

Bargaining power and the incidence of income taxes on high earners in Canada

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Raising personal income tax rates on high earners

1. Attenuating/reversing effects of surge in top-end inequality
2. Revenue generation

Literature mainly focuses on revenue issues:

- How much revenue?
- Revenue-maximizing tax rate?

This paper: What is the *incidence* of increased taxes on high earners?

- Who bears the burden of higher taxes?

January 8, 2010 11:30 pm

Bankers escape bonus blow

By Patrick Jenkins and Megan Murphy

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City bankers will suffer little or no impact from the bonus supertax imposed by the government last month, according to a Financial Times poll of leading investment banks.

Most banks, polled in an anonymised survey, said they would absorb all or part of the cost of the one-off 50 per cent tax by inflating their bonus pools, even at the risk of irritating the government and their own shareholders.

The results chime with intelligence garnered by headhunters. “The tax is going to be 90 per cent absorbed by the banks,” said one senior recruitment consultant with clients in the City.

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How do high earners respond to tax increases?

Elasticity of taxable income: Tax base shrinks as tax rates increase

- Mechanism?

Labour supply responses:

- Reduce hours worked? Seems implausible: Osberg (2015)
- Leave the (Canadian) market? Migration flows are small: Finnie (2001) (*inter alia*)

Tax avoidance:

- Wolfson, Veall, Brooks and Murphy (2016)

High earners have bargaining power

Threat to accept higher-paying position in US doesn't have to be carried out to be credible

Threat is more credible for anglophones

- Top-end income concentration muted among Quebec francophones: Saez and Veall (2005)
- An 'anglosphere' phenomenon: Atkinson and Leigh (2010)

Fortin, Green, Lemieux, Milligan and Riddell (2012):

Because top income earners are such a diverse group, it is hard to come up with a simple explanation for the growing incomes at the top end. A reasonable candidate explanation is that, like hockey teams, Canadian corporations have little choice but to pay higher and higher salaries to keep their "top players," who would otherwise be lured away by the ever-growing salaries across the border.

Bargaining power and the brain drain threat

Increase in US top-end salaries:

- ⇒ Widening gap between US and Canadian top-end salaries
- ⇒ Credible threat to emigrate to take advantage of higher US salaries
- ⇒ Increase in Canadian top-end salaries

Depreciation of the Canadian dollar:

- ⇒ Widening gap between US and Canadian top-end salaries expressed in CAD
- ⇒ Credible threat to emigrate to take advantage of higher US salaries
- ⇒ Increase in Canadian top-end salaries

Bargaining power, the brain drain threat and taxes

Decrease in US top marginal personal income tax rate

- ⇒ Widening gap between US and Canadian after-tax top-end salaries
- ⇒ Credible threat to emigrate to take advantage of higher US salaries
- ⇒ Increase in Canadian top-end salaries

Increase in Canadian top marginal personal income tax rate

- ⇒ Widening gap between US and Canadian after-tax top-end salaries
- ⇒ Credible threat to emigrate to take advantage of higher US salaries
- ⇒ Increase in Canadian top-end salaries

A salary arbitrage condition

$$\begin{array}{ccc} \text{Canadian after-tax salaries} & = & \text{US after-tax salaries} \\ \text{(expressed in Canadian dollars)} & & \text{(expressed in Canadian dollars)} \end{array}$$

The model

- P1* Canadian high earners can credibly use the salaries on offer in the US as leverage to bargain for pay increases.
- P2* Canadian high earners are able to make use of tax avoidance strategies to shelter a portion of their income from taxation.

A formalized version of the arbitrage condition

$$(1 - \tau)Y = (1 - \tau^*)SY^* \quad \Rightarrow \quad Y = \left(\frac{1 - \tau^*}{1 - \tau} \right) SY^* \quad (1)$$

- Y is the Canadian salary expressed in Canadian dollars
- τ is the Canadian tax rate
- Y^* is the comparable US salary expressed in US dollars
- τ^* is the US tax rate
- S is the Canada-US exchange rate (the Canadian dollar price of a US dollar)

A weakened form of the arbitrage condition

$$Y = e^{\alpha} \left[\left(\frac{1 - \tau^*}{1 - \tau} \right) SY^* \right]^{\beta} \quad (2)$$

β is interpreted as a measure of bargaining power:

- $\beta = 1 \Rightarrow$ Canadian salaries move in proportion with tax-adjusted and exchange rate-adjusted US salaries

The effect of higher taxes on salaries

$$\frac{d \log[Y]}{d \log[1 - \tau]} = -\beta \quad \Leftrightarrow \quad \frac{dY}{d\tau} = \beta \frac{Y}{1 - \tau}$$

⇒ Higher taxes widens gap between US and Canadian after-tax top-end salaries

⇒ Credible threat to emigrate to take advantage of higher US salaries

⇒ Increase in Canadian top-end salaries

Size of increase depends on bargaining power parameter β

Tax avoidance

Suppose that high earners can shield a fraction θ of income from personal income tax, at cost $c(\theta)Y$.

After-tax income:

$$D = Y - \tau(1 - \theta)Y - c(\theta)Y \quad (3)$$

FOC for a maximum:

$$\frac{dD}{d\theta} = \tau Y - \frac{dc}{d\theta}Y = 0 \quad \Rightarrow \quad \frac{dc}{d\theta} = \tau \quad (4)$$

High earners set θ so marginal benefit from sheltering income (τ) is equal to marginal cost.

Benefits > costs if

$$\begin{aligned} & \{Y - \tau(1 - \theta)Y - c(\theta)Y\} - \{Y - \tau Y\} > 0 \\ \Rightarrow & Y(\tau\theta - c(\theta)) > 0 \end{aligned} \quad (5)$$

Elasticity of taxable income

Suppose

$$(1 - \tilde{\theta}(\tau)) \simeq \kappa(1 - \tau)^\gamma \quad (6)$$

Then elasticity of taxable income is

$$e = \gamma - \beta \quad (7)$$

Revenue-maximizing tax rate:

$$\hat{\tau} = \frac{1}{1 + \gamma - \beta} \equiv \frac{1}{1 + e} \quad (8)$$

Decomposing the reduced form parameter e into its bargaining power and tax avoidance structural components does not affect revenues analysis.

Estimating bargaining power

For given Canadian income, US reference is income at same point of the income distribution:

$$\log \left[\frac{Y_t^{(p)}}{P_t} \right] = \alpha + \beta \log \left[\left(\frac{1 - \tau_t^*}{1 - \tau_t} \right) \left(\frac{S_t Y_t^{(p)*}}{P_t} \right) \right] + \varepsilon_t \quad (9)$$

- P is the CPI

Up until 2006, LHS and RHS trended upward

⇒ Spurious regression problem

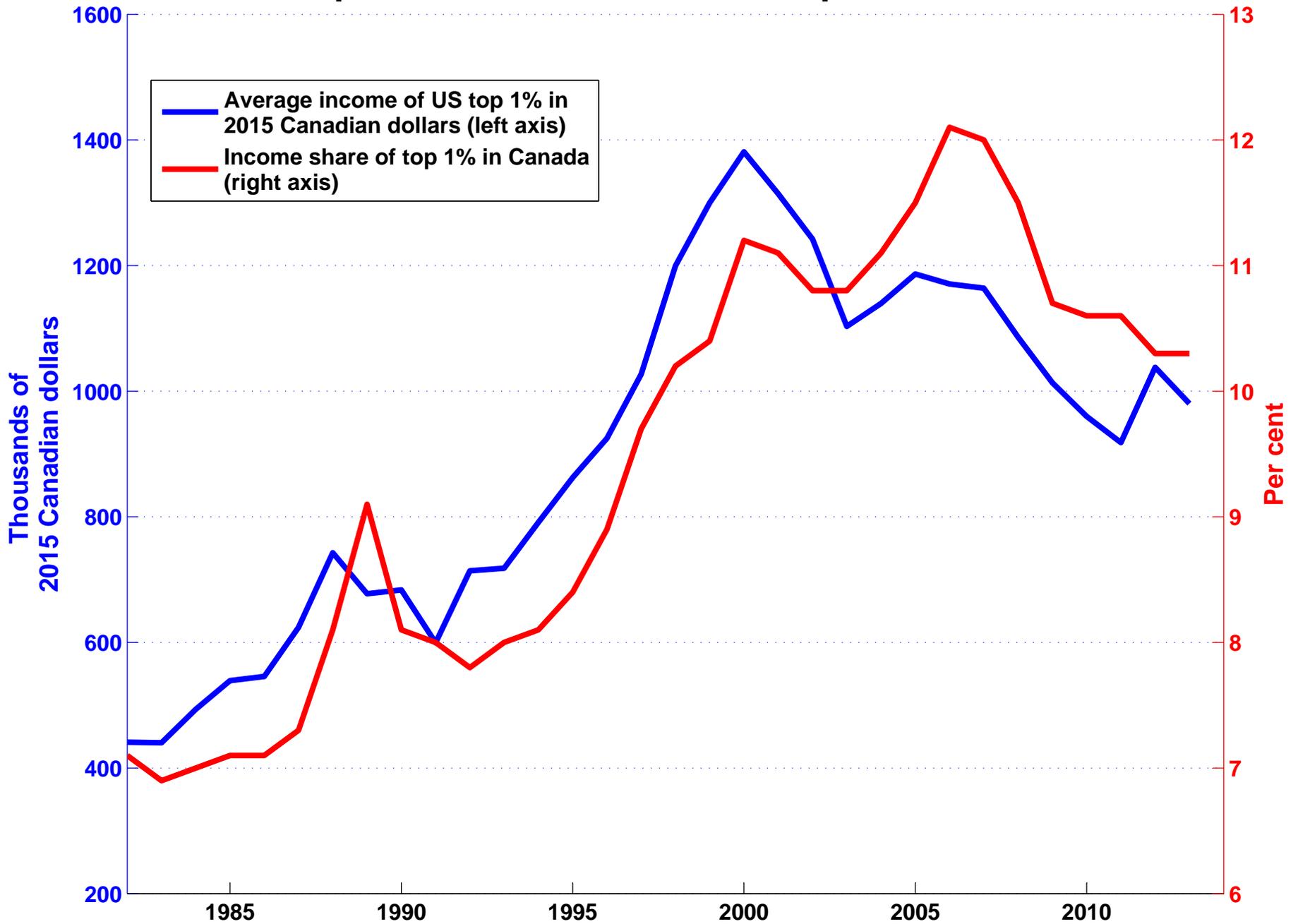
Trends changed post 2006:

- Depreciation of CAD → appreciation

- Leveling-off of US top incomes

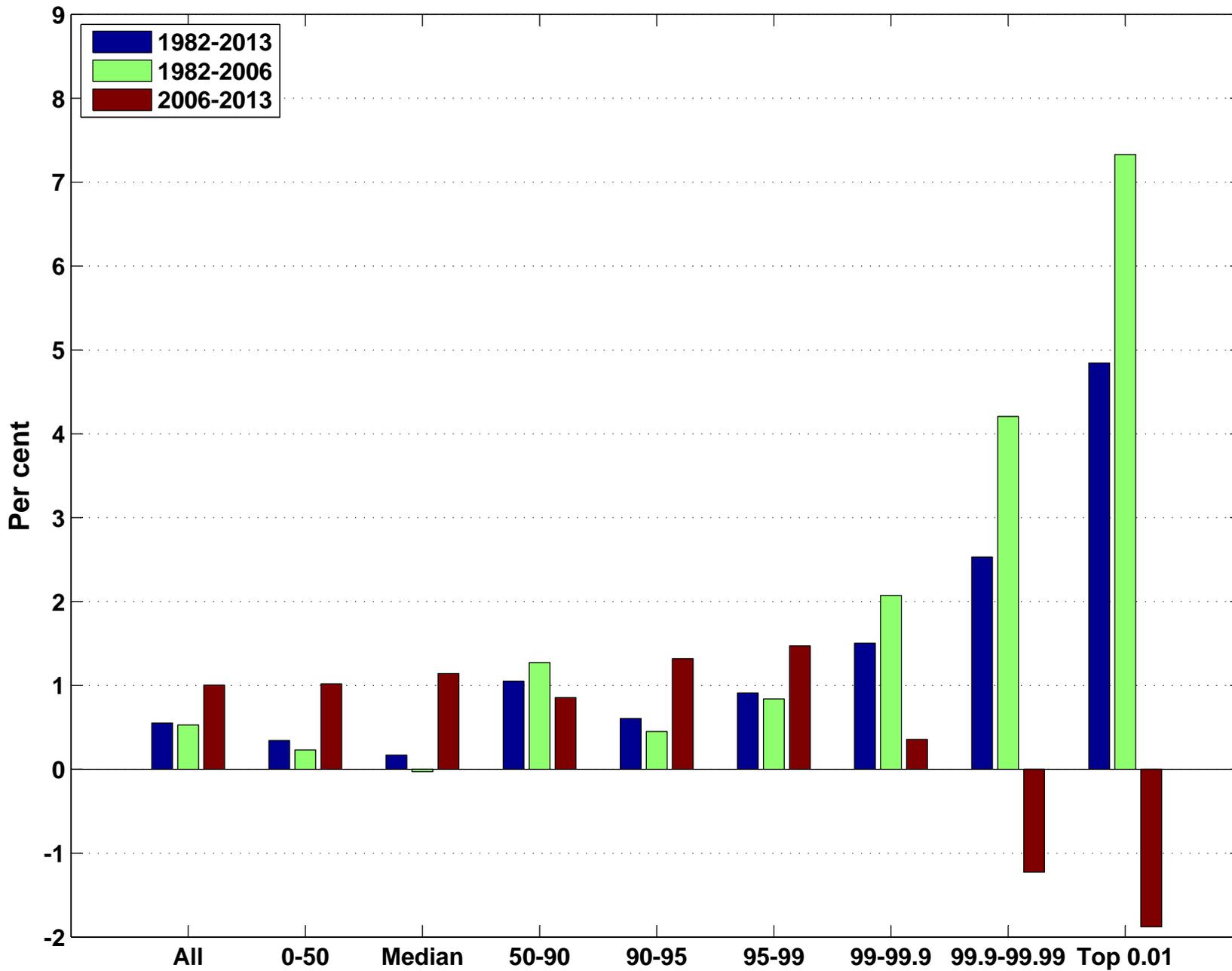
⇒ Potential for identification of bargaining power

US top incomes and Canadian top income shares



Average annual real income growth by fractiles

Total income



Data source: Cansim Tables 204-0001, 326-0021

Estimates of bargaining power: Fractiles

Table 1: Estimates for bargaining power coefficients, by income fractile

Fractile	Current US incomes on RHS		Lagged US incomes on RHS	
	With taxes	Without taxes	With taxes	Without taxes
0.9999 - 1.0	0.703 [0.84]	0.752 [0.86]	0.726 [0.90]	0.749 [0.91]
0.9990 - 1.0	0.666 [0.80]	0.733 [0.85]	0.698 [0.87]	0.736 [0.91]
0.9990 - 0.9999	0.645 [0.73]	0.727 [0.80]	0.685 [0.80]	0.735 [0.86]
0.9900 - 1.0	0.543 [0.68]	0.616 [0.75]	0.585 [0.77]	0.630 [0.82]
0.9500 - 1.0	0.403 [0.49]	0.466 [0.55]	0.453 [0.58]	0.494 [0.65]
0.9000 - 1.0	0.323 [0.37]	0.376 [0.42]	0.373 [0.46]	0.410 [0.51]
0.9500 - 0.9900	0.211 [0.17]	0.249 [0.20]	0.256 [0.23]	0.289 [0.28]
0.9000 - 0.9500	0.036 [0.01]	0.052 [0.01]	0.071 [0.03]	0.097 [0.05]

Note: R^2 in brackets

Estimates of bargaining power: Percentiles

Table 2: Estimates for bargaining power coefficients, by income percentile

Percentile	Current US incomes on RHS		Lagged US incomes on RHS	
	With taxes	Without taxes	With taxes	Without taxes
0.9999	0.671 [0.81]	0.734 [0.86]	0.703 [0.88]	0.735 [0.91]
0.9990	0.561 [0.68]	0.639 [0.75]	0.599 [0.76]	0.646 [0.81]
0.9950	0.409 [0.50]	0.483 [0.58]	0.455 [0.58]	0.505 [0.66]
0.9900	0.341 [0.38]	0.401 [0.44]	0.392 [0.47]	0.433 [0.54]
0.9500	0.106 [0.05]	0.131 [0.07]	0.144 [0.09]	0.172 [0.12]
0.9000	-0.027 [0.00]	-0.011 [0.00]	0.005 [0.00]	0.034 [0.01]

Note: R^2 in brackets

Tax avoidance: Back-of-envelope estimates

Table 3: Back-of-envelope estimates for θ , by top income fractile

	Top 10%	Top 5%	Top 1%	Top 0.1%	Top 0.01%
After-tax income (Wolfson <i>et al</i> , 2016)	118 100	159 800	359 900	1 328 700	4 690 600
Implied average tax rate (Cansim)	0.2519	0.2754	0.3202	0.3391	0.3278
Implied 'gross' income	158 000	221 000	529 000	2 010 000	6 978 000
'Sheltered' income (Wolfson <i>et al</i> , 2016)	18 900	35 900	140 300	729 300	3 338 700
Implied 'total' income	176 900	256 900	669 300	2 739 300	10 316 700
$\hat{\theta}$	0.11	0.14	0.21	0.27	0.32

Tax incidence

$$\frac{dD}{d\tau} = Y [\beta + \theta - 1] + \frac{\beta}{1 - \tau} [Y (\tau\theta - c(\theta))] + \frac{d\theta}{d\tau} Y [\tau - c'(\theta)] \quad (10)$$

From FOC (4), $Y[\tau\theta - c(\theta)] = 0$.

- Sensitivity of θ w.r.t τ affects revenues
- Doesn't affect incidence
 - At margin, are indifferent between paying extra taxes and incurring extra costs of sheltering income.

Tax incidence: A sufficient condition

$$\frac{dD}{d\tau} = Y [\beta + \theta - 1] + \frac{\beta}{1 - \tau} [Y (\tau\theta - c(\theta))] \quad (11)$$

This is not always negative! Higher taxes will *increase* after-tax incomes if

$$\frac{dD}{d\tau} = Y [\beta + \theta - 1] + \frac{\beta}{1 - \tau} [Y (\tau\theta - c(\theta))] > 0 \quad (12)$$

From (5), $[Y (\tau\theta - c(\theta))]$ represents gains from tax avoidance, and must be non-negative.

A sufficient condition:

$$\beta + \theta > 1 \quad \Rightarrow \quad \frac{dD}{d\tau} > 0 \quad (13)$$

Tax incidence: Interpreting the sufficient condition

$$\beta + \theta > 1 \quad \Rightarrow \quad \frac{dD}{d\tau} > 0 \quad (13)$$

If high earners

- have a sufficiently strong bargaining power β and
- are able to shelter a sufficiently large share of income θ from income tax

then a tax increase will *increase* after-tax incomes.

If higher top-end taxes increase government revenues, net effect will be to *widen* after-tax inequality:

- Top-end after-tax incomes will be unaffected (or increased)
- Economic incidence of new tax passed down to the lower part of the income distribution.

Tax incidence: A first pass

From Tables 1 and 3:

Table 4: Bargaining and tax avoidance coefficients for top income fractiles

Fractile	$\hat{\beta}$	$\hat{\theta}$	$(\hat{\beta} + \hat{\theta})$
Top 0.01%	0.70	0.32	1.02
Top 0.1%	0.67	0.27	0.94
Top 1%	0.54	0.21	0.75
Top 5%	0.40	0.14	0.54
Top 10%	0.32	0.11	0.43

Conclusion

This is a very rough first pass at the question of the incidence of increased taxes on high earners:

- Simple, two-parameter model, one for each behavioural response
- Not-particularly-sophisticated econometrics

Surprising result: Incidence of tax increase on high earners close to zero, and may even be negative.

- Higher taxes \Rightarrow **increase** in after-tax income concentration

Probably worth taking a second pass at the problem.