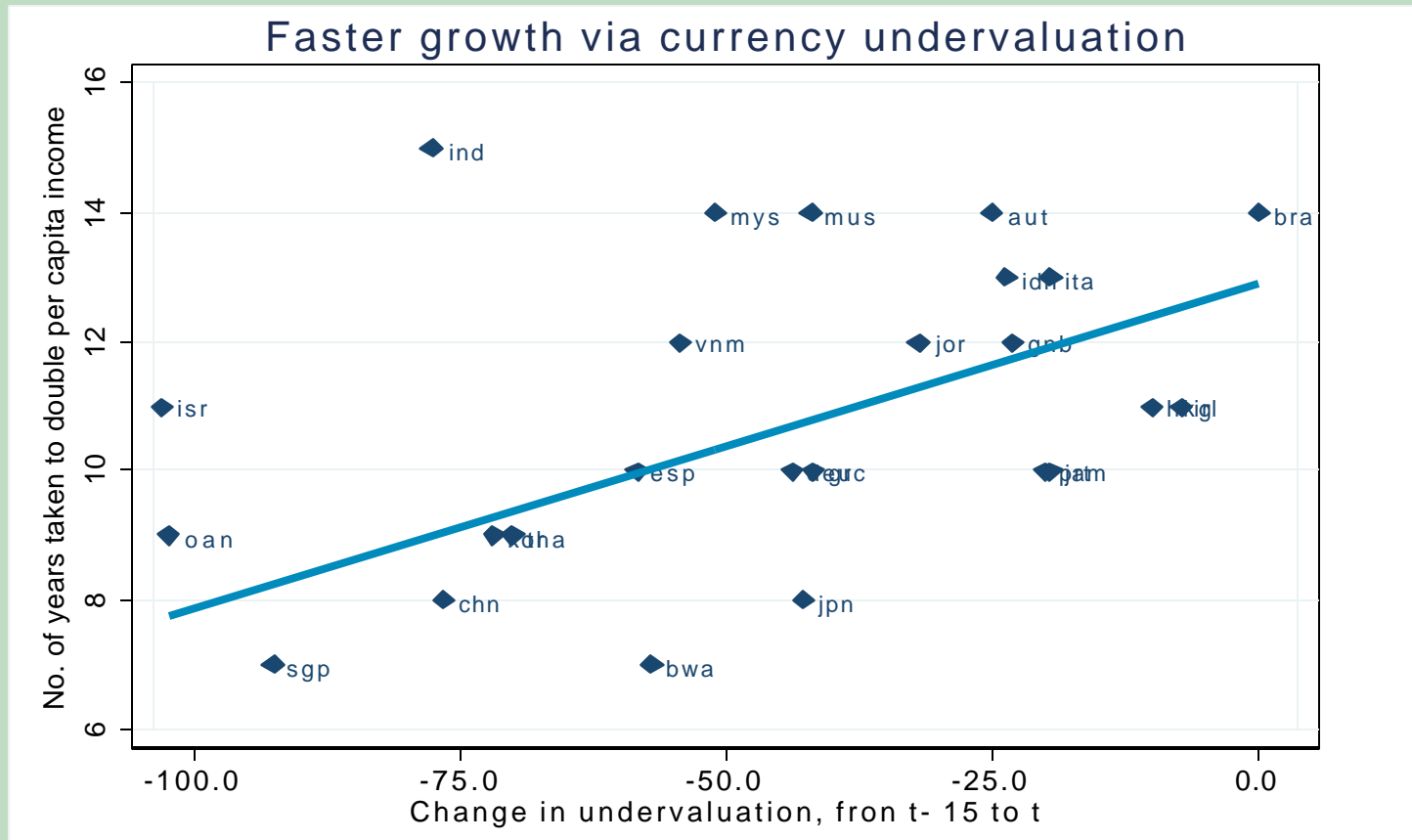
Countries registering growth accelerations, Rodrik. Et. al. (2004)

# Pace of Income doubling explained

Country	Year	Per capita income doubles in No. of years	Undervaluation			Effect on growth Acc. (%)	Acc. in growth
			Beginning (%)	End (%)	Difference (%)		
1		3	4	5	6	6*(-0.04)	8
Austria	1965	14	8.3	-16.6	-24.9	1.0	-2.4
Brazil	1980	14	26.8	27.1	0.3	0.0	-1.1
Botswana	1972	7	203.2	146.2	-57.0	2.3	9.7
China	2006	8	17.2	-59.5	-76.7	3.1	3.9
Germany	1965	10	35.1	-8.7	-43.8	1.8	-3
Spain	1970	10	28.5	-29.9	-58.4	2.3	1.6
Guinea-Bissau	1965	12	224	201	-23.0	0.9	-1.6
Greece	1972	10	37	-4.8	-41.8	1.7	1.7
Hong Kong	1979	11	15.9	6.1	-9.8	0.4	1.2
Indonesia	1980	13	107.3	83.7	-23.6	0.9	-1.2
India	2006	15	59.7	-18	-77.7	3.1	1
Ireland	2003	11	38.3	31.2	-7.1	0.3	2.1
Israel	1965	11	141	37.9	-103.1	4.1	1
Italy	1965	13	3.1	-16.3	-19.4	0.8	-0.5
Jamaica	1965	10	113.1	93.7	-19.4	0.8	-5.7
Jordan	1984	12	77.4	45.6	-31.8	1.3	4.1
Japan	1967	8	21	-21.7	-42.7	1.7	2.3
South Korea	1973	9	109.1	37.2	-71.9	2.9	6.3
Mauritius	1998	14	-48.3	-90.3	-42.0	1.7	-1.8
Malaysia	1981	14	90.9	39.9	-51.0	2.0	0.2
Taiwan	1971	9	120.9	18.5	-102.4	4.1	2.5
Portugal	1973	10	23.9	4	-19.9	0.8	1.8
Singapore	1970	7	115.2	22.6	-92.6	3.7	6.2
Thailand	1995	9	54.1	-16	-70.1	2.8	3.4
Vietnam	2003	12	39.7	-14.6	-54.3	2.2	0.4

Note: Column 2 represents the year of income doubling, and column 3 the number of years taken; beginning is UV in year minus 14, end is UV in year + 7

# Undervaluation helps in growing faster



Notes: X axis measures the change in undervaluation from year – 14 to year of income doubling

## Estimates of UV (and dUV) – different models

	1880-1950	1950-2006	1960-2006	Panel data, 1950-2006
(log) Per capita income, initial values	-0.33	-0.69	-0.58	-1.49
	<i>-1.19</i>	<i>-3.63</i>	<i>-2.31</i>	<i>-0.63</i>
Undervaluation	<b>0.01</b>	<b>-0.01</b>	<b>-0.01</b>	<b>-0.03</b>
	<i>1.83</i>	<i>-4.35</i>	<i>-3.95</i>	<i>-2.74</i>
Change in undervaluation	<b>-0.01</b>	<b>-0.03</b>	<b>-0.56</b>	<b>-0.08</b>
	<i>-2.48</i>	<i>-2.07</i>	<i>-6.84</i>	<i>-1.79</i>
Mean temperature	-0.06	-0.08	-0.01	0.03
	<i>-3.67</i>	<i>-4.13</i>	<i>-0.28</i>	<i>0.29</i>
Minimum rainfall	0.02	0.01	0.01	0.01
	<i>3.30</i>	<i>2.74</i>	<i>3.08</i>	<i>0.78</i>
Latitude			0.04	
			<i>4.88</i>	
Share of middle class				0.15
				<i>4.12</i>
Polity				0.04
				<i>0.93</i>
Constant	1.67	5.32	2.25	1.01
	<i>1.56</i>	<i>7.29</i>	<i>2.72</i>	<i>0.25</i>

Note: t-statistics are reported beneath coefficient estimates; panel data estimated by Arelliano-Bond method

## Summary: Effects of under valuation on growth

	Coefficient of	
	Undervaluation	Change in undervaluation
<i>1880-1950</i>	0.01	-0.01
1950-2006	-0.01	-0.03
1960-2006	-0.01	-0.56
Panel data, 1950-2006	-0.03	-0.09

## Summary on growth breaks

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### Acceleration

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<b>Structural break</b>	<b>No. of countries</b>	<b>Due to under valuation</b>	<b>Growth</b>	<b>TFPG</b>
Rodrik et. al.	53	0.99	2.67	1.92
SAE	46	1.18	2.10	0.70

Note:

## High Growth Episodes & Undervaluation

	Time period	Average growth (% p.a.)	Average Undervaluation (%)	Average change in undervaluation (%)
<i>OECD</i>				
United States	1960-89	2.4	-15.1	-2.2
United Kingdom	1960-80	2.2	-16.5	2.9
Germany	1960-80	3.3	7.7	1.8
Japan	1960-80	6.4	-5.9	1
<i>Emerging Markets</i>				
Brazil	1960-80	4.1	28.4	-2.5
Chile	1990-05	4	-29.5	-1.1
Indonesia	1960-80	3.1	97.8	0
Malaysia	1960-80	4.4	81.1	-2.1
Singapore	1960-80	6.8	50.1	-3.6
South Korea	1960-80	5.7	44.2	-3.1
Taiwan	1960-80	6.7	49.6	-2.2
Thailand	1960-80	4.5	72.7	-2.6
Vietnam	1991-05	5.7	10.1	-0.5
China	1980-05	6.4	26.5	-8.2
India	1991-05	4.1	19.3	-5.5

## Popular Misconceptions of Costs to Currency Undervaluation

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- A popular perception is that developing countries lose from undervaluing their currency.
- Cost of undervaluation: Low return in US assets, both on account of lower interest rate and on loss of currency depreciation.
- Benefits of undervaluation: A much higher GDP growth rate, and this “*leverage*” of costs means that the gains from undervaluation far outweigh any costs.

## How much Does Foreign Reserve Accumulation Cost?

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Elasticity of undervaluation:  $-.03$  (an underestimate)

*For every 10 % devaluation GDP increases by .3 %*

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GDP (billions)	800	2000
Reserves	180	1000
Annual increase in reserves	20	100
Loss due to interest (3 % per annum)	0.6	4
Loss due to depreciation of dollars (3 % per annum)	0.6	4
Total loss (at 6 % per annum) - in US \$ billions	1.2	8
Gains from undervaluation - in US \$ billions	4.0	34

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## Conclusions on growth models

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- Geography: It does matter, but considerably less than claimed.
- Institutions – Matter the least; very likely because “institutions” are a luxury good, determined by levels of income, and therefore not vice-versa.
- Policy – matters the most, but only one policy: an undervalued exchange rate I.e. produce cheaply and conquer the world

## Middle Class - Definition

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- Middle class: Defined as non-poor in the developed world
- Constant across time and countries
- In early stage of development *middle class were elites*
- Presence of middle class enforces “good policy”  
- on infrastructure, on governance, and therefore higher growth.

## Definition of Middle Class

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The middle class are the non-absolute poor in the developed world.

Absolute poor poverty line, PPP \$1.08 (1993 base)

Absolute poor, developed economies, PPP \$ 7.7

In 2006 PPP prices, the two values are 1.42 and 10.1

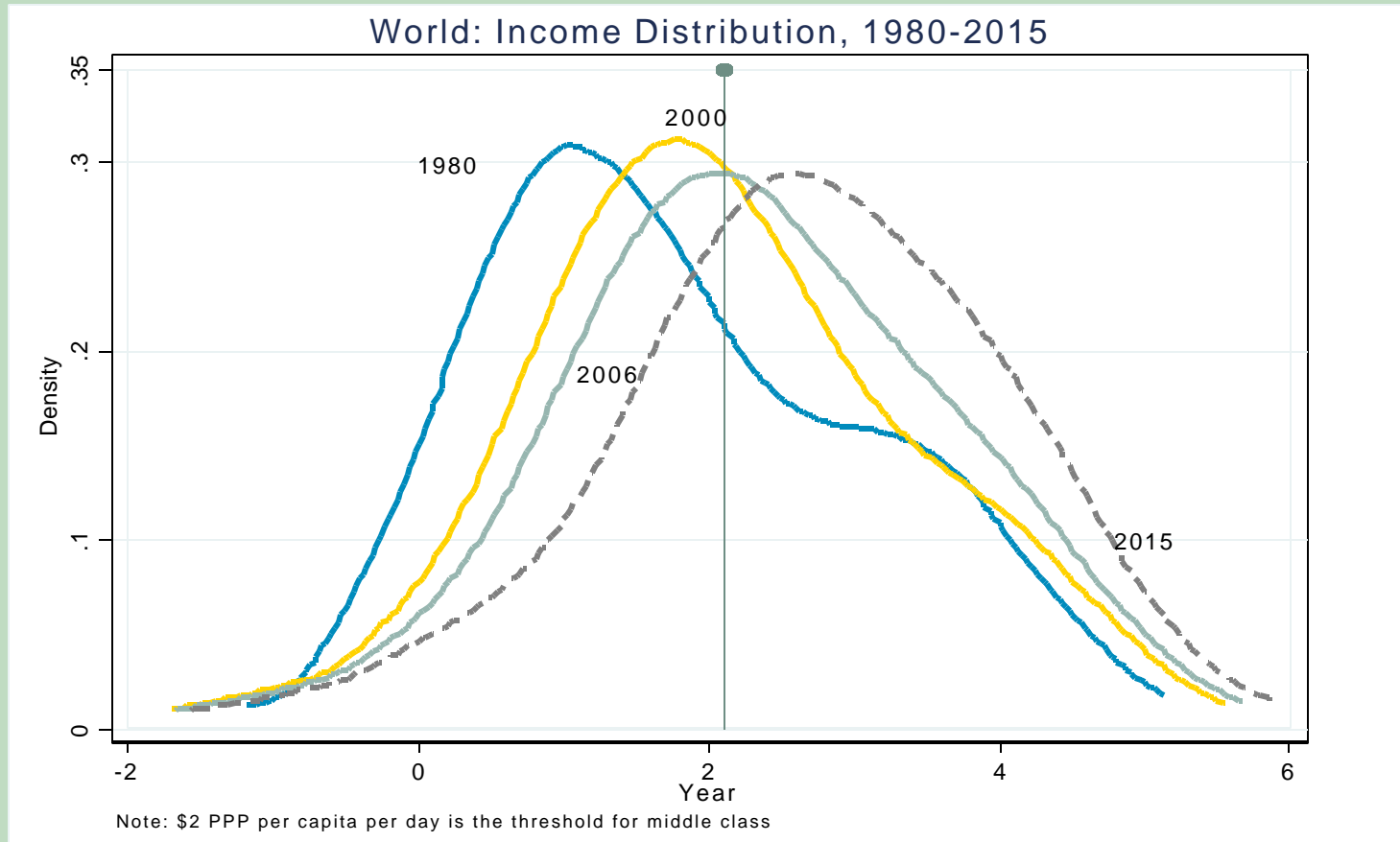
*Middle Class Line: approximately PPP\$ 3700 per capita per year in 2006 prices.*

## Middle Class as an Institution

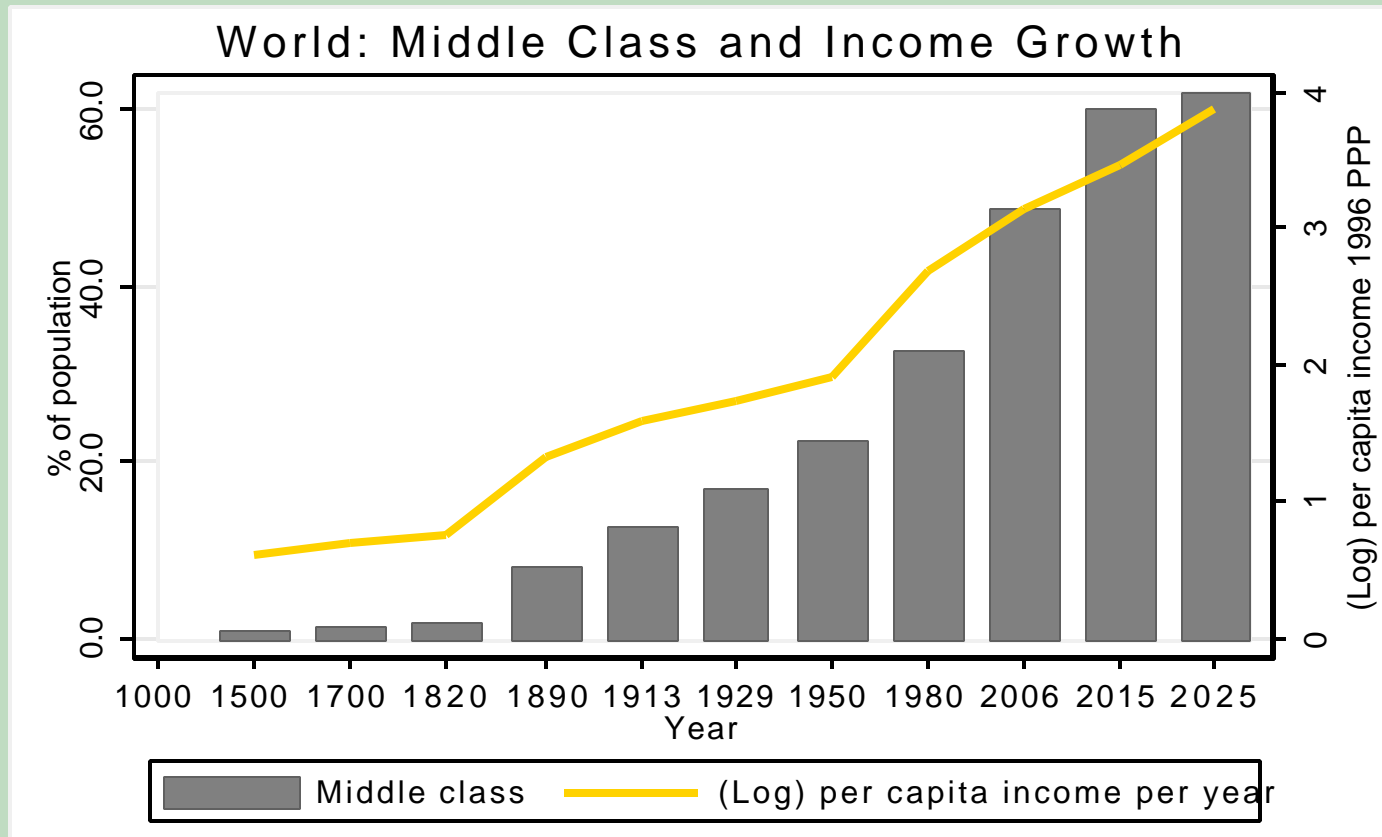
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- Middle class believes in property rights, free trade, rules of the game, anti corruption etc.
- It is not the poor, nor the landed elite, nor the industrial elite.
- Purely out of self interest it believes in market “virtues”; only way for it to prosper.

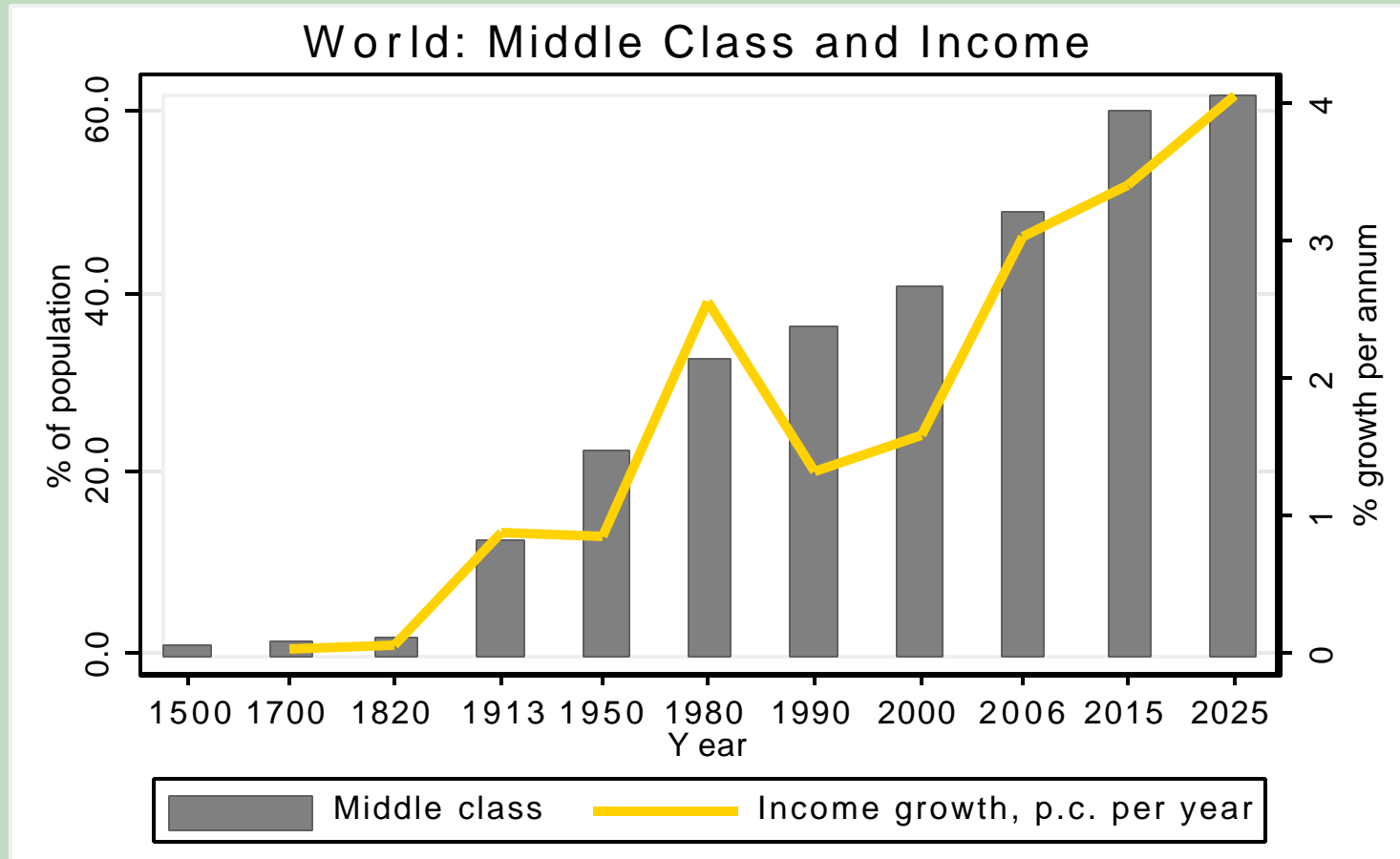
# World income distribution



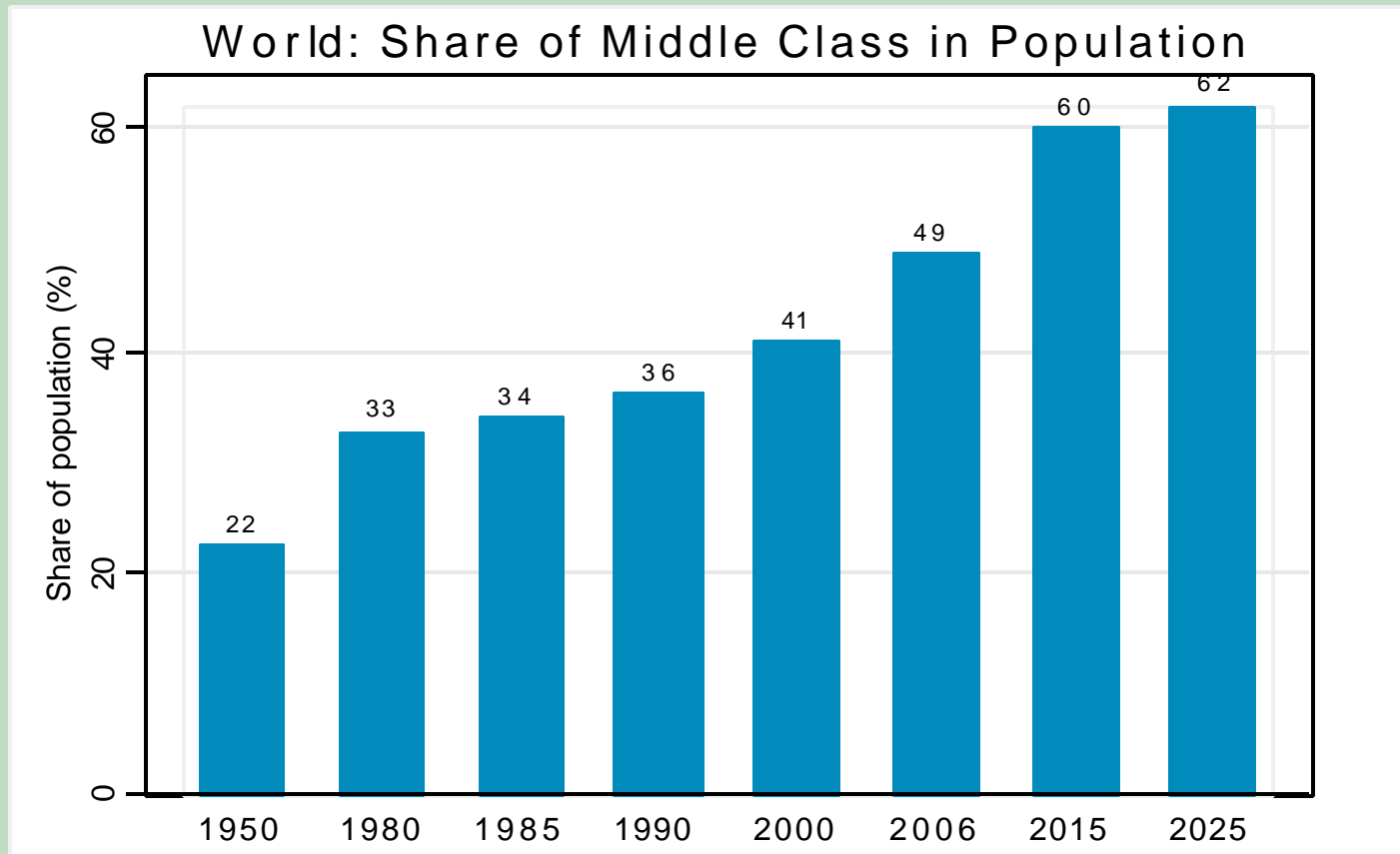
# World: Middle Class and Income Levels



# World: Middle Class and Income Growth



# The Changing Middle Class in the World



## Middle class equal to potential tax payers?

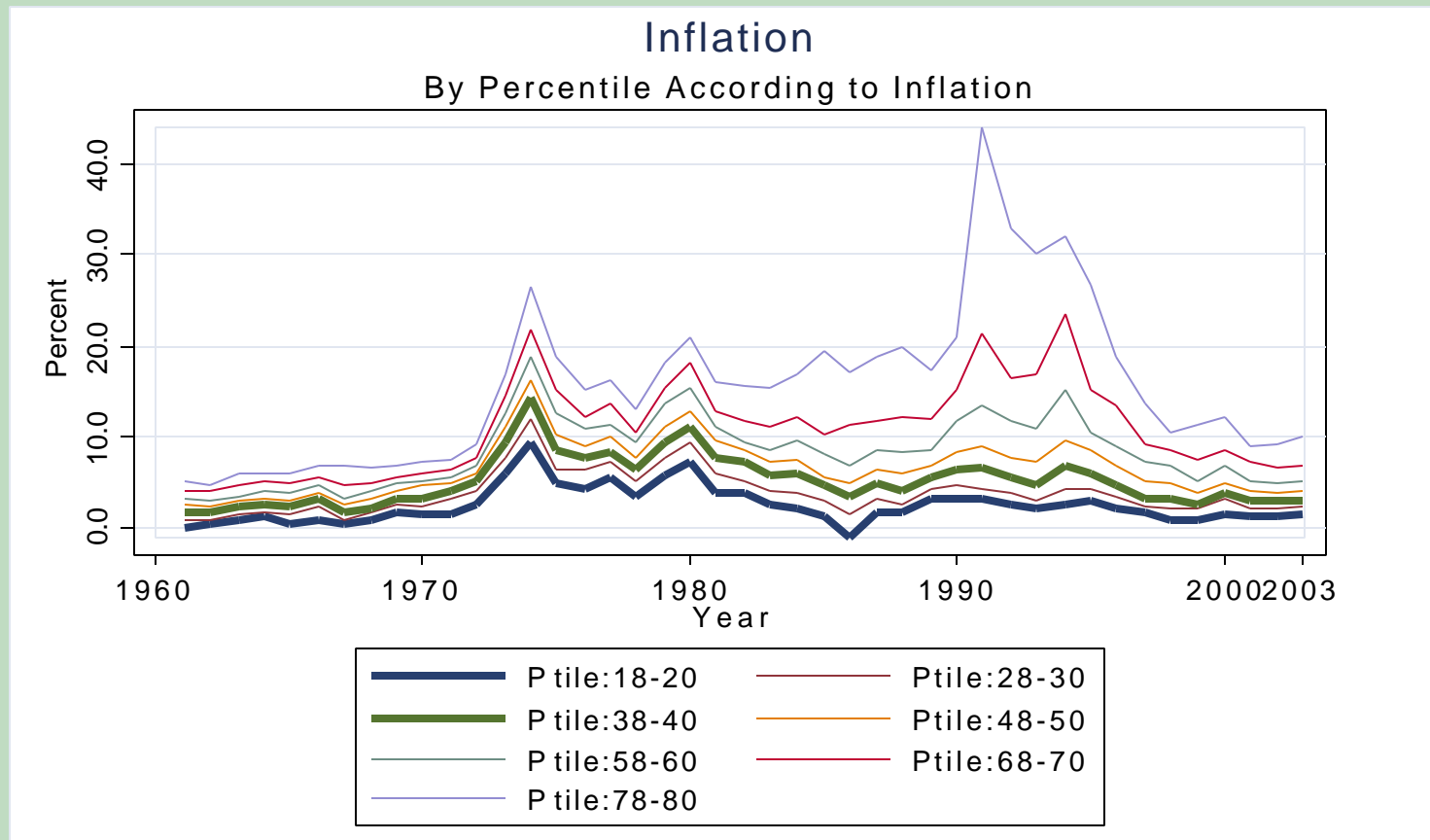
Year	China		India	
	Middle class (%)	Tax-Payers (%)	Middle class (%)	Tax-Payers (%)
1986	10	10	7	9
1990	12	2	10	19
1993	25	15	11	26
1997	39	52	18	23
2000	50	47	24	25
2003	55	54	29	35

# Conclusions

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- Institutions (governance) is a luxury good [a BMW]. Rich countries have more of it. But it does not mean that institutions *cause* growth.
- What does cause growth is “liberalization”, defined as rules of the game as dictated by the “market”.
- The middle class, for its own benefit, believes in liberalization.
- Another important contribution to growth is undervaluation of currency.
- But what if everybody undervalues the currency? That is when the benefits to all will end.

# Higher undervaluation – lower world inflation



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