Tax and benefit reforms and wage dynamics - the relative effect on work incentives in Poland

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Microsimulation for Policymaking in Times of Crisis
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Motivation

- Understanding key determinants behind changes in financial incentives to work crucial as a guide for effective policy making (*Blundell et al. 2000, Immervoll and O'Donoghue 2003, Adam et al. 2006, Brewer et al. 2010*).
- Particular relevance at the time of crisis.
- Application of microsimulation to analyse relative effects of wages and fiscal policy in Poland for years 2005-2009.
  - Major reforms to social security and personal taxation in parallel with reforms in benefits (*Morawski and Myck 2010, Domitrz et al. 2012*).
  - Rapid growth of wages:
  - Steady growth in employment levels from 2005 onwards (especially 2005-2007).
- The relative role of policy and labour market developments.
- Are there lessons for the reverse situation: falling wages and tighter fiscal policy?

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Outline: reforms, wages and financial incentives to work

Measuring financial incentives to work

Tax and benefit reforms in Poland: 2005-2009

Data and modelling

Simulation results: PTRs and RRs 2005-2009

Conclusion

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How can microsimulation help in identifying the relative effects?

Table : Different approaches to non-behavioural microsimulation

	Policies	Demographics	Employment	Wages
Microsimulation approaches:				
Approach 1)	changing	changing	changing	changing
Approach 2)	constant	changing	changing	changing
Approach 3)	changing	constant	constant	constant
Approach 4)	constant	constant	constant	changing

- Approach 1: different policy systems on different years of data.
- Approach 2: single policy system on different years of data.
- Approach 3: different policy systems on single year of data.
- Approach 4: single policy system on single year of data but different wage structure.

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Financial incentives to work in Poland: 2005-2009

- Analysis based on Polish Household Budget Survey data for 2005, 2007 and 2009;
- We use the Polish microsimulation model SIMPL (V4S3.12).
- Incentives computed by:
  - family type (singles, couples);
  - separately for first and second earners;
  - separately for those with and without children.
- Comparing incentives by analysing distribution of participation tax rates (PTRs) and replacement ratios (RRs).

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Measuring financial incentives to work

- Participation tax rates (PTRs)
  - PTRs for singles:

$$PTR_j(h) = 1 - \left(\frac{Y_j(h) - Y_j(0)}{w(h)} \right)$$

- Replacement ratios (RRs):
  - RRs for singles:

$$RR_j(h) = \frac{Y_j(0)}{Y_j(h)}$$

- Similarly: computation of PTRs and RRs for first and second earners in couples.
- Disadvantages of PTRs: can only be meaningfully used for single reference distributions of gross wages (excludes Approach 4).
- Disadvantages of RRs: not very informative if income out of work is zero.

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Main tax and benefit reforms in Poland 2005-2009

- Social security contributions
  - employee rates cut from 6.5% to 1.5% in 2007 and 2008;
  - employer rates cut from 6.5% to 4.5% in 2008.
- Income taxation
  - generous child tax credit introduced in 2007;
  - change from three rates (19%, 30% and 40%) to two (18% and 32%) in 2009;
  - at the same time a policy of parameter "freezing".
- Benefits:
  - change in the structure of family benefits (2006); frozen eligibility thresholds and values (from 2006);
  - higher levels of housing benefits and social assistance with reductions in eligibility.
- Total magnitude of the changes estimated at approximately 1.7%-2.2% of GDP (Domitrz et al. 2012).

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Data and sample selection

- Analysis using the Polish Household Budgets' Survey: 2005, 2007, 2009.
  - Labour supply "flexible" households, i.e. with at least one person defined as "LS-flexible":
    - aged 18-59;
    - not self-employed or student;
    - not receiving disability or retirement pensions.
  - Analysis divided by household type:
    - singles;
    - couples with one LS-flexible partner;
    - couples with two LS-flexible partners.
- Results presented for first and second earners in couples with two LS-flexible partners.

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Data and sample selection

Table : Sample and household types in BBGD data 2005, 2007, 2009

	Data year		
	2005	2007	2009
Full BBGD sample	34,767	37,366	37,302
Households with an "LS flexible family"	23,158	24,610	23,819
Single men	2,394	2,735	2,771
Single women	4,097	4,152	3,960
Couples with one LS-flexible partner (man)	2,295	2,499	2,338
Couples with one LS-flexible partner (woman)	3,625	3,700	2,659
Couples with two LS-flexible partners	10,747	11,524	11,091

Source: Author's calculations using BBGD data.

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Data and sample selection

Table : Employment in couples with two LS-flexible partners

	Data year		
	2005	2007	2009
All			
- no one working	6.28%	3.10%	2.88%
- only woman working	7.98%	5.30%	5.43%
- only man working	35.77%	33.11%	31.80%
- both working	49.97%	58.49%	59.89%
Without children			
- no one working	9.38%	5.70%	4.03%
- only woman working	10.82%	8.25%	7.42%
- only man working	30.93%	27.78%	25.91%
- both working	48.87%	58.27%	62.64%
With children			
- no one working	5.55%	2.42%	2.53%
- only woman working	7.30%	4.52%	4.84%
- only man working	36.91%	34.51%	33.55%
- both working	50.23%	58.55%	59.08%

Source: Author's calculations using BBGD data.

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Computing financial incentives

- Actual distributions of PTRs and RRs:
  - Actual wages of those employed and expected wages for the non-employed;
  - Actual systems for 2005/07/09 run on data for respective years used to compute PTRs and RRs (Approach 1).
- "Expected" distributions of PTRs and RRs:
  - Expected wages used both for the employed and the non-employed;
  - The 2009 system (on 2009 data) compared to:

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  - The 2009 system (on 2009 data) compared to:
    - cpi-indexed 2005 system: using 2009 data and 2009 wages (Approach 3);
    - 2009 system: using 2009 data but 2005 wages (+inflation) (Approach 4).

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Results

- Focus on couples with two LS-flexible partners.
- Cumulative frequencies of PTRs and kernel densities of RRs:
  - for first and second earners;
  - separately for those with and without children.

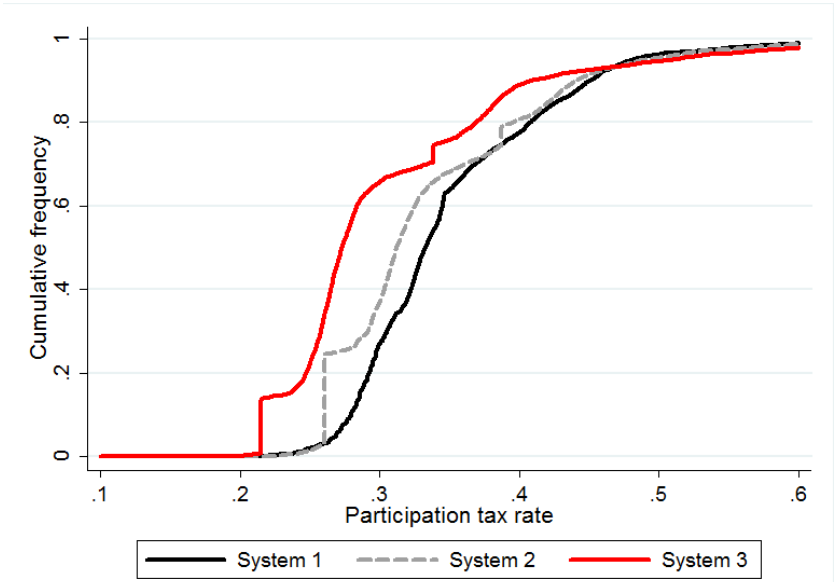
Systems from 2005, 2007 and 2009 on respective data

	PTRs		RRs	
Systems:	Median	Mean	Median	Mean
1) 2005 system on 2005 data	0.332	0.351	0.151	0.203
2) 2007 system on 2007 data	0.312	0.336	0.143	0.200
3) 2009 system on 2009 data	0.273	0.306	0.106	0.175

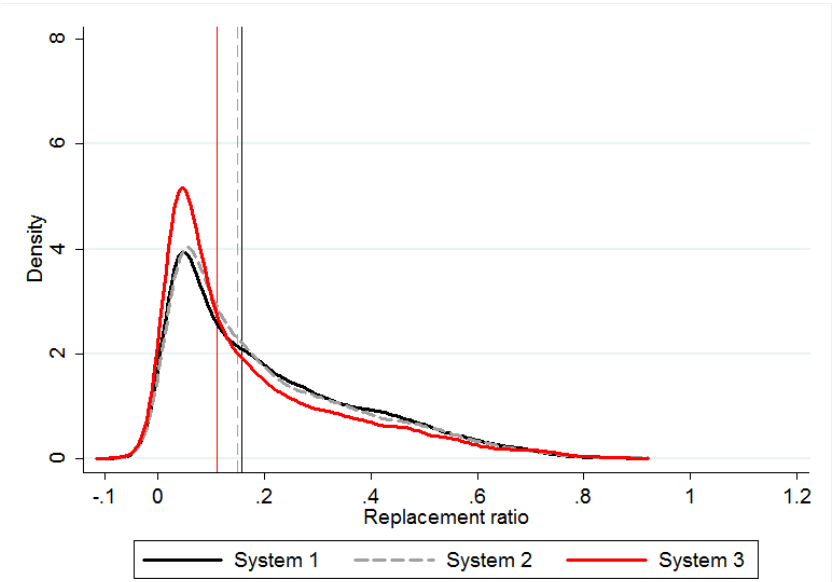
Source: Author's calculations using SIMPL microsimulation model (V4S3.12).

Figure : Actual PTRs and RRs: First earners in couples - with kids

PTRs



RRs



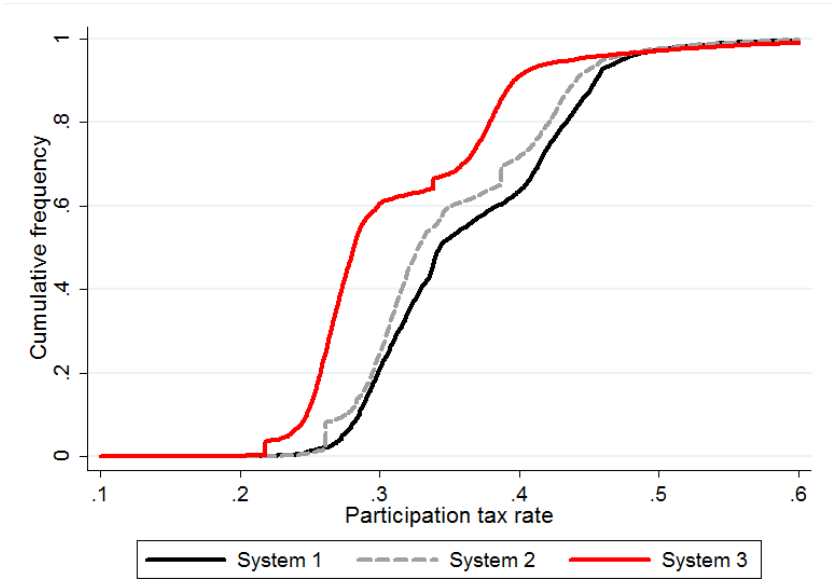
Systems from 2005, 2007 and 2009 on respective data

	PTRs		RRs	
Systems:	Median	Mean	Median	Mean
1) 2005 system on 2005 data	0.343	0.365	0.046	0.131
2) 2007 system on 2007 data	0.328	0.352	0.028	0.109
3) 2009 system on 2009 data	0.282	0.315	0.014	0.088

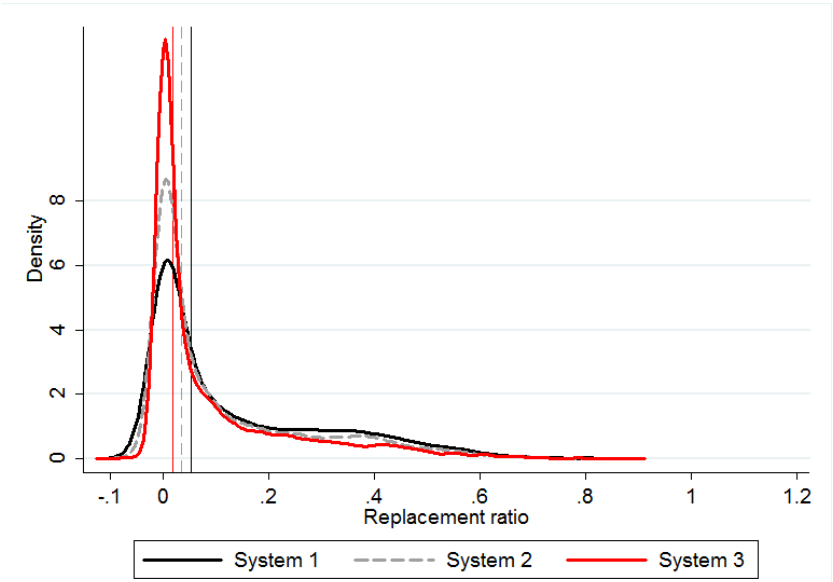
Source: Author's calculations using SIMPL microsimulation model (V4S3.12).

Figure : Actual PTRs and RRs: First earners in couples - without kids

PTRs



RRs

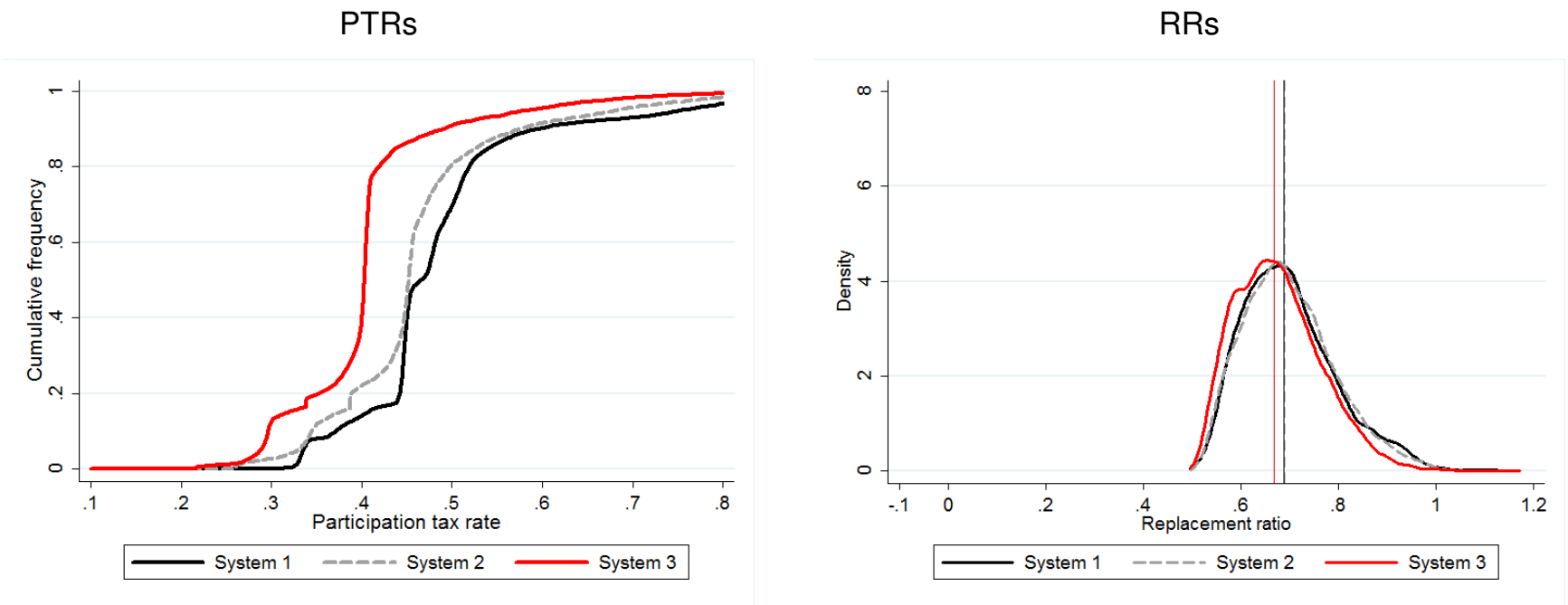


Systems from 2005, 2007 and 2009 on respective data

	PTRs		RRs	
Systems:	Median	Mean	Median	Mean
1) 2005 system on 2005 data	0.465	0.488	0.685	0.698
2) 2007 system on 2007 data	0.452	0.463	0.688	0.697
3) 2009 system on 2009 data	0.403	0.405	0.666	0.674

Source: Author's calculations using SIMPL microsimulation model (V4S3.12).

Figure : Actual PTRs and RRs: Second earners in couples - with kids

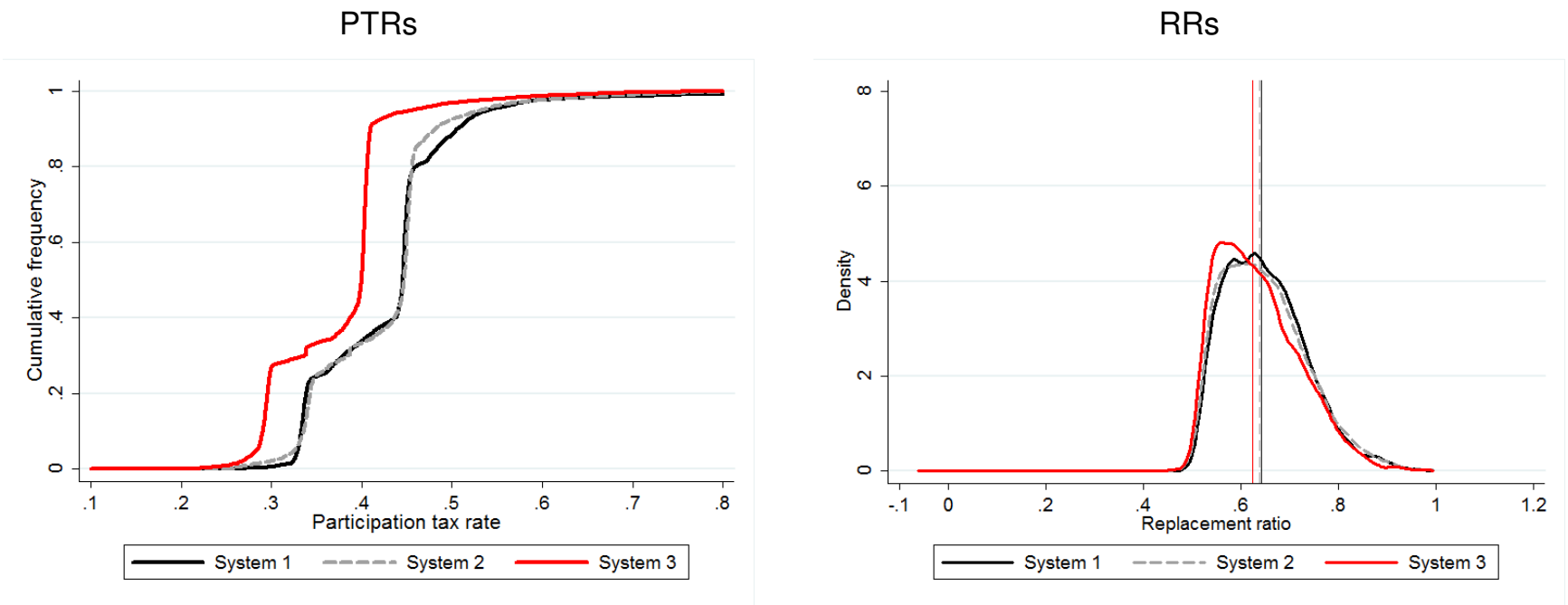


Systems from 2005, 2007 and 2009 on respective data

	PTRs		RRs	
Systems:	Median	Mean	Median	Mean
1) 2005 system on 2005 data	0.446	0.428	0.639	0.648
2) 2007 system on 2007 data	0.447	0.424	0.636	0.647
3) 2009 system on 2009 data	0.400	0.374	0.621	0.634

Source: Author's calculations using SIMPL microsimulation model (V4S3.12).

Figure : Actual PTRs and RRs: Second earners in couples - without kids

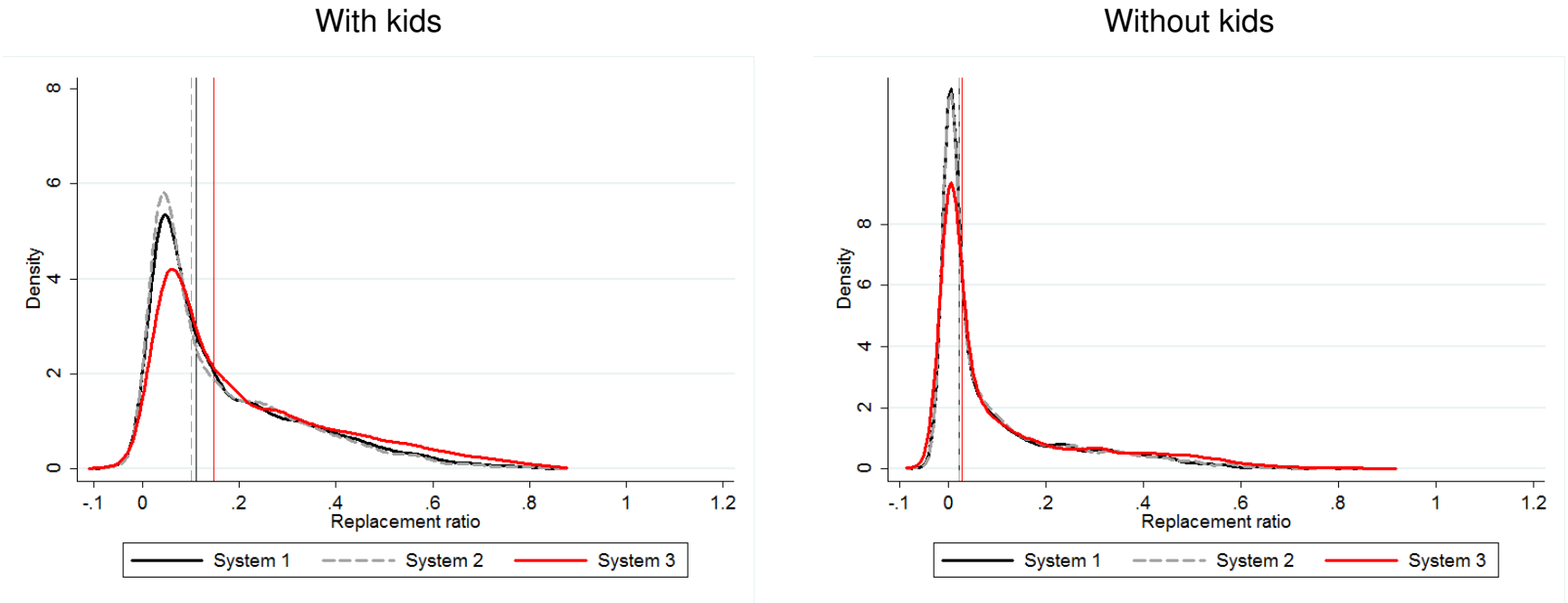


Systems on 2009 data: 1) 2009, 2) indexed 2005, 3) 2009 with 2005 wages

	With kids		Without kids	
Systems:	Median	Mean	Median	Mean
1) 2009 system on 2009 data	0.106	0.168	0.016	0.088
2) 2005 system on 2009 data	0.096	0.160	0.017	0.088
3) 2009 system on 2009 data with 2005 wages	0.140	0.208	0.021	0.109

Source: Author's calculations using SIMPL microsimulation model (V4S3.12).

Figure : Expected RRs: First earners in couples - with and without kids

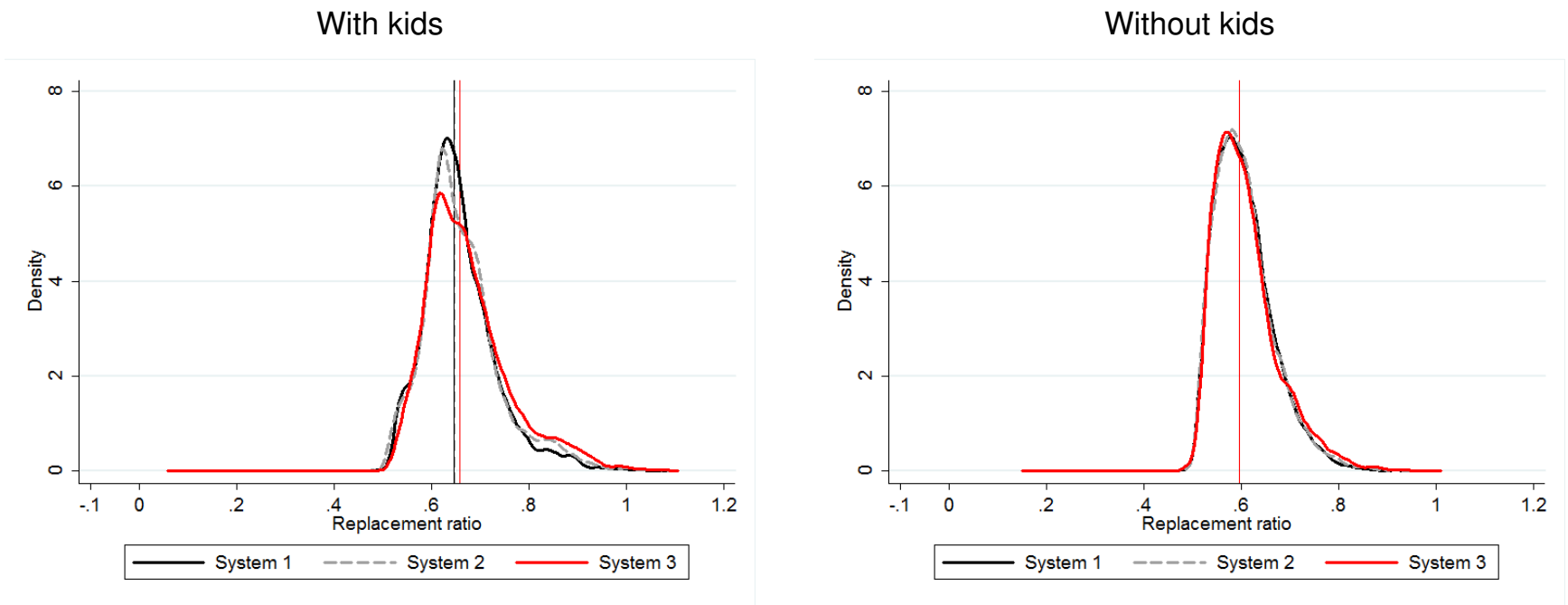


Systems on 2009 data: 1) 2009, 2) indexed 2005, 3) 2009 with 2005 wages

	With kids		Without kids	
Systems:	Median	Mean	Median	Mean
1) 2009 system on 2009 data	0.644	0.656	0.595	0.604
2) 2005 system on 2009 data	0.647	0.660	0.595	0.605
3) 2009 system on 2009 data with 2005 wages	0.655	0.672	0.594	0.607

Source: Author's calculations using SIMPL microsimulation model (V4S3.12).

Figure : Expected RRs: Second earners in couples - with and without kids



Systems on 2009 data: 1) 2009, 2) indexed 2005, 3) 2009 with 2005 wages

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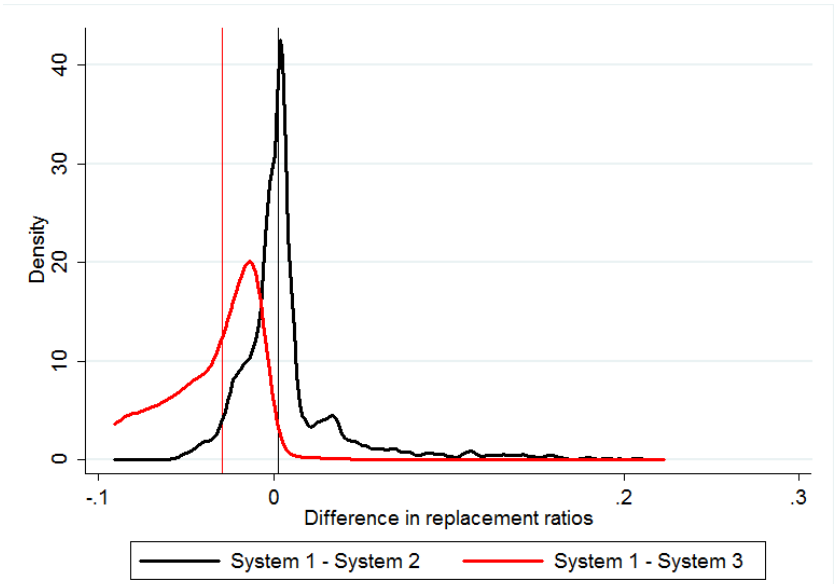
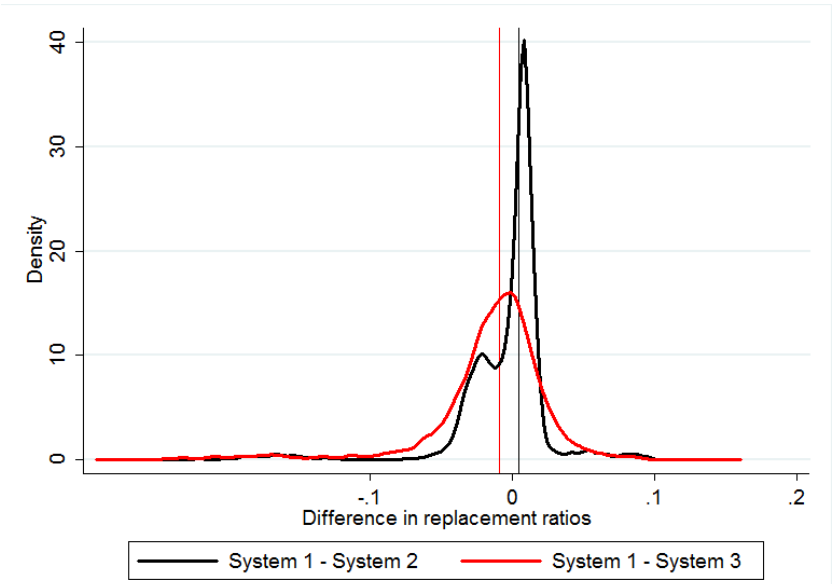
Figure : Changes in RRs for first and second earners with children

RRs - first earners



RRs - second earners



Conclusion

- 2005-2009: a period of rapid growth in real wages and of a number of important tax and benefit changes in Poland;
  - combined with increases in employment (in particular 2005-2007);
  - interesting from the point of view of measuring financial incentives to work and performance of labour supply models.
- Despite significant reductions in taxation, wage growth seems to have played the key role in determining financial incentives to work in Poland:
  - counteracting role of benefit policy and tax increases through parameter "freezing";
  - important effects mainly for first earners, weaker or no changes in incentives for second earners;
  - second earner incentives difficult to affect either through policy or wage growth.
- Setting policy at the time of crisis with stagnating or falling real wages:
  - policy effects may be small but might exacerbate labour market developments;
  - employment developments in Poland show the role of labour demand which goes beyond determining of wage growth.

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