Monetary Policy, Market Power and SMEs

By Annalisa Ferrando, Peter McAdam, Filippos Petroulakis and Xavier Vives*

A prominent debate has recently centered around the rise of market power, either through an increase in the concentration of sales, or the ability of firms to systematically charge prices above marginal costs (Syverson 2019). Several studies have pointed to substantial growth along these margins for the past two decades, especially in the United States; there is less agreement on the extent, causes and consequences of these apparent trends.

Whether increasing or not, the very existence of some differing degree of market power among sectors in the economy may well have a bearing on monetary policy effectiveness, but little is known about the issue. Standard theory posits that an immediate effect of monetary accommodation is to reduce firms' borrowing costs, allowing them to increase investment and hiring. Deviations from a perfectly competitive benchmark may influence this ability.

We focus on the effects of monetary policy in the euro area taking into account that firms have different degrees of market clout.[1] Firms with more market power will be more profitable and will have access to better financing conditions. Inter alia, firms with high market power may have preferential agreements upstream and downstream, or even political connections protecting their market. They may also wield power in specialized labor markets, preventing competitors from attracting skilled workers. Potential projects of small firms wielding little market clout may then be less profitable than otherwise, reducing their borrowing capacity. As such, the pass-through of monetary policy to lending conditions may be affected by market structure. This margin may be quantitatively crucial, given that small and medium-sized enterprises (SMEs) - firms with fewer than 250 employees- are responsible for a substantial fraction of economic activity. In 2020, they accounted for 61.7% of the euro area non-financial business economy workforce and around 50.1% of value added. Frictions to the transmission of monetary policy to SMEs can then severely curtail its effectiveness.

We begin by discussing simple but novel theoretical equilibrium conditions through which concentration may hamper monetary policy pass-through when firms are heterogeneous. Firms produce at the point where marginal revenue (MR) equals marginal cost (MC); monetary policy can shift MC (and hence the cost of capital), and affect output. The output response will depend on how MR (typically assumed to be decreasing in output) moves with market power. We discuss how, under plausible conditions in a Cournot model, how small firms react less to monetary policy changes in more concentrated markets.

We then empirically examine whether concentration can affect the transmission of monetary policy to *credit constraints* (i.e. lending conditions). We exploit variation in borrowing costs induced by the introduction of the European Central Bank's (ECB) Outright Monetary Transactions (OMT) program, launched in August 2012 as a reaction to financial fragmentation, with widely divergent borrow-

* Ferrando: European Central Bank (email: annalisa.ferrando@ecb.europa.eu); McAdam: Federal Reserve Bank of Kansas City (email: Peter.McAdam@kc.frb.org); Petroulakis: Bank of Greece (email: fpetroulakis@bankofgreece.gr); Vives: IESE Business School, (email: xvives@iese.edu). We thank Philip Lane, Deniz Igan, Luc Laeven, Wolfgang Lemke, Chad Syverson, and Felipe Saffie for helpful comments, and Jeanne Astier, Giada Bozzelli, Tosca de Ruiter, and Barna Szabó for excellent research assistance. The views expressed are of the authors and not necessarily those of the Bank of Greece, the European Central Bank, the Eurosystem, the Federal Reserve Bank of Kansas City or the Federal Reserve System.

[1] In a companion paper (Ferrando et al., 2021) we also consider pass-through to firms depending on the overall degree of market power.

ing costs across member states[2], impairing policy transmission. We use data from the Survey on the Access to Finance of Enterprises (SAFE), an ECB survey designed to study access to finance for SMEs. The size and pervasiveness of the OMT shock provides a uniquely powerful experiment to test the hypothesis that SMEs in less concentrated sectors experienced a large reduction in credit constraints.[3]

We consider credit constraints for two reasons. First, they are a direct measure of the effectiveness of monetary accommodation. Second, credit constraint measures react quickly to news shocks (as was the case following OMT) and hence allow for sharper identification, particularly since we use biannual measures of credit constraints, relative to investment, which typically reacts more sluggishly.

It is important to note that our concern is not with small firms with weak profitability due to impaired balance sheets or the lack of profitable projects. In general, such firms will indeed face stricter borrowing terms. Instead, the focus here is on identifying whether firms with less market clout are differentially affected by monetary policy.

I. Relationship to the literature

The heterogeneity of monetary policy transmission across firms has long been of interest to the literature. In general, effects appear larger for small firms, who lack alternative sources of financing, and tend to rely on collateral-based borrowing (Gertler and Gilchrist, 1994; Cloyne et al., 2019; Jeenas, 2018). The literature on market structure and monetary policy is much thinner. Scharfstein and Sunderam (2017) show that high concentration in mortgage lending reduces the sensitivity of mortgage rates and refinancing activity to the yields of mortgage-backed securities. Aghion et al. (2019) examine how sectoral and firm growth after a monetary policy shock is conditioned by the interaction of liquidity constraints and competition.[4]

More broadly, we contribute to our understanding of how market power may impact the aggregate economy. Market power is a key input in macro models. Markups affect the slope of the New Keynesian Phillips curve, and (through investment) the neutral interest rate. As for concentration, the rise of firms with such significant profits and cash reserves that they become interest-insensitive means that the slope of the IS curve attenuates, rendering monetary policy less potent in moving demand (Aquilante et al, 2019). Syverson (2019) surveys the literature linking a number of phenomena to rising markups and increasing concentration, such as muted investment and dynamism, rising risk premia and a lower labor share. Azar and Vives (2019) argue that concentration alone can only explain the aggregate phenomena of rising markups and declining labor share if models are augmented to account for the increase in common ownership.

II. Theoretical Framework

We sketch the conditions under which market structure may affect monetary effectiveness when firms are heterogeneous.[5]

In a Cournot set-up with a homogeneous product, we have two sets of firms, which differ in their marginal costs. Starting from an equilibrium, a monetary easing which reduces marginal cost c does indeed increase profitability (and in consequence reduces credit constraints), but the impact on small firms (assumed to have higher marginal costs) is larger the lower the concentration,

[2]The spreads of Spanish (Italian) ten-year government bonds relative to Germany increased by 250 (200) basis points in July 2012 compared with one year earlier.

[3]Here, we focus on concentration, even though it may not always coincide with low levels of competition (Vives, 1999). But even competition-induced concentration could affect monetary policy transmission. If concentration is high due to high fixed costs, then marginal costs, which monetary policy can affect, will matter less in the investment decisions of firms (Korinek and Ng, 2018). Our companion paper considers pricing power as well, with similar results.

[4]Duval et al. (2021) also study how the transmission of monetary policy to the real economy is conditioned by markups in a similar setting to our companion paper. They also find evidence consistent with the hypothesis that firms with high markups respond less to monetary policy shocks as in our paper.

[5]Details can be found in our companion paper, Ferrando et al. (2021).

under certain plausible conditions. In particular, and expressing marginal cost reductions as either ad-valorem or unit subsidies in c, this holds in general for constant elasticity demand with an ad-valorem subsidy or with linear demand and a unit subsidy.[6]

The above effects occur even though the cost reduction is proportional for both types of firms in the ad-valorem model, or of the same magnitude in the unit subsidy model. In the ad-valorem case, the cost advantage of large firms is reduced, and in the unit subsidy case it is not affected. In those circumstances, the effect of the cost reduction is to increase weakly the market share of small firms and reduce concentration.

This analysis implicitly assumes that credit constraints fall with profitability, and that the reduction in marginal costs is the same for all firms. A more realistic case is one where large firms can borrow in the capital markets: if easing has a larger impact through markets, which is exclusively used by larger firms and at the same time, banks have impaired balance sheets, further amplifying this difference, then the effect on profitability of small firms would be weaker. That is, in more concentrated markets we would have a lower impact of easing on SMEs' profitability if the cost reduction multiplier of large firms is high enough.

III. Data

We use the SAFE survey of the ECB, focusing on a sample of SMEs in eight countries: Belgium, France, Finland, Germany, Italy, the Netherlands, Portugal, and Spain. The sample is random and stratified, ensuring satisfactory representation at the country level.[7] We use measures of sectoral concentration from CompNet, at the 2-digit level. These are the Herfindahl-Hirschman (HHI) index (the sum of squares of the firm share of sales in the sector), and C_{10}, the share of total sectoral sales accruing to the top 10 firms in the sector.

Credit constraints, our dependent variable, is constructed from firms reporting whether: 1) their loan applications were rejected; 2) only a limited amount of credit was granted; 3) they themselves rejected the loan offer because the borrowing costs were too high, or 4) they did not apply for a loan for fear of rejection (i.e., discouraged borrowers). The indicator is equal to 1 if at least one of the above conditions is verified, and 0 otherwise. The firms in the sample are almost all independent companies (94%); mature (82% are older than 10 years) and with relatively small annual turnover (less than 2 million euros for 68% of firms); 11% are credit constrained.

IV. Empirical Framework

We attempt to causally establish a connection between market power and monetary transmission by exploiting a monetary policy shock caused by the OMT program of the ECB. While OMT reduced borrowing costs across the euro area, it had a much larger impact on borrowing costs for countries in the euro area periphery ("stressed").[8] We hence implement a differences-in-differences-in-differences setup (DDD); we compare outcomes before and after treatment, between stressed and non-stressed countries, and by the degree of the sectoral structure (or market power) measure.

The model we estimate is as follows:

$$\begin{aligned} CC_{isct} &= \beta_0 + \beta_1 pw_{sct} + \beta_2 pw_{sct} \times OMT_t \\ &+ \beta_3 cons_{sct} \times Stressed \\ &+ \beta_4 cons_{sct} \times Stressed \times OMT_t \\ &+ \mathbf{X}_{isct}\gamma + \lambda_{sc} + \lambda_{ct} + \lambda_{st} + \epsilon_{isct}, \end{aligned}$$

where CC are credit constraints; OMT is equal to 1 after the policy treatment, 0 before; $Stressed$ is equal to 1 for firms in Italy, Spain and Portugal, 0 otherwise; vector $\mathbf{X}$ includes firm characteristics to control for factors differentially affecting borrowing capacity, unrelated to the presence of powerful firms.[9] Around a third of SMEs

[6] In "mixed" models with constant elasticity demand and unit subsidies or linear demand and ad-valorem subsidies, the statement needs to be qualified.

[7] See Ferrando et al. (2021) for details.

[8] See Ferrando et al. (2021) for details.

[9] These are size, turnover, age, and dummies for whether the firm's capital and credit history improved over the past six months.

Table 1—Credit Constraints and Concentration

Parameter/Measure	(1)	(2)	(3)	(4)	(5)	(6)
	C_{10}			HHI		
Policy×Stressed×	0.2377***	0.2330***		1.5580***	1.8027***	
Measure	(0.0734)	(0.0829)		(0.4763)	(0.5900)	
Placebo ×Stressed×			0.0739			-0.1984
Measure			(0.1270)			(0.9601)
Country×Sector FE		X	X		X	X
Country×Time FE	X	X	X	X	X	X
Sector×Time FE	X	X	X	X	X	X
N	14298	14286	5519	15206	15189	5879
R^2	0.0609	0.0835	0.1091	0.0628	0.0860	0.1121

Notes: t statistics in parentheses, with standard errors clustered at the country-sector level. The significance stars are to be read as $^{*} < 0.1, ^{**} < 0.05, ^{***} < 0.01$. The dependent variable is the credit constraint measures. Each column shows results from least squares regressions of the dependent variables on the denoted controls, in addition to employment, age and turnover dummies, and dummies indicating whether the firm is a standalone entity, whether credit history improved over the previous wave, or whether the firm's capital situation has improved over the previous wave. To avoid clutter, we simply report the interacted placebo coefficient in the Placebo case.

in our sample are in stressed countries. The continuous variable *cons* measures either the degree of concentration or pricing power. We include country and sector dummies (λ_{sc}) to control for unobservable time-invariant characteristics of particular sectors, both separately and interacted; country-time dummies to control for country-specific trends (λ_{ct}); and sector-time dummies (λ_{st}) to control for disturbances affecting specific sectors globally.

We are interested in the coefficient of the triple interaction term, β_4, which is expected to be positive if higher market power or higher concentration disadvantages firms with low power. While credit constraints as a whole fell substantially during the period (Ferrando et al., 2021), if our hypothesis is correct, then for disadvantaged firms in these sectors, the pass-through of monetary policy would be weaker than observationally equivalent firms in other sectors, in stressed versus non-stressed countries. We are agnostic about the other β coefficients.

Sector or country-sector dummies control for unobserved heterogeneity at the sectoral level (e.g. structural determinants of financing conditions unrelated to market structure). We cluster errors at the country-sector level. We limit attention to firms with less than 250 employees since large firms typically have better access to credit sources. This provides the most transparent way of creating meaningfully comparable treatment and control groups.

V. Results

Table 1 shows results, starting with C_{10} in column 1, with country-by-time and sector-by-time dummies, and 2 also with country-by-sector dummies, purging our results from unobserved time-invariant effects. In the latter case, the effective assumption is that each sector is separate across countries; this is a more flexible specification, which absorbs more variation, allowing us to make inference from changes within country-sector cells across time.

We see that the results are similar regardless of the dummy specification. We find that the coefficient of interest is positive, as hypothesized, and highly significant. While, controlling for concentration, the introduction of OMT introduced a sharp reduction in financing constraints, in particular in stressed countries, this was mitigated for firms in sectors with a high concentration of sales at the top. For firms in sectors with high values (90^{th} percentile) of C_{10}, the reduction in financing constraints thanks to OMT was 0.8pp smaller than in sectors at the median, relative to an overall reduction of 5pp in stressed coun-

tries. Columns 4 and 5 repeat this exercise for HHI; results are similar, and in fact stronger in this case.

As usual with DDD strategies, the identifying assumption is that, in the absence of the treatment, credit constraints would have developed similarly in relative terms across sectors, on average, within non-stressed relative to stressed countries, which need not be true. We exploit the fact that our data allows us to test for this assumption, and focus on rounds 6 and 7 (October 2011 to September 2012), just before OMT was announced. As such, we can test for common or parallel trends within the pre-treatment period, and perform standard falsification placebo tests, where the pre-period is round 6 and the post-period is round 7. Columns 3 and 6 reports the triple interaction coefficients for both C_{10} and HHI specifications, respectively; in both cases, the coefficient is small and not statistically significant.

VI. Conclusion

Our results point to a differential impact of monetary policy on small firms in concentrated markets, a particularly salient issue given the influential literature on the extent of market power in advanced economies in recent decades. Our results point to an added benefit from improving the competitive landscape. This is particularly important at a time when policy was in recent years constrained by the zero lower bound. At the same time, the theoretical framework points to potential diminishing returns from unconventional monetary policy measures, to the extent that they disproportionately benefit larger firms. The lessons from the expansionary episode considered here imply that we could expect symmetric implications for monetary tightening as well.

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