



# An overhaul of Federal Reserve doctrine: Nominal income and the Great Moderation

Joshua R. Hendrickson

Department of Economics, University of Mississippi, 229 North Hall, University, MS 38677, United States

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## ABSTRACT

The Great Moderation is often characterized by the decline in the variability of output and inflation from earlier periods. While a multitude of explanations for the Great Moderation exist, notable research has focused on the role of monetary policy. Specifically, early evidence suggested that this increased stability is the result of monetary policy that responded much more strongly to realized inflation. Recent evidence casts doubt on this change in monetary policy. An alternative hypothesis is that the change in monetary policy was the result of a change in doctrine; specifically the rejection of the view that inflation was largely a cost-push phenomenon. As a result, this alternative hypothesis suggests that the change in monetary policy beginning in 1979 is reflected in the Federal Reserve's response to expectations of nominal income growth rather than realized inflation as previously argued. I provide evidence for this hypothesis by estimating the parameters of a monetary policy rule in which policy adjusts to forecasts of nominal GDP for the pre- and post-Volcker eras. Finally, I embed the rule in two dynamic stochastic general equilibrium models with gradual price adjustment to determine whether the overhaul of doctrine can explain the reduction in the volatility of inflation and the output gap.

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## 1. Introduction

Over the period beginning around 1984 through 2007, there was a substantial decline in macroeconomic volatility. Specifically, Blanchard and Simon (2001) have shown that the standard deviation of quarterly output growth declined by half and that of inflation declined by two-thirds over this period.<sup>1</sup> Given the increased stability, this time period has been characterized as “The Great Moderation.”

There are three general explanations for the Great Moderation. The first view is that the moderation of economic fluctuations is the result of inventory dynamics (McCarthy and Zakrajsek, 2007).<sup>2</sup> A second view presented by Stock and Watson (2003) is that the increased stability is the result of smaller macroeconomic shocks. Finally, others such as Taylor (1999), Clarida et al. (2000), and Bernanke (2004) have attributed this decline in the United States to a significant change in monetary policy. Specifically, these authors argue that monetary policy after the appointment of Paul Volcker to the Federal Reserve is characterized by an increased responsiveness of monetary policy to realized inflation.

If any part of the decline in volatility can be attributed to monetary policy, it is important to understand precisely the change in policy to ensure that past mistakes are not repeated. The purpose of this paper is to present an alternative perspective to the earlier work on monetary policy and the Great Moderation that views the changes in policy as the result of an overhaul of Federal Reserve doctrine rather than as a change in the parameters of the Taylor rule. Specifically, this paper

E-mail addresses: [jrhendr1@olemiss.edu](mailto:jrhendr1@olemiss.edu), [joshua.r.hendrickson@gmail.com](mailto:joshua.r.hendrickson@gmail.com)

<sup>1</sup> This change was also noted earlier by McConnell and Perez-Quiros (2000) and Kim and Nelson (1999).

<sup>2</sup> The authors acknowledge that changes in monetary policy are likely to have played a significant role as well.

provides empirical support for a view put forth by Nelson (2005), Hetzel (2008a,b), and Dicecio and Nelson (2009) that the change in monetary policy beginning with Paul Volcker represented an overhaul of the previous doctrine that largely viewed inflation as a cost-push phenomenon.

The paper proceeds as follows. Section 2 presents two views of monetary policy that can potentially explain the Great Moderation. The first view emphasizes the increased emphasis of the Federal Reserve in responding to realized inflation. The second view emphasizes an overhaul of the doctrine within the Federal Reserve in which the central bank changed its beliefs about the underlying causes of inflation. Specifically, this overhaul can be reflected in the Federal Reserve's responsiveness to its forecast of nominal income growth rather than that of realized inflation. Section 3 provides empirical support to the overhaul of doctrine hypothesis. Section 4 examines the macroeconomic implications of the shift in policy and Section 5 concludes.

## 2. Two stories of macroeconomic stability

### 2.1. The Taylor view and the Great Moderation

Evaluation of monetary policy and the Great Moderation often begins with a description of the Taylor (1998) curve, shown in Fig. 1. The Taylor curve is an efficiency locus for monetary policy that describes the trade-off between the variability of inflation and variability of output.<sup>3</sup> Assuming that monetary policy is optimal, the Taylor curve suggests that policymakers can only cause movements along the curve. By contrast, shifts in the curve result from structural changes in the economy. Thus, for monetary policy to explain the Great Moderation, it must be true that monetary policy was not optimal (operating beyond the Taylor curve, as shown by point A) in the prior period. It follows that in order to explain a potential role for monetary policy in the Great Moderation, one must be able to show a sizable shift in policy starting after the Volcker disinflation. The Taylor View outlined below suggests that the move from point A to point B is the result of a more aggressive response on the part of the Federal Reserve to realized inflation.

Advocates of the Taylor View suggest that empirical analysis of the behavior of the federal funds rate provides evidence for the conjecture that policy was suboptimal. Following Taylor (1993), this research has emphasized a monetary policy rule in which the Federal Reserve adjusts the federal funds rate in response to inflation and economic activity commonly known as the Taylor rule. The adoption of the framework has been aided by the ability of this rule to explain the behavior of the federal funds rate quite well (Taylor, 1993; Orphanides, 2003a). In addition, such analysis generally identifies the shift in policy that could potentially explain the Great Moderation coincides with the appointment of Paul Volcker to the Federal Reserve in October 1979 as a result of the significant and lasting reduction in inflation since the start of his tenure.<sup>4</sup>

Taylor, 1999 conducts an historical analysis for the era of the international gold standard and the period after World War II. His analysis aims to measure the particular response of the federal funds rate characterized by the Taylor rule:

$$R_t = \bar{r}_t + \pi_t + \phi_\pi(\pi_t - \pi_t^*) + \phi_y \tilde{y} + e_t$$

where  $\bar{r}$  is the real rate of interest,  $\pi$  is the inflation rate,  $\pi^*$  is the target rate of inflation, and  $\tilde{y}$  is the output gap. The coefficient estimates given by Taylor for this model are shown in Table 1.

Taylor's coefficient estimates show a clear shift in policy between the pre-1979 era and the era in which Alan Greenspan oversaw the Federal Reserve. For the period prior to 1979, the coefficient on inflation is nearly half and that on output is one-third of those estimated for the Greenspan era. What's more, the latter results are also consistent with the normative suggestions given by Taylor (1993).

Particularly important to Taylor's analysis is the fact that the response of the federal funds rate to inflation in the pre-1979 period is less than unity. As Taylor emphasizes, this tepid response to rising inflation implies that when the inflation rate rises, the real interest rate declines. The decline in the real interest rate stimulates aggregate demand and stokes further inflationary pressures. This type of policy leads to instability as inflation is able to increase without bound. By contrast, if the coefficient on inflation is greater than unity, an increase in inflation will result in an increase in the real interest rate and would generate stability. Thus, the shift in policy from the Great Inflation of the late 1960s and 1970s to that of the Great Moderation is a more aggressive response to inflation. Specifically, monetary policy in the latter period is one in which the real interest rate increases in response to rising inflation.

A similar analysis to that of Taylor is undertaken by Clarida et al. (2000). This latter analysis, however, differs in two important respects. First, one common criticism of the Taylor rule is that policy decisions require access to contemporaneous data.<sup>5</sup> As emphasized in (McCallum and Nelson, 1999a, 18), rules that require knowledge of contemporaneous data are non-operational because "there is uncertainty regarding the realized value of real GDP even at the end of the quarter in actual economies." To overcome this problem, Clarida et al. posit a forward-looking rule in which the central bank responds to deviations of expected inflation and output from their respective targets. The second difference from the earlier analysis stems from the fact that the basic Taylor rule seems much too crude to fully capture the actual behavior of the federal funds rates in that it ignores

<sup>3</sup> For examples of analyses of the Great Moderation that focus on the Taylor curve, see Stock and Watson (2003) and Bernanke (2004).

<sup>4</sup> Volcker was actually appointed to the Federal Reserve in August of 1979. Nonetheless, October is typically considered the break point in policy due to the emergency meeting of the Federal Open Market Committee on October 6, 1979, in which the FOMC adopted a monetary targeting regime.

<sup>5</sup> It should be noted that the original Taylor rule (Taylor, 1993) related the interest rate instrument with lagged values of inflation and the output gap.

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