

Global and digitalized economy, new labour demand scenarios and optimal tax-transfer reforms

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Motivation for reform

- **Innovation** processes (Globalization, Automation, Digitalization) are implying important **changes** in the size and structure of labour demand
- Possible **effects** (Acemoglou & Restrepo 2017, Autor & Dorn 2013, Sachs & Kotlikoff 2012 etc.):
 - fewer jobs
 - more temporary jobs and intermittent careers
 - increased inequality and polarization of incomes
 - **welfare policies** under stress due to increased job and income insecurity

Motivation for reform

- The **traditional** welfare policies might **not** be appropriate for **coping with the new scenario** and **distributing the gains** from automation and globalization.
- Most reforms during the last decades: more sophisticated **means-tested** and **categorical** policies
- **Alternative view**: simple, unconditional, universal policies (Islam & Colombino 2018, Colombino & Narazani 2013)

Purpose

Testing whether a simple and universalistic **tax-transfer rule (TTR)** can

- **outperform** the complex and categorical current TTRs
- more efficiently **cope** with new labour market scenarios with fewer available jobs

Our approach

- **Computational Optimal Taxation** approach
- Combination of **behavioural microsimulation** and **numerical optimization**
 - A **microeconomic model** **simulates** households' **choices** and **welfare** given alternative TTRs
 - Households' welfare levels are aggregated into a **Social Welfare function**
 - An **optimization** routine searches **polynomial TTRs** until Social Welfare is maximized s.t.
 - **Fiscal neutrality**
 - **Labour market equilibrium**

Polynomial TTRs

$$C_i = \tau_0 \sqrt{H_i} + \tau_1 y_i + \tau_2 y_i^2 + \tau_3 y_i^3 + \tau_4 y_i^4$$

- C = total household net disposable income
- y = total household taxable income
- H = household size
- If $\tau_0 > 0$: UBI or, equivalently, NIT
- If $\tau_2 = \tau_3 = \tau_4 = 0$, then we have a UBI (or NIT) with FT:

$$C_i = \tau_0 \sqrt{H_i} + \tau_1 y_i$$

The microeconomic model

- **R**andom **U**tility – **R**andom **O**pportunities (**RURO**) model
- Can account for **alternative labour demand scenarios**
- Can account for **labour market equilibrium** (Colombino 2013, Coda Moscarola & al., Colombino & Islam 2021, Colombino & Narazani 2021)
- The data are taken from **EU-Silc 2015** for France, Germany, Italy and Luxembourg
- The dataset used for estimation and simulation are created with **Euromod**

Social welfare

We adopt the following Social Welfare index (Kolm 1976):

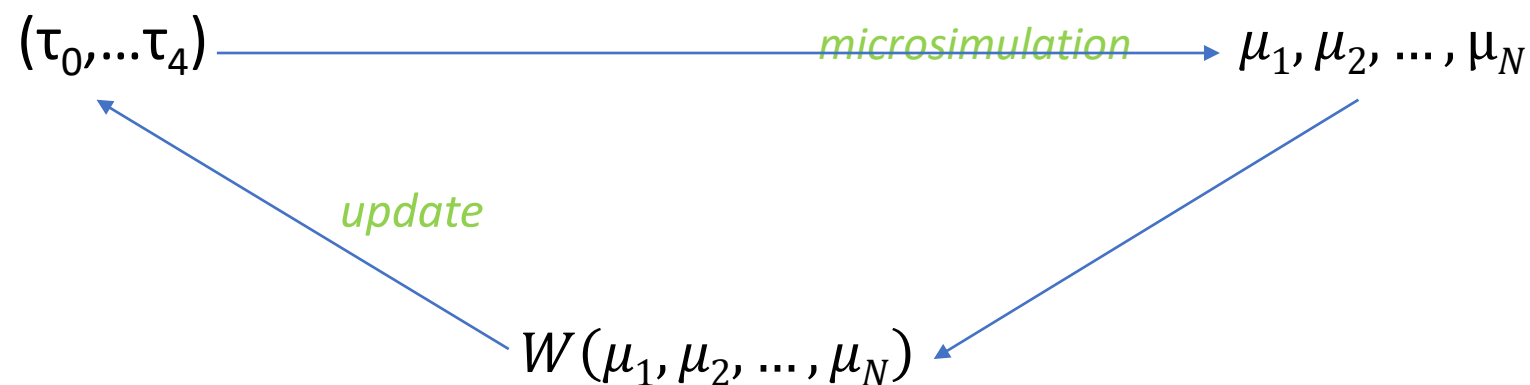
$$W = \bar{\mu} - \frac{1}{k} \ln \left[\sum_i \frac{\exp \{ -k (\mu_i - \bar{\mu}) \}}{N} \right]$$

μ_i = household i 's welfare level (comparable money-metric utility, King 1983)

$$\bar{\mu} = \frac{\sum_i \mu_i}{N}$$

Identifying optimal TTR

Iterate the polynomial TTR parameters $\tau_0, \dots, \tau_4$ until W is maximized:



with constraints:

Labour market equilibrium

Fiscal neutrality

This paper

- We consider **two alternative labour demand scenarios**:
 - The **current** (observed) one
 - The **“jobless”** scenario: -10% available market jobs for any level of the wage rate (i.e. a horizontal shift of the demand curve)
- **Two exercises**: identify optimal polynomial TTRs
 - under the **current** scenario
 - under the **“jobless”** scenario

Exercise n. 1

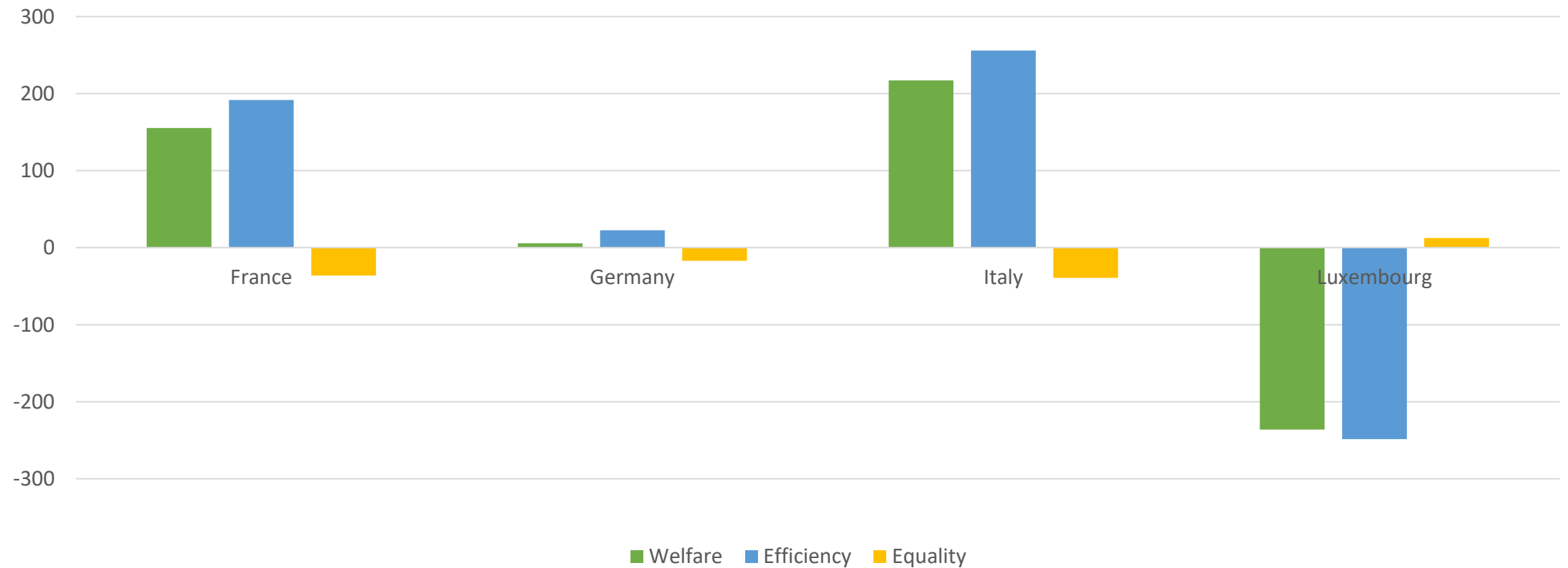
Optimal polynomial TTRs under the current labour demand scenario

- Optimal polynomial TTRs are **superior** (more efficient, although slightly disequalizing) to the current ones, exception is Luxembourg
- Optimal TTRs include a **UBI** (or, equivalently, a **NIT**)
- Optimal marginal tax rates are **flatter** than the current ones, close to flat up to 100000 euros:

$$C_i = \tau_0 \sqrt{H_i} + \tau_1 y_i$$

Exercise n. 1

Optimal Polynomial TTR vs. Current TTR: Changes in Welfare, Efficiency and Equality (monthly euro-equivalent *per* household)



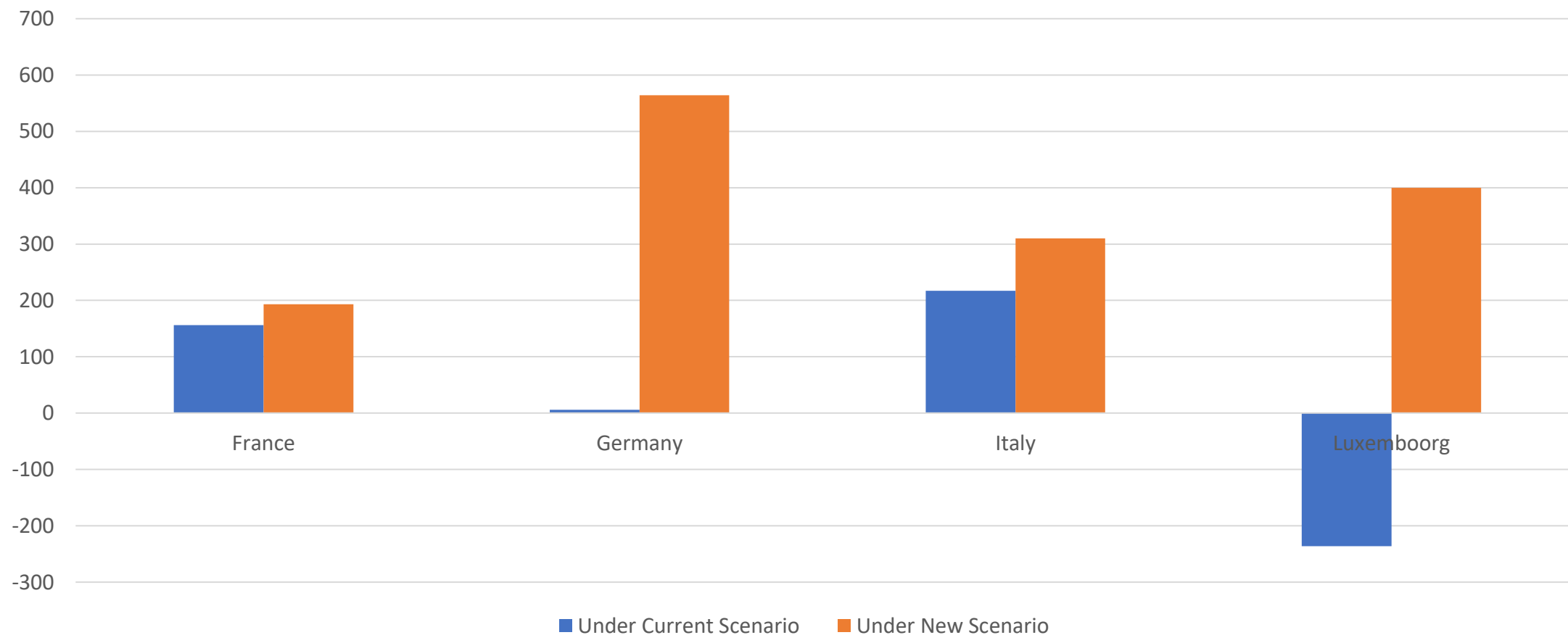
Exercise n. 2

Coping with the new scenario

- Optimized TTRs given the new scenario **outperform** current TTRs
- **Gains from optimizing:** they are **larger** under the «jobless» scenario than under the current scenario

Exercise n. 2

What do we gain by optimizing...(monthly euro-equivalent *per* household)



Conclusions

A **simple** (5 parameters) NIT or UBI with a (almost) FT might:

- Outperform the **complex** (dozens or hundreds of parameters) current TTRs
- Be an **appropriate response** to the «jobless» scenario

Thank You!

Referemces

- Coda Moscarola, Colombino, Figari & Locatelli (2020) Shifting taxes away from labour enhances equity and fiscal efficiency, *Journal of Policy Modeling*, 42(2), 367-384.
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- King (1983) Welfare analysis of tax reforms using household data. *Journal of Public Economics*, 21(2), 183-214.
- Islam & Colombino (2018) The NIT+FT case in Europe. An Empirical Optimal Taxation Exercise, *Economic Modelling*, 75C, 38-69.
- Narazani & Colombino (2021) Modelling sector-specific employment shocks with EUROLAB, a multidimensional behavioural model, JRC Working Papers on Taxation & Structural Reforms 2021-09, Joint Research Centre (Seville site).