

# Distributional Income Effects of Banking Regulation in Europe

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EEA-ESEM Congress 2023, Barcelona

August 29, 2023

# Motivation

- **Financial crises tend to be accompanied by...**
  - deep & prolonged recessions
  - higher levels of unemployment & **inequality** (e.g., Pereira da Silva et al., 2022; Reinhart & Rogoff, 2009)

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⇒ Tighter banking regulation → loan rates ↑, credit growth ↓ (Zhang & Tressel, 2017; Juelsrud & Wold, 2020)

- Bank lending **reduced disproportionately more** for riskier firms (e.g., Degryse et al., 2020; Koetter et al., 2022)

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Does the implementation of a tighter (and harmonized) regulatory framework for Europe's banking sector have distributional income effects?

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- Short-term spillover effects on households
- No consideration of longer-term financial stability benefits

## 1. Employment income channel (Beck et al., 2010, Moser et al., 2022)

- employment, wages ↑ if firms substitute labor for capital given higher borrowing costs
- employment, wages ↓ if firms finance labor with debt and banks lend less

## 2. Entrepreneurial activity channel (Popov, 2018)

- self-employed income, new entrepreneurs ↑ if credit access increases for high-collateral entrepreneurs
- self-employed income, new entrepreneurs ↓ if credit access decreases for low-collateral entrepreneurs



# Assembling a European household panel

**EU Statistics on Income and Living Conditions (EU-SILC)** provide harmonized data based on annual surveys conducted within the member states

⇒ Combining 4-year rotational groups from longitudinal user databases Rotation

- Sample: All EU countries except Germany and Luxembourg for the years 2010-2018
- Unit: Household and individual level time series data derived from rotational 4-year panels
- Household level: (Aggregated) incomes, size, and housing situation Summary statistics
- Individual level: Incomes, age, gender, education, etc. Summary statistics

Validation

# Regulatory policies

## Harmonization of EU-wide banking regulation after the financial crisis

- Three EU directives: CRD IV (2013), BRRD (2014), DGSD (2015)
  - Harmonize & tighten regulation in the European Union
  - Legal basis of the European Banking Union (EBU)
- Institutional feature: EU sets transposition deadline **but** member states often **delay the national implementation** (Koetter et al., 2022) Procedure

	Mean	SD	Min	Max	Obs.
Directive (delay in days)	167.6	179.0	-192.0	582.0	81
Directive (delay 0/1)	0.8	0.4	0.0	1.0	81

→ Uncertainty in implementation timing serves as regulatory shock Gini Health

# Model specification

We follow the approach by Amberg et al. 2022 (AER Insights):

$$\frac{Y_{i,t} - Y_{i,t-1}}{Y_{i,t-1}} \times 100 = \sum_{g=1}^{10} \mathbb{1}_{icg} (\alpha_{cg} + \beta_g D_{c,t} + \gamma_g Z_{c,t-1}) + \delta X_{i,t} + \alpha_t + \epsilon_{i,t}$$

$Y_{i,t}$ : Disposable (post-tax) income of household  $i$  in year  $t$

$\mathbb{1}_{icg}$ : = 1 if household  $i$  belongs to an ex-ante defined income group  $g$  in country  $c$  Deciles

$\alpha_{cg}$ : Income group-specific intercept for each country

$D_{c,t}$ : = 1 if a directive is implemented in country  $c$  in year  $t$

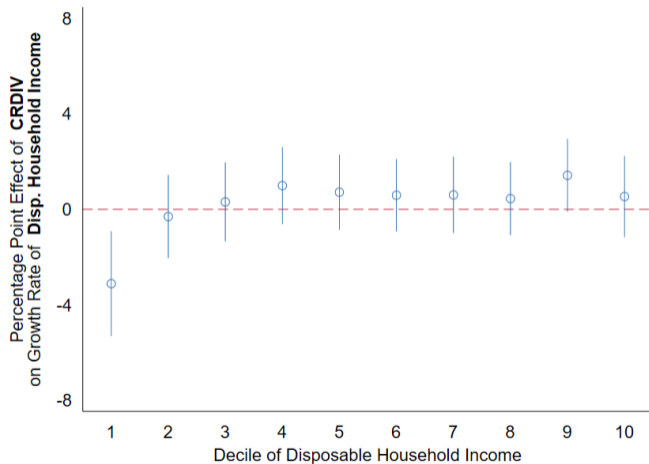
$Z_{c,t-1}$ : Country controls lagged by one year Summary statistics

$X_{i,t}$ : Household-level control variables Summary statistics

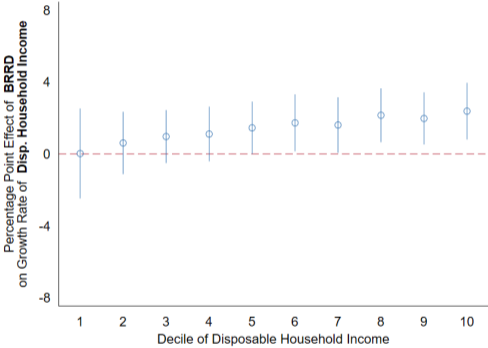
$\alpha_t$ : Year-fixed effects

→  $\beta_g$ : **Average effect on income growth for income group  $g$  across countries**

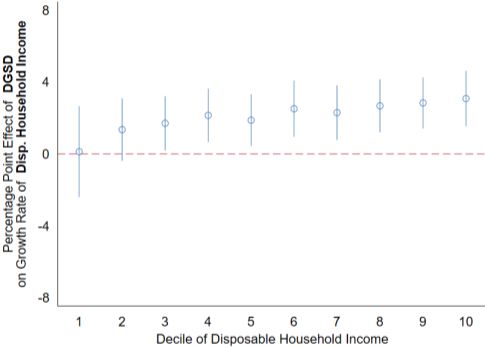
Distributional effect of **CRD IV** on *income growth*: Stricter capital requirements affect the poorer households adversely.



# Distributional effects of **BRRD & DGSD** on *income growth*: stricter regulation benefits more affluent households in the medium run.



(a) BRRD



(b) DGSD

# Results are robust to controlling for confounders and model specification

- Macro-level confounding factors CRD IV BRRD DGSD

- Region-year fixed effects
- Quantitative easing
- Minimum wage
- Social government
- Euro crisis

- Model specification CRD IV BRRD DGSD

- Placebo test
- Sample period
- Representativeness of sample
- Severe implementation delay

## Treatment intensity matters

$\Delta$ Disp. Household Income [%]	(1)	(2)	(3)	(4)	(5)
	Baseline	Stringency <50%ile >50%ile		Supervisory power <50%ile >50%ile	
<b>Panel A: CRD IV</b>					
Decile 1 $\times$ Directive	-3.114** (1.329)	-4.700** (2.018)	-2.296 (1.714)	-3.311* (1.789)	-3.881** (1.878)
<b>Panel B: BRRD</b>					
Decile 10 $\times$ Directive	2.378** (0.954)	1.167 (1.137)	3.283** (1.621)	2.284* (1.331)	2.848* (1.454)
<b>Panel C: DGSD</b>					
Decile 10 $\times$ Directive	3.078*** (0.934)	2.200* (1.264)	3.958*** (1.355)	2.027 (1.303)	5.381*** (1.385)

## Recap and next steps

- Regulatory reforms aimed at increasing financial stability have heterogeneous effects on household income growth
  - Income growth reducing effect for bottom 10% in response to CRD IV
  - Increases in income growth rates for affluent households after BRRD and DGSD transposition

**What is driving this aggregate effect?**



## Recap and next steps

- Regulatory reforms aimed at increasing financial stability have heterogeneous effects on household income growth
  - Income growth reducing effect for bottom 10% in response to CRD IV
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### What is driving this aggregate effect?

→ Zoom into affected income groups:

- Household-level income subcomponents relative to disposable income:  $\frac{Y_{i,t}^c - Y_{i,t-1}^c}{Y_{i,t-1}} \times 100$
- Individual-level extensive vs. intensive margin

Channels

Subcomponents

## Decline in **employee income growth** due to **extensive margin** adjustments drives CRD IV result

	Income growth Household (1)	Extensive effect Individuals (2)	Main earner (3)	Intensive effect Individuals (4)	Main earner (5)
<b>Panel A: Decile 1 - Employee income</b>					
Directive	-4.420** (1.910)	0.033*** (0.010)	0.040*** (0.012)	-2.112 (1.464)	-1.944 (1.551)
Observations	42,094	50,135	33,754	23,007	21,184
<b>Panel B: Decile 1 - Self-employed income</b>					
Directive	-1.258 (2.639)	-0.009 (0.017)	-0.026 (0.021)	-0.308 (2.515)	-0.384 (2.777)
Observations	19,260	25,326	15,468	10,787	9,443

# Increase in **employee & self-employed income growth** due to **intensive margin** adjustments drives BRRD result DGSD

	Income growth Household (1)	Extensive effect Individuals (2)	Main earner (3)	Intensive effect Individuals (4)	Main earner (5)
<b>Panel A: Decile 10 - Employee income</b>					
Directive	1.825*** (0.664)	-0.002 (0.003)	0.004 (0.003)	1.236*** (0.379)	1.603*** (0.482)
Observations	66,975	132,973	53,287	89,256	48,567
<b>Panel B: Decile 10 - Self-employed income</b>					
Directive	2.196** (0.888)	-0.007 (0.012)	-0.001 (0.015)	2.132** (1.039)	2.392** (1.120)
Observations	26,098	50,309	19,513	16,353	12,909

## Concluding remarks

- The European banking system has undergone significant **regulatory changes** over recent years
  - We focus on the **distributional effects** of these changes based on a rich sample of EU households and individuals
  - The national transposition of directives that implement the regulatory setting of the European Banking Union **widens the income distribution**
    - **Income growth reducing effect** for **bottom 10%** in response to CRD IV
      - Decline in employee income growth
      - Extensive margin effect
    - **Affluent households** benefit from stricter regulation in terms of **positive effects on income growth** following BRRD & DGSD
      - Increase in employee & self-employed income growth
      - Intensive margin effect
- ⇒ **First evidence on how banking sector regulation transmits heterogeneously across EU households.**

# Appendix

- **Monetary policy and inequality**

- new literature on monetary policy shocks and implications for inequality using specific micro data with mixed evidence

- Amberg et al., 2022; Andersen et al., 2022; Coibion et al., 2017; Furceri et al., 2018; Moser et al. 2022*

- **Financial integration, financial development and inequality**

- e.g. bank deregulation tightened US income distribution but no evidence on related effects of recent re-regulation in the EU

- Beck et al., 2010; De Haan and Sturm, 2017; Li and Su, 2021; Delis et al., 2014*

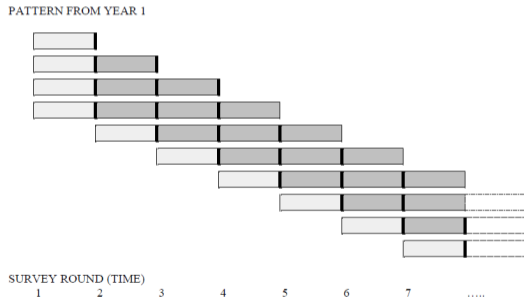
- **Macroprudential policies and inequality**

- so far the relationship has been analyzed for selected countries or it is based on aggregate country trends

- Acharya et al., 2022; Epure et al, 2021; Frost and van Stralen 2018, Peydró et al. 2020*

## EU-SILC 4-year rotational design [Back](#)

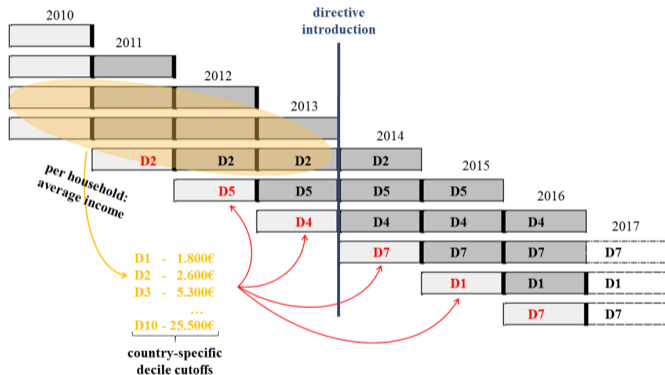
- Each yearly cross-section consists of 4 subsamples similar in size and representative for the population
- From one year to the next, 3 subsamples are kept and the “oldest” one is dropped
- E.g. in year  $T=4$ , the samples are drawn in  $T=4$ ,  $T=3$ ,  $T=2$ ,  $T=1$



Source: Eurostat.

# EU-SILC decile definition

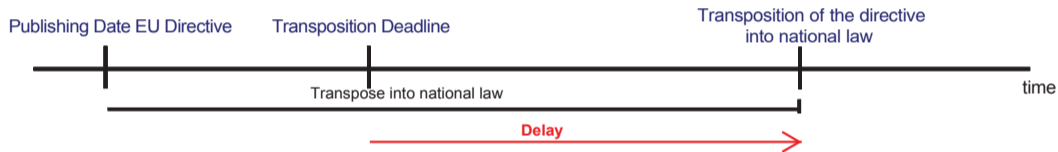
Back-Model



Source: Eurostat and own illustration.

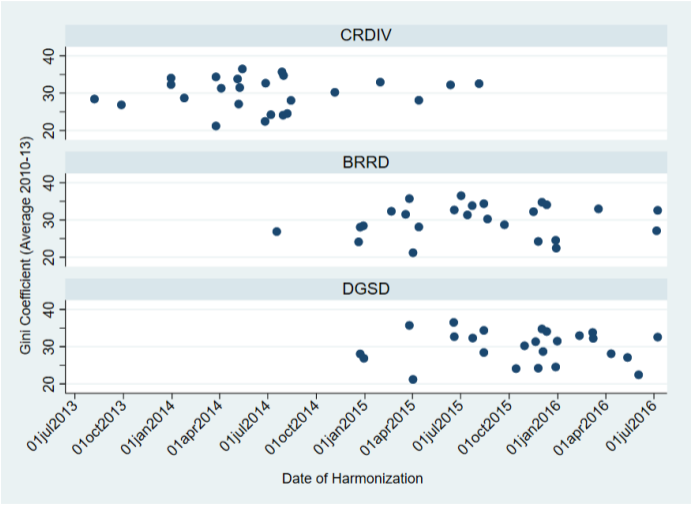


# Uncertain directives timing serves as regulatory shock [Back](#)



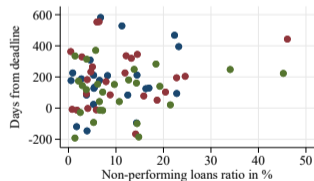
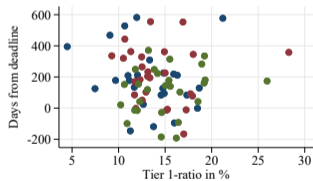
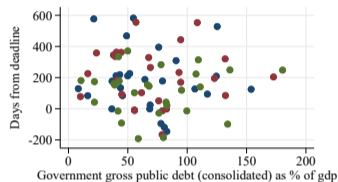
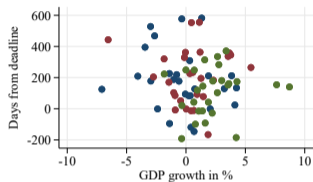
# Regulatory directives and ex-ante Gini coefficients

[Back](#)



# No systematic relation of national implementation delays of a directive and banking sector health

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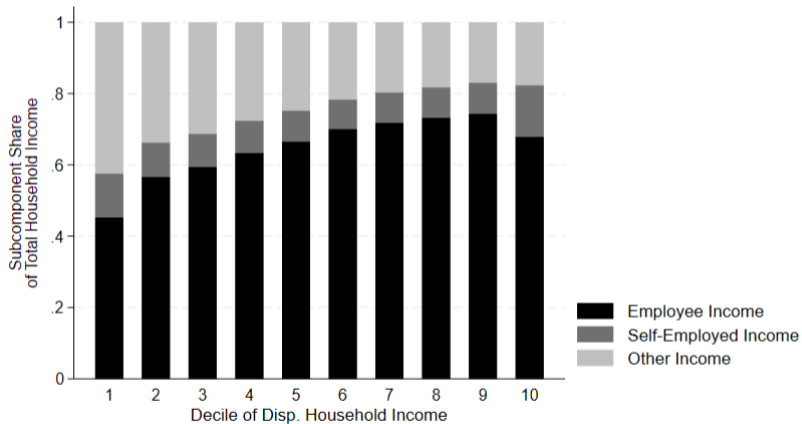


# Income subcomponents

Channels

Results

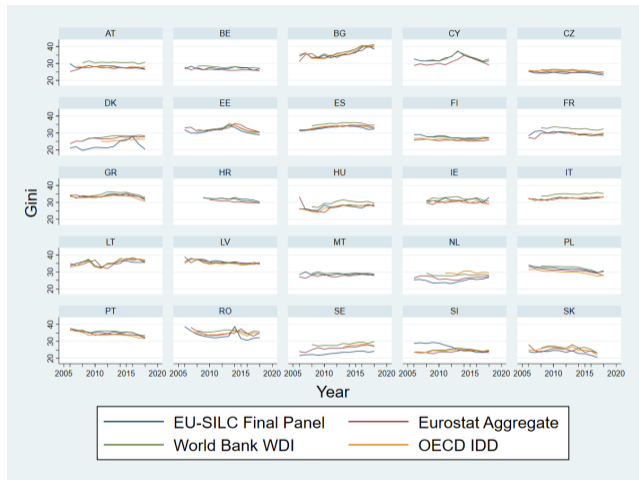
Recap



Source: Own calculations based on EU-SILC micro data.

# EU SILC - data validation

Back



Source: Own calculations based on EU-SILC micro data, aggregate Eurostat data, World Bank World Development Indicators, OECD Income Distribution Database.

# Summary statistics: household level

Data

Model

	Mean	SD	Min	Mdn	Max	Obs.
<b>Outcomes</b>						
Δ Disp. Household Income [%]	7.94	44.84	-500.00	1.99	500.00	710,398
Δ Total Household Income [%]	9.03	51.68	-500.00	2.42	500.00	703,636
Δ Employee Income [%]	6.15	45.60	-500.00	1.82	500.00	567,213
Δ Self-Employed Income [%]	4.46	49.56	-500.00	0.04	500.00	183,004
<b>Characteristics</b>						
Household Size	2.83	1.31	1.00	3.00	7.00	710,398
Owner-Occupier	0.80	0.40	0.00	1.00	1.00	710,398

# Summary statistics: individual level [Back](#)

	Mean	SD	Min	Mdn	Max	Obs.
<b>Outcomes</b>						
Δ Employee Income [%]	3.45	31.66	-500.00	0.98	500.00	710,765
Δ Self-Employed Income [%]	3.77	45.27	-500.00	0.05	500.00	172,551
<b>Characteristics</b>						
<i>Demographics</i>						
Male	0.50	0.50	0.00	0.00	1.00	1,124,633
Age	48.30	13.65	16.00	49.00	80.00	1,124,633
<i>Education</i>						
Middle School	0.26	0.44	0.00	0.00	1.00	1,124,633
High School	0.49	0.50	0.00	0.00	1.00	1,124,633
University	0.25	0.44	0.00	0.00	1.00	1,124,633
<i>Labor Market</i>						
Years of Work Experience	22.75	12.83	0.00	23.00	53.00	1,124,633

# Distributional effects of EBU directives on *income growth*

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$\Delta$ Disp. Household Income [%]	(1)	(2)	(3)	(4)	(5)	(6)
	CRDIV	CRDIV	BRRD	BRRD	DGSD	DGSD
Decile 1 $\times$ Directive	-3.572*** (1.039)	-3.114** (1.329)	-0.739 (1.238)	0.024 (1.512)	-1.086 (1.228)	0.125 (1.528)
Decile 2 $\times$ Directive	0.083 (0.823)	-0.304 (1.053)	0.885 (0.726)	0.609 (1.049)	1.047 (0.691)	1.353 (1.049)
Decile 3 $\times$ Directive	0.983 (0.690)	0.309 (1.002)	1.559*** (0.592)	0.966 (0.891)	1.719*** (0.590)	1.702* (0.914)
Decile 4 $\times$ Directive	1.830** (0.739)	0.991 (0.978)	1.775*** (0.628)	1.106 (0.920)	2.229*** (0.598)	2.143** (0.900)
Decile 5 $\times$ Directive	1.905*** (0.715)	0.715 (0.952)	2.403*** (0.599)	1.450 (0.882)	2.260*** (0.567)	1.873** (0.872)
Decile 6 $\times$ Directive	1.541** (0.657)	0.589 (0.918)	2.282*** (0.625)	1.729* (0.957)	2.565*** (0.607)	2.511*** (0.947)
Decile 7 $\times$ Directive	1.689** (0.669)	0.601 (0.967)	2.515*** (0.601)	1.606* (0.935)	2.673*** (0.586)	2.296** (0.916)
Decile 8 $\times$ Directive	1.513** (0.708)	0.448 (0.926)	2.851*** (0.591)	2.151** (0.906)	2.746*** (0.557)	2.673*** (0.898)
Decile 9 $\times$ Directive	2.544*** (0.653)	1.423 (0.922)	2.866*** (0.568)	1.973** (0.876)	3.157*** (0.559)	2.834*** (0.857)
Decile 10 $\times$ Directive	2.554*** (0.760)	0.533 (1.029)	3.726*** (0.652)	2.378** (0.954)	3.907*** (0.627)	3.078*** (0.934)
Observations	721,016	710,398	721,016	710,398	721,016	710,398
R-Squared	0.03	0.03	0.03	0.03	0.03	0.03
Country Controls	Infl.	Infl., GDP	Infl.	Infl., GDP	Infl.	Infl., GDP
Household Controls		Yes		Yes		Yes
Year FE		Yes		Yes		Yes



## Summary statistics: country-level [Back](#)

	<b>Mean</b>	<b>SD</b>	<b>Min</b>	<b>Max</b>	<b>Obs.</b>
GDP Growth [%]	1.14	4.02	-14.84	25.18	225
Consumer Price Index (HICP) Change Rate [%]	1.41	1.55	-1.70	6.10	225
Public Sector Purchase Programme (PSPP)	0.01	0.02	-0.00	0.08	225
Minimum Wage Growth [%]	3.18	5.36	-12.36	37.28	225
Social government	0.35	0.48	0.00	1.00	225
Ex-ante capital regulation stringency	7.04	1.55	4.00	9.00	207
Ex-ante restructuring power	2.27	0.86	0.00	3.00	198
Ex-ante mitigation of moral hazards from deposit insurance	1.27	0.75	0.00	3.00	198
Ex-ante supervisory power	10.91	2.11	5.00	14.00	207

# Robustness: macro-level confounders - CRD IV Back

$\Delta$ Disp. Household Income [%]	(1)	(2)	(3)	(4)	(5)	(6)
	Baseline	Region-Year FE	PSPP Control	Min. Wage Control	Social gov. Control	Euro Crisis Dummy
Decile 1 $\times$ Directive	-3.114** (1.329)	-2.794** (1.246)	-2.937** (1.330)	-3.423** (1.329)	-3.143** (1.326)	-2.829** (1.329)
Decile 2 $\times$ Directive	-0.304 (1.053)	-0.049 (1.034)	0.227 (1.033)	-0.666 (1.046)	-0.266 (1.034)	-0.079 (1.038)
Decile 3 $\times$ Directive	0.309 (1.002)	0.542 (0.895)	0.275 (0.975)	-0.147 (0.955)	0.250 (0.982)	0.422 (1.014)
Decile 4 $\times$ Directive	0.991 (0.978)	1.233 (0.934)	1.291 (0.958)	0.600 (0.970)	0.901 (0.955)	0.852 (0.961)
Decile 5 $\times$ Directive	0.715 (0.952)	0.947 (0.871)	0.853 (0.930)	0.370 (0.931)	0.700 (0.921)	0.695 (0.934)
Decile 6 $\times$ Directive	0.589 (0.918)	0.846 (0.832)	0.780 (0.871)	0.168 (0.883)	0.508 (0.891)	0.501 (0.912)
Decile 7 $\times$ Directive	0.601 (0.967)	0.813 (0.870)	0.722 (0.935)	0.196 (0.926)	0.517 (0.945)	0.508 (0.961)
Decile 8 $\times$ Directive	0.448 (0.926)	0.699 (0.837)	0.534 (0.889)	0.020 (0.901)	0.367 (0.908)	0.178 (0.879)
Decile 9 $\times$ Directive	1.423 (0.922)	1.642** (0.795)	1.646* (0.887)	1.075 (0.912)	1.338 (0.886)	1.240 (0.893)
Decile 10 $\times$ Directive	0.533 (1.029)	0.768 (0.958)	0.442 (0.994)	0.177 (1.006)	0.439 (1.011)	0.141 (1.013)
Observations	710,398	710,398	710,398	710,398	710,398	710,398
R-Squared	0.03	0.03	0.03	0.03	0.03	0.03
Country Controls	Infl., GDP	Infl., GDP	Infl., GDP	Infl., GDP	Infl., GDP	Infl., GDP
Household Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes

# Robustness: model specification - CRDIV [Back](#)

$\Delta$ Disp. Household Income [%]	(1)	(2)	(3)	(4)	(5)
	Baseline	Placebo 2010-2013	2013 - 2018	Exclude DK, NL, RO, SE	Exclude PL
Decile 1 $\times$ Directive	-3.114** (1.329)	-1.778 (2.052)	-4.034** (1.626)	-2.618* (1.435)	-3.445** (1.515)
Decile 2 $\times$ Directive	-0.304 (1.053)	-2.132 (1.600)	-0.630 (1.126)	0.444 (1.130)	-0.343 (1.225)
Decile 3 $\times$ Directive	0.309 (1.002)	-1.061 (1.483)	-0.019 (1.079)	1.054 (1.036)	-0.004 (1.163)
Decile 4 $\times$ Directive	0.991 (0.978)	-2.295 (1.644)	0.693 (0.986)	1.450 (1.030)	1.197 (1.150)
Decile 5 $\times$ Directive	0.715 (0.952)	-0.945 (1.455)	0.510 (1.018)	1.217 (0.970)	0.686 (1.115)
Decile 6 $\times$ Directive	0.589 (0.918)	-1.850 (1.515)	0.536 (0.983)	1.157 (0.943)	0.435 (1.083)
Decile 7 $\times$ Directive	0.601 (0.967)	-0.754 (1.515)	0.437 (1.063)	1.256 (1.003)	0.300 (1.138)
Decile 8 $\times$ Directive	0.448 (0.926)	-0.290 (1.531)	-0.605 (0.856)	0.849 (0.963)	0.321 (1.082)
Decile 9 $\times$ Directive	1.423 (0.922)	0.581 (1.580)	0.991 (0.985)	2.336** (0.907)	1.267 (1.070)
Decile 10 $\times$ Directive	0.533 (1.029)	1.992 (1.839)	-0.255 (1.152)	1.455 (1.032)	0.415 (1.191)
Observations	710,398	331,248	471,447	608,072	660,190
R-Squared	0.03	0.03	0.03	0.03	0.03
Country Controls	Infl., GDP	Infl., GDP	Infl., GDP	Infl., GDP	Infl., GDP
Household Controls	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes

# Robustness: macro-level confounders - BRRD Back

$\Delta$ Disp. Household Income [%]	(1)	(2)	(3)	(4)	(5)	(6)
	Baseline	Region-Year FE	PSPP Control	Min. Wage Control	Social gov. Control	Euro Crisis Dummy
Decile 1 $\times$ Directive	0.024 (1.512)	-0.019 (1.472)	0.236 (1.694)	0.115 (1.519)	-0.046 (1.530)	0.231 (1.506)
Decile 2 $\times$ Directive	0.609 (1.049)	0.528 (1.046)	1.059 (1.081)	0.648 (1.049)	0.531 (1.059)	0.747 (1.027)
Decile 3 $\times$ Directive	0.966 (0.891)	0.882 (0.905)	0.655 (0.895)	0.949 (0.880)	0.887 (0.911)	0.967 (0.886)
Decile 4 $\times$ Directive	1.106 (0.920)	1.001 (0.952)	0.808 (0.923)	1.127 (0.902)	1.024 (0.935)	0.941 (0.908)
Decile 5 $\times$ Directive	1.450 (0.882)	1.337 (0.892)	1.331 (0.876)	1.515* (0.871)	1.348 (0.905)	1.373 (0.886)
Decile 6 $\times$ Directive	1.729* (0.957)	1.632* (0.979)	1.584* (0.959)	1.730* (0.941)	1.645* (0.977)	1.662* (0.958)
Decile 7 $\times$ Directive	1.606* (0.935)	1.497 (0.968)	1.652* (0.977)	1.651* (0.914)	1.524 (0.953)	1.511 (0.925)
Decile 8 $\times$ Directive	2.151** (0.906)	2.060** (0.937)	2.160** (0.908)	2.168** (0.870)	2.053** (0.918)	1.985** (0.880)
Decile 9 $\times$ Directive	1.973** (0.876)	1.873** (0.918)	1.900** (0.897)	2.030** (0.845)	1.866** (0.892)	1.819** (0.857)
Decile 10 $\times$ Directive	2.378** (0.954)	2.269** (0.994)	2.230** (1.036)	2.439*** (0.925)	2.283** (0.969)	2.148** (0.933)
Observations	710,398	710,398	710,398	710,398	710,398	710,398
R-Squared	0.03	0.03	0.03	0.03	0.03	0.03
Country Controls	Infl., GDP	Infl., GDP	Infl., GDP	Infl., GDP	Infl., GDP	Infl., GDP
Household Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes

# Robustness: model specification - BRRD [Back](#)

$\Delta$ Disp. Household Income [%]	(1)	(2)	(3)	(4)	(5)
	Baseline	Placebo 2010-2013	2013 - 2018	Exclude DK, NL, RO, SE	Exclude BE, PL
Decile 1 $\times$ Directive	0.024 (1.512)	-1.778 (2.052)	0.401 (1.705)	0.484 (1.672)	0.306 (1.731)
Decile 2 $\times$ Directive	0.609 (1.049)	-2.132 (1.600)	0.500 (1.017)	0.974 (1.120)	0.613 (1.287)
Decile 3 $\times$ Directive	0.966 (0.891)	-1.061 (1.483)	0.985 (0.843)	1.015 (0.941)	0.387 (1.120)
Decile 4 $\times$ Directive	1.106 (0.920)	-2.295 (1.644)	0.729 (0.927)	1.460 (0.922)	0.798 (1.138)
Decile 5 $\times$ Directive	1.450 (0.882)	-0.945 (1.455)	1.632* (0.916)	2.015** (0.878)	0.847 (1.092)
Decile 6 $\times$ Directive	1.729* (0.957)	-1.850 (1.515)	1.785* (0.982)	2.066** (0.993)	1.199 (1.205)
Decile 7 $\times$ Directive	1.606* (0.935)	-0.754 (1.515)	1.729* (0.969)	2.014** (0.957)	1.068 (1.180)
Decile 8 $\times$ Directive	2.151** (0.906)	-0.290 (1.531)	2.071** (0.868)	2.572*** (0.917)	1.618 (1.138)
Decile 9 $\times$ Directive	1.973** (0.876)	0.581 (1.580)	1.897** (0.871)	2.512*** (0.892)	1.295 (1.069)
Decile 10 $\times$ Directive	2.378** (0.954)	1.992 (1.839)	2.431** (0.961)	3.024*** (1.027)	1.773 (1.162)
Observations	710,398	331,248	471,447	608,072	639,169
R-Squared	0.03	0.03	0.03	0.03	0.03
Country Controls	Infl., GDP	Infl., GDP	Infl., GDP	Infl., GDP	Infl., GDP
Household Controls	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes

# Robustness: macro-level confounders - DGSD Back

$\Delta$ Disp. Household Income [%]	(1)	(2)	(3)	(4)	(5)	(6)
	Baseline	Region-Year FE	PSPP Control	Min. Wage Control	Social gov. Control	Euro Crisis Dummy
Decile 1 $\times$ Directive	0.125 (1.528)	0.361 (1.508)	0.084 (1.806)	0.063 (1.546)	-0.010 (1.544)	0.264 (1.527)
Decile 2 $\times$ Directive	1.353 (1.049)	1.567 (1.062)	1.887* (1.110)	1.224 (1.056)	1.216 (1.049)	1.439 (1.025)
Decile 3 $\times$ Directive	1.702* (0.914)	1.909** (0.932)	1.346 (0.947)	1.517* (0.895)	1.573* (0.921)	1.656* (0.912)
Decile 4 $\times$ Directive	2.143** (0.900)	2.329** (0.940)	2.060** (0.898)	1.967** (0.881)	2.023** (0.902)	1.936** (0.891)
Decile 5 $\times$ Directive	1.873** (0.872)	2.043** (0.884)	1.694** (0.841)	1.791** (0.867)	1.714* (0.883)	1.732* (0.881)
Decile 6 $\times$ Directive	2.511*** (0.947)	2.705*** (0.998)	2.439** (0.961)	2.330** (0.931)	2.378** (0.956)	2.388** (0.952)
Decile 7 $\times$ Directive	2.296** (0.916)	2.480** (0.957)	2.401** (0.944)	2.169** (0.901)	2.178** (0.920)	2.148** (0.904)
Decile 8 $\times$ Directive	2.673*** (0.898)	2.864*** (0.935)	2.743*** (0.879)	2.490*** (0.869)	2.532*** (0.900)	2.450*** (0.873)
Decile 9 $\times$ Directive	2.834*** (0.857)	3.029*** (0.909)	2.827*** (0.864)	2.714*** (0.834)	2.685*** (0.859)	2.628*** (0.842)
Decile 10 $\times$ Directive	3.078*** (0.934)	3.273*** (1.007)	2.975*** (1.010)	2.967*** (0.914)	2.936*** (0.938)	2.792*** (0.916)
Observations	710,398	710,398	710,398	710,398	710,398	710,398
R-Squared	0.03	0.03	0.03	0.03	0.03	0.03
Country Controls	Infl., GDP	Infl., GDP	Infl., GDP	Infl., GDP	Infl., GDP	Infl., GDP
Household Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes

# Robustness: model specification - DGSD [Back](#)

$\Delta$ Disp. Household Income [%]	(1)	(2)	(3)	(4)	(5)
	Baseline	Placebo 2010-2013	2013 - 2018	Exclude DK, NL, RO, SE	Exclude PL
Decile 1 $\times$ Directive	0.125 (1.528)	-1.778 (2.052)	0.389 (1.634)	0.465 (1.719)	0.570 (1.676)
Decile 2 $\times$ Directive	1.353 (1.049)	-2.132 (1.600)	1.360 (0.959)	1.699 (1.141)	1.730 (1.210)
Decile 3 $\times$ Directive	1.702* (0.914)	-1.061 (1.483)	1.617* (0.837)	1.746* (0.979)	1.728 (1.089)
Decile 4 $\times$ Directive	2.143** (0.900)	-2.295 (1.644)	1.815** (0.829)	2.519*** (0.918)	2.393** (1.079)
Decile 5 $\times$ Directive	1.873** (0.872)	-0.945 (1.455)	1.899** (0.874)	2.363*** (0.897)	1.916* (1.035)
Decile 6 $\times$ Directive	2.511*** (0.947)	-1.850 (1.515)	2.429*** (0.909)	2.836*** (1.002)	2.576** (1.142)
Decile 7 $\times$ Directive	2.296** (0.916)	-0.754 (1.515)	2.229** (0.903)	2.680*** (0.952)	2.250** (1.112)
Decile 8 $\times$ Directive	2.673*** (0.898)	-0.290 (1.531)	2.450*** (0.833)	3.036*** (0.932)	2.634** (1.100)
Decile 9 $\times$ Directive	2.834*** (0.857)	0.581 (1.580)	2.559*** (0.826)	3.354*** (0.881)	2.714*** (1.028)
Decile 10 $\times$ Directive	3.078*** (0.934)	1.992 (1.839)	3.073*** (0.915)	3.682*** (1.006)	2.986*** (1.112)
Observations	710,398	331,248	471,447	608,072	660,190
R-Squared	0.03	0.03	0.03	0.03	0.03
Country Controls	Infl., GDP	Infl., GDP	Infl., GDP	Infl., GDP	Infl., GDP
Household Controls	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes

# Increase in **employee & self-employed income growth** due to **intensive margin** adjustments drives DGSD result BRRD

	Income growth Household (1)	Extensive effect Individuals (2)	Main earner (3)	Intensive effect Individuals (4)	Main earner (5)
<b>Panel A: Decile 10 - Employee income</b>					
Directive	2.217*** (0.658)	-0.002 (0.003)	0.004 (0.003)	1.381*** (0.368)	1.763*** (0.456)
Observations	67,217	133,214	53,419	89,447	48,706
<b>Panel B: Decile 10 - Self-employed income</b>					
Directive	2.662*** (0.885)	-0.011 (0.012)	-0.012 (0.015)	2.931*** (1.109)	3.342*** (1.199)
Observations	26,162	50,320	19,549	16,369	12,924