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Monetary Policy and Endogenous Financial Crises
discussed by

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This paper aims to answer the question:

Should a central bank deviate from its objective of price stability when financial frictions are endogenous?

Result:

- YES the best monetary policy, in a set of possible alternatives, is one that deviate from price stability (from zero inflation) when conventional monetary policy is the unique policy instrument and if the objective is to maximize welfare

- And the main fundamental shocks to take into account for this question are technological (supply) aggregate and idiosyncratic shocks

The model economy is chosen to be able to replicate economic/financial crises

- Crises are characterized by the economic activity deviating deeply and persistently from the steady state
- Financial intermediation is realized by a credit market. No banks
- This credit market is used uniquely by firms (intermediate goods producers)
- Heterogeneous firms, driven by idiosyncratic technological shocks, have gains from trading in the credit market

- **Financial frictions**, limited commitment and asymmetric information, join fragility to the credit market
- In crisis times the credit market is not used. Financial autarcy and an endogenous financial crisis
- Two different types of equilibria: the change from one to the other is not in the margin. One market is closed. And a crisis erupts
- The economy that, for a given aggregate technological stochastic process have a positive probability of crisis, face higher uncertainty and volatility

SET UP

- A standard representative HH
  - The HH invests its savings in risk–free nominal bonds Bt and equity Qt(j)

- This equity is issued by newborn firm j, that produces the intermediate good with labor and capital
- Every firm j is ex-ante identical and live one period

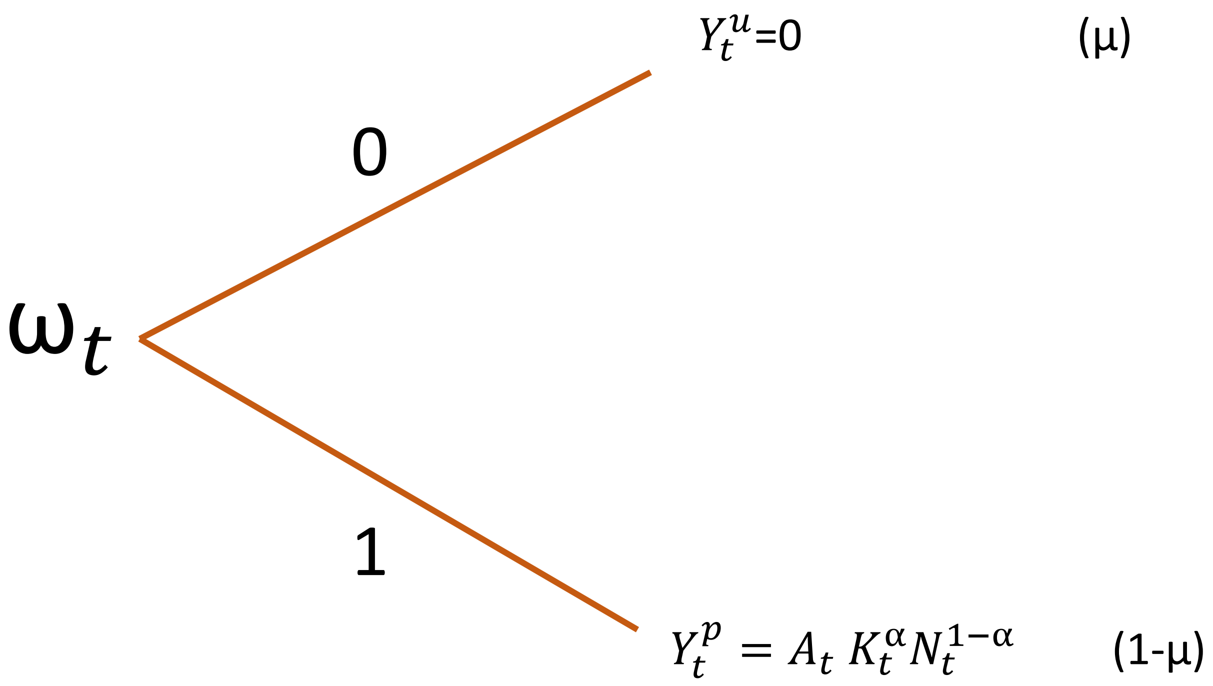
- The HH invest the same amount in each firm so that Qt(j)= Qt=Kt

- A continuum of infinitely–lived retailers: buy intermediate goods, differentiate them, and resell in a monopolistically competitive market. Subject to **nominal price rigidities a la Rotemberg**

- The final good price, identical across varieties, is determined as an expected mark-up of marginal costs

SET UP

Intermediate goods firms with idiosyncratic shocks, ω_t ⇨ heterogeneous firms



Timing. **Financial frictions**: normal times and crises

Period t

the firm is born

$P_{t-1}\ Q_{t-1}$ *receives equity*

$Q_{t-1} = K_t$ *buys capital*

$K_{t-1}(1-\delta) + I_{t-1} = K_t$

realization of A_t *and* $\omega_t(j)$

firm picks N_t

resize $\boldsymbol{K_t}$

$K_t > K_t\ (j)$ *sells K and lends in the credit market*

$K_t < K_t\ (j)$ *buys K and borrows*

sells Y_t^{pc} *and* $K_t(1-\delta)$

sells Y_t^{p} *and* $K_t^{p}(1-\delta)$

pays the loan

- The novelty of the article is in the modelling of the intermediate goods market and the credit market
- Homogenous good produced by heterogeneous firms
  - Heterogeneity results from the idiosyncratic technological shock, ω_t, take the value 0 (μ) or 1 ($1-\mu$)
- Simplicity: any firm leaves one period - just two types of firms

This simplicity comes also from the unproductive being the ones that can default

The calibration of (μ) is key to the quantitative results

Can we see some empirical evidence relating informality with lower productivity?

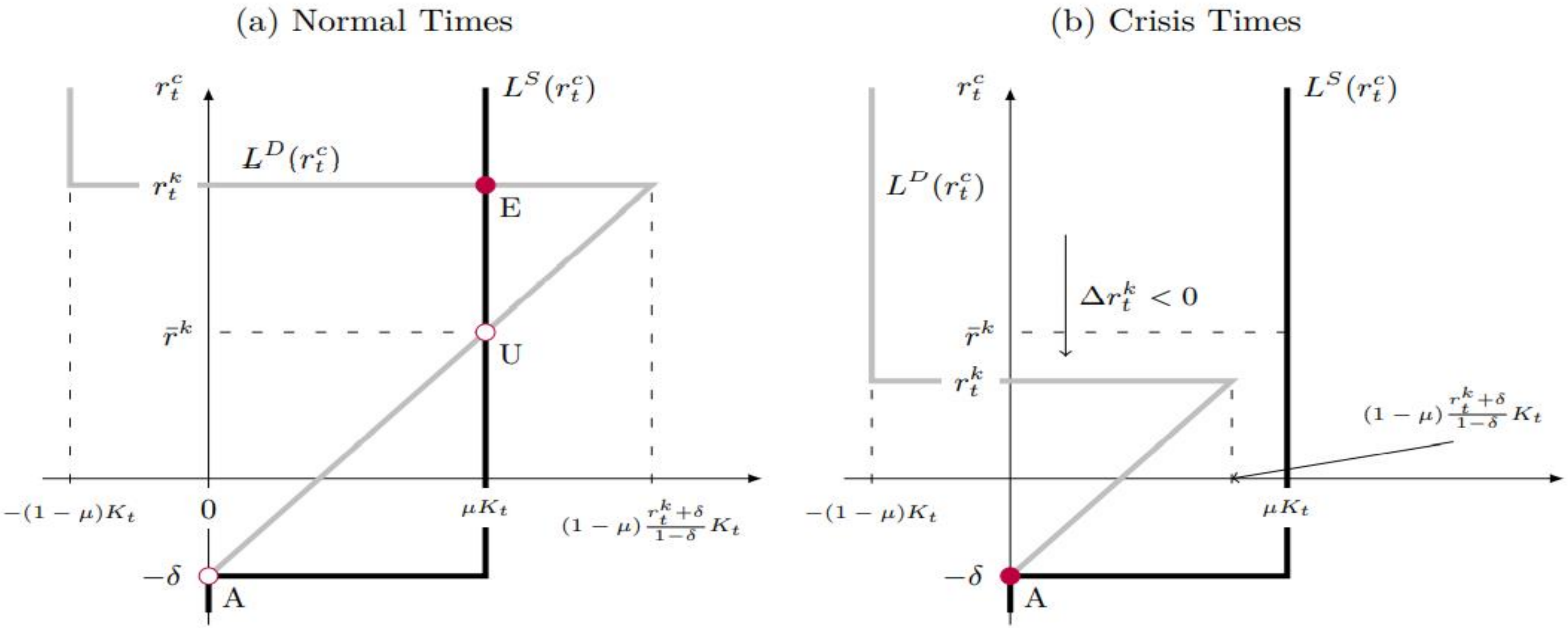
Why a crisis:

Rkbar is min loan rate that give incentive to unproductive to sell K and to lend

- Normal times
  - Rk>Rkbar E selection: allocation of K equals frictionless world

- Crisis times
  - Rk<Rbark no credit market equilibrium (unproductive firms want to buy capital as well as productive ones)
  - A autarcy: misallocation of K, the distribution of K is the ex ante and identical across firms
  - Capital misallocation creates productive inefficiency in the production of the intermediate good. Equivalent to a lower aggregate shock
  - At =At (1 − μ) $(Y_t^p \; - Y_t^{pc}\;)$

Figure 1: Credit Market Equilibrium



Note: This figure illustrates unproductive firms' aggregate supply on the credit market (black) and productive firms' incentive–compatible aggregate credit demand (gray) curves. In Panel (a), the demand curve is associated with a value of r_t^k strictly above $\bar{r}^k$ and multiple equilibria A, E, and U. In this case, U and A are ruled out on the ground that they are unstable (for U) and Pareto–dominated (for A). In Panel (b), the demand curve is associated with a value of r_t^k strictly below $\bar{r}^k$ and A as unique equilibrium. The threshold for the loan rate, $\bar{r}^k$, is constant and corresponds to the minimum incentive–compatible loan rate that is required to ensure that every unproductive firm sells its entire capital stock and lends the proceeds.

Two different types of crises:

- Some due to large adverse aggregate shocks At (1 − μ)

μ should not be countercyclical?

- Others driven by a relatively large period of positive shocks and MP easing. A relative long period of increasing K and declining Rk. A small negative shock leads to the crisis – a capital overhang here a pre–condition for a financial crisis to break. Amplification and persistence

- **Financial frictions and price rigidity** leads to crisis periods with the amplification and increasing persistence of recessions following a technological shock

- Without price stickiness (the same impact that is reported with price stickiness and SIT)
  - The reaction to a technological shock implies a recession deeper in the FB (with no financial frictions and without price stickiness)
  - Higher volatility implies that in a boom capital is high (MPK is low) without price stickiness

How does the degree of price stickiness, togheter with financial frictions, affect the probability of the crisis?

Monetary Policy

- In good times the higher uncertainty increases savings and increase the firms mark-ups in price setting to compensate the stronger break during crisis periods
- Mark-up volatility increases with financial frictions

$$1 + i_t = \frac{1}{\beta}(1+\pi_t)^{\phi_\pi} \left(\frac{Y_t}{\overline{Y}}\right)^{\phi_y}$$

Systematic monetary policy (the existence of an interest rate rule) has an impact in equilibrium

- In the short run (price stickiness and aggregate demand)
- In the medium run (through savings and capital accumulation)
- Systematic reaction to activity : **low ϕy** implies a higher K accumulation and therefore a less resilient economy to technological shocks

Monetary policy

- The bulk of crises in our model are predicted/endogenous
- The best reaction of monetary policy (in the set of Taylor type rules) should be to avoid those or to have a high ϕy
- Crises can be predicted because they follow an investment boom

Why not to test policy rules that include this information (*crisis probability can be used as a reasonable measure of endogeneity*). Reacting to lagged K or lagged I?

And our days?

Monetary policy

Best policy- how to deal with:

- Wedges introduced by **price stickiness**
  - Prices a la Rotemberg create ex–post state contingent mark-ups
  - In this work the ad-hoc productive inefficiency, measured in resources paid by every firm, is transferred back to HH
    - So every (retailer) firm is identical (no price dispersion) and the distortion is in thevintra and the intertemporal margins (like a tax on labor + a tax on capital + lump sum transfers of receipts)
  - With price stability (SIT) mark-ups are zero (after subsidy) and no wedges

- **Financial frictions** create productive inefficiency. Capital misallocation in the financial autarcy equilibrium. The importance of frequency…

Interaction: This last friction implies more volatile mark-ups (large distortions)

Monetary Policy

Two extreme policies: SIT and Back Stop (and Divine Coincidence)

- SIT: $\pi_t = 0$ mark-ups equal 1 Welfare cost= 0.11%
  The deviation from IT: intra and intertempral wedge, but no allocative inefficiency

- Back Stop: $r_t^k \geq r_t^k$ no credit market autarcy Welfare cost= 0.001%
  The financial crisis create an allocative inefficiency

Well known the huge difference in welfare of these two types of distortions:

Still lessons from Diamond- Mirrlees!

If we want to take seriously price rigidity we should introduce relative price dispersion. Also creating allocative innefficiency

How different the results?

Monetary Policy

Why to rely uniquely on MP?

- Include a state contingente firm subsidy

- A second instrument
  - a fiscal instrument
  - not one macro-pru or one unconventional MP

“While monetary policy may not be quite the right tool for the job, it has one important advantage relative to supervision and regulation — namely that it gets in all of the cracks.” (Stein (2013))

But

(Friedman (1967))

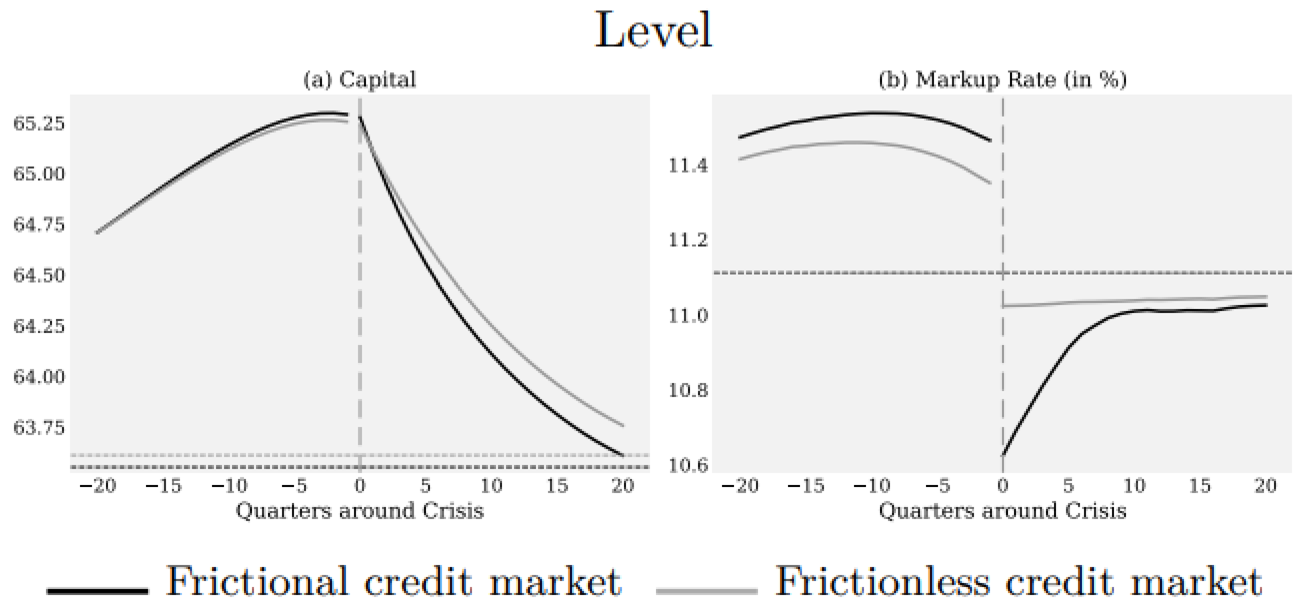
“I fear that, now as then, the pendulum may well have swung too far, that, now as then, we are in danger of assigning to monetary policy a larger role than it can perform, in danger of asking it to accomplish tasks that it cannot achieve, and, as a result, in danger of preventing it from making the contribution that it is capable of making”

Monetary policy interest rate the only instrument

- But restricted to a Taylor type (with diferent reaction parameters to Y)
- Or to SIT a no specified rule that guarantees the π_t=0.
- Back stop: how could be decentralized?
- Target versus rules in a world of unsophisticated agents

Externalities: Quantitative relevant?

Figure 7.4: Savings Glut and Markup Externalities



Note: The horizontal lines correspond to the unconditional average in each economy.

Table 7.3: Economic Performance and Welfare Under Alternative Policy Rules with Both Supp and Demand Shocks

		Frictionless	Frictional credit market				
Rule	ϕ_y	Welfare loss (%)	Welfare loss (%)	Crisis time (%)	Length (quarter)	Output loss (%)	$\mathbb{E}(\pi_t^2)$
SIT	–	0.0000	0.0563	5.03	4.59	-5.60	0.0000
Taylor rules ($\phi_\pi = 1.5$)	0.025	0.0116	0.1575	13.11	1.75	-4.06	0.0006
	0.050	0.0093	0.1407	11.74	1.77	-3.77	0.0014
	0.125	0.0062	0.0994	[8.00]	1.78	-3.20	0.0065
	0.250	0.0064	0.0587	3.93	1.75	-2.71	0.0200
	0.500	0.0126	0.0297	0.46	1.46	-2.10	0.0524
	0.750	0.0203	0.0333	0.04	1.18	-1.53	0.0834

Note: Same statistics as in Table 2.