EUROPEAN CENTRAL BANK

EUROSYSTEM

Product Market Structure and Monetary Policy: Evidence from the Euro Area

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Background and motivation

- The rise of market power a dominant policy issue of the past few years
  - Jackson Hole 2018, Sintra ECB Forum 2018, JEP volume 2019
  - Somewhat of a consensus that concentration/markups have risen in the US, big debate on implications (De Loecker et al., 2020 – Spencer et al., 2022)
  - Less clear for Europe (Cavallari et al, 2019)

- Very little work on the importance of market power for the transmission of monetary policy
  - Unsurprising given the “sheer novelty” of macro-IO literature (Syverson, 2019)
  - Scharfstein and Sunderam (2013), Aghion-Farhi-Kharroubi (2019)
  - Recent work by IMF: Duval-Furceri-Lee-Tavares et al. (2021)

Monetary policy and market power (and squeezed firms)

- **Potency of monetary policy depends on its ability to affect firms' borrowing costs and pass-through subject to competitive conditions of the market**
  - Standard hypothesis (Syverson, 2018): under perfect competition (flat MR), shifts of MC curve due to MP have a larger effect on Y than under a case where firms have market power and face downward residual demand and MR curves

- **Presence of market power by some firms may occur at the expense of others**
  - In particular of "small firms" due to :
    - preferential agreements with up/downstream firms; lower costs of advertising and retailing / Power may be the result of political connections, reduced entry
  - may yield power also in the input market
    - preventing competitors from attracting skilled workers
  - **Hence, potential projects of squeezed firms become less profitable than otherwise - resulting in reduced borrowing capacity relative to firms in other markets**

What we do in a nutshell

a) Theory - establish theoretical equilibrium conditions under which market power may hamper monetary policy pass-through

b) Empirics - We ask two questions:

1) **Does *sectoral* market power directly affect the transmission of monetary policy decisions, in particular credit constraints?** Do small firms benefit *less* from monetary easing when they operate in concentrated markets? ***YES***
   - Data from SAFE + CompNet, use OMT as a quasi-natural experiment, DDD

2) **Does *firms'* market power affect the pass-through of monetary policy to real outcomes?** ***YES***
   - Data from Orbis, EAMPD, Local Projections response to monetary shocks

Our contribution – theoretical result

- We sketch a model to precisely delineate the conditions under which the hypothesized channels may work.
  - Current literature large silent/incomplete/partial equilibrium on this issue.
- We identify conditions under which changes in marginal costs may have different effects on credit constraints and output under different competitive conditions, in a simple Cournot competition setting.
- **Result: under log-concave demand, monetary accommodation will in general be less effective with higher concentration**, as pass-through is incomplete under log-concavity.
- Monetary transmission across firms can also be influenced by a firm's dominance in its relevant market.

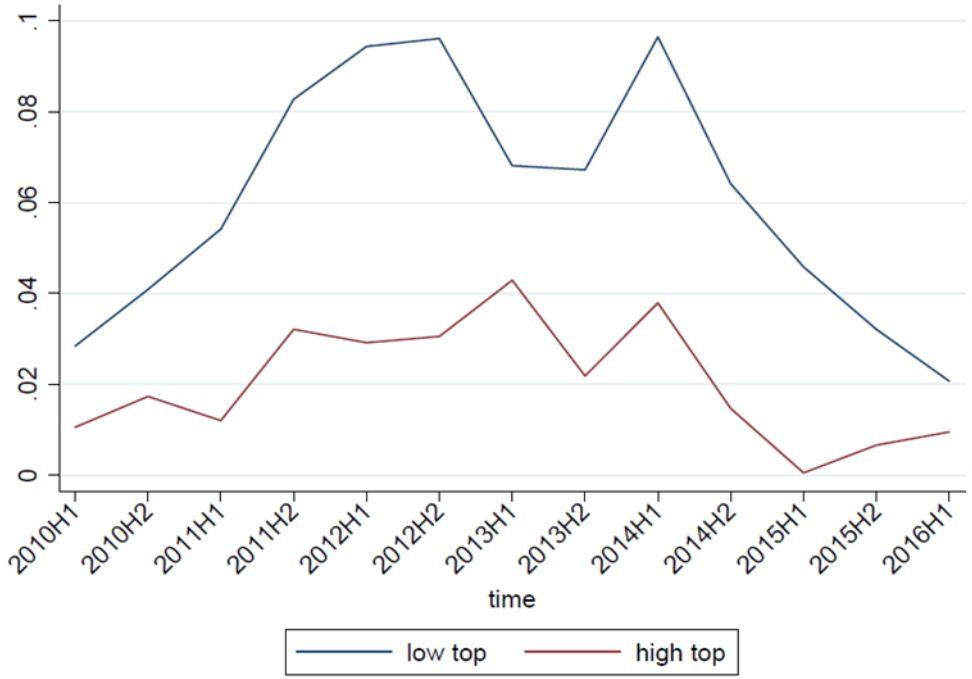
Do SMEs benefit *less* from monetary easing in concentrated markets?

- Test whether small firms in sectors with market dominance face different borrowing constraints than similar firms in more competitive sectors
- Exploit unexpected effect of OMT announcement as *a natural experiment*
  - Drastic reduction of credit constraints in "stressed" countries (Ferrando et al., 2018)
  - Compare outcomes before/after, in "stressed" vs other, and by sector concentration/power measure *pw*. ➡ Diff-in-diff-in-diff

$$CC_{isct} = \beta_0 + \beta_1 pw_{sct} + \beta_2 pw_{sct} \times OMT_t$$
$$+ \beta_3 pw_{sct} \times Stressed + \beta_4 pw_{sct} \times Stressed \times OMT_t$$
$$+ \mathbf{X}_{isct}\gamma + \lambda_{sc} + \lambda_{ct} + \lambda_{st} + \epsilon_{isct}.$$

- CC (credit constraints) is dummy variable from SAFE
- Continuous variable pw measures either concentration or pricing power at sectoral level
- Focus: β_4, expected to be positive if higher power/concentration squeezes SMEs

Evolution of credit constraints, by sectoral concentration



- A deterioration of financing conditions should have a larger effect on small firms in sectors with low concentration
- Likewise, small firms in highly concentrated sectors experience a slower reduction in financing constraints after a positive monetary policy shock

Sources: ECB SAFE
Notes: Sample is composed of firms with less than 250 employees.

Main results for Credit Constraints

1. SMEs in "stressed" countries experienced a ***smaller*** reduction in credit constraints after OMT if they were in highly concentrated sectors.
   - *For firms in sectors with above median values (75th pct) of C10, the reduction in credit constraints thanks to OMT was 2.5pp smaller than in sectors at the median*

2. Holds for both concentrations measures, C10 and HHI
3. Placebo test: period just before OMT announcement (October 2011 to September 2012)

	(1)	(2)	(3)§	(4)	(5)	(6)§
Parameter/Measure		C_{10}			HHI	
Policy×Stressed× Measure	0.2377***	0.2330***		1.5580***	1.8027***	
	(0.0734)	(0.0829)		(0.4763)	(0.5900)	
Placebo ×Stressed× Measure			0.0739			-0.1984
			(0.1270)			(-0.21)
Country FE	Yes	No	No	Yes	No	No
Sector FE	Yes	No	No	Yes	No	No
Country×Sector FE	No	Yes	Yes	No	Yes	Yes
N	14298	14286	5519	15206	15189	5879
R^2	0.0609	0.0835	0.1091	0.0628	0.0860	0.1121

Notes: All regressions includes country-time and sector-time dummies. Errors clustered at the country-sector level.

Real effects and monetary policy shocks

- Challenges:
  - 1. policy responds to cycle (endogeneity); 2. with micro data, we have to isolate MP shock from other shocks -> Exploit recent advances in measurement of shocks.

- Monetary policy shocks
  - Altavilla et al. (2019) EAMP database – measurement of shock within short windows around GovC decisions
  - Use Jarocinski and Karadi (2020) to disentangle shock itself from news about the ECB's assessment of the economy.
  - Contractionary announcement moves equity prices and interest rates in the same direction:
    - markets recognize ECB expects economy to overheat -> no shock.
  - True surprise tightening raises interest rates and reduces equity prices.
  - shock $\varepsilon_{mp} = \Delta\text{EONIA}\mathbb{1}\{\Delta EONIA * \Delta\text{STOXX} < 0\}$

Does firms' market power affect the pass-through of monpol to real outcomes?

Local Projections method (Jorda, 2005) as in Cloyne et al. (2019), Durante et al. (2022), Duval(2021)

Flexible, non-parametric approach; split sample into g bins according to defining characteristic Z:

$$\Delta_h X_{i,t+h} = \gamma_i^h + \sum_{g=1}^{G} \alpha_g^h [Z_{i,t-1} \in g] + \sum_{g=1}^{G} \beta_g^h [Z_{i,t-1} \in g] \epsilon_{mp,t} + \epsilon_{i,t+h}$$

Focus on β_g^h

- X=investment rate/log sales; $\varepsilon_{mp,\,t}$: surprise shocks
- Z refers to characteristics to split firms in groups:
  - Markups (high and low: top and bottom 25%)
    - Markups estimated as De Loecker & Warzynski (2012): Key assumption: output elasticities unchanged throughout period studied (2000-2017)
  - Age: young firms with low markups vs old firms with high markups
    - MP stronger through young firms (Durante et al., 2022). This split is expected to give the largest estimate, according to our hypothesis
  - Control variables: cash flow, leverage, working capital and sales growth

Results for real effects - investment

	$h=0$	$h=1$	$h=2$	$h=3$	$h=4$
A: Country-sector-year dummies, by markup group					
low markup	-0.1593	-1.1908***	0.0226	0.1099	-0.3902
	(0.3360)	(0.2853)	(0.1729)	(0.2145)	(0.2965)
high markup	0.1748	-0.6004**	-0.0415	0.0326	-0.0496
	(0.3647)	(0.2793)	(0.1887)	(0.1872)	(0.2894)
R^2	0.342	0.353	0.361	0.364	0.364
t-diff	1.88	3.68	0.26	0.29	1.47
N	5.9m	5.1m	4.3m	3.6 m	3.0m
B: Country-sector-month dummies, by markup group					
low markup	-0.4910***	-0.5880***	0.0464	-0.0066	-0.3922*
	(0.1837)	(0.1773)	(0.2541)	(0.2439)	(0.2349)
R^2	0.345	0.356	0.363	0.366	0.366
N	5.9m	5.1m	4.3m	3.6m	3.0m
C: Country-sector-month dummies, by markup by age group					
low markup & young	-2.6774***	-1.3847***	-0.6568	-0.6731	-1.1567**
	(0.4510)	(0.4908)	(0.8348)	(0.7678)	(0.5226)
R^2	0.340	0.353	0.364	0.368	0.369
N	1.4m	1.2m	1.0m	0.8m	0.7m

Notes: All regressions includes country-time and sector-time dummies. Errors clustered at the firm and time- level. As control variables: two lags of the change in sales, cashflow, leverage and working capital

Panel A: we compare firms within sectors, differentiated only by mark-up levels – smaller reaction for high markup firms

Panel B: we fully neutralize any temporal variation.
Difference between low and high markup firms

- *one sd of mp shock implies 0.59 pp larger response of low markup firms*

Panel C : we focus on firms with extreme responses to MP shock: low markup-young versus high markup-old

Results for real effects - sales

	$h=0$	$h=1$	$h=2$	$h=3$	$h=4$
A: Country-sector-year dummies, by markup group					
low markup	-0.5610***	-1.7250***	-0.7346***	-0.0644	-0.4343
	(0.2056)	(0.4280)	(0.1971)	(0.3825)	(0.3936)
high markup	-0.3645**	-1.2149***	-0.3962**	0.1792	-0.2998
	(0.1650)	(0.3273)	(0.1810)	(0.2860)	(0.2871)
R^2	0.054	0.070	0.080	0.090	0.096
t-diff	2.11	2.56	1.40	0.89	0.52
N	5.9m	4.9m	4.2m	3.7m	2.9m
B: Country-sector-month dummies, by markup group					
low markup	-0.2387***	-0.4862**	-0.3900*	-0.2549	-0.1521
	(0.0791)	(0.2104)	(0.2129)	(0.2684)	(0.2729)
R^2	0.057	0.074	0.084	0.095	0.101
N	5.9m	4.9m	4.2m	3.7m	2.9m
C: Country-sector-month dummies, by markup by age group					
low markup & young	-0.3082***	-0.9530***	-0.8016***	-0.4345	-0.5371
	(0.0722)	(0.1793)	(0.2454)	(0.4150)	(0.4595)
R^2	0.066	0.087	0.099	0.111	0.121
N	1.4m	1.2m	1.0m	0.8m	0.7m

Notes: All regressions includes country-time and sector-time dummies. Errors clustered at the firm and time- level. As control variables: two lags of the change in cashflow, leverage and working capital

Panel A: response of sales is faster than investment in the short-run:

- sales can more quickly reflect demand side responses from households
- firms can also draw down their inventories or increase production through an increase in their variable input use without necessarily raising investment

Panel B: overall difference is smaller than for investment but persistent over time

- *Overall, low markup firms have a 0.5-1 pp larger contraction in sales following a one sd increase in mp shock*

Concluding remarks

We assess interaction between monetary policy and the structural conditions of the real economy

First, we exploit exogenous variation in borrowing costs induced by OMT program on the credit availability of firms

- ✓ **SMEs (low market power and higher credit constraints) within less concentrated sectors experienced a larger reduction in credit constraints than those in more concentrated sectors**

Second, we study how firms' market power affects pass-through to real variables, using a continuous measure of monetary policy shocks

- ✓ **We find evidence that firms with more market power respond less to monetary policy shocks**

Follow up:

- **Investigate channels on how banking sector's health *(capital)* and concentration interact with firms' product market power in the pass-through**