

# EUROMOD: an integrated European tax-benefit model and indicators of work incentives

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# Background and acknowledgements

- **MICRESA (Micro-level Analysis of the European Social Agenda:** combating poverty and social exclusion through changes in social and fiscal policy)  
*FP5 Key Action Improving the Socio-economic Knowledge Base*
- Drawn from work of Herwig Immervoll + colleagues
  - Immervoll, “Average and marginal effective tax rates facing workers in the EU. A micro-level analysis of levels, distributions and driving factors”, EM6/04.
  - Immervoll, O’Donoghue, “Employment Transitions in 13 European Countries. Levels, Distributions and Determining Factors of Net Replacement Rates”, EM3/03
  - Immervoll, Kleven, Kreiner, Saez, “Welfare Reform in European Countries: a micro-simulation analysis”, EM1/04

# Outline

- Using microsimulation to calculate indicators of work incentives
- Why EUROMOD?
- Examples of some indicators and what they show
  - Marginal effective tax rates (METRs)
  - “Participation tax rates”
  - Replacement rates
- What else could be done?

# Tax-benefit models

- Calculate cash benefits and taxes and contributions for a (large) sample of households, representative of the population
- Focus on policies that can be straightforwardly assigned a monetary value.
- The main output from the model is household income.
- Consistent results for:
  - aggregates (budgetary effects)
  - distributions (poverty and inequality indicators)
  - individual cases (real and hypothetical)
  - indicators of incentives (NRRs METRs)
- and **changes** in these for alternative scenarios

# EUROMOD - what is it for?

- Built with *comparability* as the main objective
- Cross-country comparisons
  - distributive impact of existing systems
  - “system swapping”
- Impact of common changes or changes with common objectives
- Analysis of national changes with an EU perspective
- National analysis for countries without national models
  - Austria, Greece, Luxembourg, Portugal
- What if questions about
  - existing policy instruments and sub-components
  - changes and reforms (actual, proposed, hypothetical scenarios)

# EUROMOD - an integrated model

- Based on representative micro-datasets for each country (various types, various years)
- Original incomes taken from micro-data and updated to common policy year (1998, 2001 or 2003); tax liabilities and benefit entitlements are simulated using policy year rules ... and re-simulated for each new scenario
- Aiming to maximise comparability while maintaining transparency about real differences
- Flexibility and choice in many dimensions

# EUROMOD – calculating indicators of work incentives

- Having established the infrastructure, we have a lot of choice:
- What incentive are we interested in?
  - Tiny, small or large changes in activity? Money or time?
- Whose incentives and in what context?
- The incentive effects of policy changes (alongside distributional effects)
- Examples are all for 1998 policies, most of EU15, assuming full take-up of benefits and no tax evasion.

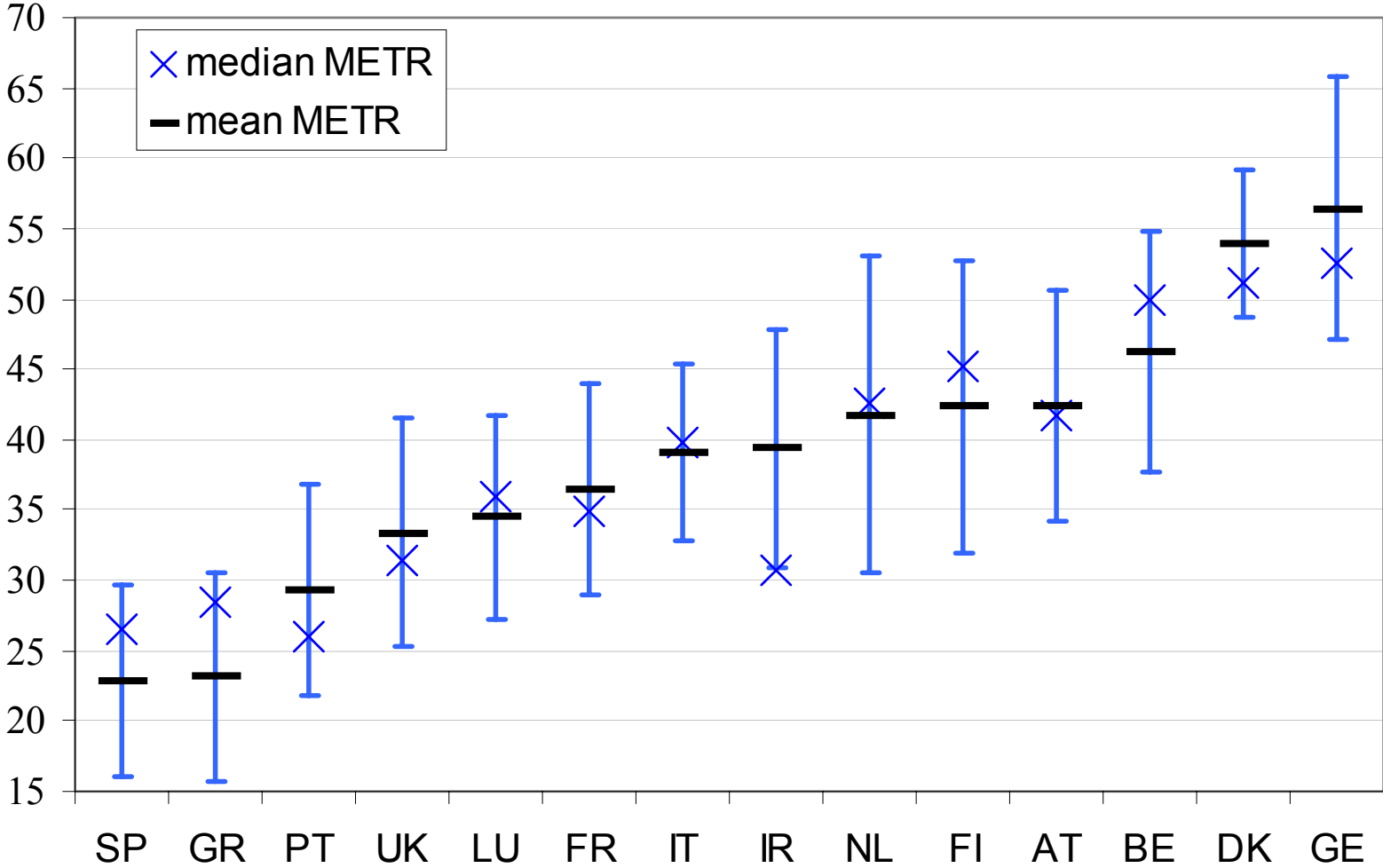
# Marginal effective tax rates

$$\begin{aligned} \text{METR} &= 1 - [(y_1 + d)(1 - t_2) - y_1(1 - t_1)] / d \\ &= 1 - \Delta Y_{\text{net}} / \Delta Y_{\text{gross}} \end{aligned}$$

- 1998, EU14 (not Sweden), population aged 18-64 in employment or self-employment
- Effect on household income (after income taxes, social contributions and benefits); taking each individual in turn
- An increase in gross earned income of 3%

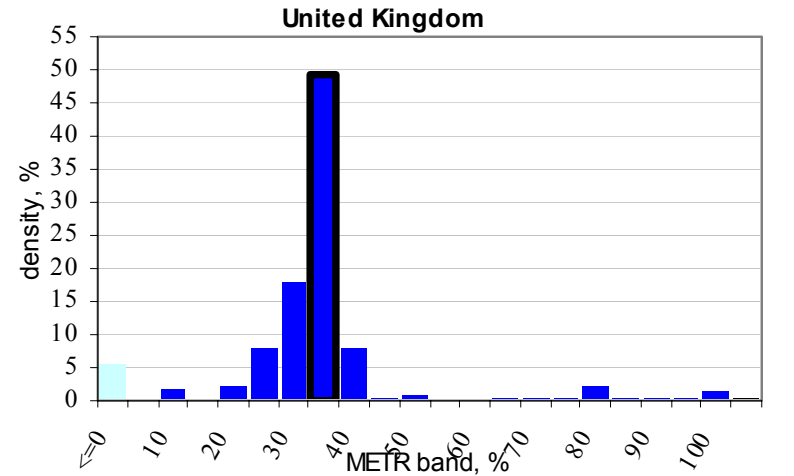
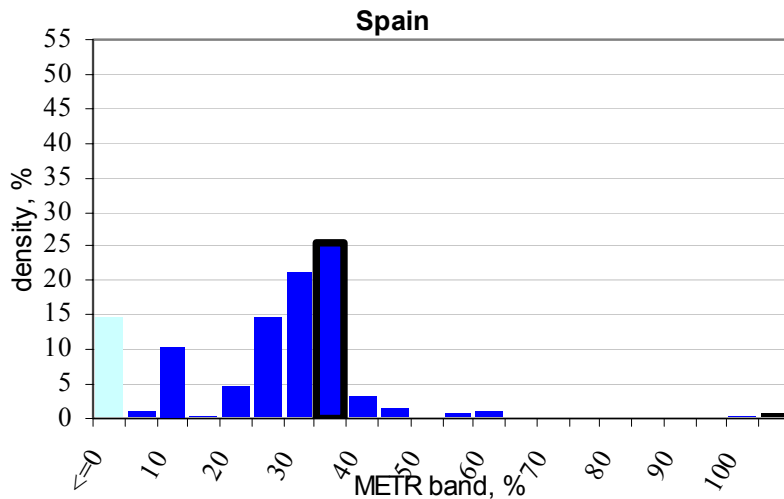
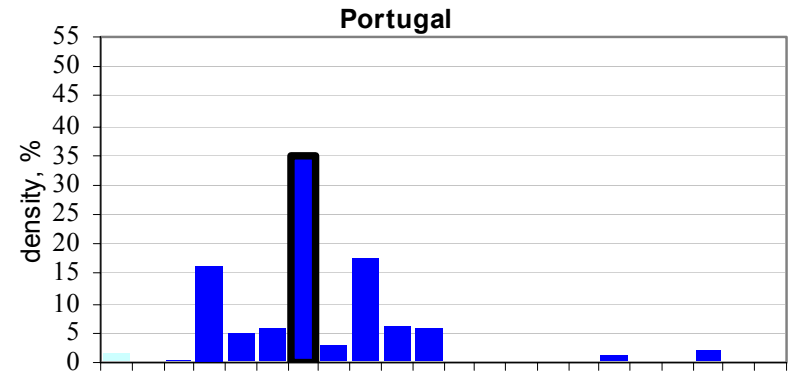
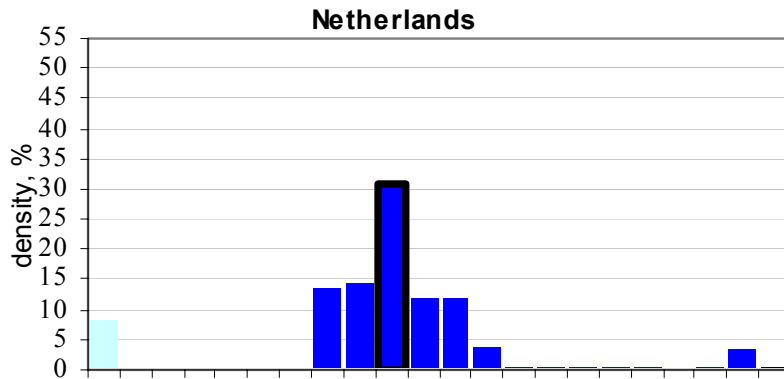


# Average METRs faced by working population



Source: EUROMOD (Immervoll, 2004)

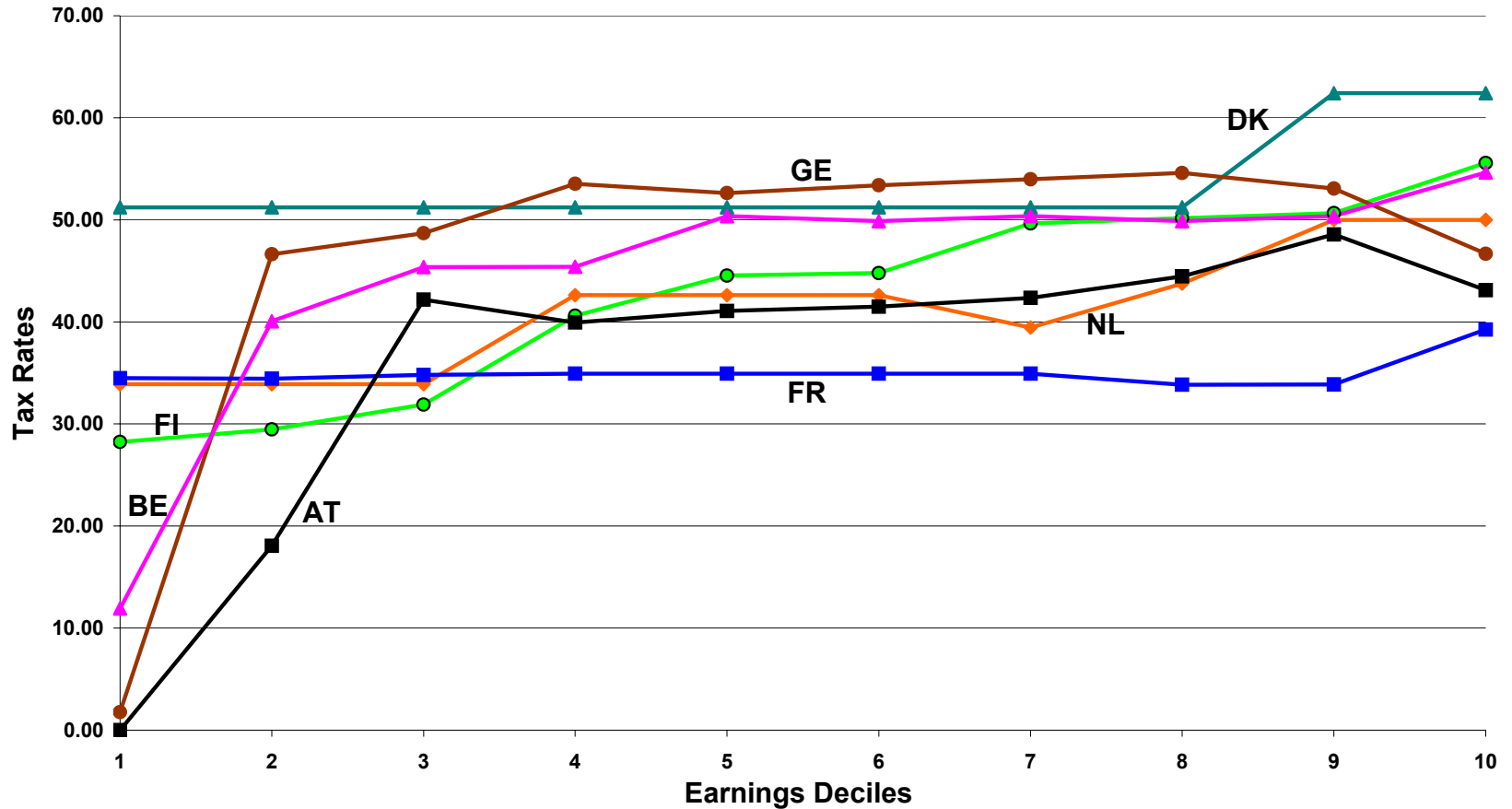
# Distribution of METRs 1998



Source: EUROMOD (Immervoll, 2004)

# Median METRs by earnings decile

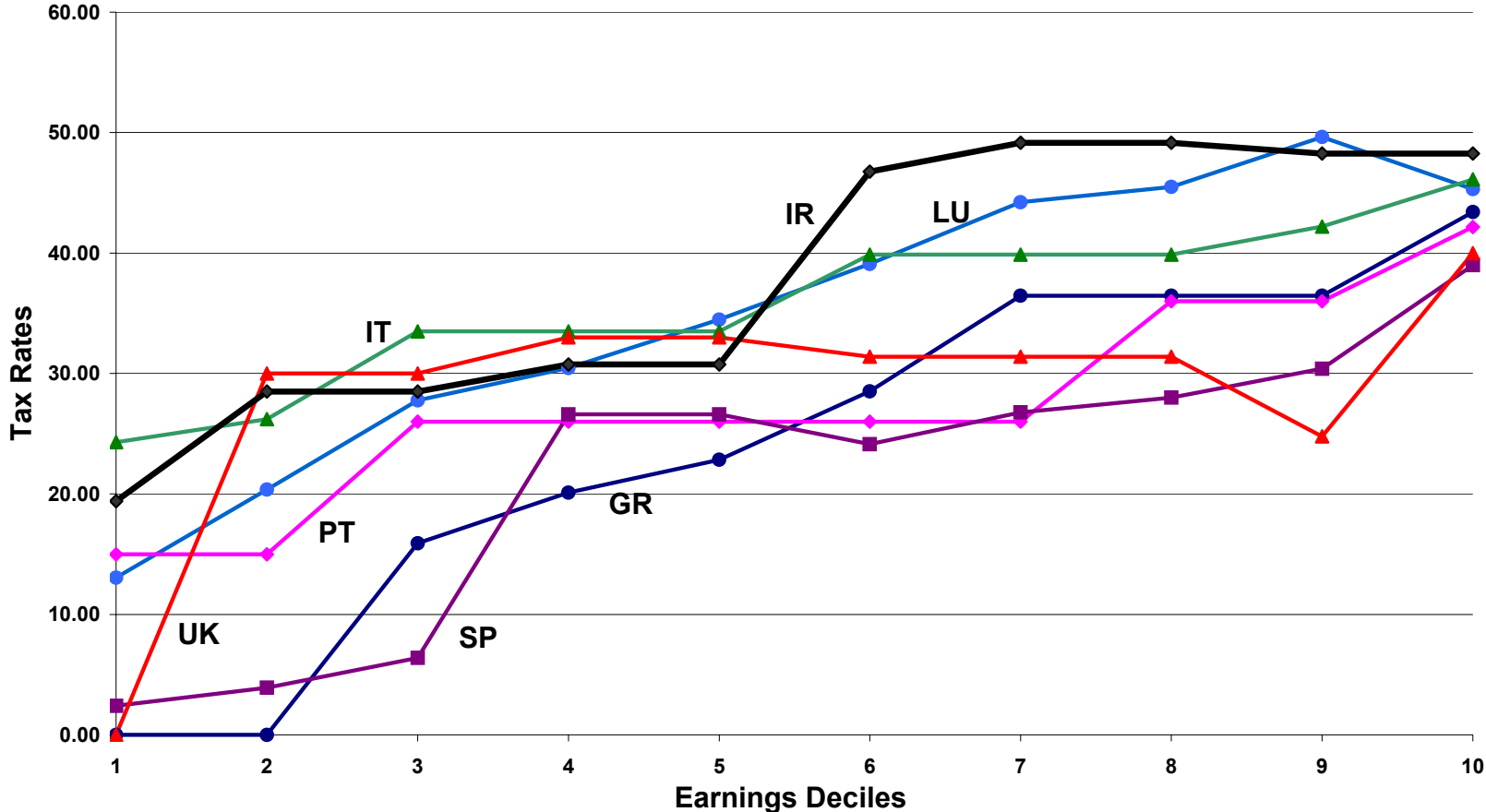
## High Tax Countries



Source: EUROMOD (Immervoll, 2004)

# Median METRs by earnings decile

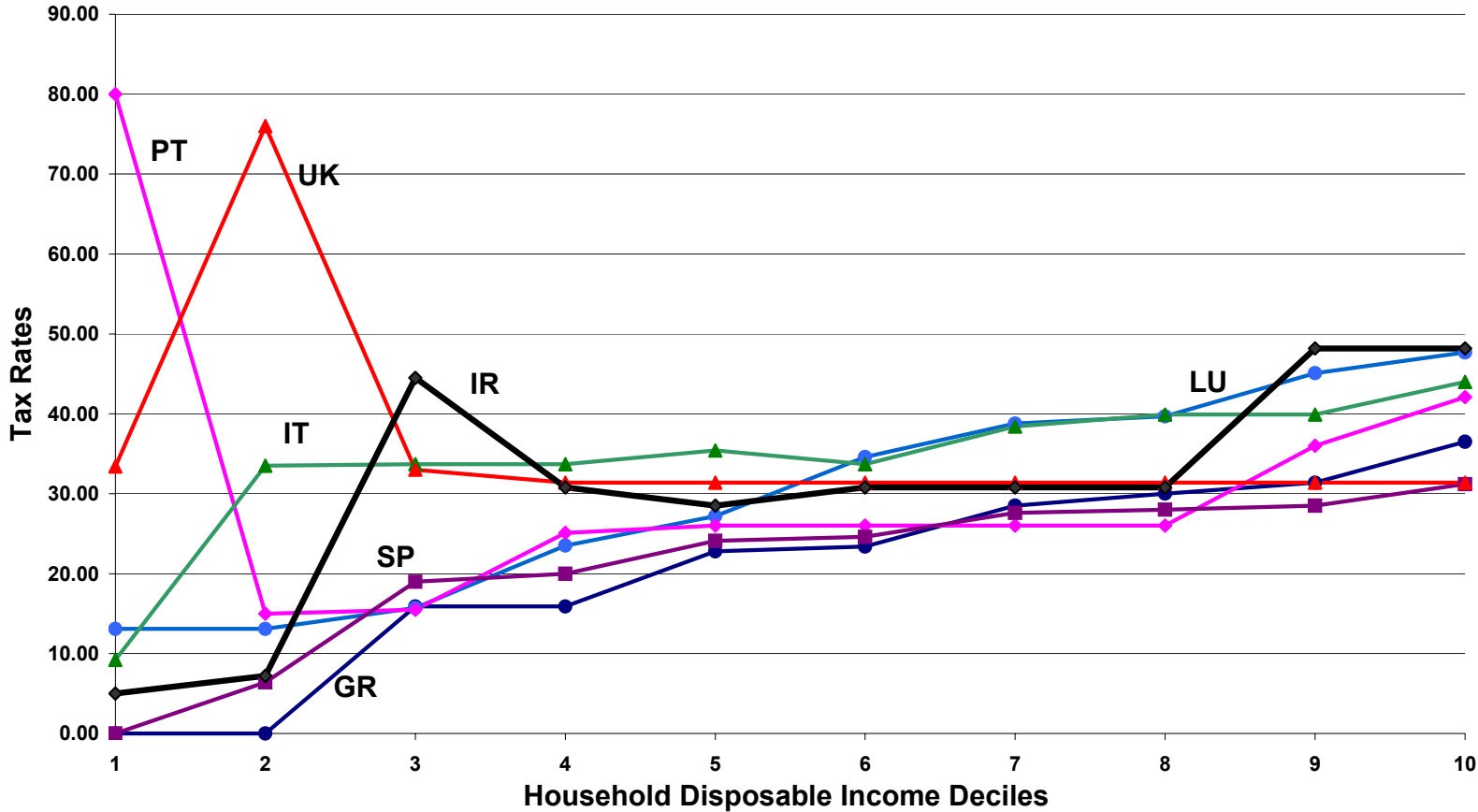
## Low Tax Countries



Source: EUROMOD (Immervoll, 2004)

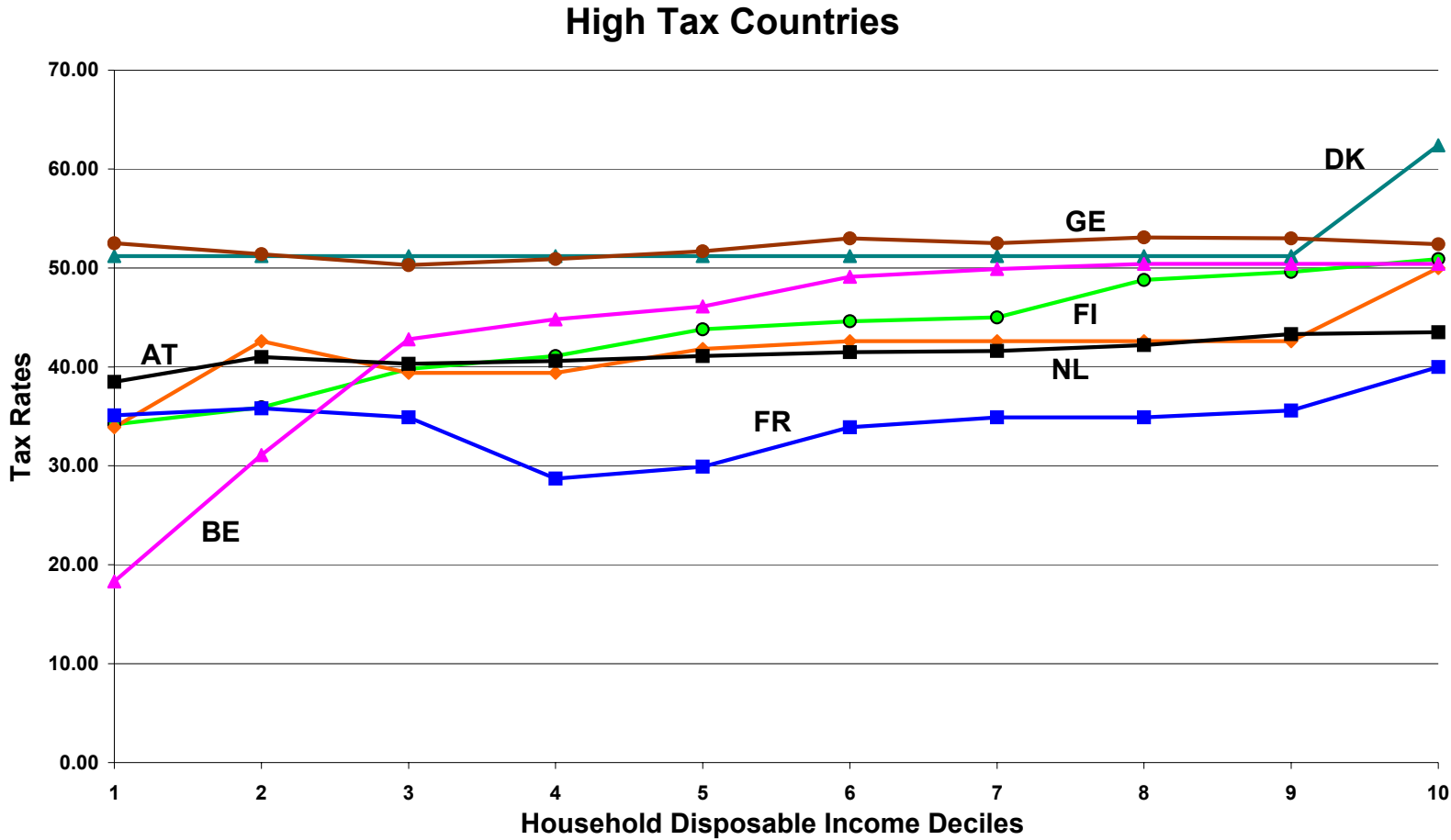
# Median METRs by hhold income decile

## Low Tax Countries



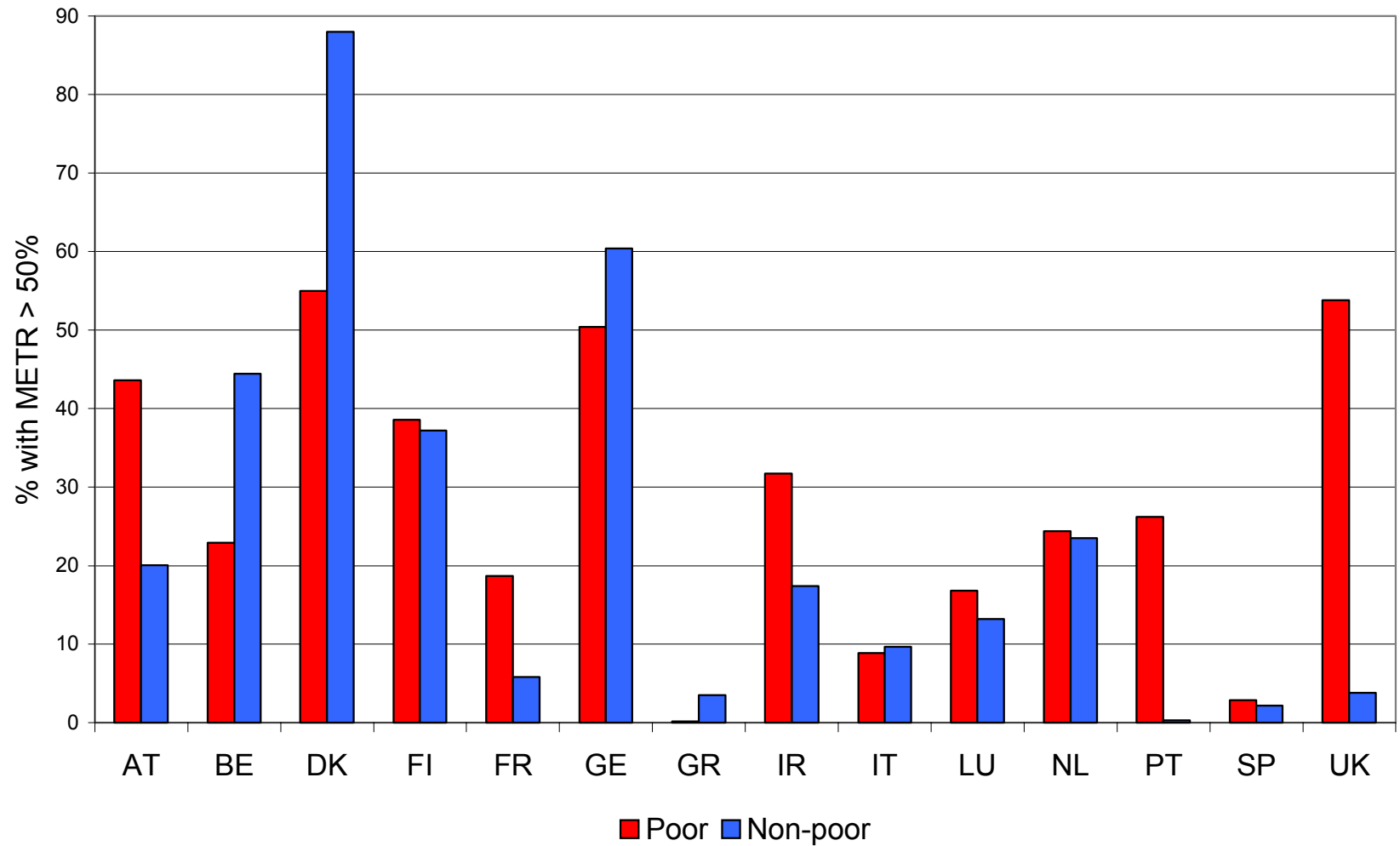
Source: EUROMOD (Immervoll, 2004)

# Median METRs by hhold income decile



Source: EUROMOD (Immervoll, 2004)

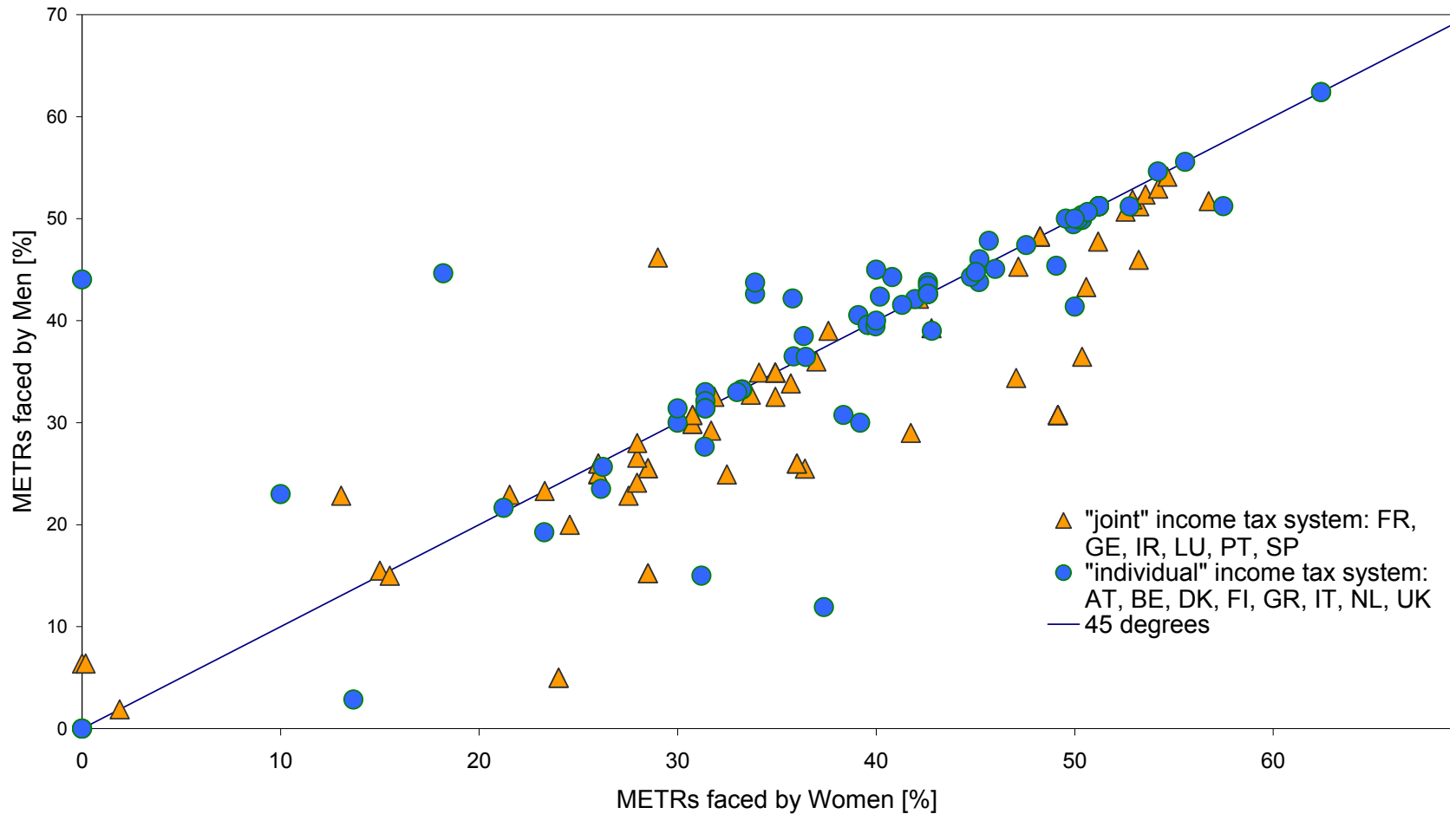
## Adults in paid work with high (> 50%) marginal effective tax rates 1998



Source: EUROMOD (Immervoll, 2004)

# Median METR by gender

(men & women in same earnings decile group)



Source: EUROMOD (Immervoll, 2004)



# “Participation” tax rates (“Average Effective Tax Rates”)

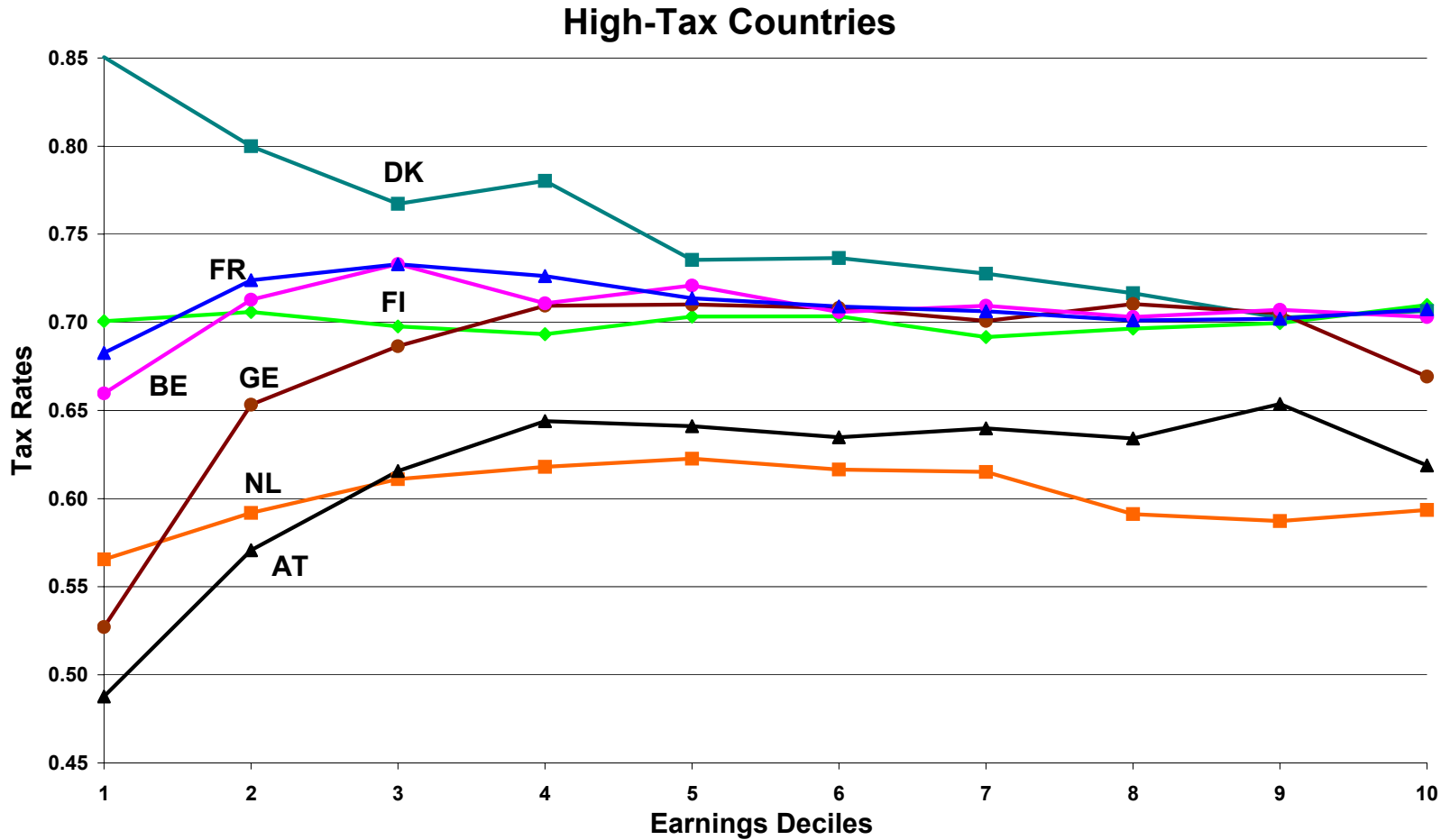
$$\text{PTR} = 1 - \frac{\Delta Y_{\text{net}}}{\Delta Y_{\text{gross}}}$$

Where  $\Delta Y_{\text{net}}$  = net increase in household disposable income when individual enters work and

$\Delta Y_{\text{gross}}$  = gross earnings in work

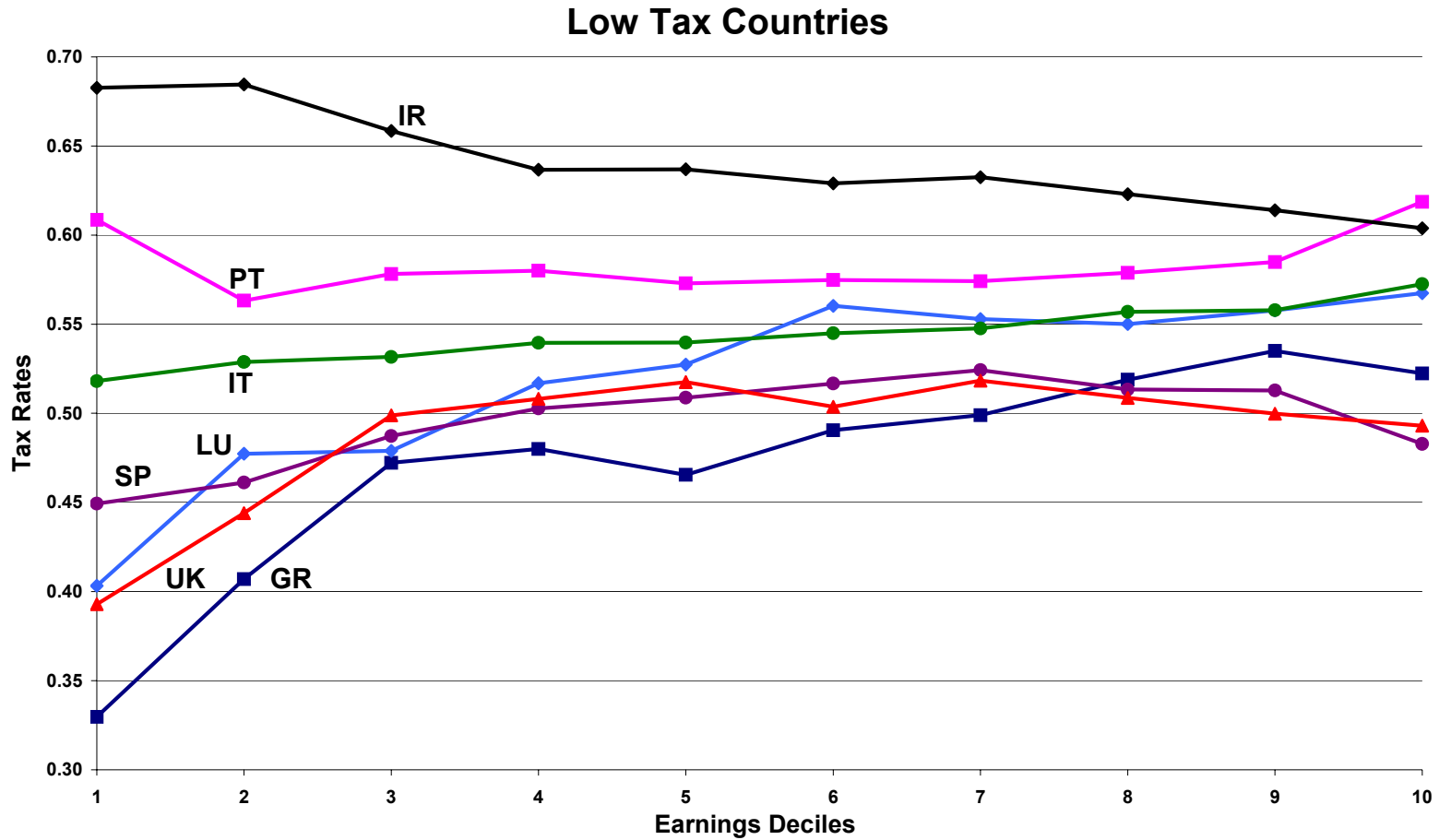
- 1998, EU14
- In this example disposable income is net of employer contributions and imputed consumption taxes

# Mean PTRs by earnings decile (1)



Source: EUROMOD (Immervoll, Kleven et al, 2004)

# Mean PTRs by earnings decile (2)



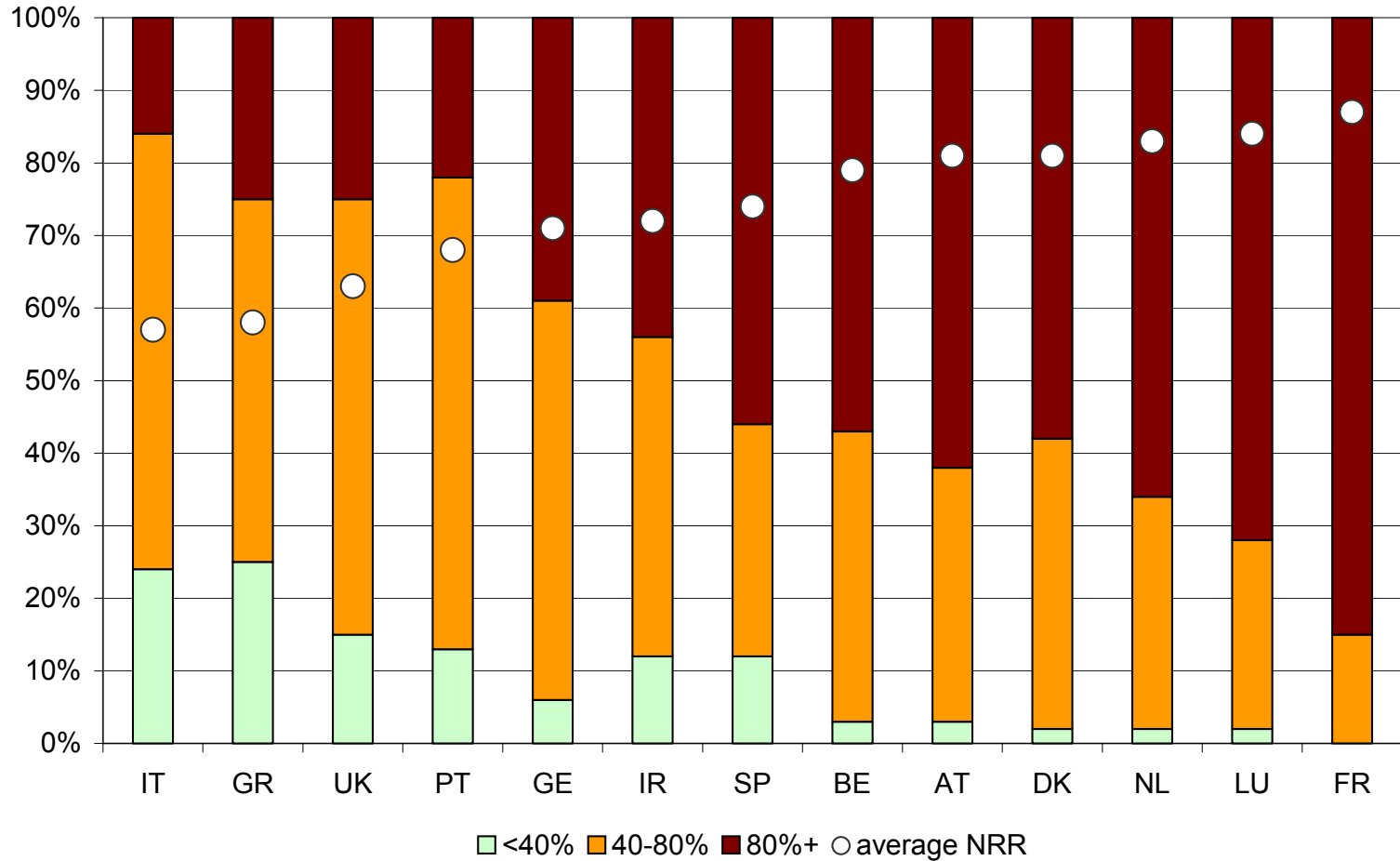
Source: EUROMOD (Immervoll, Kleven et al, 2004)

# Net replacement rates

$$\text{NRR} = Y_{\text{out}} / [Y_{\text{out}} + \Delta Y_{\text{net}}]$$

- Depends on other household income as well as operation of the tax-benefit system
- 1998, EU13 (not Sweden, Finland), transitions from unemployment and inactivity to employment (using estimated earnings); transitions from employment to unemployment
- Effect on household income (after incomes taxes, social contributions and benefits); taking each individual in turn
- Here, shown for employment » unemployment (in initial period)

# Distribution of NRRs 1998



Source: EUROMOD (Immervoll, O'Donoghue, 2003)

# What else can be done?

- Decomposition by driving factors
- Account for work-related costs (childcare)
- METRS – other margins
- Within household differences
- Update to 2001 and 2003 and beyond...
- EU25+
- Incentive effects of policy changes
- Modelling changes in behaviour (Bargain, Orsini, EM4/04)

# Contacts

- Find out more:  
[www.econ.cam.ac.uk/dae/mu/emod.htm](http://www.econ.cam.ac.uk/dae/mu/emod.htm)
- Receive email news:  
[hollys@essex.ac.uk](mailto:hollys@essex.ac.uk)