



# *Economics*

*(a Non-Economist's views)*

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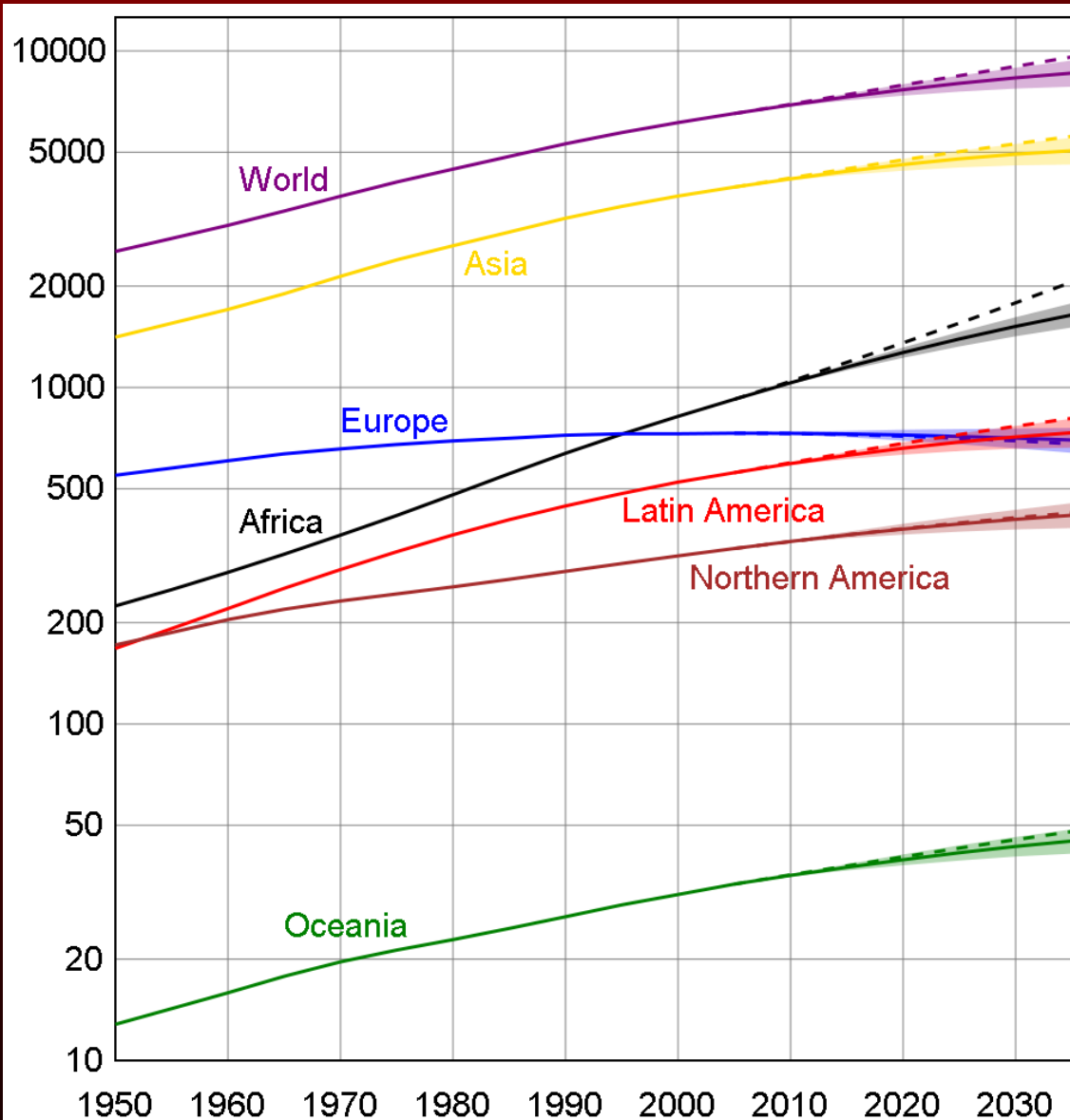
**Carnegie Mellon**



# A Stylized Skim through Economics

- Things to look out for
  - Learn the jargon
- Formal frameworks
  - Microeconomics, macroeconomics, finance, etc.
- Techno-economic (project) valuation

# Global Population



## Population 2007-09-19

1. China	1,323,607,597
2. India	1,133,843,283
3. USA	301,730,016
4. Indonesia	235,317,962
5. Brazil	190,430,440
World	6,619,111,398

Sources: UN Data; GeoHive

# Economics – Global

## Statistics

- GDP (PPP) US\$65.95 trillion (2006 est.)
- GDP (Currency) \$46.76 trillion (2006 est.)
- GDP/capita (PPP) \$10,200 (2006 est.)
- GDP/capita (Currency) \$7,178 (2006 est.)
- Annual growth 4.0% (tty\*); 2.1% (1950-2003)  
per capita GDP (PPP) [tty – trailing 10 years till  
2002]

### Distribution (2004 Est.)

GDP:	Agriculture:	4%	Labor	40.7%
	Industry:	32%		20.5%
	Services:	64%		38.8%



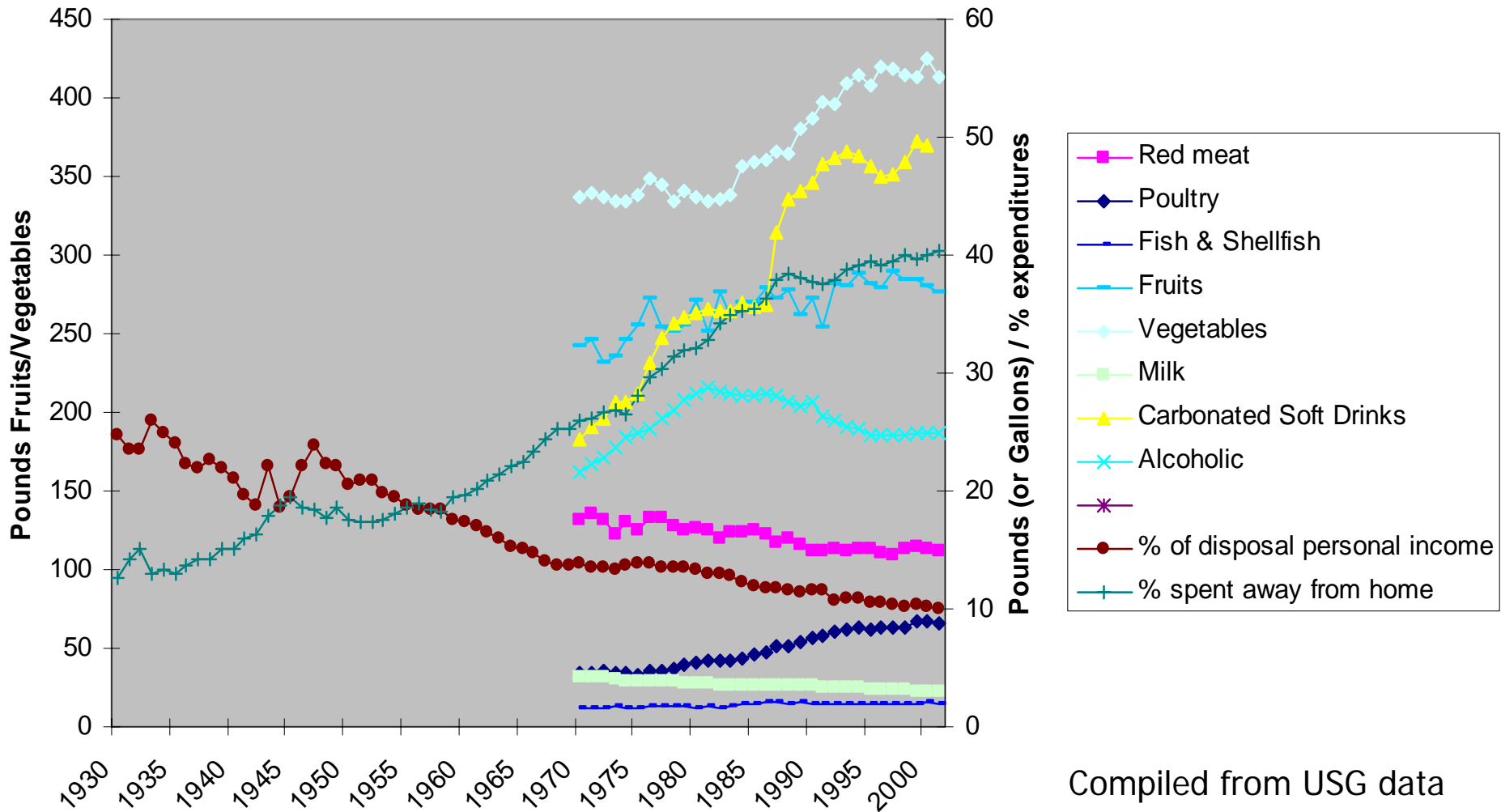
# Relative value of money

- Market exchange rate
  - What you buy and sell currency at
- Purchasing Power Parity (PPP)
  - Factors in differences in cost of living for a “basket of goods”
    - The \$1/day for absolute poverty is using a PPP number!
- What’s the Big Mac Index?

# Economics is about tradeoffs – Consider Food

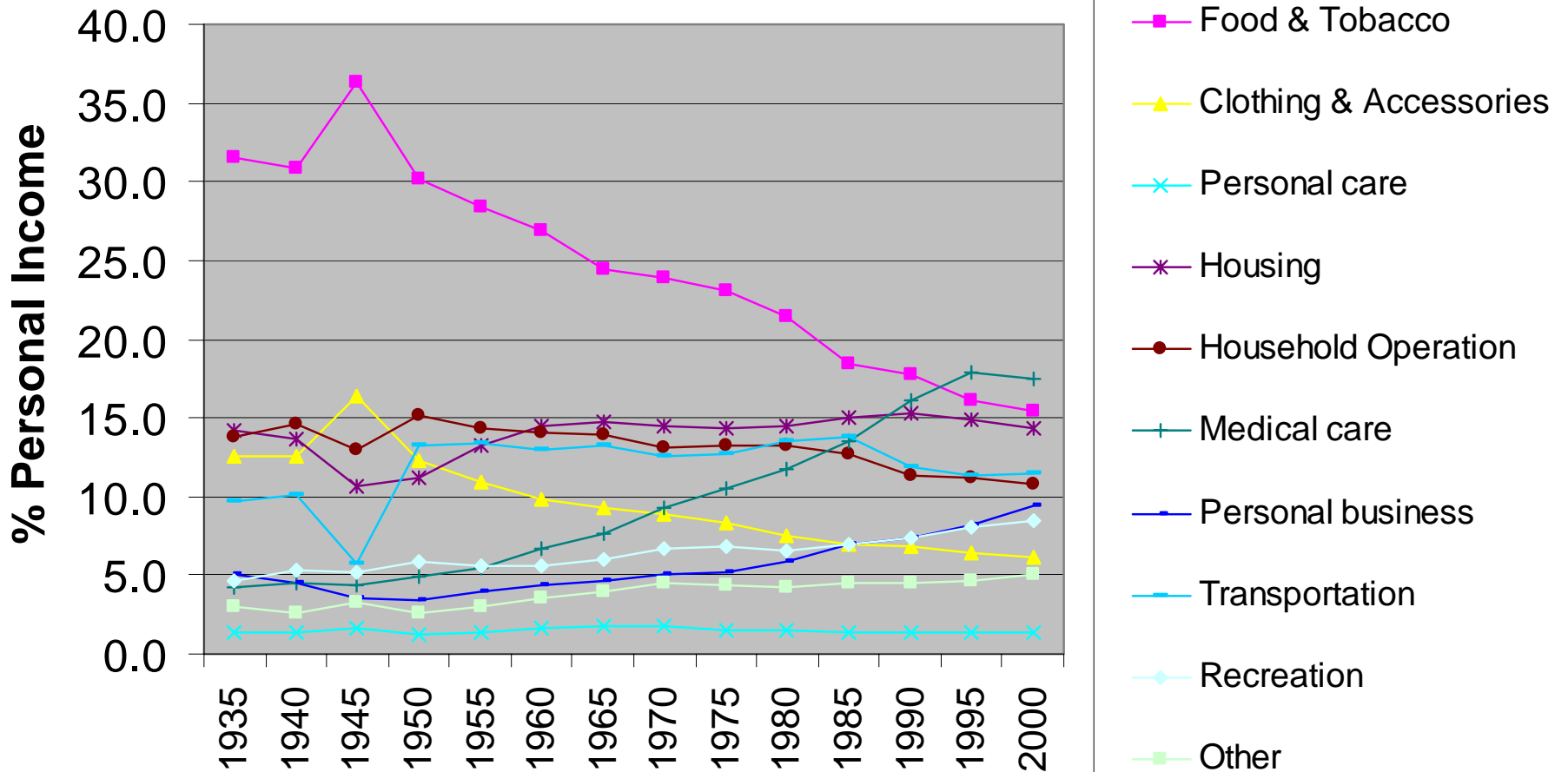
- Diets in the US have changed – for the worse
- But we're spending less money for the food
- In other countries, calories might be available but not nutrients
- UN states there are more overweight than underweight people now
  - Poverty in the US is associated with obesity, not under-nutrition

# US Food Changes



Compiled from USG data

# US Personal Expenditures



Compiled from USG data



# Economics and Development

- People just need more money (?)
  - Need to remember inflation – can't “print money”
  - Real money is “deflated” to match inflation (compared to nominal)
  
- Need to spend money better (?)
  - Not limitless
  - How to optimize and prioritize
    - Utilitarian
      - Greatest good for greatest numbers
    - Libertarian
      - No Interventions – do as you wish as long as it doesn't hurt others
    - Egalitarian
      - Equality
  
  - What are markets?

# New Models of Developing Countries

- Economist Robert Wade talks of a 1:3:2 world
  - 1<sup>st</sup> group – Developed
  - 2<sup>nd</sup> group – Developing
  - 3<sup>rd</sup> group – Failing to develop
  - 2<sup>nd</sup> group has higher growth rate than 1<sup>st</sup>; 3<sup>rd</sup> has lower
- Political Scientist Atul Kohli characterizes countries as
  - “Neopatrimonial state,”
    - Ruler treats state resources as his own
  - Cohesive-capitalist state (E. Asia)
  - Fragmented-multiclass state
    - (In-between (parts of L. America))

# Role of the State

- Much of the world had (and has) State Owned Enterprises (SOEs)
  - Some activities are not even companies, but Govt. Departments (e.g., Dept. of Telecom)
- Markets (and the belief they are better) are growing
  - Privatization
    - Not the same as competition!
    - Type I and Type II (selling off to highest bidder or letting new entrants emerge)

# What's the Role of Government In a Market World?

- **NOT AS**
  - Producer (left to private enterprise)
  - Allocator / controller (“command and control”)
- **Consumer**
  - Worked in Andhra Pradesh, India, for Fiber to the Village
- **Regulator**
  - Create level playing field
  - Set up transparent rules of the game
  - Standards
  - Is a regulator required in a “free market”?

# Role of Innovation

- Source of much of economic growth
  - Services in the economy
  - Source of more of the JOBS
  - Small companies matter

US 2003 figures (Census Bureau)

Size of Firm	Fraction of total US employees
1-19	25.0%
20-99	29.8%
100-499	25.2%
500-999	6.7%
1000+	13.3%

- It's also the growth of jobs that's higher for small firms



# Economics and Analysis

- **Macroeconomics**
  - Money supply, interest rates, inflation, exchange rates, deficits, etc.
- **Microeconomics**
  - Supply and Demand, market clearing prices
- **Development Economics**
  - Transfers, comparative advantage
- **Financial Economics**
  - Returns
- *Etc.*

# “Utils” – Measure of Utility

- Artificial measure of tradeoffs amongst producers and consumers
  - Money is used as for intermediation (“common currency”)
- Challenges
  - Rationality
  - Time periods (discounting)
  - Risk tolerance

# Wealth, Development and “Happiness”

- (Reportedly) Wealth doesn't relate to happiness *AFTER* a minimum level of wealth
- Subjective measures
  - Is “happiness” relative?
  - Locally, “in-peer,” or globally?

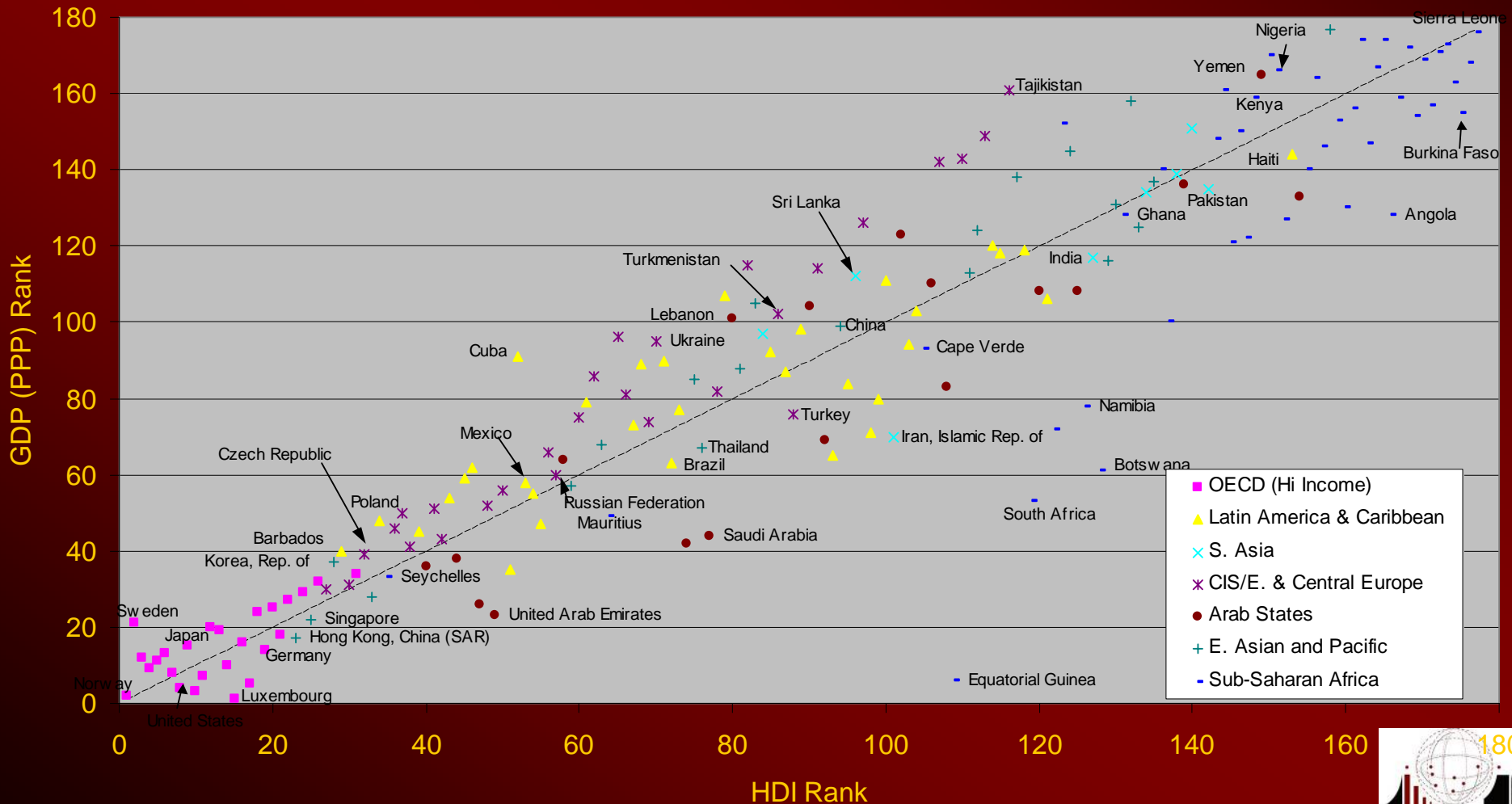


# Money and Value

- (Discuss) - Larry Summer's statement on shipping wastes to developing countries
- Thought experiment: smoking in the US
  - Viscusi has calculated that smoking leads to a net positive financial gain for states
    - Litigation Settlement
    - Excise taxes
    - Earlier death reduction of pension obligations
- Are traditional economic measures accurate or sufficient?

# Human vs. Economic Development

\* Rank means lower number is better



Created from HDR 2004 Report Data



# Economic Theories of Development

- Capital Fundamentalism
  - Need to invest (savings rate) for growth
  - If domestic funds are lacking, aid is the solution
- Solow (1957) studied all the inputs (labor, capital, etc.) and outputs and found there was unexplained growth
  - This residual was due to TECHNOLOGY

# Growth Models

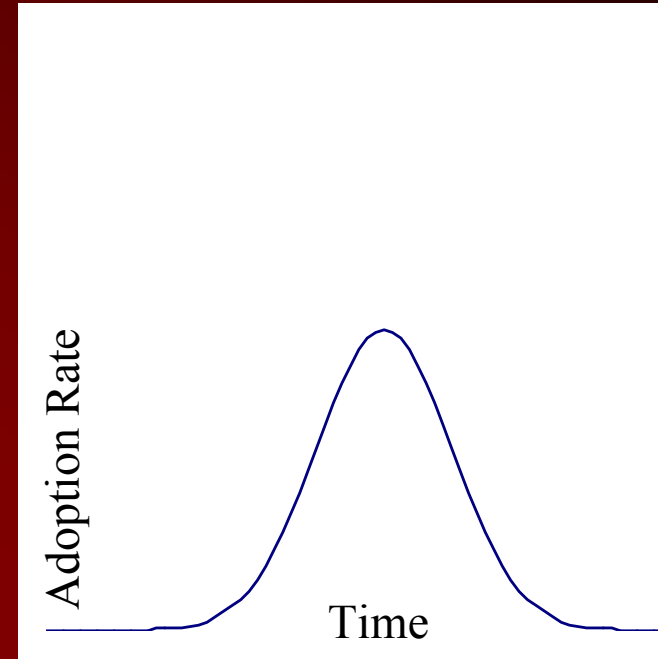
- Entire global system is predicated on growth
  - Real growth, ideally per capita
  - Demands increased productivity
  - Are there limits?
    - Malthusian view (population growth is exponential)
    - Innovation view (e.g., Julian Simon) – Materials substitution
- Developing countries often have centralized planning
  - 5 year plans
  - Socialistic history
- Subsidies, cross-subsidies and interventions are not merely socialist
  - Real estate insurance pricing in Florida – regulated to make it artificially affordable (think hurricanes)

# Growth and Sustainability

- Environmental sustainability is already in question
- Economic Sustainability
  - BOTH sides are key
    - Supplier
    - Consumer
  - Diminishing returns often seen after some point
  - Continued growth requirements – more resources and more transfers
  - Aid based economics is problematic

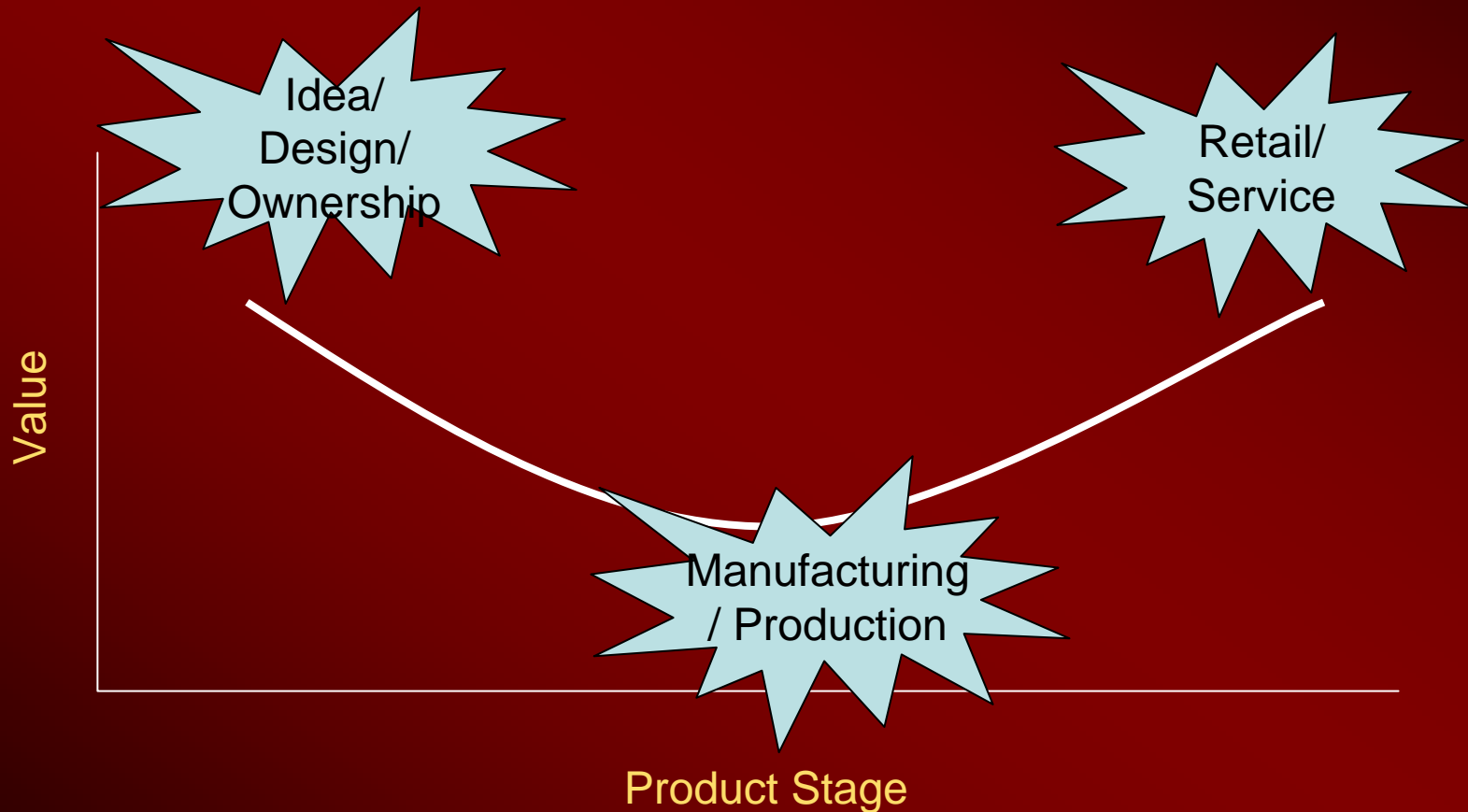
# Technology and Productivity

- o Role within economy
  - Increasing share of services (~2/3)
- o Adoption of new technologies
  - Bell Curve
- o Schumpeterian destruction?
  - Disruptive technologies
- o New business models and market structures
  - Where is the market power?
    - Fundamental Technologies
    - New market creation
    - Manufacturing
    - Implementation
    - Retailing
    - Servicing



- *Issues of barriers to entry, commoditization, etc.*

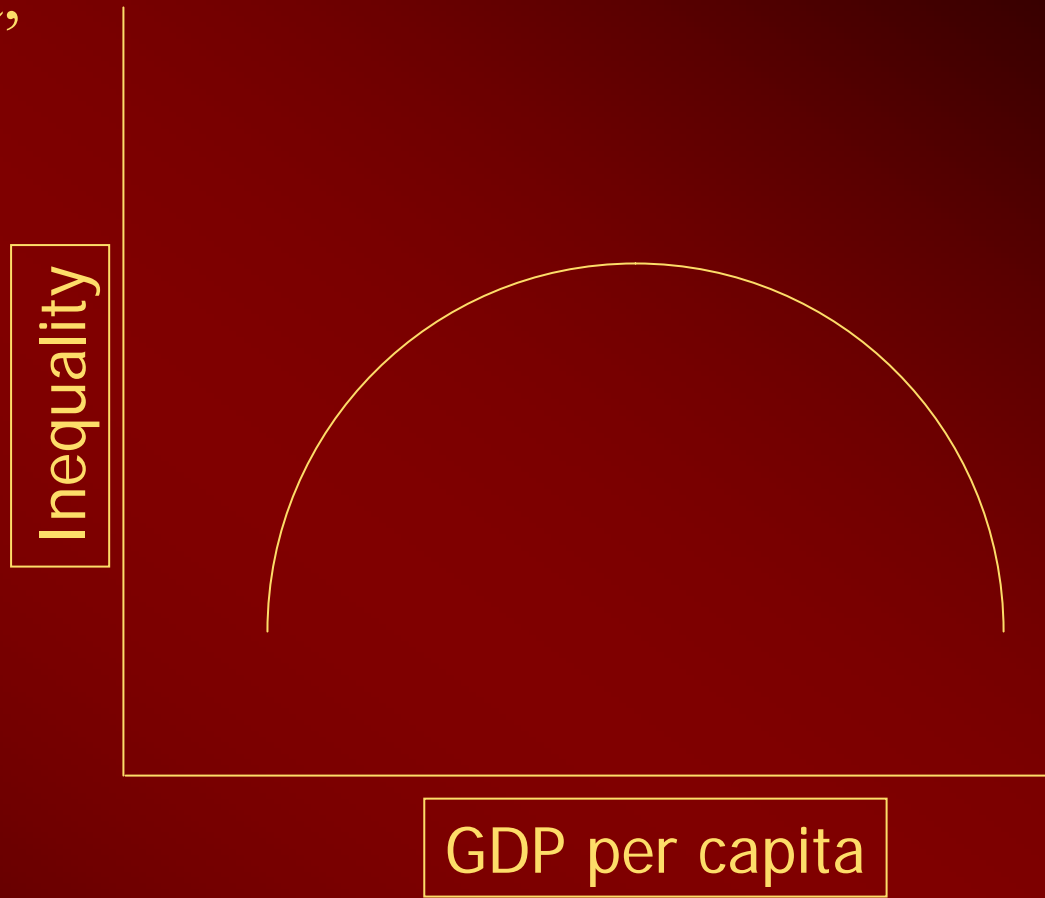
# “Smiley-Faced Curve” of Value



(A generalization if not simplification)

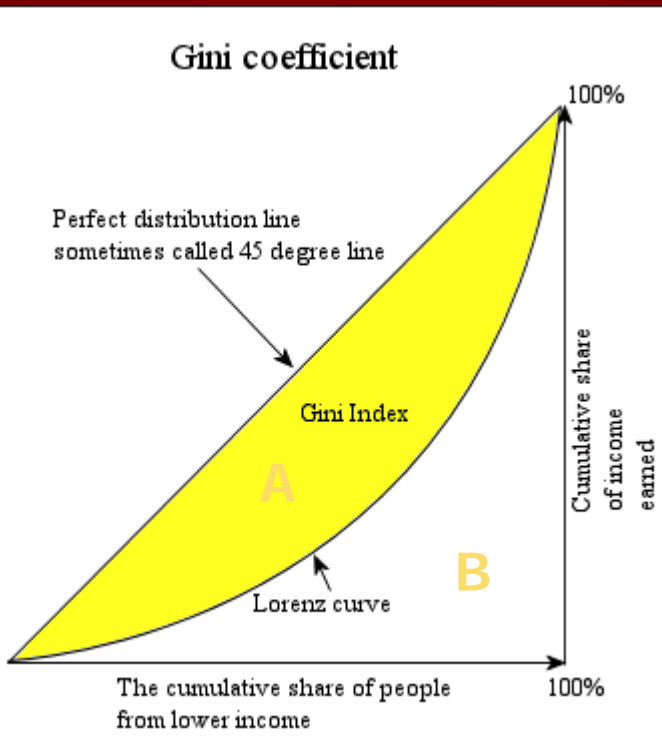
# Kuznet's Curve

- Using cross-country data, Kuznet postulated inequality grows and then decreases over time
- Has been applied to environmental degradation as well
- Criticisms
  - Used cross-sectional data across countries, instead of time-series
- More equitable trajectories possible?





# Gini Coefficient



Measure of attribute distribution vs. population =  $A/(A+B)$

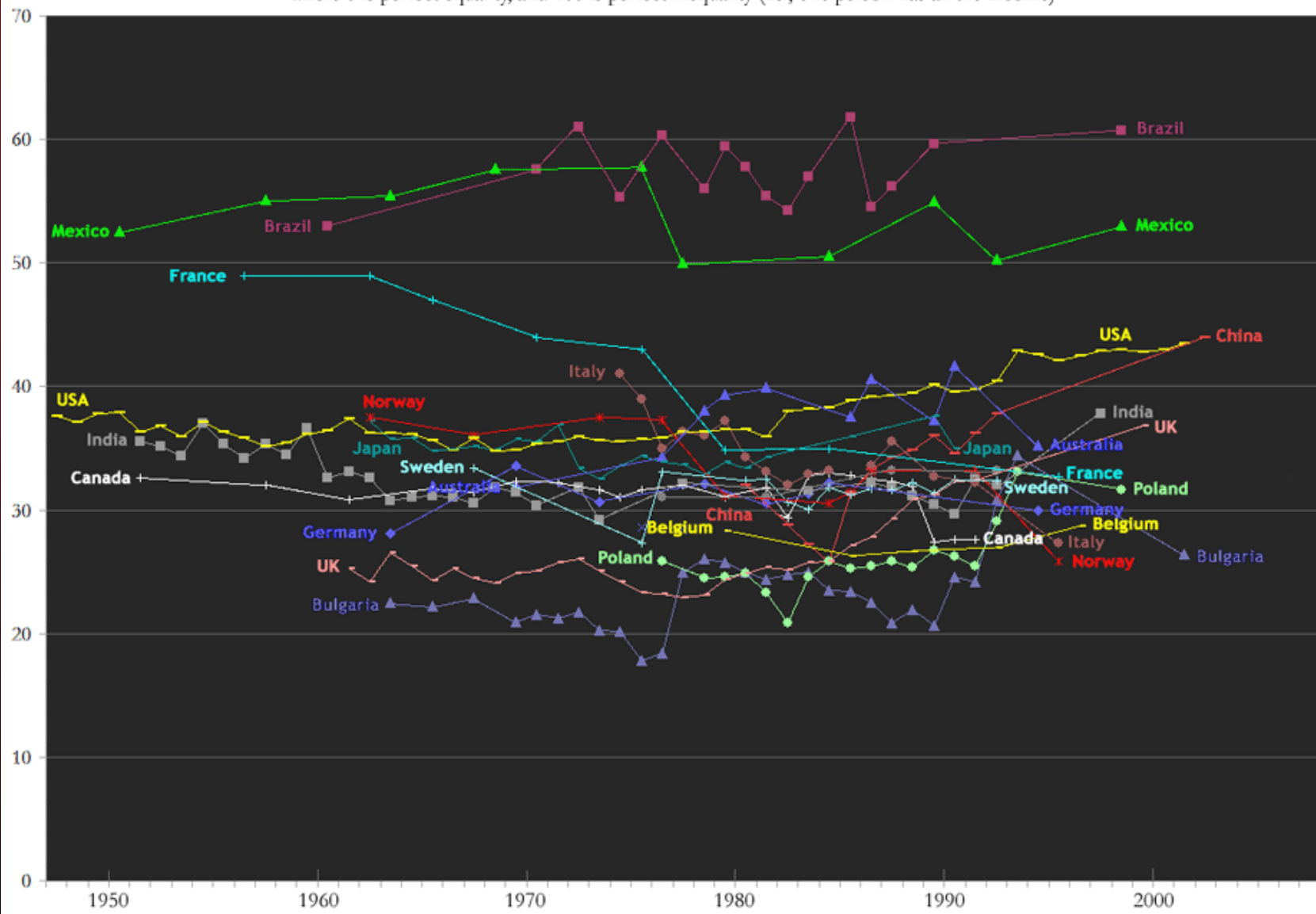
## ■ *Criticisms*

- Data issues (not unique to Gini)
- Granularity (sample size/geography; data steps)
- Households vs. individuals differ
  - E.g., poorer families may have 2 earners

# Gini Coefficients over Time

## Income Disparity since World War II – the Gini Index

where 0 is perfect equality, and 100 is perfect inequality (i.e., one person has all the income)



# Rest of the world

- Why is such data limited in value for many developing countries?
  - Non-monetary expenditures
  - Wide variance between very poor and super rich
- What expenditures are public vs. private?
  - Education
  - Infrastructure (water, electricity, etc.)
    - Exit strategies ... can lead to vicious cycles
- Can we assume developing countries will follow similar trajectories as developed?

# Jobs and Developing Countries

- Job creation
  - Sharing vs. growing the pie
  - Changes in jobs
    - Fraction in agriculture
    - Globalization
  - Changes in demographics
- How do you grow jobs?
  - Small enterprises
  - Entrepreneurship
- Role of Competition is important
  - Globalization means competition is not just domestic, e.g., WTO obligations

# Developing Country Issues

- Higher risk perceived in developing countries
- Lack of insurance schemes
  - Social Security, farmers, etc.
- Credit is expensive
  - Cell phones example – innovation beyond technology
    - Prepaid
      - Reduces distances
        - » Scratch cards for bribes!
    - Low-cost banking
  - Kiosks are inevitable for interfacing
  - Q: What is the biggest bank in India?

# Measures of Wealth

- $\text{GDP} = \text{consumption} + (\text{capital}) \text{ investment} + \text{exports} - \text{imports}$   
[final goods and services only]
- $\text{GNP} = \text{includes net income from abroad}$
- $\text{NNP} = \text{GNP} - \text{Depreciation of Capital}$
- $\text{Green NNP} = \text{GNP} - \text{Depreciation of Produced Assets} - \text{Depletion of Natural Resources}$
- $\text{Genuine Savings} = \text{Production} - \text{Consumption} - \text{Depreciation of Produced Assets} - \text{Depletion of Natural Assets}$ 
  - (Also takes out net borrowings)

*Issues of sustainability are outside typical economic metrics*

- But, what is expenditure on education?
  - Consumption, *or*
  - Investment into the future

# Macroeconomics

- Study of the overall economy, including overall production, supply, prices, employment, etc.
  - Includes currency, taxes, monetary policy, etc.
  - Domain including policy interventions
- (Beyond the scope of this course to discuss these issues in depth)
- Development linkages
  - Trade
  - Tariffs
  - Exchange rates