EUROPEAN CENTRAL BANK

EUROSYSTEM

Effects of Monetary Policy on Labor Income: the Role of the Employer

ChaMP

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∗ The views expressed are those of the authors and do not necessarily ECB or Stockholm Univ.

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Motivation

- The effects of monetary policy shocks to the labor market outcomes (both intensive and extensive margins) remains an open question, with implications for welfare and consumption behavior
  - Workers can be systematically affected through their work relationship:
    - ✓ *Firms may be differently affected (e.g. credit/profit channel);*
    - ✓ *Firms may pass on the same shock differently to workers.*

We shed light on firms' role in the transmission of MP shocks to workers' income and employment

Related literature

- **Effect of monetary policy on individual labor market outcomes:** Jasova et al. (2021); Coglianese et al. (2021); Broer et al. (2021)

We focus on Germany, and on the role of firms in the transmission.

- **Transmission of monetary policy across heterogeneous firms**: Gertlerand Gilchrist (1994); Fort et al. (2013); Chodorow-Reich (2014);Abo-Zaid and Zervou (2020); Lee et al. (2022); Popov and Rocholl(2018); Lieberknecht and Hartwig (2020)

Conduct an analysis on both wages and employment response.

- **Effect of monetary policy on inequalities**: Coibion (2012); Coibionet al. (2017); Lenza and Slacalek (2018); Holm et al. (2021);McKay and Wolf (2023)

New transmission channel, focus on labor income.

Data

Focus on full time workers aged 20-60 in Germany (1999-2018): Institute for Employment Research (IAB)

- Matched employee-employer data: **SIAB**

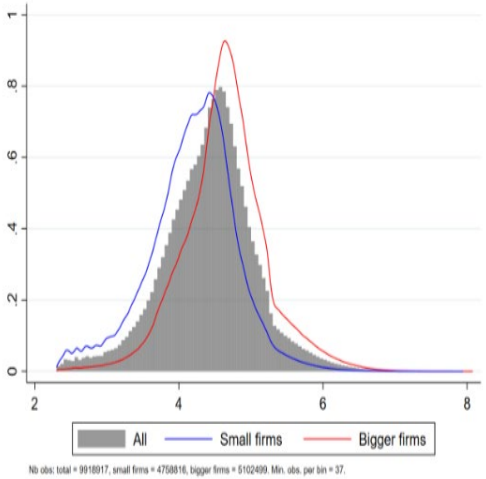
  2% population sample of workers (education, occupation, wages, skills, etc.) and respective establishments (region, industry, nr. of employees, age)

- Additional data for firm-level regressions: **LIAB**

  Same administrative data as SIAB, but representative of firms and merged with a firm survey data

- **Monetary policy surprises:** *Jarocinski and Karadi (2020) (standardized series, 1 unit corresponds to 25bpt);* ***control variables*** *(GDP, inflation, unemployment rate)*

Kernel of ln wages by firm type



(a) Firm size

Empirical methodology

- Panel regression with time, firms and workers FE (Abowd et al., 1999);
- Estimate the interaction of a characteristic of interest $\mathrm{F}_{j,t-1}$ with exogenous monetary policy shocks MP → do wages of workers in small firms react more to monetary policy?;
- *Baseline regressions (employment probabilities and wages):*

$$lny_{i,t} = \alpha_i + \Psi_{j,t} + x'_{i,t}\beta + \boldsymbol{\gamma} MP_{t-1} \times \mathrm{F}_{j,t-1} + \zeta \Delta lnGDP_{t-1} \times \mathrm{F}_{j,t-1} + \varepsilon_{i,t}$$

with:

$y_{i,t}$ *: employment status dummy (1 if employed, 0 if unemployed)/real wage*

$x_{i,t}$ *: set of time varying controls (region, quadratic in age) & time FE*

- Errors are clustered at the individual and firm level.
- Quantile regression based on

The employment probabilities effects of monetary policy shocks

	(1)	(2)	(3)	(4)	(5)
	M Pt−1	-0.0017*** (0.00010)		-0.0017*** (0.000080)		
	M Pt−1					
size	**× Sj,t−1**	-0.00073*** (0.00016)	-0.0000030 (0.00014)			
age	**× Yj,t−1**			-0.0019*** (0.00028)	-0.00052** (0.00024)	-0.00044** (0.00024
skill	× I skillj,t−1					-0.00052** (0.00028)
age & skill	× I skillj,t−1 × Yj,t−1					-0.00099 (0.0010)
	Controls & FEs	N	Y	N	Y	Y
	N	7702906	7598813	7702906	7598813	7598813
	R-sq.	0.3	0.4	0.01	0.4	0.4

*Source: Authors' calculations based on Bobasu and Repele (forthcoming, 2025); Note: standard errors in parenthesis; *p < 0.10, **p < 0.05, ***p < 0.01. Errors are clustered at the individual and firm level. Monetary policy shocks are standardized series from Jarocinski and Karadi (2020). Sj,t−1 is a dummy equal to 1 if the firm employs less than 50 employees in a certain year; Yj,t−1 is a dummy equal to 1 if the firm exists since less than 5 years; and Iskilli,t−1 is a dummy equal to 1 if the workers' education level is: no diploma.*

- *Young firms decrease employment by more following a MP tightening shock*

The effects of monetary policy on individual wages by firm type

	(1)	(2)	(3)	(4)
	MPt−1	-0.00210**			
size	× Sj,t−1	0.0063*** (0.00065)	0.0066*** (0.00067)	0.044*** (0.0015)	
skill	× I skillj,t−1		0.0033** (0.00137)		
skill and age	**× I skillj,t−1 × Sj,t−**		-0.0034 (0.0021)		
Easing/ tightening	× Sj,t−1 × M P <0t−1			-0.22*** (0.0064)	
age	× Yj,t−1				0.00036 (0.00098)
	N	7889680	7889680	7889680	7889680
	R sq.	0.92	0.95	0.93	0.9

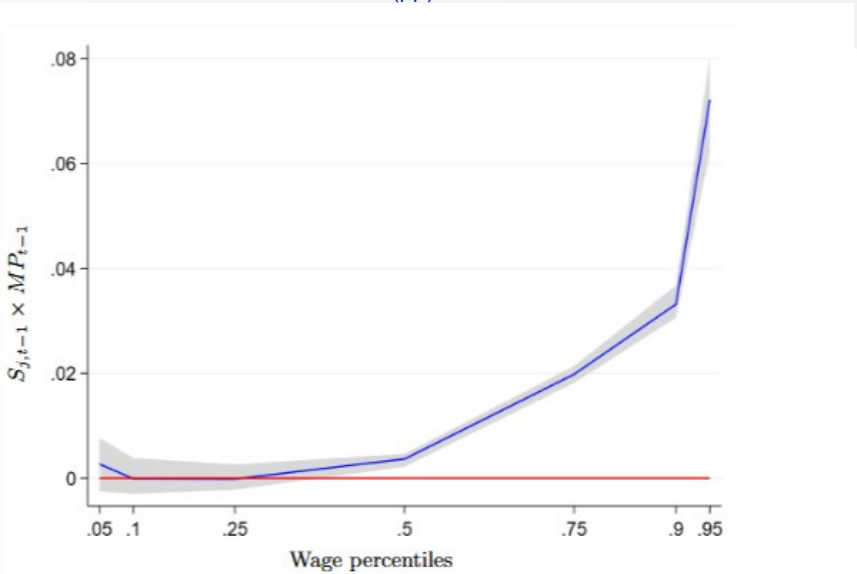
- *Wages of workers in big firms decrease by more than wages in small firms*
- *Wages in big firms react more in easing than in tightening*

*Source: Authors' calculations based on Bobasu and Repele (forthcoming, 2025); Note: standard errors in parenthesis; *p < 0.10, **p < 0.05, ***p < 0.01. Errors are clustered at the individual and firm level. All regressions include year, worker, firm, industry (of the firm) and industry by year fixed effects; as well as aggregate GDP growth as a control variable. Monetary policy shocks are standardized series from Jarocinski and Karadi (2020). Sj,t−1 is a dummy equal to 1 if the firm employs less than 50 employees in a certain year; Yj,t−1 is a dummy equal to 1 if the firm exists since less than 5 years;*

Quantile regression and non-liniarities

Individual wages on monetary policy shocks by firm size

(pp)



Source: Authors' calculations based on Bobasu and Repele (forthcoming, 2025); Note: Confidence bands at the 95% level. Errors are clustered at the individual and firm level. Standard errors are obtained by bootstrap with 50 repetitions. Monetary policy shocks are standardized series from Jarocinski and Karadi (2020). Sj,t−1 is a dummy equal to 1 if the firm employs less than 50 employees in a certain year.

- *The effect is only significant for median and above earners – there is no difference between the responses of wages in small and large firms for the lowest paid quartile of the wage distribution:*
  - ✓ *This suggests that large firms adjust their wages more and especially for high-earning workers following a monetary policy shock*

Heterogeneous pass-through of shocks to wages?

	(1) investment	(2) turnover	(3) wages
MPt−1 × Sj,t−1	0.46 (0.64)	0.21 (0.17)	0.043** (0.020)
N	5552400	4401851	6318541
R sq.	0.817	0.975	0.993

*Note: standard errors in parenthesis; *p < 0.10, **p < 0.05, ***p < 0.01. Errors are clustered at the firm level. Monetary policy shocks are standardized series from Jarocinski and Karadi (2020). Sj,t−1 is a dummy equal to 1 if the firm employs less than 50 employees in a certain year. In Column (1), the dependent variable is real total investment; in Column (2) it is real turnover; and in Column (3) total real wages.*

- *No significant difference between small and large firms concerning the impact of monetary policy shocks on investment and turnover;*
- *Small and large firms adjust their wage bills in a different way, small firms decreasing it by relatively less*

Conclusions

- *Workers in young firms have an employment probability more sensitive to monetary policy shocks than workers in older firms.*
- *Workers in larger firms experience a relatively larger wage adjustment relative to workers in small firms:*
  - ***The effect is asymmetric, with wages reacting more in easing than in tightening episodes, and differences between large and small firms being more exacerbated in easings***
- *Wages of workers ranked higher in the firm's income distribution react more to monetary policy shocks*
- *Underlying transmission channels (further evidence in the paper):*
  - *Estimated difference of wage adjustments in big and small firms is bigger for those with profit sharing than those who do not use profit sharing.*
  - *No evidence that the minimum wage affects mostly smaller firms (Dutsch and Himmelreicher, 2020): more downward rigidities*
  - *Collective bargaining: Difference between small and large firms is also present in East Germany, where collective bargaining agreements are much less common*
  - *Our baseline results are driven by the population of job switchers, namely workers who were working in small and large firms, and then changed employer within two years. On the contrary, there is no significant difference in wages between stayers*

Thank you!

Appendix

Conclusions

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- *Workers in larger firms experience a relatively larger wage adjustment relative to workers in small firms:*
  - ***The effect is asymmetric, with wages reacting more in easing than in tightening episodes, and differences between large and small firms being more exacerbated in easing periods***
- *Wages of workers ranked higher in the firm's income distribution react more to monetary policy shocks*
- *Relevance: Implications for welfare and consumption behavior*

Composition effect

	(1) mini	(2) AKM	(3) male	(4) <2015	(5) west	(6) east	(7) stayers	(8) switchers
MPt−1								
× Smj,t−1	0.0072*** (0.00071)							
× AKM Ft−1=2		-0.00058 (0.0015)						
× AKM Ft−1=3		-0.0026* 0.0014)						
× AKM Ft−1=4		-0.0087*** (0.0014)						
× Sj,t−1			0.0069*** (0.00086)	0. 0058*** (0.00064)	0.0065*** (0.00074)	0.0051*** (0.0013)	0.0026 (0.0090)	**0.0068*** (0.00066)**
N	7889680	7583056	4326061	6431716	638014 1	1497344	244129	7240532
R sq.	0.901	0.897	0.896	0.91	0.899	0.914	0.928	0.907

*Note: standard errors in parenthesis; *p < 0.10, **p < 0.05, ***p < 0.01. Errors are clustered at the individual and firm level. Monetary policy shocks are standardized series from Jarocinski and Karadi (2020). Smj,t−1 is a dummy equal to 1 if the firm employs less than 10 employees in a certain year; AKM Ft−1 are AKM effects quantiles estimated on the whole population;Ssj,t−1 is a dummy equal to 1 if the firm employs less than 50 employees in a certain year; WRi,t−1 is a dummy equal to 1 if the worker's wage is below the firm mean wage*