Financial Stability and the Impact of (Large) Interest Changes: A Portfolio Perspective

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Financial portfolios

The portfolios of investors and firms play a central role for financial stability and the effectiveness of monetary policy.

- Financial risk-taking is a key determinant of market stability and macroeconomic activity.

- The sensitivity of investor portfolios to interest rates is an important source of systemic risk.

- Portfolio rebalancing represents one of the main transmission channels of monetary policy.

  👉 Isabel Schnabel, *The Benefits and Costs of Asset Purchases*, Speech delivered at the BOJ-IMES Conference, 28 May 2024.
  https://www.ecb.europa.eu//press/key/date/2024/html/ecb.sp240528~a4f151497d.en.html

Portfolio heterogeneity

- To understand the impact of investor portfolios, one needs to take stock of their considerable heterogeneity.
- Firms and households take different levels of risk.
- Within an investor class, portfolio composition and rebalancing speed vary with characteristics.
  - Wealthier households tend to take more systematic risk & earn higher average returns than less wealthy households.
    👉 Calvet and Sodini (JF 2014), Bach, Calvet, and Sodini (AER 2020).
  - Wealthier households rebalance more rapidly.
    👉 Calvet, Campbell, and Sodini (QJE 2009).
- What are the implications of portfolio heterogeneity for monetary policy and macroprudential regulation?

Macroeconomic theory

"A spectre is haunting Macroeconomics – the spectre of Heterogeneity. Some of the world's leading policymakers have been asking for research on it, and its other name, inequality, in connection with stabilization, monetary and fiscal policies."

Florin Bilbiie, "Monetary policy and heterogeneity: An analytical framework," forthcoming *Review of Economic Studies.*

Heterogeneous Agents New Keynesian (HANK) models

- Stylized general equilibrium models designed to capture the interaction between the income/wealth distribution and the propagation of business cycle.
- Two types of agents: cash on hand & savers, facing income risk.
- The models allow researchers to study the determinacy of Taylor rules, inflation, the aggregate marginal propensity to consume...
- However, the models consider simplified financial markets in which investors trade bonds but do not trade risky assets.

👉 Kaplan, Moll, and Violante (AER 2018), Bilbiie (REStud 2024).

This talk

- **I propose to go under the hood and study how investor portfolios contribute to the transmission of monetary policy.**

- **This talk is both a presentation of recent work and a proposal for what to do next.**

Outline

1. **How do the money holdings of households and firms respond to changes in interest rates?**

2. **What do we know about the ownership of government bonds?**

3. **Next steps**

How does portfolio risk vary with interest rates?

Theory predicts rebalancing in response to interest rate changes if:

- interest rates impact risk premia 👉 Gollier (2001), Merton (1971), Tobin (1958)
- investors adjust to meet "sustainable spending" 👉 Campbell and Sigalov (2020)
- investors reach for yield.

Fragmentary evidence of reaching for yield:

- 👉 Mutual funds and insurance companies: Becker and Ivashina (2015), Daniel et. al. (2021).
- 👉 Changes in money market funds' product mix: Maggio and Kacperczyk (2017)
- 👉 Money holdings of non-financial firms: Gao et al (2021)

What is the overall impact for M2?

- M2 ≈ the economy's main source of safe and liquid assets
- M2 plays a central role in transmitting central bank decisions (Drechsler et al 2017)

Betermier Calvet and Kvaerner (2023)

Comprehensively assess the properties of money demand across investor groups and countries

Administrative dataset from Norway

- Disaggregated asset holdings of every resident between 1993 and 2016
- Disaggregated asset holdings of every nonfinancial firm between 2004 and 2015
- Study both the macro and micro level drivers of money demand over long period

Administrative dataset from the Netherlands

- Disaggregated asset holdings of every household between 2011 and 2019

US household holdings from Survey of Consumer Finances since 1989

Eurostat data on the consolidated aggregate holdings of household and firm sectors in Norway and 11 founding countries of Euro area between 1995 and 2020

Cash share

$$c_t = \frac{M2_t}{M2_t + FA_t}$$

where:

- $M2_t$ is the value of cash holdings,
- FA_t is the value of noncash financial assets.

We apply this definition to countries, sectors (households, corporate, government, etc.), as well as individuals and firms.

Financial assets

- Household sector: M2, money market funds, bond funds, equity funds, listed securities, private equity,
- Firm sector: M2, mutual funds, bonds, listed stocks, private equity.

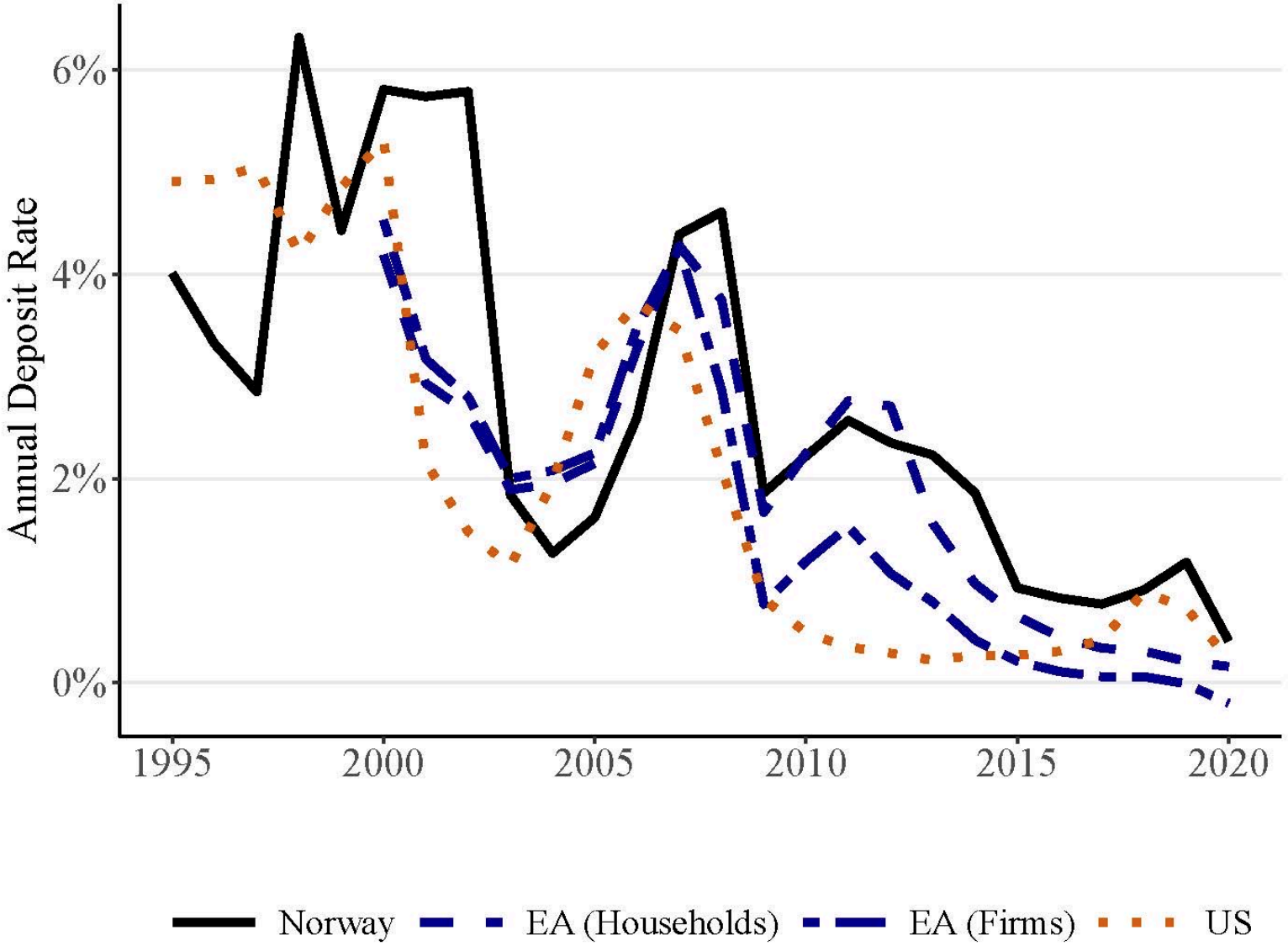
Careful reconciliation of macro and micro data

Control for institutional and composition effects

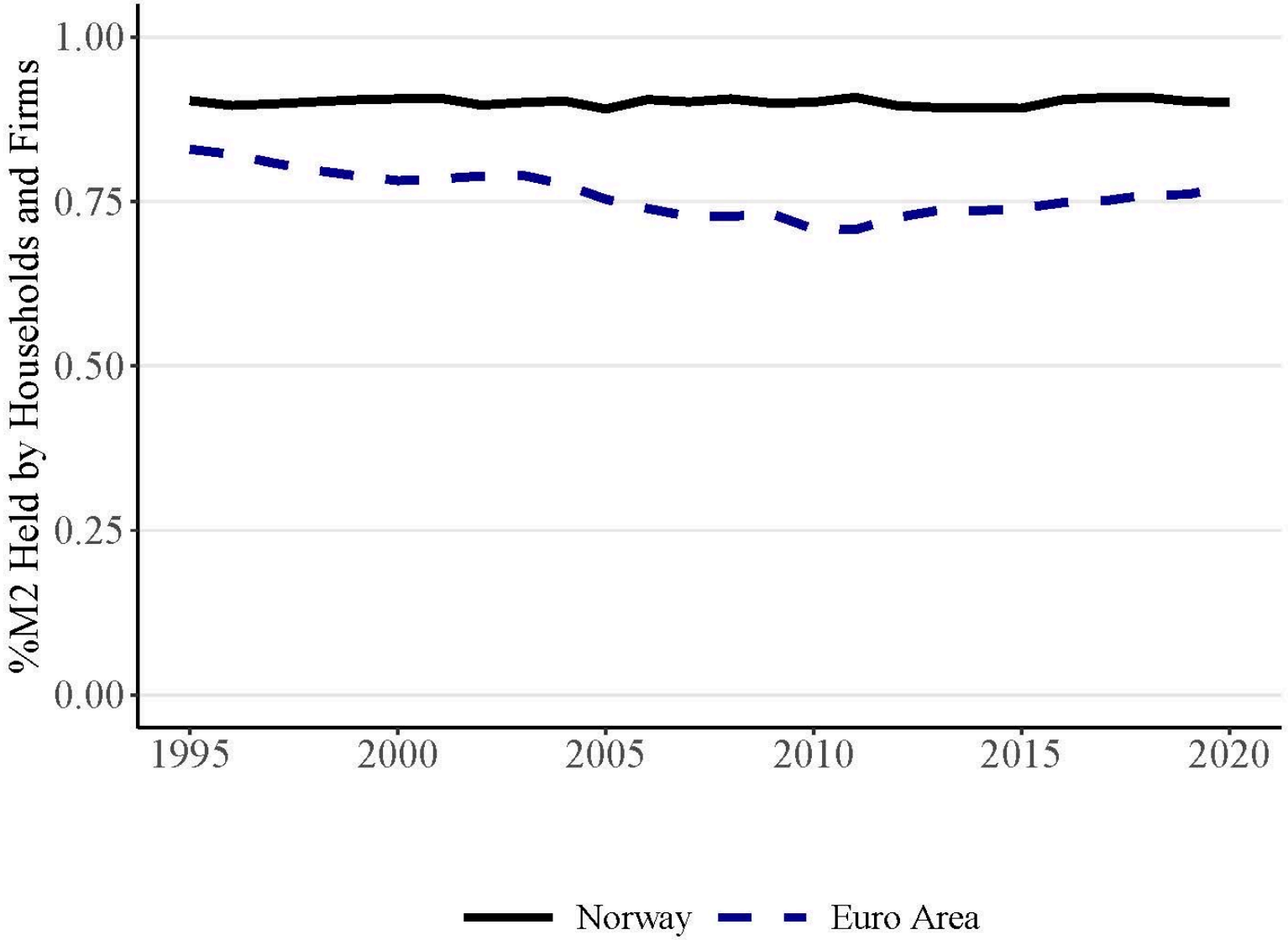
- Countries joining Euro area
- Tax reforms affecting value of private equity
- Firms switching from GAAP to IFRS standards
- Consolidation of firms

We verify that our cash share estimates obtained from micro data are consistent with cash share estimates obtained from macro data.

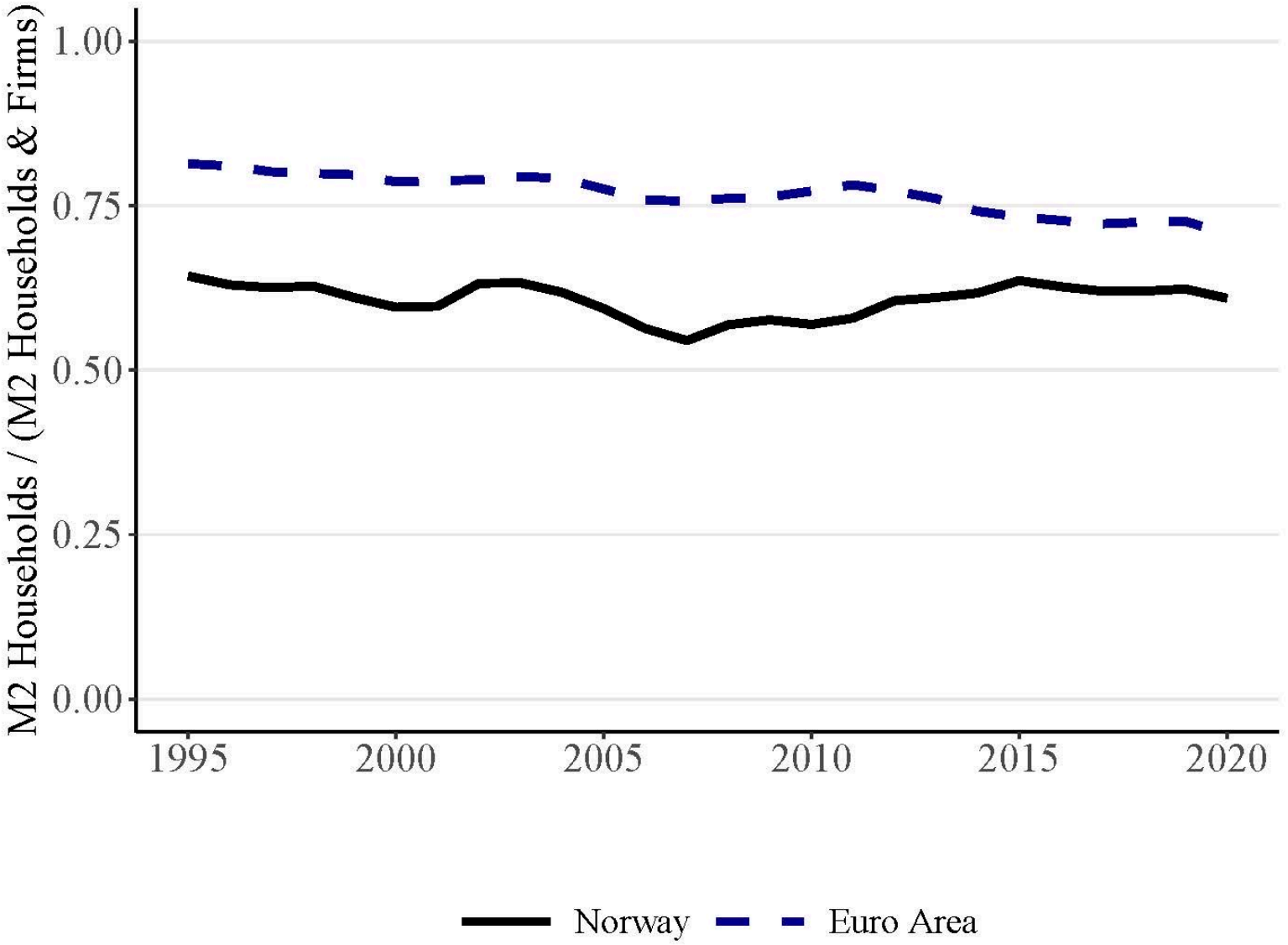
Large variation in deposit rates



Households and nonfinancial firms dominate M2



Household share dominates



Households

Distribution of household wealth

	Panel A: Norway				
	Average per individual (thousand euros)			Share of household sector	
	All	Top 10%	Bottom 90%	Top 10%	Bottom 90%
Labor income	31.0	41.2	29.9	0.13	0.87
Cash holdings	27.6	148.1	14.2	0.54	0.46
Financial wealth	57.7	420.5	17.4	0.73	0.27
Number of individuals	4,074,583	407,458	3,667,125		
	Panel B: Netherlands				
	Average per household (thousand euros)			Share of household sector	
	All	Top 10%	Bottom 90%	Top 10%	Bottom 90%
Labor income	38.7	66.9	35.5	0.17	0.83
Cash holdings	39.2	212.1	20.0	0.54	0.46
Financial wealth	95.8	755.8	22.4	0.79	0.21
Number of households	7,538,692	753,872	6,784,820		

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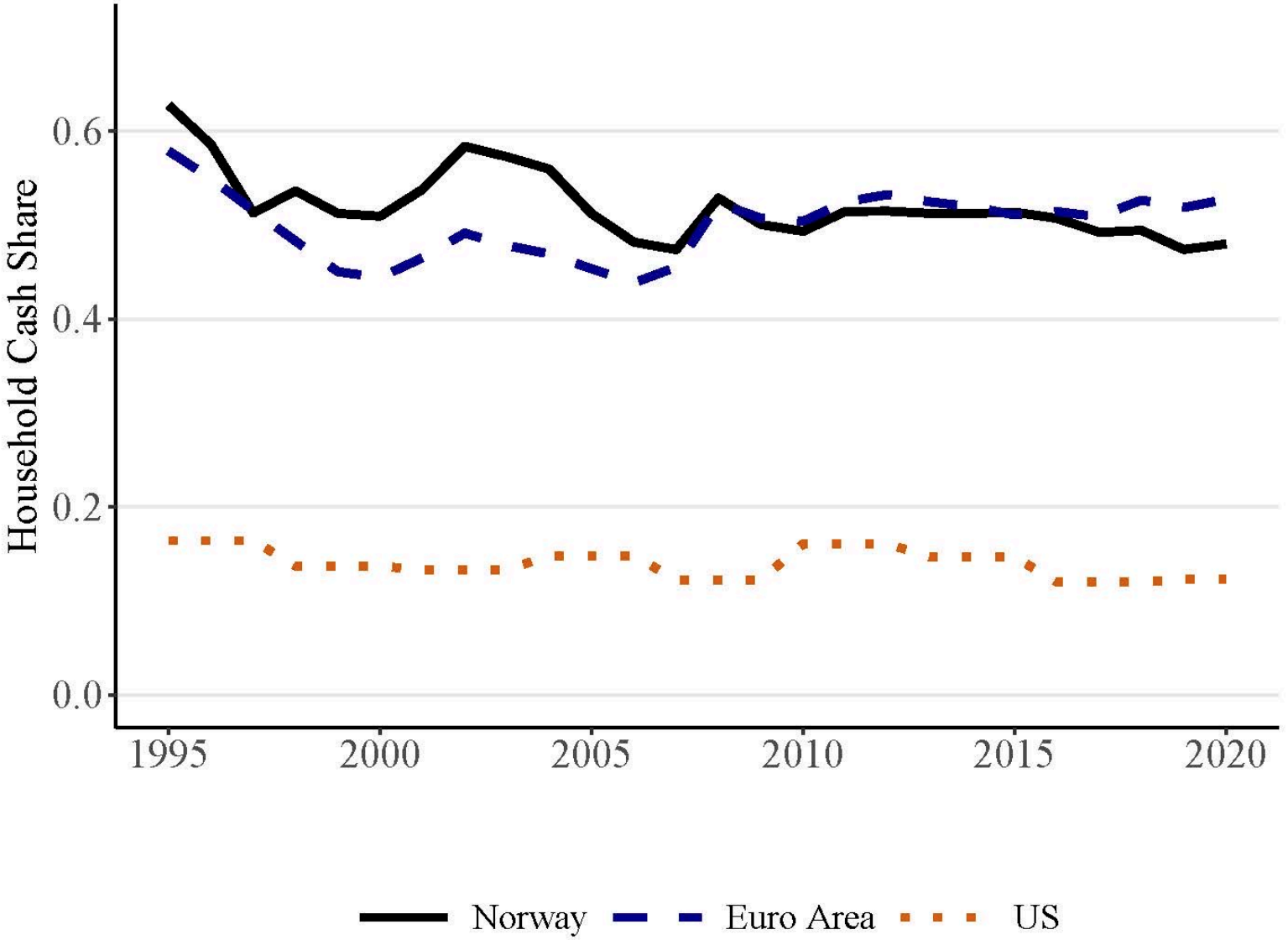
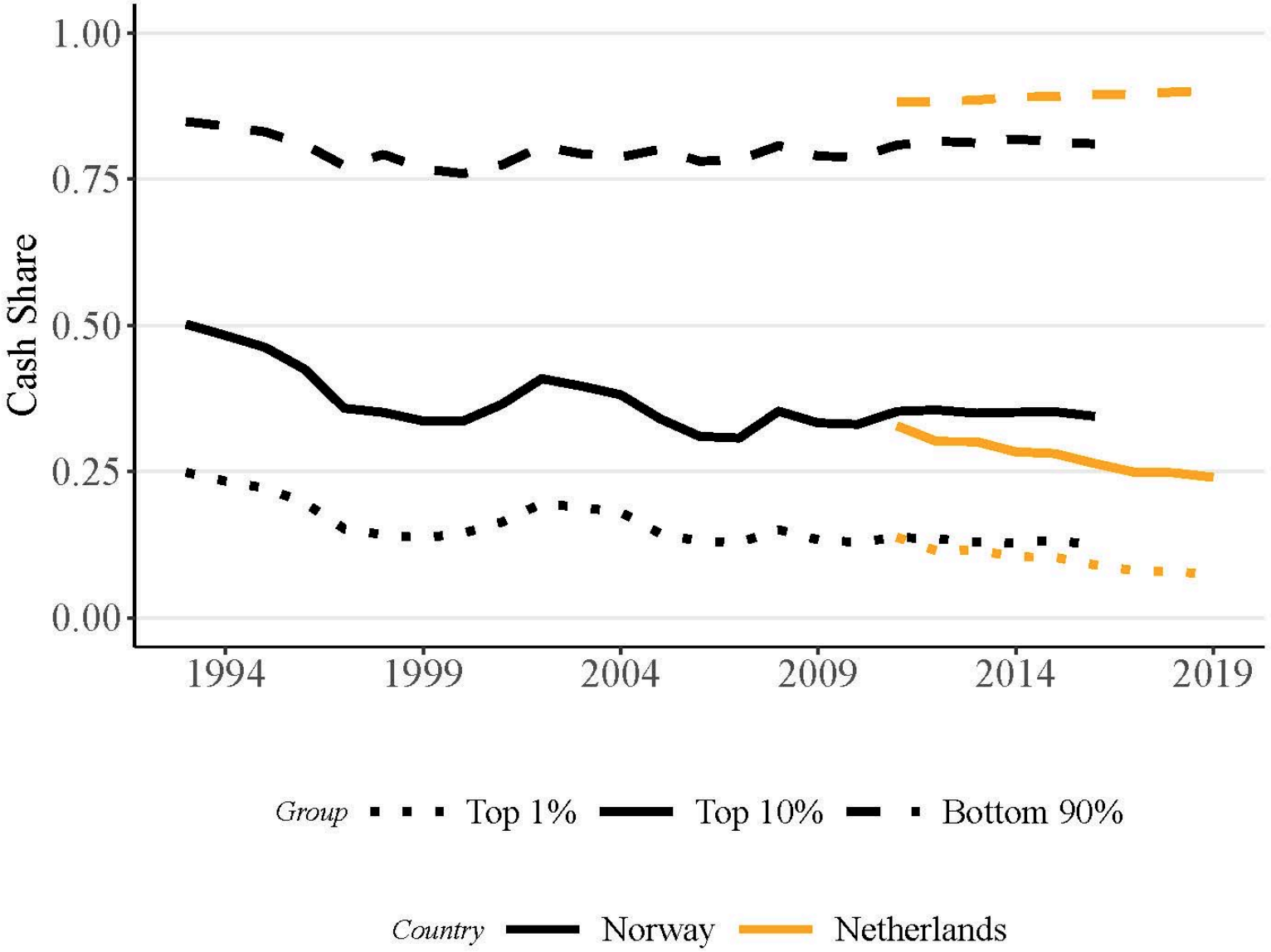
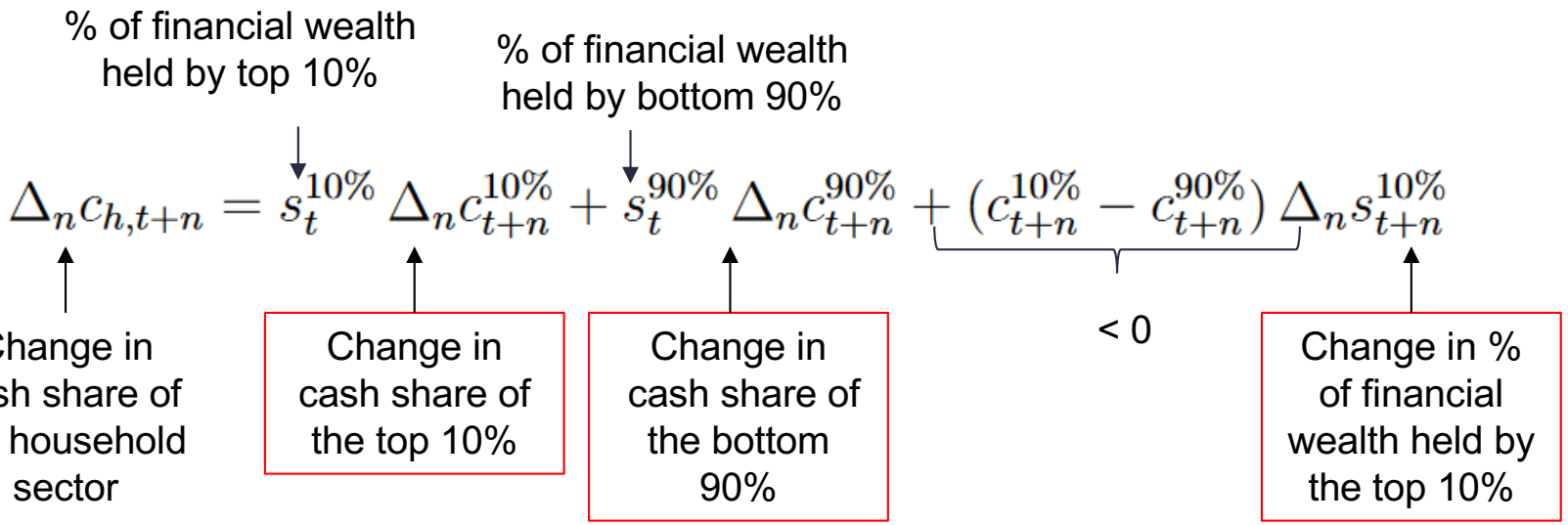
Variation in the cash share of the household sector



Bottom 90%, top 10%, and top 1% of households



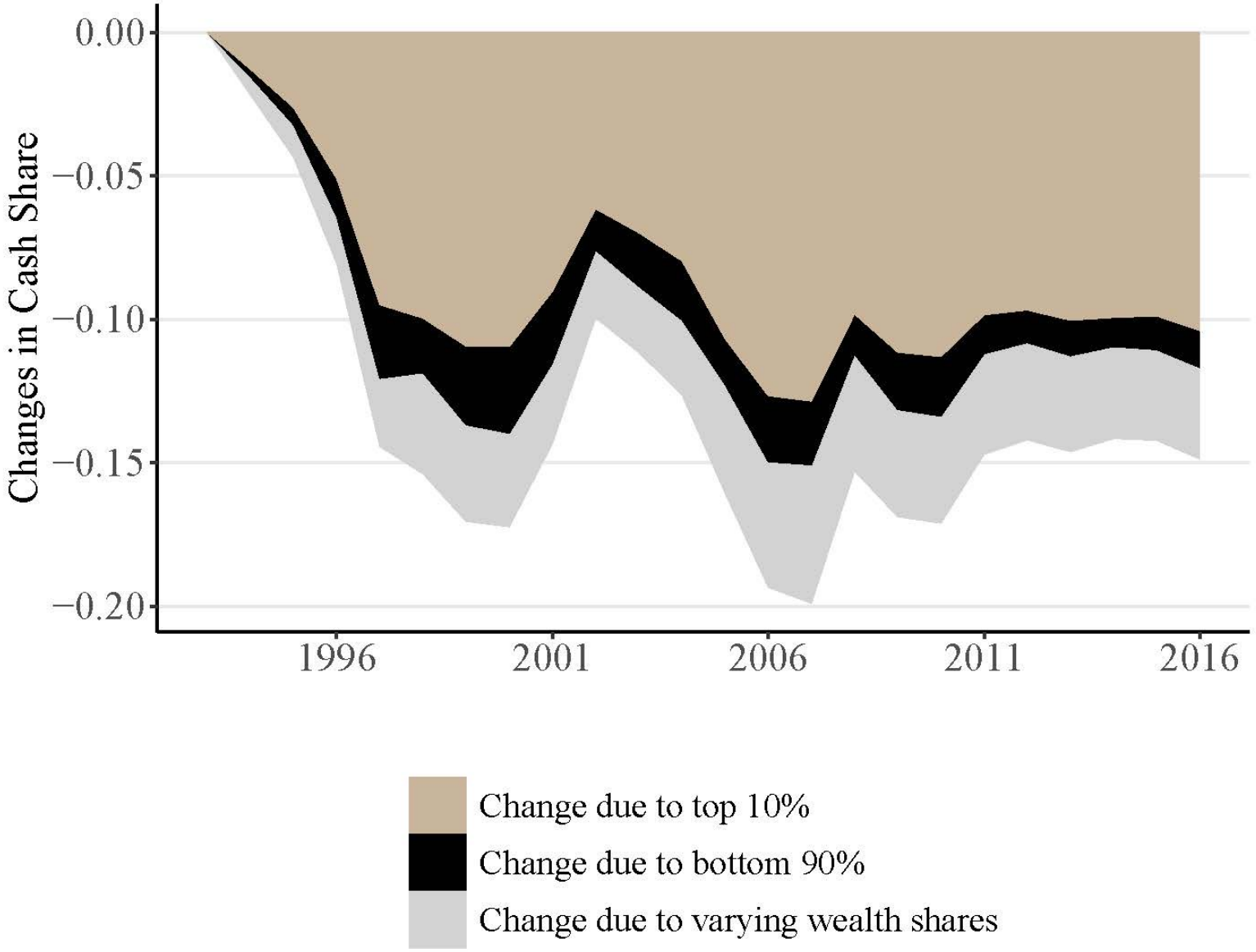
Change in cash share of household sector



Cash share of the household sector could go down because:

- Cash share of the top 10% decreases
- Cash share of the bottom 90% decreases
- % of financial wealth held by the top 10% increases

Change in cash share of household sector



Do deposit rates predict household cash shares?

$$\ln(c^{1\%}_{t+1}) = a + b_1\, r_t + b_2\, \ln(dp_t) + b_3\, \ln(c^{1\%}_t) + u_{t+1}$$

Predictive power of the deposit rate

High div-price ratio forecasts high expected return

Controls for investor inertia

Run the regression for the top 1%, top 10%, bottom 90%

Additional tests to rule out the effects of passive rebalancing

Do deposit rates predict household cash shares?

	Dependent variable: Log cash share $\ln(c_{t+1})$					
	Top 1%		Top 10%		Bottom 90%	
	(1)	(2)	(3)	(4)	(5)	(6)
Deposit rate r_t	6.332**	3.390***	2.904*	1.669*	−0.332	−0.185
	(2.529)	(1.218)	(1.532)	(0.916)	(0.433)	(0.278)
Dividend-price ratio $\ln(dp_t)$		−1.802		−0.503		−0.013
		(1.411)		(1.034)		(0.272)
Lagged cash share $\ln(c_t)$		0.667***		0.677***		0.599***
		(0.074)		(0.090)		(0.140)
Constant	−2.093***	−0.708***	−1.111***	−0.380***	−0.214***	−0.085**
	(0.068)	(0.155)	(0.037)	(0.099)	(0.013)	(0.038)
Observations	23	23	23	23	23	23
R^2	0.271	0.844	0.160	0.776	0.042	0.477
Adjusted R^2	0.236	0.820	0.120	0.740	−0.004	0.395

Household sector: Take-aways

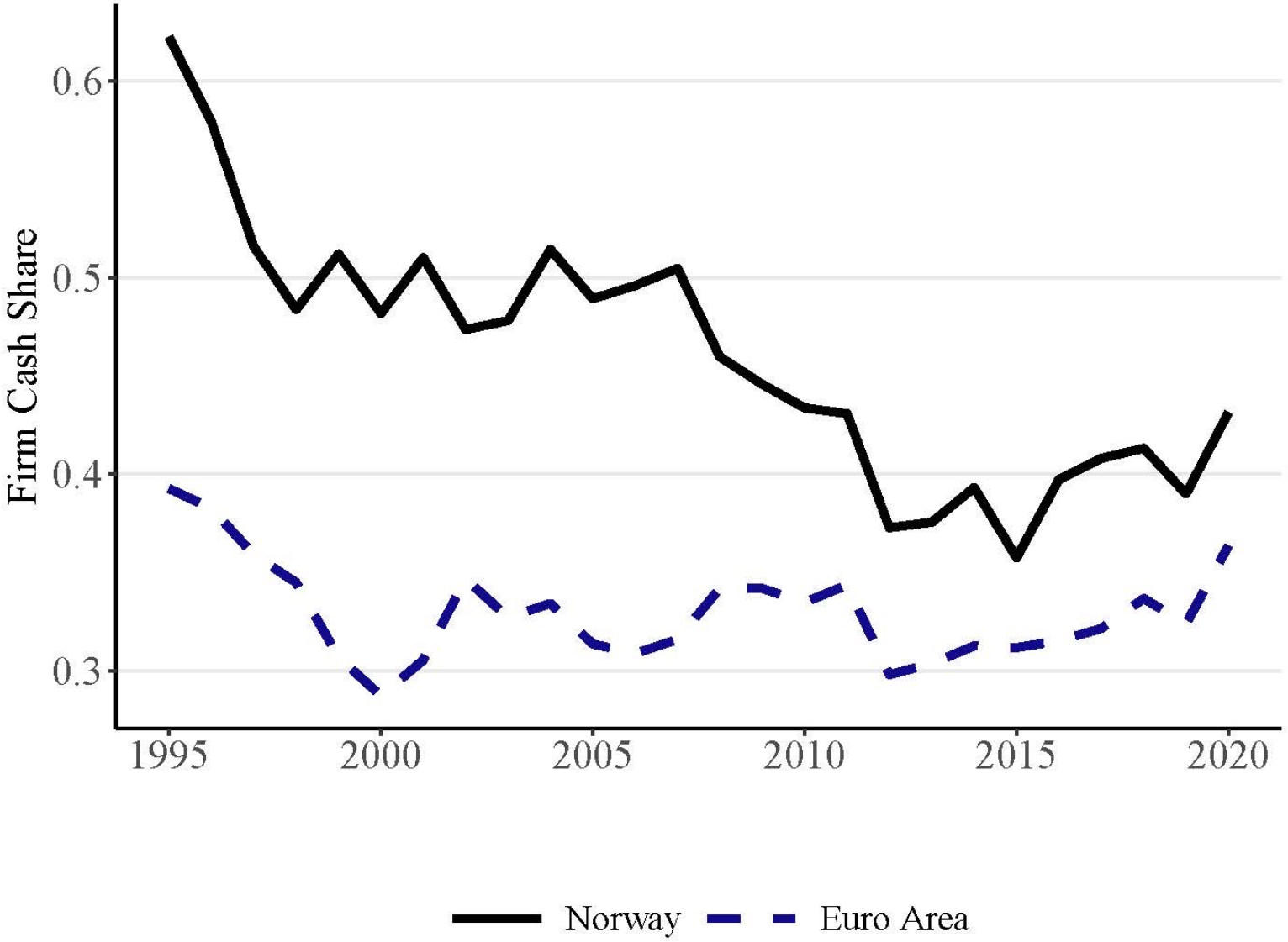
- **The variation of the cash share of the household sector is driven almost entirely by wealthy agents.**

- **This operates both directly (variation in the wealthy's own portfolios) and through distributional effects (variation in the wealthy's share of total household wealth).**

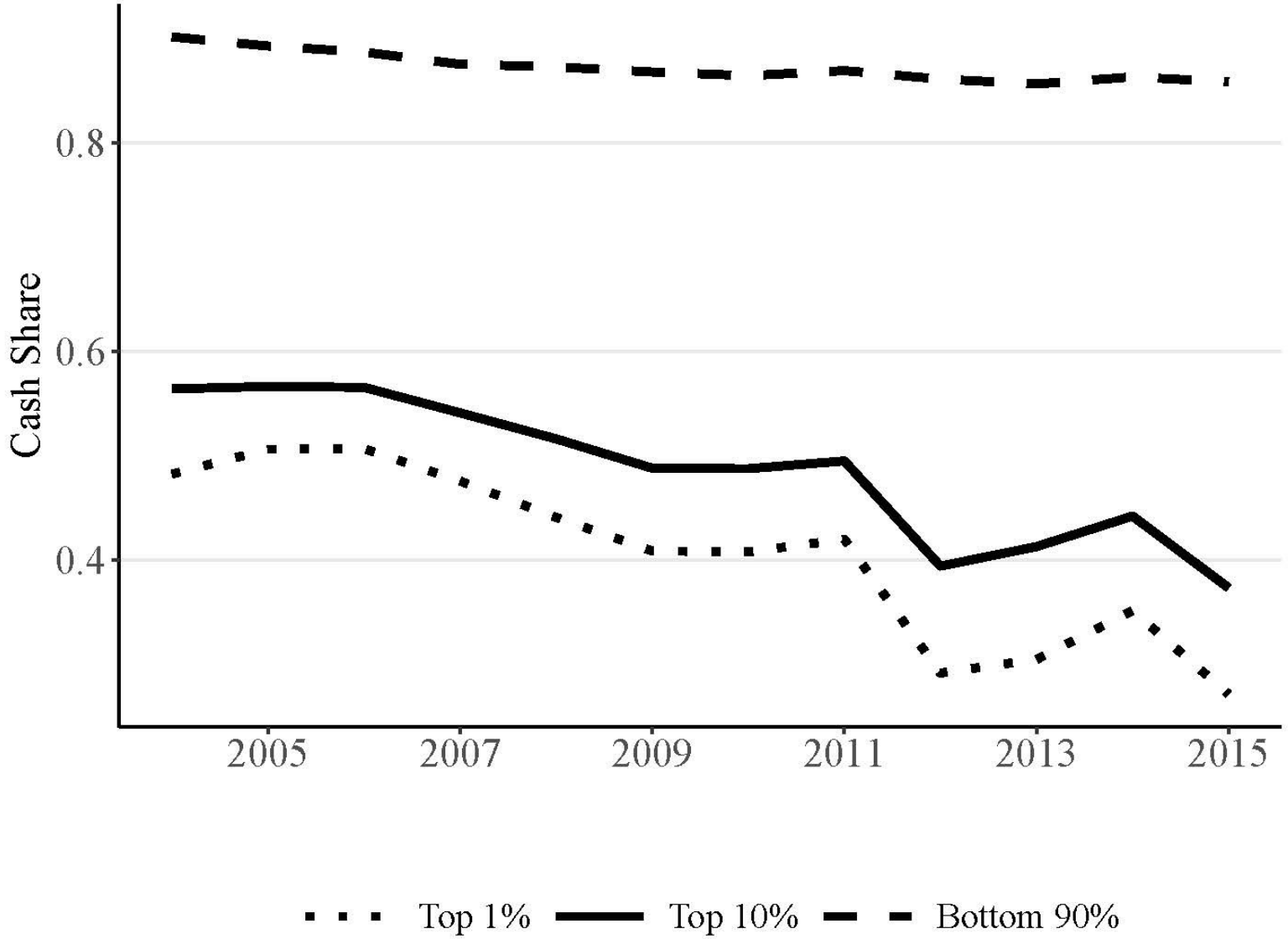
- **Deposit rates predict household cash shares in top wealth brackets.**

Firms

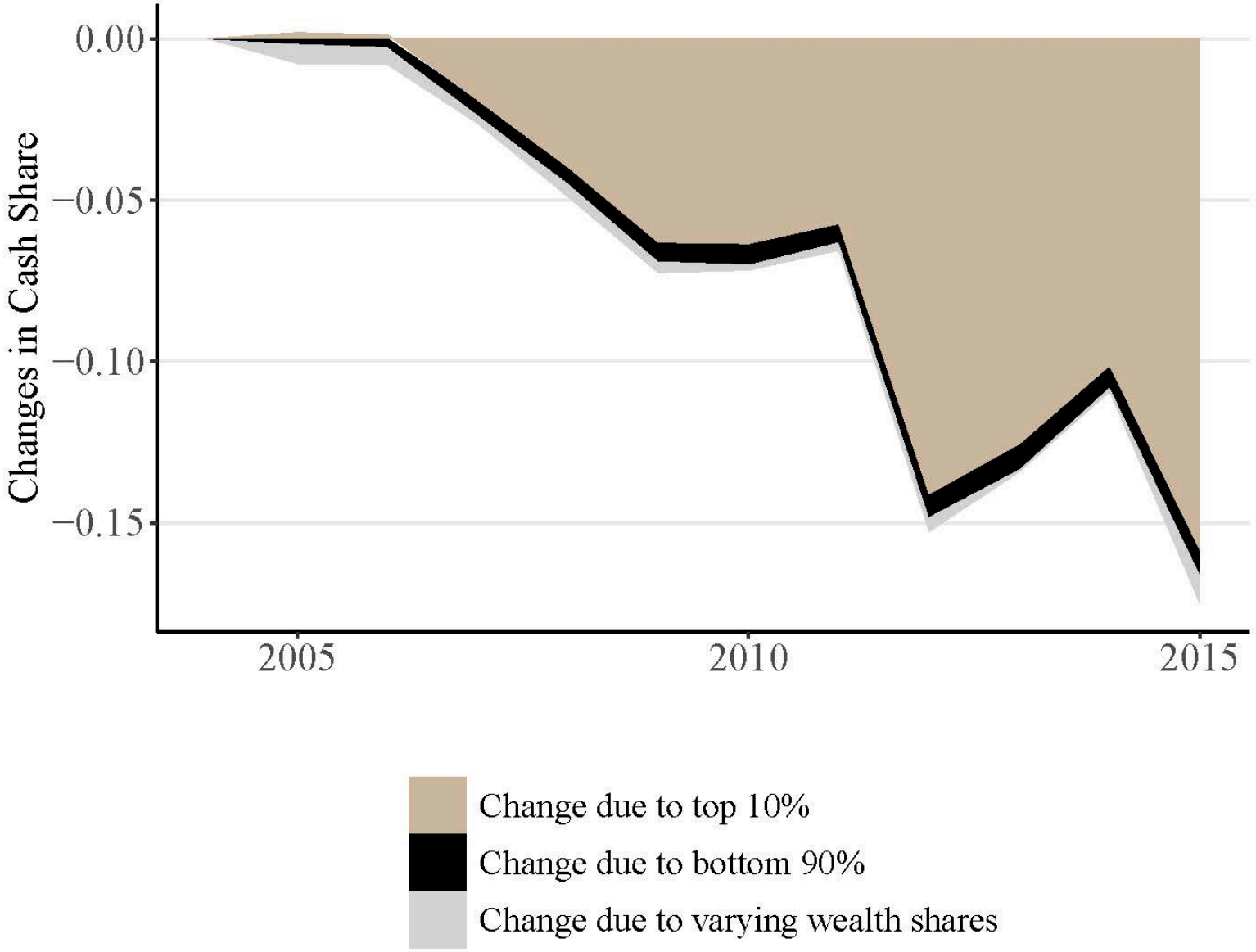
Variation in the cash share of the firm sector



Bottom 90%, top 10%, and top 1% of firms

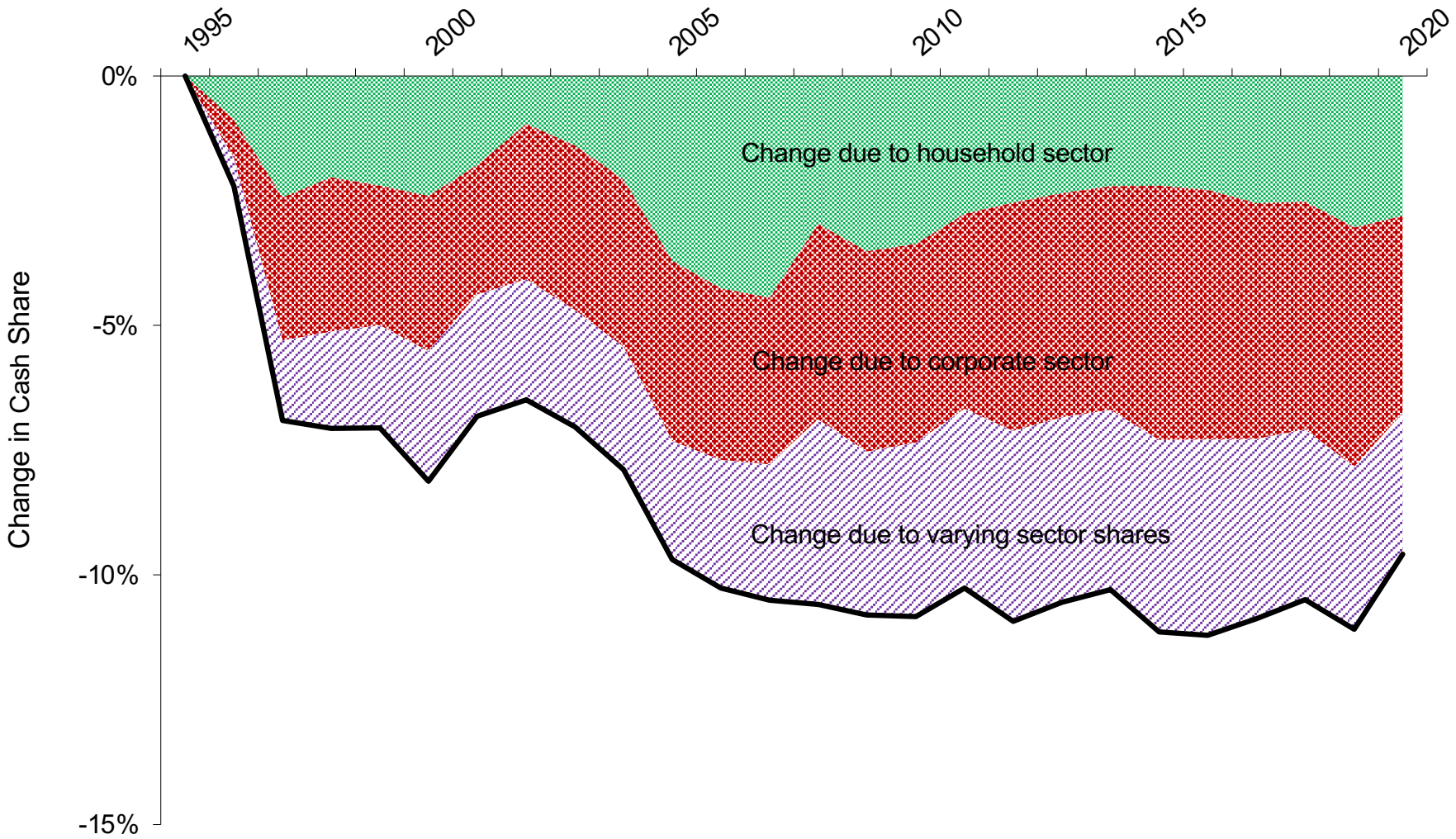


Cash share decomposition



Combining households and firms

Cash share decomposition



2. Ownership of US government bonds

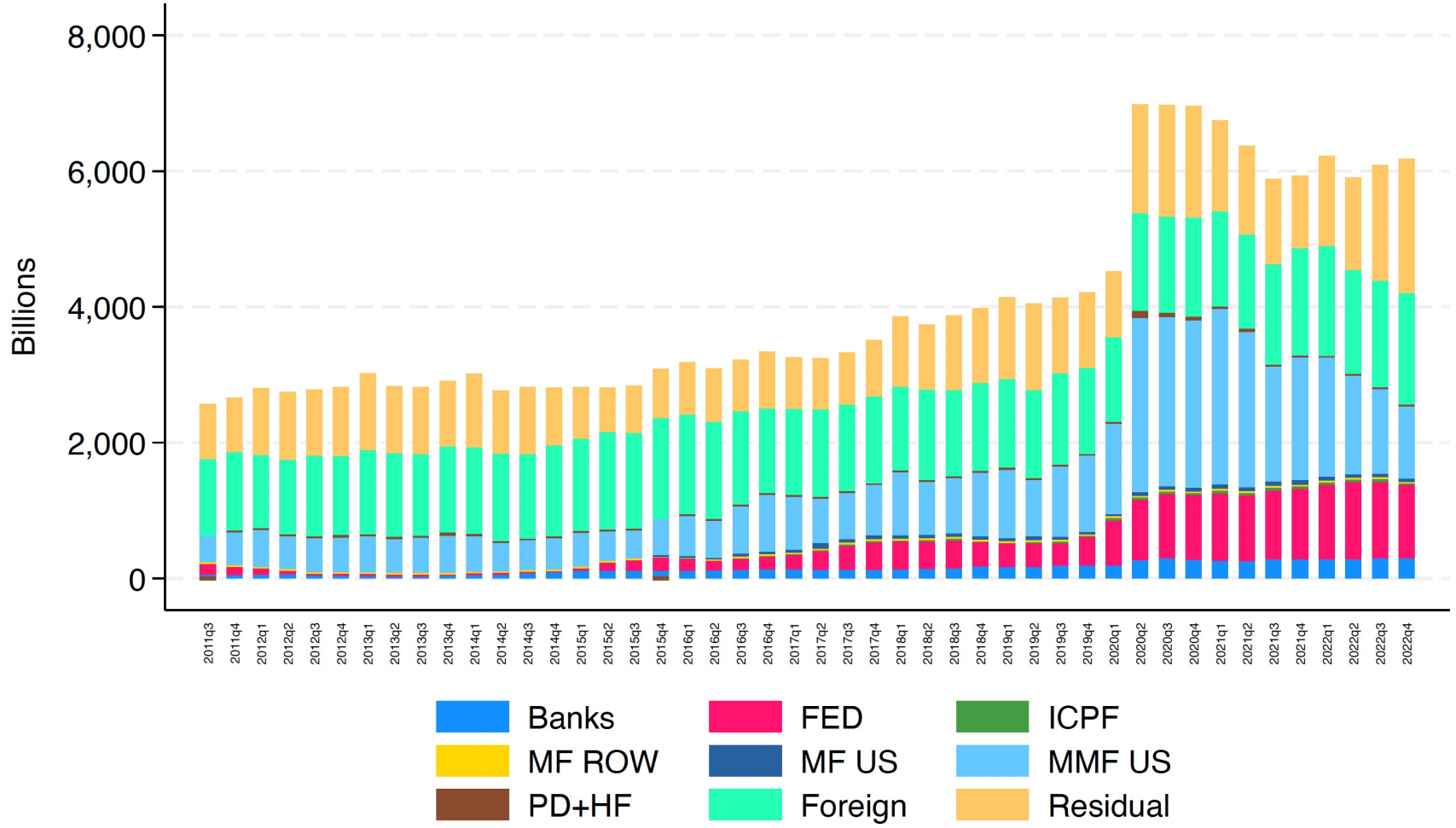
👉 New paper by Kristy Jansen, Wenhao Li, and Lukas Schmid
"Granular Treasury demand with arbitrageurs"

- Comprehensive study of the demand for US Treasuries
- Impressive data on ownership by maturity and investor type.
- I thank the authors for sharing their results for this talk.
- The paper is available at: https://www.kristyjansen.com

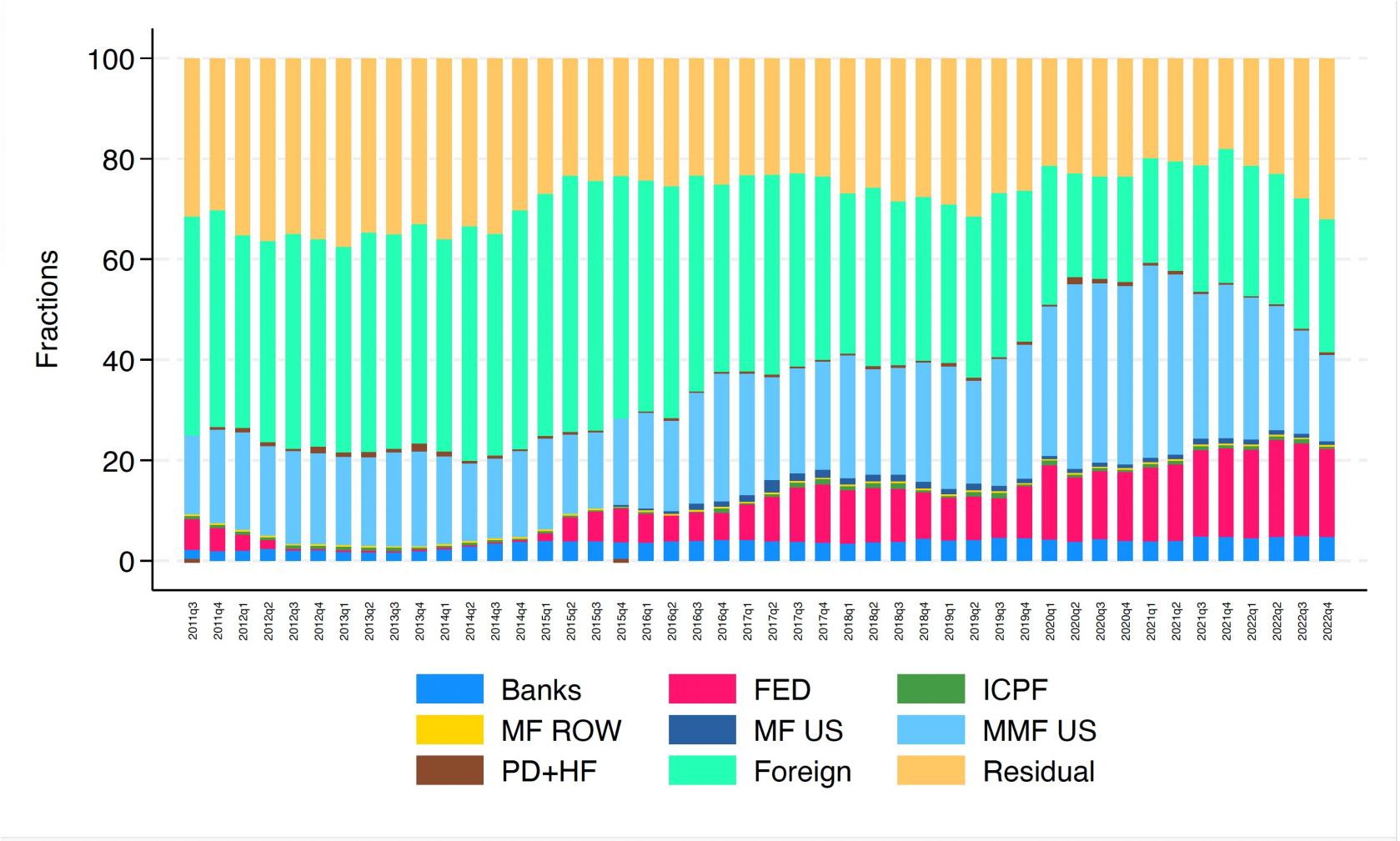
Data on ownership of US Treasuries

Investor Type	Data
Banks	CALL Reports
ETFs	ETF Global
Fed	Federal Reserve
Foreign holders	Public TIC
Hedge funds	CFTC
Insurers & pension funds	eMAXX
Money market funds	IMoneyNet
Mutual funds	Morningstar
Primary dealers	Federal Reserve

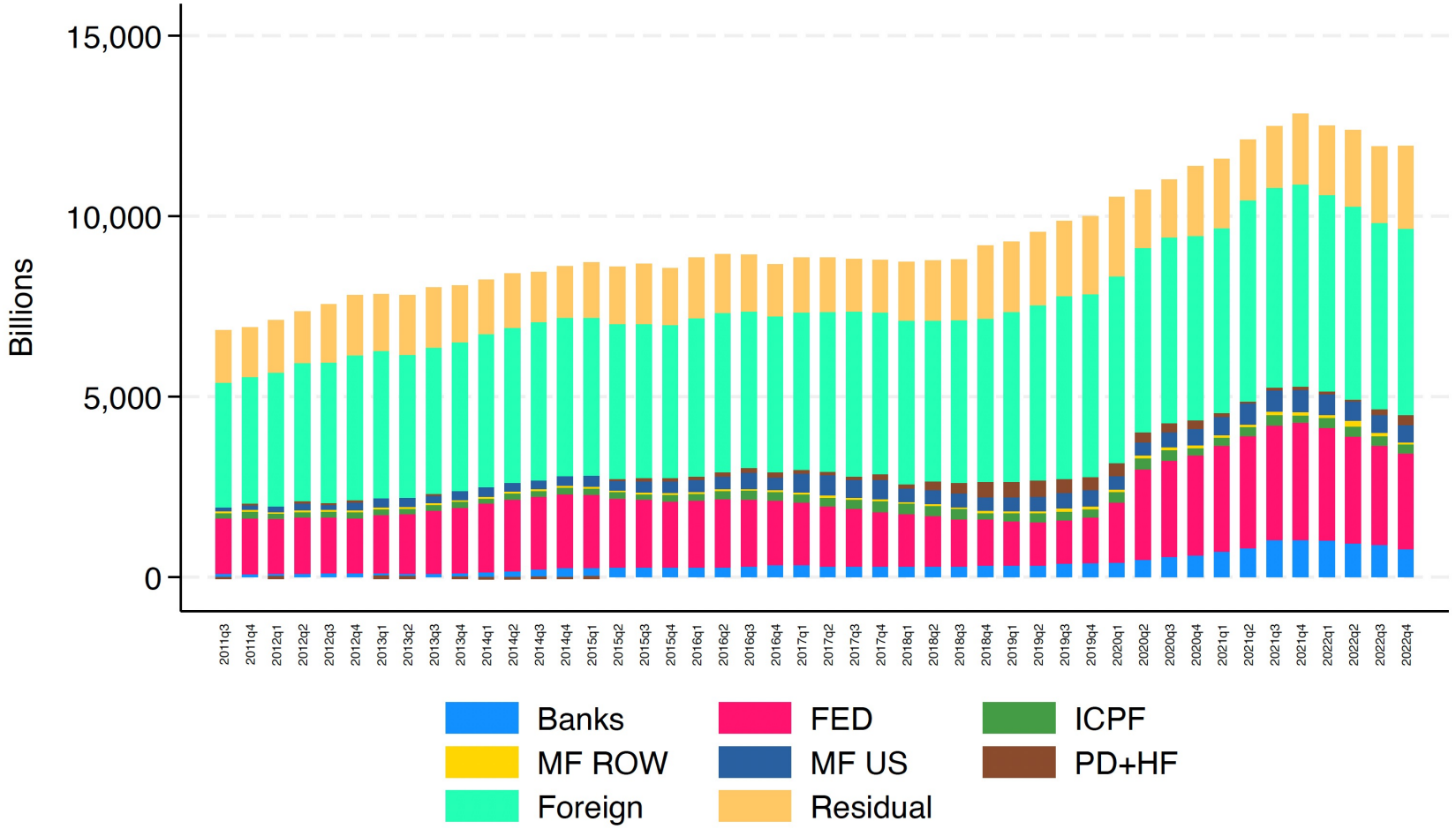
US Treasuries (maturity < 1 year) - Dollars



US Treasuries (maturity < 1 year) - Shares



US Treasuries (1 to 15 year maturity) - Dollars



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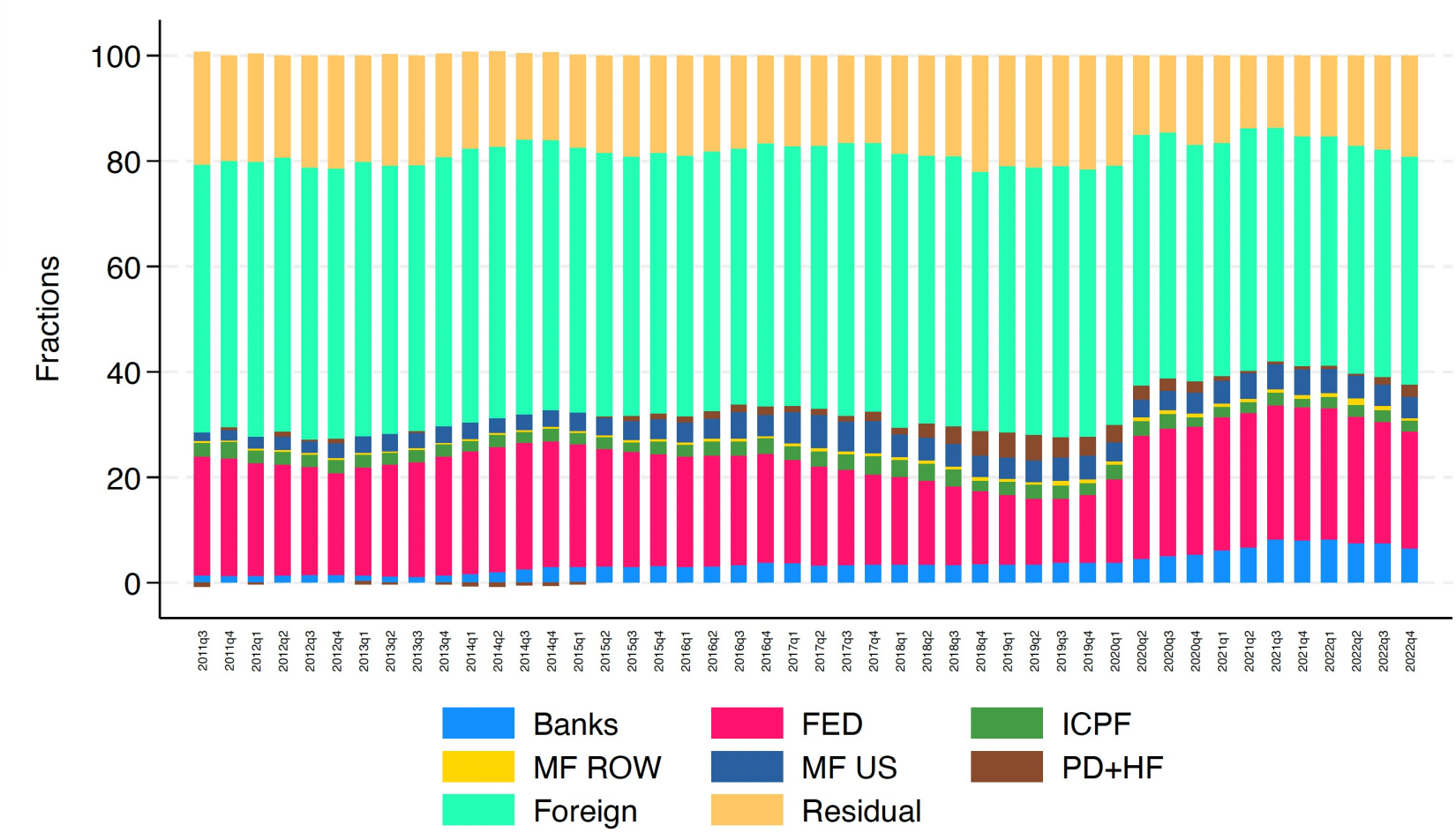
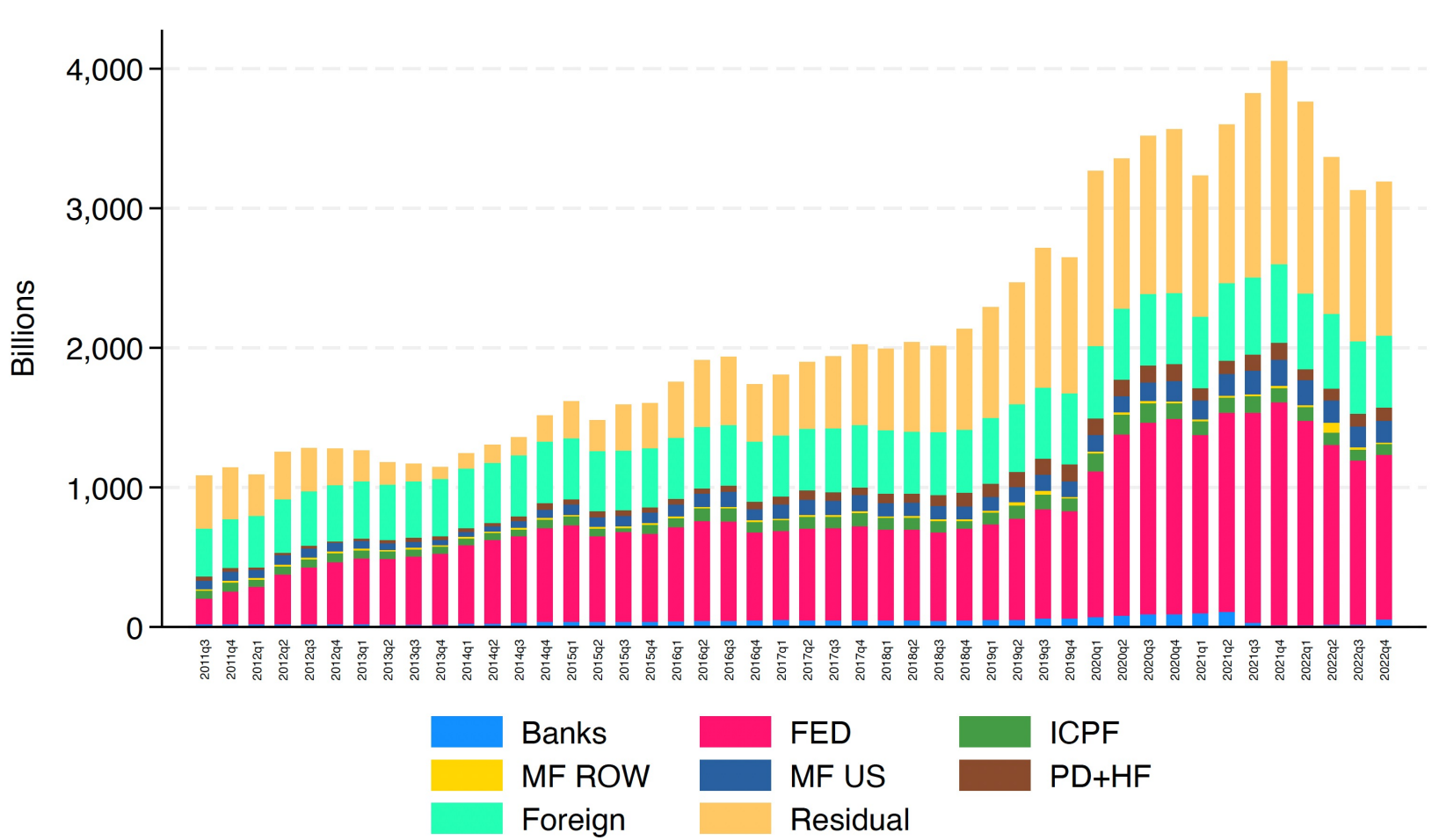


US Treasuries (maturity > 15 years) - Dollars



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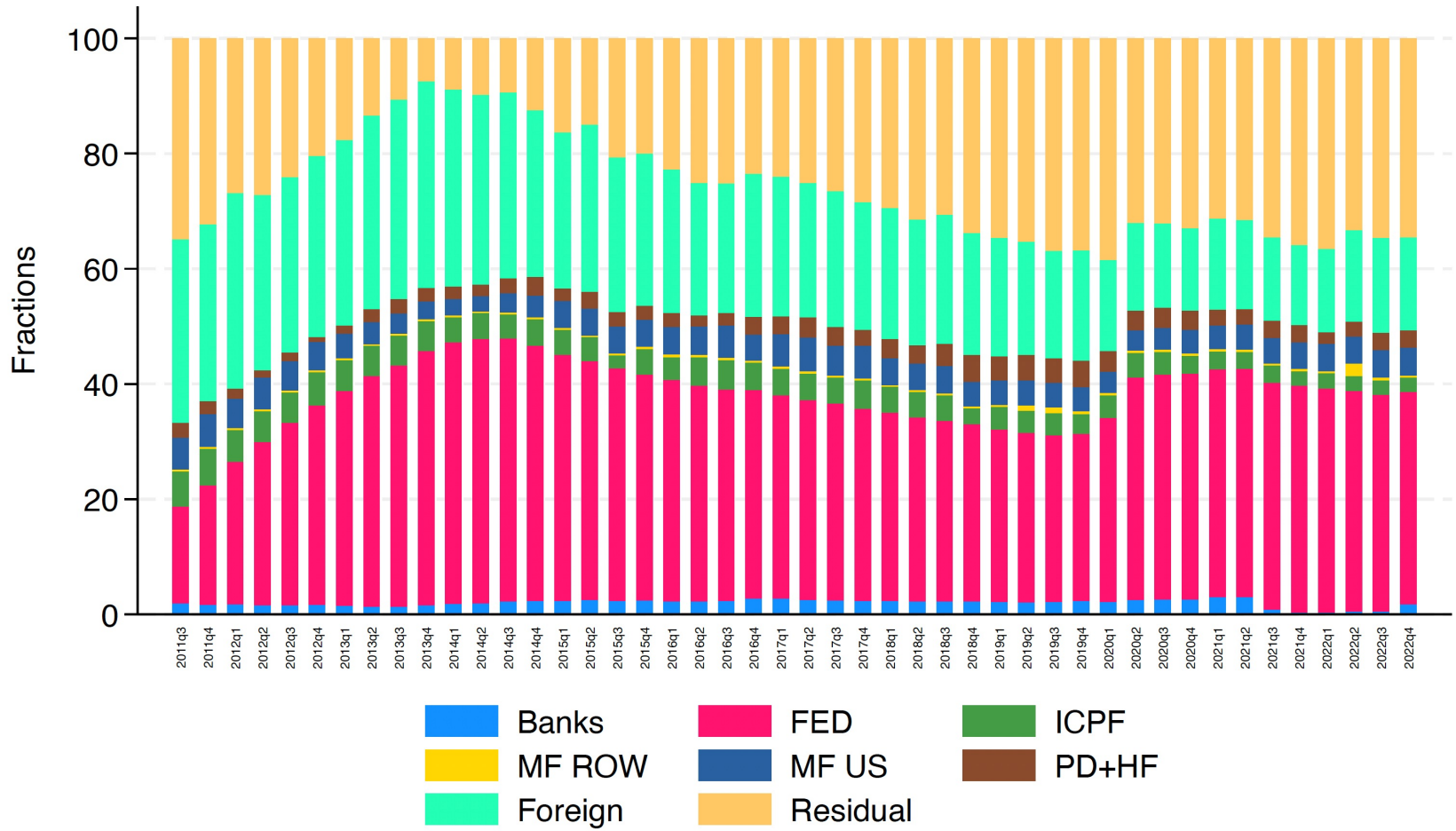

3. Looking ahead

- I propose to map the holdings of fixed income securities in the Euro area:
  - by investor type
  - by duration / maturity
  - over the monetary cycle.

- This would allow us to measure the sensitivity of various classes of participants to interest rate risk, and thereby obtain better estimates of systemic risk.

- Such estimates would be useful for forecasting the holdings and pricing implications of central banks's asset purchases.

Conclusion

- Disaggregated portfolio data are important for understanding the sensitivity of investor portfolios to interest rates.

- I suggest that we track the ownership of money and government bonds by maturity & investor class over the monetary cycle in the Euro area.

- This would provide policymakers with a more accurate assessment of:
  - the transmission of monetary policy;
  - systematic exposure to interest rate risk.

References

All papers are available at:

https://www.laurentcalvet.com

https://papers.ssrn.com/sol3/cf_dev/AbsByAuth.cfm?per_id=75695

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https://papers.ssr[illegible]cfm?per_id=75695

THANK YOU!