

## Lecture 18: An Historic Analysis of Monetary Policy Rules

### I. OVERVIEW

- Recall that the three primary areas of applications of monetary policy rules in the literature are
  1. Examining how different Taylor type rules perform in a macroeconomic model.
  2. Examining the historical conduct of monetary policy in an economy, using a Taylor Rule to identify the behavior of different policy regimes.
  3. Estimating Taylor-type rules that describe the monetary policy maker's behavior in different countries.
- Today's paper falls into the second category: it is a paper by John Taylor that examines the conduct of monetary policy by U.S. monetary policy makers, starting in the period prior to the establishment of the Fed.
- By using the Taylor Rule as a baseline policy, we are able to characterize policy in one period relative to another and identify potential impact of policy on the macroeconomy. For example, what kind of monetary policy did the Federal Reserve follow in the 1970s when compared to the 1990s? Can we find that policy differences are potential explanations for the adverse economic performance of the 1970s, above and beyond the negative oil price shocks?

### II. INTRODUCTION TO THE TAYLOR PAPER

- Taylor argues that the "historical approach" to studying monetary policy is an important one. The model based approach, as exemplified by the Rudebusch/Svensson paper, is vulnerable to the problem that policy rules that seem to work well in one model are often unsuccessful in the context of another model. This makes the results from such models, limited in their practical usefulness.
- Taylor instead argues that examining different policy regimes over time, using a monetary policy rule, can provide useful information. First, we can identify when policy shifts occurred, i.e. compare the reaction coefficients of the monetary policy rule under different policy makers. Second, we can try to see if the characterization of different policy regimes broadly conforms with the macroeconomic performance of the economy.
- So the specific research agenda of Taylor is to estimate reaction functions for three different periods in U.S. history: the period of the gold standard (1880-1914), the terms of Arthur Burns and William McChesney-Martin (1955-1978), and the terms of Paul Volcker and Alan Greenspan (1979 to date). For each period, Taylor estimates reaction coefficients on output and inflation.

- Finally, Taylor tries to look for a relationship between the policy rule and the macroeconomic performance of the economy. In particular Taylor compares the interest rate set by each policy maker to what the interest rate would have been had policy been set according to a Taylor Rule. Finally, Taylor identifies several episodes that he characterizes as policy mistakes: instances when the interest rate diverges from the value predicted by the policy rule.
- The results from Taylor show that the gold standard can be characterized as a period where the monetary policy maker was extremely passive: interest rates were adjusted only by very small amounts in response to movements in inflation and output gap. The period when McChesney-Martin and Burns were in power was characterized by policy that was more active than the gold standard period. However, the reaction coefficients were not what we consider to be characteristic of good policy: namely interest rates go up by less than the increase in inflation, leading to a decline in real rates in the face of rising inflation. Finally, the period of Volcker and Greenspan tends to be much closer to what we now consider to be good policy: involving very active reaction to inflation and output fluctuations.
- Taylor also shows that the macroeconomic performances of the three periods conform with the behavior of monetary policy makers: the economy was very volatile during the period of the gold standard, characterized by high inflation during the period of Burns, declining inflation during the period of Volcker and stability during the period of Greenspan.
- Taylor tackles the concern that the link between the behavior of policy and the macroeconomic outcomes may reflect reverse causality: namely that greater stability makes it easy for the policy maker to follow the Taylor Rule. Taylor provides some evidence, albeit anecdotal, that shows the evolution of the reaction functions of the policy maker as reflecting the learning process of the Fed. Basically, Taylor claims that the Fed noticed the link between a policy rule with low reaction coefficients and adverse macroeconomic performance and used this knowledge to fine-tune their policy rule.
- Finally, the three policy mistakes identified by Taylor were the periods of monetary policy that was “too tight” in the early 1960s, the periods of “too easy” monetary policy and high inflation in the late 1960s and the 1970s and the “too tight” monetary policy of the Paul Volcker era.

### **Monetary Policy Under The Gold Standard (1880-1914)**

- The Federal Reserve was only set up in 1913. Prior to that the U.S. operated under the international gold standard, where the currency was backed completely by gold. As a result, the amount of money that the U.S. could do was constrained by the amount of gold that the government had in reserve.
- Taylor argues that even under such a regime, we can describe monetary policy behavior using a policy rule. Consider a rise in inflation: the price of U.S. goods rises, causing U.S. exports to decline and causing the trade deficit to rise.
- In order to pay for the surplus of imports, the U.S. will have to send gold abroad, reducing their holdings of gold. The fall in gold reserves leads to a contraction in the U.S. money supply and a rise in U.S. interest rates. So there should be a positive relationship between inflation and interest rates.

- A similar relationship exists between output and interest rates as well. Higher output leads to an increase in U.S. imports AND an increase in money demand. Higher money demand directly leads to a rise in interest rates. The increase in imports leads to an increase in the trade deficit and a subsequent monetary contraction as explained earlier. Therefore, we would expect to see a positive relationship between interest rates and output.
- The results in Table 1 show the magnitude of the response of interest rates to movements in inflation and output. As expected, the reaction coefficients are close to zero: indicative of the relatively passive monetary policy under the gold standard. Over the period 1879:1 to 1914:4 interest rates were raised by about 0.006 percentage points for every 1 percentage point rise in inflation and by 0.034 p.p for every 1 p.p increase in the output gap.
- The macroeconomic outcomes for this period are not very good. Figure 1 shows that the period was extremely volatile especially in the 1890-1900 period. Recessions and booms are very common, often only a year or two apart from each other. Periods of high inflation AND high deflation are often interspersed amongst each other.
- This, of course, is insufficient evidence to prove that the passive monetary policy was responsible for the economic fluctuations. But it certainly opens up the possibility that there was a link between the two.

### **Monetary Policy in the Immediate Post-War Period (1955-1979)**

- Following the gold standard, Taylor jumps to 1955. The reason for skipping the interim years is because of the World Wars. If we are going to use monetary policy rules to characterize baseline policy, then this period has to be left out because policy is going to be mostly driven by wartime considerations.
- This period coincides with the tenure of McChesney-Martin and Burns. The evidence, taken from Table 1 leads Taylor to the conclusion that policy was too easy, for the most part. The reaction coefficient on inflation is 0.813, indicating that the real interest rate actually goes down when inflation goes up. This, of course, would lead the economy to speed up even more and lead to higher inflation and greater economic stability.
- Figure 4 confirms this result. Except for policy that was excessively tight in the early 1960s, for the most part interest rates are below what would be predicted by either the Taylor Rule or a Taylor-type rule with a higher output reaction coefficient of 1.
- According to Taylor, this period can then be characterized as a giant policy mistake! First, policy was too tight in the period 1960-64 and too easy in the period 1965-1979.

### **Monetary Policy in the Volcker/Greenspan era (1979-today)**

- The results for this period indicate that policy was tighter than what a Taylor Rule would indicate during the period under Volcker. Policy under Greenspan, on the other hand matches the Taylor Rule very closely.
- These results are broadly consistent with the performance of the economy: Volcker's period was characterized by declining inflation and large negative output gaps, while Greenspan's era was characterized by greater economic stability.

### III. OTHER ISSUES DISCUSSED IN THE TAYLOR PAPER

- Taylor focuses on the possibility that the relationship between the policy rule and the economic performance of the economy as reflecting reverse causality. Basically, is it possible that the greater stability of the economy in recent times, made it easier for policy makers to follow the Taylor Rule.
- Taylor argues that the lower reaction coefficients of the Fed's policy rule in earlier time was not the result of greater economic volatility but instead reflected the learning process the Fed has been undergoing over time. Following the collapse of the gold standard, the Federal Reserve was created in 1913. The Fed obviously would have to quickly learn how to conduct monetary policy in which the discipline (or equivalently, the constraints) imposed by the gold standard had disappeared.
- In the 1920s, the Fed had figured out the idea that policy should "lean against the wind", i.e. the Fed should slow down the economy when growing too fast, and speed the economy up when it was growing too slowly. However, the Fed could not agree on the right magnitude of leaning against the wind, and the confusion of policy was made very evident during the Great Depression when the Fed pursued tight monetary policy with disastrous results.
- Following WW II, the Fed again pursued "leaning against the wind" but did not quite understand how much to raise rates by. In fact by not raising rates enough to offset higher inflation, the economy actually grew even faster as real interest rates fell. Compounding this was the development of the Phillips Curve by academics during this period. In the 1960s, U.S. monetary policy makers may have believed that there was a long-run tradeoff between unemployment and inflation and may have kept interest rate low in order to lower unemployment.
- So in addition to the oil price shocks of the early 1970s, the Fed keeping interest rates low may have contributed to the great inflation in the 1970s.