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Did the Fed follow an implicit McCallum rule during the Great Depression?☆

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ABSTRACT

In this paper we address the issue of the consistency of the Fed action during the interwar period using a McCallum base money rule. Developing backward-looking models, forward-looking models and counterfactual historical simulation, we found that the McCallum rule provides interesting historical lessons to identify possible driving forces of its policy setting. We give evidence that over the period 1921–1933 the Fed followed an imperfect and partial McCallum rule, moving the money base instrument according to an output target but not correcting for the deviation from this target. Lastly, our outcomes highlight that during the Great Depression the Fed was probably more active than suggested in the literature.

1. Introduction

The issue of the consistency of the Fed action during the Great Depression has received considerable attention in the literature. The main explanation, most notably defended by Friedman and Schwartz (1963), insists on the erroneous understanding of monetary conditions, as well as an erroneous implicit model of the economy by Fed's officials. Using domestic monetary aggregates, Friedman and Schwartz (1963) argue that the Great Depression was caused by domestic monetary contraction and that the Fed could have prevented and even reversed it with an appropriately expansionary monetary policy. They contend that the Fed's refusal to fight against the monetary contraction was a monumental policy mistake. This judgment became the dominant view thereafter. Wheelock (1992) surveys all existing approaches and alternative views about the incidence of monetary policy on the development of the crisis: Why did Fed officials supposedly fail to respond appropriately to the crisis? Our article should be seen as an extension of this vein of work and interrogation. In addressing the following issue "Did the Fed follow an implicit McCallum rule during the interwar period?" our purpose is to assess and test, from a cliometric perspective, possible guidelines of the Fed action over this period. Despite the abundance of literature on the Great Depression in the US, the attempts to test implicit rules by the Fed over this period are very rare (Wheelock, 1990). In the body of the text, we recall the virtue and the limits of this type of exercise applied to History. Most of all, the idea in applying a McCallum rule to the period of the Great Depression in the US is to potentially provide new insights for consideration of policy settings during the interwar period in the US and contribute to a still open debate.

Our paper is organized as follows: in Section 1, we survey the existing historical exercises of a base money rule; in Section 2, we present data and methodology of a base money rule applied to the Great Depression; in Section 3, we deliver a historical analysis in light of a standard McCallum rule, using successively backward-looking models, forward-looking models and counterfactual historical simulation; Section 4 is devoted to discussion of our own findings. Last section concludes.

1.1. Historical exercises of base money rule: a review of literature

As depicted by Chandler (1958), it is likely that the Fed pursued various policy goals during the Great Depression. Controversy among contemporary policymakers may cast doubt about the pursuit of a unique goal. Nonetheless, regardless of historical context and epoch, central banks have always permitted discretion to affect their decisions.

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Therefore, these arguments should not prevent us from adopting a retrospective econometric analysis and test an implicit rule to assess the meaning of the Fed officials' decisions over this period. In this paper, we try to understand the Fed action in light of a McCallum base money rule, in order to detect possible guidelines in their policy settings.

The rule reported by McCallum (1988, 1990, 1993, 1995, 1997, 2002) specifies the growth rate of the monetary base that the Fed should provide. We recall that the monetary base is the sum of currency held by the non-bank public and bank reserves (i.e., the central-bank money held by the private sector). Since this aggregate appears on its own balance sheet, the Fed can monitor it on a daily, weekly, or monthly basis and make adjustments as needed to keep it at any desired level.

In the first analysis, it could seem less realistic than Taylor's rule (1993) in the sense that the Fed, already during the twenties and the thirties implemented policy by control of a short term interest rate. Nevertheless, the literature of that time insists on the fact that it was possible for the Fed to control both the growth of the monetary base and the discount rate and that the Fed chose to do so. More specifically, monetary policy instruments seemed to be coordinated: there is agreement in the literature that the money base and the discount rate were substitutes (Epstein and Ferguson, 1984; Friedman and Schwartz, 1963; Wicker, 1966) or "*somewhat interchangeable*" (Wheelock, 1989). We leave the issue of effective coordination of monetary base and interest rate instrument over this historical period to future research. In this paper, we wonder whether the Fed operates as to control the base growth rate. According to McCallum (1988, 1995, 1997, 2002) this is an indicator of monetary policy ease or restrictiveness. In McCallum standard presentation, the base growth rule in question can be expressed as follows:

$$\Delta b_t = \Delta x* - \Delta v_t + 0.5(\Delta x* - \Delta x_{t-1}). \quad (1)$$

Here the symbols are:

Δb_t Rate of growth of the monetary base, percent per year
Δv_t Rate of growth of base velocity, percent per year, averaged over previous four years
Δx_t Rate of growth of nominal GDP, percent per year
Δx^* Target rate of growth of nominal GDP, percent per year.

In this rule, the target value Δx^* is taken to be the sum of π^*, the target inflation rate, and the long-run average rate of growth of real GDP.

In its usual presentation, McCallum takes the latter to be 3% per year, so with an inflation target of 2%, Δx^* equals to 5. The term Δv_t reflects changes in the growth of base velocity from year to year. The rule's measure relating to the past four years is intended by this author as a forecast of the average growth rate of velocity over a "foreseeable" future; it is not intended to reflect current cyclical conditions. These are represented by the final term, $\Delta x^* - \Delta x_{t-1}$, which is positive when recent growth of output and the price level have been slow. A large resulting value for Δb_t is a signal for monetary ease, represented by a rapid rate of increase in the monetary base—which tends to generate or support a rapid rate of increase in monetary aggregates and thereby stimulate aggregate demand.

McCallum (1988, 1990, 1995, 1997, 2002) applied many simulations of this rule to several historical periods, calculating for each of them, the retrospective value of base growth suggested by this rule. Over the period corresponding to the roaring twenties, the crash of 1929 and the early thirties, the article of reference is McCallum (1990). In this article, McCallum (1990) wonders whether a monetary base rule could have prevented the Great Depression. Counterfactual historical simulations for 1923–1941 are conducted with a monetary base rule and a model of nominal GNP determination estimated with quarterly data.

The issue raised by this author is "whether the extreme decline in nominal GNP that actually occurred over 1929–1933 would have been prevented if monetary policy had been conducted according to the base rule under discussion" (p. 4). "The policy rule under consideration would have attempted to keep the growth rate close to a 3% target path by means of quarterly adjustments in the growth rate of monetary base, a policy instrument that can be accurately controlled by the Fed" (p. 6).

Relationship of money stock to monetary base (McCallum, 1990) is characterized as follows: the money stock is represented by the M1 measure and the purpose is to develop a model explaining mt–bt, the log of the ratio of M1 to the base. Given the econometric correlation found over the period between B and M1, and between M1 and the GNP, the simulation consists in an evaluation of the volume of B sufficient to reach the target of a steady 3% growth rate over the period 1923–1941. Simulation results indicate that nominal GDP would have been kept reasonably close to a steady 3% path over 1923–1941, if the rule had been in effect.

Three major objections can be put forward: this exercise is a pure counterfactual one assuming that policy makers knew what growth rate for M1 would be appropriate in 1923; secondly, this article supposes that Fed officials had the correct underlying model of the economy in mind, i.e., characterized by a monetarist money demand function. The outcome of the counterfactual simulation (a base rule would have been efficient to stop the Great Depression) is tributary from this monetarist representation of the Economy. Lastly, McCallum (1990) wonders what would have happen if the Fed had followed a strict base money rule, insinuating the Fed did not. The purpose of our article is slightly different: we do not prejudge the nature of the policy pursued by the Fed over this period. Using real data, we wonder whether the Fed officials actually followed a McCallum rule and what lessons can be drawn from this analytical framework in terms of Fed policy conduct over the interwar period.

It has to be noted that Bordo et al. (2002) implemented a counterfactual analysis in order to test Friedman and Schwartz's (1963) proposition that the Great Depression occurred because the Fed failed to undertake expansionary open-market operations. In their simulation the tool for expansionary monetary policy is designed as the monetary basis, but they do not test, strictly speaking, a McCallum rule. They contend that a monetary base policy would have offset the decline in the stock of money. The argument relies on the idea that the US, the largest country in the world who had massive gold reserves, was not constrained from using expansionary policy to offset the Great Depression. Simulations, based on a monetarist model of a large open economy,[1] indicate that expansionary open market operations by the Fed at two critical junctures (Oct. 1930 to Feb. 1931 and Sept. 1931 to Jan. 1932) would have been successful in averting the banking panics that occurred. They reach the conclusion that had expansionary open market purchases been conducted in the 1930s, the contraction would not have led to the international crises that followed. American monetary authorities had room for maneuver and expansionary monetary policy though a monetary base policy would have been efficient and desirable.

These outcomes corroborate conventional wisdom which concludes in concert that the Fed policy was systematically flawed over this

[1] In their specification, these authors assume that the US demand for money in period t is given by: $m_t - p_t = \alpha_0 + \alpha_1 y_t + \alpha_2 i_t + v_t$, $\alpha_1 > 0$, $\alpha_2 < 0$ (1) where, m_t, p_t, and y_t represent logs of money stock, the price level and real income, i_t denotes the interest rate and v_t is the error term. The determinants of m_t are expressed by the two following identities:

$$m_t \equiv \mu_t + \log(H_t) \quad (2)$$

$$H_t = G_t + D_t \quad (3)$$

where μ_t is the log of the money multiplier while, H_t, G_t, and D_t represent high-powered money, gold reserves and domestic credit. The authors examine the effect of an expansion in high-powered money on gold reserves and model the monetary relations in the rest of the world to explore this channel. The conclusion of the authors is that even with perfect or near-perfect capital mobility, gold flows would not have severely constrained the Fed's ability to determine the high-powered stock of money in the short run.