Who Should Bear the Burden of COVID-19 Related Fiscal Pressure? An Optimal Income Taxation Perspective

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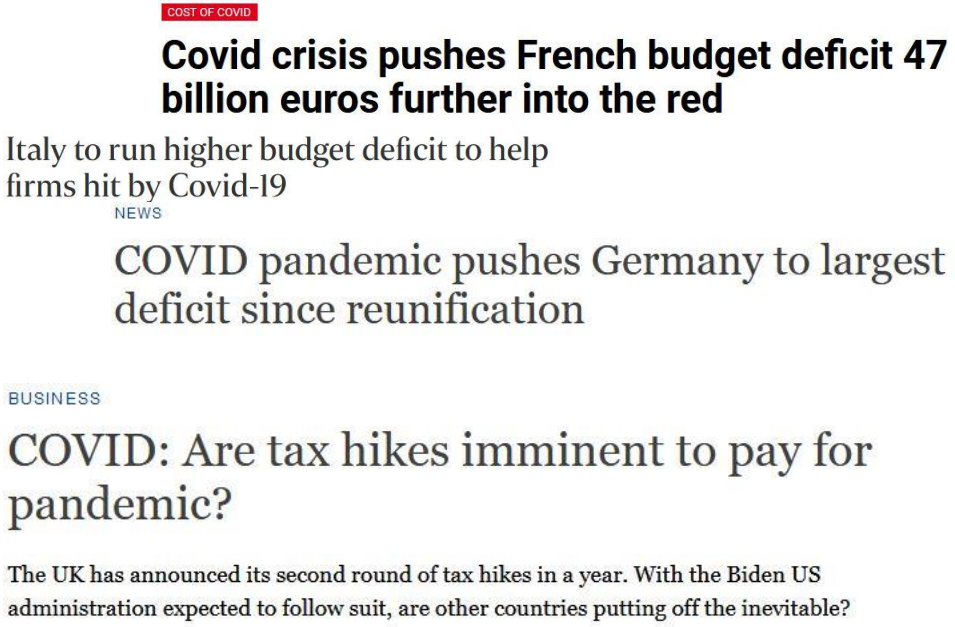
Public Economics Workshop

Motivation

- Covid-19 has caused and will continue to cause governments to increase their spending. This is accompanied by a decrease in revenues.

- A considerable stock of additional government debt
  - Less spending?
  - More revenue?

- Should taxes become more progressive?



COST OF COVID

Covid crisis pushes French budget deficit 47 billion euros further into the red

Italy to run higher budget deficit to help firms hit by Covid-19

NEWS

COVID pandemic pushes Germany to largest deficit since reunification

BUSINESS

COVID: Are tax hikes imminent to pay for pandemic?

The UK has announced its second round of tax hikes in a year. With the Biden US administration expected to follow suit, are other countries putting off the inevitable?

"…the optimal degree of progressivity should strike a balance between equity and efficiency."
(IMF special note on COVID)

This Paper

How should the tax-transfers systems change when governments face increased fiscal pressure to service the extra debt caused by Covid-19 pandemic?

- Workhorse optimal income taxation model and its extensions
  - Decreasing marginal utility of consumption
  - Income effects
- Numerical analysis on five European countries
  - France, Germany, Italy, Spain, and the United Kingdom

Literature

- Optimal income tax literature
  - Mirrlees (1971), Diamond (1998), Saez (2001)

- … and its numerous extensions
  - **Different labor supply margins**: Kleven and Kreiner (2006), Jacquet, Lehmann and Van der Linden (2013)
  - **Couples**: Kleven, Kreiner and Saez (2009)
  - **General equilibrium**: Sachs, Tsyvinski and Werquin (2020), Rothschild and Scheuer (2013)
  - **Government spending**: Heathcote and Tsujiyama (2021)

In a nutshell

- We find that transfers should decrease and marginal tax rates should increase to service the additional debt.
- This increase is regressive. That is, marginal and average tax rates increase more for lower incomes.
- If we don’t allow transfers to decrease, then the increase in marginal tax rates are even more regressive. However, the increase in average taxes is less regressive.
- Some minor differences according between countries according to their tax-transfer systems before the pandemic

Overview

- **Theory**
  - Benchmark
  - Decreasing marginal utility
  - Income effects
- **Calibration**
- **Quantitative results**
  - Baseline analysis
  - Extensions and robustness

Theory

Benchmark | Irrelevance result

Static model of income taxation with $u(c,l) = c - \frac{l^{1+\frac{1}{\varepsilon}}}{1+\frac{1}{\varepsilon}}$

- Constant marginal utility, no income effects

$$\frac{T'\big(y(w)\big)}{1-T'\big(y(w)\big)} = \left(1+\frac{1}{\varepsilon}\right)\frac{\int_w^{\bar{w}}\big(1-s(x)\big)f(x)dx}{f(w)w}$$

- Tax rates don't depend on the exogenous revenue requirement. Only lump-sum transfers change to balance the budget.

Extension I | Decreasing Marginal Utility

- $u(c,l) = U\left(c - \frac{l^{1+\frac{1}{\varepsilon}}}{1+\frac{1}{\varepsilon}}\right)$, where $U' > 0, U'' < 0$
- Decreasing marginal utility, no income effects

$$\frac{T'\big(y(w)\big)}{1 - T'\big(y(w)\big)} = \left(1 + \frac{1}{\varepsilon}\right) \frac{\int_w^{\bar{w}} \left(1 - \frac{u_c(x)}{\lambda} s(x)\right) f(x) dx}{f(w) w}$$

- Captures how much the planner wants to redistribute
- Increases if lump-sum transfer decreases

Extension II | Income effects

- $u(c,l) = \frac{c^{1-\gamma}}{1-\gamma} - \frac{l^{1+\frac{1}{\varepsilon}}}{1+\frac{1}{\varepsilon}}$
- Decreasing marginal utility, income effects

$$\frac{T'\big(y(w)\big)}{1-T'\big(y(w)\big)} = \left(1+\frac{1}{\varepsilon}\right)\frac{\int_w^{\bar{w}}\left(1-\frac{u_c(x)}{\lambda}s(x)+\eta(x)T'(y(x))\right)f(x)dx}{f(w)w}$$

- Captures the income effects
- Decreases if lump-sum transfer decreases

Laffer bounds

- Set welfare weights to zero
- Tax rates to obtain if the goal is to raise as much tax revenue as possible

$$\frac{T'_{laffer}\big(y(w)\big)}{1-T'_{laffer}\big(y(w)\big)} = \left(1+\frac{1}{\varepsilon}\right)\frac{\int_w^{\bar{w}}(1+\eta(x)T'(y(x)))f(x)dx}{f(w)w}$$

- Useful benchmark!

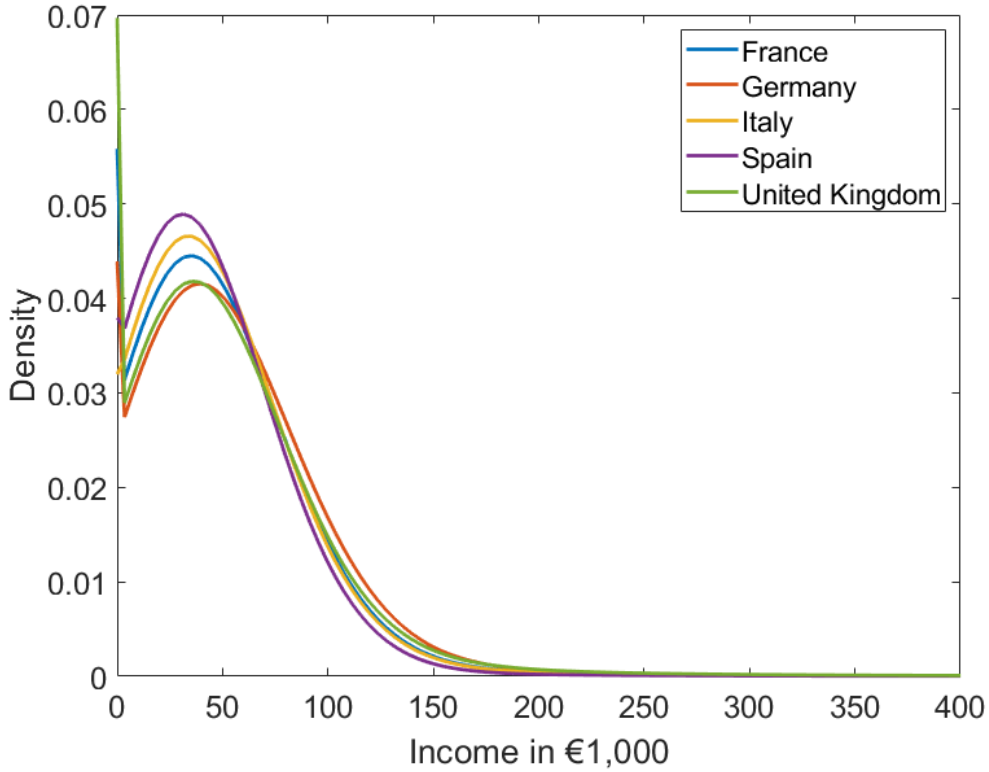
Calibration

Data

- Income distribution
  - European Union - Statistics on Income and Living Conditions 2018 (EU-SILC)
- Marginal tax rates
  - European Benefit-tax Model and Social Integration (EUROMOD)
- Lump-sum transfers
  - Social Assistance and Minimum Income Protection Interim Dataset (SaMip)
- Fiscal pressure
  - OECD Government expenditure data (until 2020)
  - IMF World Economics Outlook (from 2021 onwards)

Income Distribution

1. Kernel density estimation of income distribution
2. Add a linearly decreasing Pareto tail
3. Smooth income distribution again to overcome kinks at thresholds
4. Add country-specific mass of people with zero earnings

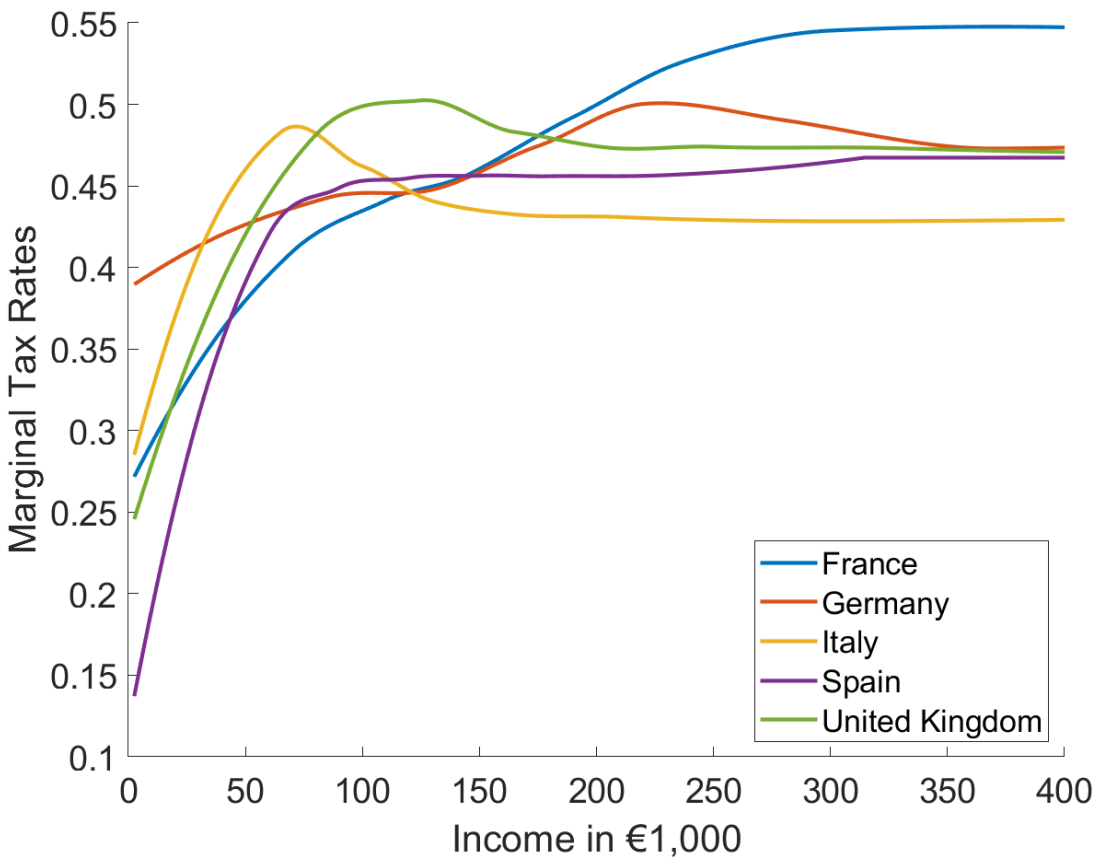


► Notes

Marginal Tax Rates

1. Simulate effective marginal tax rates based on the 2017 income tax schedule with EUROMOD

2. Calibrate the tax function using a non-parametric estimation (LOESS)

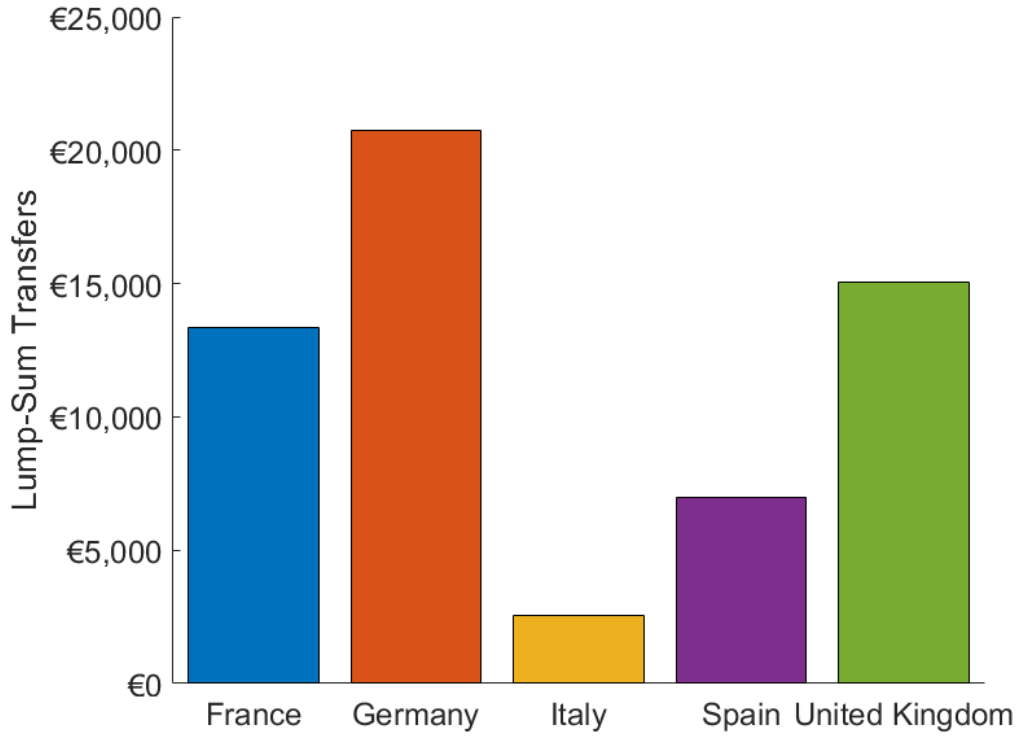


► Notes

Lump-sum Transfers

Use average minimum income protection

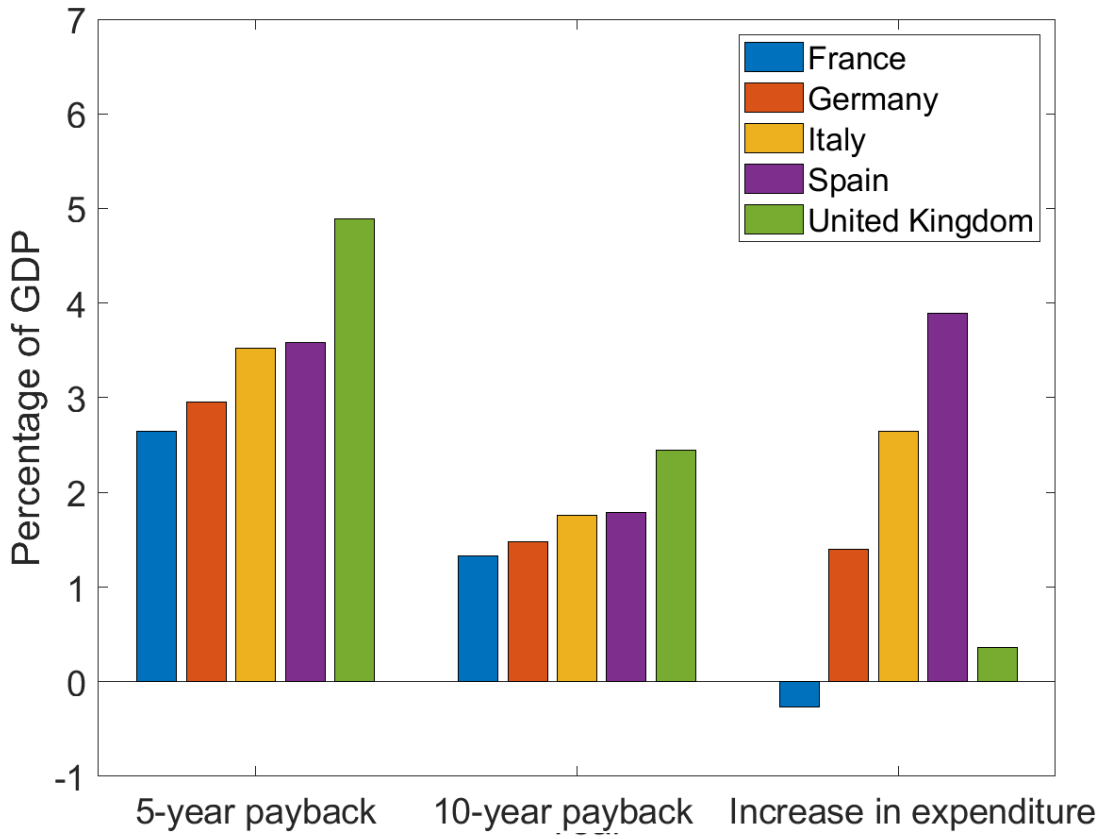
- Includes social assistance, child supplement, housing supplement, and other benefits



► Notes

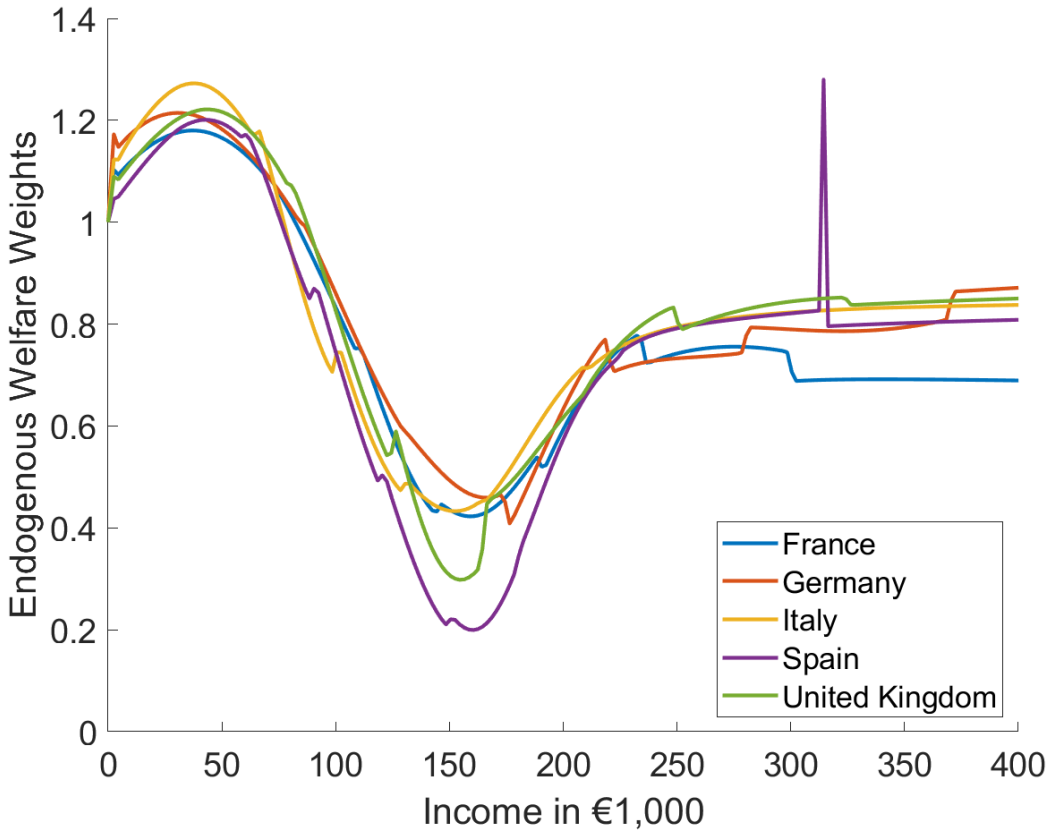
Fiscal Pressure

1. Calculate additionally accrued (and will accrue) debt stock during the pandemic
2. Different assumptions about how this additional debt stock will be paid back



Inverse-optimum Approach

1. We don’t assume any welfare function.
2. Instead, we assume that the tax-transfer systems we observe are optimal.

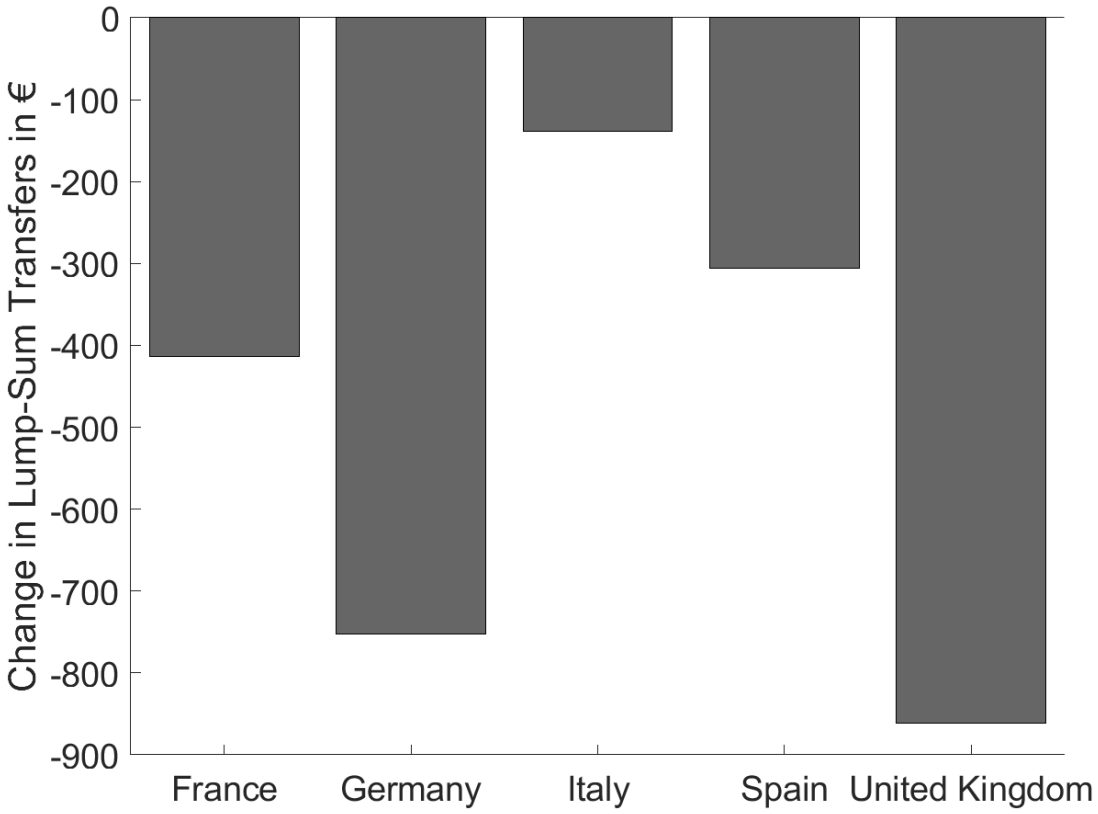


► Exogenous weights

Quantitative Results

Lump-sum Transfers

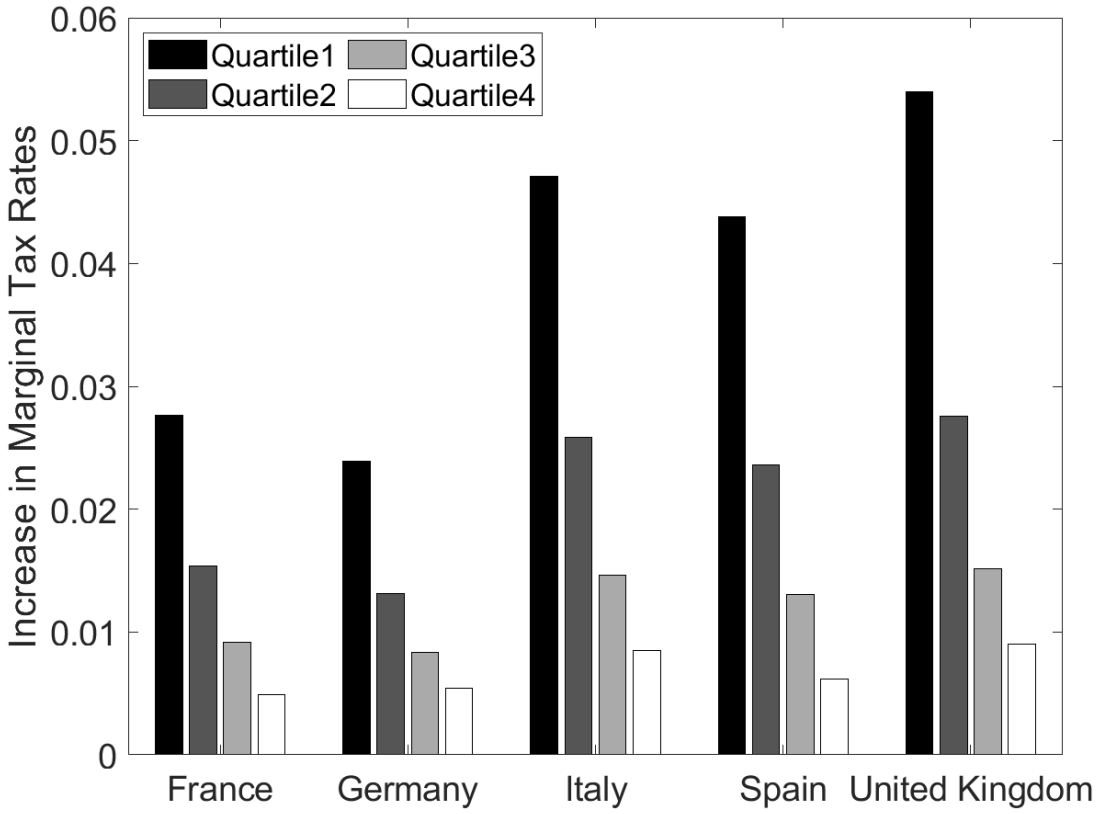
- Higher fiscal pressure results in a decrease in lump-sum transfers.
- Two main determinants
  - Extent of fiscal pressure
  - Initial level of transfers



► Proportional changes

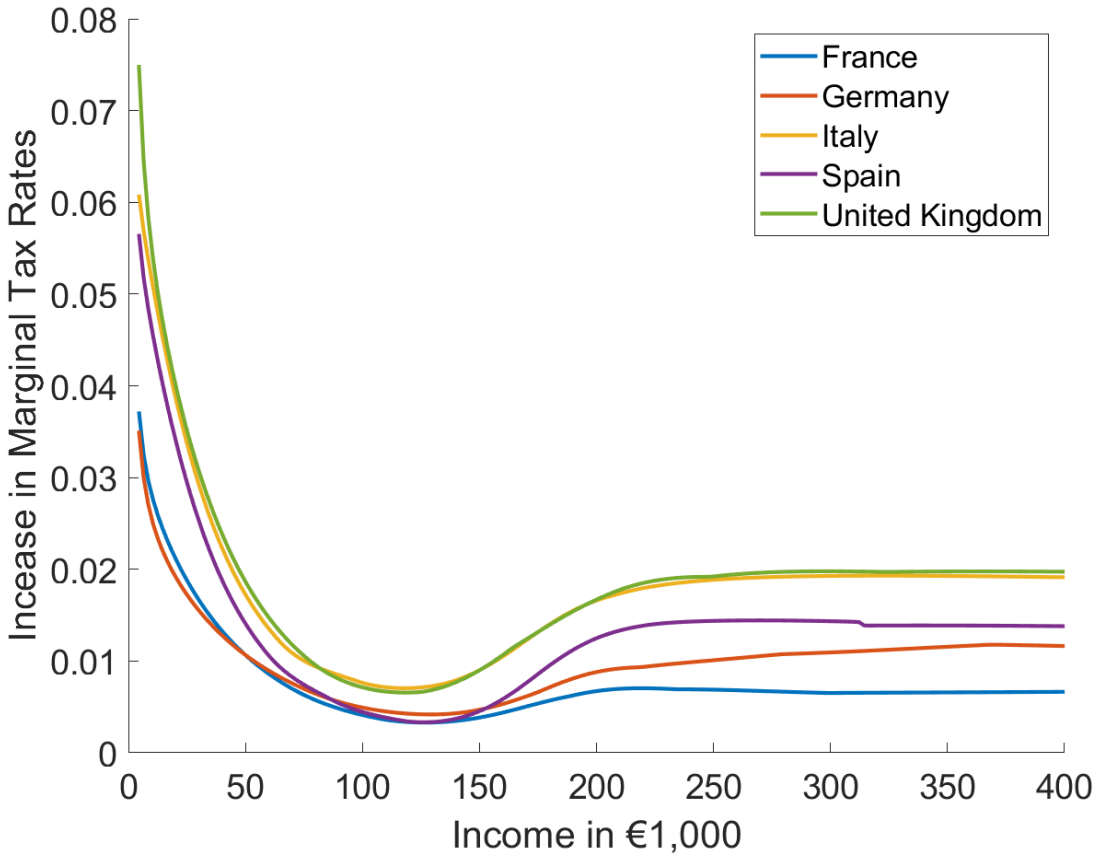
Marginal Tax Rates

- Marginal income taxes should increase to service the additional debt
- This increase is regressive
- The tax rate increase should be around 3-5 pp for the lowest income quartiles

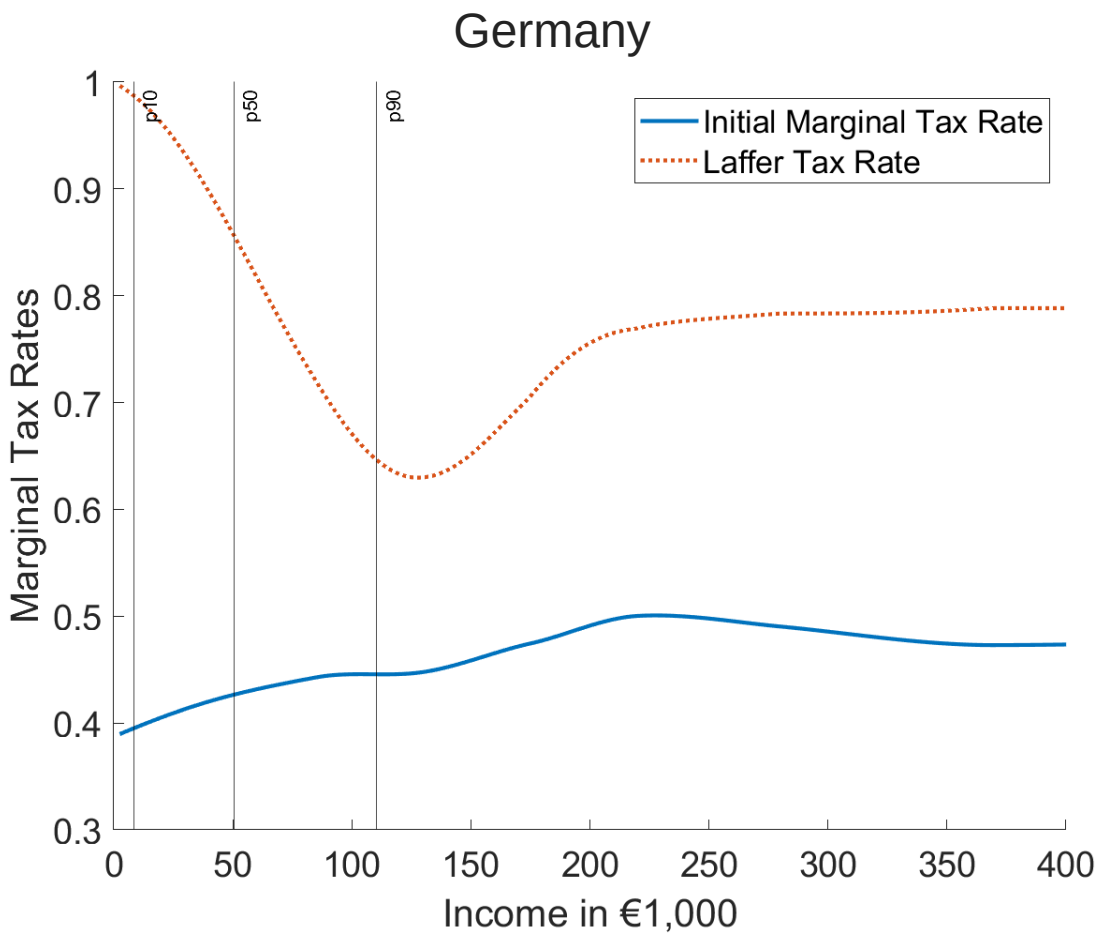


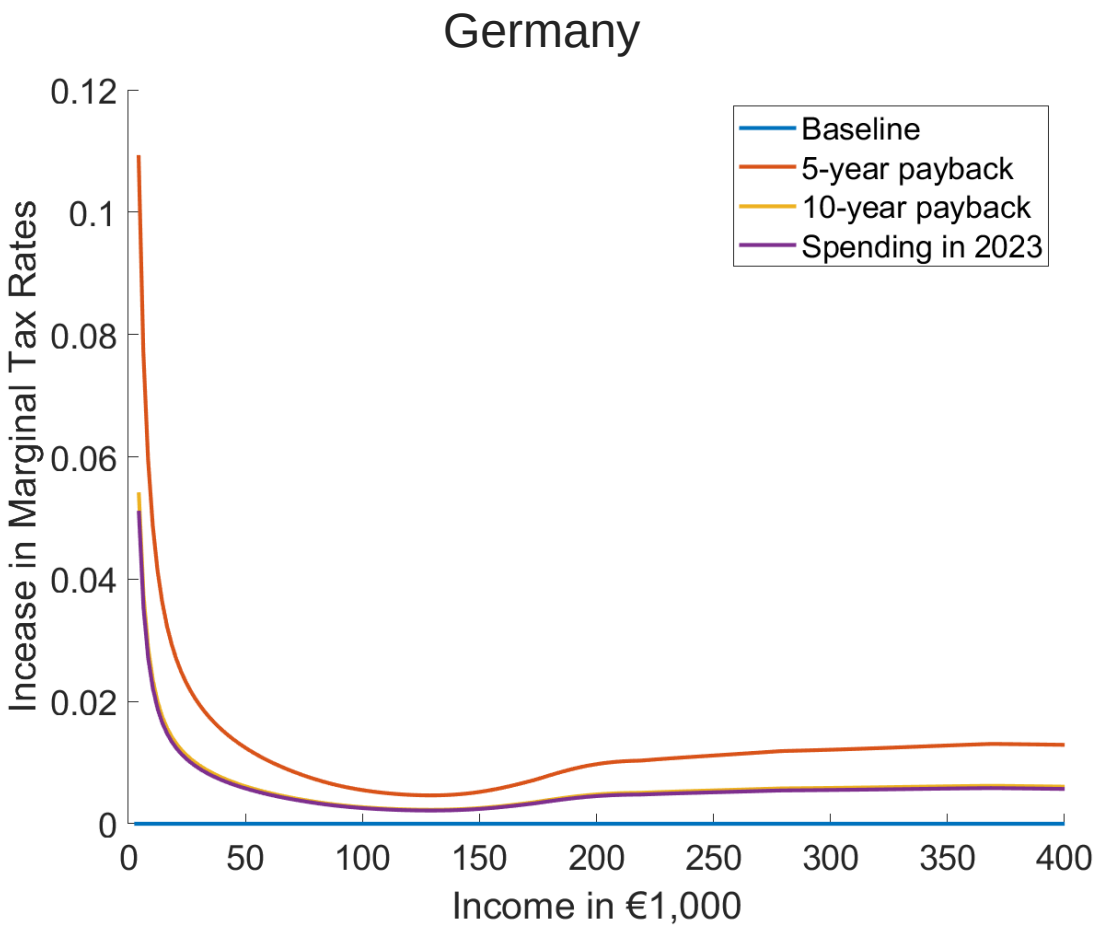
Marginal Tax Rates | U-shape

- If we look at the change in marginal tax rates as a function of income, the change is U-shaped.
- Mainly due to the difference between Laffer bounds and initial tax rates
- Efficiency!



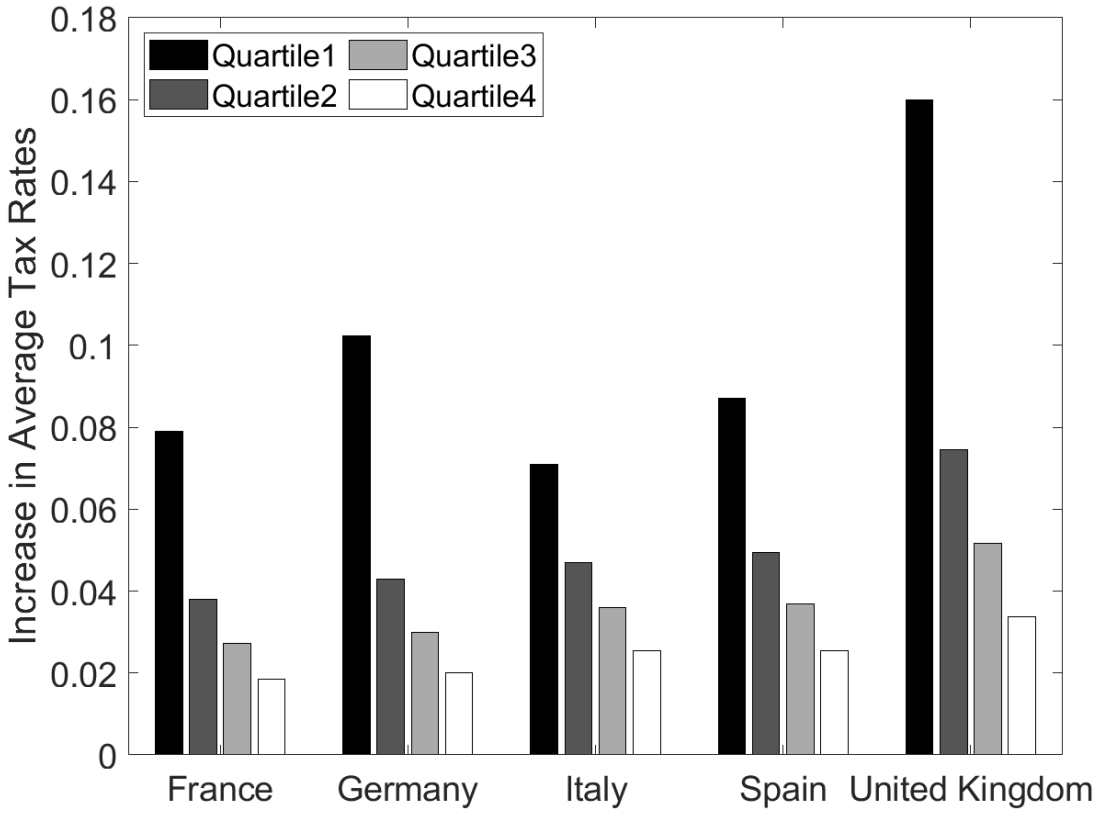
Laffer Bounds vs. Initial Tax Rates





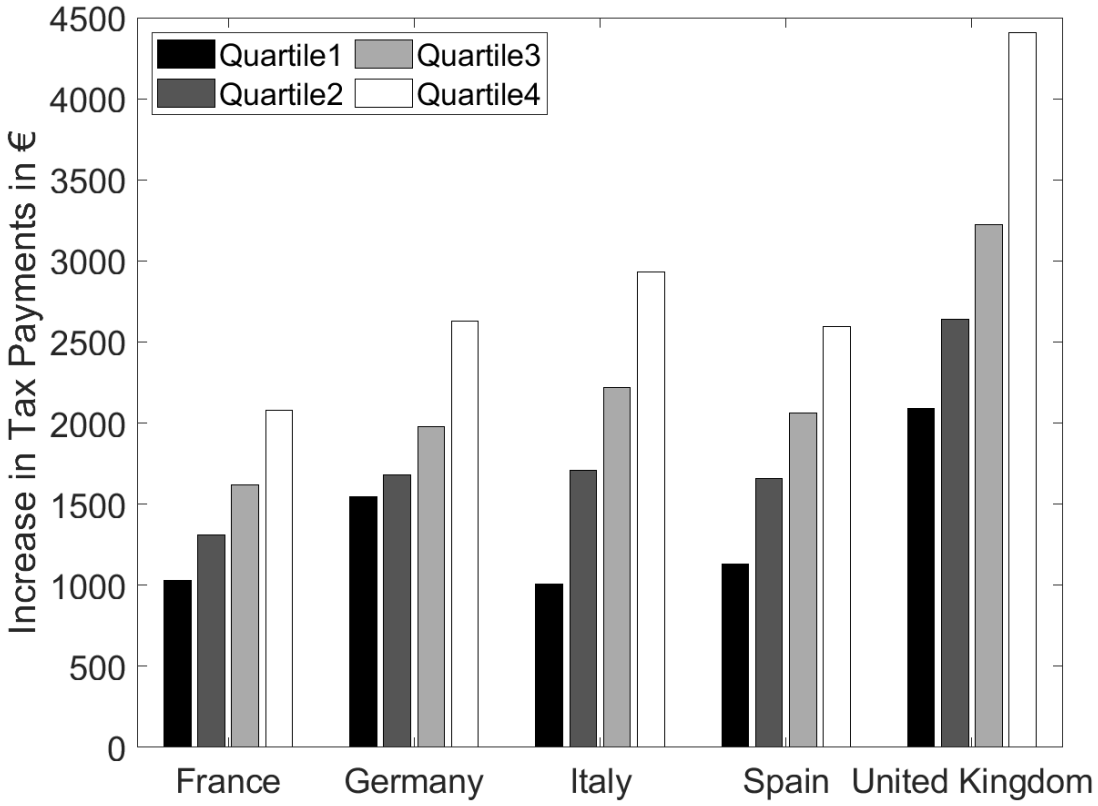
Average Tax Rates

- Combining changes in both lump-sum transfer and marginal tax rates, we can calculate the change in average tax rates.
- It should increase up to 16 pp for the lowest income quartile in the UK.



Total Tax Payment

- The increase in total tax payment is the largest for the highest income quartile.
- One can say that the rich carries most of the burden in absolute terms, just not as much compared to their income

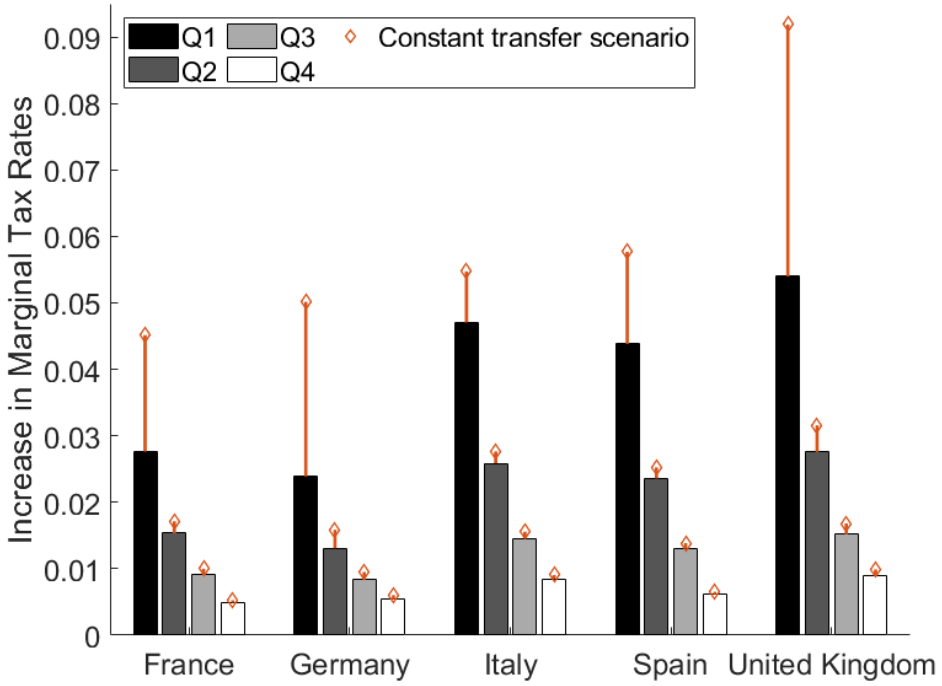


Intuition

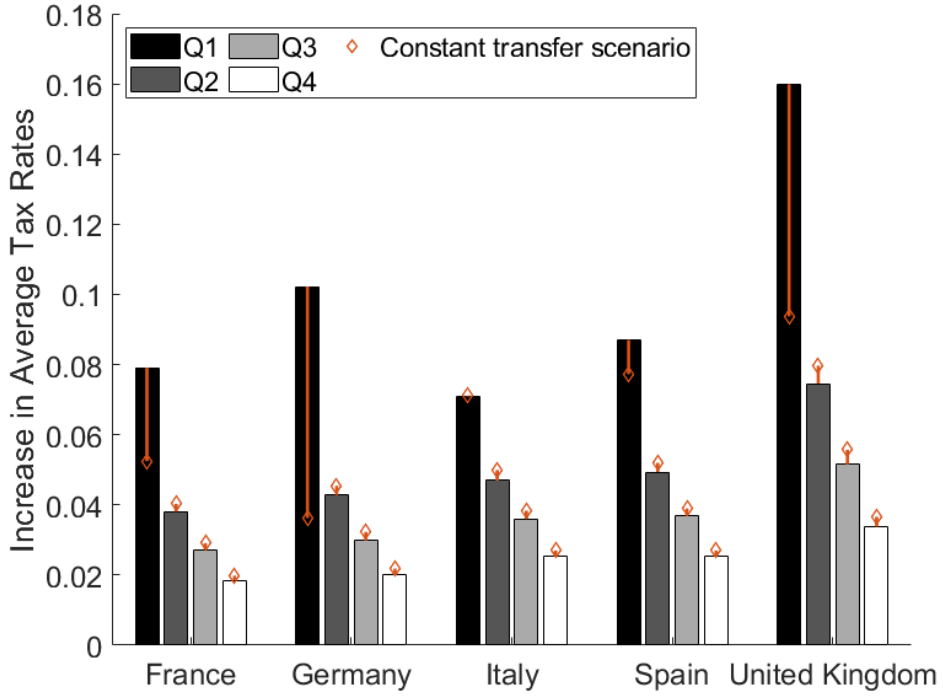
- Increased spending requirement mechanically crowds out lump-sum transfers, and therefore makes gains from redistributing higher compared to efficiency costs.
- Marginal tax rates for high incomes are already close to the revenue maximizing tax rates. Therefore, marginal tax rates for low incomes increase.
- Pressure to raise revenue decreases redistributive power of governments.

Constant Transfers

- Marginal tax rate increase in more regressive

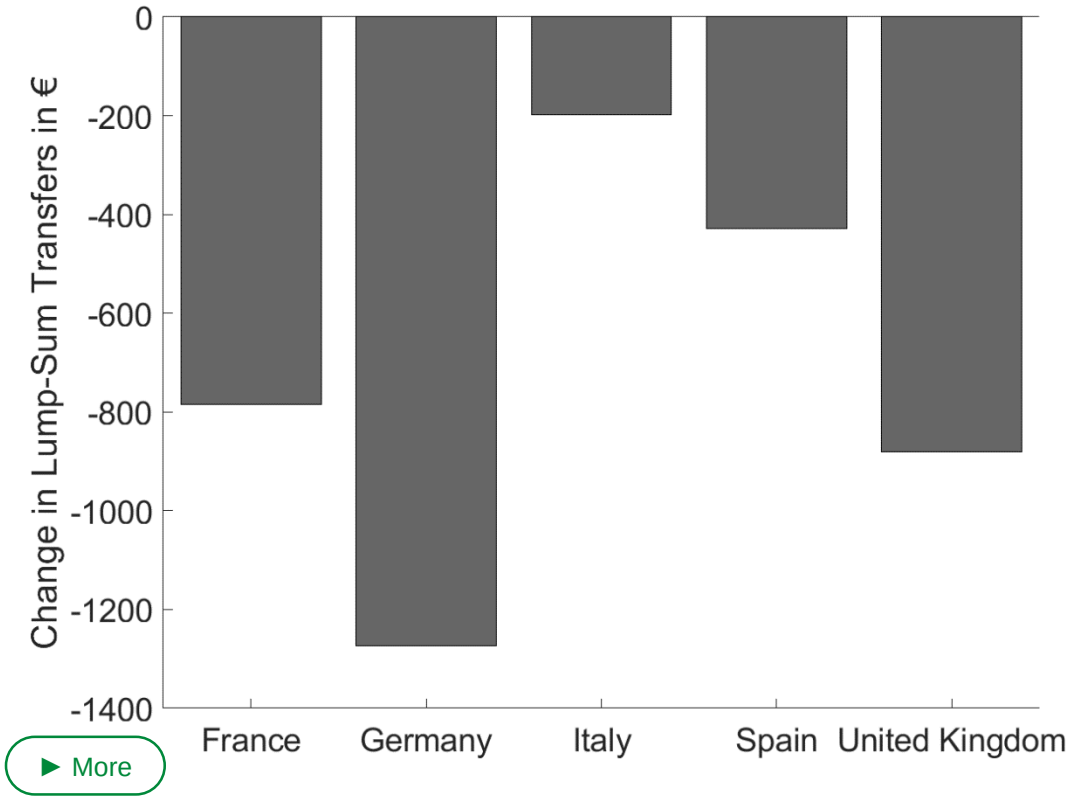


- Average tax rate increase is less regressive



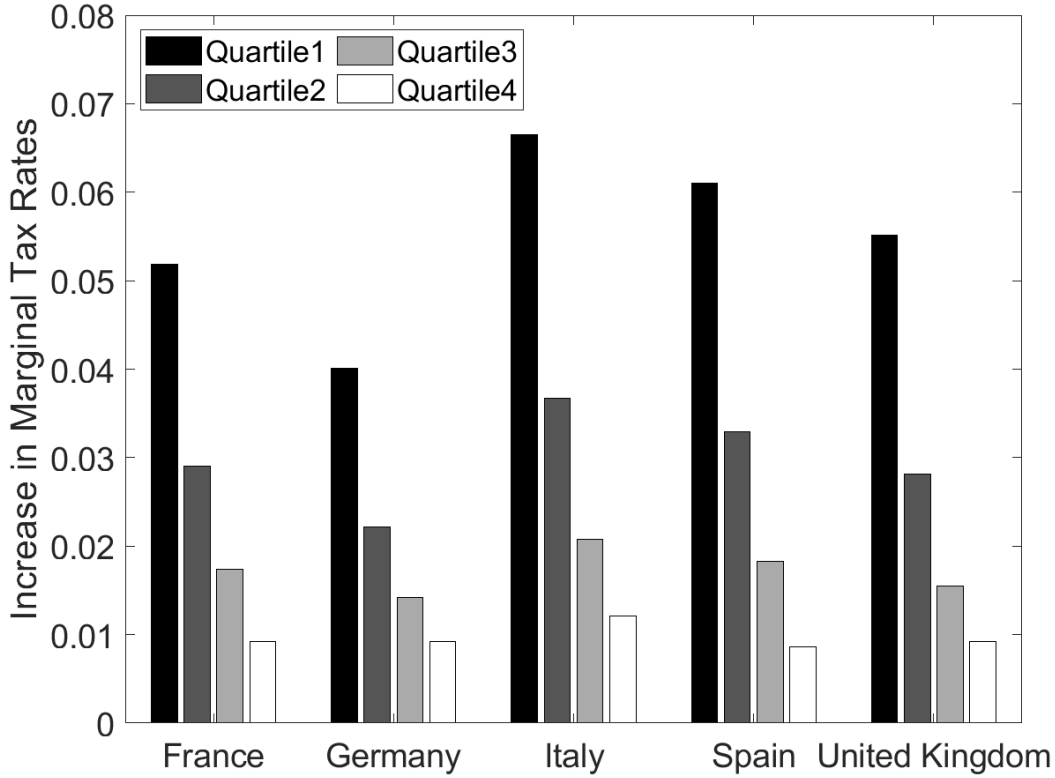
Between-country Differences | Same pressure

- Decrease in lump-sum transfers is smallest for Italy



► More

- Marginal tax rates increase more to compensate



Robustness

- High elasticity
- Risk aversion
- Different utility function specifications
- Lump-sum payments
- Mass of people with zero earnings

Conclusion

- Even though it does not show up in the optimal taxation formulas, exogenous revenue requirement has a non-trivial effect on the shape of optimal marginal taxes.
- There is a trade-off between the objectives of raising revenue and redistributing through a more progressive tax system
- This result is qualitatively similar for the countries we analyze with some differences according to their initial tax-transfer systems.

Any questions?

Calibration Notes

- Constant Pareto Threshold from Jenkins (2017) (refers to 2010 in UK)
- Starting Pareto threshold is calculated such that the hazard rate is continuous at the threshold k: $\mathrm{a} = \frac{f(k)k}{1-F(k)}$
- Constant Pareto parameter from Atkinson, Piketty, and Saez (2011) (refers to 2005)
- Mass of people with zero earnings matches the share of recipients of disability benefits in 2007 as reported by OECD (2009).

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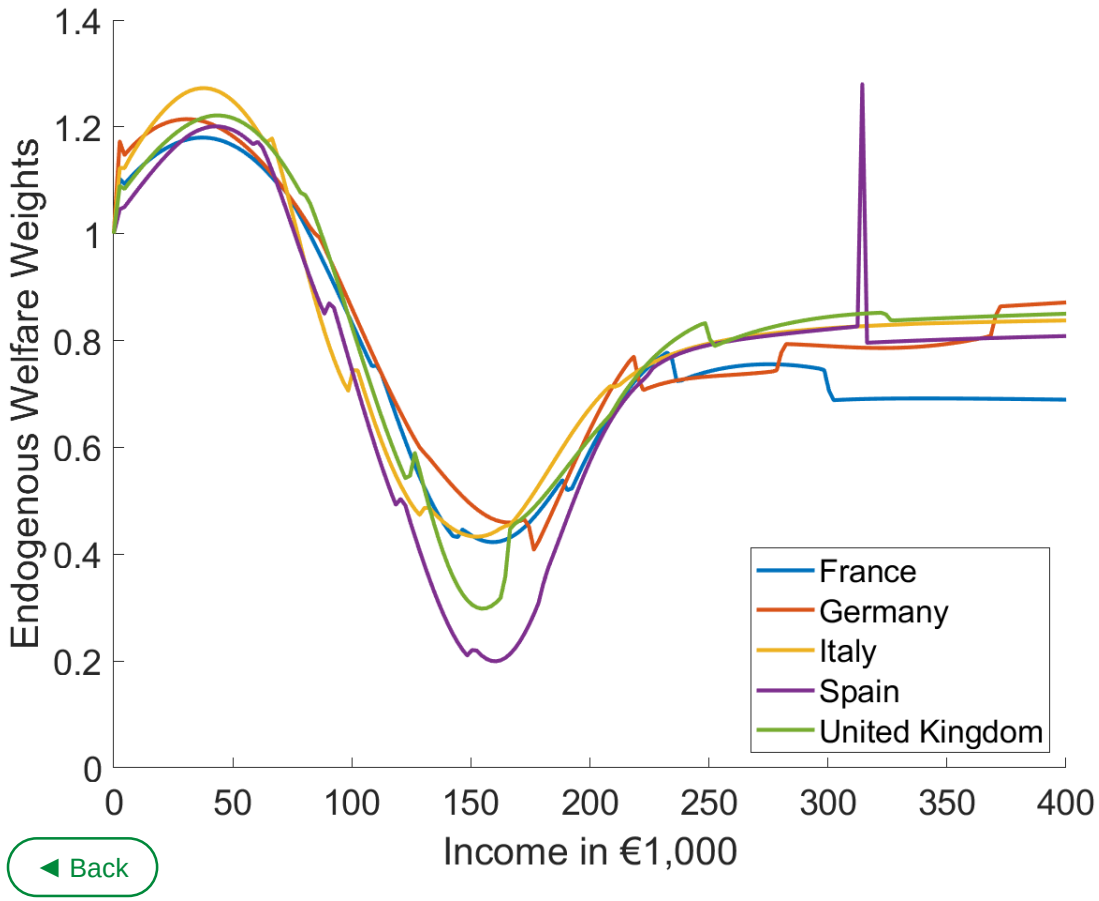
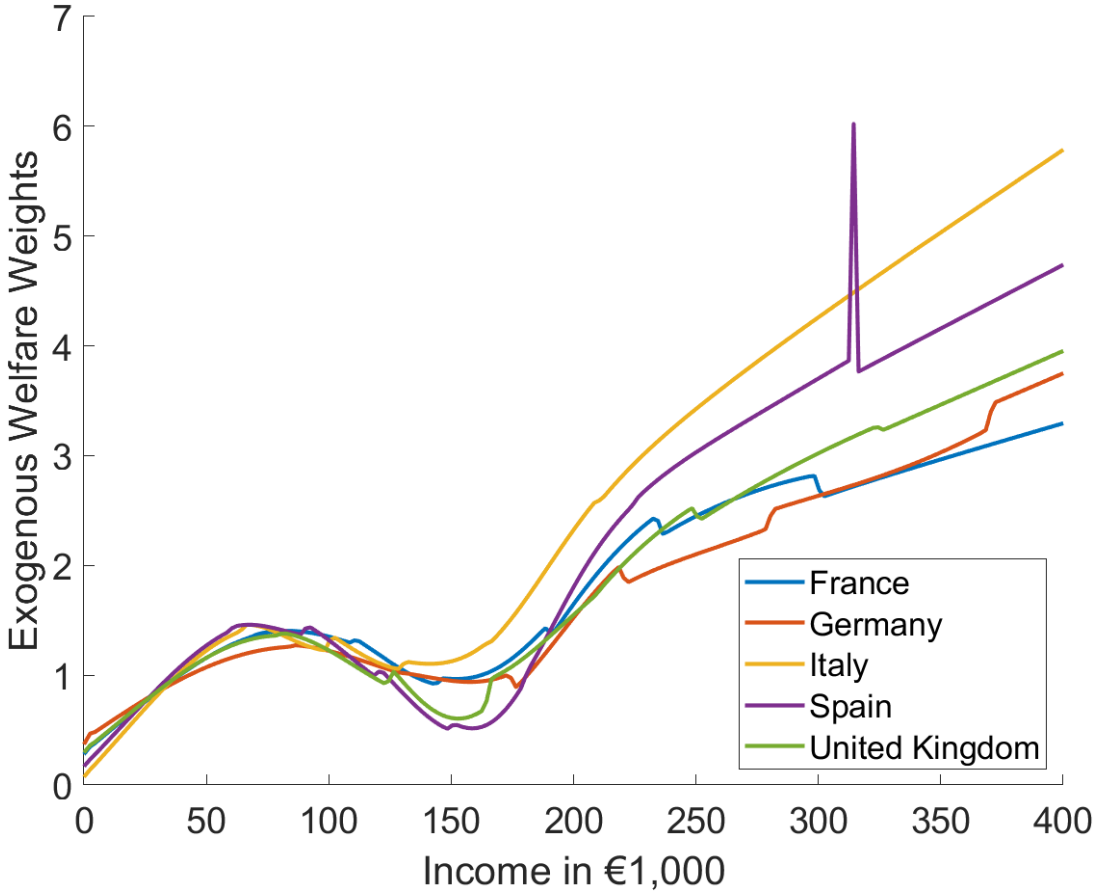
Welfare Weights





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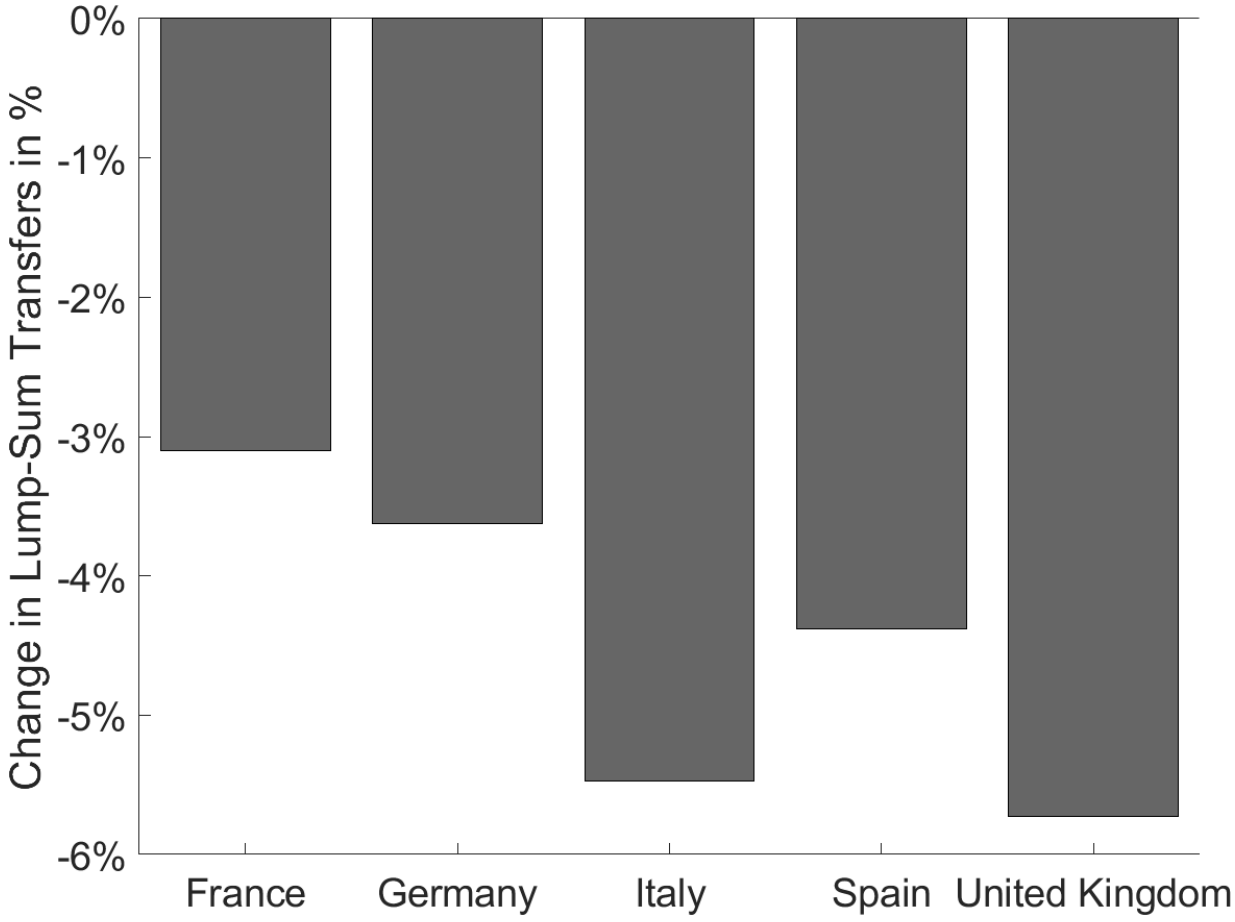
Lump-sum Transfers | Proportional



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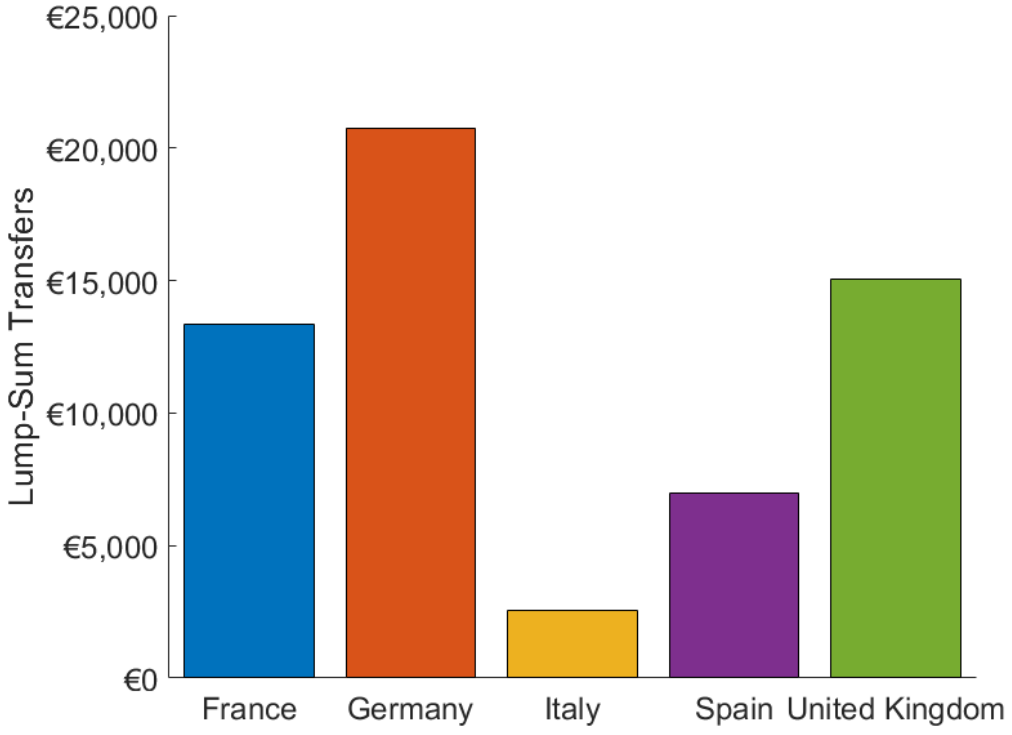
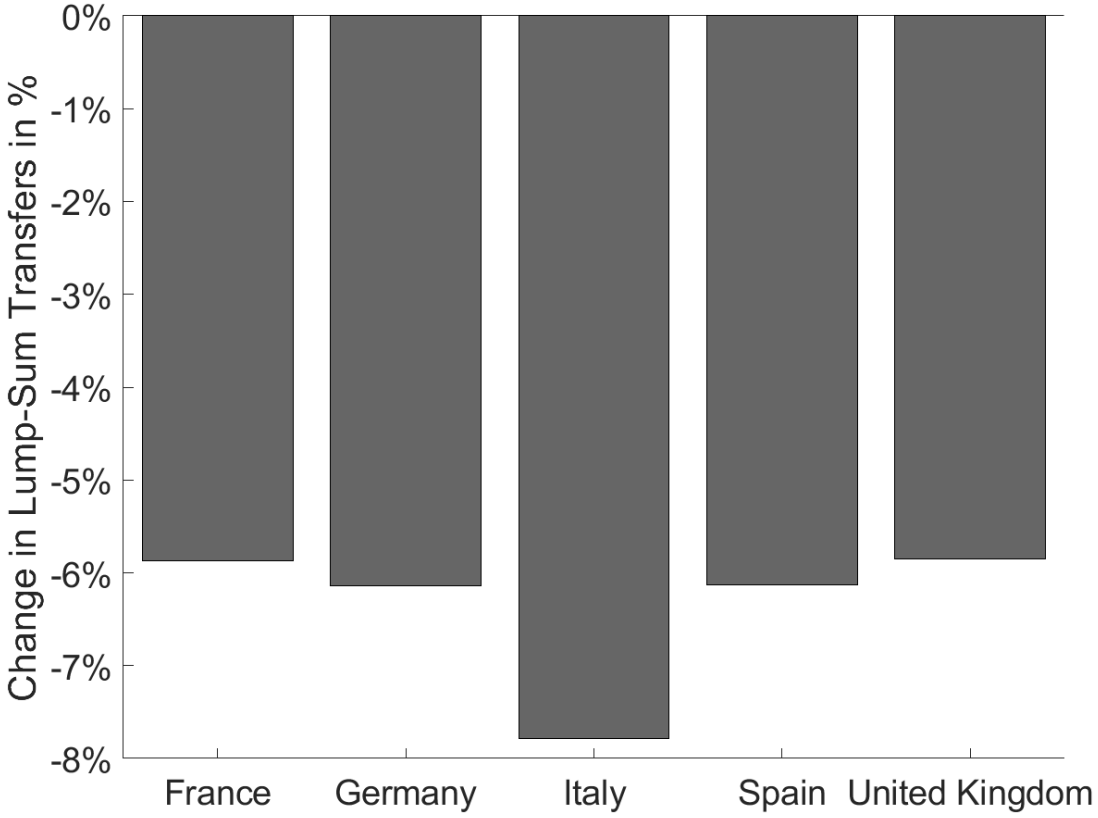
Lump-sum Transfers | Same pressure





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