Picking Up Nickels in Front of the Steamroller: A Simple and Partial Finger Exercise

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Modeling Monetary Accommodation:

Begin with the assumption that there is an Okun gap: a shortfall of aggregate demand producing mass unemployment. In order to fight this Okun gap, the central bank is going to lower its policy rate r and follow an accommodative monetary policy for some period of time. For simplicity, assume that the amount of time that accommodative policy will be followed is stochastic, and that the end of accommodation follows a Poisson distribution: at every moment in which accommodation is still in force, the expected duration of accommodation is a variable π, which the central bank chooses: π is the index of how accommodative it is willing to make monetary policy.

Accommodative policy closes the Okun gap to some extent, and has benefits. It also has costs—it makes it cheap for financiers to borrow and speculate, and so deranges asset prices. As Michael Mussa wrote nearly six years ago:

> Policy interest rates are exceptionally low in most industrial countries.... The very low level... reflects exceptionally easy monetary policies to combat economic weakness. This policy imbalance poses an important challenge... these situations tend to be associated with high valuations of equities, real estate, and long-term bonds, which can become fertile ground for large, unsustainable increases in asset prices.... [I]f monetary policy remains too easy for too long... large asset price anomalies may develop.... The monetary authority would then confront the grim choice of trying to keep an unsustainable asset price bubble alive or trying to combat the collapse of such a bubble without a great deal of room for monetary easing...

Now let us see if we can make any progress by modeling these considerations.

Modeling a "Carry Trade" Bubble:

We will model financial markets with one single asset: a consol paying a coupon δ. Asset prices will be set by risk-neutral speculators who can borrow at the short-term policy rate r set by the central bank. Again for simplicity, assume that r is set at 0 for the unknown time during which monetary accommodation is in place, and then rises back to a normal value which we will set at δ in order to give our consols a long-run fundamental value of one.

The fundamental value of a consol before and after the period of monetary accommodation is then:

(1) $p = 1$

The fundamental value of a consol during the period of monetary accommodation is then

(2) $p = 1 + \delta\pi$

Risk-neutral speculators collect δ in yield per unit of time on each consol they hold, and run an instantaneous probability $1/\pi$ of a $\delta\pi$ capital loss

should accommodation come to an end and the cost of capital to speculators revert to normal.

Now let us complicate things. Each speculator believes:

- there is a believed probability θ of bailed out as too-big-to-fail in the event of the end of accommodation and an asset price crash;
- there is a probability ϕ of inside information or order flow signal that the crash is coming in time to avoid losses.

Hence each speculator calculates that the capital loss is (1-θ– ϕ)(p-1) with instantaneous probability π, which must be set against the flow yield gain of δ from holding a consol. Thus the price of consols will be not p = 1 + δπ, but will instead be:

$$(3) \qquad p = 1 + \frac{\delta\pi}{(1 - \phi - \theta)}$$

Prices are thus above fundamentals—and when accommodation ends we have an asset price crash, both because the end of accommodation is a downward fundamental shock to asset prices, and because prices were above and now come crashing down to fundamentals.

Note the symmetry: irrational exuberance on the part of investors has the same effect on asset prices during the bubble as does the expectation of a government bailout. The differences between the two come later: (a) An ex post bailout reduces the size of the crash, but there is corresponding factor when irrational exuberance comes to an end. (b) An ex post bailout costs the government money.

The Social Welfare Function:

There are costs and benefits from responding to the emergence of an Okun gap by embarking on a policy of monetary accommodation that will then lead to an asset-market crash.

Model the benefit of embarking on a policy of monetary accommodation as a flow gain: as a result of the reduced Okun gap, you gain an amount proportional by some multiplier μ to the degree of monetary accommodation δ for the period π that accommodation is expected to last. Thus the gain will be:

(4) $\mu\delta\pi$

However, there is also the cost of a crash, which will be some parameter α times the square of the magnitude of the asset-price crash. If the government bails out a fraction θ^* of the decline, then the financial distress-induced costs of the crash are:

(5) $$\alpha\left(\frac{(1-\theta^*)\delta\pi}{(1-\phi-\theta)}\right)^2$$

In addition, a bailout is expensive: the cost to the Treasury is the transfer:

(6) $\theta*\delta\pi$

and even though the transfer is simply a redistribution away from taxpayers we count its entire cost as waste: the beneficiaries, after all, are feckless financiers. The net social welfare effect of monetary accommodation is then the difference between the gain (4) and the sum of the two costs (5) and (6):

(7) $$\mu\delta\pi-\alpha\left(\frac{(1-\theta^*)\delta\pi}{(1-\phi-\theta)}\right)^2-\theta^*\delta\pi=(\mu-\theta^*)\delta\pi-\alpha\left(\frac{(1-\theta^*)\delta\pi}{(1-\phi-\theta)}\right)^2$$

Assessment:

We have now six quantities to consider:

- the amount of accommodation $\delta\pi$;
- the monetary-financial multiplier μ that gives us the output and employment benefit of accommodation;
- the parameter α that governs the financial fragility of the economy;
- the true size θ^* of the bailouts;
- speculators' *ex ante* estimate θ of the probability of a bailout;
- speculators' *ex ante* estimate ϕ of the probability that they will receive inside or order-flow information and sell before the crash, and thus succeed in picking up nickels without being squashed by the steamroller.

There is no strong reason to believe *ex ante* that the speculators' expectations will match reality: that ϕ must equal zero or that θ must equal θ^*. Bubble collapses are rare events, and are ruled by the logic of: "this time it's different," after all. Overoptimists are much more likely to put their money where there mind is than are people with correct expectations of their skill and information.

From our social welfare function we can immediately derive the optimal amount of monetary accommodation:

$$\delta\pi = \frac{(\mu - \theta^*)(1 - \phi - \theta)^2}{2\alpha(1 - \theta^*)^2} \tag{8}$$

and for the value of our maximized social welfare function:

$$SWF = \frac{(\mu - \theta^*)^2(1 - \phi - \theta)^2}{4\alpha(1 - \theta^*)^2} \tag{9}$$

What can we say about this?

First, let's consider the case in which traders are not overoptimistic—in which $\phi=0$—and in which speculators have correct anticipations of a bailout. Then (8) reduces to:

(10) $$\delta\pi = \frac{(\mu - \theta^*)}{2\alpha}$$

asset prices during the accommodation period are:

(11) $$p = 1 + \frac{\delta\pi}{(1-\theta)}$$

and our social welfare function is:

(12) (9) $$SWF = \frac{(\mu - \theta^*)^2}{4\alpha}$$

With correct anticipations of bailouts, raising the size of the bailout does not reduce the crash—it simply raises the extent to which asset prices rise above fundamentals. Since correctly-anticipated bailouts are costly to the Treasury, they are thus unambiguously bad things: simply not worth doing.

And the greater the amount of correctly-anticipated bailouts, the smaller is the desired amount of monetary accommodation.

This is as Charles Kindleberger says: nobody would wish to "contravert" the claim that the:

> presence of a lender of last resort weakens the self-reliance of the banking system and increases its likelihood of falling into excesses of overtrading, revulsion, and discredit... [an argument that] has overtones... that there is no use providing the poor with housing since they will only keep coal in the bathtub...

And as long as by firmly committing *ex ante* to not providing bailouts *ex post* one can minimize the size of the overvaluation, that is the best policy to pursue.

Allergy to bailouts and fear of accommodation when bailouts are likely are reinforced whenever speculators are overoptimistic. When speculators are overoptimistic, bailouts are much worse: not only do speculators expect the government to bail them out, they also expect to get out ahead of the crowed. As a result their (irrational) tolerance for risk reaches absurd heights, and the size of the bubble grows—increasing the damage to the economy that its eventual crash will produce. In an economy with correctly-anticipated bailouts and overoptimism, the room for constructive monetary accommodation is small indeed.

This does not, however, mean that no-bailouts is best. A no-bailout policy produces (10') through (12'):

$$(10') \quad \delta\pi = \frac{\mu}{2\alpha}\left(\frac{1}{(1-\phi-\theta)}\right)^2$$

$$(11') \quad p = 1 + \frac{\delta\pi}{(1-\phi-\theta)}$$

$$(12') \quad SWF = \frac{(\mu)^2(1-\phi-\theta)^2}{4\alpha}$$

It is very bad to have speculators anticipate *ex ante* that there will be bailouts, yet not to provide them *ex post*. Much worse than a government that creates the expectation of bailouts and then validates that expectation is one that creates the expectation of bailouts and then does not validate that expectation.

And, of course, a government that can provide a bailout *ex post* that was not anticipated *ex ante* blessed. It doesn't magnify the problem ex ante, yet it reduces the size of the crisis ex post. But it is doubtful that this can be done. As Charlie Kindleberger wrote, economic policy under such circumstances "is an art." The rescuer of the system, the "lender of last resort":

> should exist... but his presence should be doubted.... This is a neat trick: always come to the rescue in order to prevent needless deflation, but always leave it uncertain whether rescue will arrive in time or at all, so as to instill caution in other speculators, banks, cities, or countries.... some sleight of hand, some trick with mirrors... because monetarist fundamentalism has such unhappy consequences for the economic system...

In that (unlikely) case, our equations become:

$$(10'') \quad \delta\pi = \frac{(\mu - \theta^*)(1-\phi)^2}{2\alpha(1-\theta^*)^2}$$

$$(11'') \quad p = 1 + \frac{\delta\pi}{(1-\phi)}$$

$$(12'') \quad SWF = \frac{(\mu - \theta^*)^2(1-\phi)^2}{4\alpha(1-\theta^*)^2}$$

Conclusion:

In this finger exercise with "overoptimism," Michael Mussa is right: monetary accommodation is to be feared, and to be entered into gingerly, hesitantly, and partially. The more speculators *ex ante* expect bailouts and the more speculators are impressed with their own cleverness, the more hesitant should the central bank be about providing monetary accommodation.

William McChesney Martin said that the job of the Federal Reserve was to take away the punchbowl before the party got rolling. Alan Greenspan thought that as long as there was an Okun gap and no sign of inflation the Federal Reserve should spike the punchbowl with the grain alcohol of low interest rates because it could, if necessary, serve as designated driver to get everybody home safely. In this finger exercise it is William

McChesney Martin and Michael Mussa who are right. And how right they are depends on the vulnerability of the market—on speculators' expectations of rescue (the "Greenspan put") and on speculators' confidence in their own expertise.

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