

Monetary Policy and Inequality

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Question

Does monetary policy affect households *differentially* across the income distribution?

- In terms of disposable income? Wealth?
- If so, why? Which channels matter most?

Distribution of gains and losses from monetary policy changes matters for

- the level of inequality in society
- the aggregate effects of monetary policy (Auclert 2019, Holm et al. 2021)

What should we expect?

Much debate among commentators, central bankers, academics:

- Expansionary MP raises asset prices, better for well-off hhs (Acemoglu & Johnson, 2012)
- But also lowers unemployment, better for low- and mid-income households (Draghi, 2016)
- Effect of monetary policy on inequality is ex ante ambiguous (Bernanke, 2015)

Recent theory papers (e.g. Auclert 2019; Kaplan, Moll and Violante 2018) identify multiple channels through which MP can affect distribution of income

This paper

Question: How do the effects of expansionary MP on income and wealth vary across the income distribution?

Data: Administrative data from Denmark with detailed information about households' income and wealth

Design:

- Monetary policy shocks in Germany / Euro area
- Exploit that Denmark imports monetary policy from Germany/EA due to Danish currency peg
- Estimate MP effects on disposable income and wealth for households with different levels of *ex ante* income

Administrative micro data

Micro data, 1987-2014

- Entire Danish population (73 mill. household-year obs)
- Income and wealth data from annual tax returns: Third-party reported
- Family structure → households
- Car purchases → measure of durables consumption

For income, focus on effects on *disposable income*: income net of taxes and interest expenses

For wealth, we impute stocks and housing wealth *capital gains*

- stock wealth in year $t-1$ * change in national stock index
- housing wealth in year $t-1$ * change in local price index

Estimating differential effects of monetary policy

Isolate monetary policy shocks in Germany / Euro area
(residual after controlling for macro variables)

Instrument changes in Danish monetary policy rate with these shocks (Currency peg: Denmark imports monetary policy changes from DE / EA)

Lots of robustness checks, including other methods for identification (Romer-Romer, Jarocinski-Karadi)

Split households by ex ante income level and estimate effects of *lower* policy rate for each group

- Outcomes always measured relative to ex ante disposable income.
- Varying time horizon: 1-4 years (local projections)

Model

Denoting households with j , years with t and income groups with k :

$$\frac{y_{j;t+h} - \bar{y}_{j;<t}}{\bar{d}_{j;<t}} = \sum_{k=1}^{21} \mathbb{1}[j \in k] \left[\alpha_h^k + \beta_h^k (-\Delta i_t) + \gamma_h^k X_t^* \right] + \varepsilon_{j,t}$$

$y_{j;t+h}$: outcome (disp. income, wealth) in year $t + h$, $h \in \{1, 2, 3, 4\}$

$\bar{y}_{j;<t}$: ex ante value of outcome

$\bar{d}_{j;<t}$: ex ante value of disposable income

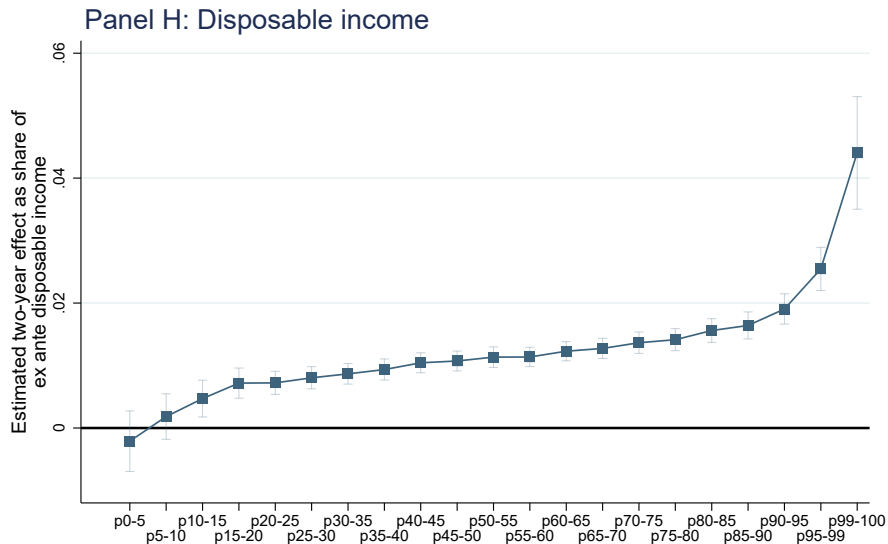
$\mathbb{1}[j \in k]$: indicator for belonging to income group k

X_t^* : macro controls (in t and $t - 1$)

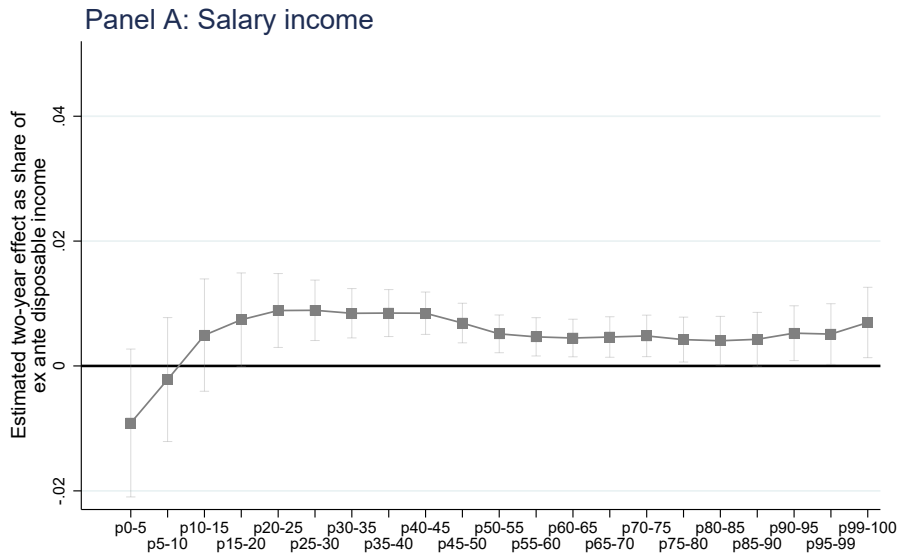
Exposure to monetary policy channels varies across the income distribution

	p0-20	p20-40	p40-60	p60-80	p80-90	p90-99	p99-100
Panel A: Level of disposable income (in % of middle group)	66%	85%	100%	115%	132%	170%	432%
Panel B: Composition of income (each component in % of overall disposable income)							
salary income	40%	96%	118%	128%	135%	130%	73%
business income	4%	5%	6%	8%	12%	27%	62%
stock market income	0%	0%	1%	1%	2%	6%	41%
interest income	1%	2%	2%	2%	3%	5%	10%
net government transfers	58%	5%	-18%	-35%	-51%	-67%	-80%
interest expenses	8%	13%	15%	16%	18%	21%	23%
private pension	4%	5%	6%	10%	15%	17%	11%
other income	1%	1%	1%	1%	2%	3%	7%
Panel C: Composition of balance sheets (each component in % of overall disposable income)							
deposits	64%	67%	66%	82%	96%	129%	234%
stocks	8%	10%	11%	16%	23%	42%	180%
housing	283%	348%	366%	435%	506%	604%	578%
debt	145%	210%	235%	263%	294%	337%	321%
net wealth	210%	214%	208%	270%	331%	438%	670%

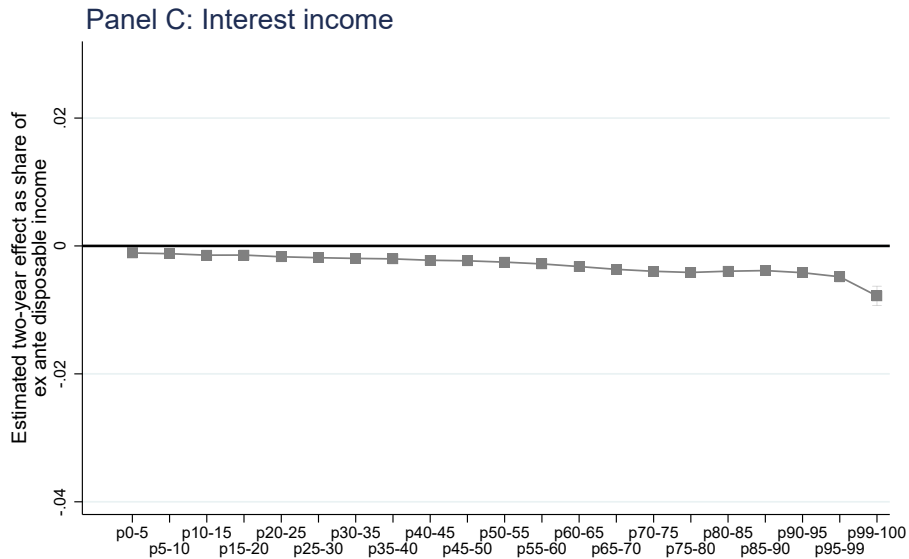
Clear income gradient in effect on **disposable** income



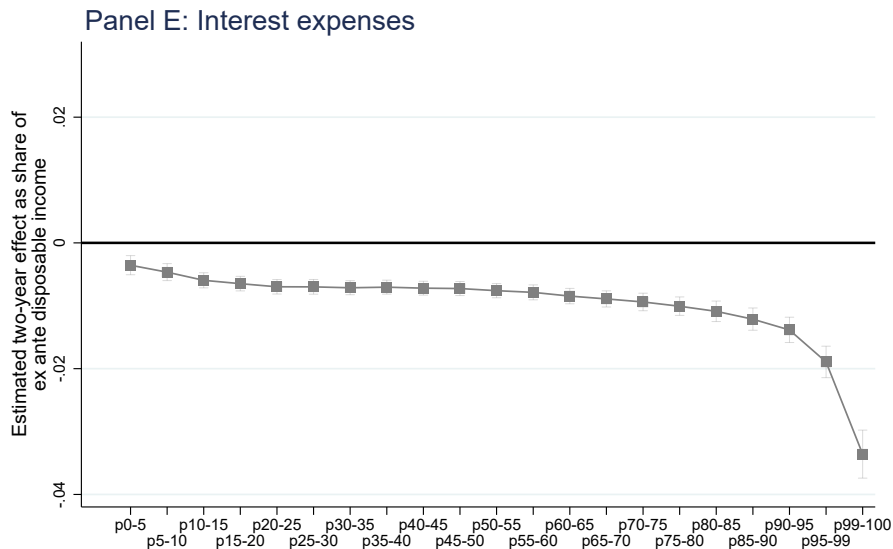
The largest impact on **salary income** is around the 25th percentile



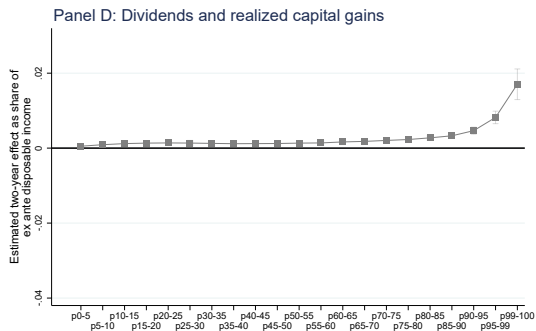
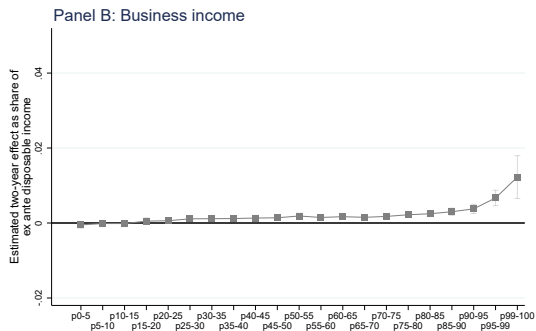
And the largest decrease in **interest income** is among the top income groups



But decrease in **interest expenses** is also largest at the top



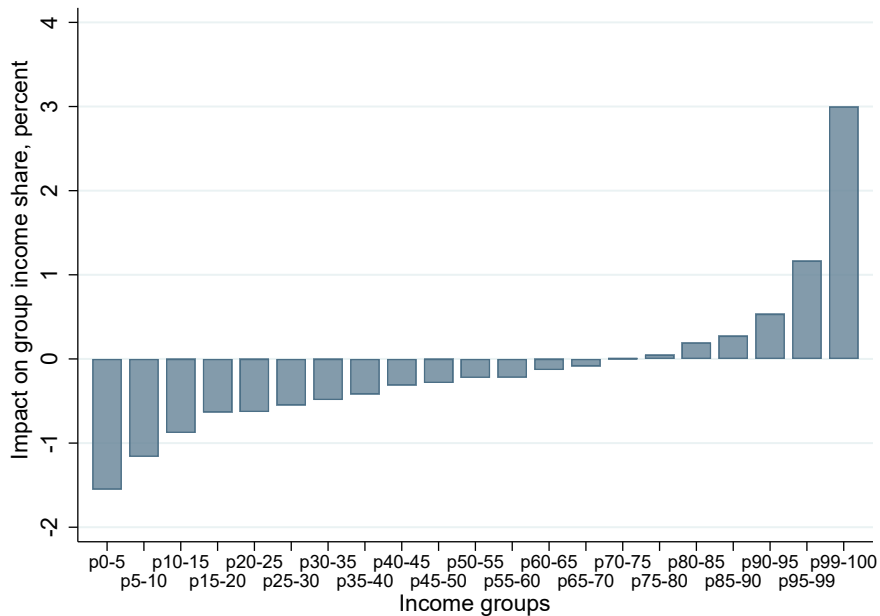
And so are the increases in **business income** and **capital income**



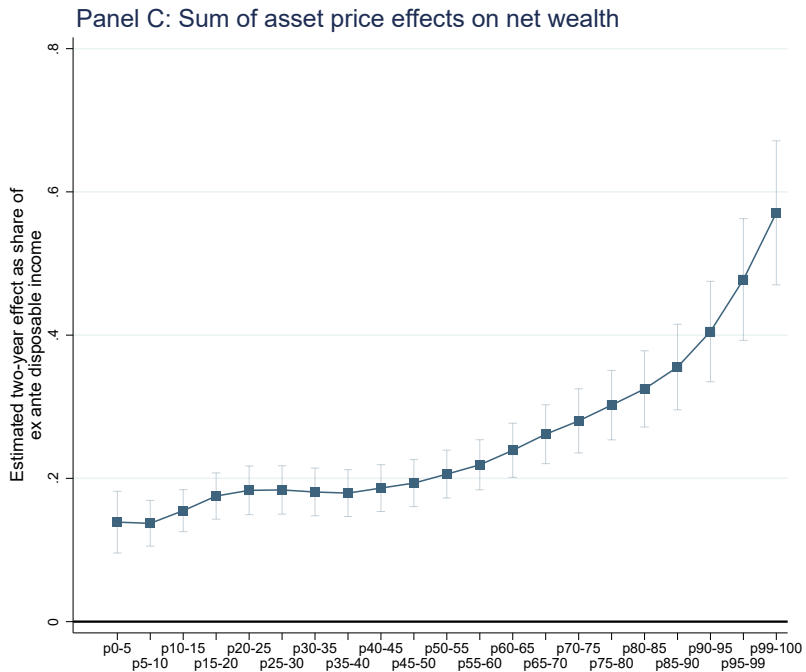
Disposable income results, summary

- Lowering monetary policy rates increases disposable income for (almost) all groups, but especially for those at the top of the income distribution
 - 4% for top-1% vs 1% for mid-income after 1 pp lower MP rate
- Positive income gradient driven by stronger impacts on interest payments, capital income and business income for high-income groups
 - dominate effects on employment and salary income, which are stronger at lower income levels

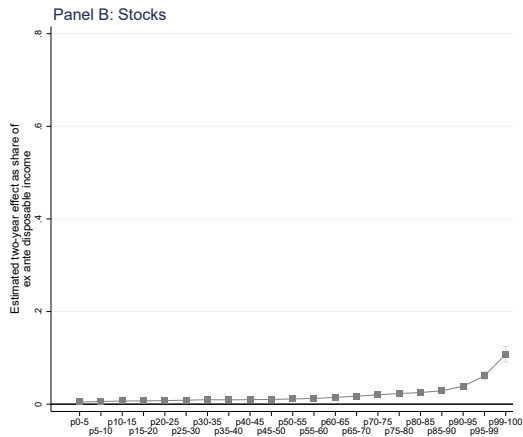
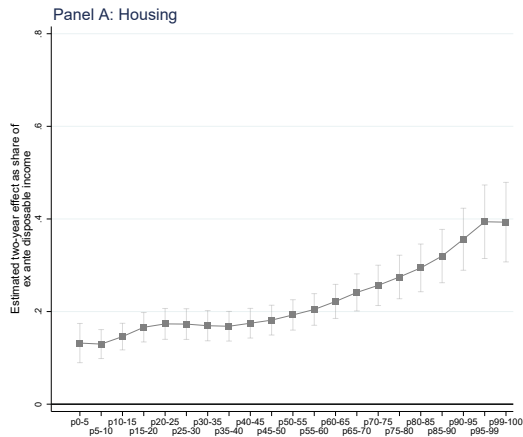
Effect on income inequality



Clear gradient in effect on **wealth** through capital gains



Operates through stock market wealth and especially housing wealth



Monetary policy and wealth, summary

Capital gains following expansionary monetary policy are highly unequally distributed:

A 1 ppt reduction of the monetary policy rate produces capital gains of

≈ 80% of disposable income at the top of the income distribution

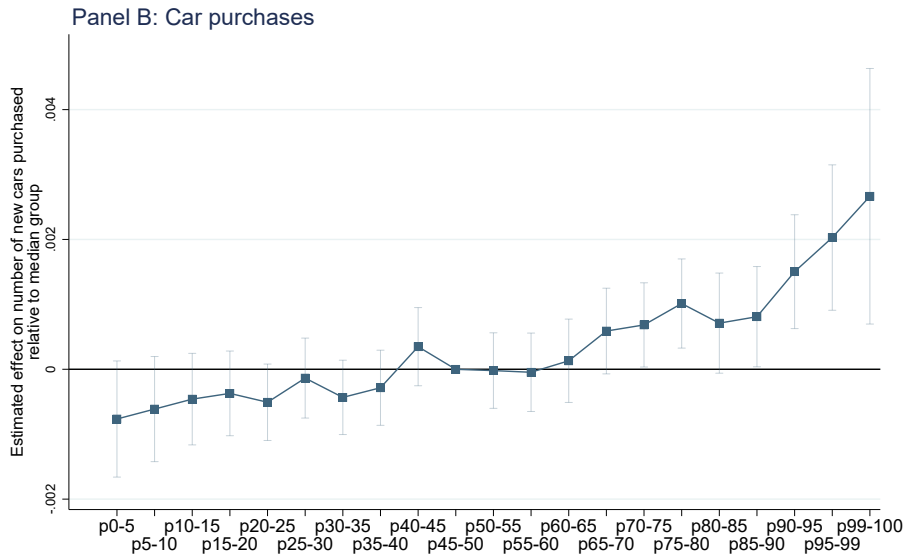
< 20% of disposable income at the bottom of the distribution

The gradient mainly reflects that wealth-to-income ratios increase along the income distribution

But also higher asset price sensitivity at the top

- for housing: 7% increase in response to 1 ppt. rate reduction at the top, 4% at the bottom

Also a positive income gradient in effect on new car purchases



Conclusion

Main take-away: Strong income gradient in the effects of expansionary monetary policy on disposable income and wealth.

High-income households benefit more!

Disposable income: larger increases at the top of income distribution, mainly due to

- larger drops in interest payments
- stronger increases in business income

Implication: Expansionary monetary policy increases income inequality.

Wealth: larger increases at the top (rel. to disp. inc.) due to

- larger asset holdings relative to disposable income
- home prices more sensitive to changes in policy rate