Discussion of ”Inflation and Floating-Rate Loans: Evidence from the Euro-Area”

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Motivation

- Transmission of monetary policy is state-dependent.
  - Plenty of evidence on the household side.
  - Less so on the firm side: price puzzle, working capital, covenants, leverage.
  - In particular, how does the **composition of debt** matter?

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- Consider an interest rate hike. What happens to firms' marginal costs?
  - Funding costs $\uparrow \implies$ marginal costs $\uparrow$.
  - What if firms have fixed rate debt?
  - What are the implications for **price dispersion**?
  - What are the implications for the **agg. price level**?

The Paper

Data:

- AnaCredit: all loans to firms.
- Sector-level prices + product-level prices.

$$\Delta \text{CPI}_{i,c,t} = \beta \text{Share Float}_{i,c} \times \Delta \text{DFR}_t + \alpha' X_{i,c,t} + \delta_{i,c} + \eta_{i,t} + \gamma_{c,t} + \varepsilon_{i,c,t}$$

with a similar regression for prices.

Result 1 - Inflation higher in sectors with variable rates

	Inflation rate (%)				
	(1)	(2)	(3)	(4)	(5)
Δ DFR	-0.338***	-0.645***			
	(0.0916)	(0.194)			
ShareFloat$_{ic}$ × Δ DFR		0.0052*	0.0108***	0.0099***	
		(0.0029)	(0.0031)	(0.0032)	
High Share$_{ic}$ × Δ DFR					0.347**
					(0.165)
Energy cost				0.0414	0.0392
				(0.0466)	(0.0476)
Observations	13,944	13,944	13,920	11,544	11,544
R-squared	0.565	0.566	0.821	0.837	0.836
Macro controls	Y	Y	-	-	-
Country-industry FE	Y	Y	Y	Y	Y
Ind-month FE	N	N	Y	Y	Y
Country-month FE	N	N	Y	Y	Y

Result 2 - Results stronger in sectors with high working capital needs

	Working Capital		HHI	
	Low	High	Low	High
	(1)	(2)	(3)	(4)
ShareFloat$_{ic}$	0.0059	0.0167***	-0.0027	0.0164***
$\times \Delta$ DFR	(0.0049)	(0.0043)	(0.0044)	(0.0045)
Observations	5,784	5,328	5,634	5,670
R-squared	0.831	0.897	0.893	0.812
Country-Ind FE	Y	Y	Y	Y
Ind-month FE	Y	Y	Y	Y
Country-month FE	Y	Y	Y	Y

Result 3 - Higher increase in interest rates

	Interest rate (%)			
	(1)	(2)	(3)	(4)
Δ DFR	0.0937***			
	(0.0061)			
ShareFloat$_{fb}$ $\times$ Δ DFR	0.609***	0.609***	0.539***	0.576***
	(0.0092)	(0.0097)	(0.0079)	(0.0082)
Observations	110,253,844	110,253,844	110,252,694	110,238,610
Bank-Firm FE	Y	Y	Y	Y
Month FE	N	Y	-	-
Country-industry-month FE	N	N	Y	Y
Bank-month FE	N	N	N	Y

- Pass-through elasticity is around 0.5.

Why do prices change?

Cost channel: interest rates affect current marginal costs. Barth & Ramey (2002)

- Doesn't seem to be the case as these loans are not about **working capital**.
- Average loan maturity is around 3,000 days.
- Therefore, in PE, current marginal costs don't change.

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Alternative mechanism: investment.

- Higher cost of debt $\Longrightarrow$ lower investment.
- Lower investment $\Longrightarrow$ future marginal costs $\uparrow$.
- Marginal costs $\uparrow$ in the future $\Longrightarrow$ higher prices today.

From marginal costs to prices

Need: Calvo + perfect foresight + risk-neutrality.

$$d \log P_t^\star(i) = ... + \Omega(i) \times \sum_{k \geq 0} (\varepsilon d \log P_{t+k} + d \log Y_{t+k})$$
$$+ \Omega(i) \times \sum_{k \geq 0} d \log \underbrace{\mathcal{M}_{t+k}(i)}_{\text{marginal cost}}$$

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With a symmetric equilibrium, $\Omega(i) = \Omega$ and we have identification.

- Otherwise, differential exposure to the cycle introduces a bias.
- Will return to this later.

From interest rates to marginal costs

Need: predetermined capital + two types of debt.

- Capital share is α, leverage is d.
- Firm has a share γ of floating debt and share $1-\gamma$ of fixed debt.
- At time t, fixed rate is known to be R_{t+1} and floating rate R^v_{t+1}.

Cost of capital at time t is $\gamma \mathbb{E}_t R^v_{t+1} + (1-\gamma) R_{t+1}$.

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$$d \log \mathcal{M}_{t+1}(i) = \ldots - \alpha d \log K_{t+1}(i)$$

$$d \log K_{t+1}(i) = \ldots - \frac{1}{1-\alpha} \times d \times \underbrace{m^v_t(i)}_{\text{share of floating debt}} \times d \log R^v_{t+1}$$

From the model to the data

$$d \log P_t^\star(i) = ... + \Omega \times \sum_{k \geq 0} \frac{\alpha}{1-\alpha} dm_{t+k-1}^v(i) d \log R_{t+k+1}^v$$

If we assume the shock only takes place at $t+1$, we get a simpler expression

$$d \log P_t^\star(i) = ... + \Omega \times \frac{\alpha}{1-\alpha} \times d \times m_t^v(i) \times d \log R_{t+1}^v$$

- Shock affects prices through investment.
- This is a testable implication: higher m_t^v implies larger drop in **investment**.
- Also implies drop in **credit demand**.
- Consistent with the findings on leverage.

Possible confounders

$$d \log P_t^\star(i) = ... + \Omega(i) \times \lambda_t + \Omega(i) \times \frac{\alpha}{1-\alpha} \times m_t^v(i) \times d \log R_{t+1}^v$$

1. **Capital share**: higher $\alpha \implies$ higher price change.
   - Can compare sectors based on their capital share.
2. **Calvo parameter**: lower price adjustment ($\theta \uparrow$) $\implies$ higher price change.
   - If firms know they can only change prices infrequently, they will change more.
   - Can also be tested using sectoral prob. of price change.
3. **Exposure to the business cycle**:
   - Even if there is no shock, price behavior might be different across sectors.
   - It depends on $Cov(\Omega, m_t^v)$.
   - This is why looking at firm-level data helps.

Selection into variable rates

What type of firms select into adjustable rate loans?

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As an example, take a mean-variance firm with risk aversion σ. This firm chooses a variable share of

$$\gamma^\star = \underbrace{\frac{Cov(y, r^v)}{dVar(r^v)}}_{\text{hedging}} - \underbrace{\frac{\mathbb{E}r^v - r}{d\sigma Var(r^v)}}_{\text{speculative}}$$

- Higher leverage d implies lower share of floating rate. Vickery (2008)
- Higher comovement implies higher share of floating.
- Key to describe the differences between firms.

Why do prices increase by more in high HHI sectors?

Suppose high HHI implies firms with high markup.

Then, **high-markup firms increase markups?**

- With Kimball demand, expect the opposite.
- Decrease in markups is also consistent with evidence in tariff pass-through.

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Or maybe **high-markup firms face larger increase in marginal costs.**

- Maybe through either capital share or lower reset prob.
- This is testable.
- But then it's not about markups or HHI.

Conclusion

I really like this paper!

- Plenty to like: sharp question, great execution, interesting conclusions.
- Could be a bit clearer on the mechanism.

Some concluding thoughts:

- Paper is positive, not normative.
- But they find that the composition of debt leads to **price dispersion**.
- Inefficient price dispersion is like a negative TFP shock.
- But is this the case if marginal costs are just changing differently?