

## Lecture 4b: Taxation and income distribution II

Economics 336/337

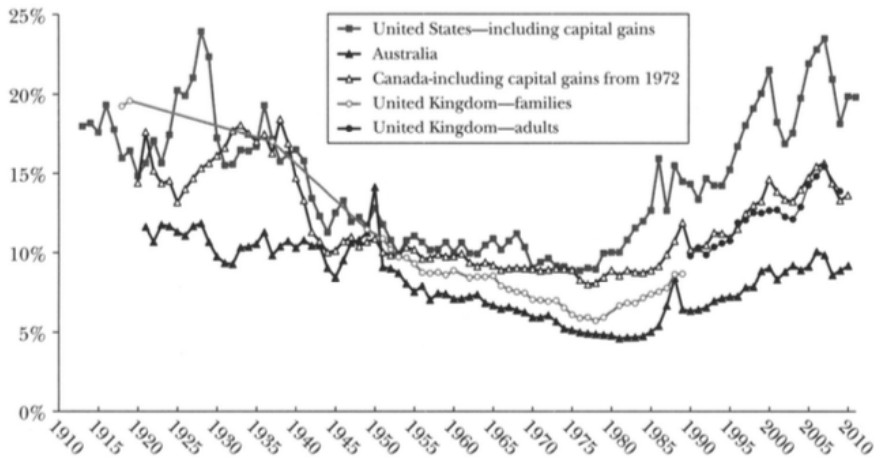
In recent years we have been increasingly aware that changes in income distribution are concentrated at the top of the distribution – the “one percent”.

This raises a number of questions

- what is happening, and what is causing it?
  - inequality trends
  - who are the 1%? 0.1%? etc.
  - structural economic changes
- should taxes on the rich rise?
  - requires a theory of optimal taxation
  - understand potential benefits and costs of tax increases at the top

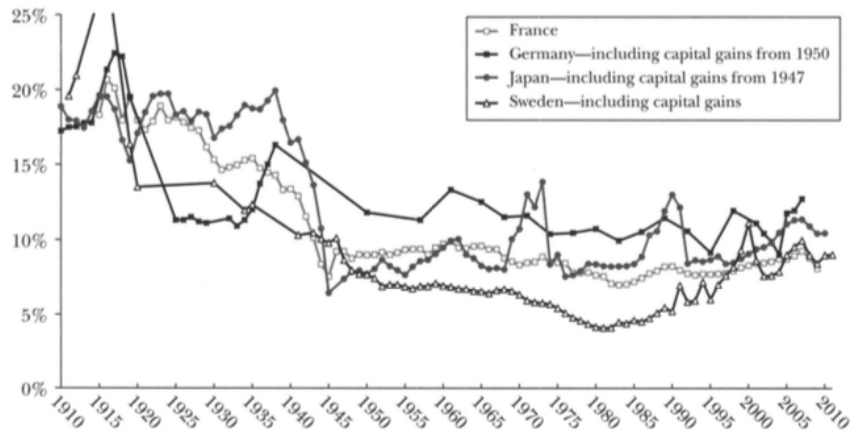
# Richer getting richer in “anglo” world

A: Top 1 Percent Income Shares in English-speaking Countries (U-Shape)



## ... and not elsewhere

B: Top 1 Percent Income Shares in Continental Europe and Japan (L-Shape)



Source: Atkinson et al. (2013)

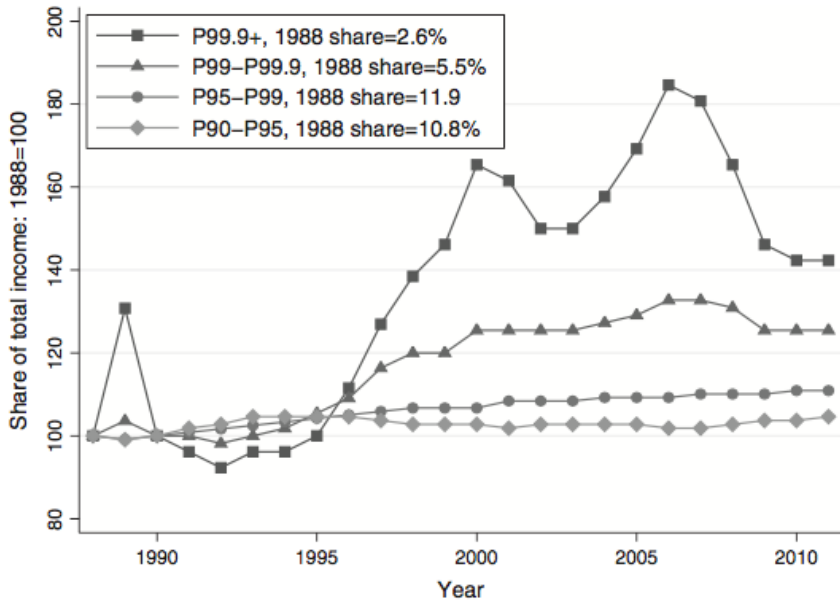
## What does it take to get into the top 1% top 0.1%?

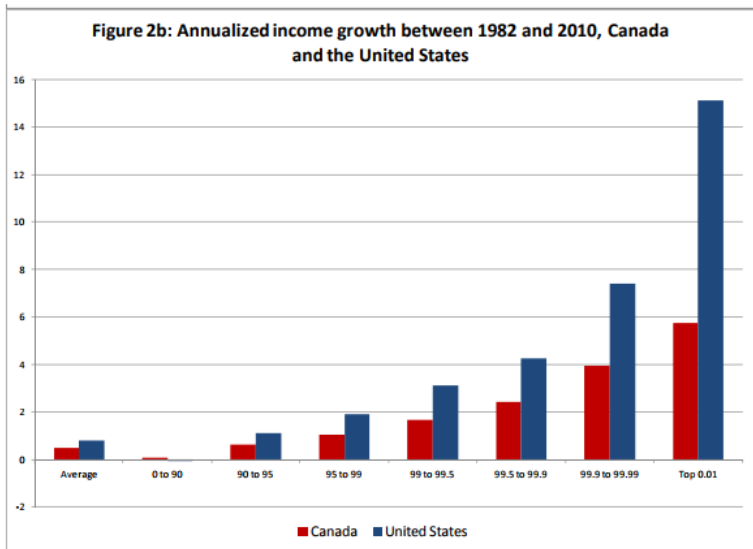
Table: Top income thresholds by country, 2014

| Fractile | Australia | Canada | US |
|----------|-----------|--------|----|
| p50      |           |        |    |
| p90      |           |        |    |
| p95      |           |        |    |
| p99      |           |        |    |
| p99.9    |           |        |    |
| p99.99   |           |        |    |

Note: Total income for tax purposes, 2014 CAD at PPP exchange rates.

Source: <http://wid.world>





Source: Lemieux and Riddell (2015)

This graph is sometimes called the “hockey stick” – why?

The top 1% are very rich – but by definition, it's not a lot of people!  
Should we care about the incomes of this very small group of very rich people?

- ① understanding broader economic changes
  - more than in the past, growth favours the rich – what has changed?
- ② politics of redistribution
  - economic and political consequences of the top surge?
- ③ revenue considerations
  - the rich are important source of revenue
    - Top 1% pay 21% of PIT revenues (top 0.1%: 7.5%)
  - the rich are hard to tax – their response to taxes appears much higher – better accountants?



## What factors might be causing the rise in top income inequality?

### 1 Quantity factors:

- 
- 
- 

### 2 Price factors:

- 
- 
-

Suppose we want to maximize tax revenue from top-bracket taxpayers (is this fair?), taking into account behavioural response. Solve for the optimal tax rate.

Let the top tax rate be  $\tau$ , on incomes above  $z^*$ . Revenues from the top bracket are

$$R(\tau) = \tau \times [z(1 - \tau) - z^*]$$

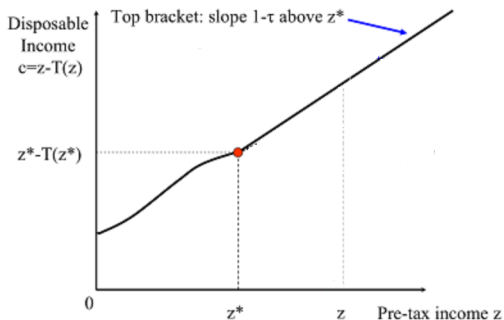
where  $z(1 - \tau)$  is average income in the bracket.

This is like our Laffer curve earlier – but a bit more complicated, because of the bracket threshold  $z^*$ . Now

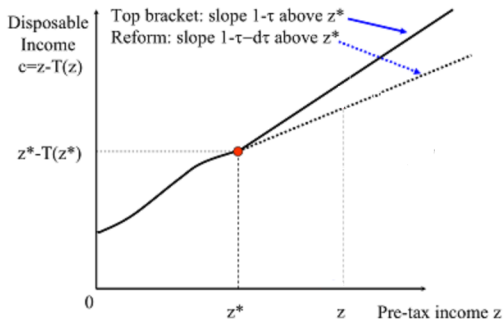
$$\frac{\partial R}{\partial \tau} = M + B = (z - z^*) - \frac{\tau}{1 - \tau} ez$$

The mechanical effect is smaller than before, because the tax rate increase applies only to incomes above  $z^*$ .

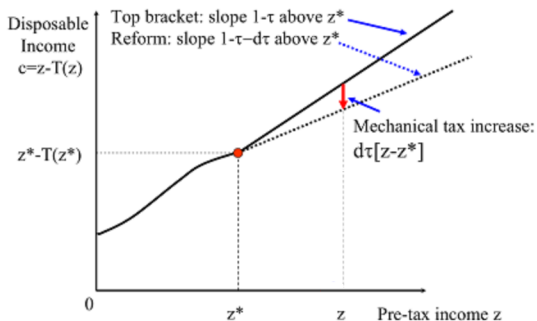
Next see a graphical derivation, based on Diamond and Saez (2011).



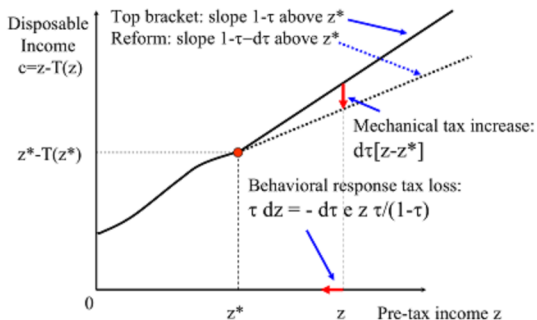
The graph of the taxpayer's budget constraint, with a constant MTR  $\tau$  on incomes above  $z^*$ .



Consider an increase in the tax rate above  $z^*$  from  $\tau$  to  $\tau + 1\%$ . The average income of taxpayers with incomes above  $z^*$  is  $z$ .



The rate increase  $d\tau$  causes a “mechanical” transfer of  $(z - z^*)/100$  from the average high-income taxpayer to government revenues.



The increase in MTR causes a behavioural response and decline in revenue on average equal to  $\tau \Delta z = -\tau e z / (1 - \tau)$  where

$$e = -\frac{\Delta z / z}{1 / (1 - \tau)}$$

is the elasticity of taxable income.

To maximize revenues from the top bracket, set the net gain to zero:

$$\frac{\partial R(\tau^*)}{\partial \tau} = (z - z^*) - ez \frac{\tau^*}{1 - \tau^*} = 0$$

Simplifying this first-order condition,

$$\tau^* = \frac{1}{1 + ae}$$

where

$$a = \frac{z}{z - z^*}$$

is the **Pareto parameter**, a measure of inequality (low  $a$  means high inequality).

So we have a formula for the revenue-maximizing tax rate as a function of inequality  $a$  and elasticity  $e$ . If  $a$  and  $e$  are known, we can find the optimal tax rate on the rich!

(Do you agree with this analysis? What hidden assumptions were required?)

Since 2010, Ottawa and many provinces have increased top income tax rates: Was this good policy? **What should be the top tax rate in Canada and each of the provinces?**

- Milligan and Smart (2015) estimated that for Canada  $e = 0.51$
- We can estimate  $a$  from 2010 tax return data.
- We can simulate the additional revenues from raising rates on the top one percent of taxpayers.

### Graded exercise

Fill out the missing entries in the following table.



Figure: Revenue simulations for Canadian provinces ( $e = 0.51$ )

| Province         | Top 1% Incomes     |                      | Pareto<br>a | Top<br>MTR<br>(%) | Effect of a 1% increase in MTR: |         |       | Rev Max<br>MTR<br>(%) |
|------------------|--------------------|----------------------|-------------|-------------------|---------------------------------|---------|-------|-----------------------|
|                  | Average<br>(\$000) | Threshold<br>(\$000) |             |                   | M                               | B       | Total |                       |
| Newfoundland     | 332.2              | 206.5                | 2.6         | 43.0              | 1257.0                          | -1279.7 | -22.7 | 42.6                  |
| PEI              | 229.2              | 156.4                | 3.1         | 46.9              |                                 |         |       |                       |
| Nova Scotia      | 299.3              | 176.0                | 2.4         | 49.4              |                                 |         |       |                       |
| New Brunswick    | 263.3              | 162.2                | 2.6         | 42.8              |                                 |         |       |                       |
| Quebec           | 357.2              | 184.6                | 2.1         | 47.7              |                                 |         |       |                       |
| Ontario          | 501.3              | 233.3                | 1.9         | 46.3              |                                 |         |       |                       |
| Manitoba         | 333.0              | 181.2                | 2.2         | 46.0              |                                 |         |       |                       |
| Saskatchewan     | 356.4              | 209.5                | 2.4         | 43.5              |                                 |         |       |                       |
| Alberta          | 739.9              | 325.3                | 1.8         | 39.0              |                                 |         |       |                       |
| British Columbia | 419.8              | 211.2                | 2.0         | 43.1              |                                 |         |       |                       |

# Key concepts

rise in top incomes

elasticity of taxable income

difference in difference estimator

mechanical and behavioural effect of tax change

optimal income tax rate