IWH Leibniz-Institut für Wirtschaftsforschung Halle

CompNet

Monetary Policy

Daniele Aglio
Eric Bartelsman
Marco Miorandi

CompNet & VU Amsterdam

3rd TSI Workshop,
Vienna, 22nd February 2024

This project has received funding from the European Commission; Directorate-general for Structural Reform Support under grant agreement No 101101853.

The Research Agenda

- Cash and other balance sheet trends among firms and the role of monetary policy (together with Benedicta Marzinotto, EUI)

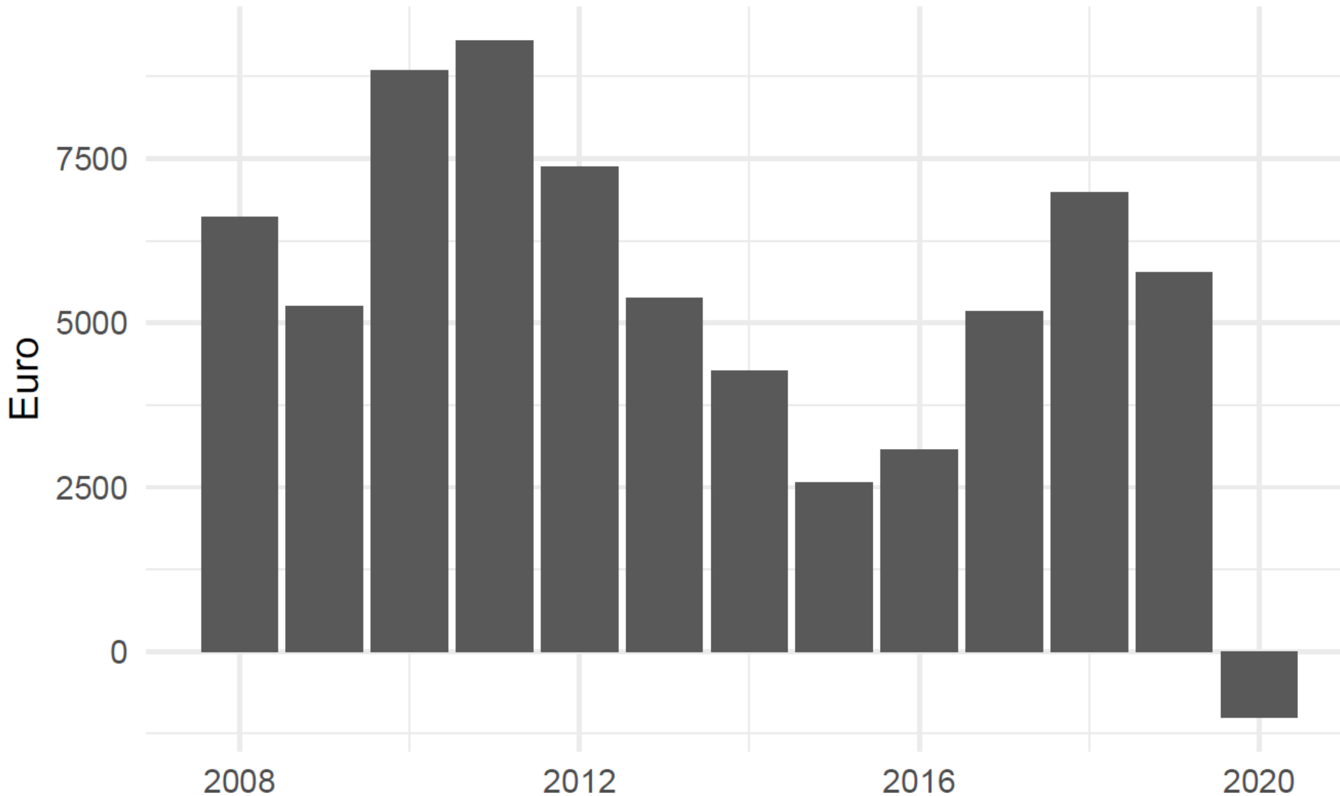
- Pricing behaviour among heterogeneous firms

Outline

- Descriptive statistics
- Theoretical framework to explain firm pricing behaviour
- Empirical evidence from micro data

Descriptive Statistics

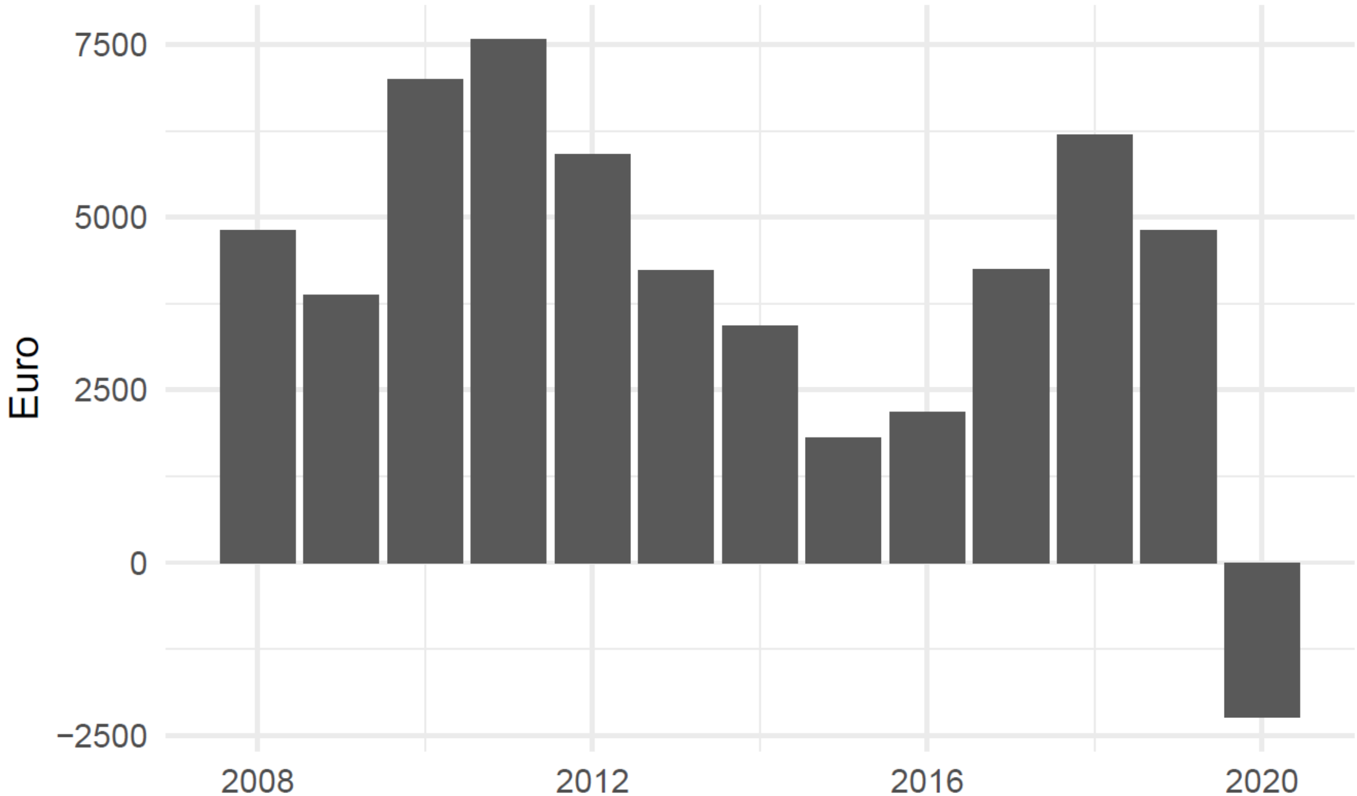
- Average firm cash flow (Netherlands)



Cash flow from operating activities according to IAS 7 (before taxes and interest paid), indirect method.

Descriptive Statistics

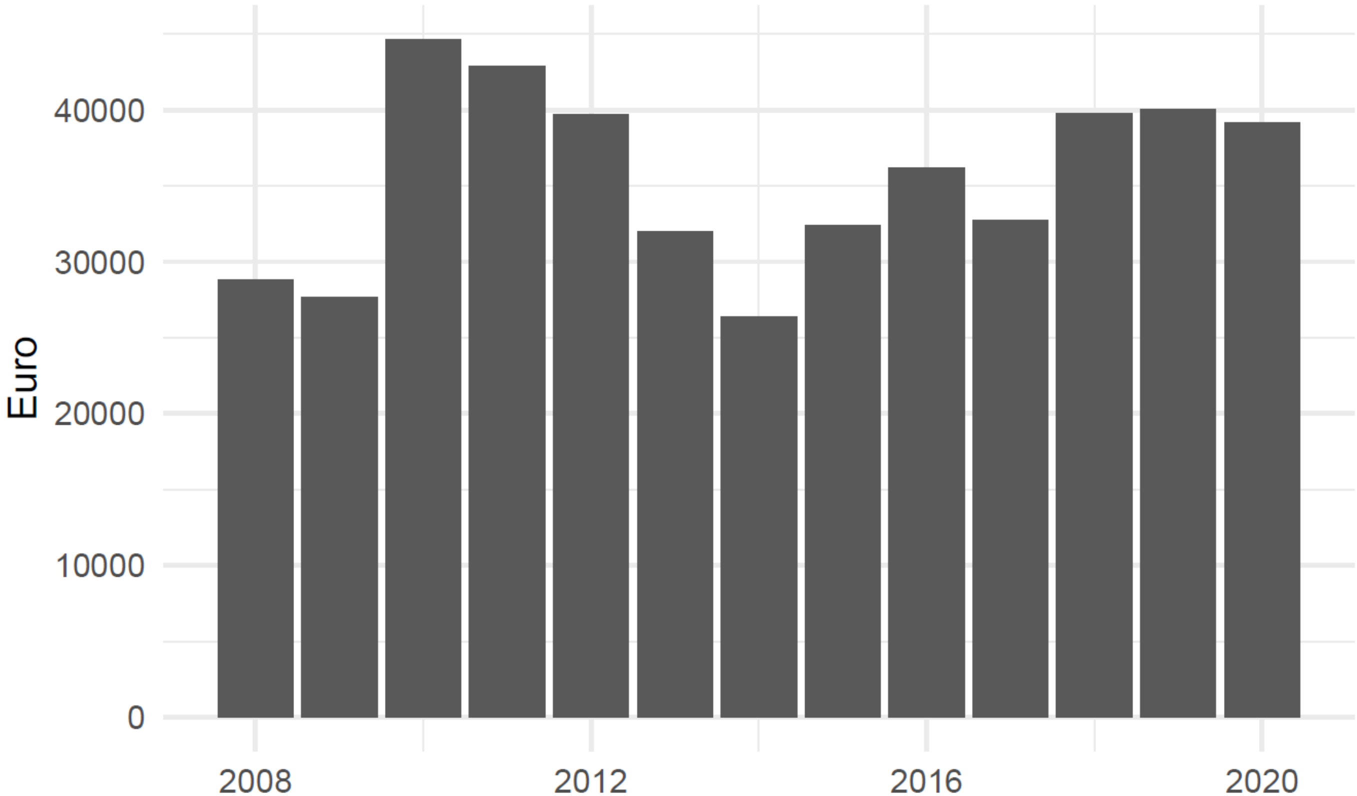
- Average firm profit (Netherlands)



IAS 1.92 EBIT (Earnings Before Interest and Taxes) according to the "cost of goods sold approach".

Descriptive Statistics

- Average firm total debt (Netherlands)

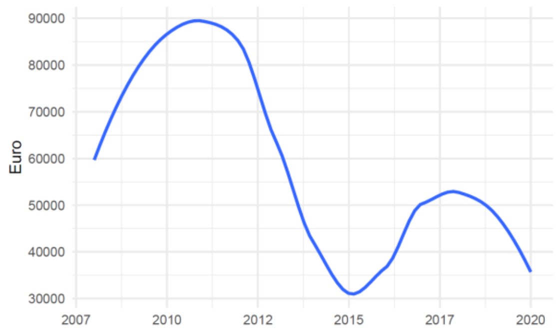


Long-term debt sub-item of non-current liabilities.

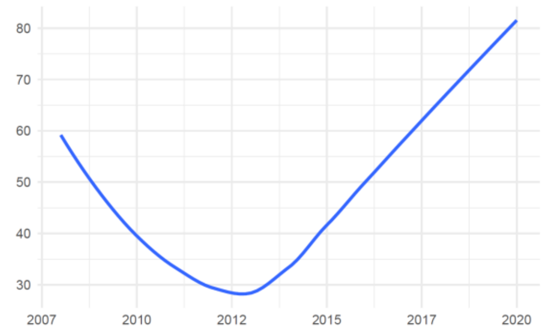
Descriptive Statistics

- Differences across deciles: cash flows

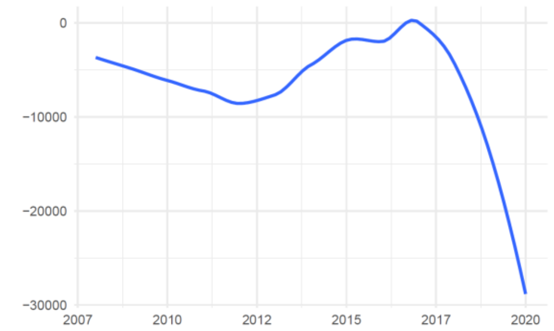
Decile 10



Average btw Decile 4 and 6



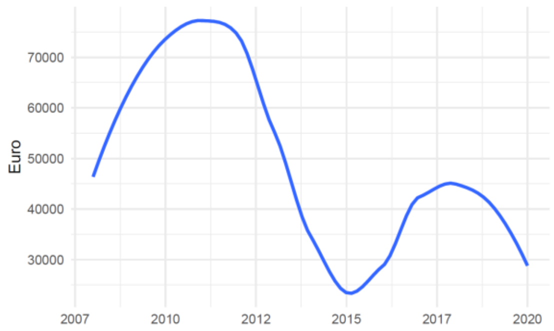
Decile 1



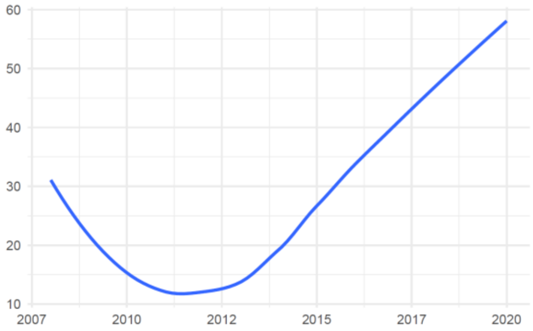
Descriptive Statistics

- Differences across deciles: profits

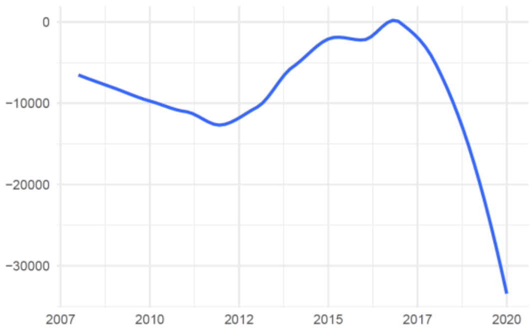
Decile 10



Average btw Decile 4 and 6



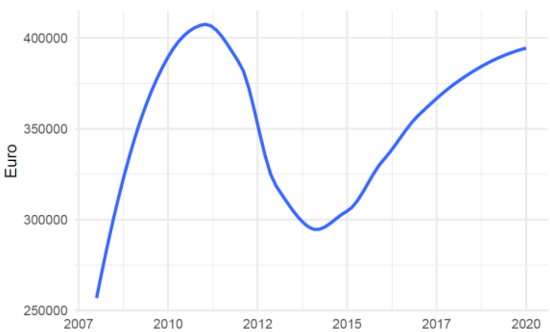
Decile 1



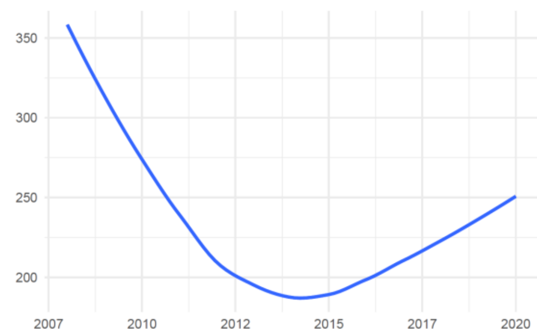
Descriptive Statistics

- Differences across deciles: total debts

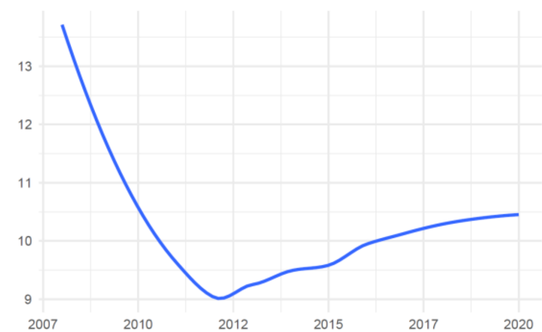
Decile 10



Average btw Decile 4 and 6

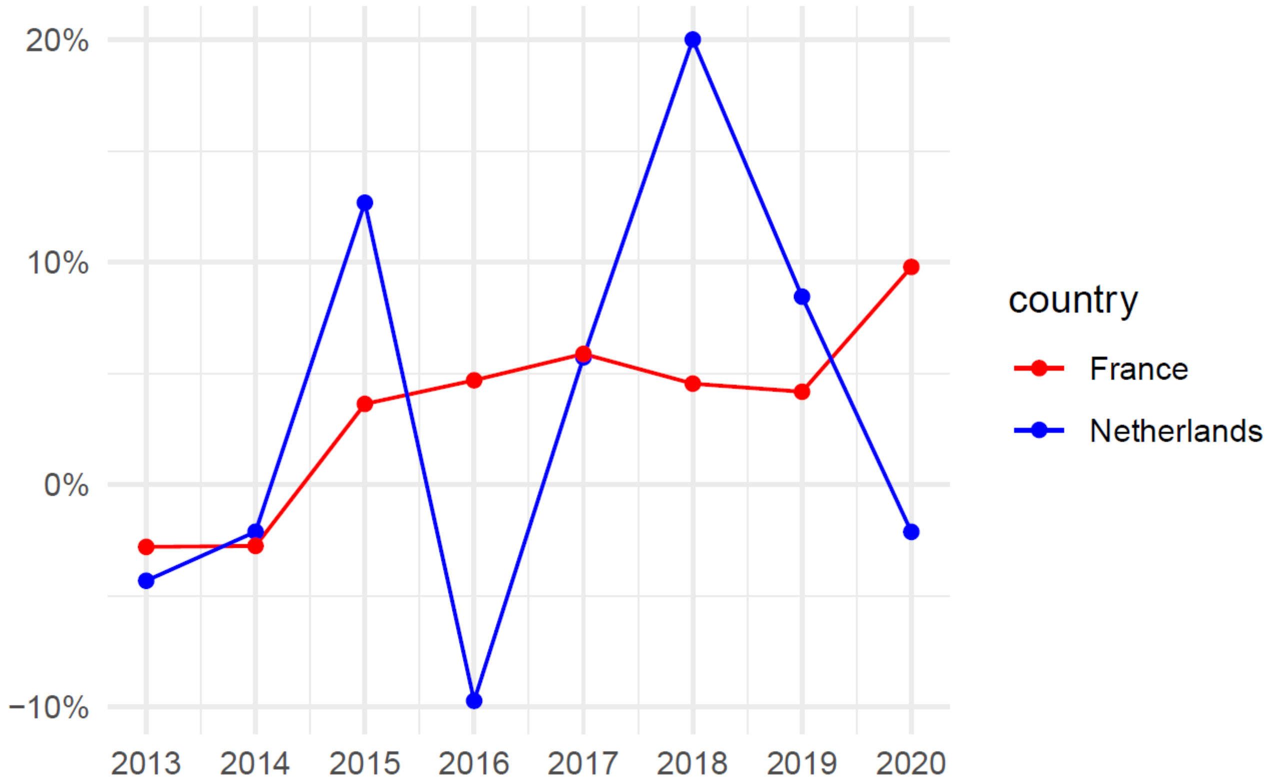


Decile 1



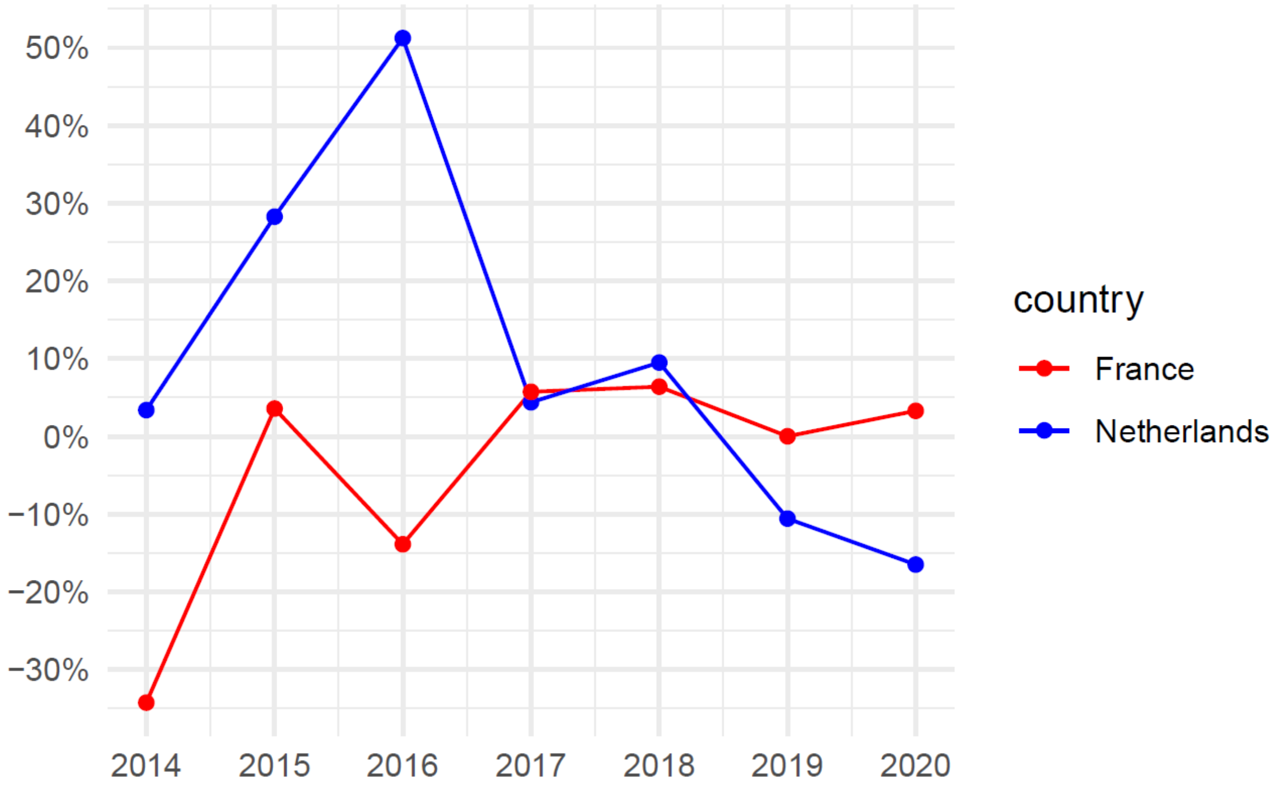
Descriptive Statistics

- % growth of average firm investment in tangible assets: France and the Netherlands



Descriptive Statistics

- % growth of average firm investment in intangible assets: France and the Netherlands



Heterogeneous Pricing Behaviour

- Microeconomic pricing behaviour happens at the firm-level and depends on production function, demand function, and market structure

- Microfoundations are misapplied in much of the macro literature, with heterogeneity and market (re)allocation being ignored

- The appropriate marginal cost to apply in Phillips' curve estimation is the marginal cost of the supplier "at the margin". Macro data does not reveal this

Heterogeneous Pricing Behaviour

- We analyse the pricing behaviour among heterogeneous firms in a New Keynesian framework

- Firm heterogeneity in terms of productivity and, hence, return to scales

$$Y_f = A_f (K^{\alpha} N^{1-\alpha})^{\gamma_f}$$

- Firms compete in imperfect competition over prices

Some Details of the Model

- From the micro pricing equation:

$$\hat{p}^{o}_{fst} = (1-\beta\theta)E_t \sum_{k=0}^{\infty}(\beta\theta)^k[(1-\Omega_{fs})(\hat{c}_{fst+k}+v_f\,\hat{y}_{fst+k})+\Omega_{fs}p_{st+k}+u^{\mu}_{fst+k}]$$

- To the macro Phillips' curve:

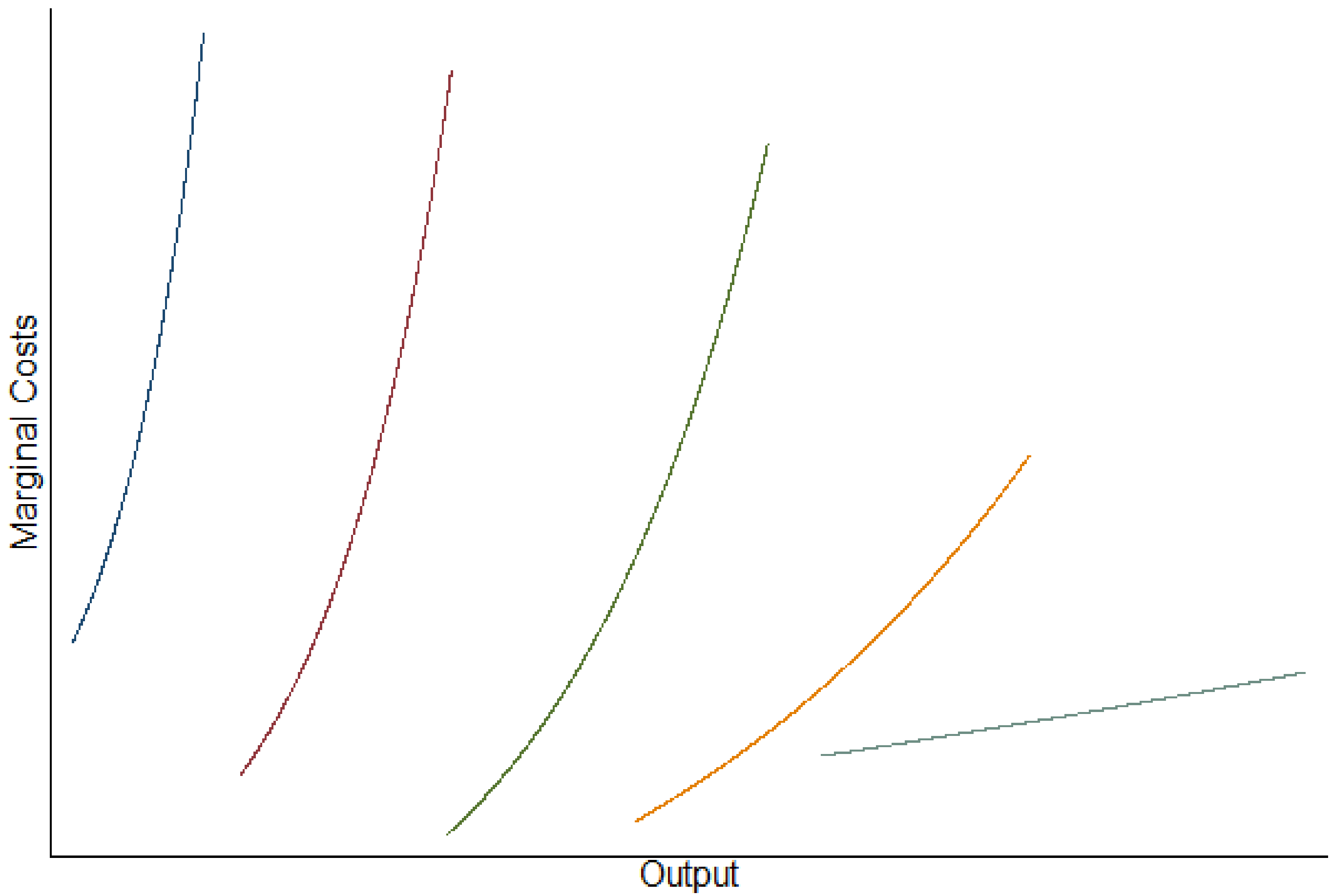
$$\pi_t = \beta E_t \pi_{t+1} + (1-\Omega)(1-\beta\theta)\hat{c}^r_t + (1-\beta\theta)v\hat{y}_t + u_t$$

Some Details of the Model

- The style production function used in our model gives a firm size distribution where the larger firms with a higher A_f also have a flatter marginal cost curve, higher market shares, and higher markups

- The slope of the aggregate supply curve will depend on the particular distribution of A_f of heterogeneous firms and on the elasticity and curvature of demand that producers are facing (which determines reallocation)

Some Details of the Model



Higher A decreases the marginal cost curve and higher γ flattens it.

Some Details of the Model

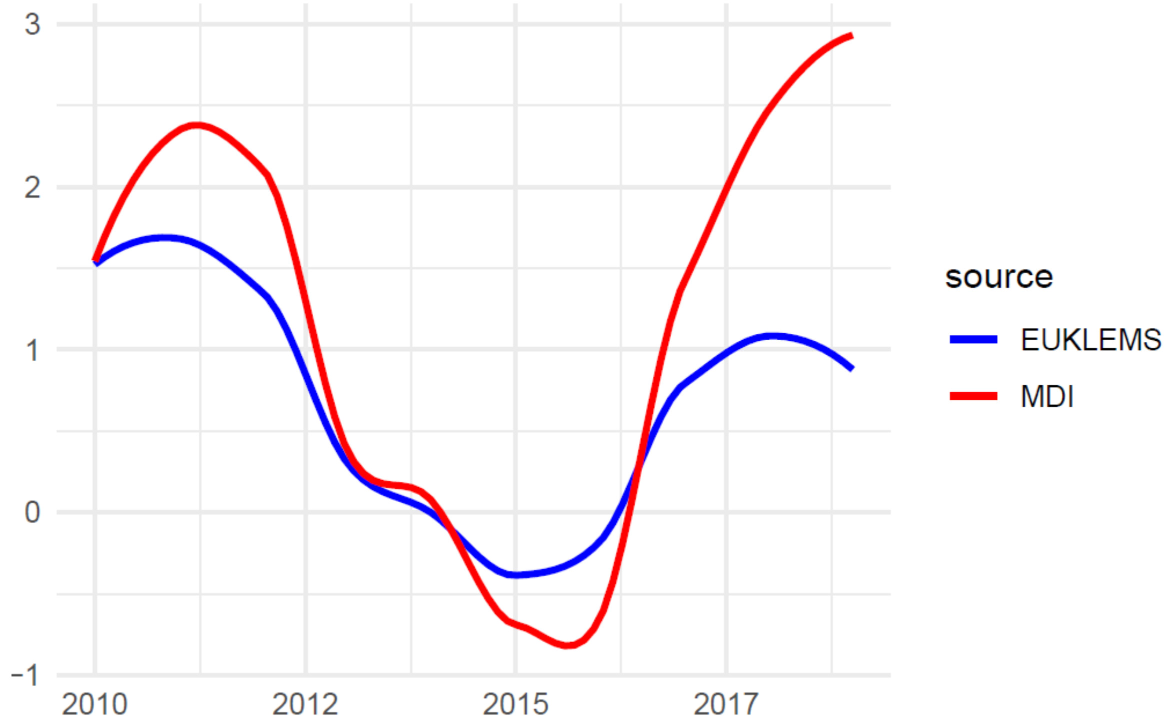
- The supply curve is flatter for the most productive firms
- Productivity distribution within country-sector matters
- Supplier "at the margin" matters for macro response

Micro Data

- MDI provides with ProdCom data. From these data, we can retrieve price information by firm and product
- For France, data are from 2009 to 2021, with a total of around 500 thousands firm-product observations
- For the Netherlands, from 2000 to 2020, with a total of around 250 thousands firm-product observations
- Sectors included are mining, manufacturing, and utilities

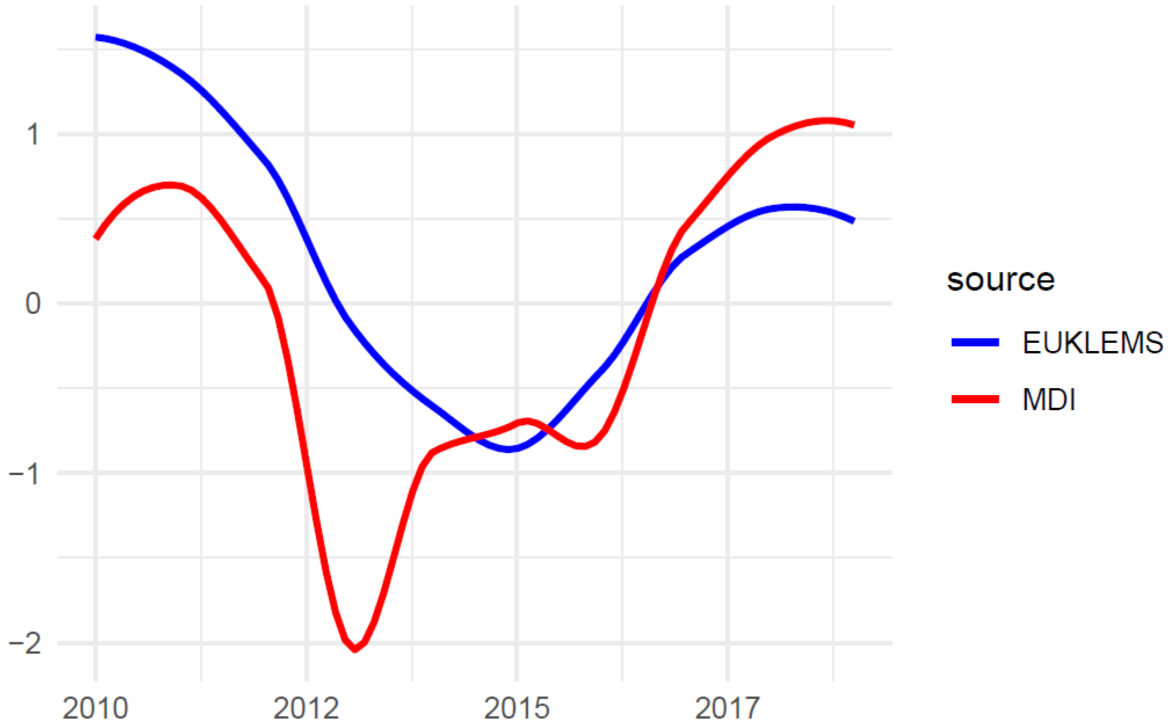
Micro Data Evidence

- Aggregate price index (annual % change) is made up by firms' pricing decisions (France): EUKLEMS vs MDI - Manufacturing and Utilities



Micro Data Evidence

- Aggregate price index (annual % change) is made up by firms' pricing decisions (France): EUKLEMS vs MDI - Manufacturing



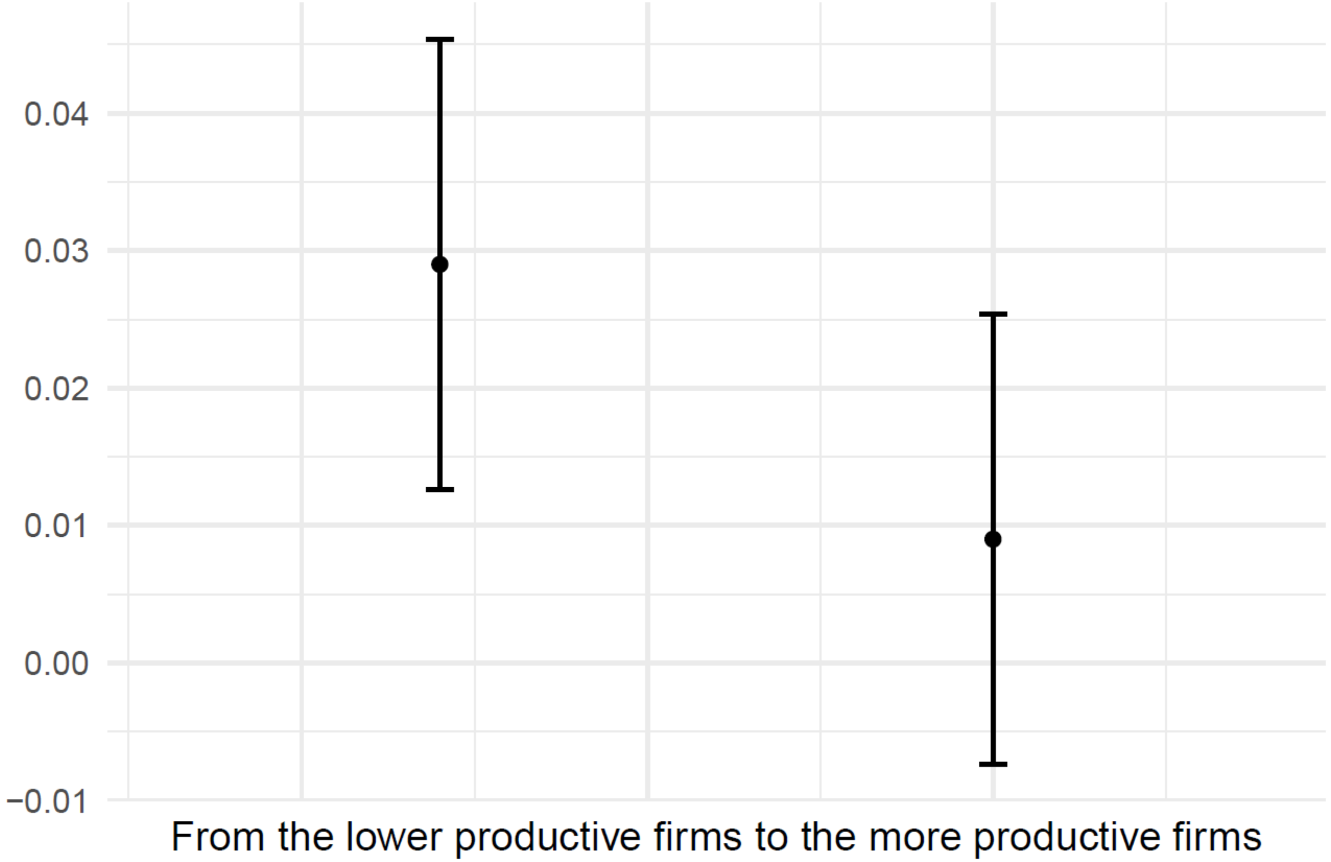
Micro Data Evidence

- Bringing the pricing equation to the data (Netherlands): $\pi_{fpt} = \alpha + \beta OutGap_{fpt} + \delta_i + \delta_t + \varepsilon_{fpt}$

	Less Productive Firms		→	More Productive Firms
Models	π_{fpt}	π_{fpt}	π_{fpt}	π_{fpt}
Output Gap_{fpt}	0.02*	0.03***	0.03**	0.01
	(0.01)	(0.01)	(0.01)	(0.01)
α	0.15***	0.06***	0.07***	0.08***
	(0.05)	(0.02)	(0.02)	(0.03)
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	19,828	19,967	15,638	14,015
R-squared	0.065	0.035	0.033	0.01

Micro Data Evidence

- Bringing the pricing equation to the data (Netherlands):



Way Forward

- Tuning estimation of pricing equations, including marginal costs and markups
- Classification of firms through several indicators
- Apply demand shocks to estimations
- Implement the analysis to wider range of countries

Conclusion

- Firm-level heterogeneity matters for price pass-through

- More productive firms have flatter marginal cost response to output and, hence, Phillips curve flattens with larger, more productive firms

- Micro-level empirical work can improve signal on current slope of Phillips

Thank you for kind attention!