Monetary Policy and Market Structure

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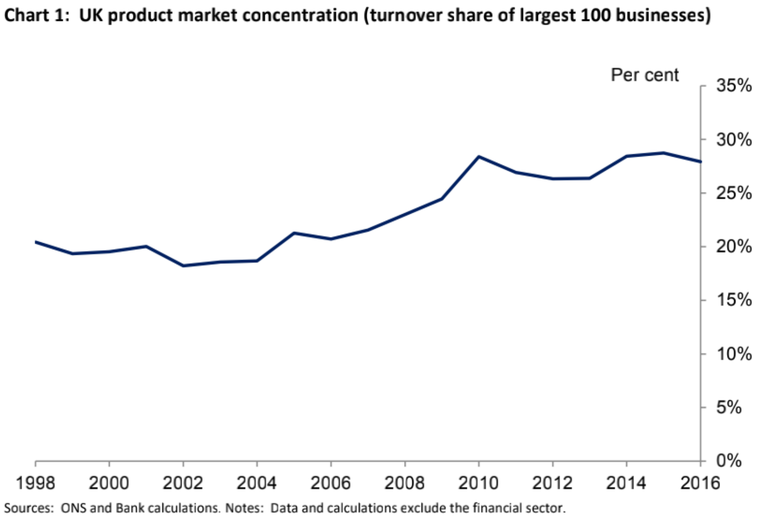
Product market developments and monetary policy

*"The relationship between **labour markets** and monetary policy has rightly received a lot of attention in recent years$<$ ... $>$ The relationship between monetary policy and **product markets** has, by comparison, been the road less travelled. Yet, over the same period, structural shifts in the product market have been no less profound"*

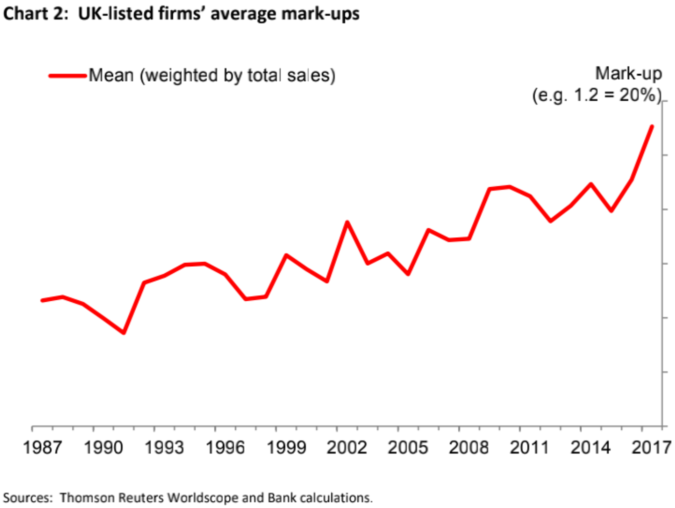
Aquilante et al. (Bank of England, 2019)

Product market concentration in the UK



Similar findings for the US (see Autor et al., 2019)

Markups in the UK



Markup changes internationally

Table 1: G7 mark-ups

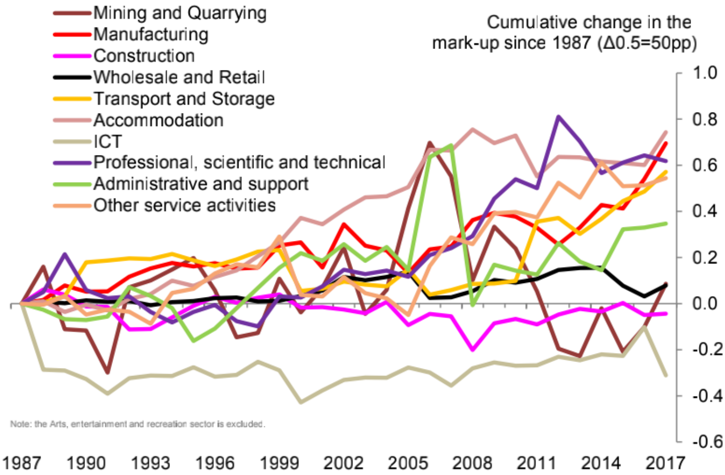
Country	Mark-up level (2016)	Mark-up increase from 1980-2016	Implied impact on annual price inflation (pp)
Canada	1.53	0.61	1.3
France	1.50	0.53	1.2
Germany	1.35	0.29	0.7
Italy	2.46	1.46	2.5
Japan	1.33	0.30	0.7
UK	1.68	0.74	1.6
US	1.78	0.63	1.4
G7 average	**1.66**	**0.65**	**1.3**

Sources: De Loecker and Eeckhout (2018) and Bank calculations.

Notes: Final column shows a simple indicative calculation where we assume that higher firm-level mark-ups have been fully reflected in a higher economy-wide price level and therefore higher inflation rates between 1980 and 2016.

Markups in the UK: sectoral evidence

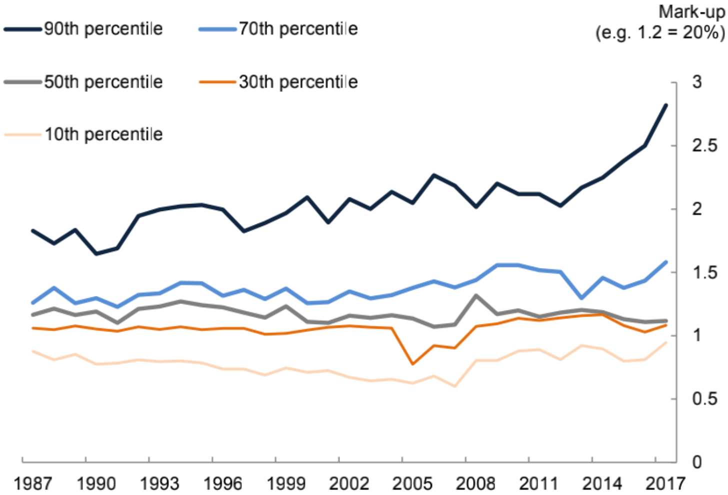
Chart 3: UK-listed firms' mark-ups by sector



Sources: Thomson Reuters Worldscope and Bank calculations.

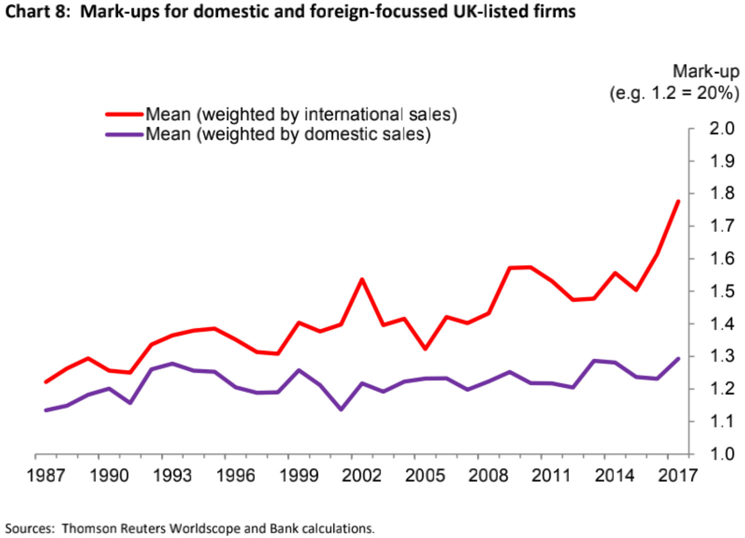
Markups in the UK: by markup deciles

Chart 5: UK-listed firms' mark-up distribution over time



Sources: Thomson Reuters Worldscope and Bank calculations.

Markups in the UK: by domestic vs international sales



Monetary policy and market power under *monopolistic competition*

Standard New Keynesian setting

- Continuum of **monopolistically competitive firms**, constant elasticity of substitution aggregation; each firm face a downward-slopping demand schedule:

$$Y_t(i) = \left[\frac{P_t(i)}{P_t}\right]^{-\epsilon} Y_t$$

  where ϵ is the elasticity of substitution across firms

- Steady-state pricing:

$$P(i) = \frac{\epsilon}{\epsilon - 1} MC(i)$$

  where $\mu \equiv \frac{\epsilon}{\epsilon-1}$ is the long-run (steady-state) markup

Phillips curve and long-run markup

- Forward-looking Phillips curve:

$$\pi_t = \beta \mathbb{E}_t \pi_{t+1} + \kappa x_t + u_t$$

where π_t is inflation, x_t is the output gap and u_t is cost-push shock

- Slope κ as function of structural parameters:

$$\kappa = \frac{(1-\theta)(1-\beta\theta)}{\theta} \frac{1-\alpha}{1-\alpha+\alpha\epsilon} \left(\sigma + \frac{\varphi+\alpha}{1-\alpha}\right)$$

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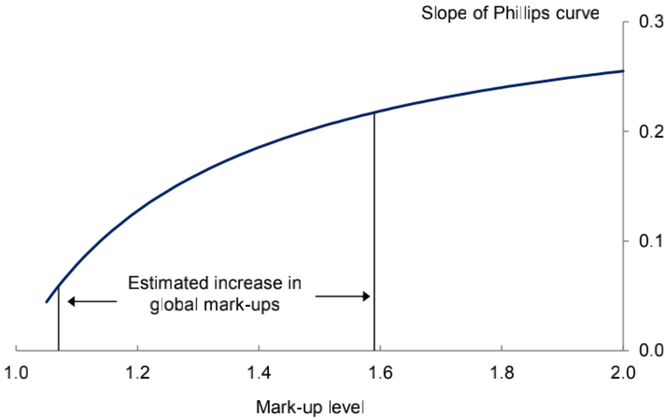
- PC slope: $\epsilon \downarrow (\mu \uparrow) \quad \rightarrow \quad \kappa \uparrow$

- Sacrifice ratio (SR): $\epsilon \downarrow (\mu \uparrow) \quad \rightarrow \quad \text{SR} \downarrow$

Phillips curve slope and markup

Chart 12: Mark-ups and the slope of the Phillips curve



Sources: De Loecker and Eeckhout (2018), Galí (2015) model and Bank calculations.

Notes: Parametrisation such that β = 0.99, θ = 2/3, α = 1/3, φ = σ =1.

Optimal monetary policy

- Central bank period loss function, derived as approximation to HH utility:

$$L_t = \pi_t^2 + \gamma x_t^2, \qquad \gamma = \frac{\kappa}{\epsilon}$$

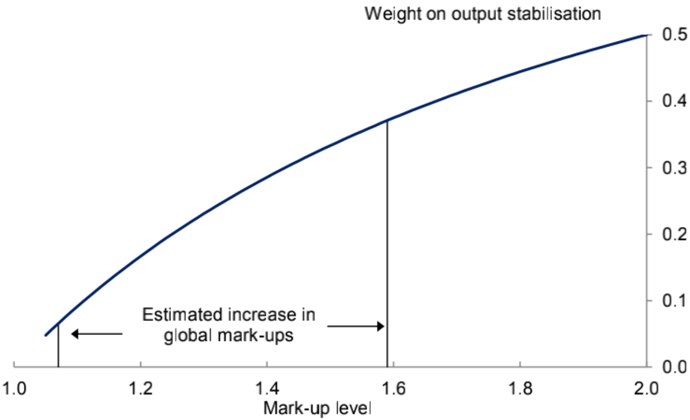
- Optimal policy under discretion:

$$\pi_t = -\frac{\gamma}{\kappa} x_t = -\frac{1}{\epsilon} x_t$$

- Lower ϵ implies the central bank should let inflation absorb more, as optimal to do a greater amount of (now less costly) output-smoothing in the face of trade-off inducing shocks

Optimal weight on output stabilization and markup

Chart 14: Mark-ups and optimal policy weight on output stabilisation in targeting rule



Sources: De Loecker and Eeckhout (2018), Galí (2015) model and Bank calculations.

Notes: Parametrisation such that β = 0.99, θ = 2/3, α = 1/3, φ = σ =1.

Monetary policy and market power under *oligopoly (Wang and Werning, 2020)*

Beyond monopolistic competition

- Suppose there is now a finite number of firms n, which measures **concentration**, so firms engage in strategic behaviour

Proposition (Wang and Werning, 2020)

In a sector with n firms, the slope of the reaction function around the steady state $\beta = \frac{\partial g_j}{\partial g_k}(\bar{p})$ *satisfies*

$$(n-1)\beta = \frac{\lambda}{\lambda + \rho} \frac{1}{\frac{n-2}{n-1} + \frac{1}{n-1}\left(\frac{-\epsilon - 1}{-\epsilon - \frac{\mu}{\mu - 1}}\right)}$$

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Proposition (Wang and Werning, 2020)

The cumulative output effect of a monetary shock is:

$$\int_0^\infty \log\left(\frac{C(t)}{\bar{C}}\right) dt = \frac{\delta}{\sigma\lambda} \times \int_s \frac{ds}{1-(n_s-1)\beta_s}$$

Conclusion

- Tremendous product market developments over the last decades, strongly indicative of higher **market power**
- Implications for monetary policy still under-researched
- Standard NK models with monopolistic competition indicate that lower elasticity of substitution=higher markups and leads to steeper Phillips and lower sacrifice ratio
- Less clear once relax the crucial assumption of monopolistic competition