

Public Economics: Tax & Transfer Policies

(Master PPD & APE, Paris School of Economics)

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Academic year 2015-2016

Lecture 3: Income & Wage Taxation Over Time & Across Countries

(check [on line](#) for updated versions)

Roadmap of lecture 3

- The rise of the modern progressive income tax
- Effective tax rates vs marginal tax rates
- Taxing individuals or couples?
- Illustration with French and US income tax rates
- The top marginal tax rate in history
- From an elite tax to a mass tax
- Income tax in China and India

The modern progressive income tax vs previous forms of income taxation

- The modern progressive income tax was created in 1909 in the UK, 1913 in the US, 1914 in France, 1922 in India, 1932 in Argentina, etc., and is based upon the principle of a **comprehensive** tax base
- **Comprehensive** income tax: $t = t(y)$
with y = total income from all income categories
(wages + pensions + self-employment income + rent + dividend + interest + etc.)
- \neq **schedular** income tax: different tax rates for different income categories (UK system in 19^c)

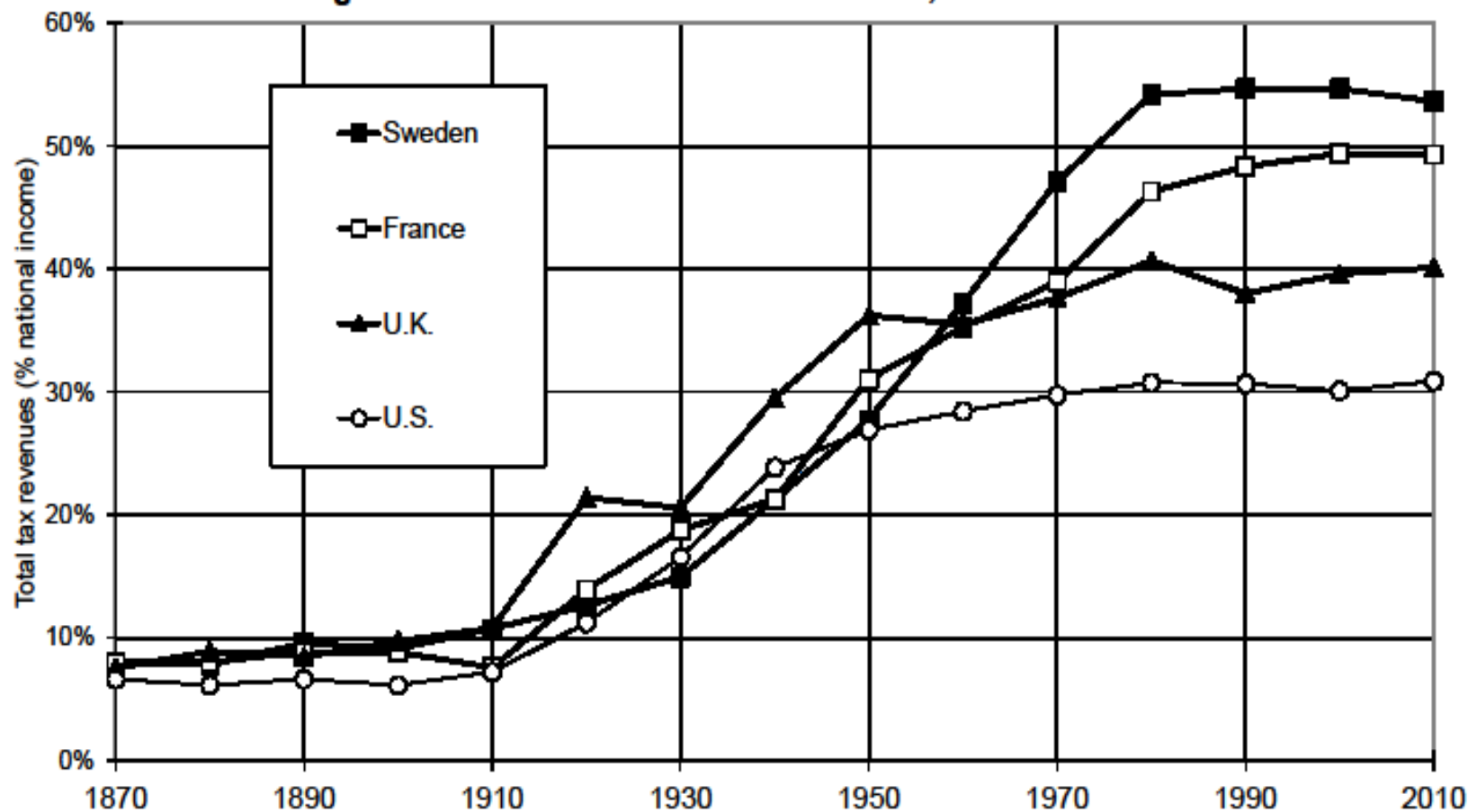
- One also finds older forms of income taxation (sometime with fixed tax payments by income brackets) in many countries prior to 19c. See e.g. 18^c France: Touzery, *L'invention de l'impôt sur le revenu – La taille tarifée 1715-1789*, 1994.
- French Revolution: income tax viewed as very intrusive, replaced during French revolution by taxes on property that were viewed as less intrusive. Creation of new tax system based upon « les quatre vieilles contributions »:
 - Contribution foncière (tax on housing, buildings and land)
 - Contribution des patentes (based upon business assets)
 - Contribution sur les portes et fenêtres (number of doors and windows)
 - Contribution personnelle-mobilière (based upon rental values)
(+ droits de mutation (inheritance tax))

- During 19c: with industrialization, many new forms of wealth creation are untaxed >> creation of modern income tax: tax reforms in UK 1840s-1850s, France IRVM 1872, and finally everywhere in 1910-1920
- See e.g. Mehrotra, *Making the Modern American Fiscal State. Law, Politics, and the Rise of Progressive Taxation, 1877-1929*, CUP 2013; J. Witte, *The Politics and Development of the Federal Income Tax*, University of Wisconsin Press, 1985
- **Every society always needs to find its own mix between different forms of taxes on capital, income and consumption**

The rise of income & wage taxation

- If we consider all forms of income and wage taxation in general (putting together income taxes with social contributions), then we typically have 60-65% of total tax revenues for income and wage taxation in today's developed countries (vs. 30-35% for VAT and other consumption taxes, and 5-10% for wealth & property taxes)
- The rise of the modern fiscal state (from <10% Y in tax revenues until WW1 to 40% today) comes almost entirely from the rise of income and wage taxation
- See EU 28: income taxes + social contributions = 24.6% GDP out of 39.4% GDP for total taxes (2012)
- France: 27.8% GDP out of 45.0% for total taxes (progressive income tax strictly speaking <4% GDP)

Figure 13.1. Tax revenues in rich countries, 1870-2010



Total tax revenues were less than 10% of national income in rich countries until 1900-1910; they represent between 30% and 55% of national income in 2000-2010. Sources and series: see piketty.pse.ens.fr/capital21c.

European Union 28 GDP-weighted averages	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Revenue in 2012
A. Structure of revenues	% of GDP													€ bn
Indirect taxes	:	:	13.4	13.3	13.3	13.4	13.5	13.4	13.1	12.9	13.2	13.4	13.6	1 763.1
VAT	:	:	6.8	6.8	6.8	6.9	7.0	7.0	6.9	6.7	7.0	7.1	7.1	926.9
Excise duties and consumption taxes	:	:	3.0	3.0	2.9	2.8	2.7	2.6	2.6	2.7	2.7	2.7	2.7	349.1
Other taxes on products (incl. import duties)	:	:	1.6	1.6	1.7	1.7	1.8	1.8	1.6	1.5	1.5	1.5	1.4	188.0
Other taxes on production	:	:	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.1	2.3	299.1
Direct taxes	:	:	13.0	12.8	12.8	13.1	13.6	13.8	13.7	12.7	12.6	12.8	13.2	1 707.4
Personal income	:	:	9.4	9.1	8.9	9.0	9.2	9.3	9.4	9.3	9.1	9.1	9.4	1 222.6
Corporate income	:	:	2.6	2.4	2.7	2.9	3.3	3.3	3.0	2.2	2.4	2.5	2.5	322.8
Other	:	:	1.1	1.3	1.2	1.2	1.1	1.2	1.3	1.2	1.2	1.2	1.2	162.1
Social contributions	:	:	12.5	12.7	12.5	12.4	12.3	12.2	12.5	12.8	12.6	12.7	12.7	1 653.2
Employers	:	:	7.2	7.3	7.2	7.1	7.1	7.1	7.2	7.4	7.3	7.3	7.3	947.9
Employees	:	:	3.9	3.9	3.9	3.8	3.8	3.7	3.8	3.8	3.8	3.9	3.9	506.4
Self- and non-employed	:	:	1.4	1.4	1.5	1.5	1.5	1.4	1.5	1.6	1.6	1.5	1.5	198.8
Total	:	:	38.8	38.8	38.6	38.9	39.4	39.3	39.2	38.3	38.3	38.8	39.4	5 109.4

France	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2012	
A. Structure of revenues	% of GDP													Ranking (1)	€ bn
Indirect taxes	15.8	15.4	15.4	15.3	15.6	15.7	15.6	15.4	15.2	15.3	15.1	15.5	15.7	5	318.9
VAT	7.4	7.3	7.2	7.2	7.3	7.4	7.3	7.2	7.1	6.9	7.0	7.0	7.0	23	142.5
Excise duties and consumption taxes	2.6	2.5	2.6	2.5	2.3	2.2	2.3	2.2	2.1	2.2	2.2	2.2	2.2	25	45.2
Other taxes on products (incl. import duties)	1.7	1.6	1.6	1.6	1.8	1.9	1.7	1.7	1.6	1.6	1.7	1.9	1.9	5	39.4
Other taxes on production	4.2	4.1	4.1	4.1	4.2	4.3	4.2	4.3	4.3	4.7	4.2	4.4	4.5	2	91.9
Direct taxes	12.5	12.6	11.8	11.4	11.7	11.9	12.2	12.0	12.0	10.3	11.0	11.7	12.4	11	253.0
Personal income	8.4	8.2	7.9	8.0	7.9	8.1	7.9	7.6	7.8	7.6	7.6	7.8	8.5	11	172.1
Corporate income	2.8	3.1	2.6	2.1	2.4	2.3	2.9	2.9	2.7	1.3	1.9	2.3	2.3	14	46.0
Other	1.3	1.4	1.3	1.3	1.4	1.5	1.4	1.5	1.4	1.5	1.5	1.7	1.7	4	34.9
Social contributions	16.1	16.1	16.2	16.4	16.2	16.4	16.5	16.3	16.3	16.8	16.7	16.8	17.0	1	346.4
Employers	11.1	11.0	11.1	11.2	11.0	11.1	11.2	11.0	11.1	11.4	11.3	11.5	11.6	1	235.1
Employees	4.0	4.0	4.1	4.1	4.1	4.1	4.1	4.1	4.0	4.1	4.1	4.1	4.2	11	84.4
Self- and non-employed	1.0	1.1	1.1	1.1	1.2	1.2	1.2	1.2	1.2	1.3	1.3	1.3	1.3	14	26.9
Less: amounts assessed but unlikely to be collected	0.3	0.3	0.2	0.1	0.2	0.1	0.2	0.2	0.2	0.3	0.2	0.3	0.3		
Total	44.2	43.8	43.3	43.1	43.3	43.8	44.1	43.4	43.2	42.1	42.5	43.7	45.0	3	913.5

Effective vs. Marginal tax rates

- **Effective** or average tax rate = $t(y)/y$
- $t(y)$ progressive if and only if $t(y)/y$ rises with y
- **Marginal** tax rate = $t'(y)$
- $t(y)$ convex = $t''(y) > 0$, i.e. $t'(y)$ rises with y
- Convexity implies progressivity (but not necessary: as we will see, U-shaped pattern of marginal tax rates when transfers are taken into account)
- Most progressive income taxes use a bracket system: fixed marginal tax rates within income brackets
- But one can also use continuous system
- Exemple of computations using tax schedules from France and the US: see [excel file](#)

Taxing individuals or couples?

- In many European countries (Scandinavia, UK, Italy, Spain,..), income tax $t(y)$ is based upon individual income y : whether one lives in a couple or not is irrelevant
- In France, Germany & US (for bottom half of pop), income tax is computed at the level of married couples using « split » system (« quotient conjugal »): income tax = $2 \times t[(y_1+y_2)/2]$, with $y_1, y_2 =$ spouses incomes
- With $t(y)$ convex, this favours unequal couples; if $y_1=y_2$, there is no tax advantage at all
- Key question: unitary household or not?
- The split system can reinforce gender inequality; the individual system favours female labor supply

Marginal vs average tax rates: illustration with French 2013 Income Tax

French 2013 income tax schedule
(applied to 2012
incomes)
(*barème de l'impôt sur le revenu
(IR)*)
(see
www.impots.gouv.fr)

Income brackets		Marginal tax rate
(€)		(%)
0	5 964	0,0%
5 964	11 896	5,5%
11 896	26 420	14,0%
26 420	70 830	30,0%
70 830	150 000	41,0%
150 000		45,0%

French "quotient familial" (QF)
system:

y = taxable income = annual income - standard deduction for professional expenses (10%)
 n = number of units of QF (*nombre de parts de QF*): $n=1$ if single, $n=2$ if couple, $n=2.5$ if couple with 1 kid, etc.

y/n = taxable income per QF unit (*revenu imposable par part de QF*)

Income tax = $n \times t(y/n)$ (because $t(y)$ is convex, it is better to have a high n)

Exemple with an annual income $y = 100\,000\text{€}$ and $n=2,5$ (couple with one kid) (about P99):

$100\,000 - 10\% \times 100\,000 = 90\,000$ (standard deduction for professional expenses of wage earners: 10%)

$90\,000 / 2,5 = 36\,000\text{€} =$ taxable income per QF unit

>>> marginal income tax rate = 30%

Income tax per QF unit = $5.5\% \times (11\,896 - 5\,964) + 14\% \times (26\,420 - 11\,896) + 30\% \times (36\,000 - 26\,420) =$

4 033

Total income tax = $2,5 \times 4\,033 =$ 10 081

>>> average income tax rate = $10\,081 / 100\,000 = 10,1\%$

>>> average effective tax rate taking into account tax credits etc. = $0,85 \times 10,1\% = 8,6\%$

>>>> 8,6% << 30,0% , i.e. average rate << marginal rate

U.S. Federal income tax rates applied to 2013 incomes

Note: This does not include the personal tax exemption (\$3,900 for singles & \$7,800 for couples), the standard deduction (\$6,100 for singles & \$12,200 for couples), and the earned income tax credit (EITC) (tax rebate for low incomes)

I.e. singles start paying federal income taxes above 10,000\$ and couples above 20,000\$

See Internal revenue service (IRS) web site for complete tax rates and schedules

Marginal tax rate	Single	Married Filing Jointly or Qualified Widow(er)	Married Filing Separately
10%	\$0 – \$8,925	\$0 – \$17,850	\$0 – \$8,925
15%	\$8,925 – \$36,250	\$17,850 – \$72,500	\$8,925 – \$36,250
25%	\$36,250 – \$87,850	\$72,500 – \$146,400	\$36,250 – \$73,200
28%	\$87,850 – \$183,250	\$146,400 – \$223,050	\$73,200 – \$111,525
33%	\$183,250 – \$398,350	\$223,050 – \$398,350	\$111,525 – \$199,175
35%	\$398,350 – \$400,000	\$398,350 – \$450,000	\$199,175 – \$225,000
39,6%	\$400,000+	\$450,000+	\$225,000+

(10/10/2012)

U.S. Federal income tax rates applied to 2012 incomes

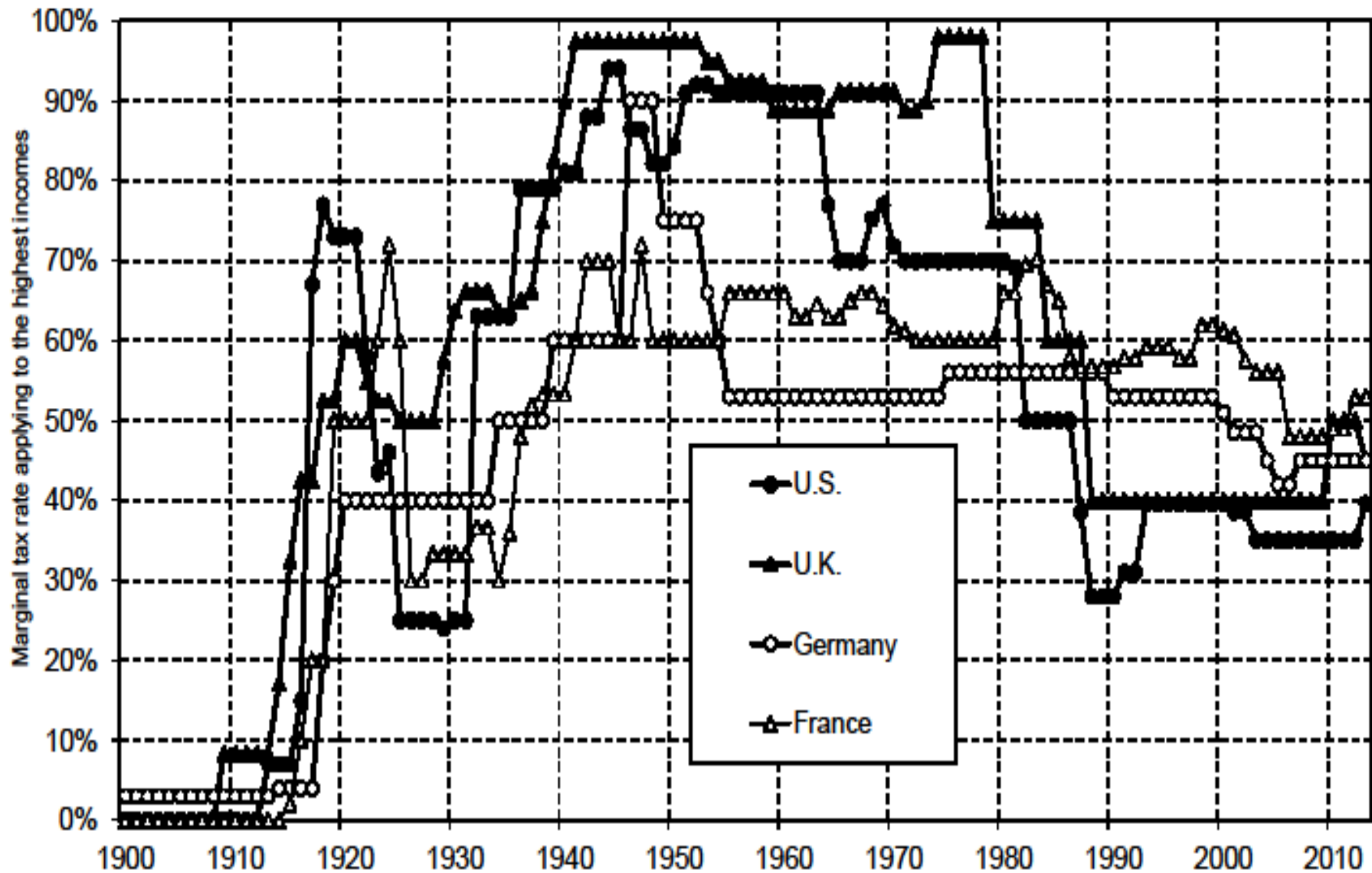
Note: This does not include the personal tax exemption (\$3,800 for singles & \$7,600 for couples), the standard deduction (\$5,950 for singles & \$11,900 for couples), and the earned income tax credit (EITC) (tax rebate for low incomes)
I.e. singles start paying federal income taxes above 9,750\$ and couples above 19,500\$
See Internal revenue service (IRS) web site for complete tax rates and schedules

Marginal tax rate	Single	Married Filing Jointly or Qualified Widow(er)	Married Filing Separately
10%	\$0 – \$8,700	\$0 – \$17,400	\$0 – \$8,700
15%	\$8,701 – \$35,350	\$17,401 – \$70,700	\$8,701 – \$35,350
25%	\$35,351 – \$85,650	\$70,701 – \$142,700	\$35,351 – \$71,350
28%	\$85,651 – \$178,650	\$142,701 – \$217,450	\$71,351 – \$108,725
33%	\$178,651 – \$388,350	\$217,451 – \$388,350	\$108,726 – \$194,175
35%	\$388,351+	\$388,351+	\$194,176+

The top marginal tax rate in history

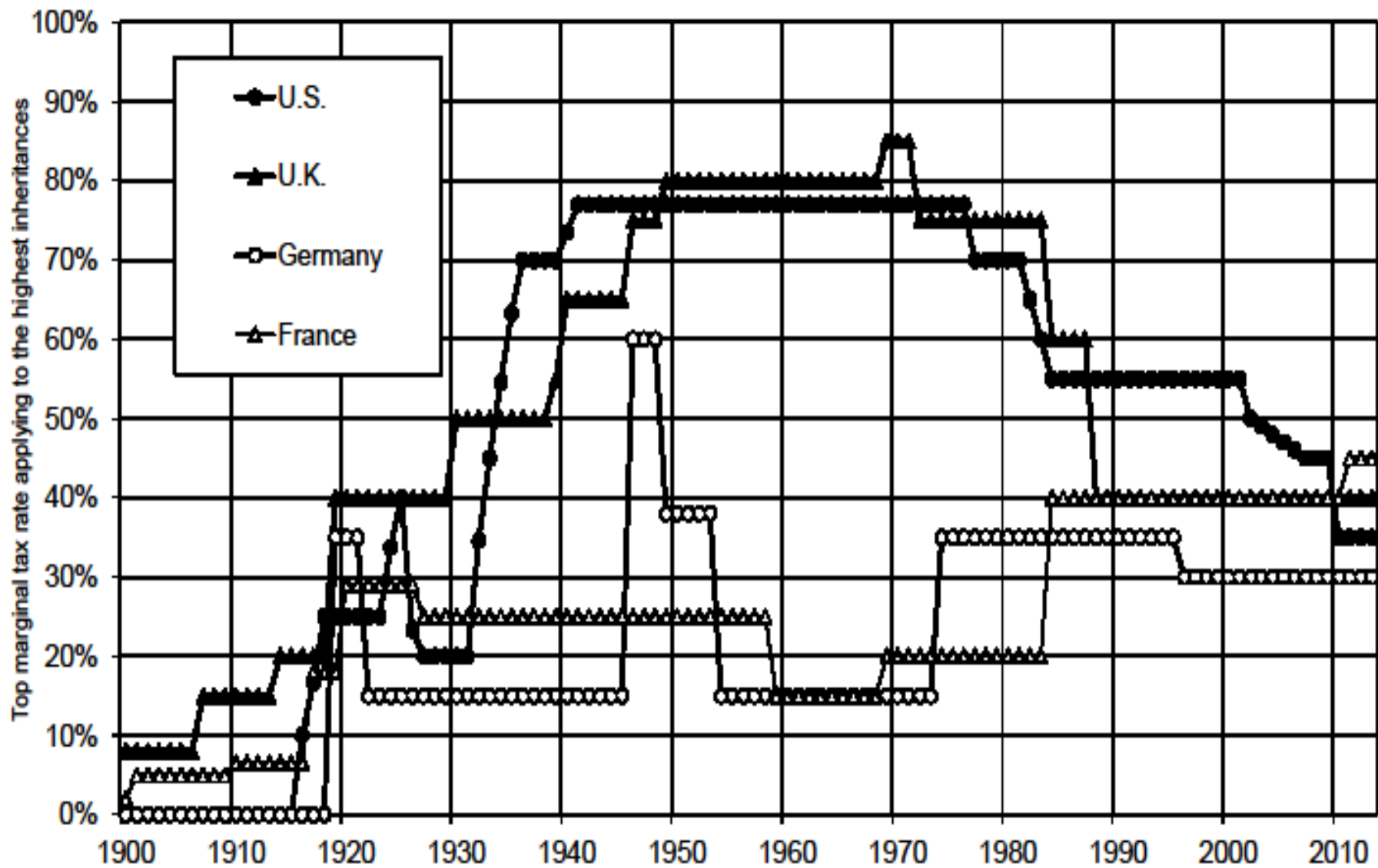
- Top marginal tax rate = marginal tax rate applying to the highest incomes
- Chaotic history during past century
- US and UK invented confiscatory tax rates for very high incomes; then big reversal since 1980s
- Same pattern for top inheritance tax rates: US-UK invented confiscatory top rates, then big reversal since 1980s (see Lectures 6-7)
- Until 1970s, top tax rates on « unearned income » (capital income) often higher than top tax rate on « earned income » (labor income)
- Reversal since 1980s: free capital flows with no exchange of information, special tax regimes for capital income >>> regressivity at the top (see [France 2010](#))

Figure 14.1. Top income tax rates, 1900-2013



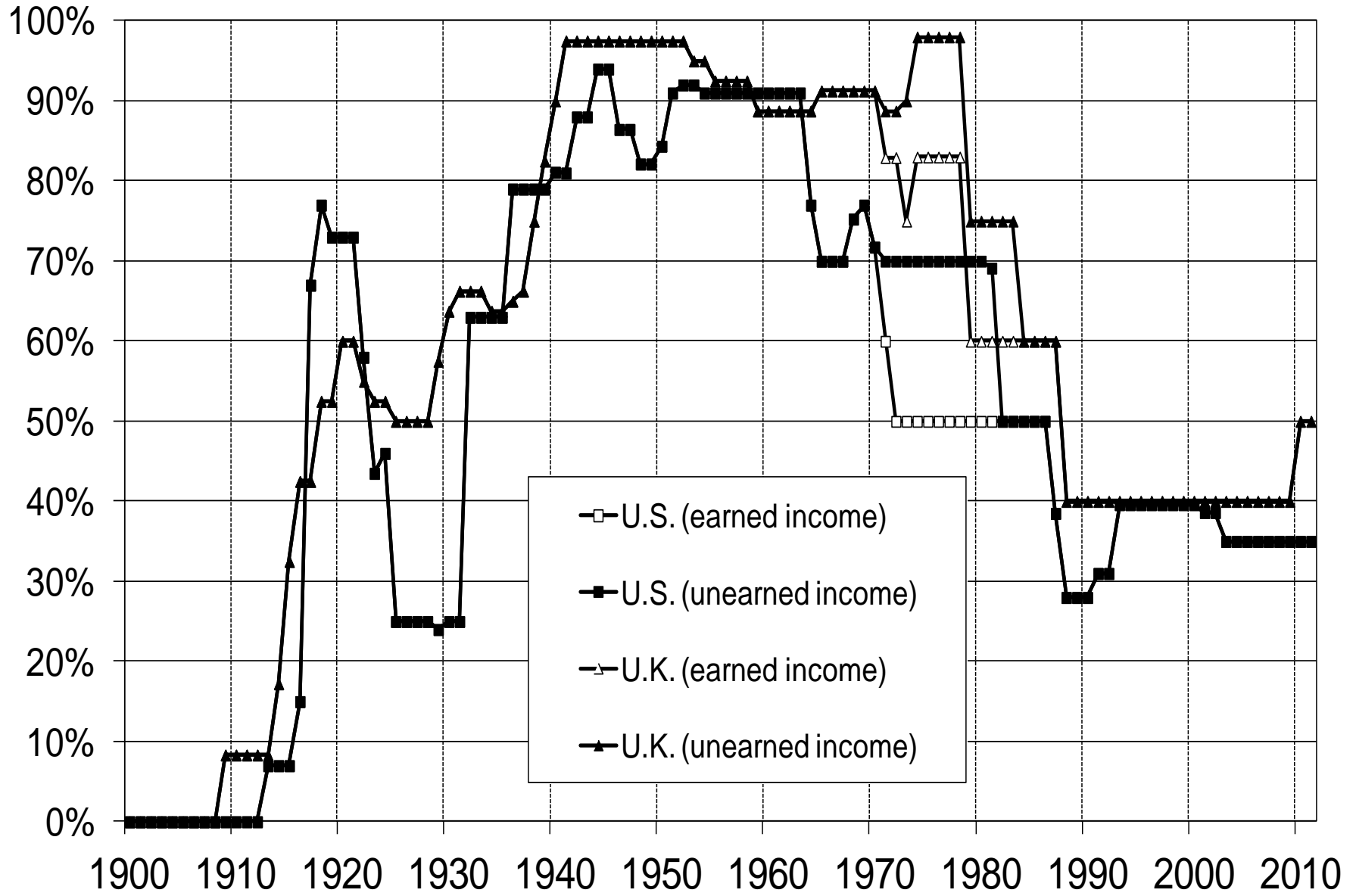
The top marginal tax rate of the income tax (applying to the highest incomes) in the U.S. dropped from 70% in 1980 to 28% in 1988. Sources and series: see piketty.pse.ens.fr/capital21c.

Figure 14.2. Top inheritance tax rates, 1900-2013



The top marginal tax rate of the inheritance tax (applying to the highest inheritances) in the U.S. dropped from 70% in 1980 to 35% in 2013. Sources and series: see piketty.pse.ens.fr/capital21c.

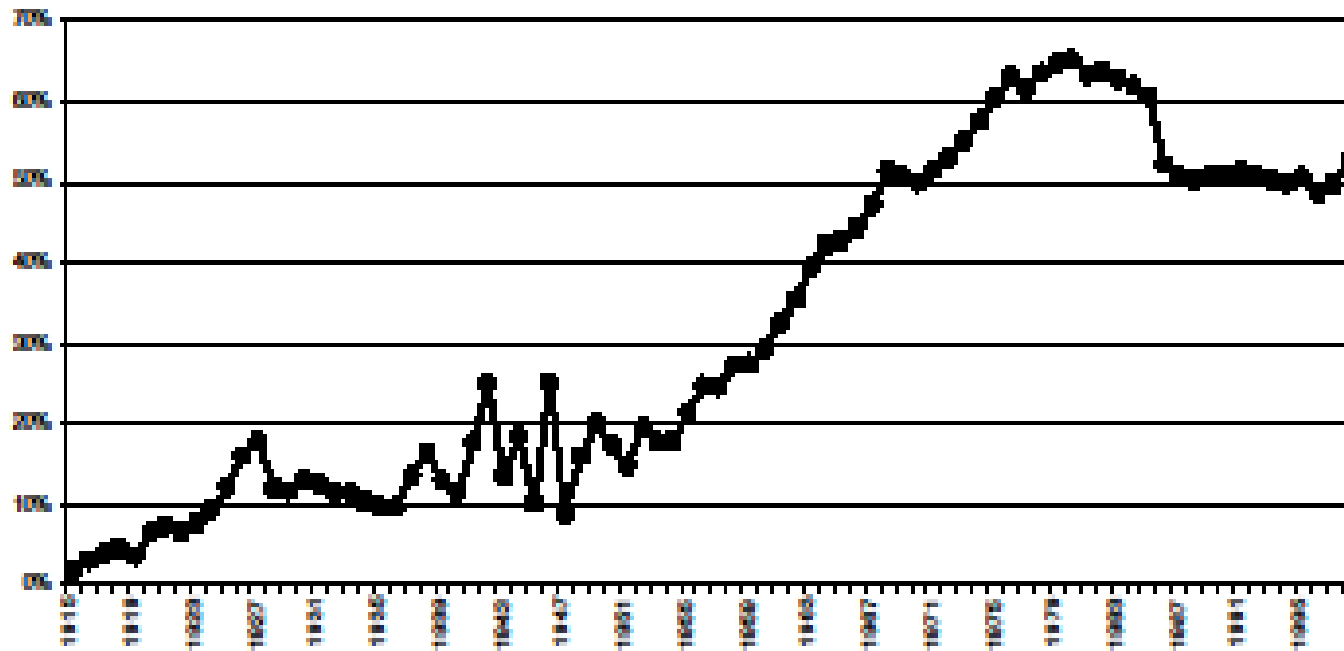
Figure 3: Top Income Tax Rates: Earned (Labor) vs Unearned (Capital)



From an elite tax to a mass tax

- In every country, the income tax at the time it is created is targeted on the top 1-2% of the population; then it is gradually extended to the entire population (or at least to 50-60% of the population). This makes tax revenues much more significant: **the mass income tax is an important part of the rise of the modern fiscal state**
- See e.g. graph on fraction of pop subject to tax in France. See my [2001 book](#) (chapters 4-5) for a complete politico-economic history of the French income tax
- **Explanations** for this transition from elite to mass tax ?
Is it happening everywhere in developing countries?

Graphique 5-1 : La proportion de foyers imposables à l'impôt sur le revenu de 1915 à 1998



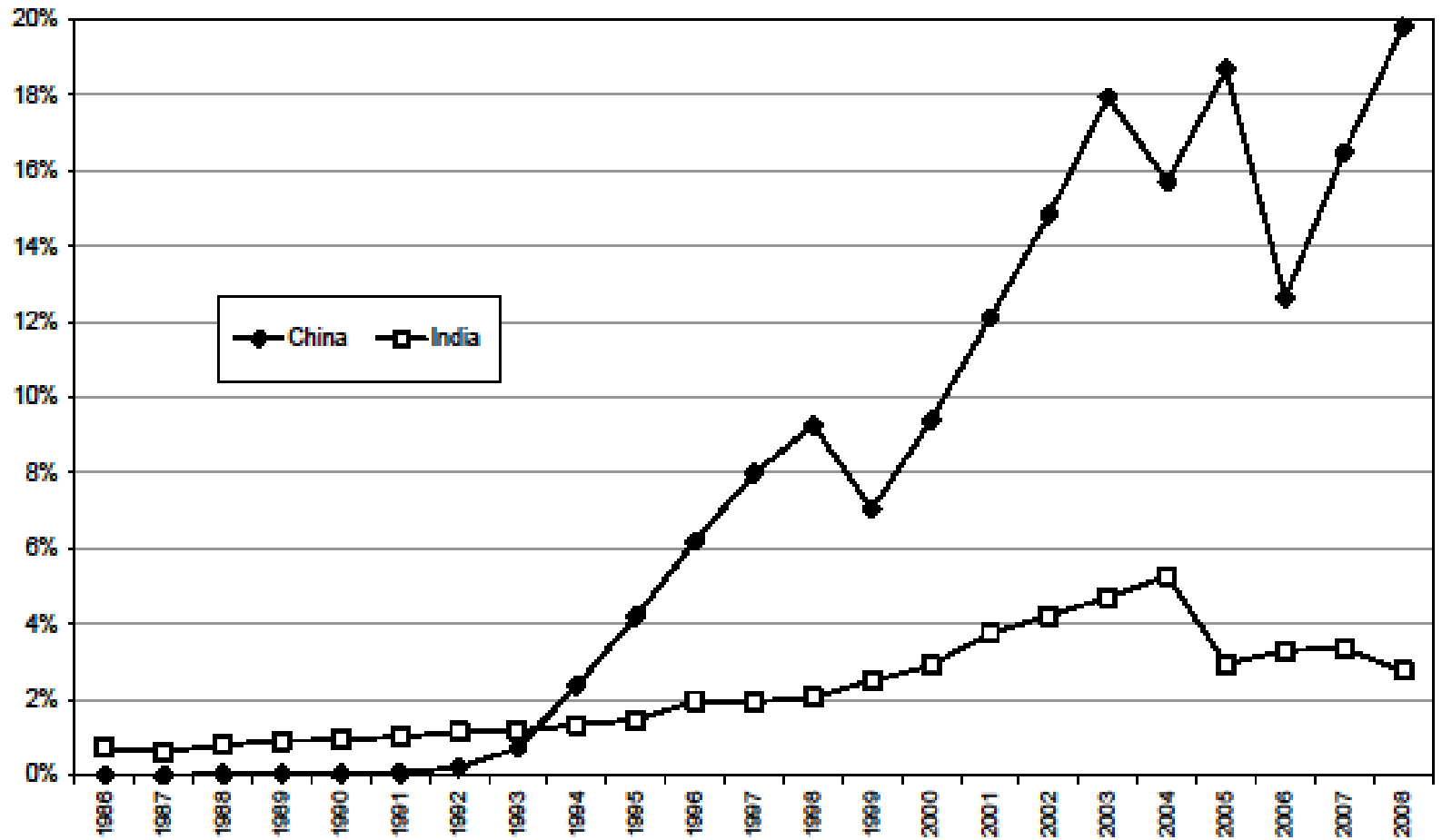
Source : Colonne (3) de tableau A2 (annexe A)

- **Explanations: Economics/Technology** (rise of large corporations and wage-earner status >> easier to tax) or **Politics** (social acceptability of tax, fiscal consent) ? **Probably both**: politics and culture are about choosing different ways to regulate, organize and provide meaning and sense to economic and technological change.
- On the political economy of fiscal development:
- Besley-Persson, “On the Origins of State Capacity”, [2009](#) ; “Why do developing countries tax so little?”, [JEP 2014](#)
- Kleven-Kreiner-Saez, “Why Can Modern Governments Tax so much?”, [2009](#); “How Can Scandinavians Tax So Much?”, [JEP 2014](#)

Income tax in India and China

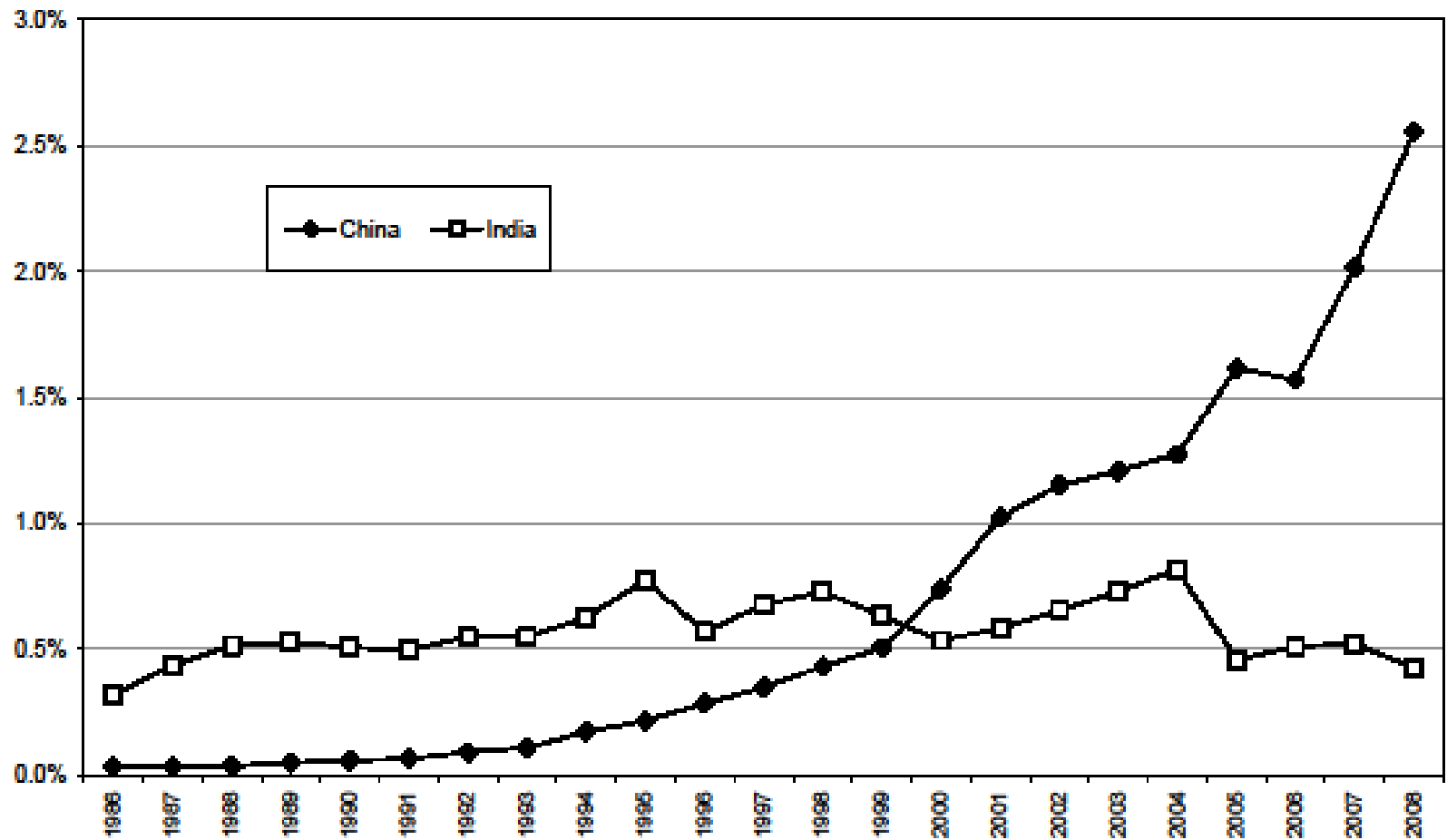
- An interesting contrast: income tax in India and China
- Income tax started much earlier in India (1922), but remained a small elite tax until the present day
- In contrast, it very quickly became a mass tax in China; why ?
- This illustrates the different mechanisms: politics (limited democracy in China/limited political pressures by the rich to index the brackets; but income tax not very transparent), legal-fiscal-social modernization (limited fraction of formal wage labor in India, more difficult to generalize income taxation)
- See T. Piketty & N. Qian, « Income inequality and progressive income taxation in China and India: 1986-2015 », *AEJ* 2009 [\[article in pdf format\]](#)

Figure 4: The fraction of population subject to the income tax in China and India, 1986-2008



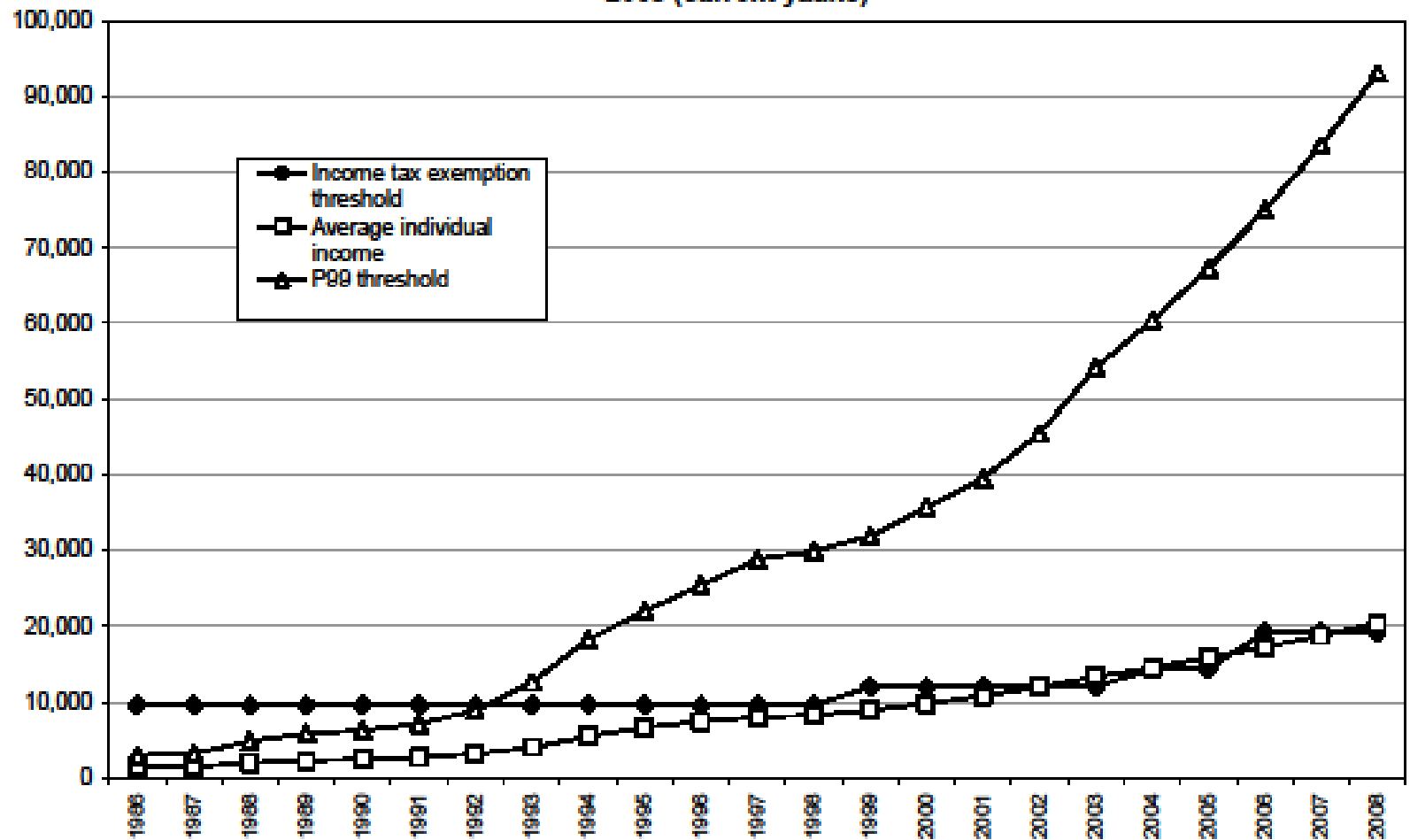
Source: China: authors' computations using household surveys tabulations (Data Appendix, Table A7, col. (16)); India: authors' computations using tax returns data (see Banerjee and Piketty (2004, Table A0, col.(4)))

Figure 5: Income tax revenues as a fraction of GDP in China and India, 1986-2008



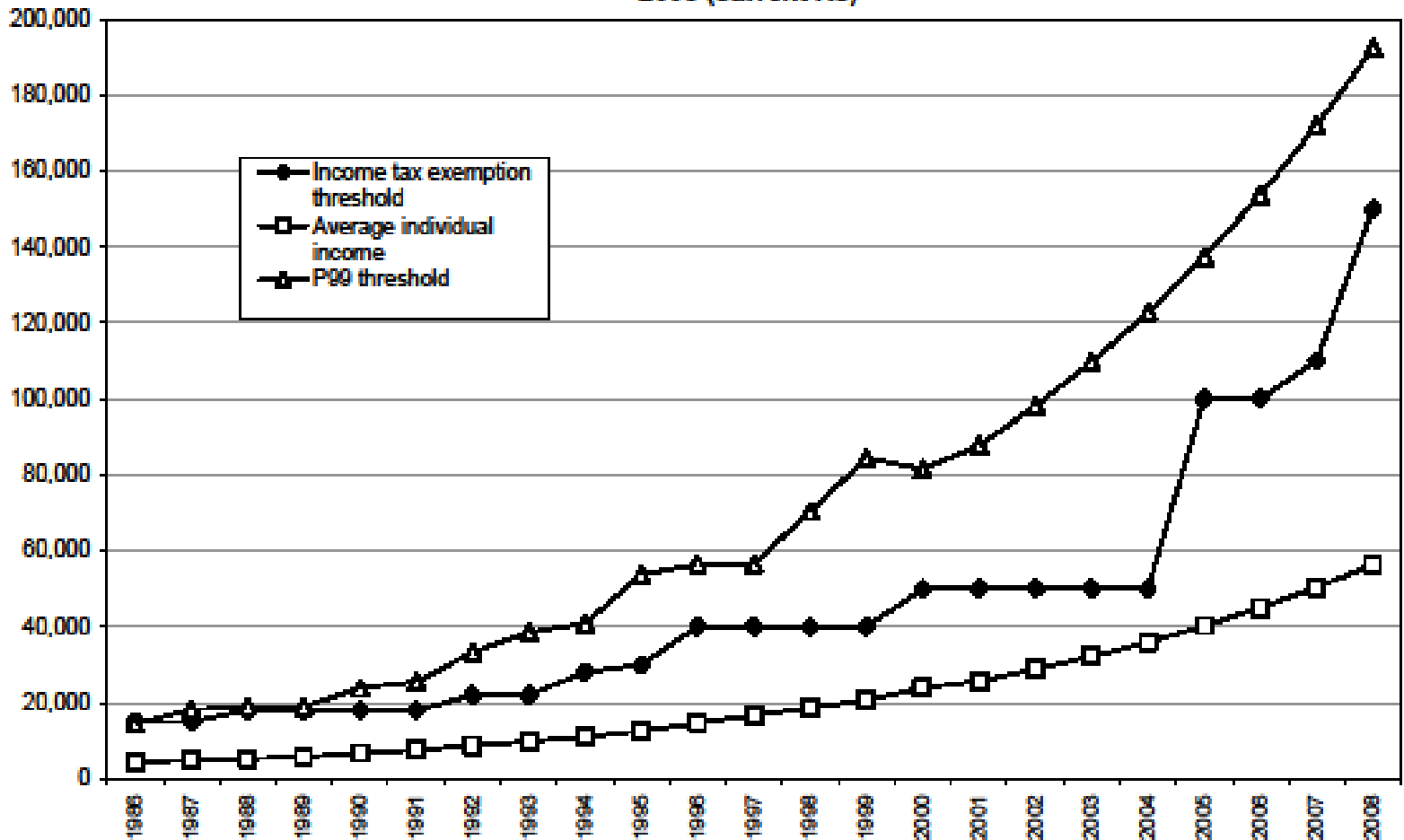
Source: China: authors' computations using tax receipts data and household survey tabulations (Data Appendix, Table A7, col.(15)); India: authors' computations using income tax returns data (Banerjee and Piketty (2004, Table A0))

Figure 2: Income tax exemption threshold, average income and P99 income threshold in China, 1986-2008 (current yuans)



Source: Exemption threshold: Chinese tax law (Data Appendix, Table 1); average Income and P99 threshold: authors' computations using household surveys tabulations (Data Appendix, Table A1, col. (10), and Table A4, col. (15))

Figure 3: Income tax exemption threshold, average income and P99 income threshold in India, 1986-2008 (current Rs)



Source: Exemption threshold: Indian tax law (see Data Appendix, Table 2); average income and P99 threshold: authors' computations using income tax returns (see Banerjee and Piketty (2004, Table A0, col. (7), and Table A1, col. (9))