COMMENT BY

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On

"EULER EQUATIONS AND MONEY MARKET INTEREST RATES: A CHALLENGE FOR MONETARY POLICY MODELS"

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THE PROBLEM

FACT: The empirical literature shows that an increase in the real federal funds rate by the Fed that persists for several quarters is associated with slower growth or an outright decline of real GDP and consumption.

PUZZLE: It is difficult to reconcile that empirical finding with models that incorporate a standard consumption Euler equation in which planned consumption growth is positively related to the expected real interest rate over the planning horizon.

The authors point out that this *appears to be a gross empirical failure* of the Euler equation: high real interest rates ought to be associated with relatively rapid consumption growth and low real interest rates ought to be associated with relatively slow consumption growth.

The problem is illustrated most clearly during the Volcker disinflation in the early 1980s when the Fed maintained an extraordinarily high 9 percent real funds rate during most of the 1981-82 recession while the unemployment rate rose from 7 to 10 percent, and real GDP and consumption declined.

The authors argue convincingly that various alternative specifications of preferences can not make the data consistent with an Euler equation.

GO/STOP MONETARY POLICY[2]

Until the Volcker disinflation in the1980s the Fed pursued **go/stop** monetary policy.

The Fed was inclined to pursue an objective for unemployment by maintaining low real short term interest rates until rising inflation

[2] See Goodfriend (2003).

became a problem. Only then were real short rates raised to create an output gap to fight inflation. As unemployment worsened and inflation stabilized, the Fed would eventually move short real rates sharply lower to bring unemployment down.

Numerous go/stop cycles occurred between the 1950s and the early 1990s. Not until the Volcker disinflation did the Fed reverse the rising inflation trend and begin to secure credibility for low inflation.

Note that the Fed's credibility for low inflation was far from secure even *after* the Volcker Fed brought the inflation rate down from over 10 percent to around 4 percent in 1982. Even though inflation remained low thereafter, an inflation scare briefly took the 30 year government bond rate back up to nearly 15 percent in the summer of 1984.

More go and stop phases of monetary policy seemed likely for a while even after the Volcker disinflation.

MY PROPOSED RECONCILIATION

The extreme go/stop monetary policy behavior sketched above can potentially reconcile the observed negative relationship between real interest rates and subsequent consumption growth with the positive theoretical relationship between real interest rates and planned consumption growth required by the Euler equation.

Let me sketch the argument….

The Economic Structure is This

1) Planned consumption growth is relatively insensitive to the behavior of short term real interest rates over the business cycle.

2) The leverage that monetary policy exerts over aggregate demand works mainly through the interest sensitivity of investment in producer and consumer durable goods, through a wealth effect associated with perceived permanent income, and a net worth effect on the external finance premium in asset markets.

3) According to the New Neoclassical Synthesis (NNS) and the New Keynesian sticky price models for analyzing monetary policy, inflation is negatively related to expected future output gaps, ie, markups.[3]

4) In these frameworks, rising inflation is caused by significant markup compression (relative to the profit maximizing markup) that is expected to persist.

[3] The reasoning sketched here about how inflation behaves and how monetary policy works in NNS models is exposited fully in Goodfriend (2002).

5) According to NNS models, expected persistent, significantly compressed markups act like a tax cut to raise expected future economic activity (relative to potential output) with a significant effect on the level of wealth or permanent income, and thus on planned consumption.

<u>Go/Stop Monetary Policy Works Like This</u>

1) Low short term real rates in the “go” policy phase compress the markup tax, expand economic activity relative to potential output, reduce unemployment, and create rising inflation.

2) High short term real rates in the “stop” policy phase expand the markup tax, contract economic activity relative to potential output, raise unemployment, and stabilize or possibly reverse rising inflation.

3) Go/stop monetary policy can be thought of as driven by a two-state stochastic process in which the probability of continuing in the same state (go or stop) is between ½ and 1.[4]

4) So there is persistence of go or stop states with a stochastic possibility of switching from one policy phase to another…depending on relative behavior of inflation and unemployment and the political economy of monetary policy.

Household Consumption Behaves as Follows

1) Household consumption plans are geared to permanent income, which is an **average** of relatively high income generated in the "go" policy state and relatively low income generated in the "stop" state.

[4] What I have in mind is an empirical framework like the one presented and analyzed in Hamilton (1989).

2) Each *realized continuation* of the "go" state involves an *upward revision* of permanent income, which is reflected in an upward adjustment of consumption.

3) And each *realized continuation* of the "stop" state involves a *downward revision* of permanent income, which is reflected in a downward adjustment of consumption.

4) It follows that consumption will be negatively correlated with lagged real short rates.

5) A series of low real short rates in the "go" state will generate a cumulative increase in consumption due to the associated series of favorable upward revisions in permanent income that occur as the "go" state continues.

6) Likewise, a series of high real short rates in the “stop” policy state will generate a cumulative decrease in consumption due to the associated series of downward revisions of permanent income that occur as the “stop” state continues.

7) Also, consumption falls sharply when policy switches from the “go” to the “stop” state to fight inflation…and consumption rises sharply when policy switches from the “stop” to the “go” state to bring unemployment down.

THE BOTTOM LINE

Conditional on remaining in the low-interest “go” (or the high-interest “stop”) state for a while, one can generate persistent positive (or negative) consumption growth, essentially due to serially correlated errors in forecasting permanent income.

In principle, such outcomes are entirely consistent with an underlying Euler equation in which planned consumption growth is positively related to the real interest rate, especially if consumption growth is relatively insensitive to the short term real interest rate over the business cycle.

We started off wondering how household behavior consistent with an underlying consumption Euler equation could be consistent with…

FACT: The empirical literature shows that an increase in the real federal funds rate by the Fed that persists for several quarters is associated with slower growth or an outright decline of real GDP and consumption.

I proposed a potential reconciliation by exploring the implications of go/stop monetary policy for the time series correlation of real short term interest rates

and consumption within an NNS sticky price macromodel.

TESTABLE IMPLICATION

According to my proposed reconciliation, the empirical FACT is regime dependent. The NNS model predicts that if the Fed stabilizes inflation, it also stabilizes the markup and makes the NNS model behave like an RBC model. Then there is no go/stop monetary policy. In principle, the Fed then makes the short term real interest rate conform *better* to expected consumption growth according to an Euler equation, that is, with less serial correlation in forecast errors. If the business cycle fundamentally involves two distinct (expansion and contraction) states, however, such "peso problems" with respect to the Euler equation may continue to persist in the data.

REFERENCES

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