Discussion of Operating Procedures with Ample Reserves

by Alfonso,Kim, Martin, Nosal, Potter

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Casper G. de Vries
Erasmus University Rotterdam

Intro

- Some History
- Current Situation
- Objective Function
- Multiple Equilibria & Ample Reserves
- Quibbles
- Proof
- On the Agenda

History

Poole's & Brainard's analyses

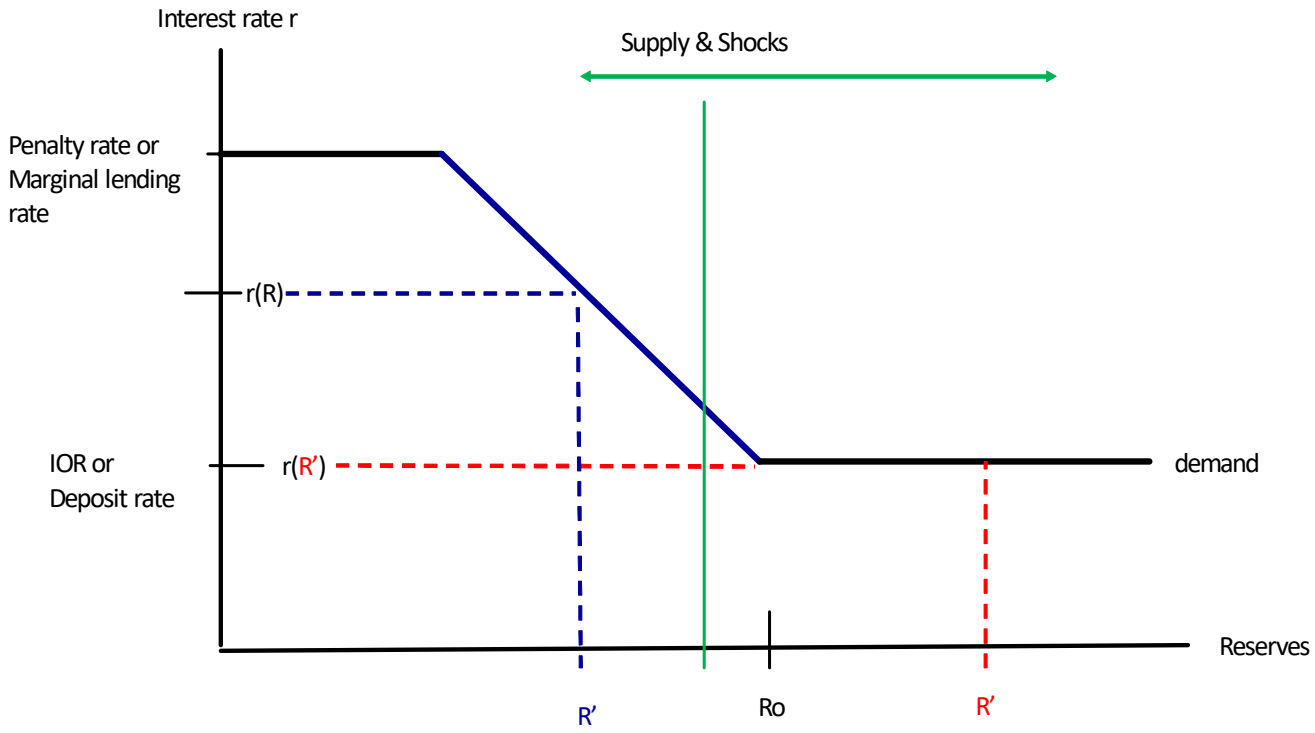
Hold interest rate constant or supply of money (and reserves)?

If money demand disturbances are larger, use the interest rate

Financial innovations made money demand more variable

But in the 1950-1970 period reserves and other constraints like credit ceilings were used to restrain bank leverage. Same holds for e.g. DNB, as it used cash ratios, credit ceilings, required reserves at zero interest and partitioned banks by the type of a bank's activity. These constraints and the longer run objective regarding reserves went by the way-side, but maybe unjustified, since today almost all money is created by commercial banks that are leveraged up to the hill.

Current Situation



Linear Objective Function

$$V = \alpha \times E\big[\text{deviation from target } r(R)\big]$$
$$+ \beta \times E\big[\text{cost of open market operation } x\big]$$
$$+ \gamma R$$
$$= \alpha E[|r(R+s+x) - r(R)|]$$
$$+ \beta E[|x|] + \gamma R$$

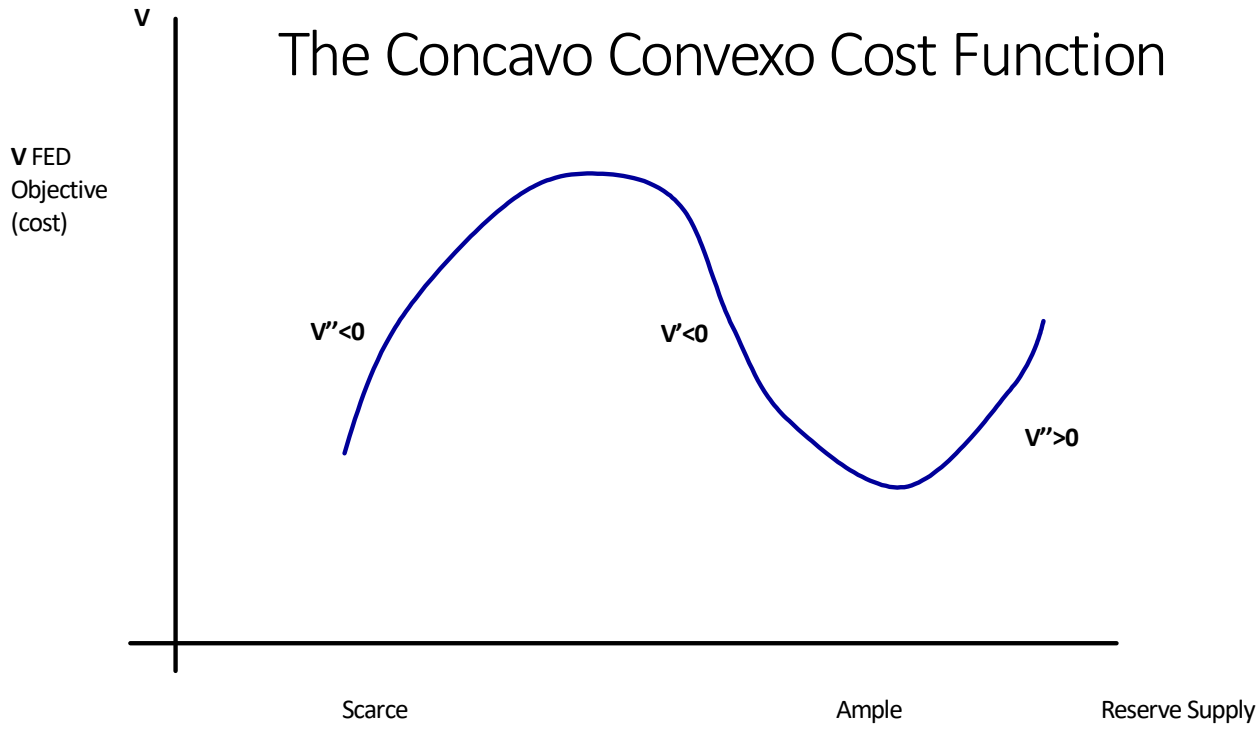
γR reflects size of FED balance sheet

Two questions:

- Given history and leverage of banks, why necessarily $\gamma > 0$?

-For proofs, easier to normalize $\beta = 1$ and leave γ.

Multiple Equilibria & Ample Reserves



Quibbles

1/ Late Day Commercial Bank Shocks u_i after interbank market closure.

Assumed to be uniformly distributed.

But since after closure total amount of reserves are given $\sum_i u_i = 0$.

A late payment of one bank to another keeps reserves constant, only liquidity not available to clear this on interbank market, need to borrow from FED.

But then u_i cannot all be iid uniform as there is this adding up constraint.

Please clarify.

2/ How reasonable is the assumption regarding the normal distribution on supply and demand shocks. Any empirical evidence, or are these skewed etc. in case of e.g. **market turbulence**?

Nice thing is, you don't need this assumption (next slide).

3/ Proofs are not very clean and sometimes confusing. For example, on p.34 it is stated in B-10 that

$$r(y) = r_{IOR} + c_0(R_0 - y)$$

and subsequently for the deviation part of V in B-11

$$\alpha|r(R + s + x) - r(R)|$$

Using the above, I get

$$\alpha|c_0(R_0 - R - s - x) - r(R_0 - R)|$$

$$= \alpha c_0|(-s - x)| = 0$$

as $s = -x$ for $s < R_0 - R$. But in the proof $R_0 - R$ is used (correctly).

Simplify proof

If FED initial choice of reserves R is in the flat portion where $r(R) = r_{IOR}$, there is no deviation from the target, so first part of $V = 0$, remains

$V = \beta \times \left(\text{cost of open market operation}\right) + \gamma R$

Analytically

$$V(R) = \beta \int_{-\infty}^{R_0 - R} (R_0 - R - s) f(s) ds + \gamma R$$

where $f(s)$is the density of the supply shock s.

Differentiating once (b-19 on p. 36) gives (apply Leibiniz' rule)

$$V'(R) = -\beta \int_{-\infty}^{R_0 - R} f(s) ds + \gamma$$

Differentiate again, get what you want

$$V''(R) = \beta f(s) > 0$$

Holds for any density. No assumption of normality required!

This also flies for the other parts of the proof of Proposition 1.

Furthermore, I don’t think one should make the (technical) assumptions A1-3, but just point out that one may loose concavo-convexity if one of these do not apply. Otherwise it comes across as being rigged. It is in fact also interesting that there maybe just one equilibrium. This leaves more room for alternatives against which one can test empirically.

Can also allow $\gamma < 0$ and may be normalize $\beta = 1$ to streamline proof.

On the Agenda

Face the data rigorously!

Think about how to reject this theory and formulate interesting H0 and H1 hypotheses.

Look forward to the empirical evaluation!