Discussion of "Money talks" by M. Hoerova, C. Monnet and T. Temzelides

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Context I

- A very nice paper on central bank communication.
- Could be (and, to some extent, is) applied to a hot topic: monetary policy and asset-price bubbles.
- Asset-price bubbles then implicitly defined as a situation where the private sector (PS) ignores the information of the central bank (CB) on productivity.

Context II

- Everybody agrees that two conditions should be met for a monetary policy reaction to a perceived asset-price bubble to be desirable: loosely speaking,
  1. the CB should be sufficiently certain that there is a bubble;
  2. the bubble should be sufficiently sensitive to interest-rate changes.
- The first condition is met in the paper because the CB is assumed to have some private information (see Loisel, Pommeret and Portier, 2009, for a framework where that condition is met without this assumption).

Context III

- The second condition is met in the paper because the only aim of the interest-rate changes is to credibly convey the CB's information to the PS: however large the bubble (*i.e.* the difference between the CB's and the PS's informations), the interest-rate change needed may be small simply because the CB's incentive to lie is small.
- One could even expect (but this would remain to be checked) that the larger the bubble, the smaller the CB's incentive to lie and hence the smaller the interest-rate change needed to eliminate the bubble.

Summary I

- A central bank (CB) and a private sector (PS).
- A productivity parameter θ^2, common to all private agents and uncertain.
- The CB receives a signal about the value of θ, whose *value* y is common knowledge but whose *precision* α is the CB's private information.
- Each private agent receives a signal about the value of θ, whose *precision* is common knowledge but whose *value* is the private agent's private information.

Summary II

- Each private agent i wants to produce a quantity k_i of investment goods as close as possible to the fundamentals θ^2: $k_i = E_i\left\{\theta^2\right\}$ (no beauty contest).
- Because the production cost function is strictly convex, social welfare would be increased if, for a given distance between average(k_i) and θ^2, dispersion(k_i) were reduced.
- Moreover, it seems that, because of non-linear effects (not discussed in the paper), social welfare would be increased if, for a given dispersion(k_i), average(k_i) were increased above θ^2.
- Hence the CB's objective, which is to maximize social welfare, differs from the PS's for two reasons.

Summary III

- Because the CB's objective differs from the PS's, the CB's annoucements about α may be rationally judged non-credible by the PS.
- In the absence of any information considerations, optimal monetary policy does not depend on θ^2 (for simplicity) and consists in the Friedman rule: $r = 0$.
- By setting $r > 0$, which is costly *per se*, the CB may lend credibility to its announcements about α.
- It is found that **the CB raises rates to credibly convey the information that the precision of its signal is low** (whatever the value of this signal).
- This rise in rates need not be large to credibly convey this information (27 bp for their parametrization of the model).

Summary IV

A parallel with Solomon's judgment:

- Objective of the true mother: 1/ keep her child alive; 2/ have her child back.
- She credibly communicates her private information (*i.e.*, that she is the true mother) by showing that she is ready to meet her first objective at the cost of not meeting her second.
- Objective of the central bank: 1/ credibly communicate its private information; 2/ follow the Friedman rule.
- The central bank credibly communicates its private information (*i.e.*, meets its first objective) by showing that it is ready to pay the cost of not meeting its second objective for that.

Motivation I

What is the best illustration: Sweden 2005-2007 or the US 1996-1997?

- "Our model is motivated by events that took place in Sweden during the period 2005-2007".
- But this story is about a house-price bubble, while the model is all about productivity considerations.
- One illustration that may fare better on this ground is that about the Greenspan's Fed in 1996-1997:

  Mr Greenspan did once warn financial markets against "irrational exuberance", in December 1996, when the stockmarket was soaring. The market was jolted briefly, then carried on up.

Motivation II

A few months later Mr Greenspan tried again, this time with a rate rise. According to Mr Greenspan's recent book, at the Fed's rate-setting committee meeting in February 1997 "we agreed that trying to avoid a bubble was consistent with our mission, and that it was our duty to take the chance." In March the Fed put up rates by a quarter of a point, citing worries about inflation (and making no mention of share prices). The Dow Jones slipped by 7% a few weeks later, but roared on again afterwards. Mr Greenspan stopped trying to fight the market: "We looked for other ways to deal with the risk of a bubble. But we did not raise rates any further, and we never tried to rein in stock prices again."

The Economist, "Assets and their liabilities", 18 October 2007.

Motivation III

How the model would interpret these events:

- irrational-exuberance speech: non-credible cheap talk;
- 25-bp hike: costly talk (though the Fed did not explicitly mention its concerns about share prices) that is not coslty enough to be credible. And indeed, for their parametrization of the model, a 27-bp hike is needed.

Interpretation I

What exactly is this α that the CB would like to communicate?

- Assumptions: $\theta \sim U_{(-\infty,+\infty)}$ and the CB receives a signal $y = \theta + \eta$, where $\eta \sim N\left(0, \frac{1}{\alpha}\right)$.
- But the productivity parameter is θ^2, not θ (to ensure that investment is always positive).
- So α affects not only the variance of $E\left\{\theta^2 | y, \alpha\right\}$, but also its value $E\left\{\theta^2 | y, \alpha\right\} = y^2 + \frac{1}{\alpha}$: α **is about both the precision and the value of the CB's signal about θ^2.**
- This complicates the computations and makes α difficult to interpret.
- Would the result be robust to, say, a Normal law for θ^2? (Such that the probability that $\theta^2 < 0$ is negligible.) Computations may be easier!

Interpretation II

Why not announce y instead of α?

- That would be somewhat more intuitive: y **is only about the value of the CB's signal about θ^2.**
- With α public, the CB would probably have an incentive to lie about y (more precisely, to overstate y) because that would be neutral in terms of dispersion(k_i) and beneficial in terms of increasing average(k_i) above θ^2.

Interpretation III

Why is expected social welfare increased by making average(k_i) higher than θ^2, for a given dispersion(k_i)?

- This effect is due to non-linear effects that are not discussed in the paper.
- It would be worth explaining and interpreting this effect in the paper, as it plays a central role in the results obtained.
- Indeed, Proposition 1 says that if the PS always believed the CB's announcement, then the CB would choose to understate α.
- This means that the CB would overstate both the noise around its signal about θ^2 and the value of this signal.
- This implies that the gain in increasing average(k_i) above θ^2 dominates the cost of increasing dispersion(k_i).

Results I

Is the strategy considered for the CB really credible?

- If the PS always believed the CB's announcement, then the CB would always announce $\alpha = \alpha_L$ (cry wolf).
- Therefore an announcement $\alpha = \alpha_H$ seems honest (not cry wolf), an announcement $\alpha = \alpha_L$ seems suspicious (cry wolf).
- This leads the authors to consider the following CB's strategy (S1):
  - set $r = 0$ (not costly) when $\alpha = \alpha_H$;
  - set $r > 0$ (costly) when $\alpha = \alpha_L$.
- Proposition 2 says that this strategy is credible from the point of view of the PS. Is it?

Results II

- Assume that the PS's strategy is:
  - $\widehat{\alpha} = \alpha_H$ when $r = 0$;
  - $\widehat{\alpha} = \alpha_L$ when $r > 0$.
- Then two possible pure strategies for the CB are:
  - (S1) set $r = 0$ when $\alpha = \alpha_H$ (gains: $+$ wrt Friedman rule,$+$ wrt communication) and $r > 0$ when $\alpha = \alpha_L$ (gains: $-$,$+$);
  - (S2) set $r > 0$ when $\alpha = \alpha_H$ (gains: $-$,$++$) and $r = 0$ when $\alpha = \alpha_L$ (gains: $+$,$-$).
- If, as may be the case at first sight, S2 dominates S1 (both when $\alpha = \alpha_H$ and when $\alpha = \alpha_L$, as there is one CB per period), then S1 is not credible.
- This credibility condition doesn't seem to be taken into account in the paper (though the way incentive compatibility constraints are written makes it hard to check this).

Results III

Can the CB credibly communicate both y and α?

- The CB can use r to convey both y and α, with a rule $r(y, \alpha)$.
- In the absence of any credibility considerations, all that is needed is a bijection between $\mathbb{R} \times S_\alpha$ and $\mathbb{R}^+$.
- As they show, such a bijection exists for any finite or countable set S_α.
- But they require that this rule be not only a bijection, but also a homeomorphism: is it with the aim of showing that it enables the CB to credibly communicate its private information?
- However, this rule seems to be designed to satisfy an incentive-compatibility constraint about α, not about y.
- Now, the CB may have the incentive to lie about both y and α (more precisely, overstate y and understate α) because this would enable it to increase average(k_i) and decrease dispersion(k_i) at the same time.