



CPB Netherlands Bureau for Economic  
Policy Analysis

## Simulating Income Tax Reforms in the Netherlands with MICSIM

Egbert Jongen  
Henk-Wim de Boer  
Peter Dekker



# Introduction



## Introduction

- Simulating tax-benefit reform is core business at CPB
- Business has been good in recent years
- We simulate budgetary, redistributive and employment effects
- Our analyses play a key role during e.g. election times, for coalition agreements and 'everyday' policymaking
- The Netherlands is currently gearing up for a major tax reform



## The MICSIM project

- **Goal:** build an **evidence based** and **integrated** microsimulation model for the analyses of tax-benefit reform in the Netherlands
- Two key elements:
  1. Evidence based: bigger, better and more recent empirical base for behavioural responses
  2. Integrated: generates all the relevant output in one run



## The MICSIM model

- MICSIM – A behavioural microsimulation model
- Key components
  1. Advanced tax-benefit calculator for taxes and premiums at the individual and household level
  2. Aggregation over households to get to nationwide totals
  3. Behavioural model for participation in persons and hours, labour productivity and formal childcare



## Output of MICSIM



- With one push on a button we now have
  1. Budgetary effects ex ante
  2. Redistributive effects ex ante
  3. Effects on labour participation, in persons and hours, labour productivity and formal childcare
  4. Knock-on effects for the government budget
- Integrates previous analyses with MIMOSI and MIMIC, and with a much better empirical base



## Outline of the talk

- Key findings empirical analysis
- Illustrate relevance with policy simulations
- Lessons for tax reform



# Key findings empirical analyses



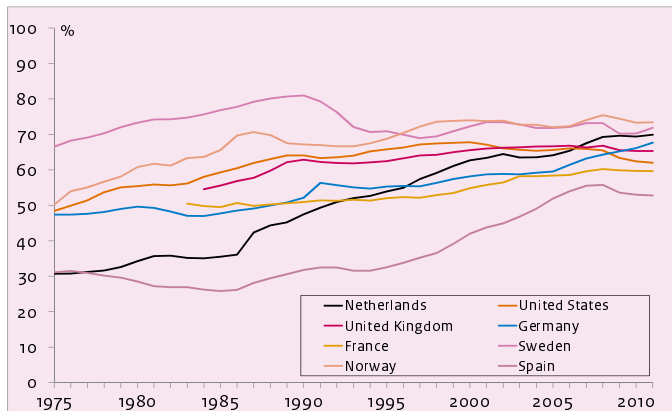


## Key findings empirical analysis

- Labour supply responses women much lower than in the past
- Large differences in responses across demographic groups
- Response mostly on decision to participate, not hours per week
- Price elasticity formal childcare higher
- Model does a good job at predicting behavioural responses of past reforms



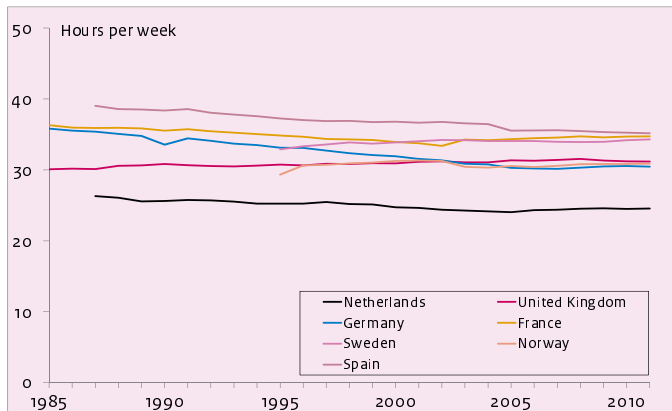
## Employment-to-population rate women



Source: OECD Labour Force Statistics



## Usual weekly hours employed women



Source: OECD Labour Force Statistics



## The elasticities they are a-changin'

- Measure responsiveness of labour participation by the so-called labour supply elasticity
- Labour supply elasticity = % change in hours worked / % change in wages
- Significant drop in labour supply elasticity of women since the '80s
  - ▶ Theeuwes and Woittiez (1992) studies from the '80s: 1.0
  - ▶ Evers et al. (2008) studies from the '80s and '90s: 0.5
  - ▶ Jongen et al. (2014) data late '00s: 0.10 (no kid) – 0.45 (young kids)



## ... continued

- A similar pattern is observed for the US
  - ▶ Blau and Kahn (2007): 1980 0.77-0.88, 2000 0.36-0.41
  - ▶ Heim (2007): finds even stronger decline
- What to expect for the future?
  - ▶ Blau and Kahn (2007): increase in participation levels off
  - ▶ Euwals et al. (2014): NL same story
  - ▶ Blau and Kahn (2007): drop elasticity levels off as well (comparing drop 1980 → 1990 with drop 1990 → 2000)

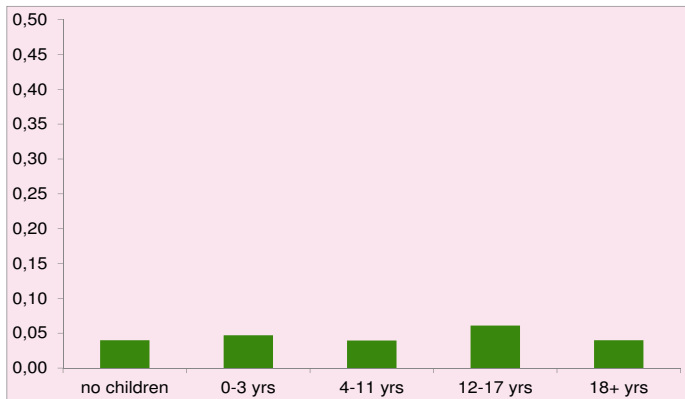


## Large differences in behavioural responses

- We uncover large differences between demographic groups
- In particular for women
- Differences between singles and couples
- Differences between households with and without children
- Differences by age of the youngest child

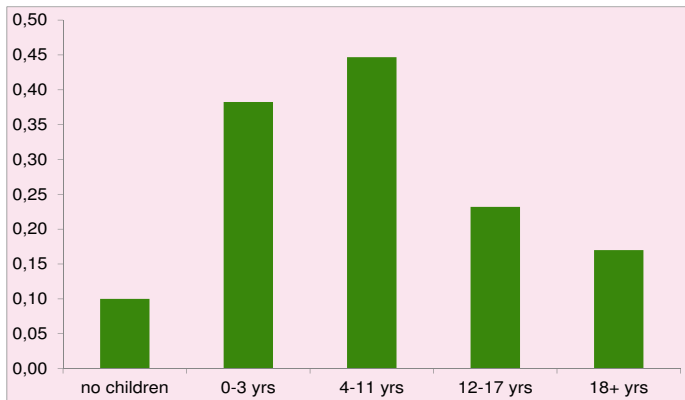


## Men in couples indeed rather unresponsive





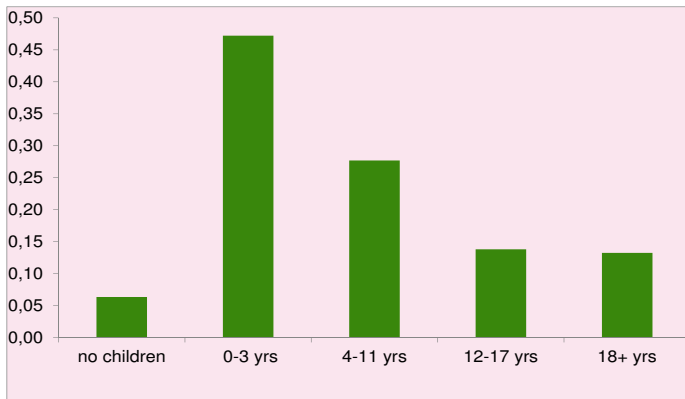
## Large differences for women in couples





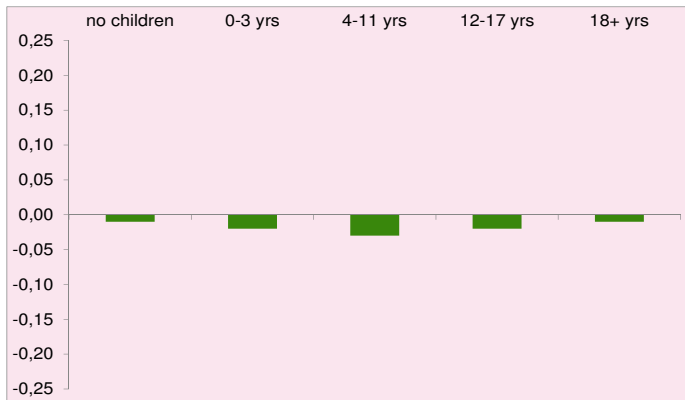


## Large differences singles and single parents



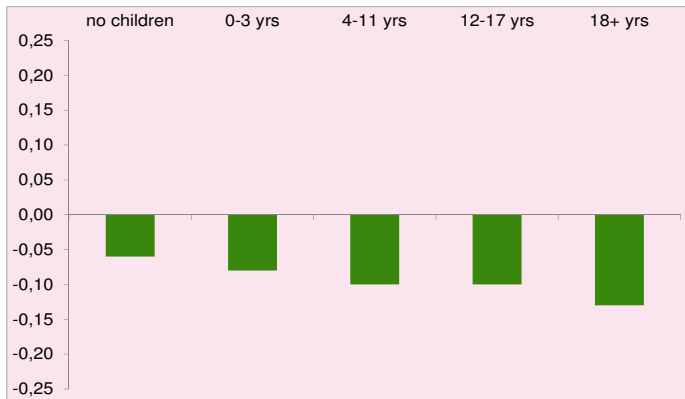


## Cross effect wage wife on hours husband small



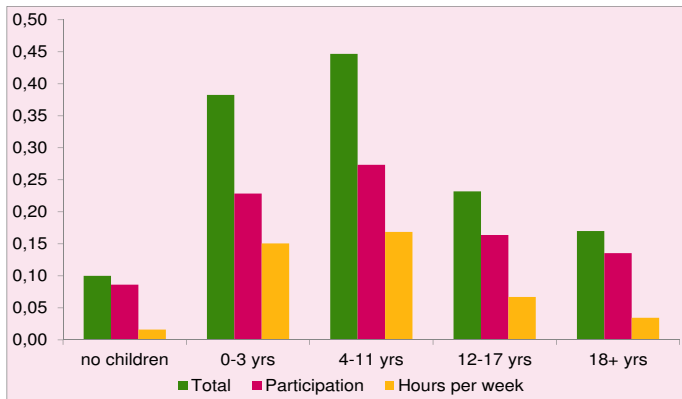


## Cross effect wage husband on hours wife large





## Effect on participation bigger than on hours per week (example: women in couples)





## Price elasticity of formal childcare higher

- Ooms et al. (2003)
  - ▶ Price elasticity daycare:  $-0.2$
- Jongen, De Boer and Dekker (2104)
  - ▶ Price elasticity daycare:  $-0.4$
  - ▶ Price elasticity out-of-school care:  $-0.4$
- Consistent with large drop in childcare following budget cuts
- Substitution between formal and informal care important



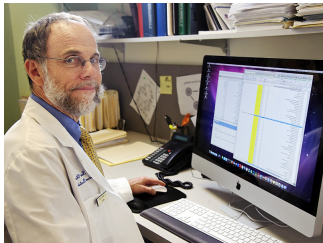
## Validation of the structural model

- We estimate so-called structural models: policy invariant 'deep' parameters of preferences over e.g. income and leisure
- Necessary if we want to study effects of new policies
- Natural question to ask: how well does the model predict behavioural responses of past reforms?
- Check key behavioural responses with treatment–control studies
  1. Reform of childcare and in-work benefits for parents
  2. Reform of in-work tax credit for single parents
  3. Changes in marginal tax rates of the 2001 reform
- Model predicts behavioural changes very well!



## Back to MICSIM

- We put all of this knowledge in our simulation model
- We then simulate all the relevant output of counterfactual policies



- Show you some results next
- But good to make a few remarks on what MICSIM is not first



## What MICSIM is not

- Not a lifecycle model (need additional data and dynamic model)
- Not a general equilibrium model (small open economy, long run)
- No explicit modelling of frictions
  - ▶ De Boer (2014): explicitly accounts for involuntary unemployment
  - ▶ Makes little difference, **when unemployment is close to the long run value (not now)**





# Policy simulations



## Policy simulations

- Illustrate relevance empirical findings with some policy simulations
  1. Small effects of marginal tax rates
  2. Larger effects of welfare benefits and in-work tax credits
  3. Large effects subsidies for working young mothers
  4. But beware the knock-on effects for childcare subsidies
- Present simulation results for 2014
- However: results should be interpreted as **long run** responses!
- Some key numbers on slides, see Jongen et al. (2014) for details



## Small effects of reducing marginal tax rates

- Example: reduce the third bracket rate
- For 1.5 billion euro we get just  $\approx +4$  thousand FTE
- Why?
  - ▶ Increases mostly incentive for men in couples to work more hours, but they are rather unresponsive, especially in hours per week
  - ▶ Cross-effect on the wife: work less when the household gets richer



## Larger effects welfare benefits & in-work tax credits

- Reducing welfare benefits (Bijstand) has a large effect
- Cutting benefits by 0.5 bln euro we get  $\approx +40$  thousand FTE
- Why?
  - ▶ Targets the participation decision
  - ▶ Targets the responsive group of single parents
- Note: recall that these are **long run** responses



## Larger effects welfare benefits & in-work tax credits

- Increase the in-work tax credit (Arbeidskorting) for workers up to 40 thousand euro
- For 1.5 billion euro we get  $\approx +10$  thousand FTE
- In between 3rd bracket and welfare benefits, why?
  - ▶ Also targets the participation decision
  - ▶ But many people work, and less targeted at single parents
- Note: increases participation of low productive workers



## Large effects for income dependent in-work tax credit for young mothers

- Increase the in-work tax credit for secondary earners and single parents with children up to 12 years of age (ICK)
- Increase in-work tax credit more for those that earn more
- For 0.5 bln euro we get  $\approx +11$  thousand FTE
- Large effect, why?
  - ▶ Targets the elastic group of young mothers
  - ▶ Also gives incentives to work more days per week



## Beware the knock-on effects of childcare subsidies

- Increase childcare subsidies, proportional drop in parental fee
- For 0.5 bln euro we get  $\approx +13$  thousand FTE
- Large effect, why?
  - ▶ Also targets the elastic group of young mothers
  - ▶ And also gives incentives to work more days per week
- Catch: substitution to formal care drives up budgetary costs



## Overview

Simulation		Third bracket	Welfare benefits	In-work tax credit	IWTC 'mothers'	Childcare subsidies
Impulse (bln euro)		+ 1.5	-0.5	+1.5	+0.5	+0.5
Inequality (Gini)	$\Delta$ %	+0.63	+0.56	-0.30	-0.01	-0.01
FTE (x1000)	$\Delta$	+4	+40	+10	+11	+13
Labour product.	$\Delta$ %	+0.02	-0.10	-0.09	-0.04	-0.03
Knock-on effect	% imp.	+7	+132	+1	+7	-60





# Lessons for tax reform



## No unique optimal tax system

- There is no unique optimal tax system
- Depends on your social preferences for
  - ▶ Vertical equity
  - ▶ Horizontal equity
  - ▶ Labour participation in persons or hours
  - ▶ Labour participation by skill type
- But for given social preferences interesting to consider which elements you really need and how you have to set the parameters to maximize social welfare



## Suppose that we want to stimulate LS in hours

- Reducing marginal tax rates will only have a small effect
- Reducing the participation tax via lower benefits or higher in-work tax credits more promising
- Study the most effective phase-in and phase-out of in-work tax credits for hours worked and the government budget



## Income support for families with children

- Interesting to study the efficient income support for single parents (what will the 2015 reform do?)
- Dito for couples with children
- The role of tagging by age of the youngest child



A big thank you!

**Henk-Wim de Boer**



**Peter Dekker**





## Many thanks also go to!

- The **scientific sounding board**
- The **policymakers sounding board**
- **Statistics Netherlands** for constructing the dataset
- The **Ministry of Social Affairs and Employment** for co-financing the construction of the dataset and the empirical research
- The **Ministry of Finance** for hosting this workshop!



The shop is open for business again



Thank you for your attention!

Questions or comments: [E.L.W.Jongen@cpb.nl](mailto:E.L.W.Jongen@cpb.nl)