Understanding Recent Trends in Income Redistribution in Australia: The Role of Tax-Transfer Policies and Labour Supply Decisions

Nicholas Herault & Francisco Azpitarte

University of Melbourne & Brotherhood of St Laurence

CRAWFORD SCHOOL OF PUBLIC POLICY

OCTOBER 2013

Aim of the paper

- Study the trends in the *redistributive effect* of the income tax and cash benefits in Australia over the period 1994-2009

- Investigate to what extent changes in the redistributive capacity can be attributed to reforms in tax-transfer policies or other factors affecting the distribution of pre-fiscal incomes. We consider:

  - *Immediate* fiscal effect: capacity of the tax-transfer system to shape pre-fiscal incomes

  - Labour supply effects: induced by fiscal reforms or not

Introduction

- The period 1994-2009 was a period of strong economic growth: in 1994 Australia GDPpc was below the average in the OECD and by 2009 it was well above the average of the high income OECD economies
- Recent research shows that the growth in the mean came with significant changes in distribution:
  - **Whiteford (2013)**: inequality in 1980-2010. Rise in inequality partially offset the increase in the mean. Welfare gains: Sen index in 2009 more than 50% higher than in 1994.
  - **Wilkins (2013)**: Period 2001-10. Consistency of ABS, HILDA, and Tax data. Inequality didn't decline: increase of different magnitude
  - **Greenville *et al.* (2013)**: Based on ABS data, capital income growth at the top was a key factor

Introduction

- Interestingly, these authors report a decline in the equalizing effect of the tax-transfer system, especially in the 2000s
- Wilkins (2013): the marginal effects of taxes and benefits declined, respectively, 0.004-0.007 and 0.009-0.013 Gini points between 2001 and 2010. Similar findings in the other two papers.
- It is pointed out that changes in policy could potentially explain the fall in the redistributive capacity of the system:
  - Cut in top marginal tax rates and increase in thresholds mitigated the effect of income taxes
  - Indexation of unemployment benefits, expansion of family payments (family tax benefit and the baby bonus) reduced the effect of transfers

What Do We Do?

- We extend these works by studying the redistributive effect and its vertical, horizontal, and reranking components over the period 1994-2009, using the measurement framework proposed by Urban and Lambert (2008)

- Assess the contribution of policy reforms and labour supply:

  - Immediate fiscal effect (no behavioral) using the *fixed-income approach* proposed by Kasten *et al.* (2004)

  - Changes in labour supply (induced by policy reforms and others) using the methods proposed in Herault and Azpitarte (2013)

Data Sources and Methods

- The unit of analysis is the individual. Each individual is assigned the equivalent income of his income unit derived using

$$s = (n_a + \theta n_c)^{\delta},$$

where s = # equivalent individuals, n_a and n_c are # adults and children; θ $(= 0.6)$ is weight attached to children; and δ $(= 0.8)$ the economies of scale. Similar to OECD scales.

- Sample and the data from the various editions of the Australian Survey of Income and Housing Costs (SIHC) conducted over the period under analysis.

- Information on weekly income in each release is used to construct our measure of annual household market income. This includes wages and salaries, business and investment income, private pensions, and other incomes.

Data Sources and Methods

- Data on income tax liabilities and benefit entitlements are derived using information from the SIHCs and the Melbourne Institute Tax and Transfer Simulator (MITTS).

MITTS: Income tax

Income Tax +Medicare

Tax rebates/offsets	**Not included**
Pensioner Rebate	Child care rebate
Low Income Earner Rebate	Private health insurance offset
Dependent Spouse Rebate	Superannuation concessions
Sole Parent Rebate	Capital gains discount
Senior Australians Tax Offset	
Mature Age Workers Tax Offset	

Data Sources and Methods

- In the case of benefits:

MITTS: Cash Benefits

Pensions	Family payments	Allowances	Other benefits
Age Pension	Parenting Payment	Newstart Allowance	Austudy/Abstudy
Disability Support Pension	Family Tax Benefit ,Part A	Youth Allowance	Special Benefit
Wife Pension	Family Tax Benefit Part B	Mature Age Allowance	Rent Assistance
Carer Payment	Family Tax Assistance	Sickness Allowance	
Widow Pension	Family Tax Payment	Widow Allowance	
DVA Service Pension	[Baby Bonus not included]	Partner Allowance	
DVA Disability Pension			
DVA War Widows Pension			

Measurement Framework

- The redistributive effect is measured using the Gini-based measure:

$$\mathbf{RE} = \mathbf{G}_{\textit{pre-fiscal}} - \mathbf{G}_{\textit{post-fiscal}}$$

- We consider net tax (taxes minus benefits), taxes, benefits

Table-Pre-fiscal and Post-fiscal variables

	Net tax	Tax	Benefits
Pre-fiscal	Market Income	Market Income+Benefits	Market Income
Post-fiscal	Market-Tax+Benefits	Market-Tax+Benefits	Market+Benefits

Measurement Framework

- Following Urban and Lambert (2008) we decompose *RE*:

$$\mathbf{RE} = \mathbf{V} - \mathbf{H} - \mathbf{R}$$

where $R = overall\ reranking$; $H = horizontal\ inequity$;
and $V = RE\ in\ the\ absence\ of\ reranking\ and\ horizontal\ inequity$

- Kakwani (1977) shows that for taxes and transfers, separately,

$$\mathbf{V}^K = \left(\frac{\mathbf{g}}{\mathbf{1}-\mathbf{g}}\right)\mathbf{P}^K$$

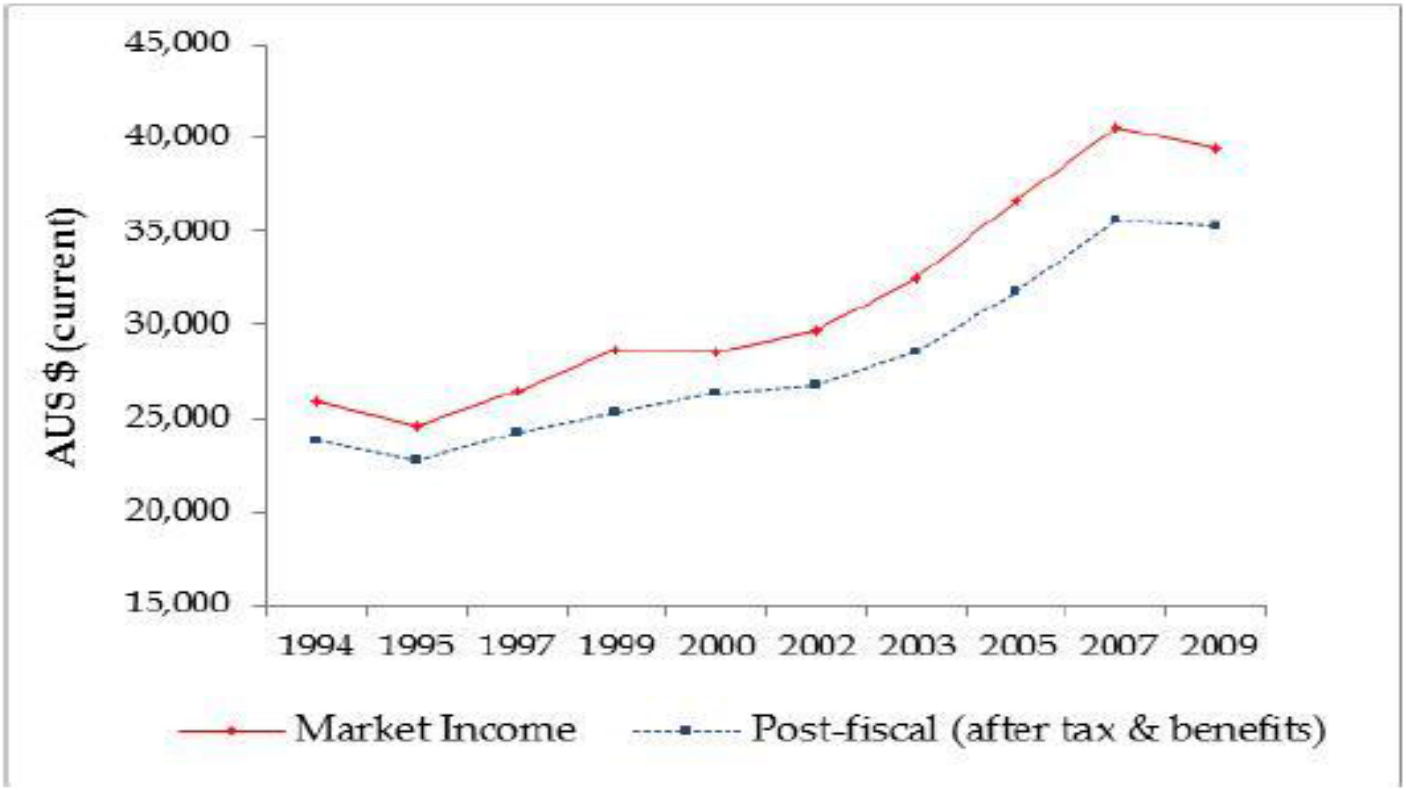
where $P^K = progressivity$ and $g = share\ ofincome\ in\ taxes/benefits$

- For the net tax, Lambert (1985) shows:

$$\mathbf{V}^K = \underbrace{\frac{\mathbf{t}\mathbf{P}_T^K}{\mathbf{1}-\mathbf{t}+\mathbf{b}}}_{\mathbf{S}_T} + \underbrace{\frac{\mathbf{b}|\mathbf{P}_B^K|}{\mathbf{1}-\mathbf{t}+\mathbf{b}}}_{S_B}$$

Results

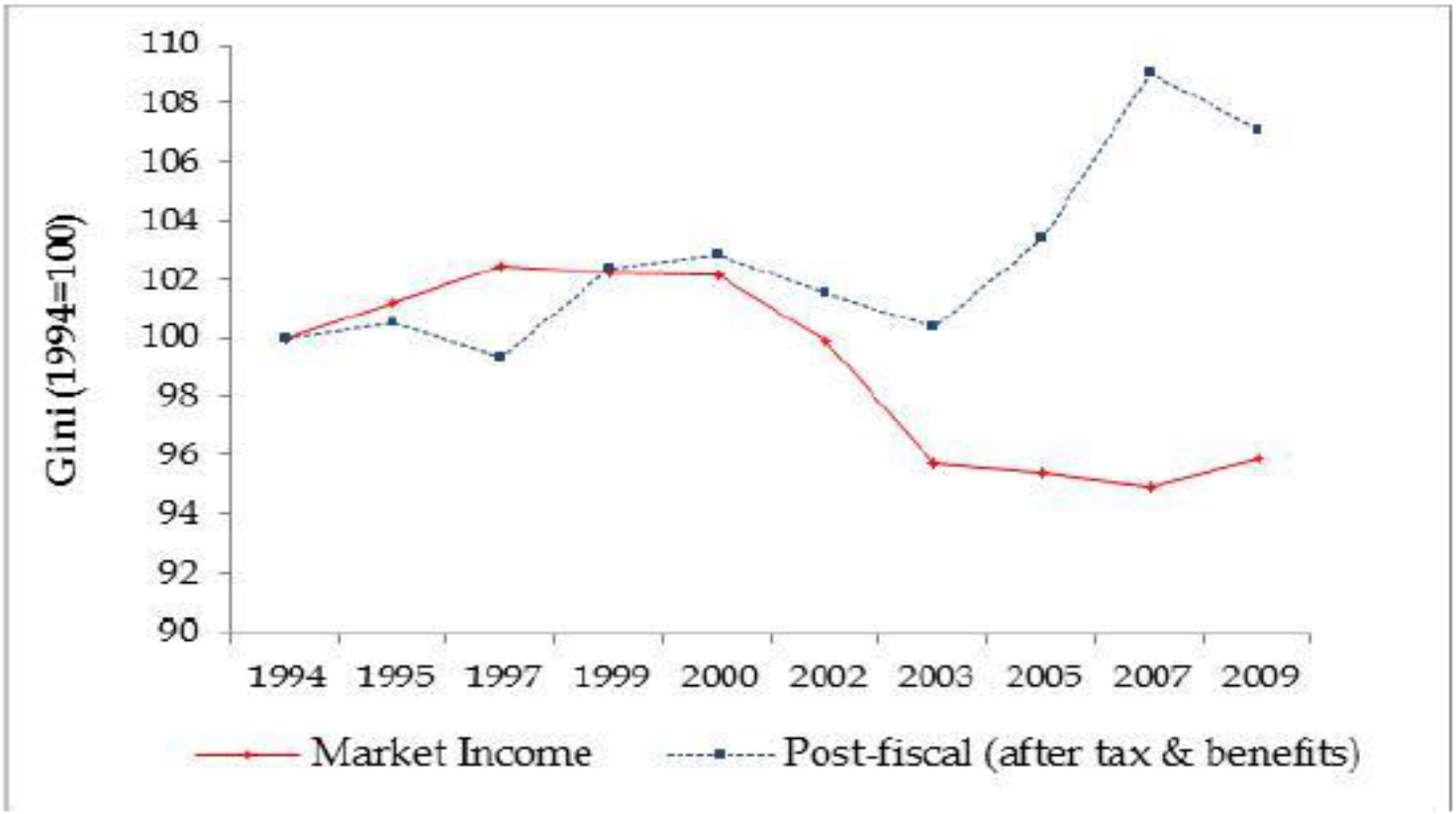
Figure-Mean Income, Australia 1994-2009 (1994=100)



Source: SIHCs and MITTS

Results

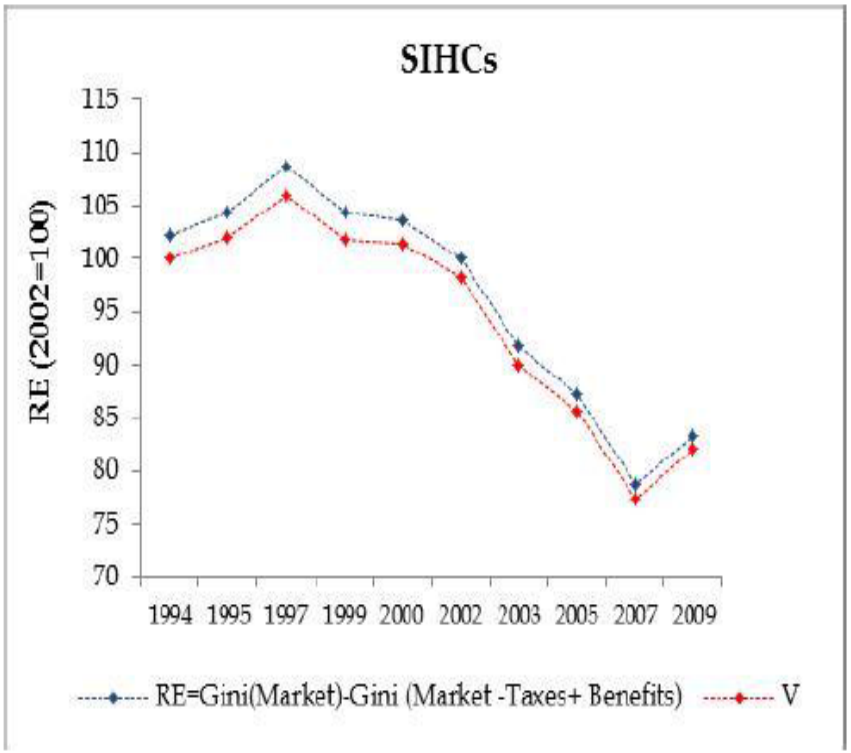
Figure-Income inequality-Gini, Australia 1994-2009 (1994=100)

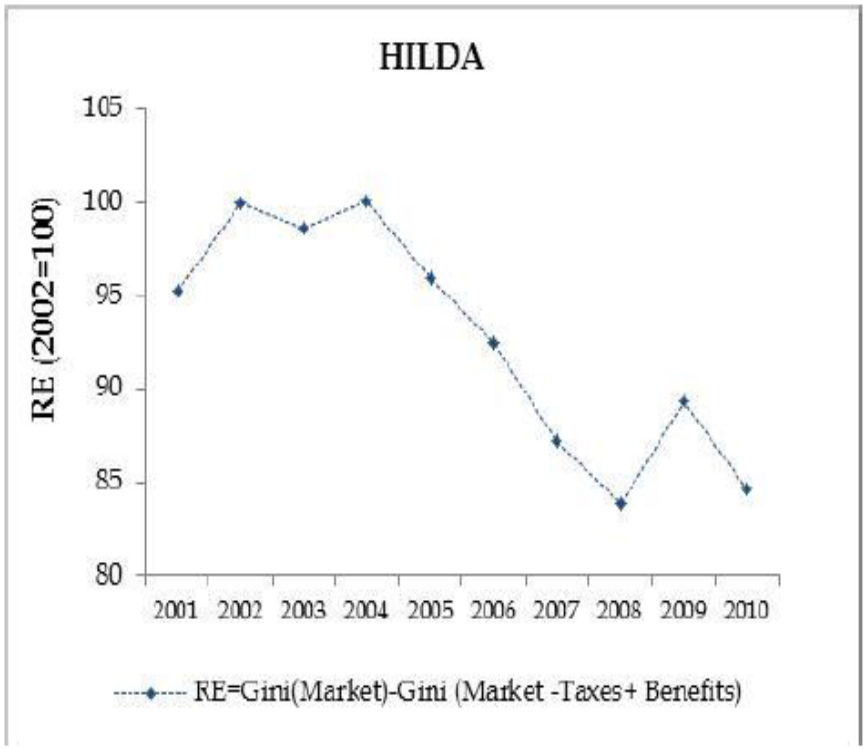


Source: SIHCs and MITTS

Results:Net Tax

Figure-Redistributive effect: Net Tax, 1994-2009 (2002=100)





Source:Source: SIHCs, MITTS and HILDA

Results:Net Tax

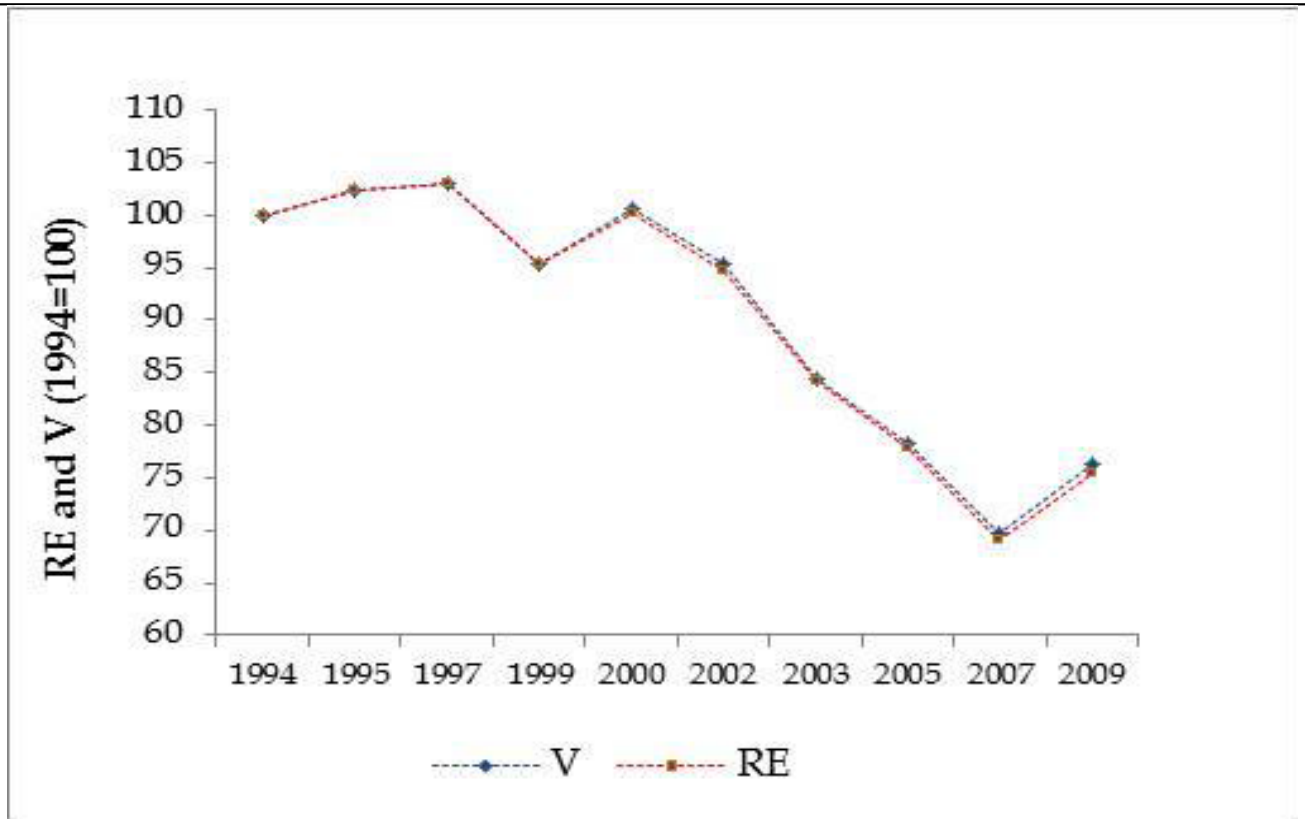
Table-Redistributive effect and components: Net Tax, 1994-2009

	Net Tax (T-B)							
Year	RE	$t-b$	V^K	$S_T(\%)$	$S_B(\%)$	$V(\%)$	$H(\%)$	$R(\%)$
1994	0.217	8.1	0.221	0.026 (11.9)	0.195 (88.1)	0.201 (92.9)	-0.019 (-9.2)	0.004 (2.1)
1995	0.221	7.4	0.226	0.026 (11.8)	0.199 (88.2)	0.217 (97.9)	-0.009 (-4.1)	0.004 (2.0)
1997	0.230	8.5	0.234	0.031 (13.5)	0.202 (86.5)	0.216 (93.7)	-0.018 (-8.0)	0.004 (1.7)
1999	0.221	11.6	0.225	0.033 (15.1)	0.191 (84.9)	0.208 (94.0)	-0.017 (-7.9)	0.004 (1.9)
2000	0.219	7.6	0.224	0.028 (12.8)	0.195 (87.2)	0.206 (94.1)	-0.017 (-8.1)	0.004 (2.2)
2002	0.212	9.6	0.217	0.029 (13.6)	0.188 (86.4)	0.213 (100.5)	-0.004 (-2.0)	0.005 (2.5)
2003	0.194	12.1	0.199	0.030 (15.4)	0.168 (84.6)	0.197 (101.3)	-0.002 (-1.2)	0.004 (2.5)
2005	0.185	13.3	0.189	0.032 (17.1)	0.157 (82.9)	0.185 (100.4)	-0.003 (-2.1)	0.004 (2.5)
2007	0.166	12.2	0.171	0.035 (20.5)	0.136 (79.5)	0.176 (105.7)	0.005 (3.0)	0.004 (2.6)
2009	0.176	10.4	0.182	0.034 (18.9)	0.147 (81.1)	0.189 (107.3)	0.007 (4.4)	0.005 (2.9)

Source: SIHCs and MITTS

Results:Benefits

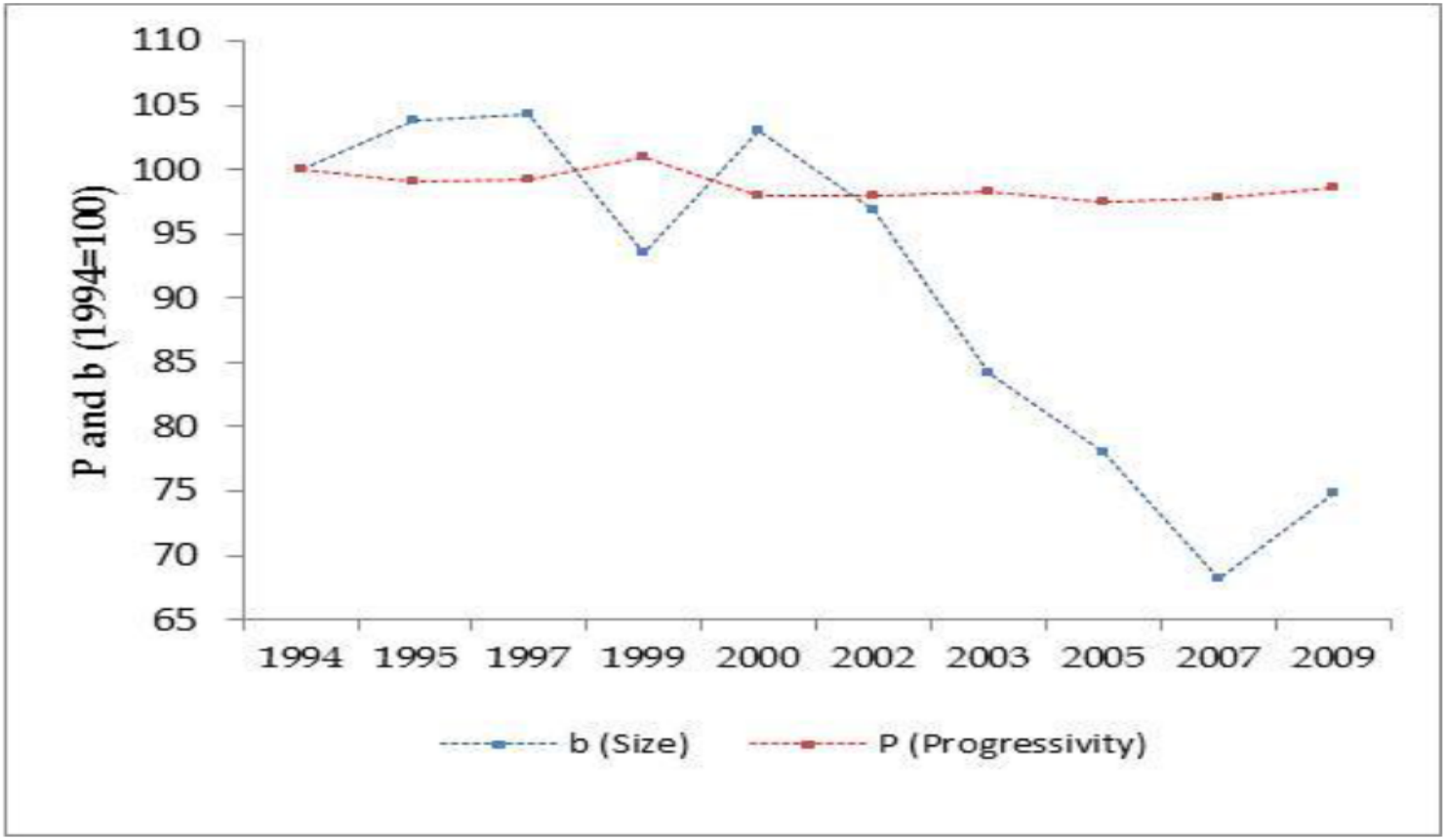
Figure-Redistributive effect: Benefits, 1994-2009 (1994=100)



Source: SIHCs and MITTS

Results:Benefits

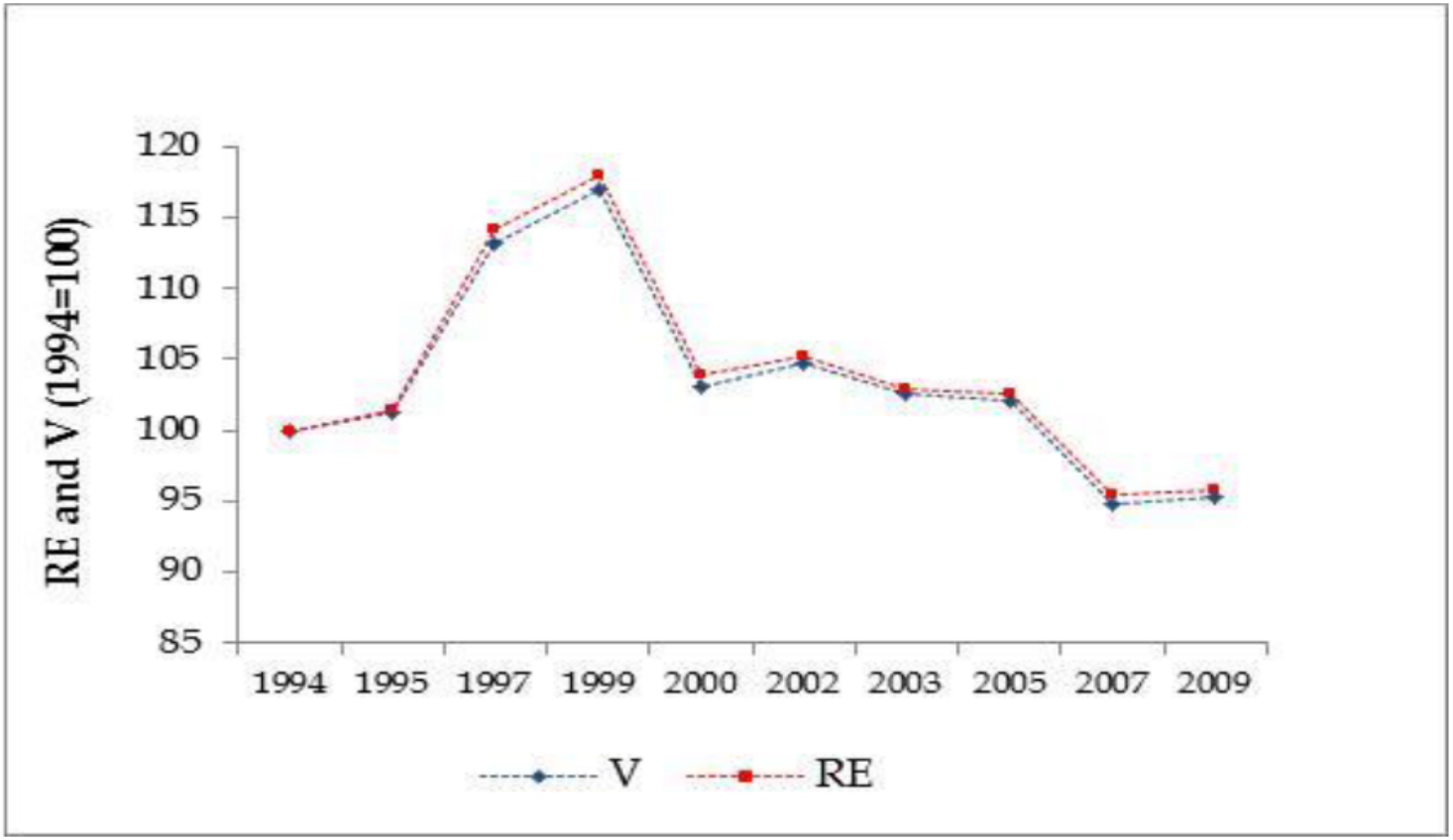
Figure-Progressivity and Average rate: Benefits, 1994-2009 (1994=100)



Source: SIHCs and MITTS

Results:Tax

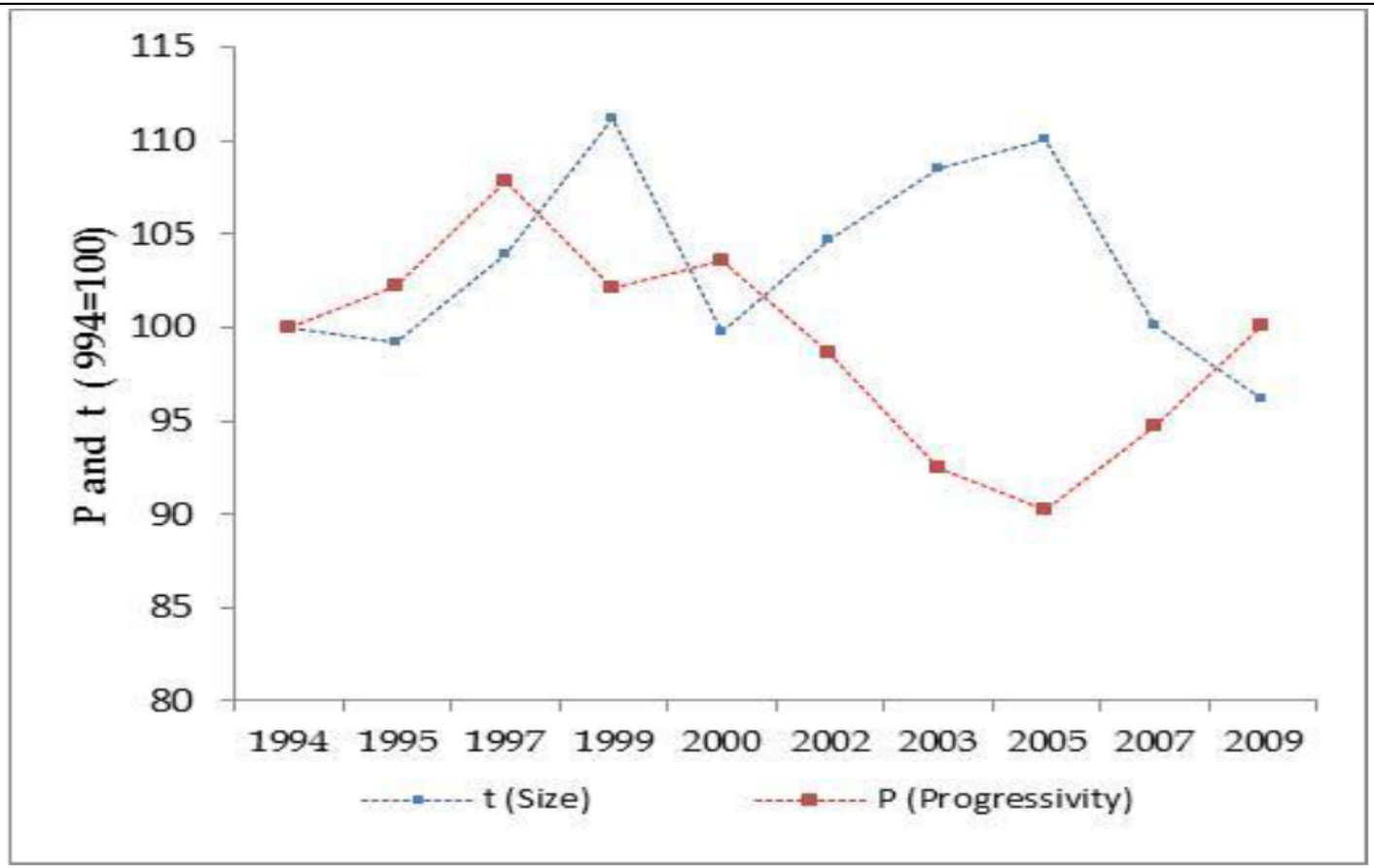
Figure-Redistributive effect: Tax, 1994-2009 (1994=100)



Source: SIHCs and MITTS

Results:Tax

Figure Progressivity and average rate: Tax, 1994-2009 (1994=100)



Source: SIHCs and MITTS

Results: summary

Consistent with existing research we find:

- Fall in the equalizing effect of the income tax-transfer system, especially in the 2000s. This was due to the vertical effect: the contribution of reranking and horizontal inequity did not change
- Both taxes and benefits contributed to this decline: large in the case of benefits
- For benefits: size more than distribution⇒inability of transfers to keep pace with the growth in market income
- For taxes: distribution more than size: fall in progressivity⇒less concentrated at the top

The Role of Tax-Transfer Policies

- Did changes in policies contributed to the decline in redistribution? We need to isolate the changes caused by policy reforms from other changes in the pre-fiscal distribution of income
- Two methods available in the literature:
  - **Fixed-income approach**: Kasten *et al.*(1994)⇒Based on microsimulation
  - **Transplant-compare method**: Dardadoni and Lambert (2002)⇒Transformation of distributions
- The fixed-income procedure provides a framework to evaluate the redistributive consequences of policy reforms:
  - with no behavioural responses (*immediate* effect)
  - with behavioural reponses (later)

The Role of Tax-Transfer Policies

- Let $\tau_t = (T_t, B_t)$ be a vector with all relevant information on income-tax and transfers policies at time t
- Let F_t be the distribution of pre-fiscal income. Any redistributive measure M_t is given by

$$M_t = M(F_t, \tau_t)$$

- The *immediate* contribution of policy reforms is assessed by keeping the distribution of pre-fiscal income fixed
- Comparison of $M(F_B, \tau_t), M(F_B, \tau_{t+1}), M(F_B, \tau_{t+2}), ..., M(F_B, \tau_{t+T})$ $\Rightarrow$changes in the capacity to shape a given distribution of pre-fiscal income

The Role of Tax-Transfer Policies

- Compute $M(F_{t+1}, \tau_t)$ for which we must apply the policy of one period to the distribution of a different period.
- We make use of MITTS. For the simualtions, the vector of thresholds and transfer parameters are adjusted using an uprating factor
- To evaluate the policy effect we apply the policies of the different years to a base pre-fiscal income distribution
- To check that conclusions are base independent we run the analysis for three reference distributions 1994, 2000, and 2007

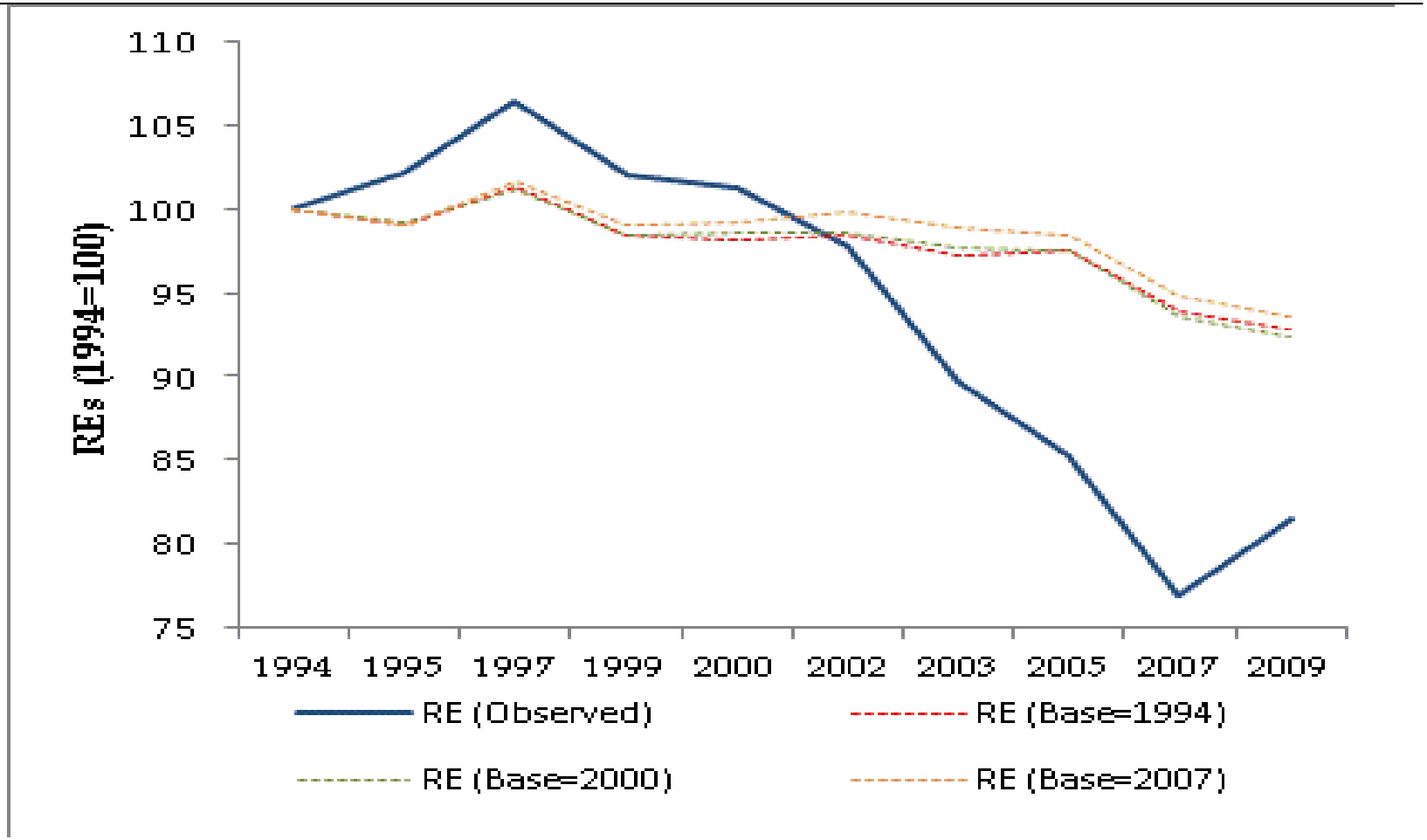
The Role of Tax-Transfer Policies

- The period 1994-2009 saw significant reforms aimed at reducing effective tax rates and increasing labour market participation and reducing welfare dependency

Income tax	Benefits
-Rise in top thresholds	-Increase value family payments and pensions
-Cut in marginal top rates	-Strength incentives to work: lower taper rates
-Lower thresholds not updated:B-C	rates and income tests liberalized
-Increase max value of tax-offsets (LITO)	-Tightening eligibility for pensions
	-Shift from pensions to Newstart allowance
	-Increasing gap due to indexation

The Role of Tax-Transfer Policies: Net tax

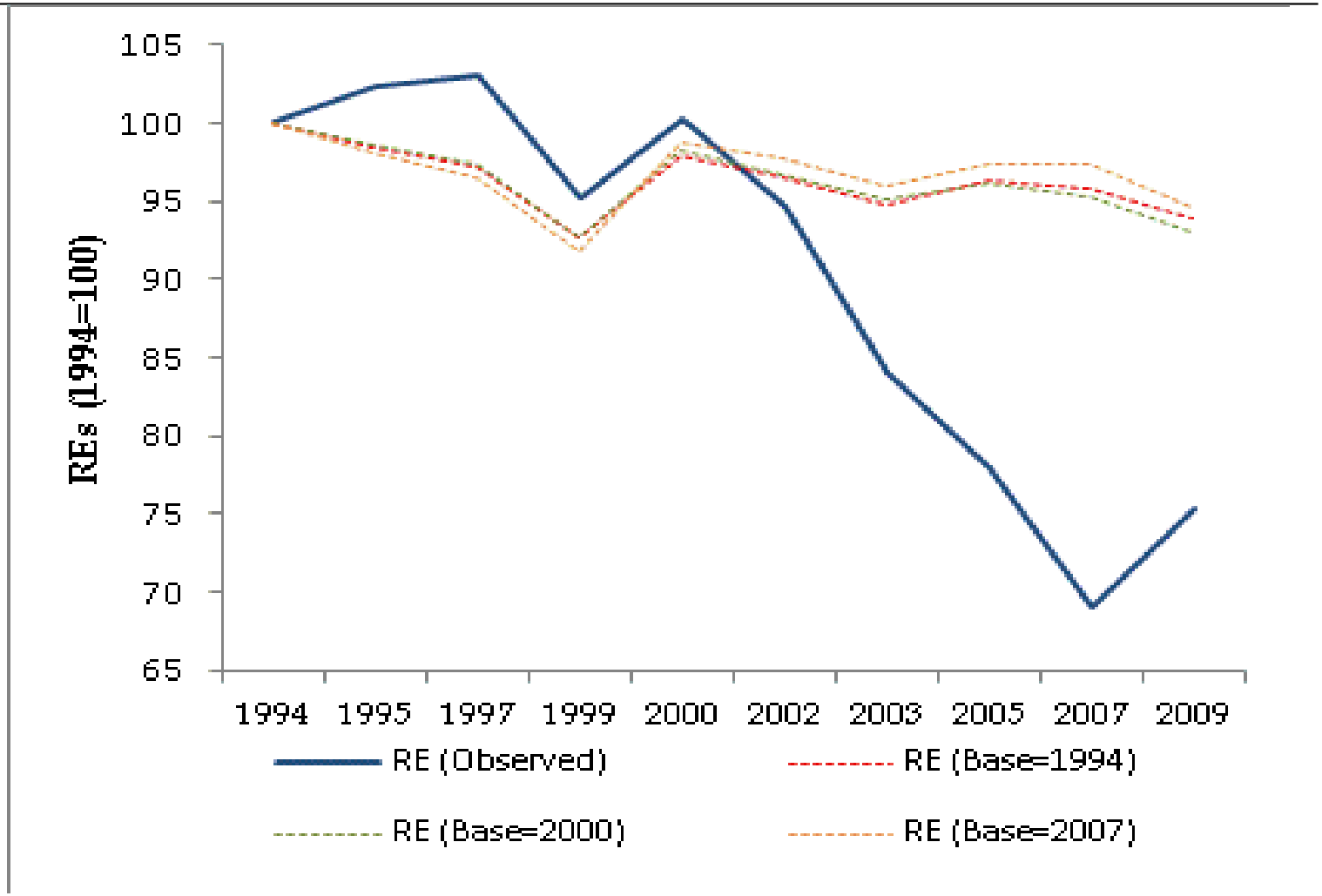
Figure-Redistributive effect: Net Tax, 1994-2009 (1994=100)



Source: SIHCs and MITTS

The Role of Tax-Transfer Policies: Benefits

Figure-Redistributive effect: Benefits, 1994-2009 (1994=100)



Source: SIHCs and MITTS

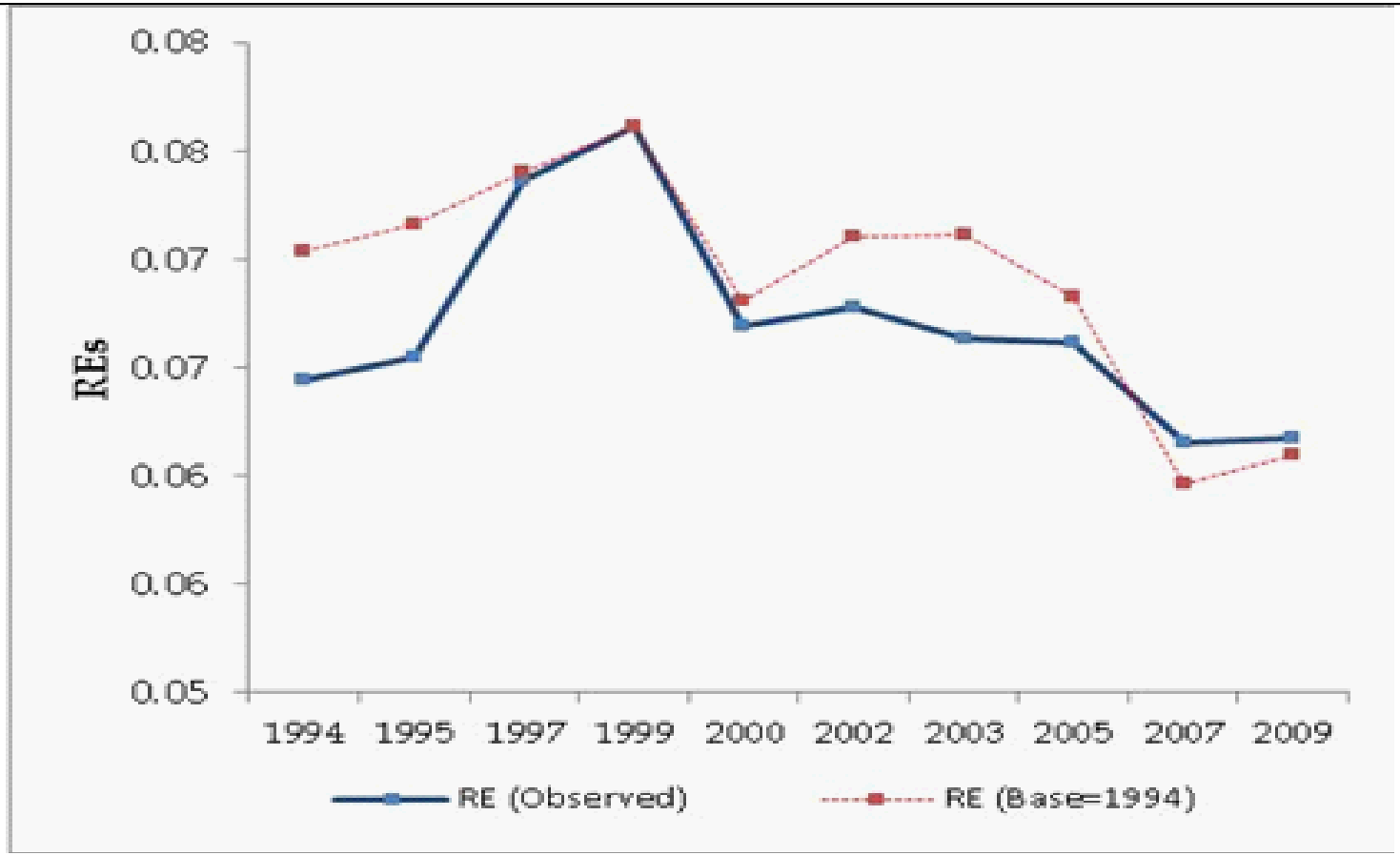
The Role of Tax-Transfer Policies: Benefits

Figure-Average rate: Benefits, 1994-2009 (1994=100)

Source: SIHCs and MITTS

The Role of Tax-Transfer Policies: Taxes

Figure-Redistributive effect: Taxes, 1994-2009



Source: SIHCs and MITTS

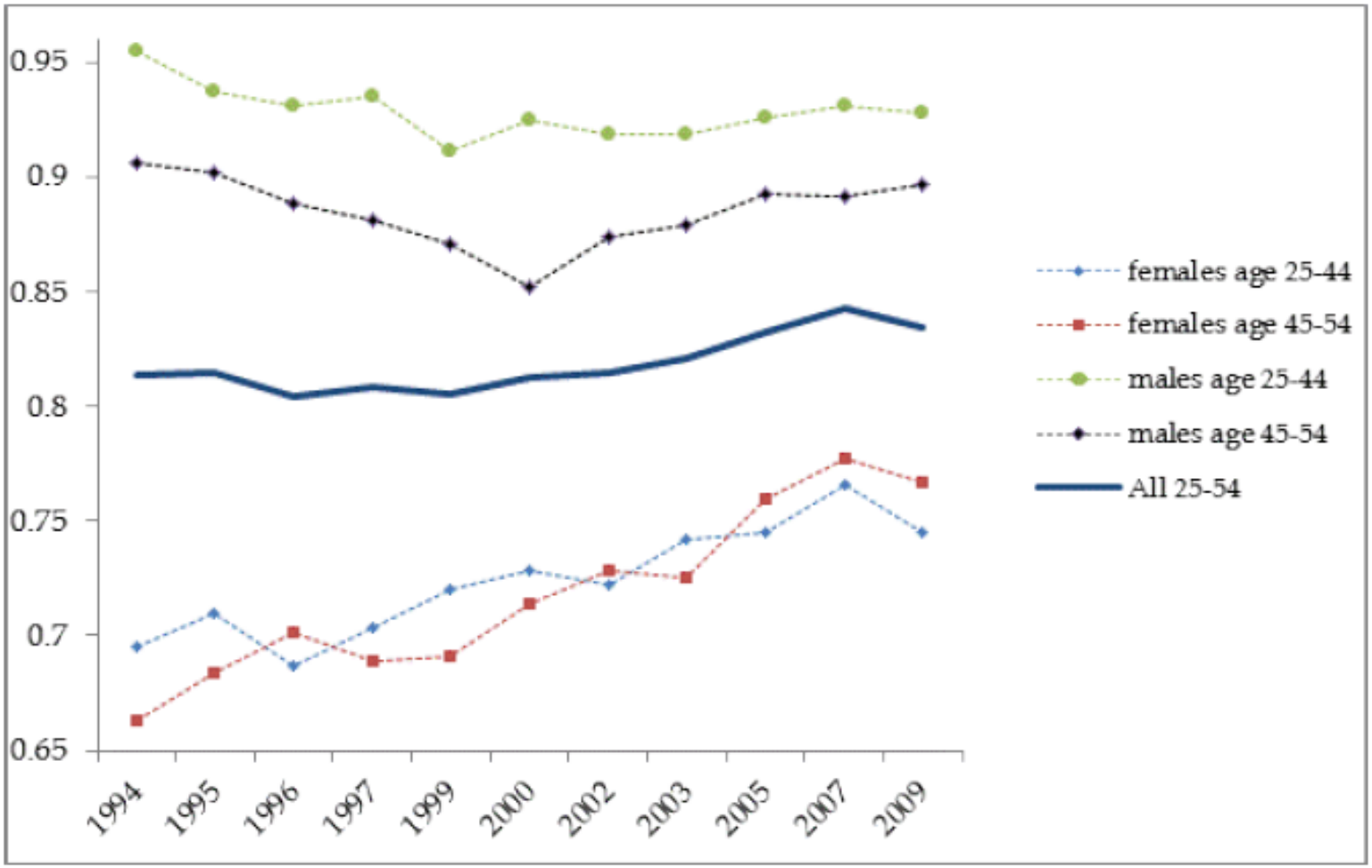
The Role of Labour Supply

- Changes in policy reduced the capacity of the tax-transfer system to shape market income: limited the redistributive effect of both taxes and transfers.
- However, much of the fall was due to changes in the distribution of pre-fiscal income.
- An important determinant is labour supply. Labour income is the main source of income. Labour decisions determine taxable income and eligibility for transfers⇒conditions the equalizing effect of the system
- Significant changes since mid-1990s: assess the impact of changes:

$$\begin{cases} \text{Induced by changes in taxes and transfers} \\ \\ \text{Other factors} \end{cases}$$

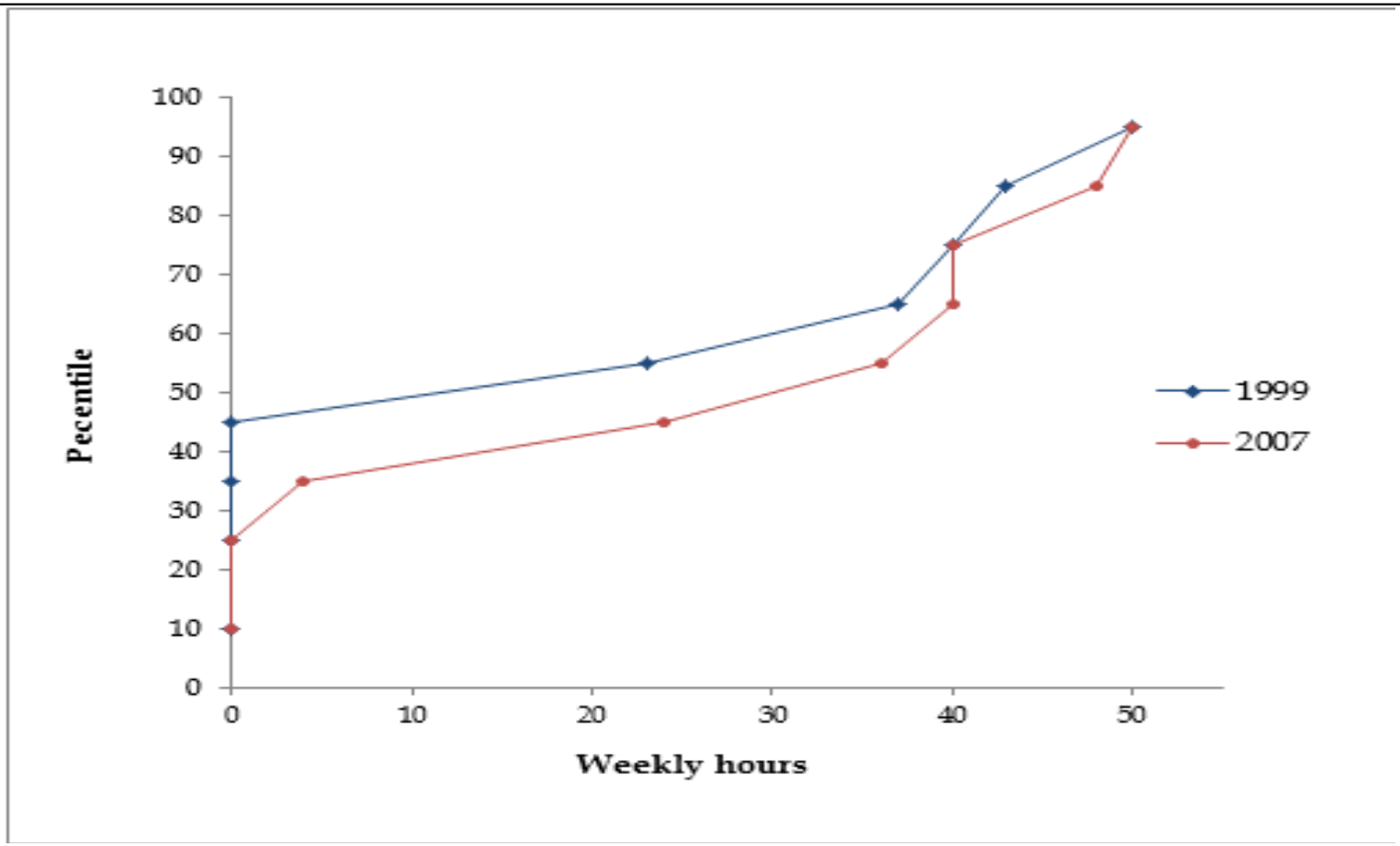
The Role of Labour Supply

Figure-Labour Force Participation: 25-54 Age group, 1994-2009



Source: SIHCs

Figure-Distribution of weekly hours: All groups, 1999 and 2007



Source: SIHCs

The Role of Labour Supply

- We use the methods proposed in Herault and Azpitarte (2013). Any redistributive measure can be written as $M(P_t, L_t, \tau_t)$.
- Decompose the variation between period 0 and 1

$$M_1(P_1, L_1, \tau_1) - M_0(P_0, L_0, \tau_0)$$

- We need three counterfactuals:

1. $M(P_1, L_0, \tau_1)$: counterfactual methods in Bover (2010)
2. $M(P_1, L_1^{\tau_0}, \tau_1)$: behavioural microsimulation MITTS-B
3. $M(P_1, L_1, \tau_0)$: microsimulation MITTS

The Role of Labour Supply

- They can be used to decompose

$$M(P_1, L_1, \tau_1) - M(P_0, L_0, \tau_0) =$$

$$M(P_1, L_1, \tau_1) - M(P_1, L_1^{\tau_0}, \tau_1) + \qquad [induced\ LS]$$

$$M(P_1, L_1^{\tau_0}, \tau_1) - M(P_1, L_0, \tau_1) + \qquad [other\ LS]$$

$$M(P_0, L_0, \tau_1) - M(P_0, L_0, \tau_0) + \qquad [Policy\text{-}immediate]$$

$$M(P_1, L_0, \tau_1) - M(P_0, L_0, \tau_1) \qquad [residual]$$

The Role of Labour Supply

Table-Decomposition of changes between 1999 and 2007

	Market income (Gini)	Disposable income (Gini)	Redistributive effect (net tax)	Average transfer rate
Variation 1999-2007 (%)	-7.1	6.5	-24.5	-27.1
Contribution of (%)				
Policy (immediate)	0.0	49.6	16.9	-33.7
Labour supply-Induced	23.1	-11.0	11.5	17.0
Labour supply-Other	53.6	-18.8	29.0	41.2
Residual	23.3	80.1	42.6	75.5
Total	100.0	100.00	100.0	100.0

Conclusions

- Period 1994-2009, strong growth with significant changes in the distribution: improvement in the distribution of market income but increase in disposable income inequality
- Decline in the redistributive impact of the tax-transfer system: the fall in the size of benefits and the distribution of taxes account for the decline
- Policy reforms contributed to the decline in redistribution: reduction in the capacity of the system to shape market incomes
- However, most of decline was driven by changes in the distribution of pre-fiscal incomes. The increase in labour supply, partly induced by the reforms, led to a more equal distribution of market income
- Policy reforms had two reinforcing effects on redistribution

$$\begin{cases} \text{Equalize market income via labour supply: } \Downarrow Gini_{\textit{pre-fiscal}} \\ \text{Reduced the capacity to shape market incomes: } \Uparrow Gini_{\textit{post-fiscal}} \end{cases}$$

Questions

Table 1. Mean Income and Gini Index, 1994-2009

	Market Income		Net Income (after tax and transfers)	
Year	Mean	Gini	Mean	Gini
1994	25,893	0.496	23,803	0.279
1995	24,633	0.502	22,809	0.280
1997	26,510	0.508	24,264	0.277
1999	28,618	0.507	25,298	0.285
2000	28,564	0.506	26,391	0.286
2002	29,659	0.495	26,804	0.283
2003	32,494	0.474	28,558	0.280
2005	36,615	0.473	31,758	0.288
2007	40,600	0.471	35,657	0.304
2009	39,377	0.475	35,280	0.298

Note: Mean values expressed in 2009 dollars

Questions

Table 1 Decomposition of changes in income distribution and redistribution between 1999/00 and 2007/08

	Tax progressivity (PG)	Transfer regressivity (RG)	Average tax rate	Average transfer rate	Redistributive effect (RE)	Gini	
						market income	disposable income
1999/00 base value	0.256	1.124	0.232	0.151	0.221	0.507	0.285
1999/00 to 2007/08 change							
Relative (in per cent of base value)	-7.2	-3.4	-10.0	-27.1	-24.5	-7.1	6.5
Absolute	-0.018	-0.038	-0.023	-0.041	-0.055	-0.036	0.019
Contributions to historical changes (in per cent)							
T	-86.9	136.6	208.1	-33.7	16.9	0.0	49.6
TLS	20.0	-0.5	-6.5	17.0	11.5	23.1	-11.0
OLS	64.1	-5.6	-16.5	41.2	29.0	53.6	-18.8
O	102.8	-30.6	-85.1	75.5	42.6	23.3	80.1
Total	100	100	100	100	100	100	100

Source: Authors' calculations based on MITTS and SIHC data