Locked Down, Saved Up

– work in progress –

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Surge in household savings

- Unprecedented increase in households' savings at the onset of the pandemic 2020Q2
- Little evidence on who held these savings: mostly rich households, or even distribution?
- Poor -*micro*- evidence from National Accounts (DFA)
- This paper:
  - Develops a model that updates the cross-section of households of the HFCS
  - Focuses on the **distribution** of the saving's glut
  - Sheds light on policy questions: role of transfers, lockdown, and excess savings.

A statistical model of household finances

- Our goal is to craft a model that deals with
  - **Volatile macroeconomic dynamics** during the pandemic
  - **Rich labor market transitions**, e.g. sectoral heterogeneity
  - **Two consumption functions:** one before Covid, other during Covid
  - **Dynamic fiscal policy** implemented by governments, e.g. Covid-specific support measures
- Handy tool for policy analysis
  - Pass-through of rate hikes to households
  - Financial vulnerability of households

Today's talk

- Statistical model and data
  - **Labor market**
  - **Consumption decision**
  - **Fiscal policy**
  - **Aggregate environment**
- Use the model to
  - Provide a brief description of households' position during the pandemic
  - Assess **pass-through** of **transfers** to savings, and excess savings

Overview

1. The model
   - The labor market
   - The consumption function
   - The fiscal rule
2. Macroeconomic environment
3. Baseline results
   - Disposable income
   - Total consumption
4. Counterfactuals
   - No transfers

The model

- Built around 4 blocks
  - **Labor market:** transitions and income: individual level
  - **Consumption decisions:** household level
  - **Fiscal rule:** household level
  - **Aggregate Dynamics:** simulation matches aggregate dynamics
- Data
  - Household Finance and Consumption Survey 2017 (**HFCS**)
  - Household Budget Survey 2015 (**HBS**)
  - ECB'S Statistical Data Warehouse (**SDW**)
- Ultimate goal is to update the cross-section of households from the HFCS 2017

The labor market

- Incidence of unemployment (U) heterogeneous across sectors and skills
  - Rank individuals i according to probability to remain employed (E)

$$Pr(E_{i,t+1}) = \underbrace{Pr(E_{i,t}|X_i)}_{i\text{'s predicted E prob}} - \underbrace{\eta_{i,t}}_{\text{sector shock}} - \underbrace{\epsilon_{i,t}}_{\text{individual shock}} \quad (1)$$

    with X_i: individual i's characteristics

  - Assign individual changes in E $\leftrightarrow$ U status so that

$$\Delta_{t,t+1} \text{ aggregate U rate in HFCS} = \Delta_{t,t+1} \text{ U rate in macro series} \quad (2)$$

- Changes of individual employment status drive changes of income
  - E $\rightarrow$ U: country, year specific replacement rates
  - U $\rightarrow$ E: Heckman selection model to predict labor income
  - E $\rightarrow$ E: growth rate of aggregate wage rate

The consumption decision: Step 1

Estimate consumption expenditures on Household Budget Survey

- Two consumption rules, one before Covid, another during Covid

$$\begin{cases} \mathcal{C}_i^{hbs} & = x_i^{hbs'}\beta^{hbs} + u_i^{hbs} \text{if} \notin [2020Q2, 2021] \\ \mathcal{C}_i^{hbs} - \bar{\mathcal{C}}_i & = x_i^{hbs'}\beta_{covid}^{hbs} + e_i^{hbs} \text{if} \in [2020Q2, 2021] \end{cases} \tag{3}$$

where $x_i^{hbs'}$ are covariates, $\mathcal{C}_i^{hbs}$ is the sum of consumption expenditures of household i and $\bar{\mathcal{C}}$ a list of prohibited items during the pandemic: trips, food outside, vacations...

- Estimate parameters by absolute shrinkage and validate by k-fold cross validation

$$\frac{1}{2N}(\mathbf{y} - \mathbf{x}\beta^{hbs})'(\mathbf{y} - \mathbf{X}\beta^{hbs}) + \alpha \sum_{j=1}^{P} |\beta_p^{hbs}| \tag{4}$$

The consumption decision: Step 2

With our estimates at hand,

- Project estimated β^{hbs}'s onto x^{hfcs}, similar to Lamarche (2017)

$$\hat{C}_i^{hfcs} = x_i^{hfcs\prime} \cdot \hat{\beta}^{hbs} + \varphi_i \tag{5}$$

  Where φ is an individual shock

- Estimate a set of λ_j's such that two conditions are satisfied:
  1. Aggregate saving rate in the HFCS = aggregate saving rate from macrodata (dynamic target)
  2. Distribution for estimated consumption in HFCS = distribution of consumption in HBS

The consumption decision: Step 3

– Final measure of total consumption is

$$\hat{\mathcal{C}}^{hfcs}_{i,i\in j} = \lambda_j(x_i^{hfcs'} \cdot \hat{\beta}^{hbs} + \varphi_i) \tag{6}$$

Where $i \in j$ stresses that we adjust the consumption of household i by λ_j only if that household belongs to the j percentile of the initial distribution of consumption ($\hat{C}^{hfcs}$).

– Two remarks:

- Rich MPCs
- We do not torture the model to hit on desired targets. For example, λ_j ranges from increasing/decreasing consumption between 1 to 7 % relative to the initial level.

Empirical Consumption Function

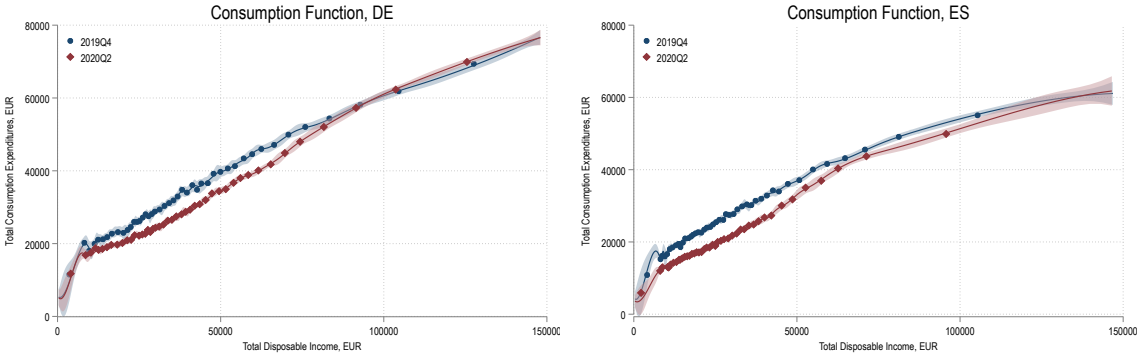


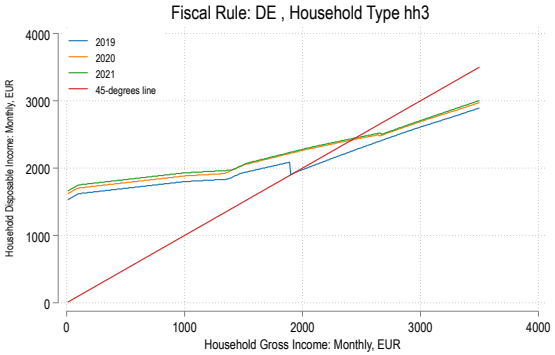
Figure: Binscatter **household disposable income** and **total consumption**.

The fiscal rule

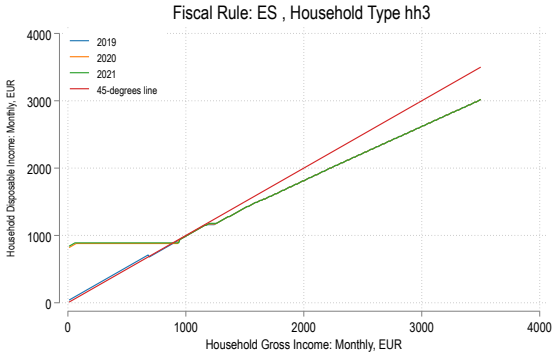
- A Fiscal Rule $\mathcal{F}_{c,j,t}$ is a **mapping gross income** $\rightarrow$ **disposable income**
- Contingent on country (c), year (t) and household type (j)
  - Household type 1: single, no children
  - Household type 2: single parent
  - Household type 3: couple with children
- Includes pandemic-specific transfers
- Recovered from **Euromod** $\rightarrow$ EU counterpart of Taxsim in the US

  Integrated tool that computes tax and benefits for all European countries

Fiscal rule



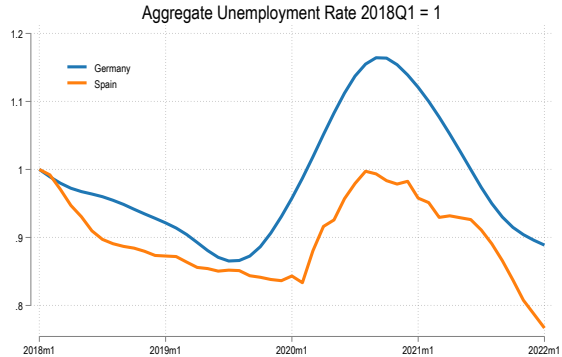
(a) Fiscal Rule for Germany



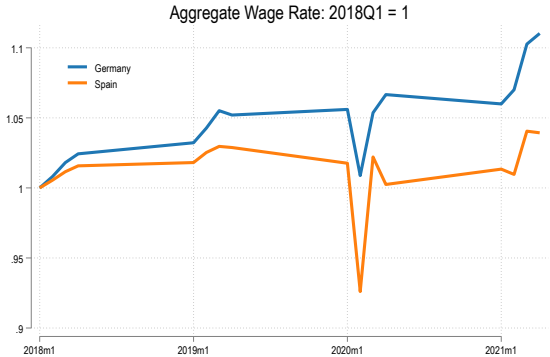
(b) Fiscal Rule for Spain

Figure: Source: Euromod

Macrodata, an informative example (1)



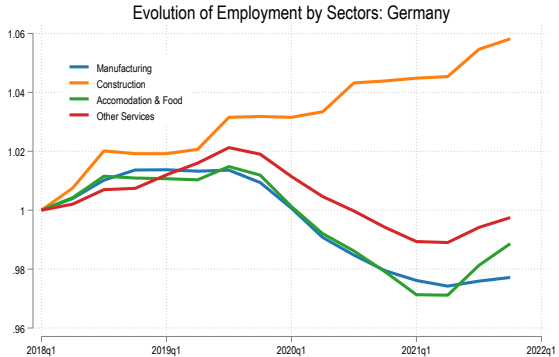
(a) Aggregate unemployment rate



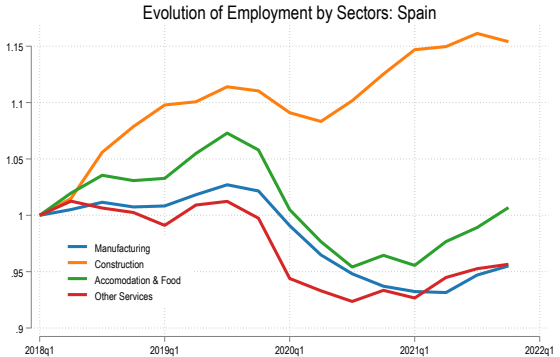
(b) Aggregate wage rate

Figure: Source: ECB's Statistical Data Warehouse

Macrodata, an informative example (2)



(a) Sectoral employment dynamics in Germany

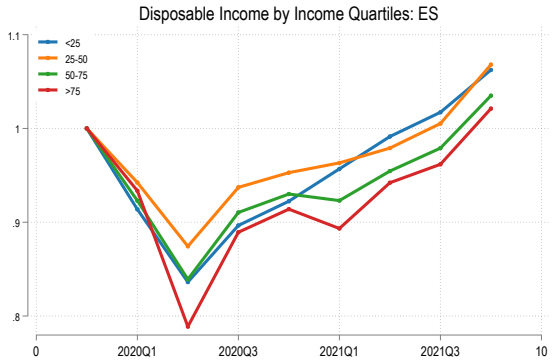


(b) Sectoral Employment dynamics in Spain

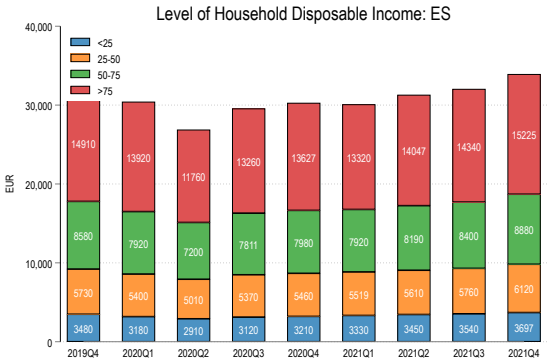
Figure: Source: ECB's Statistical Data Warehouse

Model's **back-cast**

Baseline: Disposable income, ES

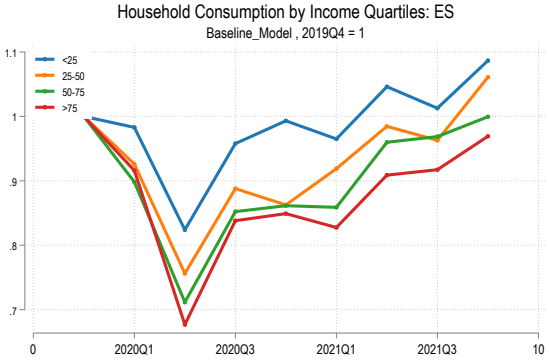


(a) Disposable income

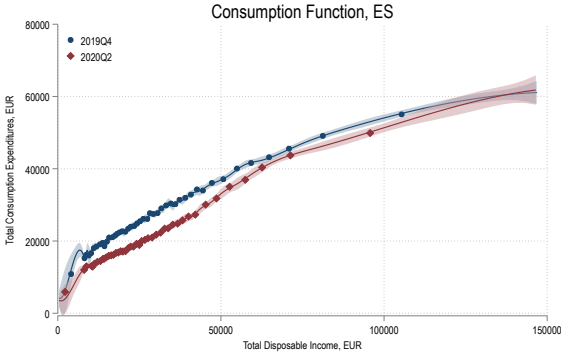


(b) Quarterly level of hh disposable income

Baseline: Total consumption, ES

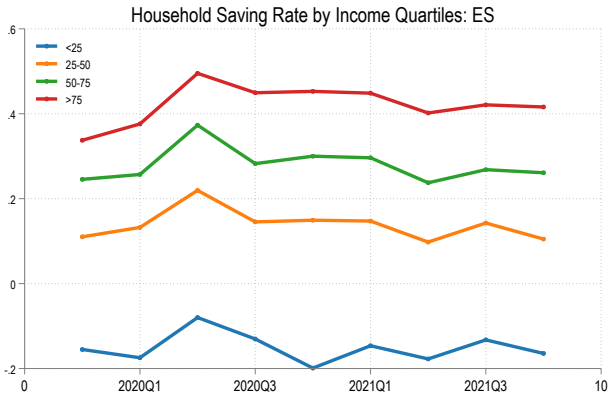


(c) Evolution of hh consumption expenditures



(d) Binscatter disposable income - total consumption

Baseline: Saving Rate, ES



(e) Household saving rate

Counterfactuals

Counterfactuals

– What does the model have to say about

1. **No government transfers**
2. **Excess savings?**

→**Critical assumption: no general equilibrium effects**

Counterfactuals: *No transfers*

1. Let A_t describe the set of macroeconomic conditions at quarter t,

– We set fiscal rule $\mathcal{F}_t$ equal to $\mathcal{F}_{2019} \rightarrow$ no gov. reaction

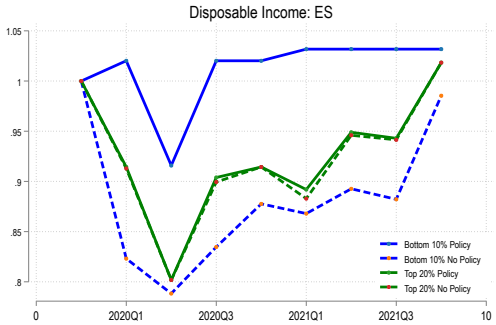
– Household disposable income evolves according to A_t and fiscal rule $\mathcal{F}_t$

$$\hat{y}_t^{(1)} = \hat{y}_t(A_t, \mathcal{F}_{2019}) \tag{7}$$

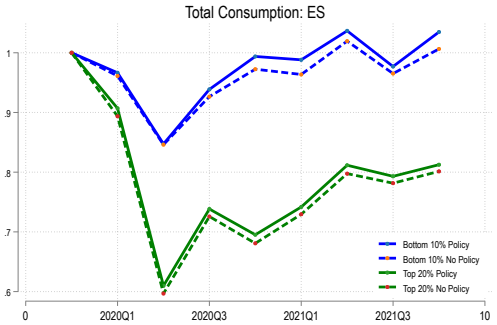
– Thus, consumption evolves according to $\lambda_t(A_t)$, β_t^{hbs} and $\hat{y}_t^{(1)}$

$$\hat{\mathcal{C}}_t^{(1)} = \hat{\mathcal{C}}_t(\hat{y}_t(A_t, \mathcal{F}_{2019}), \lambda_t(A_t), \beta_t^{hbs}) \tag{8}$$

Counterfactuals: *No Transfers*



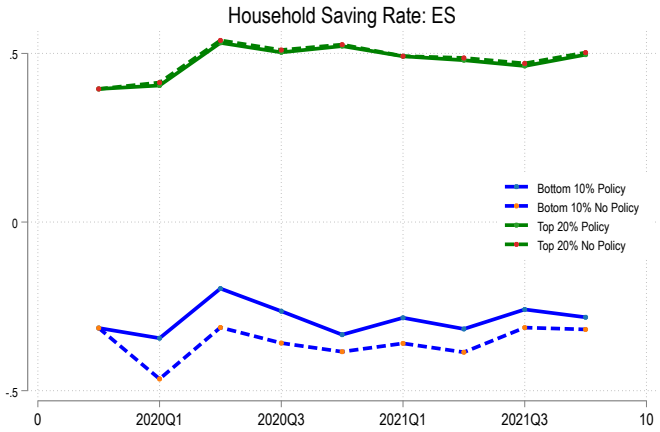
(f) Disposable income



(g) Total consumption

Counterfactuals: *No Transfers*

- "Rich" $\rightarrow$ No effect at all $\rightarrow$ progressive implementation
- "Poor" $\rightarrow$ have their saving rate fueled by transfers! but still rather poor



Counterfactuals: *Excess Savings?*

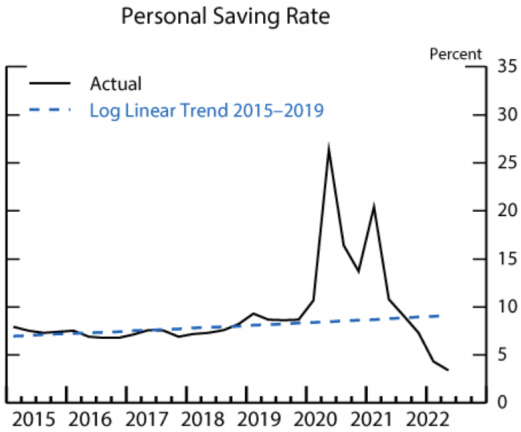
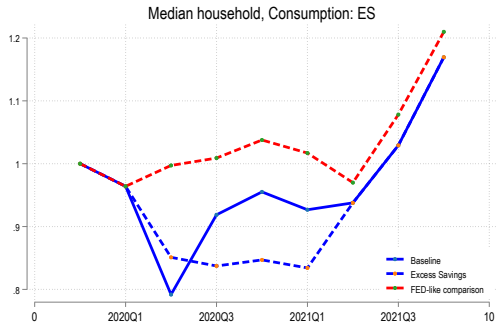


Figure: Excess Savings according to FED policy note

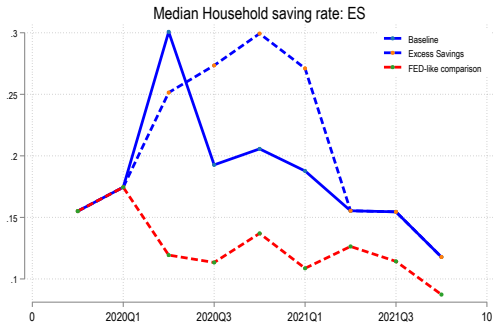
Counterfactuals: *Excess Savings?*

- Given the **drop in income** and **consumption** the above definition of excess savings seems to miss something. What about the equilibrium effects?
- How to *approximate* excess savings?
  1. Keep the macroeconomic environment A_t, except for S_t^{agg}
  2. Keep fiscal policy and two consumption functions
  3. Households will respond - given $\mathcal{F}_t$ and $\mathcal{C}^{Covid}$ to the macroeconomic environment
  4. However, set $\lambda_t = \lambda_{2019Q4}$ and let S_t^{agg} be determined endogenously
- This way captures all dynamics, but does not force the model to save as much as in 2020Q2. We trade-off the shape of the consumption distribution, in exchange for an approximation to an **equilibrium** saving rate

Counterfactuals: *Excess Savings?*



(a) Consumption



(b) Saving rate

Concluding remarks

- Easy-to-use tool for policy analysis that feeds on public and transparent data
- Fiscal policy was very effective offsetting poor's income **with no remarkable pass-through to consumption**
- The median household over-saved just in 2020Q2, under-saved the rest of the pandemic