Tax Reform from a State Perspective: A Multiregional Dynamic General Equilibrium Framework

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Introduction

- Particular feature of recent Australian tax debate is CGE evaluation of excess burdens of taxes
- Mostly done with national comparative-static CGE models
- Here look at excess burdens from a state perspective
- Use example of state payroll tax to consider:
  - what issues raised in computing state-level excess burdens
  - What role do dynamics play in evaluating tax reform
- Use multiregional dynamic fiscal model of Australia, VURM

Marginal & average excess burden results

A 2-region VURM example - NSW and RoA regions

Results for unilateral adjustment in NSW payroll tax policy

	MEBs	AEB
(a) Due to adjustment in the payroll tax rate		
NSW	33.7	46.8
Australia	60.0	82.9
(b) Due to threshold reduction/removal		
NSW	14.3	-2.7
Australia	25.2	8.0

Marginal & average excess burden results

$$MEB_{R_1} = -100 \frac{\Delta GSP_{R_1}}{\Delta TR_{R_1}}$$ **Region imposing tax**

$$MEB_{Nat} = -100 \frac{\Delta GNI_{Nat}}{\Delta TR_{Nat}}$$ **National level**

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Payroll tax excess burden question 1

Why is AEB > MEB?

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Payroll tax excess burden question 2

Why are national MEBs & AEBs greater than they are for NSW?

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Payroll tax excess burden question 3

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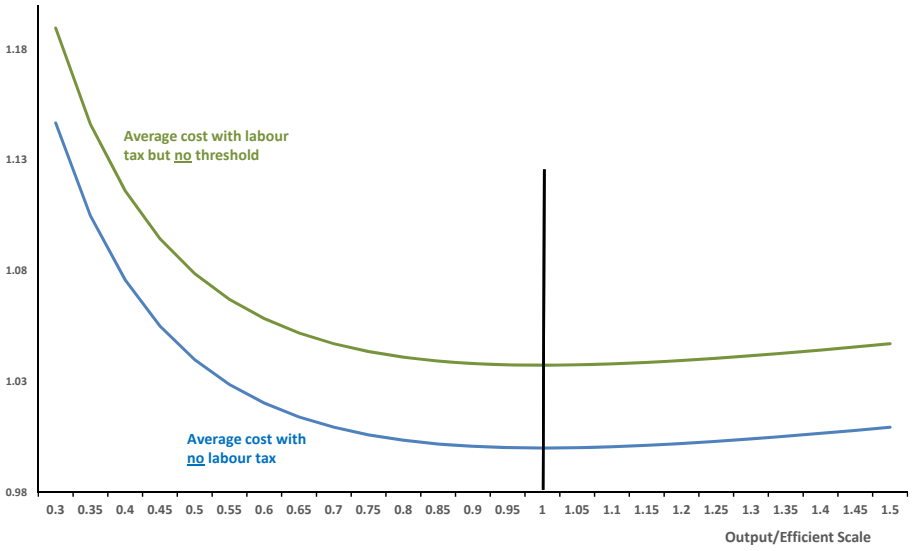
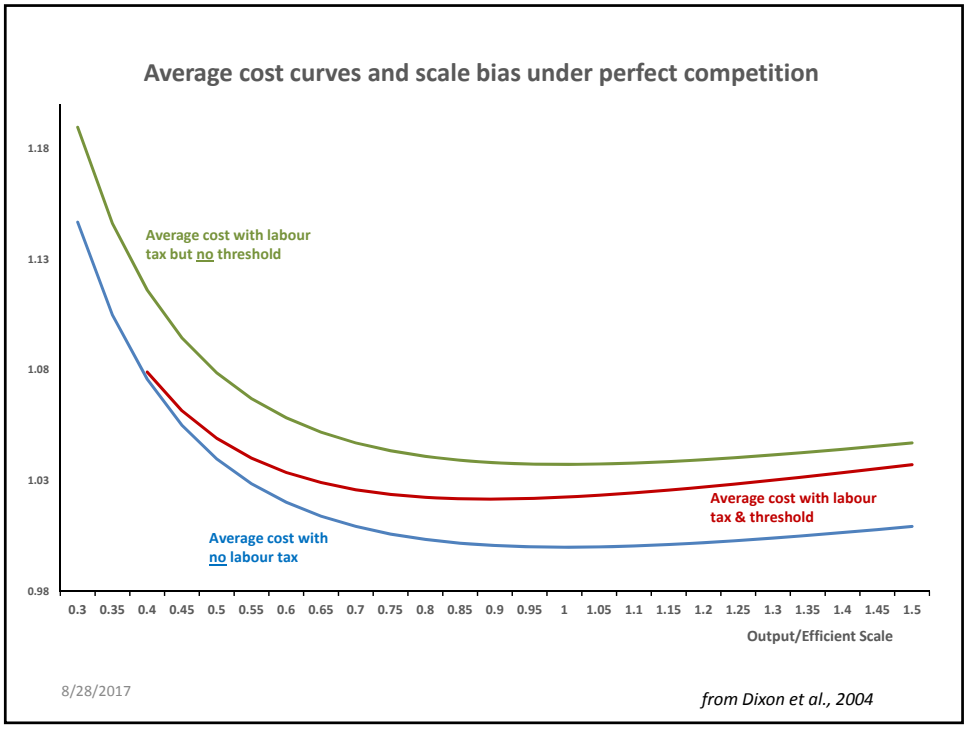
Why is NSW AEB negative for a threshold removal?

Average cost curves and scale bias under perfect competition



from Dixon et al., 2004


Average cost curves and scale bias under perfect competition
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1.13
1.08
1.03
0.98
Average cost with labour tax but no threshold
Average cost with labour tax & threshold
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Output/Efficient Scale
8/28/2017
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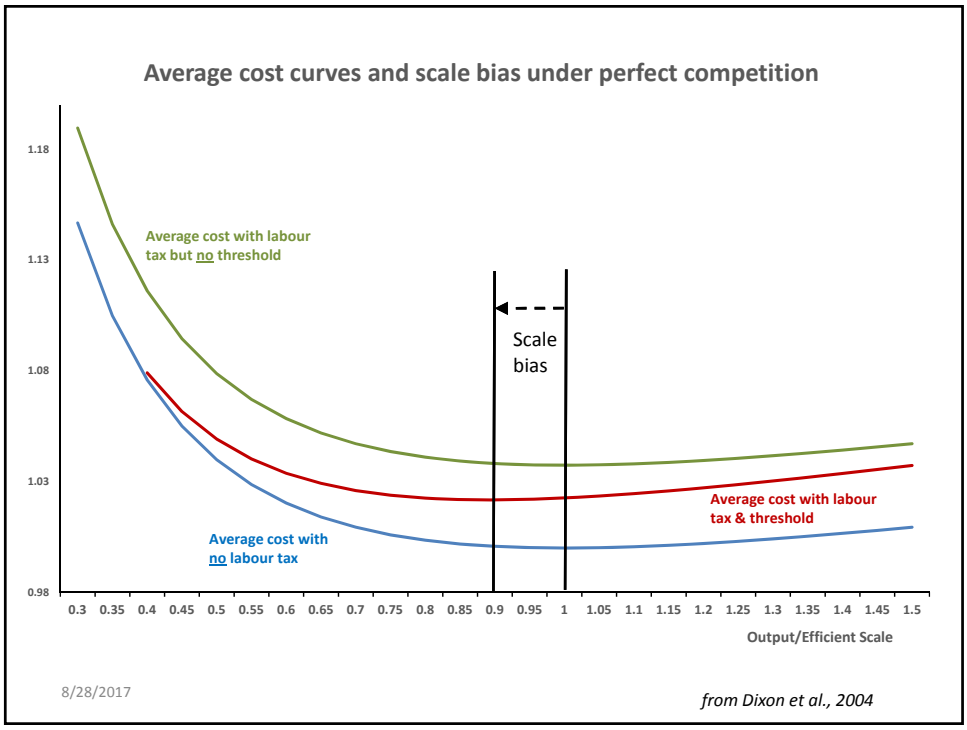
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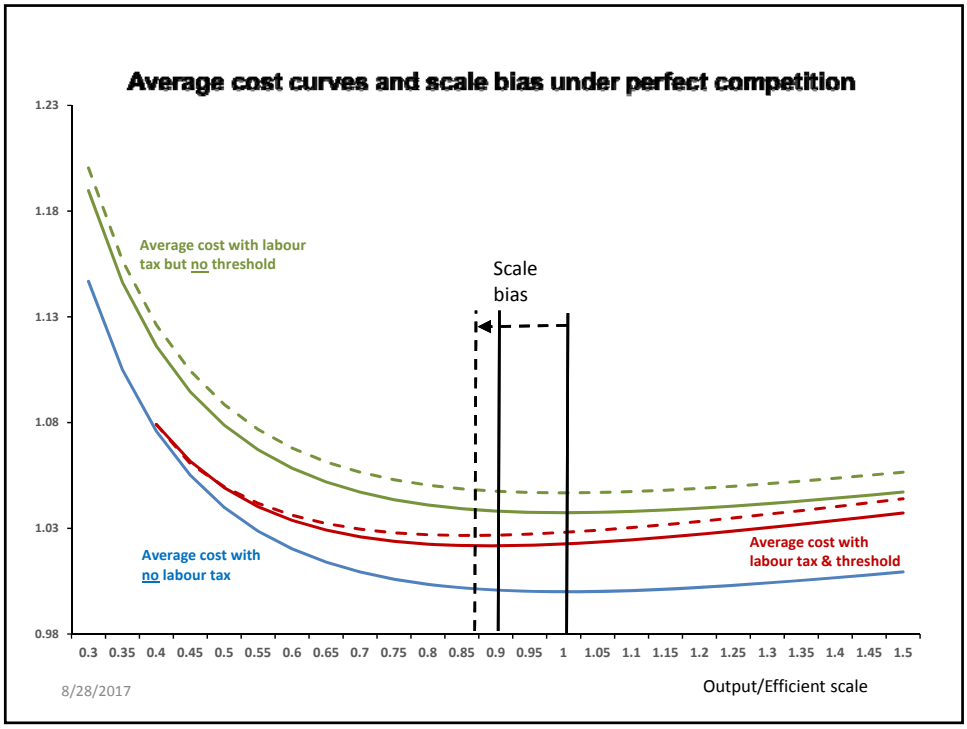
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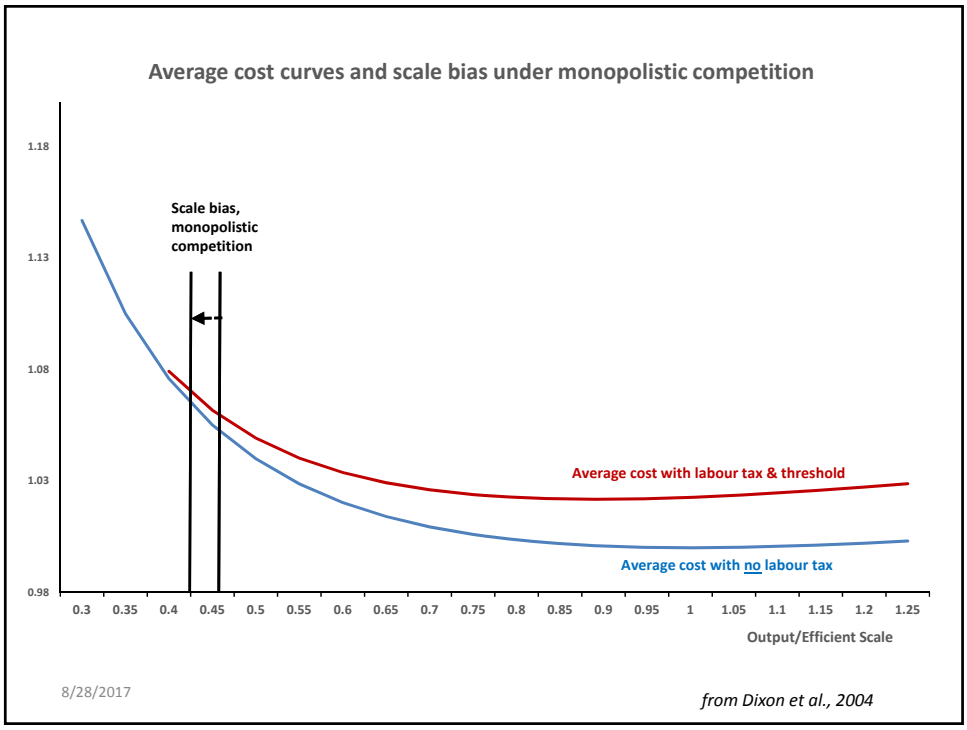
Average cost curves and scale bias under monopolistic competition
1.18
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Scale bias, monopolistic competition
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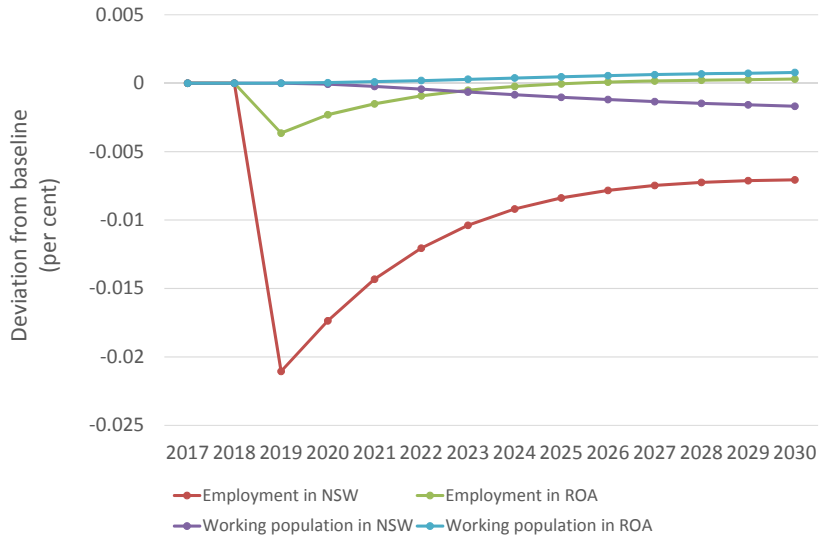
Adjustment paths and dynamics
Marginal increase in payroll tax rate in NSW



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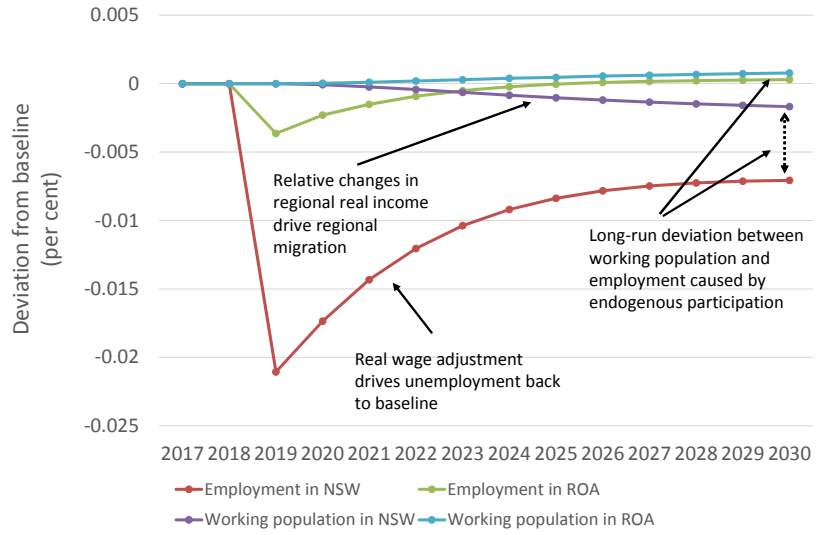
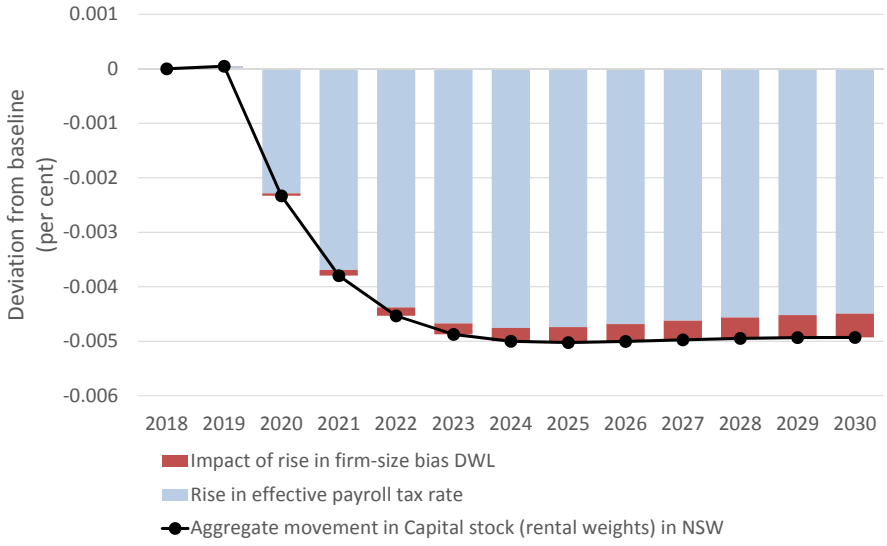
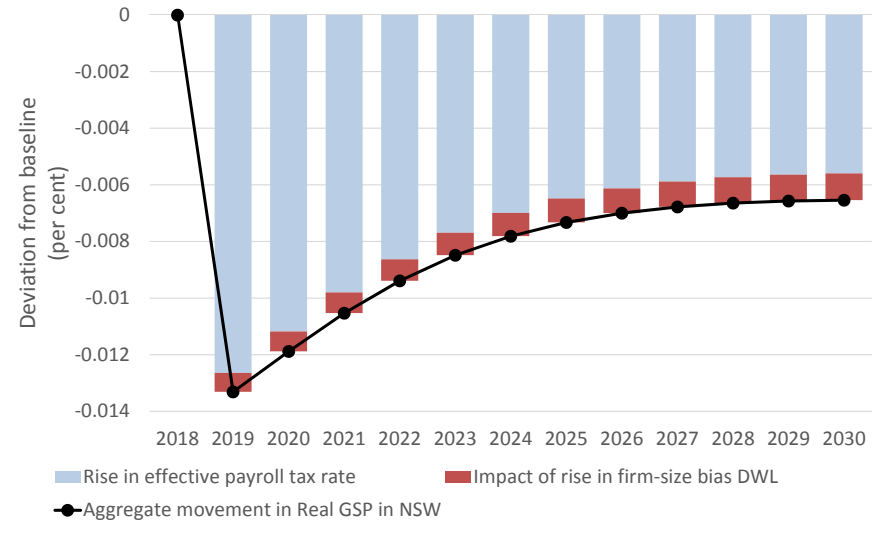


Capital Stock, Marginal increase in payroll tax rate in NSW
Structurally lower employment in NSW drives a long-run fall in NSW capital



Real GSP, Marginal increase in payroll tax rate in NSW
Reduced employment and capital drive a long-run reduction in NSW GSP



Payroll tax excess burden question 1

Why is AEB > MEB?

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Payroll tax rates and the dead-weight loss (DWL) from threshold interact

- The higher the tax rate the greater the DWL from the threshold
- The lower the threshold level, the higher the effective payroll tax rate

Decomposing MEB/AEB of NSW payroll tax rise

	MEB	AEB
Effect of rate adjustment only	28.8	28.1
Effect of change in threshold-DWL	4.9	18.7
Total effect of rate change	33.7	46.8

Payroll tax excess burden question 2

Why are national MEBs & AEBs greater than they are for NSW?

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MEB/AEB concepts in VURM

For state-level tax, define marginal excess burdens as:

1) $MEB_{Nat} = -100\frac{\Delta GNI_{Nat}}{\Delta TR_{Nat}}$ National level

2) $MEB_{R_1} = -100\frac{\Delta GSP_{R_1}}{\Delta TR_{R_1}}$ Region imposing tax

3) $MEB_{R_2} = -100\frac{\Delta GSP_{R_2}}{\Delta TR_{R_1}}$ Residual region

where ΔTR_{Nat} *and* ΔTR_{R_1} are deviations (resulting from marginal tax increase) in aggregate tax revenue for Australia and Region 1, respectively

National and regional AEB definitions are the same, except that the Region 1 tax change involves a complete removal of the tax.

Governments are modelled as maintaining their net operating balance with offsetting lump-sum compensation to households.

MEB/AEB concepts in VURM

Since $GDP_{NAT} = \Sigma GSP_r$

$$MEB_{Nat} = (MEB_{NSW} + MEB_{ROA}) \times \left(\frac{\Delta TR_{NSW}}{\Delta TR_{Nat}}\right) \times \left(\frac{\Delta GNI_{Nat}}{\Delta GDP_{Nat}}\right)$$

NSW MEB (a)	ROA MEB (b)	(a)+(b) (1)	Tax base multiplier (2)	Real GDP vs Real GNI multiplier (3)	National MEB (1)*(2)*(3)
33.7	2.6	36.3	1.548	1.07	60.01

Payroll tax excess burden question 3

Why is AEB negative for a threshold removal?

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Decomposing effects of threshold removal

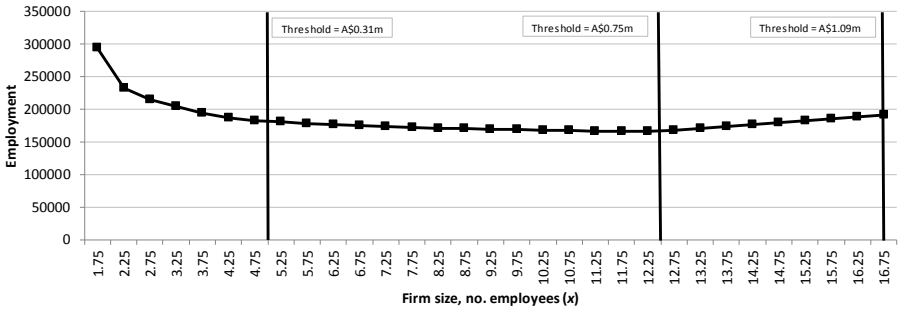
- Eliminating the threshold raises the effective rate to 5.45 per cent for all industries in NSW. This augments the existing tax-induced DWL.
- BUT, it also reclaims the DWL caused by a downward bias on firm size due to the payroll tax threshold

Decomposing AEB of NSW threshold removal

	AEB
Effect of effective rate adjustment	31.2
Effect of change in threshold DWL	-33.9
Total effect of threshold removal	-2.7

Threshold-induced DWL varies slowly with changes in threshold level

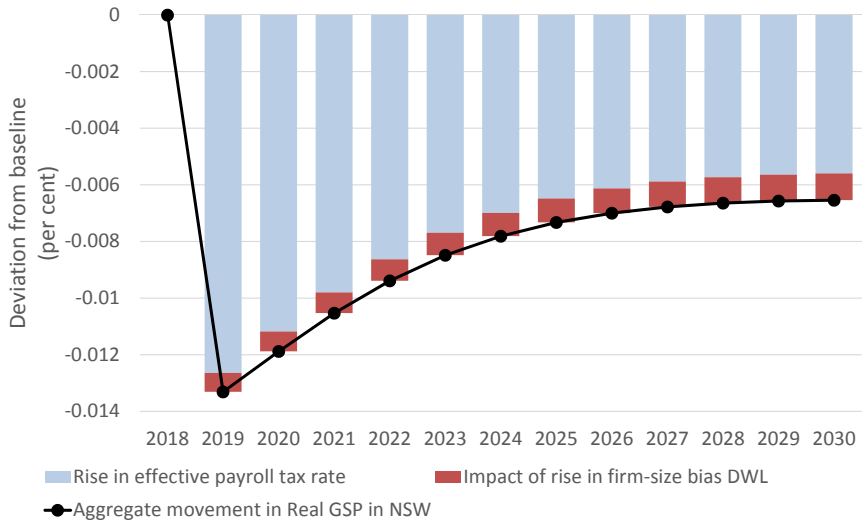
Employment in firms in which the number of employees is greater than *x* but less than or equal to 1.5*x* (smoothed distribution)



Adjusting for the value of leisure

	AEB Unadjusted for labour/leisure trade-off	AEB Adjusted for labour/leisure trade-off
Due to adjustment in NSW payroll tax rate		
NSW	46.8	37.7
RoA	3.0	0.8
Australia	82.9	64.5

Real NSW GSP, Marginal increase in payroll tax rate in NSW
Negative impact on GSP greater in short-run than long-run



Concluding comments

- MEB/AEBs differ between national and state viewpoints
- MEB/AEBs seen as long-run concept; but perhaps they should be computed in net present value terms
- Successful tax modelling requires:
  - An up-to-date data base reflecting tax statistics
  - Modelling which captures the details of tax implementation
  - Modelling which captures interregional effects
  - Modelling which incorporates dynamic effects
    - to estimate adjustment paths, including any short run transitional costs
    - to capture effects of underlying structural changes in growth path that can alter the outcomes of tax reform
  - Detailed explanation of results