

# The Plato Index

a new international comparative  
measure of tax progressivity

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"When there is an income tax,  
the just man will pay more and  
the unjust less on the same  
amount of income"

*The Republic*, bk. I, 343-D

# **1. Introduction**

# The problem

- International comparisons of tax burdens that inform discussions of tax policy use GDP/GNP as the denominator. Distributional incidence (‘progressivity’) is not compared, nor is the effective income base for direct taxation identified.
- In fact, few countries have official incidence statistics, nor do international organisations address this issue systematically.
- This paper puts forward a simplified yet straightforward method of estimating a comparable indicator of direct tax incidence (the Plato Index) that enables robust comparisons between countries and over time.

# Motivation

- Welfare and poverty reduction in developed countries based on progressive fiscal transfers with a progressive (income/wealth) tax base.
- Improved secondary distribution though primary very unequal (UK  $\approx$  Brazil). Recent reduction of tax progressivity, compensating with income support.
- Developing countries have severe inequality problems (direct transfers difficult) *and* chronic fiscal imbalances. Yet direct tax reform not on agenda.

# Caveat: taxing foreign assets

- This paper does not deal directly with taxation of foreign assets, whether those of non-residents or residents: see FitzGerald (2002).
- Evidence is of large-scale profit shifting to low-tax jurisdictions; yet inter-state tax competition to attract foreign investment (or to retain own capital) is counter-productive.
- Low corporate tax rates in EMs clearly favour the wealthy, as most domestic firms are family-owned.

## **2. Direct tax incidence**

<b>Sources of Tax Revenue for various country groups, 2001</b>									
	Taxes on income profits and capital gains	Social Security contribution and taxes on payroll	Property tax	Subtotal: taxes on income and property	Taxes on goods and services	Other taxes	Total		
<b>Percent of GDP</b>									
OECD <sub>a</sub>	12.4	9.7	2.4	24.5	7.7	0.3	32.5		
<b>LAC<sub>b</sub></b>	<b>4.7</b>	<b>3.8</b>	<b>0.3</b>	<b>8.8</b>	<b>8.8</b>	<b>3.4</b>	<b>21.1</b>		
Others <sub>c</sub>	6.5	0.8	0.2	7.5	8.3	3.4	19.2		
<b>Percent of total tax revenues</b>									
OECD	38.2	29.8	29.8	75.3	23.8	0.9	100		
LAC	22.1	18.1	18.1	41.5	42.1	16.2	100		
Others	33.9	4.2	4.2	39.1	43.2	17.8	100		
a. Excludes Mexico									
b. LAC include Argentina, Brazil, Colombia, Chile, Guatemala, Ecuador, Mexico, Paraguay, Peru, Uruguay and Venezuela									
c. Others include India, Indonesia, Malaysia, Russia, Singapore, Thailand and Ukraine									
Sources: Artana, Lopez Murphy and Navajas, 2003									
(OECD Revenue Statistics 2001; IMF Government Finance Statistics and IMF country reports to complete on subnational governments).									

# Tax incidence studies

- Very few reliable studies of tax incidence in developing countries. Broad indication of mildly progressive impact.
- Chile case shows that this is not due to direct taxation; with VAT strongly regressive.
- World Bank study (Ferranti et al, 2004) stresses importance of topic but comes up with no new evidence.

Country	Decade	Before-Tax Gini Coeff	After-Tax Gini coeff	Difference
<b>Brazil</b>	1970s	56.2	55.3	<b>-0.9</b>
China	1970s	27.3	31.7	<b>4.5</b>
	1980s	31.7	33.3	<b>1.6</b>
	1990s	36.2	43.0	<b>6.8</b>
Czech Republic	1990s	28.3	22.1	<b>-6.1</b>
<b>Ecuador</b>	1990s	51.5	43.0	<b>-8.5</b>
Hungary	1980s	26.9	22.4	<b>-4.5</b>
	1990s	28.1	26.3	<b>-1.9</b>
India	1970s	40.5	30.9	<b>-9.6</b>
Indonesia	1970s	42.7	36.6	<b>-6.1</b>
Mauritius	1980s	45.7	39.6	<b>-6.1</b>
<b>Mexico</b>	1970s	52.5	51.0	<b>-1.5</b>
	1980s	50.6	55.0	<b>4.4</b>
Nigeria	1980s	35.7	37.0	<b>1.4</b>
Pakistan	1970s	33.5	31.2	<b>-2.3</b>
	1980s	33.4	32.0	<b>-1.4</b>
<b>Peru</b>	1980s	49.3	42.8	<b>-6.6</b>
Singapore	1970s	38.7	34.0	<b>-4.7</b>
	1980s	41.3	35.5	<b>-5.9</b>
	1990s	37.8	37.9	<b>0</b>
Taiwan	1970s	29.3	28.9	<b>-0.3</b>
Source: Chu, et al. (2000)				

<b>Before and After -Tax Income distribution for Chile (1996)</b>							
				Progressivity (tax as % of income)			
Decile	Income share pre-tax	Income share after-tax	Change in total share	Income tax	VAT	other taxes	<b>Tax System</b>
1	1.45	1.4	-0.05	0	11	3.42	<b>14.4</b>
2	2.74	2.63	-0.11	0	11.8	4.2	<b>16</b>
3	3.77	3.61	-0.16	0	11.4	4.33	<b>15.8</b>
4	4.73	4.59	-0.14	0	10.9	4.25	<b>15.2</b>
5	5.57	5.47	-0.1	0.01	10.7	4.21	<b>15</b>
6	6.76	6.64	-0.12	0.04	10.2	4.07	<b>14.3</b>
7	8.22	8.2	-0.02	0.11	9.7	4	<b>13.8</b>
8	10.6	10.61	0.01	0.23	9	3.85	<b>13.1</b>
9	15.42	15.75	0.33	0.62	8	3.54	<b>12.2</b>
10	40.75	41.09	0.34	2.54	6.3	2.96	<b>11.8</b>
GINI	0.4883	0.4961					
RATIO	13.41	14.12					
Source: Engel, Galetovic and Raddatz (1999)							

# Incidence of tax and spend

- Now widely argued that a single rate of tax on income/consumption combined with equal per capita income would be strongly redistributive (IADB, 1998)
- But this would only work if large cash transfers to the poor were involved (*not* a feature of EMs) as in UK; and above all depends on strong assumptions about distributive effect of public goods.
- The imputation of the benefits of public goods by income class is difficult, and can only be done rigorously for health and education (a third or so of public expenditure).

# Evidence on direct tax and growth

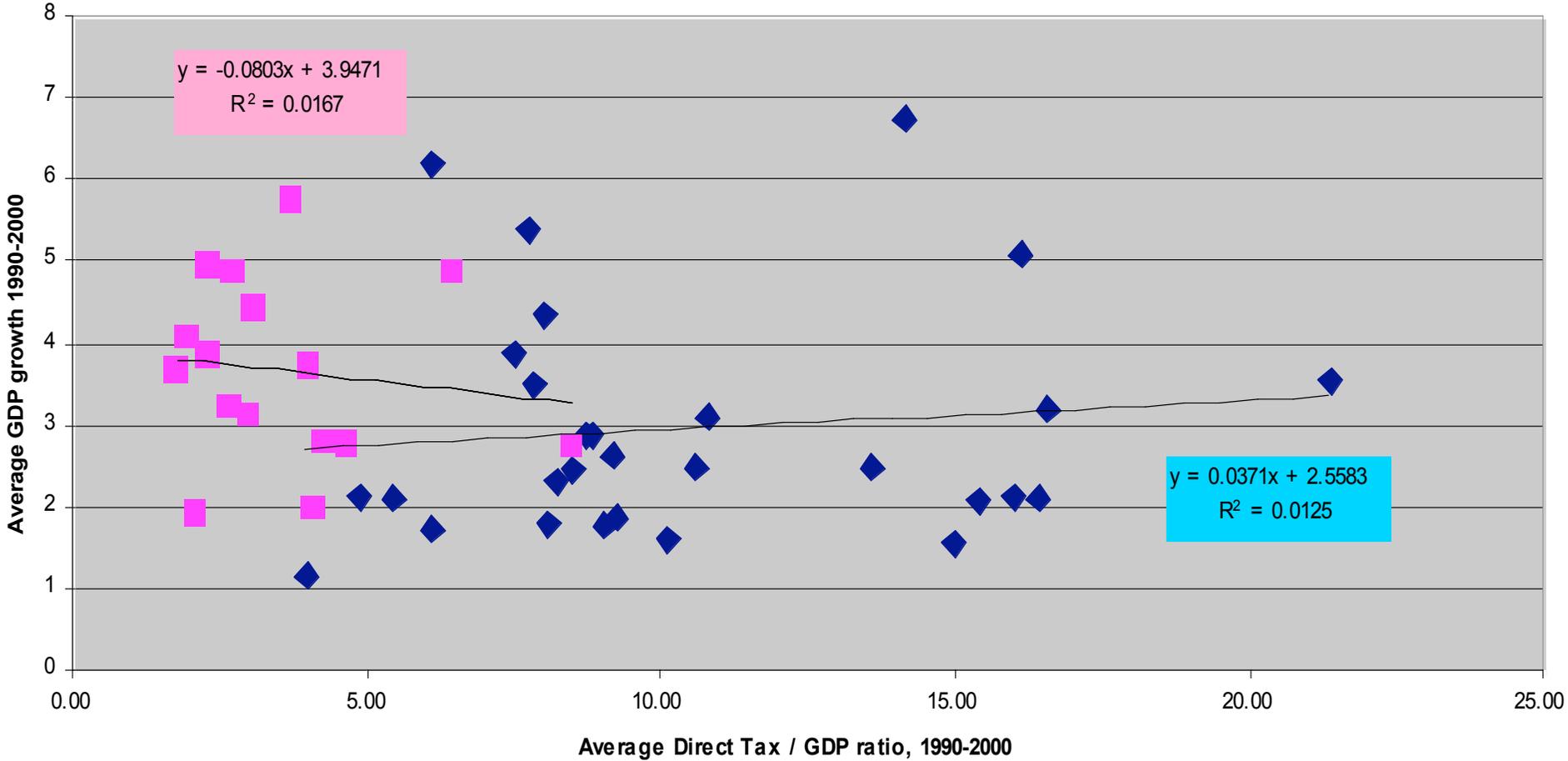
- Macroeconomic instability, debt overhang, social conflict much more an enemy of private investment than tax (Serven and Solimano)
- Empirical literature for OECD countries indicates little or no effect of direct tax rates on growth.
- Strong intuition in endogenous growth theory that human capital is not a credit collateral, so inequality hurts growth (Aghion and Howitt, 1998)

# Growth and direct taxation

- Our preliminary estimates for OECD countries indicate a marginal positive relationship; and direction of causality remains to be established.
- Our estimates for Latin America indicate a barely significant ( $R^2=1.7\%$ ) negative relationship. Growth is thus largely independent of tax rates.
- But even accepting this and assuming that causality runs tax  $\Rightarrow$  growth, implies that doubling direct tax burden from 5 to 10% of GDP would only reduce growth by 0.4% - surely an acceptable price for the welfare gain?

Direct tax revenue as share of GDP vs Growth rates, 1990-2000

◆ OECD    ■ LAC    — Linear (LAC)    — Linear (OECD)



# 3. The Plato Index

# The 'Plato Index'

- Absent
  - tax incidence studies for developing countries,
  - and thus the ability to make comparisons over time and space,
  - and in particular of measures of the direct tax burden borne by the non-poor,

I have devised the '*Plato Index*'.

- Simply defined as the ratio of direct tax revenue to the gross income of the top quintile of households.
- This proxies direct tax incidence for this quintile as they provide the main direct tax base.

where

$\bar{T}$  the Plato Index  $\frac{t_d \cdot T}{Y_H}$   
 $\bar{T}$  Government Current Revenue / national income GNI  
 $t_d$  Direct tax revenue / government current revenue  
 $\alpha$  Share of top quintile in gross household income  
 $\bar{Y}_H$  Gross income of households/GNI

# Data sources

- Direct tax data from IMF/IFS
- GNI data from WB/WDI
- First quintile (Q1) share in household income from WIDER database
- Household income/GNI more difficult, but can be estimated for non-OECD countries as

$$= (C_p + S_p + T_d)/GNI$$

# Estimations

- We assume that all direct taxation is paid by the first quintile; as the second and others generally fall below the income tax threshold, do not occupy taxable urban property and are not covered by social security.
- Note that we use gross income as base, before tax and transfers. Inconsistent HH surveys and non-comparable tax systems make estimation tricky.
- Note also that in many cases HH distribution estimates are for *consumption*; so that savings as well as tax have to be added back to get gross income.

# Validity of the index

- This Index thus combines information on income distribution and tax pressure: for a given direct tax *rate*, the worse the income distribution the higher the direct tax yield should be.
- The assumption that the top quintile provides the main direct tax base may be valid for developing countries, but may require downward adjustment of the Index for developed countries where the ‘reach’ is greater and the income distribution better.
- However, even in in the UK for instance true direct tax/gross income ratio for the top quintile is 20%; which compares quite well with the Plato value of 21%.

# Comparative rankings on Plato

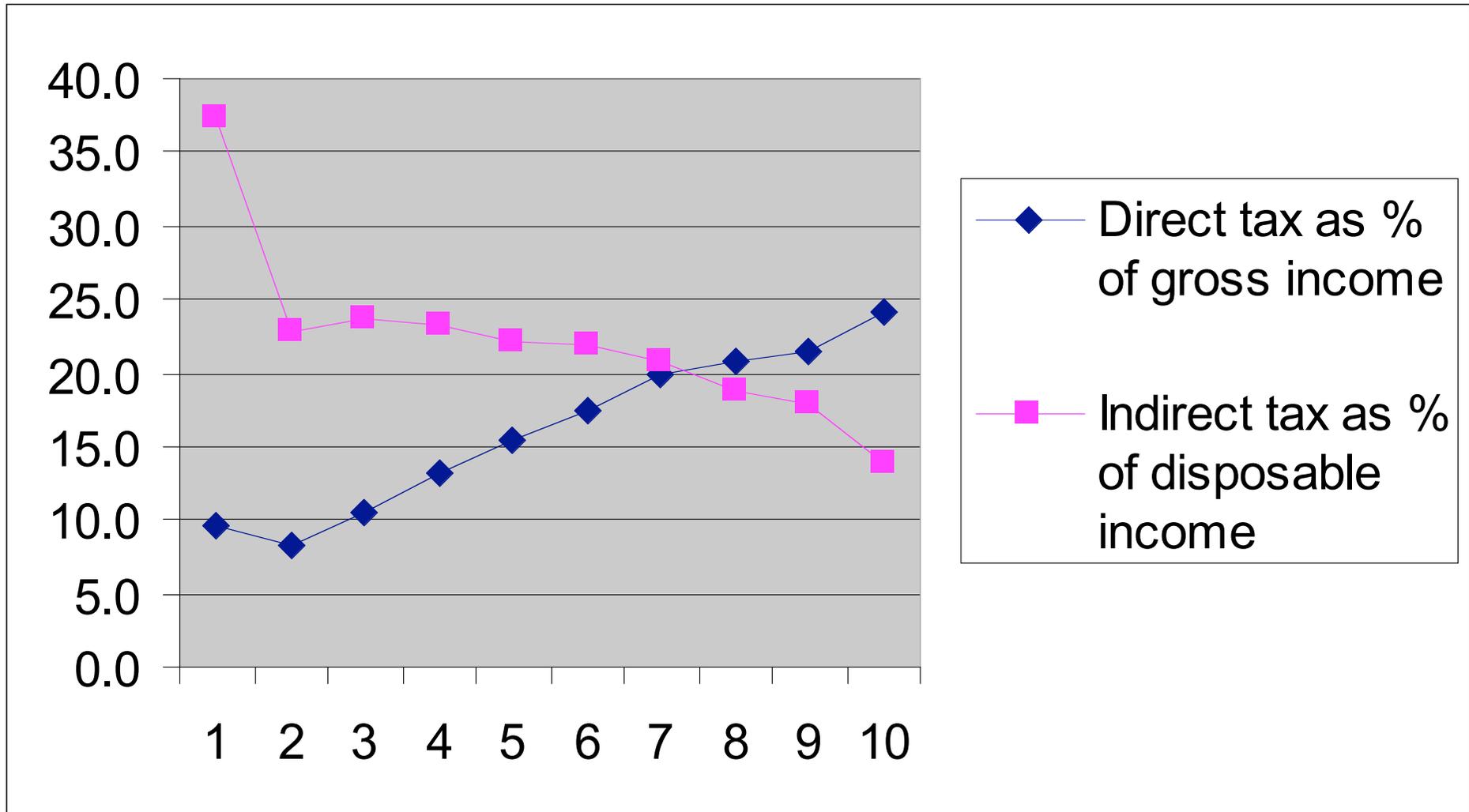
- Normatively, we expect that countries with worse income distribution (higher Gini) would exhibit higher Plato to restore equity; but positively we anticipate the reverse...
- Evidence is of Index value high for advanced industrial countries at 20+; and 10-15 for recently industrialised ones.
- Latin America is very low at 5-7; well below comparable industrialising middle-income countries.

# Plato trends

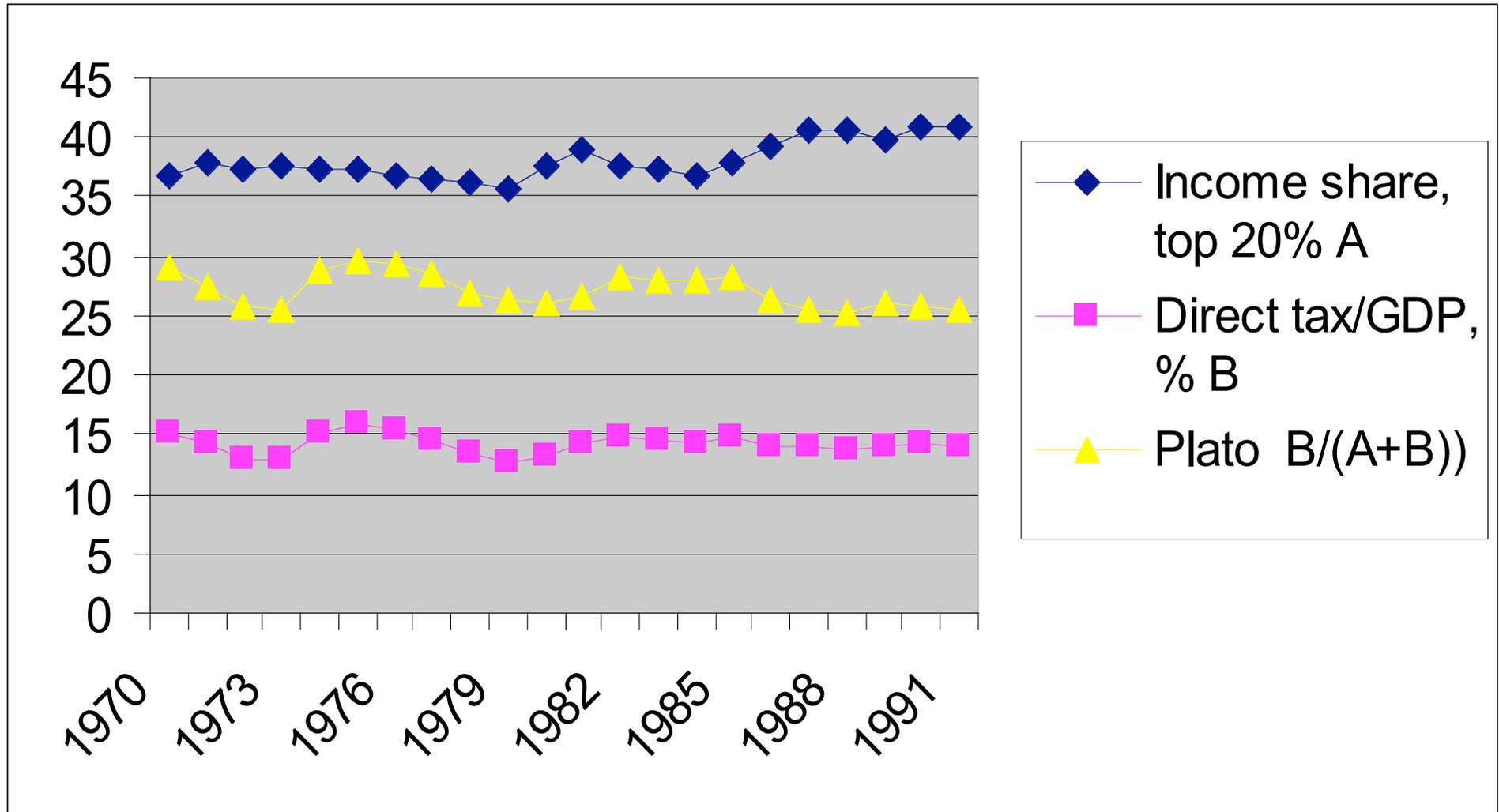
- UK Plato has been declining over time; but due to worsening income distribution, while the direct tax/GDP ratio has stayed roughly stable.
- Worldwide the trends are mixed, with some small improvement (from very low levels) in LA; but worsening in OECD countries.
- Though note that Swedish figures omit local income taxation which makes up half the direct tax pressure; while UK includes this ('council tax').

"THE PLATO INDEX"										
		around 2000					around 2000			
		Income Shares			Gini		dirtax/	govrev/	dirtax/	
		Top 10%	Top 20%		coeff		cgovrev	GDP	GDP	
		A	B		C		D	E	F=D*E	<b>F/(B+F)</b>
Argentina		38.9	56.4		52.2		17.9	14.9	2.7	<b>4.5</b>
Brazil		40.7	64.4		59.1		19.4	25.9	5.0	<b>7.2</b>
Chile		47.0	62.2		57.1		20.3	19.2	3.9	<b>5.9</b>
Colombia		46.5	61.8		57.6		34.2	13.3	4.6	<b>6.9</b>
Mexico		43.1	59.1		54.6		34.0	14.4	4.9	<b>7.7</b>
Venezuela		36.3	53.4		49.1		19.6	20.5	4.0	<b>7.0</b>
UK		28.5	44.0		36.0		39.7	30.0	11.9	<b>21.3</b>
Greece		28.5	43.6		35.4		22.7	30.2	6.9	<b>13.6</b>
Ireland		27.6	43.3		35.9		41.8	29.0	12.1	<b>21.9</b>
Spain		25.2	40.8		32.5		29.7	19.5	5.8	<b>12.5</b>
Korea		22.5	37.5		31.6		26.4	20.3	5.4	<b>12.5</b>
Philippines		36.3	52.3		46.1		39.8	15.0	6.0	<b>10.3</b>
Turkey		30.7	46.7		40.0		33.5	28.4	9.5	<b>16.9</b>
Source		HDR	HDR		HDR		GFS	IFS		

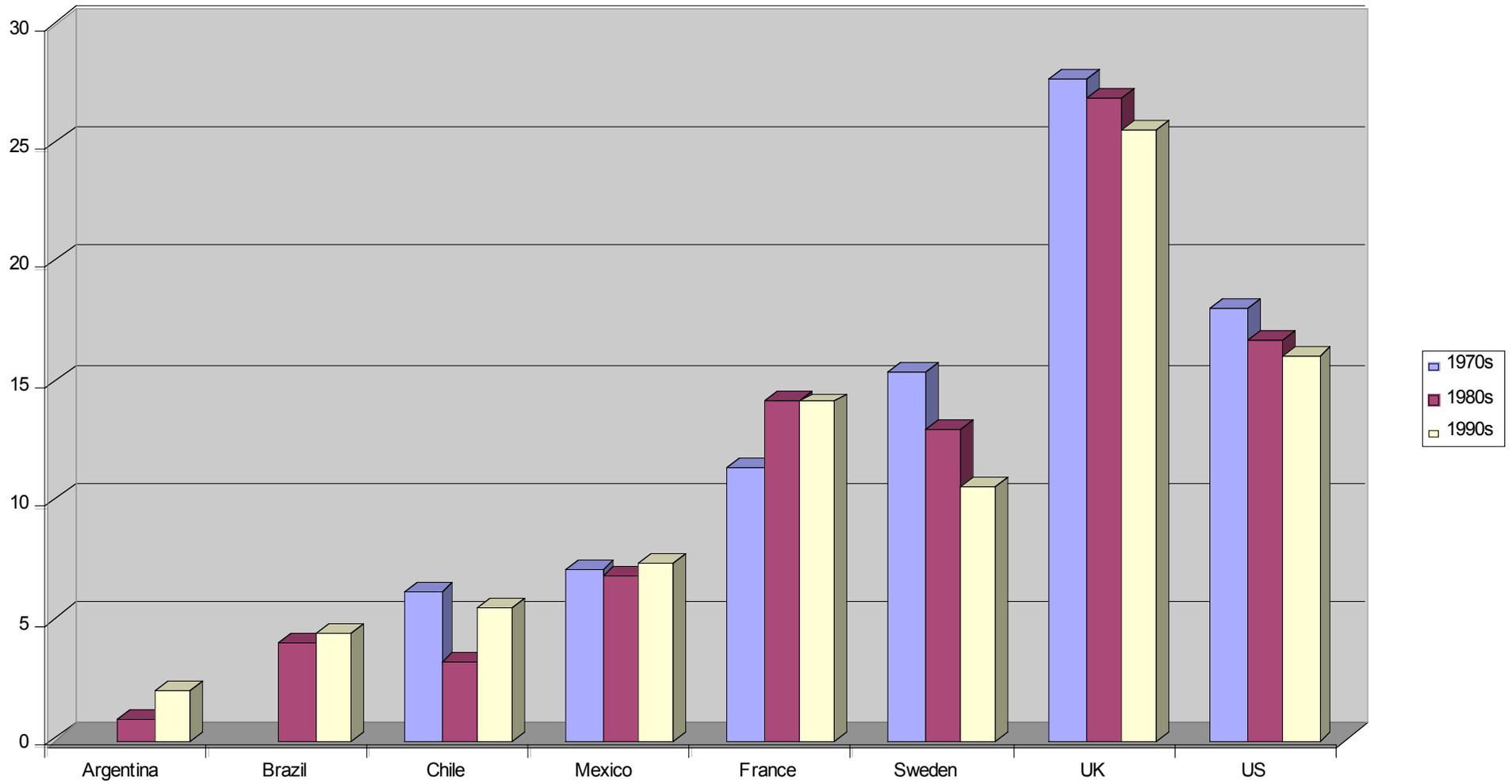
# UK tax burden by income decile



# UK Plato index over time



Comparative Plato index



## 4. Conclusion

- Plato Index shows that direct tax pressure is low in emerging economies (particularly LA) in relation to income share of the wealthy. Unjustified on efficiency or welfare grounds - as IMF admits (Shome, 1999).
- Implications for macroeconomic stability and growth: and for income distribution, poverty. Role of direct taxation in reducing income inequality (by separating primary from secondary distribution) downplayed by targeting.
- The Plato Index illustrates this dramatically. Possible inclusion in the *Human Development Report*. I plan to test explanatory factor for welfare outcomes, growth rates etc..

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# **APPENDIX 1**

## **Attributing public expenditure incidence**

# Imputing benefits from public goods provision

- The assignment of the ‘intangible benefits in kind’ from police, law, defence, roads, public administration, debt service etc to particular income groups is not just a technical problem.
- It depends on an implicit theory of the state (FitzGerald 1978):
  - Equal benefits per capita: republican egalitarian theory
  - Proportional to income: libertarian ‘services’ theory
  - All benefits accrue to upper class: dependency theory (Furtado) or the ‘predatory state’.

## Flat Tax and Spend Simulation

	Top 20 percent	Bottom 80 percent	Total population
<i>Gross income</i>	50.0	50.0	100.0
<i>Tax contribution</i> (25% flat tax)	12.5	12.5	25.0
<i>Directed expenditure</i> (equal per capita)	2.0	8.0	10.0
<i>'Other expenditure' allocation:</i>			
Per capita (A)	3.0	12.0	15.0
By income (B)	7.5	7.5	15.0
By class (C)	15.0	0	15.0
<i>Net Transfer</i>			
A	- 7.5	+ 7.5	0
B	- 3.0	+ 3.0	0
C	+ 4.5	- 4.5	0

## **APPENDIX 2**

# **Political Economy of Direct Taxation in Emerging Market Economies**

# Arguments against direct taxation

- Disincentives to saving and entrepreneurial or professional effort; corporation tax passed on to consumers.
- Difficulty and cost of collection, particularly in open economies (asset mobility) with large unregulated sectors (informal firms) and no cadasters etc.
- What matters is net incidence, so flat rate income tax (or better consumption tax, i.e. VAT) combined with targetted expenditure is the solution.

# Arguments for direct taxation

- Savings effect ambiguous (Ricardian Equivalence) and effort disincentives exaggerated: inequality may lower growth.
- Collection problem one of political pressure rather than administrative incapacity.
- Direct taxation (progressive) central to the social contract with wealth-holders in a democratic society (Rawls).

# Political issues

- Lack of administrative reach created by political process as well as crime, corruption etc. Wealthy avoid paying tax ‘legally’.
- Tax evasion justified in elite discourse by corruption and waste in the public sector.
- Underlying lack of a sound social contract: not only between state and society, but between the wealthy and society.