The Growth Effects of Corporate & Personal Taxes in the OECD

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Overview

- *"Higher tax rates reduce GDP growth"*: remains a controversial view
- Theory supports *the possibility of* short- and longer-run effects
- Empirical evidence is mixed or 'fails to convince'
- Yet: at Tax/GDP = 1/3: for every $2 of private output $1 is taken in tax on average. And *at the margin*?

Overview

- Key recent distinctions are:
  - *Total* tax levels versus *some types* of tax
  - It matters what the taxes finance (spending, deficits?)
- Evidence would be more convincing if:
  - *International* tax dimensions recognised
  - *effective tax rate* measures used instead of tax *revenues*

This paper…

Main objectives:

1. Test impact of taxes on *long-run* growth at the aggregate level
2. Overcome two failings:
   - Include *international dimensions* for corporate taxes
   - Most studies use "*an aggregate average rate, or constructed marginal rate, that probably does not affect the rate that any particular economic decision maker is facing*" *(Myles, Report to the OECD, 2007, p.89).*
3. Identify which of *personal* or *corporate* taxes are more growth-retarding
4. Explain apparently *inconsistent findings* for corporate taxes – do higher rates raise or lower growth ?

Taxes in Growth Models

Question: How does fiscal policy affect long-term economic growth?

- Mainly closed economy models
- New Neoclassical
  - Taxes affect income *growth* in the short-run & income *levels* in the long-run
  - But tax may affect growth over ´long transitions´ (several decades)
- Endogenous Growth models
  - Permanent growth effects; no diminishing returns to public-plus-private capital

⇒ Emerging concensus that tax-growth effects are possible over many years (decades?)

- What about small *open* economies?

Taxes in Open-Economy Growth Models

- Small open economy with *mobile capital* but *immobile human capital (Barro, Mankiw & Sala-i-Martin, 1995)*
  - Growth affected by domestic tax rate (via after-tax MP_K) and foreign (world) rate of return
- Different countries tax 'foreign returns' differently: e.g.
  - double tax agreements
  - extent of relief for tax paid abroad (tax *credit/exemption/deduction*)
- Relevant tax rates for MNCs differ for:
  - marginal investment: effective *marginal* (EMTR)
  - investment or headquarters *location*: effective *average* (EATR)
  - declared profit: *statutory* tax rate

Taxing foreign income

- Effective tax rate on foreign income differs depending on the foreign tax relief system - *most OECD use tax credits*
  - **Tax credits**:

Foreign taxes paid may be deducted from domestic tax liabilities

  - **Tax exemptions**:

Foreign-sourced income is exempt from domestic tax or is taxed only on repatriation

  - **Tax deductions**:

Foreign taxes paid are treated as a 'business cost' to be deducted from domestic *profit* (rather than from domestic *tax liability*)

Taxing foreign income of parents and subsidiaries

t = statutory rate ; τ = 'effective' or 'final' rate

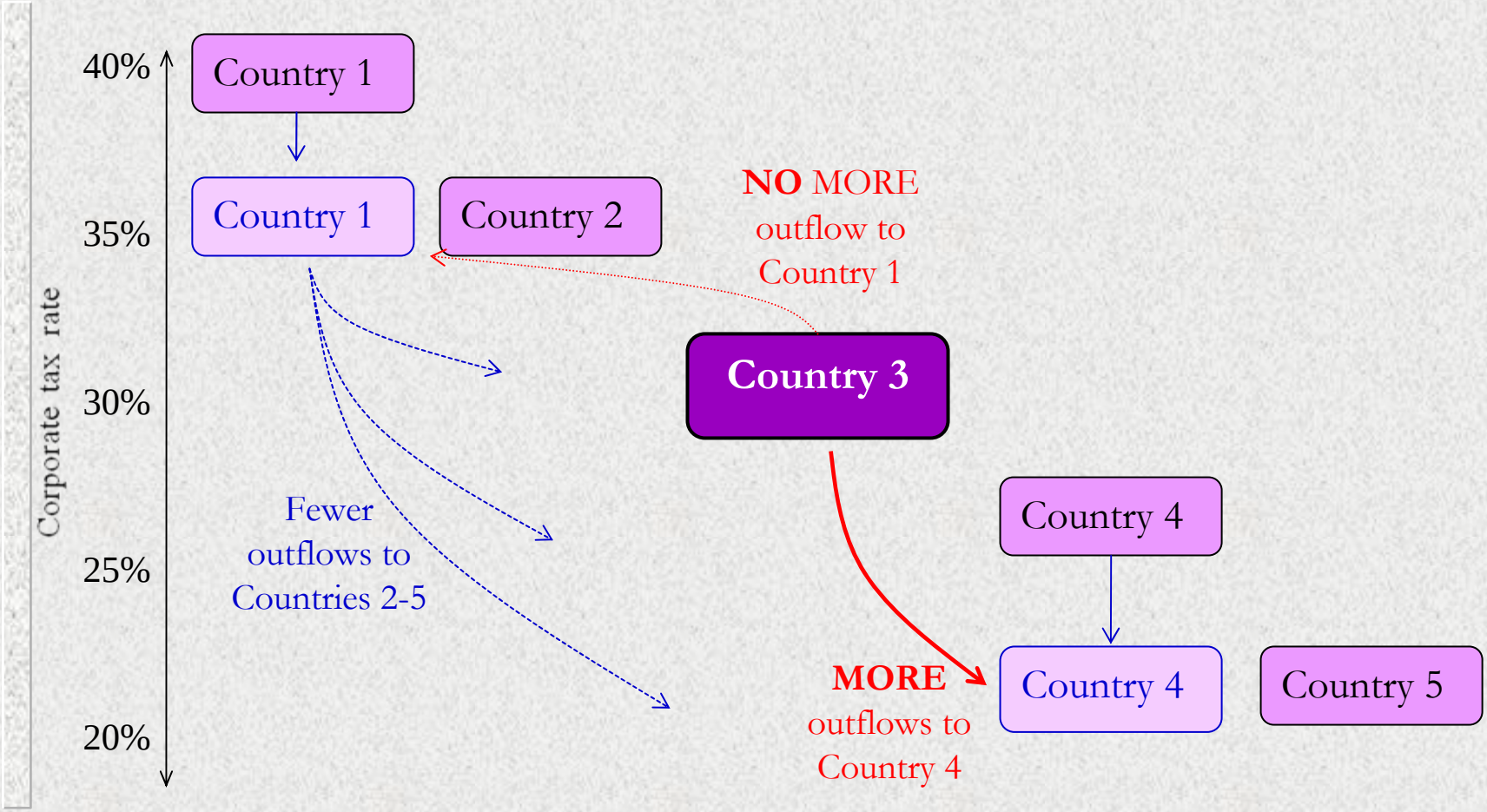
p = parent ; *s = subsidiary*

	Tax credit	Tax exemption	Tax deduction
parent:	$\tau_p = t_p$	$\tau_p = t_p$	$\tau_p = t_p$
subsidiary:	$\tau_s = max.[t_p, t_s]$	$\tau_s = t_s$	$\tau_s = t_s + t_p(1 - t_s)$

Asymmetric

Symmetric

International Flows with Tax Credits



Which tax rates affect growth?

- Relevant tax rates - those that influence economic decisions:

  Corporate: statutory; EMTRs EATRs ; *domestic* & *foreign*

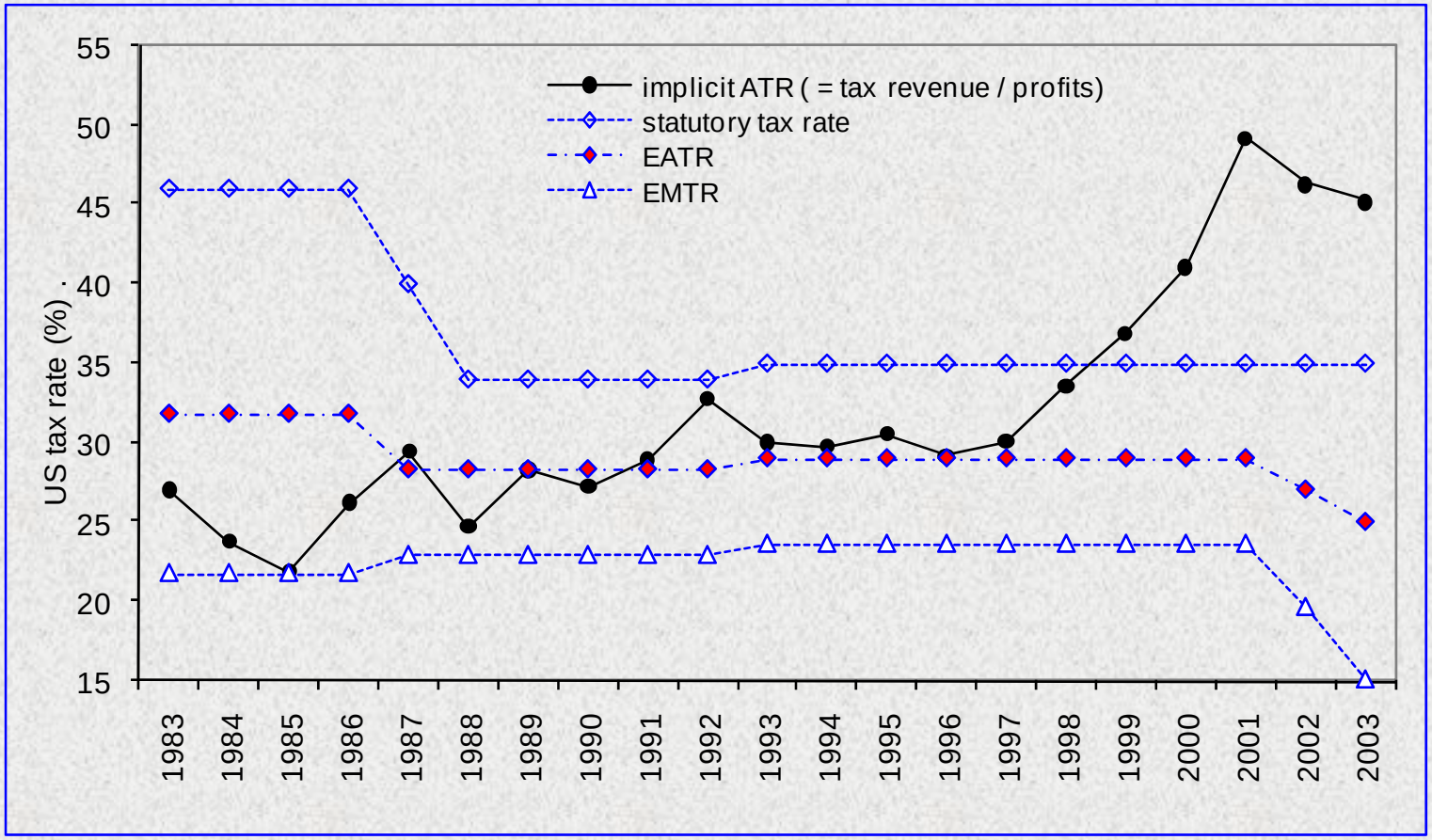
  Personal: (top) marginal rate on different income sources: domestic

  (& *foreign …for New Zealand?)*

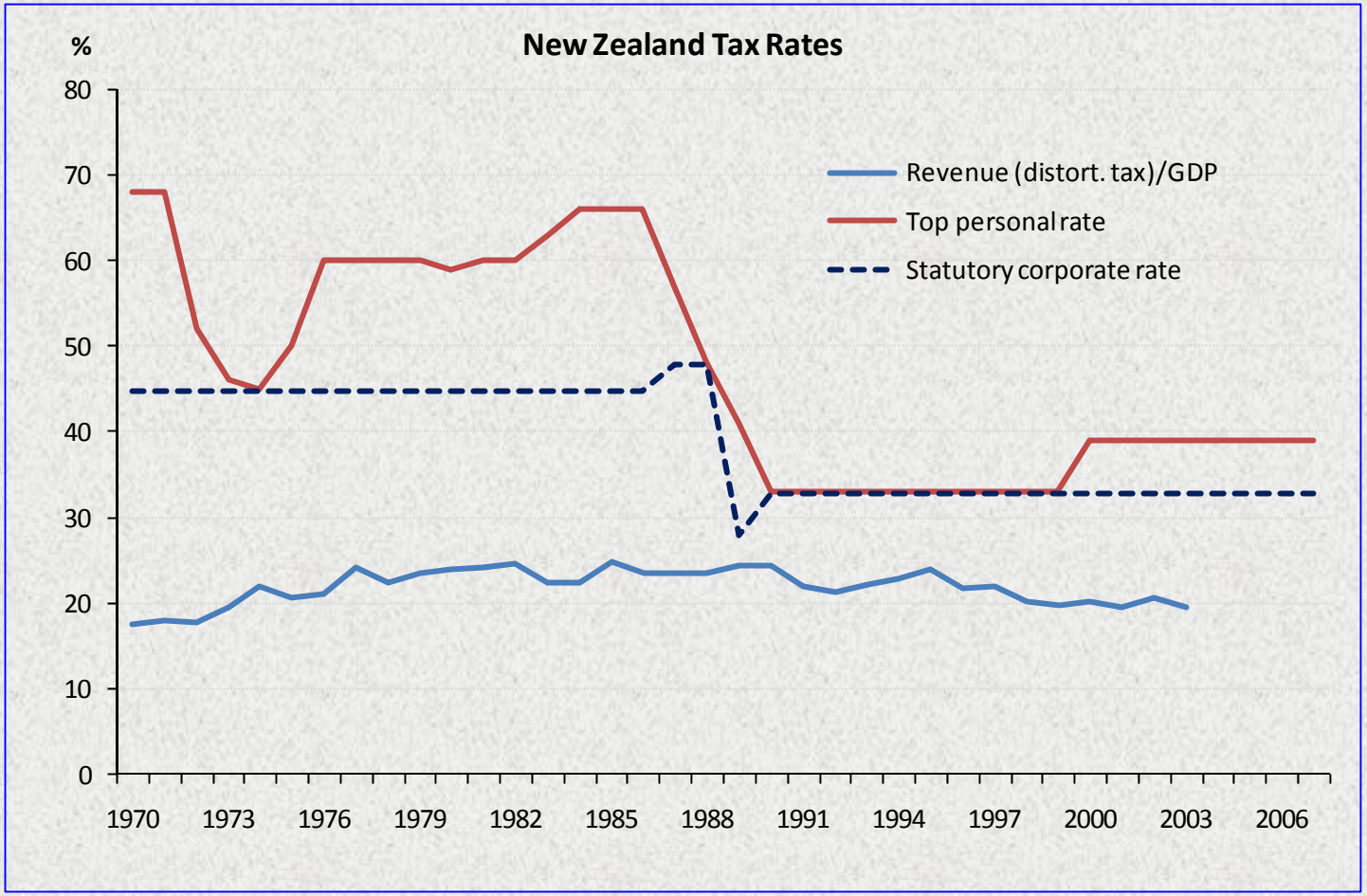
- For corporate tax: need to recognise asymmetric growth effect of 'high tax' and 'low tax' competitor countries
- Most studies: use Revenue/GDP or Revenue/Base

  = Implicit average tax rate (IATR) - for different taxes
- But: tax revenue & base include responses to changes in tax rates; and revenues change even when there are no tax rate changes
- Different tax rates can look very different … e.g. USA, NZ

Comparing corporate tax rates: USA



Personal & corporate tax rate: New Zealand



Results Summary

- High (top?) personal tax rates are growth-retarding
- High domestic corporate tax rates are growth-retarding and may be larger than personal tax effects
- Foreign corporate tax rates are important; especially changes in 'lower tax' countries
- Being left behind in the trend towards lower corporate rates will likely harm growth but joining the trend will be approximately growth-neutral.

Now… sleeeep *!*

Regression analysis

Regressions need to include:

- Domestic corporate tax rates (statutory, EMTR, EATR)
- Foreign corporate tax rates:
  - Weighted average of 'competitor countries' rates
  - Weight by GDP, distance, none (equal)
- *Asymmetry* implies different response of investment & profit flows to country *i* if higher or lower corporate tax rates in *j*

⇒ Construct 'above' & 'below' weighted averages

- If *j* is 'below': lower corp tax rate reduces growth in *i* (positive sign)
- If *j* is 'above': lower corp tax rate has no (small?) effect on growth in *i*
- If *i* lowers its corporate rate, this raises *i*'s growth (negative sign)

Some methodology …

- Are international corporate tax rates jointly determined? (Devereux et al.)
- Controlling for 'other things':
  - government budget constraint
  - fiscal effects occur partly via investment
  - we control for private investment, labour and human capital growth
- Econometric methods & endogeneity
  - Pooled Mean Group (PMG)
    - dynamic panel regressions
    - parameters: heterogeneous short-run; homogeneous long-run
  - Instrumental variables & 'other countries weighted averages'
  - Annual data: 1970s to 2004 (EMTRs/EATRs: 1980-2004)
  - 17 OECD countries, incl. NZ (12 for EMTRs/EATRs; excl. NZ)

Results: Preliminaries

Abbreviations:

P_i – top	Top personal rate
C_i – stat	Statutory corp rate
C_j – stat-H	Average of 'Higher' stat corp rate
C_j – stat-L	Average of 'Lower' stat corp rate
C_i – eff	Effective corp tax rate (marginal or average)

Control variables

- Fiscal:
  - 'productive' public spending
  - 'distortionary' tax IATR
  - Budget surplus
- Private investment, labour and human capital growth
- Does tax operate through investment/labour or productivity?

Results: long-run parameters - *statutory tax rates*

Makes no difference

Regression No.:	**[3]**	**[4]**	**[5]**	**[6]**	**[4']**	**[4"]**	**[7]**	**[8]**
Comment:	*Testing foreign corporate tax rate effects (Unweighted C_j-stat)*				*Using weighted C_j-stat: 'Distance'*	*'GDP'*	*Including IATRs*	*Endogenous C_i-stat ?*
Tax Rates:								
P_i-top	**-0.033**	**-0.031**	**-0.033**	**-0.022**	**-0.027**	**-0.024**	**-0.039**	**-0.022**
	(4.31)**	(4.51)**	(4.63)**	(3.34)**	(3.96)**	(3.47)**	(6.03)**	(2.99)**
C_i-stat	**-0.129**	**-0.130**	**-0.004**	**0.020**	**-0.035**	**-0.073**	**-0.130**	–
	(2.85)**	(3.28)**	(0.32)	(2.02)*	(2.39)**	(2.69)**	(3.44)**	
C_j-stat			**0.068**					
			(3.23)**					
C_j-stat-L	**0.225**	**0.223**			**0.074**	**0.117**	**0.231**	**0.072**
	(3.51)**	(3.84)**			(4.86)**	(3.47)**	(4.20)**	(1.94)
C_j-stat-H	**-0.001**							**-0.025**
	(0.05)							(0.91)
'Fiscal Controls':								
Productive Expend.	0.076	0.081	0.081	0.084	0.071	0.094	0.158	0.052
	(2.12)*	(2.51)*	(2.23)*	(2.18)*	(2.34)**	(2.81)**	(6.35)**	(1.18)
Budget Surplus	0.150	0.146	0.132	0.125	0.136	0.147	0.099	0.103
	(5.28)**	(5.24)**	(4.67)**	(4.27)**	(4.95)**	(5.37)**	(3.50)**	(3.37)**
Distort. Tax IATR							**-0.208**	
							(6.64)**	
Observations	420	420	420	420	420	420	420	

For control variable results & regressions [1] &[2]: see paper

Results: long-run parameters - *effective tax rates*

Regression No.:	(1)	(2)	(3)	(4)	(5)	(6)
Effective tax rate:	*EATR bc*	*EATR bc*	*EATR bc*	*EATR vi*	*EMTR bc*	*EMTR vi*
Tax Rates:	*bc = 'base case' ; vi = 'variable inflation' case*					
P_i-top	**-0.021**	**-0.032**	**-0.034**	**-0.025**	**-0.028**	**-0.022**
	(3.22)**	(4.49)**	(4.85)**	(3.58)**	(3.94)**	(2.69)**
C_i-eff	**-0.056**	**-0.068**	**-0.052**	**-0.116**	**0.010**	**-0.143**
	(1.64)**	(2.18)**	(1.60)	(3.68)**	(0.94)*	(4.84)**
C_j-eff						
C_j-eff-L	**0.160**	**0.183**	**0.195**	**0.241**	**0.052**	**0.285**
	(2.88)**	(3.71)**	(3.78)**	(5.00)**	(2.27)*	(6.20)**
C_j-eff-H	**-0.006**					
	(0.19)					
'Fiscal Controls':						
Productive Expend.	0.064	0.082	0.081	0.062	0.096	0.094
	(2.33)*	(3.74)**	(3.17)*	(2.49)*	(3.98)*	(4.00)**
Budget Surplus	0.072	0.113	0.073	0.064	0.157	0.146
	(2.75)**	(3.91)**	(2.42)**	(2.13)**	(5.41)**	(4.50)**
Distort. Tax IATR			**-0.024**			
			(0.63)			
Observations	279	279	279	270	279	270

Table 3 Instrumental Variable Regressions

Regression No.:	**[4]**	**(IV1)**	**(IV2)**	**(IV3)**
Tax Rates:	*Using PMG*	*Using IV methods*		
P_i-top	**-0.031**	**-0.018**	**-0.018**	**-0.012**
	(4.51)**	(6.03)**	(2.92)**	(3.73)**
C_i-stat	**-0.130**	**-0.049**	**-0.161**	
	(3.28)**	(2.43)**	(2.40)*	
C_j-stat-L	**0.223**	**0.087**	**0.217**	**0.049**
	(3.84)**	(2.90)**	(2.12)*	(2.77)**
C_j-stat-H	Previous regression			**-0.034**
				(2.66)**
'Fiscal Controls':				
Productive Expend.	0.081	0.087	0.001	0.047
	(2.51)*	(3.67)**	(0.03)	(1.89)
Budget Surplus	0.146	-0.035	-0.088	-0.045
	(5.24)**	(1.78)	(3.02)**	(2.30)*
Observations	420	405	382	405

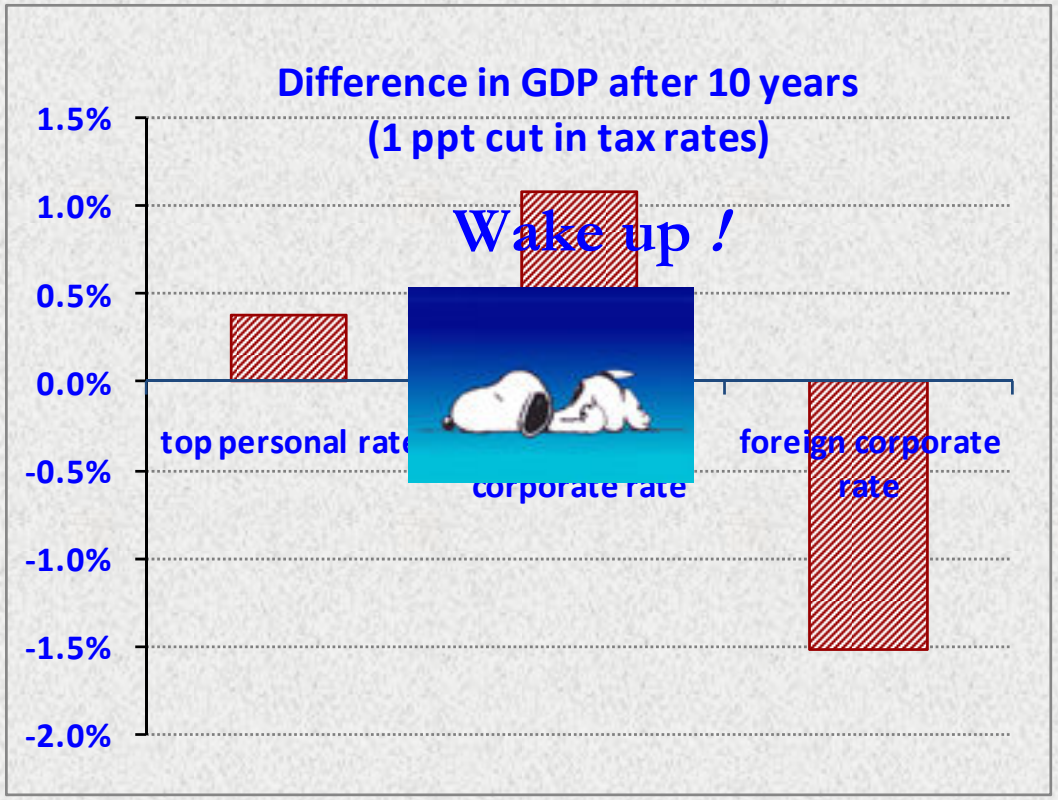
Taxes and Productivity

- Initial regressions: apparent interaction (conflict?) between fiscal and production function variables
- Construct TFP series using residuals from 'control variable only' regression (Table 1, regression ([1])
- Explain 'residual growth' : GDP growth net of impacts from investment, labour force and human capital growth.
- Results: 'residual growth' regressions $\Rightarrow$ *similar personal and corporate tax effects*

'Residual Growth' Regressions

Regression No.:	**[i]**	**[ii]**	**[iii]**	**[iv]**
Method:	PMG	IV	PMG	IV
Tax Rates:				
P_i-top	**-0.012**	**-0.018**	**-0.013**	**-0.020**
	(2.51)**	(3.14)**	(3.03)**	(3.34)**
C_i-stat	**-0.049**	**-0.116**	**-0.031**	**-0.113**
	(1.59)	(2.42)**	(1.04)	(2.12)*
C_j-stat-L	**0.083**	**0.118**	**0.053**	**0.179**
	(1.85)*	(2.64)**	(1.23)	(2.34)*
'Fiscal Controls':				
Productive Expenditure	0.032	0.054	0.063	0.076
	(1.13)	(1.55)	(2.28)*	(1.69)
Budget Surplus	0.052	-0.034	0.045	-0.004
	(2.54)*	(1.08)	(2.28)*	(0.13)
Distortionary Tax IATR			-0.106	-0.094
			(4.06)**	(2.76)**
Observations	417	381	417	381

Effects on GDP Levels?



Annual GDP growth (without tax changes) = 1.5%

Conclusions

- Higher (top?) personal tax rates are growth-retarding
- Higher domestic corporate tax rates are growth-retarding and may be larger than personal tax effects
- Recognising changes in foreign corporate tax rates is important – where competitor tax rates are *lower*
- Being left behind in the trend towards lower corporate rates will likely harm growth but joining the trend will be approximately growth-neutral.
- **New Zealand ?**
  - reduce top personal tax rates for *small* growth benefit ?
  - do other aspects of personal tax/transfer system matter? ... Migration ?
  - foreign corporate rate = 'trans-Tasman' or wider ?
  - what is the growth risk of being left behind if/when Australia acts ?