Discussion of Pierpaolo Benigno and Luca Antonio Ricci "The Inflation-Unemployment Trade-off at Low Inflation"

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Summary

- This is an important paper, that had to be written; substantiating a claim of Tobin (1972).
- Very elegant and relatively parsimonious.
- Main contribution threefold:

1. Downward rigidity without sectoral asymmetries;

   -The little literature tackling this subject: multiple sectors, relative wage adjustments are key. Keynes (?)

2. Phillips curve flatter at low inflation
3. Size of tradeoff increases with macro volatility (i.e. nominal spending)

- Recipe for Phillips curve:

1. Model where money is not superneutral, so money growth rate θ influences $L_{\infty} = f(\theta);$
2. Make money growth equal to mean inflation rate. E.g. $M\,(= PC) = WL$, no growth in hours (KPR preferences)$\longrightarrow E[\pi_{\infty}] = \theta$

This paper's recipe

- Money is not neutral (and not superneutral), so $L = f(M), E[L_\infty] = E[f(M)]$.
- Money follows a Geometric Brownian motion (its log follows a Brownian motion with drift).
- Hours are bounded above (so they will follow a Brownian motion with barrier).
- Apply Ito's Lemma, $E[L_\infty]$ will depend on expected value of money growth θ, while location/size of tradeoff depends on variability of σ_M^2.
- Very rich set of testable implications: how does tradeoff depend on level of inflation and volatility of nominak shocks, over time and across countries.

More existing literature

- Sticky prices/wages and trend inflation/money growth: Ascari (1998, 2000, staggered wage setting), Devereux and Yetman (2002, endogenous frequency of adjustment), Graham and Snower (2003, both).

- In that literature too, at high levels of inflation tradeoff becomes negligible.

- When frequency of price adjustment is endogenized (Romer, Ball and Romer), probability of adjusting price is increasing with the level of trend inflation. This induces a non-monotonicity in the Phillips Curve: Output increases at low trend inflation rates, but starts falling after a certain threshold. At very high inflation nothing happens. Similar to Akerlof et al's 'Near-rational' model.

- Moreover, in those models and in any model featuring a long-run tradeoff (e.g. Calvo, Rotemberg)! one would get dependence upon volatility if one made the same distributional assumption (i.e. unit root log of money/expenditure with drift and lognormal shocks) and looked at a stochastic steady-state, or take second-order Taylor expansion.

- generally, I wish the paper did more in terms of comparing and contrasting its findings with a (comparable) standard, symmetric rigidities model. This would only make the paper stronger. More even parsimony would also help (no role for monopolistic competition in goods markets, or for technology shocks -see below).

Trying to understand this paper: two analogies

How do P. Benigno and Ricci introduce non-(super)neutrality?

-Households set nominal wage under $dW_t(j) \geq 0$. State-dependent model of nominal rigidity.

- One state (productivity) does not matter at all. Explanation: income and substitution effects of real wage on labor supply cancel out (even if we had downward-sloping labor demand). Realistic for employment???

Related: Christina Romer has shown that the growth rate of output/employment is also significant for Phillips curve estimation.

- What about the other state? (money, or nominal spending)

Analogy 1: Option value and 'bad news'

Household chooses a wage lower than the unconstrained case; the difference is the value of a (call) option to adjust wage tomorrow.

'Bad news principle' (Bernake, 1983, p. 91): " Given the current return, the willingness to invest in the current period depends only on the severity of bad news that may arrive. Just how good is the potential future good news for the investment does not matter at all "

All 'action' comes from expected adverse shocks.

'Proof': Long-run tradeoff higher at low trend inflation rates and higher volatility of money growth shocks (probability of 'bad news' is higher). At high trend inflation and low volatility tradeoff disappears (so probability of 'bad news' goes to zero).

How plausible is ’bad news’? Does it matter?

Analogy 2: Precautionary saving and liquidity constraints (’prudence’):

Precautionary wage setting because a slightly lower wage increase today makes it less likely that constraint will bind tomorrow.

What matters is the possibility that constraint may bind, even though evidence may suggest that the constraint did not effectively bind.

In a sense, this is similar to the role of liquidity constraints for precautionary savings (Carroll and Kimball): having a potentially binding constraint induces concavity around the point where constraint may bind. That is why this mechanism applies even when utility is linear (infinite Frisch elasticity).

- This argument (that in this framework it is the possibility that constraint may bind, rather than its actual being binding) could help the authors address the main criticism of downward-rigidity models: survey data shows that agents oppose wage cuts, but this is gathered in a world without positive inflation. In a zero-inflation world, agents would be less opposed to wage cuts.

Where the paper could do more

1. Too tight a link between inflation rate and nominal spending growth. Wage-setting mechanism affects employment only, but long-run inflation is pinned down by nominal spending (money) growth.

2. Constraint too restrictive: Akerlof et al (wage-setters accept wage cuts in distress); Ball and Mankiw: constraint less likely to bind at low trend inflation rates.

P. Benigno and Ricci's extension:

$$d \ln W > k_2 \theta - k_1 = k_2 E \left[\pi_\infty \right] - k_1$$

- Constraint more likely to bind at high inflation rates.
- Need to impose a constraint that becomes endogenously less likely to bind at low inflation rates (Lagrange multiplier tends to zero as trend inflation tends to zero).
- Conclusions crucially depend on this. Extreme example: Ball and Mankiw: menu cost generates endogenous asymmetry, but optimal rate of inflation is zero.
- Idea - pay adjustment cost to adjust wage. For good shocks, trend inflation would do the job, and no need to pay the cost. For bad shocks, would need to pay the cost.
- Dealing with this may help to overcome the circularity of this argument for explaining the Great Depression. That episode is often cited as evidence for a Phillips curve. But nominal wages fell by 17 percent! (contradicting the baseline assumption of complete irreversibility).

In the data, constraint is less likely to bind in very bad times, but it is such a scenario that matters ultimately to generate option value considerations. A constraint that would let wages fall in bad times and still generate the tradeoff would overcome that criticism.

3. Extensive versus intensive margins.

- 'Unemployment' is leisure, all discussion can be cast in terms of optimal choices: Too little effort and output occurs because household 'buys' too much leisure - a relatively cheaper good, since there is a markup on consumption and a negative markup on leisure (a positive wage markup). (Bilbiie, Ghironi, Melitz 2007c).

- Add irreversibility constraint: the relative price of leisure (wage) is lower, so a gap opens with more leisure and less labor and consumption.

Tobin (1972): "First, an observed amount of unemployment is not revealed to be voluntary simply by the fact that money wage rates are constant, or rising, or even accelerating [...] faster inflation can diminish involuntary, disequilibrium unemployment, even though voluntary, equilibrium labor supply is entirely free of money illusion"

"In the new microeconomics of labor markets and inflation, the principal activity whose marginal value sets the reservation price of employment is job search. It is not pure leisure, for in principle persons who choose that option are not reported as unemployed; however, there may be a leisure component in job seeking."

- Why extensive margin would make a difference: the unemployed would take jobs at the posted wage. l_t would go down, but N_t would go up.

$$L_t = N_t l_t$$

- Model extensive margin, or cast paper in terms of output gap.

Business cycle implications:

- Calibration of continuous-time model using quarterly data? Length of time period matters (Hintermeier 2004). One instance of this: Taylor principle with capital accummulation (Dupor 2001 vs. Carlstrom and Fuerst). See Campbell et al (JEDC 2005) for a method to calibrate a (portfolio-decision) continuous-time model based on quarterly data.
- Asymmetric business cycles? Recessions versus booms.
- Welfare considerations - costs of fluctuations: Lucas conjectured that costs from variability are negligible. Is this the case here?
- It is only fair to ask a model of the labor market its implications in terms of real wage cyclicality. It seems that this model can have less procyclical real wage (than a flex-wage model) without implying countercyclical real wages (like the fixed-wage model).

Conclusion

- A very useful and elegant step in the direction of understanding long-run Phillips curves
- Could do more in terms of:

- contrasting with comparable frameworks
- endogenizing inflation
- modelling extensive margin to talk about unemployment
- addressing the ’Lucas critique’ that applies when using an assumption (irreversibility) that is less likely to bind in the parameter region for which the result is obtained (low trend inflation).