

# Uneven Growth, Inequality and Economic Policy

ISI Kolkata Conference, 2014

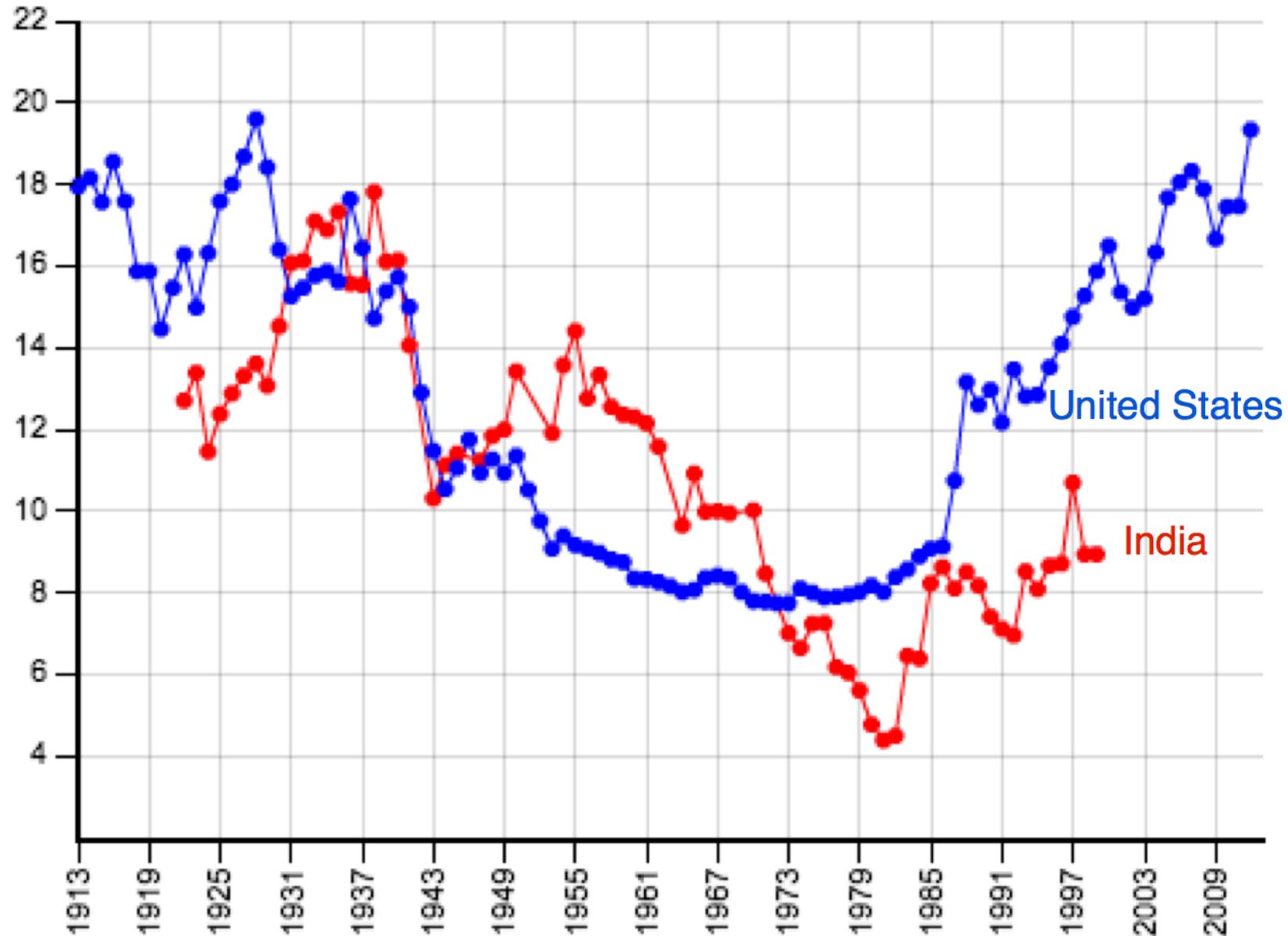
Debraj Ray

---

- As in many OECD countries, Indian inequality is high and rising.

**Top income shares. 1913-2012** **Top 1%**

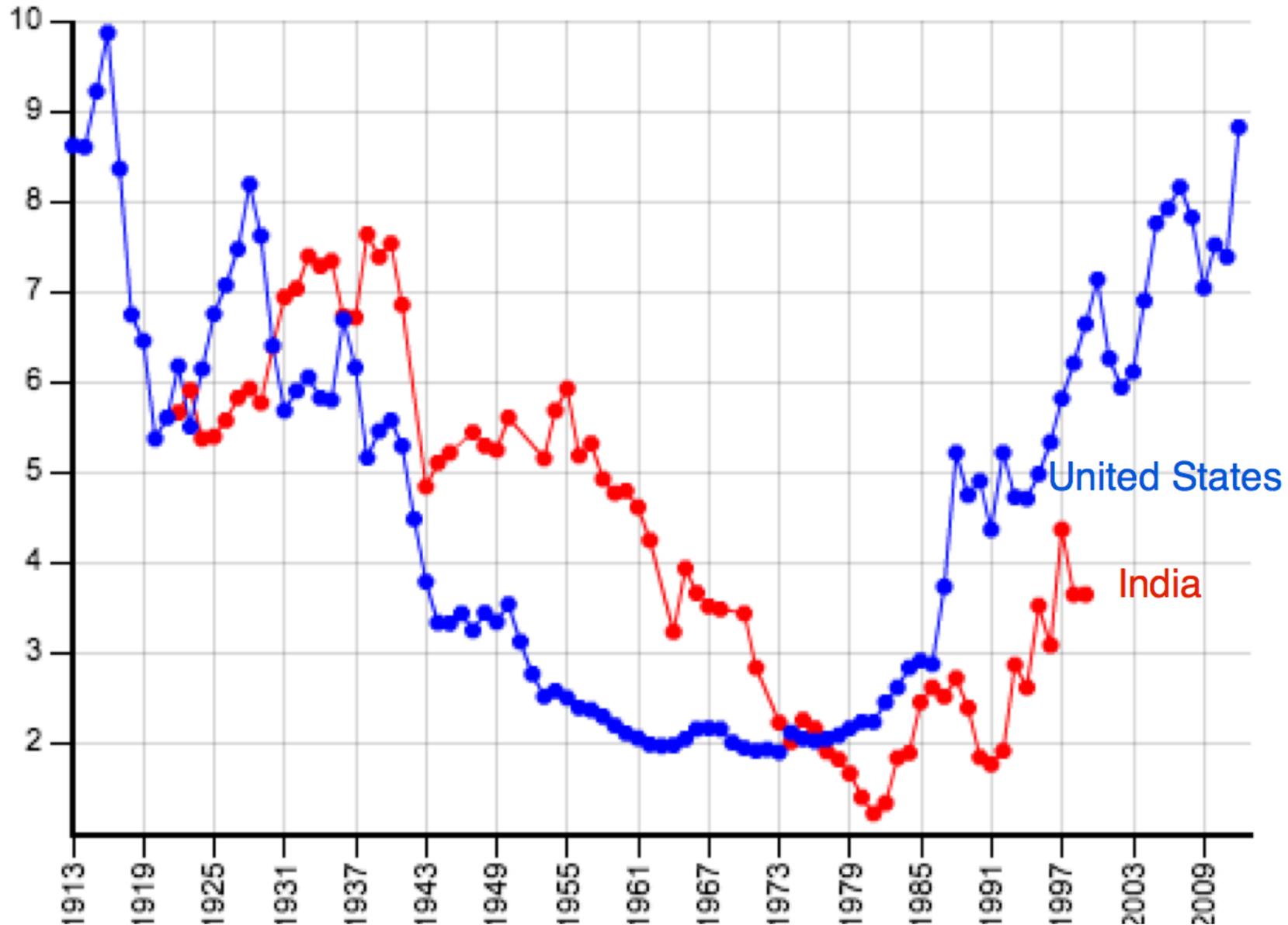
Sources: The World Top Incomes Database. <http://topincomes.g-mond.parisschoolofeconomics.eu/>  
IN: Banerjee & Piketty (2010); US: Piketty & Saez (2007)



- As in many OECD countries, Indian inequality is high and rising.

Top income shares. 1913-2012 **Top 0.1%**

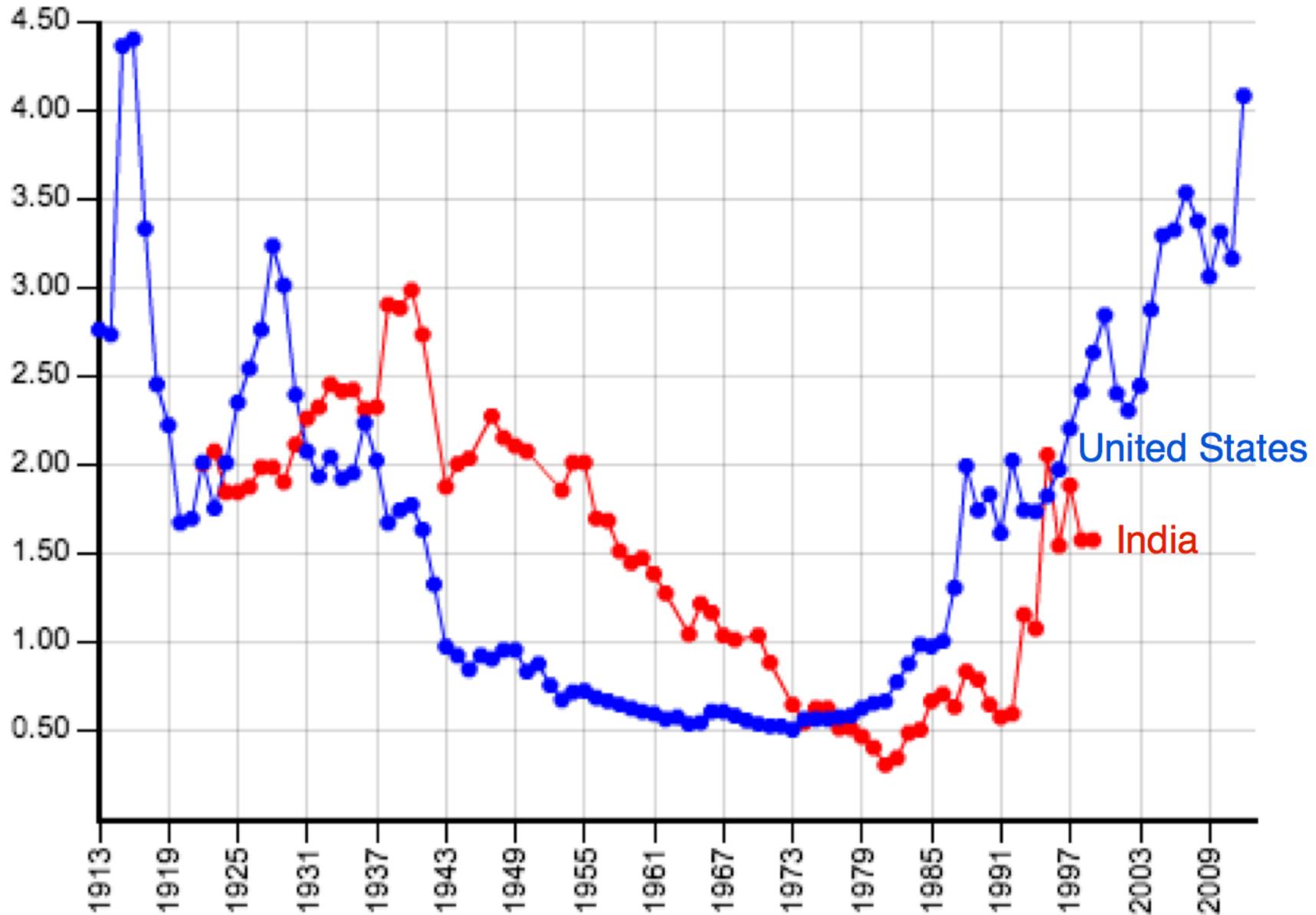
Sources: The World Top Incomes Database. <http://topincomes.g-mond.parisschoolofeconomics.eu/>  
IN: Banerjee & Piketty (2010); US: Piketty & Saez (2007)



- As in many OECD countries, Indian inequality is high and rising.

Top income shares. 1913-2012 Top 0.01%

Sources: The World Top Incomes Database. <http://topincomes.g-mond.parisschoolofeconomics.eu/>  
IN: Banerjee & Piketty (2010); US: Piketty & Saez (2007)



■ Indirect evidence suggests that the problem could be worse.

■ **Millionaires and Multimillionaires**

Ghatak and Ray, 2014

Country	ReY(US)	M	MM	PredShare	ReIM	ReIMM
India	0.03	0.020	0.001	1.28	1.22	2.06
China	0.11	0.094	0.002	6.54	5.71	3.38
UK	0.75	1.053	0.034	70.08	64.12	58.76
Germany	0.88	1.643	0.031	85.44	100.03	54.62
Japan	0.94	1.656	0.017	92.73	100.85	28.68
Singapore	1.01	2.908	0.122	101.06	177.07	212.20
Switzerland	1.60	3.639	0.224	179.66	221.61	389.25
US	1.00	1.642	0.058	100.00	100.00	100.00
World	0.20	0.167	0.007	13.54	10.18	11.97

## The Other End

- Of course, poverty has fallen as well.

---

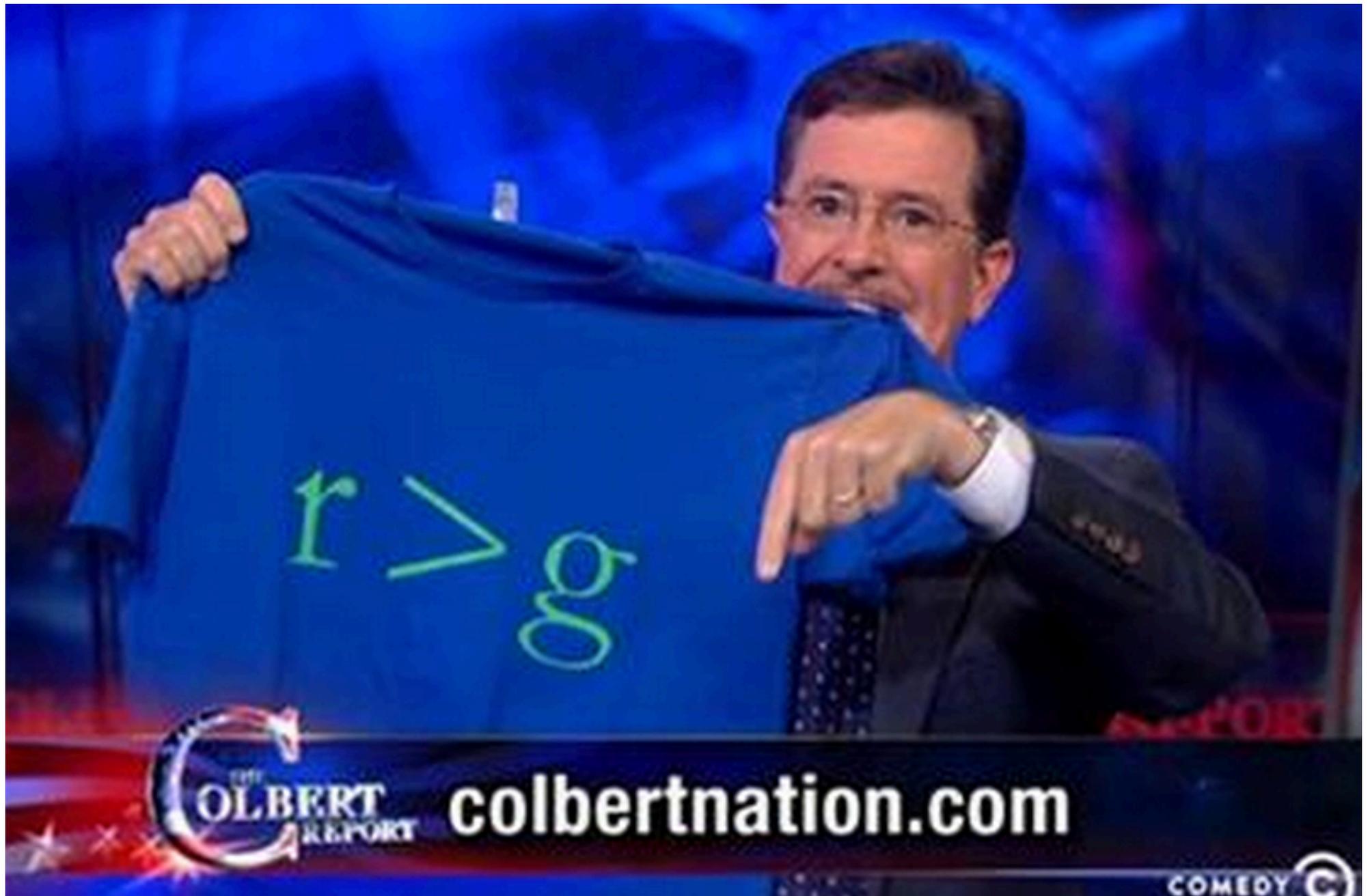
	Poverty Headcount				
	1995	2005	2010	2011	2012
World Bank	49.4	41.6	32.7	24.7	
National	45.3	37.2	29.8		21.9

---

- Growth is inevitably disequalizing and uneven.
- But rising inequality raises aspirations and frustrations:
  - Would you accept 2% growth per year along with everyone else?
  - Would you accept it when others are growing at 10% per year?
- This has sharpened the growth-redistribution debate.

# Understanding the Rise of Inequality

- Piketty (2014) has been at the forefront of attention.
- Extraordinary compendium of data
- But unfortunately limited on explanation
- Piketty describes three “fundamental laws,” among them:
- **The Third Fundamental Law**  
a.k.a. the “central contradiction of capitalism”
- $r > g$ .
- $\Rightarrow$  capital income grows faster than overall income:
- income of capital owners eventually dominates overall income.



**THE COLBERT REPORT**

[colbertnation.com](http://colbertnation.com)

COMEDY C

- Piketty's analysis problematic on different grounds:
- $r > g$  is a standard transversality condition in growth theory
- Malinvaud, Phelps, Cass ...
- $r > g$  compares apples and oranges:
  - $r$  tracks level of  $K$ -income,  $g$  tracks growth of average income.
  - $g$  (if not  $r$ ) is endogenous: outcome, not explanation.
  - Lastly, human capital also at work.
  - True in the US, and (as we shall see) also of India
- Piketty's argument broadly in line with Kaldor and Pasinetti:
  - High savers take advantage of  $r$  and grow faster than  $g$ .

## I. The Rate of Return on Capital [Piketty]

- High savers take advantage of  $r$ ; grow faster than average  $g$ .
- US Estimates from Survey of Consumer Finances (SCF):

	6-Yr Income Average	Instrumented By Vehicle Consumption
Quintile 1	1.4	2.8
Quintile 2	9.0	14.0
Quintile 3	11.1	13.4
Quintile 4	17.3	17.3
Quintile 5	23.6	28.6
Top 5%	37.2	50.5
Top 1%	51.2	35.6

Source: Dynan-Skinner-Zeldes (2004), they have other estimates too.

## Does Average $r$ Explain Rise in Inequality?

$$r = \frac{[x(t)/x(0)]^{1/t}(1+g) - 1}{s_R}$$

- Some quick calculations for top 10% in the US:
  - $x_0 = 1/3$  in 1970, rises to  $x_t = 47/100$  in 2000.
  - Estimate for  $g$ : 2% per year.
  - Estimate from Dynan et al for  $s_R$ : 35% (optimistic).
  - Can back out for  $r$ :  $r = 9.7\%$ .
  - **Much** higher than the average rate of return (around 3–4%).

- Similar estimates for other quantiles and countries:

(savings rates from Dynan et al used in each case)

- For top 1% in the US:  $r = 10.5\%$ .
- For top 0.1% in the US:  $r = 9.6\% - 14.4\%$ .
- For top 10% in Europe:  $r = 7.5\%$ .
- For top 1% in the UK:  $r = 11.4\%$ .
- These rates are pretty high:
  - average  $r$  of the order of 3% in this period.

## ■ Focus

- not on the average rate of return to capital
- but on **variations** in that rate of return
- and not just for physical, but also for human capital.

## ■ Scenario:

- Ongoing, **uneven rates of return** across sectors or occupations.
- Individuals adjust as best they can.

## ■ Question:

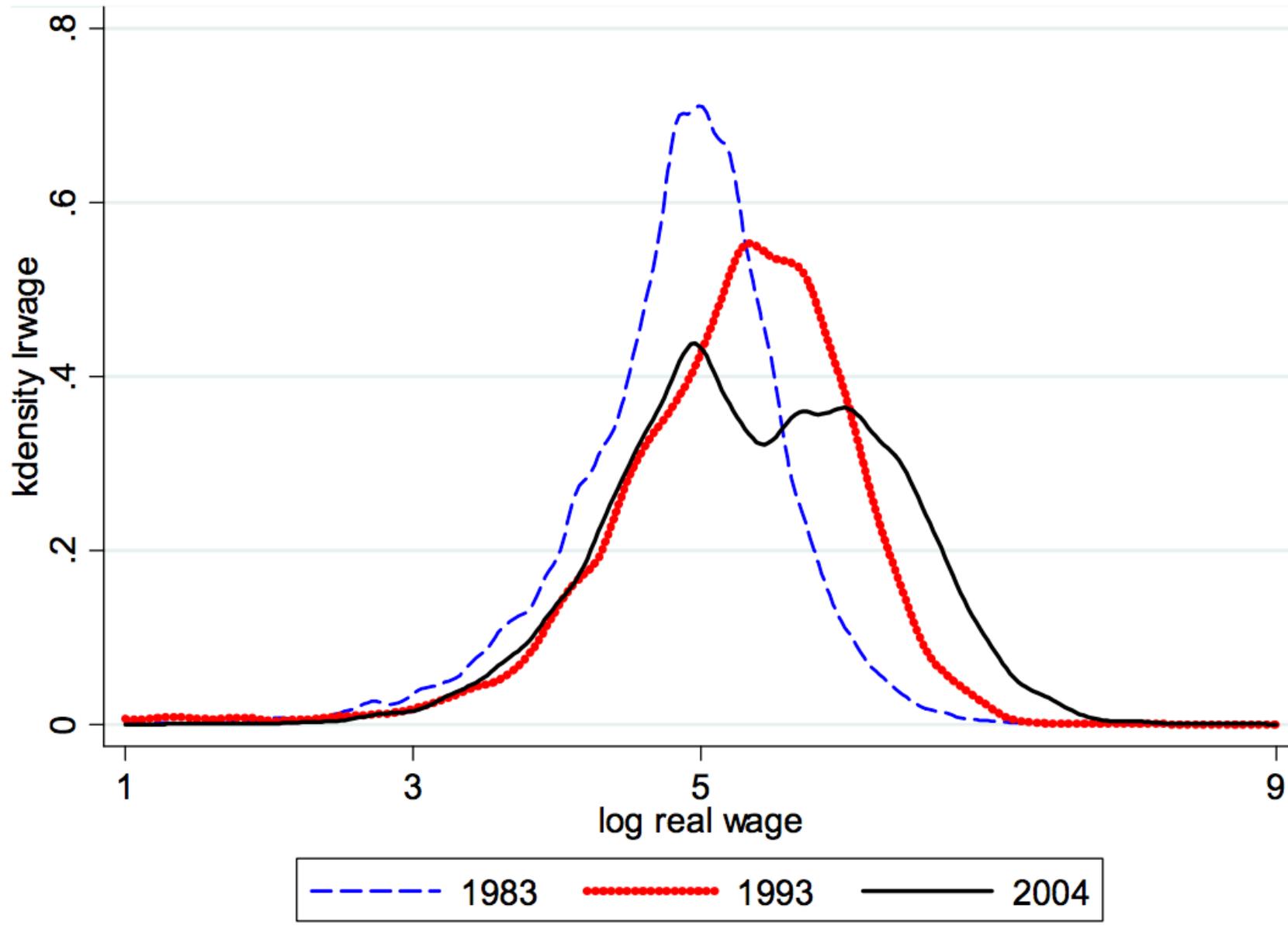
- who benefits from those variations, and who loses?

## II. Generators of Uneven Growth

- Nonhomothetic demand and structural change  
Kuznets 1955, 1963
- Change in consumption patterns → shifting sectoral demand
- Kuznets considered agriculture → industry
- This pattern is increasingly relevant for India today
- Rural employment share below 50% since 2010
- **Absolute numbers** have been shrinking since 2005  
(for the first time in Indian history).

- The Kuznets hypothesis:
  - Economic inequality rises and then falls with development.
  - Maybe, but if so, we are only in the middle of it.
  - Moreover, agriculture and industry not the only games in town.
- Two new contenders:
  - Technological shifts and globalization
- In all these situations, we have:
  - uneven change (generating heterogeneous rates of return)
  - compensatory change, as the initial non-beneficiaries catch up.
- In short, there isn't just one Kuznets inverted-U.
  - There are many, one for each source of uneven growth.

■ Log wage distributions in India (NSS 1983, 1993-4, 2005-5)



## Some Current and Potential Employment Sectors for India

- **Infrastructure, Transport:** highways, railways, aviation, energy sources.
  - Booming sectoral growth especially in transport and communication
  - Employment growth for infrastructure-building especially strong
- **Finance, Insurance, Real Estate, Business Services:**
  - Employment growth 7.7% per year 2000–2010.
- **IT: Software and Services:**
  - IT services, BPO
  - Direct employment:  $\sim 3\text{m}$ , indirect  $\sim 9\text{m}$ .

## ■ Healthcare:

- Aging population worldwide / exponentially growing domestic demand
- All India Management Association + BCG + CII project 40m by 2020.

## ■ Tourism:

- 5–8% of total employment (25–35m), direct + indirect.

## ■ Retail:

- A dark horse; controversial
- Employment unclear in short-run; could have huge potential.

## ■ Notes: some of these sectors could decline, or never take off

- E.g., rise of terrorism can destroy tourism sector
- country competition could affect BPO

### III. Reacting to Uneven Growth: Large Thresholds

- Key ingredients
  - Nonconvexities in occupational choice
  - Variations with sparse or rich occupational structure
  - Missing or imperfect capital markets

Dasgupta-Ray (1986), Banerjee-Newman (1993), Galor-Zeira (1993), Ljungvist (1993), Ghatak-Jiang (2002), Mookherjee-Ray (2002, 2003)

- **Main results:** Mookherjee-Ray (2003, 2011)
- Persistent inequality
  - Variety of occupational slots necessitate inequality
  - Yet that inequality causes inefficiency
  - Marginal costs of occupational choice not equalized across families
  - History-dependence of inequality?
    - Theory is ambiguous on this score.
    - With a rich occupational structure, multiplicity could vanish.

- Do Individuals React To “Reachable Opportunities”?
- There is evidence that they do.
- I consider one example: female reactions to educational premia.  
Munshi-Rosenzweig (2006), survey of Dadar, Bombay
- Returns to schooling ↑ since 1980.
- Overall: generally flat around 10-12% for men and women
- In English for men: 15% (1980) ↑ 24% (2000)
- In English for women: 0% (1980) ↑ 27% (2000)

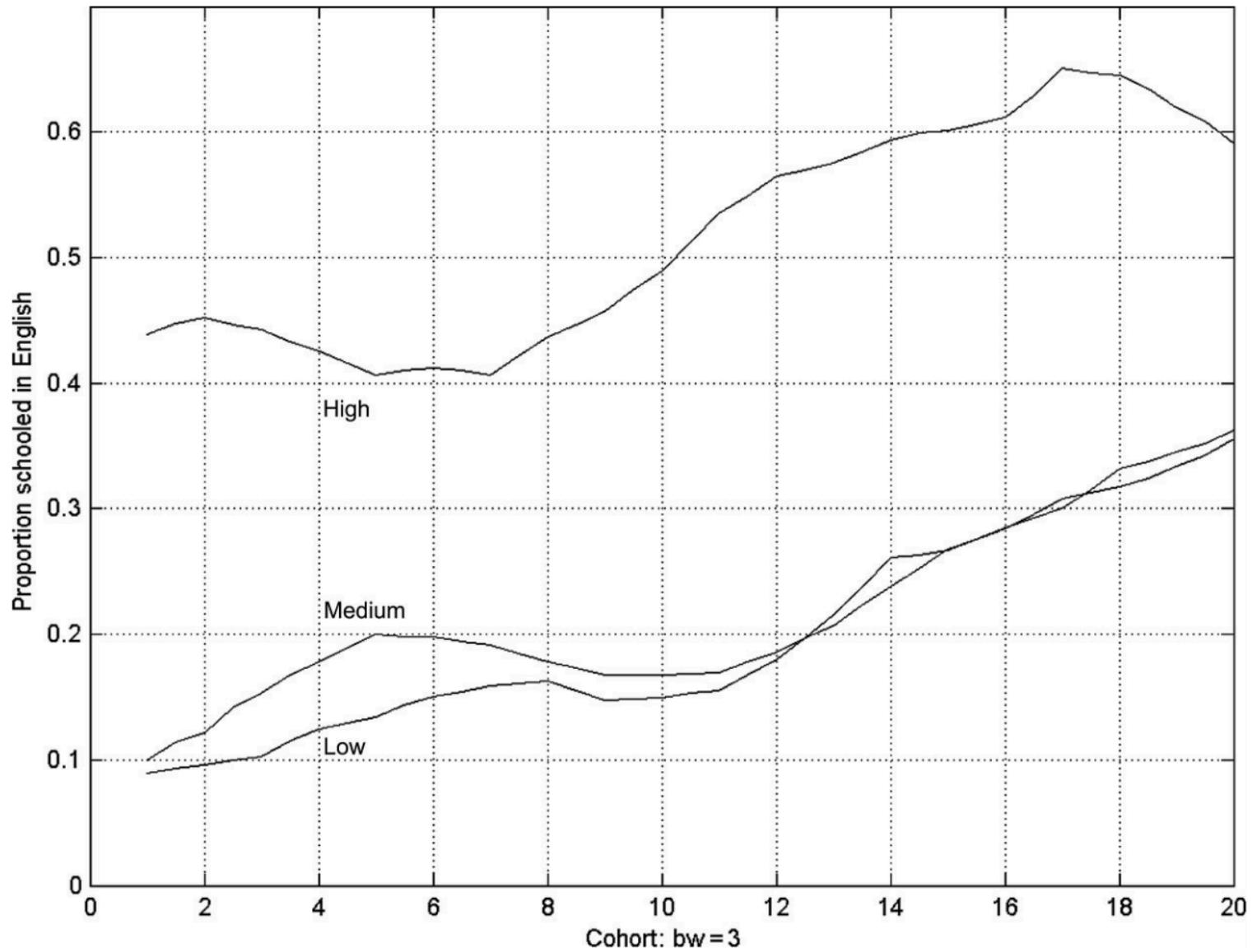


FIGURE 3. ENGLISH SCHOOLING: NET PARENTAL EDUCATION EFFECT—BOYS

- Munshi-Rosenzweig (2006)

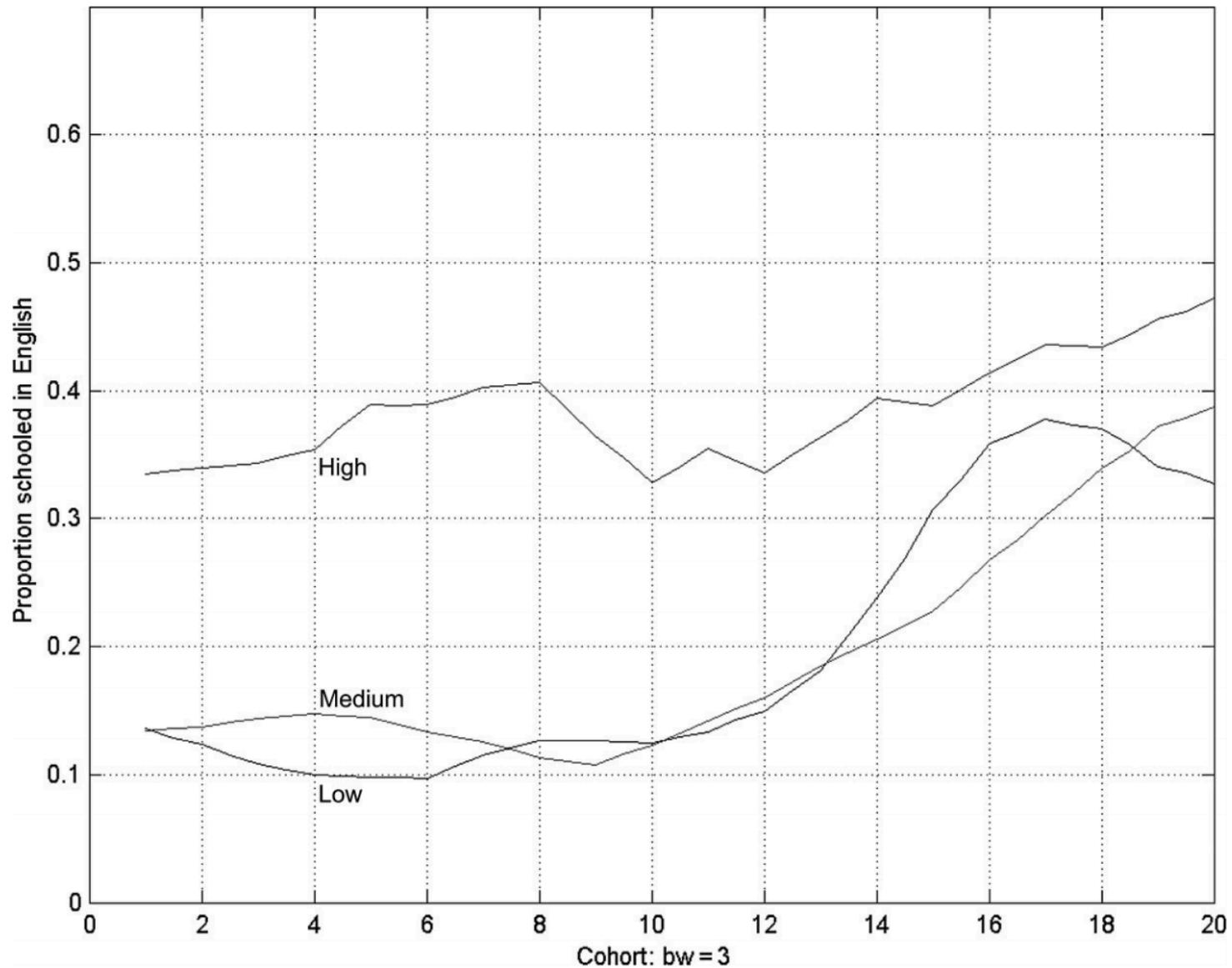
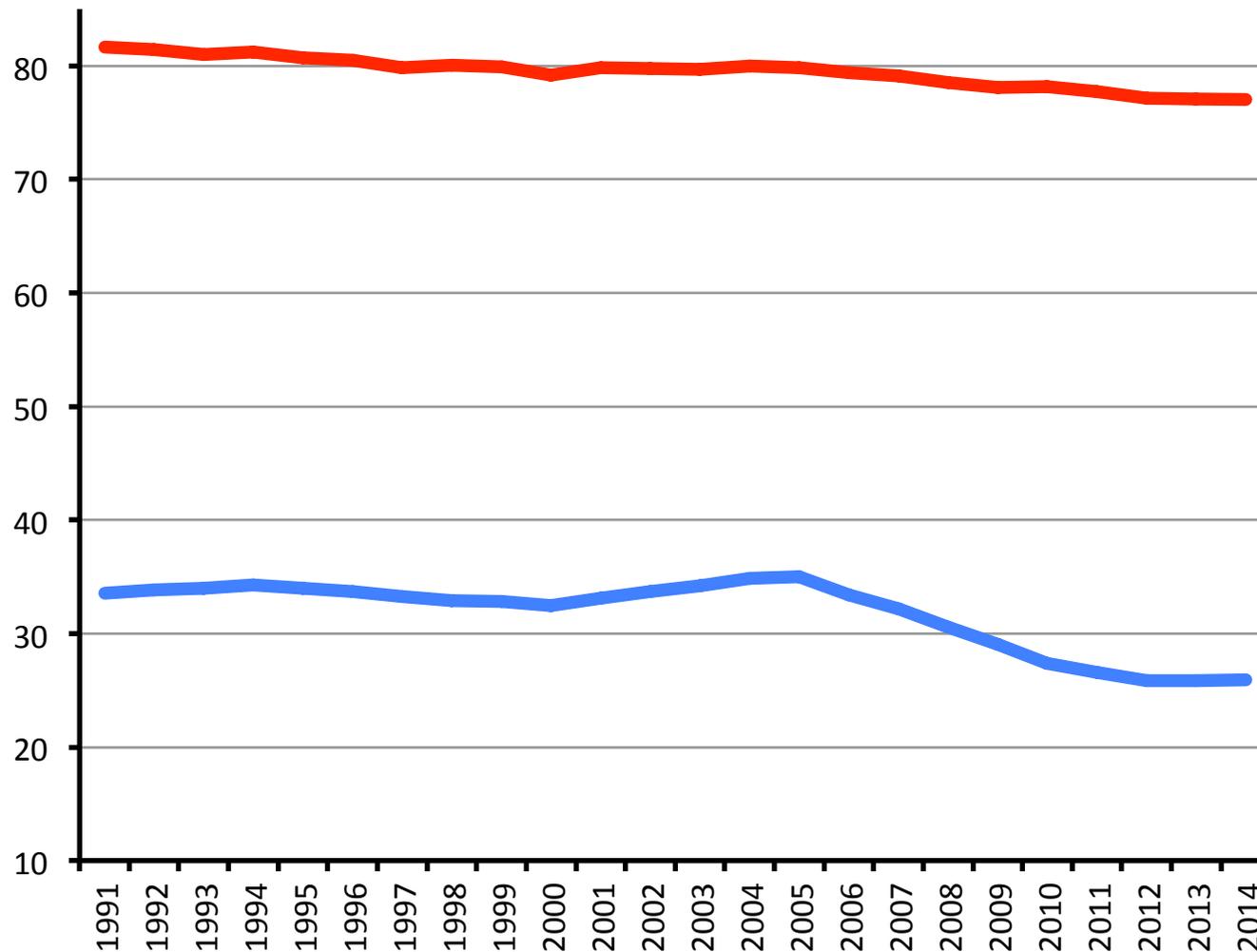


FIGURE 4. ENGLISH SCHOOLING: NET PARENTAL EDUCATION EFFECT—GIRLS

- Munshi-Rosenzweig (2006)

- Reversal in female labor-force participation in India after 2005.
- Most of it at the expense of farm work.
- Increasing educational enrollment rates for young women.



## IV. Limited Knowledge: The Scope for Small Steps

- Yet, there are limits, and often nonconvexities are not binding.
- Continue with female participation example. Jensen (2012)
  - Recruiters for BPO jobs randomly assigned to villages.
  - Women (18–24) from recruiter villages
    - were 4.6pp more likely to work in BPO job
    - were 2.4pp more likely to work outside the home
    - were 2.8pp more likely to take computer/English courses
    - were 5pp more likely to be enrolled in school
    - experienced improved nutrition, and delayed their marriage
    - wanted to have .35 fewer children.

- Other circumstances in which small steps can accomplish a lot.
- Returns to microenterprise
  - De Mel, McKenzie and Woodruff 2008, McKenzie and Woodruff 2008
- Random cash/equipment grants to small firms in Sri Lanka and Mexico
- Estimated rates of return are over 5% per month.
- “These high returns at very low levels of capital stock imply that nonconvex production sets are unlikely to lead to permanent poverty traps.”
- Raises the puzzle of why these firms don't invest.

## ■ Returns to agricultural activity

Goldstein and Udry 1999, Udry and Anagol 2006

- Average rates of return among small scale farms in Ghana
- 50% per year for traditional crops like maize and cassava
- over 250% per year for pineapple

## ■ Returns to input use

Duflo, Kremer and Robinson 2008, 2011

- Fertilizer use in Western Kenyan maize farms
- Returns between 52–85% (annual) after netting out extra labor at market wages.
- No nonconvexity: can apply in small quantities.
- Suggestion that hyperbolic discounting might be responsible for unfulfilled plans to buy fertilizer.

## ■ Returns to financial literacy

- Financial markets are the great linearizer.

## ■ A thought experiment:

- why doesn't everyone with Rs 50,000 in savings hold stocks?

Answer 1: it costs more than that to buy stocks. Wrong.

Answer 2: Maybe people don't want to save? Wrong (Ponzi).

Answer 3: it can be very risky. Partly correct.

Answer 4. people don't know they can do it. Correct.

## Limited Knowledge and Inequality

- Incomplete knowledge may be as important as nonconvexities.
- Knowledge is just another commodity: the poor consume less of it.
- But knowledge is also a **state variable**:
  - Can capitalize on opportunity when it arises
  - Learn about what works, what doesn't
  - Cushions the downside when something doesn't work
- It can generate **poverty traps in a convex model**.
- Can serve as a foundation for **conditionality** in policy.

# Policy in a Second-Best World

## ■ Transfer Policies

### ■ Resource transfers:

- financial or human

### ■ Conditionalities:

- limited knowledge / self-selection

## ■ Enabling Policies

- supply of price information

- marketing boards to eliminate middlemen (ECX Ethiopia)

- regulated contract farming

- Main argument against conditional redistributive policy:
  - Any such attempt must result in leakages.
  - So make those transfers unconditional and universal.

“[O]ur myriad social programmes and schemes that have been in place for decades ...suffer from endemic corruption and poor implementation. Any time a voice is raised against these schemes, their defenders ...come together to argue that we can eliminate corruption and improve implementation by doing this or that. Yet, business as usual continues ...How long must the poor suffer under the assurance of improved outcomes the next time before they are granted the private option — an option the rich already enjoy — through enhanced purchasing power derived from a policy of cash transfers?” Bhagwati and Panagariya 2014

- This argument is problematic:
  - The notion of unconditional lump-sum transfers borrows from welfare economics in a first-best world.
  - With 30% poverty, an unconditional cash transfer must have 70% “leakage.”
  - Comparison with corruption leakages is an empirical matter.
- Can try unconditional transfers targeted to the poor.
  - Need efficient identification of the poor, often very hard.
- Conditionality:
  - generates self-selection
  - combats limited knowledge

## An Example: Bolsa Família

- Launched 2003 by Lula and continued by Dilma Rousseff.
- Consolidates transfer programs in Brazil such as Bolsa Escola and PETI (conditional transfers to eradicate child labor).
- Aimed at **extremely poor** (< BRL70 p.m./USD 30) and **poor** (< BRL140 p.m./USD 70).
- Reaches 50m people; 14 m hh. (Total population 200m.)
- Average monthly transfer per hh approx BRL150 p.m./USD 75.
- Payout approx. BRL 24b per year.
- Brazilian income 2013 is BRL 5500b, so **0.5% of GDP**.  
(Exchange rate moves a lot + coverage changed in 2014)

- The transfers are **conditional**.
  - children must attend local schools (85% for 15-, 75% for 16-17)
  - regular medical check-ups + full immunization schedule
  - child development monitoring for children 7-
  - pre-natal monitoring for pregnant women
  - monitoring for nursing mothers.
- The payments are **electronic**.
  - Serendipitous byproduct of Brazilian hyperinflation.
  - Debit cards mailed to family.
  - Issued by Caixa Econômica Federal, a huge government bank
  - Every enrolled person (+ amounts) searchable online.

Controladoria-Geral da União

# Portal da Transparência

GOVERNO FEDERAL

[Perguntas frequentes](#) | [Contato](#) | [Glossário](#) | [Links](#) | [Manual de navegação](#)

Acesso rápido

Selecione... 

OK

**Você está em:**Início» Download de Dados» **Bolsa Família - Pagamentos**

## Download de Dados

### Despesas – Transferências – Programas Sociais – Bolsa Família - Pagamentos

Nesta seção estão disponíveis informações, em formato aberto, das transferências de recursos federais diretamente repassados a cidadãos, referentes ao pagamento do Bolsa Família, realizadas pelo Ministério do Desenvolvimento Social, por meio da Caixa Econômica Federal.

#### Os arquivos abaixo apresentam:

UF; Código SIAFI Município; Nome Município; Código Função; Código Subfunção; Código Programa; Código Ação; NIS Favorecido; Nome Favorecido; Fonte-Finalidade; Valor Parcela e Mês Competência.

**Atualização dos arquivos:** Mensal

**Modelo do nome do arquivo:** AAAAMM\_BolsaFamiliaFolhaPagamento.csv

**Origem das informações:** Caixa Econômica Federal

#### Exercícios Disponíveis

[2014](#) [2013](#) [2012](#) [2011](#)

## Evaluation

- Not easy to evaluate Bolsa Família as randomization not politically feasible.

(unlike Progresas/Oportunidades)

- But all studies point to significant and measurable impacts on inequality decline

(huge in the 2000s in Brazil)

- and on poverty (28% of overall poverty decline)

Barros et al 2010, Azevedo et al 2013, Barrientos-Debowicz 2011, Barrientos-Debowicz-Woolard 2013

- And I am not counting pro-poor Brazilian pension programs (a whole separate area).

# National Rural Employment Guarantee Act

- Bolsa Família outlay bears striking resemblance to that of NREGA.
- Employment at around Rs. 130 per day for up to 100 days per household per year.
- Reaches 50 million households since 2008, about 250m people, about the same % of population as Bolsa Família.
- The payouts are lower (India is poorer).
- **Conditionalities:** work alone.
- Outlay: about 0.4% of GDP (very close to Brazil)

## The Backlash 1. Corruption

- There are many positives about NREGA:
  - 50m hh (250m people)
  - Women + SC/ST in majority
  - Slack season employment
  - Some evidence on assets: rural roads, soil conservation, flood control, groundwater recharge and land improvement.
- Nevertheless, corruption is a huge and legitimate concern.
  - Compare NREGA online numbers with NSS.
  - Large discrepancies ranging from 20% to 65%. Imbert, 2014
  - Even without discrepancies, there are concerns because individuals may be partly paid but allowed not to show up.

- The problem is that unmet demand is huge.
- Among the poorest two quintiles of rural households, over 40% of those who want NREGA employment did not get it.
- 2013–14: only 9% of hh who sought NREGA got 100 days; average 43 days.
- So even with bank accounts and direct deposit, workers willing to pay the sarpanch.
- In fact, at payment time GP officials are hanging around with workers at the bank.
- Illiteracy/lack of knowledge clearly has a lot to do with this.
- It is also possible to put non-working family members on the rolls and make payments to their accounts.

See Adhikari and Bhatia 2010

- Brazil's hyperinflationary history → efficient banking system.
- [Jan Dhan Yojana](#), which attempts to bring universal banking to every household, tries to imitate this.
- Electronic deposits can be made to these accounts.
- Each account comes with a debit card and ATM access.
- To open, need one of: Aadhaar Card, Voter ID Card, Driving Licence, PAN Card, Passport or NREGA Card. (But can open a "Small Account" with restrictions even without these.)
- Jan Dhan Yojana is a definite improvement (once implemented).
- Moreover, can think of incentives to implementer to sign up more people, [once control over the cash is taken away](#).
- Can also contemplate CCTs in more generality.

## The Backlash 2. Conditionality

- NREGA's work conditionality also comes in for criticism:

“[The] NREGA program is inefficiently designed because it seeks to address two targets, poverty reduction and asset creation, with one instrument, public works ... [W]e generally require two instruments to achieve two goals. Even our grandmothers knew this when they told us that you generally couldn't hit two birds with one stone.” Bhagwati and Panagariya TOI November 14 2014

- Conditionality in an imperfect world:
  - Conditionality as [paternalism](#)
  - Conditionality as [self-selection](#)
  - Conditionality as [rights](#) (to employment, in the case of NREGA).

(Last item can make it difficult to remove a program.)

## ■ Three summary reactions

- Even incremental redistribution is a long, hard struggle.
- Compare NREGA and Bolsa Família, both under 0.5% of GDP.
- Brazilian pension programs for the poor: around 1.5% of GDP
- Non-merit subsidies to the non-poor: around 9% of GDP in India. Mundle and Govinda Rao 1991, NIPFP

“[S]ignificant redistribution in India could not have preceded growth as there were too few rich and too many poor ... Sen, with no evidence and with only wishful thinking to support his assertions ... puts the cart before the horse.”  
Bhagwati 2013

“[Modi] has announced his intention to step up expenditures to reflect his ‘grand vision’ for India ... Implementation of this vision requires resources ... This alone justifies the decision to confine NREGA to 200 poorest districts. ... Bhagwati and Panagariya TOI October 23 2014

- Taxing the rich will be even harder
- Tax-GDP ratio in India: 17.7% (Brazil: 34.4%, around OECD average)
- India has strong inter-state competition for investment
- Plus Indian wealth is internationally mobile
- Counterarguments display (deliberate?) ignorance of second-best policy :
  - Counting instruments and goals (like equations and unknowns)
  - Singing the praises of lump sum taxes and transfers.
  - Lopsided appreciation of markets versus government
  - Complete unwillingness to discuss incentive schemes for bureaucrats.

## Final Thoughts: The Ultra-Long Run

- The employment puzzle:
  - Since the 1970s, about 2% p.a.: not bad, but steady decline in rate
  - 2004/05–2009/10, zero growth in Indian employment (NSS)
  - 2001–2010: 17% had regular wage or salary employment.
- This happened during a time when GDP growth accelerated.

Year	GDP gr p.a. (%)	Empl gr p.a. (%)
1972/3–1983	4.7	2.4
1983–1993/4	5.0	2.0
1993/4–2004/05	6.3	1.8
2004/05–2009/10	8.1	0.2

- Some “leading sectors” grew: construction, finance, transport ...

- At one level, this isn't bad. For the 1990s:
  - US: 0.45%, UK 0.18%, France 0.32%, Germany 0.41%, Japan: -0.15%.
  - And India isn't exactly the master of new labor-intensive methods.
  - But it does point to a fundamental law in advanced capitalist economies:
    - The Fourth Fundamental Law of Capitalism
  - There is a long-run tendency for technical progress to displace labor.
  - Cf. Marx's Grundrisse (though argument there is unclear)

## Outline of the Argument

- My main argument parallels Ricardian theory of rent:
  - Recall: land fixed, labor grows, so rentiers grab all income.
- Today, land is no longer (as) important.
  - To a first approximation, it is **labor** that grows exogenously.
  - **Capital** is endogenously accumulated.

- There are two possibilities: **decay** or **growth**.
- Under **decay**, savings is low, so that  $K/L \rightarrow 0$  over time.
- Ignore this uninteresting case.
- Under **growth**,  $K/L \uparrow$  over time.
- With no technical change, the price of capital relative to labor falls.
- Induces technical progress that **displaces labor**.
- **Note**: this process cannot happen “too fast.”
- If it did, the price of labor would collapse
- Cannot happen in a rational expectations equilibrium.
- So “in equilibrium,” it will have to **happen gradually**.
- But it must happen.

- That leaves two options for human beings in the long run:
  - Design new machines, or teach other human beings to do so.
  - Hold shares in companies.
- So in this sense, it is ultimately all about capital income.
  - Thankfully, we can be employed for a while longer.
  - There is still room in infrastructure, transport, communications, finance, healthcare, tourism, retailing, industry and agriculture ...

## An Illustrative Example

- For simplicity, fix the labor supply at  $\bar{L}$ .

(Can easily have exogenous growth.)

- Output produced by capital and labor using Cobb-Douglas:

$$Y = AK^\alpha L^{1-\alpha}$$

- Capitalists accumulate own capital, hire labor at wage  $w$ :

$$\max_L AK^\alpha L^{1-\alpha} - wL$$

- Indirect **linear profit function** defined on  $K$  alone:

$$\pi(\alpha, A, w)K \equiv \alpha A^{1/\alpha} \left( \frac{1-\alpha}{w} \right)^{(1-\alpha)/\alpha} K.$$

- $w$  is going to be endogenously pinned by  $\bar{L}$  (later).

- Capitalists choose an accumulation path  $\{K_t\}$  to maximize

$$\sum_{t=0}^{\infty} \delta^t (\text{Dividends})_t = \sum_{t=0}^{\infty} \delta^t [\pi(\alpha, A, w_t) K_t - K_{t+1}],$$

where  $K_{t+1} \geq (1 - d)K_t$ ,

$\{w_t\}$  is fully anticipated, and

$(\alpha, A)$  taken as a constant for now.

- Close the model by positing that  $L_t = \bar{L}$  for all  $t$ .
- In equilibrium,  $K_t \rightarrow K^*$  such that

$$(1 - \alpha)A (K^* / \bar{L})^\alpha = w^*,$$

so that the **modified golden rule** condition on  $\delta\pi$  is satisfied:

$$\delta\pi(\alpha, A, w^*) = \delta\alpha A^{1/\alpha} \left( \frac{1 - \alpha}{w^*} \right)^{(1-\alpha)/\alpha} = 1.$$

$$\delta\pi(\alpha, A, w^*) = \delta\alpha A^{1/\alpha} \left( \frac{1-\alpha}{w^*} \right)^{(1-\alpha)/\alpha} = 1.$$

■ To allow for growth, suppose that exogenously:

- $A_t < A_{t+1}$  for all  $t$ , and  $A_t \rightarrow \infty$ .

(just like the Solow model with exogenous technical progress)

■ Then “in the long run”  $w_t$  chases  $A_t$  to maintain the equality

$$\delta\alpha A_t^{1/\alpha} \left( \frac{1-\alpha}{w_t} \right)^{(1-\alpha)/\alpha} = 1,$$

- and in particular,  $w_t \rightarrow \infty$ .

- The “chasing relationship”:

$$\delta \alpha A^{1/\alpha} \left( \frac{1-\alpha}{w(A)} \right)^{(1-\alpha)/\alpha} = 1,$$

- **Proposition.** For each  $\alpha$ , there is a threshold  $A^*(\alpha)$  such that
  - $\pi(\alpha, A, w(A))$  is decreasing in  $\alpha$  when  $A < A^*(\alpha)$ , and
  - $\pi(\alpha, A, w(A))$  is increasing in  $\alpha$  when  $A > A^*(\alpha)$ .
- **Intuition.**  $w(A)$  rises faster than  $A$ , benefiting from both technical progress and capital accumulation.