

Real-time data and the Taylor rule

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Abstract

Orphanides' finding that the data available at the time change the verdict on the 1970s, and what it means for judging policy today.

Everything in The Taylor rule is computed from data. The data that exist today for, say, 1975 are not the data the Federal Open Market Committee saw in 1975. GDP is revised for years, and estimates of *potential* output are revised for decades. Athanasios Orphanides showed that this changes the history of monetary policy (Orphanides, 2001).

The experiment

Orphanides rebuilt the Taylor-rule prescription using only the information available at each meeting: the inflation and output-gap estimates in the Fed staff's briefing documents, not the revised series in today's databases. Two results stand out.

- With **real-time** data the rule tracks actual Fed policy in the 1970s much more closely than with revised data. The Fed of the 1970s looks, by its own lights, roughly like a Taylor-rule follower.
- The reason is the output gap. In real time the staff believed that the economy was operating far below potential for most of the decade, so the rule prescribed low rates. Later revisions lowered the estimate of potential, and with it the gap; the same rule computed on revised data prescribes much higher rates.

Example 1 (Orders of magnitude). Real-time estimates of the US output gap in the mid-1970s were more negative than today's estimates by amounts of the order of several percentage points. With a coefficient of 0.5 on the gap, a mismeasurement of 4 points moves the rule prescription by 2 percentage points; with the balanced-approach coefficient of 1.0 it moves it by 4.

The conclusion is not that the 1970s inflation was an accident. It is that a large part of the policy error was a measurement error about potential output, compounded by the productivity slowdown that was not recognised until later, and that the estimated shift in the inflation response after 1979 reported by Clarida, Galí and Gertler is smaller once real-time data are used (Clarida et al., 2000; Orphanides, 2003).

The same problem, thirty years later

The debate about whether Fed policy was too loose in 2002–2006 replayed the argument. Taylor argued that the funds rate sat well below the rule's prescription and that this fed the housing boom (Taylor, 2007). Bernanke replied that with the data and forecasts available at the time, and with forecast inflation rather than realised inflation in the rule, the deviation was small (Bernanke, 2010). Both computed a Taylor rule; they disagreed about the inputs.

Implications for anyone computing a rule

1. **State the vintage.** A prescription computed from today's data is a statement about what policy *should have been*, not about what the central bank could have known.

2. **Prefer inputs that are revised less.** Inflation is revised little; output gaps are revised a lot. This is one argument for rules with a larger weight on inflation and for the first-difference rules in Variants of the Taylor rule.
3. **Show the range.** Report the prescription under two or three gap estimates, for example the central bank's own, the OECD's and a statistical filter, rather than one number.
4. **Treat r^* the same way.** The natural rate of interest is revised as heavily as the gap, and its revisions move the prescription one for one.

Real-time databases now exist for exactly this purpose: the Federal Reserve Bank of Philadelphia's *Real-Time Data Set for Macroeconomists* and the ECB's real-time database make the vintages available, so the experiment can be repeated for later periods and other economies.

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