Some Political Economy of Monetary Rules

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In this paper, I evaluate the efficacy of various rules for monetary policy from the perspective of political economy. I present several rules that are popular in current debates over monetary policy as well as some that are more radical and hence less frequently discussed. I also discuss whether a given rule may have helped to contain the negative effects of the recent financial crisis. My political economy perspective, to be discussed in much more depth in subsequent sections, evaluates political-economic proposals by taking into account both incentive and knowledge problems. I focus on how such rules function, the conditions under which they can be expected to achieve macroeconomic stability, and the plausibility of implementing them should the desire to do so arise.

The importance of securing an institutional environment conducive to effective and responsible monetary policy has been made apparent by the 2008–2009 financial crisis. There is disagreement over what role monetary policy played in the crisis, however. Some contend that overly loose monetary policy helped fuel an unsustainable boom that would inevitably result in a painful recession (e.g., Horwitz and Luther 2011; Beckworth 2012; White 2012). Others argue that monetary policy was not responsible for creating an unsustainable boom, but it was responsible for the ensuing bust through a failure to act decisively once it became obvious that financial markets were distressed (e.g., Sumner 2011, 2012; Hetzel 2012). The consensus is that monetary policy bears some of the blame for the recession and lingering economic malaise. To prevent such calamities in the future, policy makers

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must have the tools to determine which policies and institutions constitute sound monetary policy. This paper provides these tools.

I begin by presenting the case for rules-based monetary policy. After discussing some recent empirical studies suggesting that the financial crisis occurred during an era of ad hoc monetary policy (thus supporting the superiority of rules), I present the theory behind the desirability of rules-based monetary policy. The second section covers four monetary-policy rules that could be implemented without significant changes to current monetary institutions—namely, central banks: Milton Friedman's k-percent growth rule, John Taylor's interest-rate rule, Bennett McCallum's monetary base rule, and inflation targeting. Whereas these four rules may be seen as commandments passed down to the monetary authority, the more radical rules I consider in the third section—nominal income targeting and free banking—would fundamentally change the nature of the monetary authority itself. The paper concludes by summarizing the results and calling for a reorientation of modern macroeconomic and monetary debate to emphasize the rule of law rather than economic control.

Rules versus Discretion in the Monetary Authority

In the vast majority of advanced economies, the institution responsible for conducting monetary policy is the central bank.[1] Ideally, the central bank adjusts the supply of money in the economy whenever necessary to act as a stabilizing force against the possibility of monetary disequilibrium. However, it is an open question what means a central bank ought to employ in order to achieve the desired stability in the monetary economy. The most important issue is whether the central bank should be given a firm rule that dictates what actions it can take to stabilize the economy or should be allowed discretion to perform monetary policy as it sees fit. It should be noted that a binding rule does not need to be a precise mathematical formula. A good monetary-policy rule specifies plans of action, depending on contingencies, on which the central bank cannot later renege.

The empirical literature on rules versus discretion in monetary policy is enormous. Rather than conduct an exhaustive literature review, I discuss briefly some recent arguments to provide a frame for the theoretical discussion to follow. John Taylor (2012), after whom the Taylor rule for monetary policy is named, argues that recent monetary policy in the United States can be divided into an implicitly rules-based era from 1985 to 2003, followed by an ad hoc era characterized by discretionary policy. The generally favorable economic performance in the first era and the generally poor economic performance during the second lead Taylor to conclude that rules are preferable to discretion. Alan Meltzer (2012), another prominent economist and scholar of monetary policy, concurs. Alex Nikolsko-Rzhevskyy, David Papell, and

1. This section is adapted from Salter 2014a.

Ruxandra Prodan (2013), using different methods, date the beginning of the rules era to 1984 and its end to 2000. Both sets of dates suggest that there is some link between the monetary policy's abandonment of an implicit rules framework[2] and the recent financial crisis. For example, if David Beckworth (2012) is correct that the U.S. Federal Reserve misread crucial economic signals and engaged in overly expansionary policy in the years leading up to the crisis, then the judgment of monetary policy makers—the predominant guiding force in the ad hoc period identified by Taylor, Meltzer, as well as Nikolsko-Rzhevskyy, Papell, and Prodan—resulted in significant economic harm, which in turn suggests that rules-based policy might have spared us the economic calamity that followed.

At first, the superiority of rules over discretion seems confusing. An economy is an overwhelmingly complex order that is constantly in flux. How can a single rule account for all economic contingencies? Shouldn't the judgment of leading monetary scholars and policy makers on the specifics of each situation inform the conduct of monetary policy? Defenders of discretion frequently employ such arguments to justify central banks' unconstrained freedom to take the necessary steps to stabilize the economy. Although there is some truth in arguments for discretion, there is also much these arguments miss. In addition, a little more deduction shows some of the premises favored by advocates of discretion, especially the incredible complexity of the economy, actually tilt the balance in favor of rules. In the next three subsections, I sketch the reasons why discretionary policy, despite its initial appeal, is second best to rules.[3]

Time Inconsistency

In the rules-versus-discretion debate, the single most familiar argument in favor of rules is that of time inconsistency. According to a simplified explanation, an individual or organization faces a time-inconsistency problem when his or its preferences tomorrow are at variance with his or its preferences today. The problem was first articulated and applied to central-bank behavior by Finn Kydland and Edward Prescott (1977) and extended soon thereafter by Robert Barro and David Gordon (1983). The time-inconsistency problem shows that even when the central bank and the public are perfectly informed, and even when the central bank is perfectly benevolent (i.e., seeks to do nothing more than maximize social welfare), discretion on the part of the central bank will lead to suboptimal outcomes. If the central bank could somehow commit itself to following a rule for monetary policy *that it cannot later change,* social welfare would improve.

2. I say "implicit" because the Federal Reserve has never formally adopted a specific monetary-policy rule. The Fed is instead subject to the vague "dual mandate" of price stability and full employment. The authors cited suggest that during the earlier era the Fed had been following a form of the Taylor rule, which I discuss further later in this section.

3. Many of these arguments can be found in nascent form in Simons 1936. The subsequent points can be seen as a continuation of Simons's project.

More concretely, the problem with discretion is that the central bank cannot credibly commit to restricting its behavior when it knows it can take action to improve social welfare from the public's perspective. The public is typically conceived as disliking both inflation and unemployment but willing to accept a certain amount of one in order to avoid too much of the other. The central bank has short-run control over unemployment—it can temporarily lower the unemployment rate by expanding the money supply—and long-run control over inflation—if it creates money today, inflation will materialize later. The central bank has an incentive to tell the public that it will commit to a particular stance on monetary policy, which it will not later violate. Assume that the public believes the central bank and conducts economic activity by entering into contracts and other agreements with the expectation that there will be a given amount of inflation because the central bank promised to deliver only that amount. Because the public believes the central bank, the central bank has an incentive to break its promise and engage in surprise expansionary monetary policy. The short-run result would be both low inflation (it takes time for the new money to work its way through the economy and put upward pressure on prices) and low unemployment, clearly an advantage from the public's perspective, at least for now. But the public realizes that the central bank faces this temptation, so it would never make its expectations conditional upon the central bank's keeping its word. The public instead incorporates expectations of higher inflation into its contracts and other agreements, and there is no reduction in unemployment.

If something could bind the central bank's behavior, such as a monetary-policy rule, this problem could be avoided. If the central bank is committed to a specific monetary policy due to some rule that it cannot violate, the public can then safely believe the central bank and can coordinate on a more preferred equilibrium with lower levels of inflation and unemployment.

Political Economy Considerations

The time-inconsistency problem shows that even in a world where the public and central bank are fully rational and the central bank is fully altruistic, discretion leads to suboptimal results. Of course, real-world monetary-policy decisions are made by imperfectly rational agents and imperfectly altruistic central bankers for an imperfectly rational public. We need some way of comparing the decisions available to the central bank when information is less than perfect and incentives are not fully aligned. We must ask, "Which institutions perform best when people have limited knowledge *and* are prone to self-interested behavior?" (Pennington 2011, 3). This perspective, known as "robust" political economy, further strengthens the case for a binding monetary-policy rule.

Knowledge. As stated earlier, the complexity of the economy seems to suggest the unlikelihood that a firm monetary-policy rule will be adequate for all scenarios, which in turn suggests that monetary policy makers' judgment ought to be left

unconstrained to do what they feel is best. But this position overlooks two problems. First, by allowing the central bank such an extensive mandate, we are subsuming the social intelligence of the marketplace to the individual and far more limited intelligences of the members of a committee (Hayek 1948). As a rule, it is unwise to believe that a small group of policy makers, however intelligent and well educated they may be, can outplan the market. Second, related to the preceding point, discretion allows the possibility that monetary policy makers and market actors will come to conclusions at odds with each other with respect to the best course of action, which can result in an environment of uncertainty that is inimical to economic well-being. Counterintuitively, a second-best rule may be better than first-best discretion because the former at least anchors market actors' expectations and reduces the chance of uncertainty and central-bank miscommunication. Thus, the complexity of the economy is better managed by a simple and easily communicated rule that minimizes the knowledge burden on both market actors and monetary policy makers.

Incentives. As in all areas of economics, incentives matter for central-bank decisions. If a central bank's policy decision can be influenced by public *or private* interests, it is unlikely to work well. A firm monetary-policy rule would limit these interests' ability to use monetary authority to achieve their own ends, which almost certainly would not align with the public's welfare. The actual degree to which central banks are free from political influence is unfortunately nontrivial (Cargill and O'Driscoll 2013). As Peter Boettke and Daniel Smith (2014) note, the U.S. Federal Reserve has deferred to politicians on a number of issues, the most obvious being public-debt accommodation during the Korean War and Chairman Arthur Burns's use of monetary policy in support of President Richard Nixon's electoral ambitions.

Nor are central banks immune to private interests. As key players in an advanced economy's financial systems, large private financial institutions have a very strong incentive to influence central banks' behavior at the margin. This influence, although privately beneficial to financial institutions, is socially costly (Buiter 2008; Dowd 2009; Roberts 2010; Selgin 2010, 2012; Hetzel 2012; Ravier and Lewin 2012; Salter 2013, [2012] 2014b; see also the journalistic account in Stewart 2009). The most obvious example is the Fed's handling of the recent financial crisis. Although the Fed's publicly stated motivation for its unprecedented actions during the crisis was adherence to emergency-lending orthodoxy, in actuality its activities were of dubious merit, serving primarily to enhance the balance sheets of large and well-connected financial houses (Hogan, Le, and Salter 2015).

Central Banks and Bureaucracy

Finally, even putting aside the problems associated with the susceptibility of central banks to other interests, there is still the problem of central banks' interests themselves. Monetary-policy decisions are not made in a vacuum. Central banks are bureaucracies, with their own procedures and decision structures. As in any bureaucracy, these

procedures and structures are very difficult to change, even in situations where change would serve the public interest. A key area of worry is the resistance to new developments in monetary economics and macroeconomics. Old ways are familiar; new ways are uncertain and costly to implement; and because it is the public who benefits rather than a central bank's staff, observers should be skeptical that advances in economic theory will make their way to central banks' decision makers. As N. Gregory Mankiw remarks in commenting on the memoirs of former Federal Reserve governor Laurence Meyer,

> Recent developments in business cycle theory, promulgated by both new classicals and new Keynesians, have had close to zero impact on practical policymaking. Meyer's analysis of economic fluctuations and monetary policy is intelligent and nuanced, but it shows no traces of modern macroeconomic theory. It would seem almost completely familiar to someone who was schooled in the neoclassical–Keynesian synthesis that prevailed around 1970 and has ignored the scholarly literature ever since. Meyer's worldview would be easy to dismiss as outdated if it were idiosyncratic, but it's not. It is typical of economists who have held top positions in the world's central banks. (2006, 14–15)

As with informational difficulties, problems with incentive alignment on the part of central banks weaken the case for discretion. A firm and clear rule dictating the range of policy options can help the public coordinate its expectations based on credible commitment, limit the knowledge burden facing monetary policy makers, and help insulate the central bank from undue influence.

All these factors suggest that a rule better serves the public interest than does discretion. However, the fact that a rule is preferable to discretion does not tell us anything about which rule the central bank should be forced to adopt. The next two sections address this issue.

Which Rule? The Pros and Cons of Some Popular Targets

This section examines four well-known rules: Milton Friedman k-percent growth rule, John Taylor's interest-rate rule, Bennett McCallum's rule for adjusting the monetary base, and inflation targeting. Each of these rules has its pros and cons; it is the purpose of this article to compare them, not to make a definitive suggestion regarding which one is better.[4]

4. In this discussion, I assume the reader is familiar with monetary equilibrium theory and both the static ($MV = Py$) and dynamic ($gM + gP = gV + gy$) versions of the equation of exchange, where M = the money supply; V = the velocity of money; P = the price level; y = real gross domestic product; and g = the growth rate.

Friedman's k-Percent Growth Rule

Milton Friedman's recommendation that the money supply be increased by a certain fixed percentage per time period (Friedman 1960, 1968) is arguably the simplest of the rules discussed here. His reasoning was based on his view that the economy's real variables tended in the long run to a natural rate that is independent of monetary policy. The interest rate, unemployment, and output are in the long run determined by technological factors and hence are an issue of the economy's supply side. Monetary policy, in contrast, acts upon aggregate demand. Although monetary policy can affect real variables in the short run—for example, surprise increases in the money supply can temporarily lower interest rates and raise output—these changes will eventually reverse as variables tend toward their natural levels. In Friedman's view, it is best to avoid the costly disturbances associated with deviations from variables' natural rates by completely tying the central bank's hands. The money supply would grow by some predetermined rate every time period, and this rate cannot be changed by agents of the central bank (see also White 1999, 219–22).

The k in Friedman's plan denotes the rate at which the money supply would grow.[5] That rate should be chosen to achieve, on average, no change in money's purchasing power, meaning a constant price level. In terms of the dynamic equation of exchange, this implies $g_P = 0$. By substituting $g_P = 0$ into the dynamic equation of exchange, we can see that the money supply should grow at a rate equal to real-income growth less velocity growth:

$$g_M = k = g_P - g_V + g_y = g_y - g_V. \tag{1}$$

Friedman's plan has great intuitive appeal. It would be very easy to implement. The committees that determine monetary policy for central banks could be replaced by a computer that calculated what the money supply should be in any given period in order to be consistent with the stated target. From there, the already existing framework for actually conducting monetary policy could be put to work adjusting the money supply to the rule-determined level. With such a simple metric and little if any room for discretion, the k-percent rule seems promising.

However, as Friedman himself recognized, the ability of Friedman's rule to achieve short-run stability is contingent on the stability of the two variables, g_y and g_V, which determine k. If either one of these variables is subject to sudden and unexpected swings, picking a k and sticking to it will be insufficient to provide the economy with a stable nominal anchor. Unfortunately, history has proven these variables to be subject to such swings. Although velocity appeared stable when Friedman was writing the papers that contained his proposals, it has since ceased to exhibit the stability necessary to serve as an anchor for a predetermined money-growth

5. Readers will note that the central banks keep many measures of the money supply. In Friedman's proposal, the measure of money to be targeted is determined by whichever has the most stable velocity of circulation.

rate.[6] Implementing Friedman's rule in a world where velocity is subject to unexpected swings can still result in costly resource misallocations through booms and busts. For example, if velocity growth suddenly and unexpectedly increases, the result would be "not enough" money added to the economy. This development would result in a temporary downturn in economic activity as the dearth of money lowered economy-wide demand and hence output, employment, and the price level. Output and employment, as real variables, would eventually return to their natural (long-run) rate, but depressed conditions would prevail in the meantime. It is this eventuality that Friedman's rule was intended to avoid in the first place.[7]

Could adherence to Friedman's rule have prevented the 2008–2009 financial crisis? It depends on the role of overly loose monetary policy in creating the crisis. If such policy, unconstrained from a money-supply growth rule, was responsible, then it is probable that strict adherence to the rule in the years before the crisis would have resulted in a monetary policy that was neither too loose nor too tight and hence in no unsustainable boom. But if the main cause of the crisis was irresponsible behavior on the part of financial organizations due to implicit promises that the Fed would not allow them to fail—which is in part the Fed's fault but does not constitute monetary policy per se—the crisis may have happened anyway, and strict adherence to Friedman's rule may have prevented the money supply from growing enough to mitigate the crisis. Ultimately, too many variables need to be specified for this question to be answered satisfactorily. The same holds for whether adherence to Friedman's rule could have mitigated the crisis.

Knowing the costs and benefits of any one rule is not enough to determine whether that rule is desirable. All exercises in economic policy are inherently comparative. Although we can speak in the abstract of the benefits and costs of Friedman's rule, this discussion does not provide us with any course of action until we examine additional rules to which we can compare it.

Taylor's Interest-Rate Rule

A slightly more complicated rule but one that is still rigorously discussed and debated in the academic literature on monetary policy is the Taylor rule.[8] Named after John

6. See http://www.research.stlouisfed.org/fred2/tags/series/?t=velocity for data on the variability of velocity.

7. Real-income growth can also change unexpectedly due to supply shocks. This possibility is discussed in more detail in the section on inflation targeting. Another important element affecting the stability of Friedman's rule is the money multiplier. If the money multiplier is not stable over time (meaning a given change to the monetary base by a central bank does not map to a constant change in larger monetary aggregates), Friedman's rule will not result in stability. Let B be the size of the monetary base and m the multiplier that maps a given base, B, to some broader monetary aggregate. The equation of exchange becomes $BmV = Py$ and, in terms of growth rates, $gB + gm + gV = gP + gy$. The central bank controls only B directly, so if the central bank wants zero inflation ($gP = 0$), this implies $gB = gy - gV - gm$. If the money multiplier changes across time, meaning gm is not always equal to zero, the central bank must wrestle with another parameter to which its target is sensitive.

8. Most central banks use the Taylor rule as part of a "flexible inflation-targeting" regime, where they target a low and stable rate of inflation over the medium term. More specifically, the European Central

Taylor, the Stanford economist who first formulated it (Taylor 1993), this rule specifies not a money-supply target but a target for the short-run interest rate that the monetary authority sets in conducting open-market operations. The Taylor interest-rate rule generally takes the form

$$i = \pi P + r + \alpha(\pi P - \pi P^{*}) + \beta(\ln y - \ln y^{*}), \tag{2}$$

where i is the target for the short-term interest rate, r is the assumed equilibrium real interest rate, and α and β are terms dictating how the monetary authority should adjust the target rate when inflation (πP) is above the desired rate (πP^{*}) and (the natural log of) real output is above its long-run trend rate (y^{*}), respectively. In Taylor's original formulation, $\alpha = \beta = 0.5$.[9]

Taylor's rule basically says that whenever inflation or output is above its desired rate, the monetary authority should raise the target rate by contracting the money supply. Because money is typically taken out of capital markets when the monetary authority shrinks the money supply, this action raises the price of loanable funds—that is, the interest rate—thus slowing down the economy by raising the costs associated with investment and hence lowering total spending (aggregate demand). These actions should result in prices and output dropping from their currently too-high levels. If prices and output are below their desired levels, the monetary authority does the opposite. By injecting money into capital markets, the monetary authority increases the supply of loanable funds, which (all else being equal) lowers the interest rate.[10]

The chief benefit of the Taylor rule is its specificity. Specifically, the Taylor rule can tell the monetary authority how to adjust the short-term interest rate in response to changing economic conditions, thus making it more adaptable than Friedman's rule, at least theoretically.[11] However, the specificity of the Taylor rule is a double-edged

Bank has an explicit mandate to focus on stabilizing the purchasing power of the Euro. It aims to keep inflation near but below 2 percent as its monetary-policy goal. Since 2012, the Federal Reserve has stated it is targeting 2 percent inflation until the output gap, approximated by unemployment, shrinks to acceptable levels. Proponents of using the Taylor rule to implement flexible inflation targeting argue that it delivers the benefits of rule-constraining behavior while allowing monetary policy makers enough leeway to respond to any given macroeconomic problem. An example is Chairman Ben Bernanke's advocacy of "constrained discretion" (Bernanke and Mishkin 1997; Bernanke 2003). Inflation targeting in general is discussed further in a subsequent section.

9. Interestingly, Taylor's original simulation described how central banks *actually did* behave. However, the massive literature spawned on the Taylor rule typically takes this result as a standard against which monetary policy ought to be judged. In other words, the Taylor rule is now widely regarded as a measure of how central banks *ought* to behave.

10. This action affects other variables as well. Changing interest rates will also influence aggregate demand through changes in net exports (because exchange rates will change) and personal consumption (because lifetime wealth will change). Investment will also be affected through the change in assets' market value relative to the costs of replacing these assets.

11. This does not mean that there is a stable relationship between the Fed funds rate and output. The Taylor rule is more adaptable than Friedman's rule in the sense that there are more opportunities to adjust the relevant parameters, not in the sense that the parameters are any more stable than, say, money velocity.

sword. The difficulty lies in finding the right balance between the magnitude of the coefficients on the inflation and output gaps.[12] Although this difficulty seems trivial, it is a subject of much debate among economists (e.g., Taylor 1999), and it is easy to see why. If the monetary authority sets an "incorrect" interest rate perhaps based on flawed information, one of the most important prices in the economy—the price of time—will not accurately reflect the real scarcity of capital and can result in costly resource misallocations.

Taylor (2012), building on Meltzer (2012), does seem to suggest that adherence to a Taylor rule would have prevented the recent financial crisis. Given that real interest rates and hence the cost of financial capital were held low by the Fed for such a long period in the years before the crisis (see, e.g., White 2012), it does seem that continued adherence to the pre-2003 (or 2000 if one uses the timeline given in Nikolsko-Rzhevskyy, Papell, and Prodan 2013) implicit rule scenario would have meant no artificially cheap capital and hence less financial irresponsibility. But, as in the discussion of Friedman's rule, this conclusion assumes that overly loose monetary policy was the proximate cause of the crisis. If moral hazard is primarily to blame, distress in financial markets may have resulted anyway. In addition, recent discussion of the infamous "zero lower bound"—referring to the fact that nominal interest rates cannot go below zero and hence conventional monetary policy can become inoperable to the degree necessary to stabilize the economy—calls into question the flexibility of Taylor rules in stemming deep recessions.

McCallum's Feedback Rule

A less well-known rule proposal than Taylor's is Bennett McCallum's (1989) feedback rule.[13] Like Friedman's rule, it targets the money supply; like Taylor's rule, it is more specific as to how the target variable should change in response to other macroeconomic variables. McCallum notes that Friedman's rule—picking a k and hoping that, due to intertemporal velocity and real-income stability, this k will result in zero inflation—is unlikely to work. Velocity can and does frequently change. Although less frequently, real income can also suddenly change for reasons other than demand-side (monetary) factors. Supply-side factors, such as the global spike in oil prices beginning in the 1970s, also matter.

McCallum's rule attempts to take into account the possibility of changes in both velocity and income. Defining B to be the monetary base and m the money multiplier that determines how a given monetary base maps to the money supply, we can rewrite the equation of exchange as $BmV = Py$. In growth rates, this becomes

12. The output gap in particular is very difficult to estimate. On the dangers of measurement error in monetary policy, see, for example, Orphanides et al. 2000.

13. White provides a cogent discussion of McCallum's rule (1999, 223–25) upon which this section is based.

$gB + gm + gV = gP + gy$. McCallum's rule is for the monetary base, taking the form of the following equation:

$$gB = gy^* - gV + \gamma(\ln\ Py^* - \ln\ Py), \tag{3}$$

where gy^* is the trend growth rate of real output, Py^* is the target value for nominal income, and Py is the current period's nominal income. And finally, γ is a parameter dictating how the money-supply growth should change in response to nominal-income deviations from the "ideal" level. In McCallum's formulation, $\gamma = 0.25$. McCallum's rule explicitly takes nominal income into account in order to minimize the undesirable effects of sudden and unexpected swings in nominal income.

The benefits and costs of McCallum's rule are similar to those of Taylor's rule. It is a more specific rule than Friedman's in that it takes into account the possibility that other variables may change. But taking these variables into account also places an increased knowledge burden on monetary policy makers. Relative to the Taylor rule, McCallum's rule is probably less costly to implement on the grounds that the variables required to implement McCallum's rule (money supply, velocity, and nominal income) seem easier to observe and measure than those required to implement the Taylor rule (real income, especially in the context of the output gap, and the equilibrium real interest rate). Whether one prefers Friedman's, Taylor's, or McCallum's rule will depend largely on the difficulties one perceives in measuring macroeconomic variables accurately and how costly deviations from the rule or a breakdown of the rule will be in terms of negative effects on output and employment.

As with the previous rules, answering the question whether McCallum's rule would have prevented the financial crisis requires knowing the relative weights in money mischief versus moral hazard in precipitating the crisis. But assuming McCallum's rule had been effectively institutionalized before the Great Recession, it probably would have made the financial crisis much less severe. Irrespective of the debate as to the importance of overly loose monetary policy versus moral hazard in creating the crisis, the sudden drop in nominal income in 2008 was probably the single largest factor influencing the length and depth of the Great Recession (Sumner 2011, 2012). Because McCallum's rule takes nominal income into account, it could have provided some much-needed cushioning.

Inflation Targeting

The final rule considered in this section, inflation targeting, is very popular both in the academic literature and in real-world monetary-policy decisions.

The desirability of an inflation target grew out of the macroeconomic consensus that began to form in the late 1970s and early 1980s when faith in the old Keynesian system of macroeconomic fine-tuning broke down in the face of the simultaneous rise in unemployment and inflation. The latter phenomenon, known as stagflation, was difficult to understand in the then-popular paradigm. Macroeconomic theorists and

especially monetary-policy theorists came to believe that effective monetary policy could not and ought not steer the real economy. The monetary authority should instead focus on predictability by committing to stabilize a nominal variable, which would provide an anchor to help coordinate market actors' expectations. Such a policy would promote economic activity.

The mechanics of an inflation target are easy to understand using the dynamic equation of exchange. If the monetary authority were targeting 2 percent inflation, as in the case of the European Central Bank, it would increase the money supply every time period by 2 percent, plus the period's growth in real income, less that period's growth in velocity:[14]

$$g_M = 2\% + g_y - g_V. \tag{4}$$

An inflation target does not specify whether the central banks should measure g_y and g_V every time period or whether they ought to take average or trend values. As we have seen, there are costs to each approach. Measuring these variables every time period is costly in terms of collecting information, but using trend values runs the risk of sudden deviations from trend, rendering the rule insufficient to achieve economic stability. Which of these approaches is preferred depends on one's evaluation as to which of these costs is greater.

Inflation targeting is quite similar to the previous three rules, especially Friedman's and McCallum's, because it specifies desired changes in terms of making adjustments to the money supply. Also, because Friedman's and McCallum's rules were calibrated to deliver zero secular inflation, they can be thought of as a form of inflation targeting—namely, a zero-inflation or price-level target. Like these rules, inflation targeting has an advantage over the Taylor rule in economizing on the knowledge necessary to implement the rule.

However, relative to Friedman's and McCallum's rules, there is a larger possibility that an inflation target can *de*stabilize the economy. Take the case of a negative supply shock. In this case, real income (and likely its growth rate) and employment are reduced by some change unrelated to the economy's monetary system. This reduction would tend to also *raise* prices across the economy and hence increase inflation because a negative supply shock reduces the real quantity of goods and services but not the quantity of money. With an unchanged quantity of money chasing fewer real goods and services, the purchasing power of money must fall; that is, inflation must increase. If inflation is pushed above the targeted level, the monetary authority will then *contract* the money supply to push prices back down. But in this case, although contractionary policy would serve to push inflation back to its targeted level, it would also cause a further reduction in real output and employment. The unsettling

14. An inflation target is simply the dynamic form of a price-level target. A price-level target aims for a constant price level, meaning $g_P = 0$. Price-level targeting is less favorably viewed than inflation targeting both in the academic literature and in central-bank boardrooms.

possibility of this double whammy is perhaps the most significant argument against inflation targeting.[15]

The Great Recession was primarily a demand-side phenomenon, resulting from a sudden drop in nominal income in 2008, so an inflation target would have been a stabilizing force much in the same way McCallum's rule would have been. But again we need to consider the possibility that overly loose monetary policy helped fuel an unsustainable boom in the first place. Supply-side growth in the precrisis years put benign downward pressure on inflation. To keep a given inflation target, a central bank would have had to increase the money supply. As an unintended consequence of the inflation target, the extra money could have fueled a speculation boom in financial markets, which is precisely Beckworth's (2012) account of the run-up to the financial crisis. In the final analysis, an inflation target would have mitigated a crisis that was manufactured in part by that target in the first place!

As we have seen, each of the proposed rules has its pros and cons. What these rules also have in common is that they can be implemented without significantly changing the operating structure of currently existing central banks. However, there are proposals for macroeconomic stability that, in theory, improve on the outcomes expected from the rules. The implementation of these rules would require or at least work best conditional upon a radical restructuring of monetary institutions.

Radical Possibilities: Market-Based Nominal-Income Targeting and Free Banking

The proposals discussed in this section go even further in limiting the monetary authority in an attempt to institutionalize a predictable and stable monetary-policy rule. In these cases, the concept of a rule is broadened to include the choice of the monetary-institutional framework itself. The rules-as-institutions approach to economics has its own subfield within academic economics, known as constitutional political economy (e.g., Brennan and Buchanan 2000).[16] As such, this section can be viewed as a combination exercise in constitutional political economy and monetary theory.

Each of these proposals in theory eliminates the possibility of the monetary authority influencing the economy once the underlying rule has been chosen. In these scenarios, what remains of the monetary authority looks vastly different from a modern central bank.

15. Because Friedman's rule specifies a predetermined rate of money growth, it would actually be *less* destabilizing in the presence of supply shocks. Because McCallum's rule uses aggregate demand, P_y, as its nominal anchor, it, too, would be less destabilizing because it takes into account changes in both prices and output.

16. Here the term *constitution* refers not to any one document but to the overarching rules that give structure to interpersonal behavior within a given society.

Market-Based Nominal-Income Targeting

The four rules discussed in the previous section, aimed at maintaining macroeconomic stability through monetary equilibrium, can be viewed as varying technologies for hitting a nominal-income target. Those proposals can thus be understood as competing views as to which variables are sufficiently stable over time to be treated as parameters upon which the policy is built. The ultimate question is deciding which method is best for offsetting changes in V with opposite changes in M to maintain either a constant Py or a constant $gP + gy$. But what if this knowledge burden could be entirely sidestepped? Is it possible to make an end run around the question of whether changes in the observed variables are due to demand-side factors—in which case there may be a valid monetary response—or supply-side factors—in which case the best policy, from an efficiency standpoint, is to allow the variables to adjust to new underlying market conditions?

Scott Sumner (1989, 2006, 2011, 2012), a macroeconomist who has risen to public prominence since the financial crisis, says yes. Rather than having a central monetary authority that attempts to engineer monetary equilibrium, we would alter the institutional structure of the monetary authority to allow market forces themselves to change the supply of money in response to changes in the demand to hold money. The monetary authority's role in such a scheme would be limited to buying and selling an unlimited amount of a derivative financial instrument, the market value of which is dependent on the actual level of nominal income. By stabilizing the value of this "quasi-futures contract" (Dowd 1994, passim), the monetary authority can harness the diffused knowledge and incentive-aligning features of the market process to bring about macroeconomic stability.

In more detail, Sumner proposes that the monetary authority promises to buy or sell—at some date in the future—however much the market is willing to bear of this quasi-futures contract. The price at which the monetary authority will buy or sell this contract is pegged by the same monetary authority. It can be set to be a constant level of nominal income, Py, or any constant growth rate of nominal income, $gP + gy$, that the monetary authority believes to be consistent with market actors' expectations. But the value of the contract—the rate at which the monetary authority will exchange the contract for dollars and vice versa—is determined by the level of nominal income in the economy when the execution of the contract falls due.

Suppose market actors believe that *actual* nominal income, at the time the contract is to be executed, will be higher than the level specified in the contract. Market actors then have a financial incentive to buy this contract from the monetary authority immediately. Because they expect nominal income to be higher when the contract falls due than it was when they bought the contract, they expect to make a pure arbitrage profit. In response, the monetary authority will take the money used by market actors to purchase these contracts and destroy it, thus reducing the money supply, which puts downward pressure on nominal income. The money supply will eventually fall enough

to bring expected future nominal income in line with the pegged value selected by the monetary authority. Arbitrage profits from buying the contract would be zero, and the system would be in equilibrium.

Conversely, if expected future nominal income falls below the pegged level, individuals would have an incentive to sell this contract to the monetary authority. Because the contract, the value of which is tied to the prevailing level of nominal income, is expected to depreciate in value, this action would again result in pure arbitrage profits for traders. In buying this contract from traders, the monetary authority would inject base money into the economy, which would raise the money supply. This action would eventually raise future expected nominal income until the point where it equals the monetary authority's pegged level, again bringing the system into equilibrium, with zero arbitrage profits expected to the traders.

Sumner's proposal thus harnesses individuals' profit-seeking behavior to stabilize the macroeconomy. As mentioned earlier, this proposal, if implemented correctly, would put the knowledge of the whole marketplace to work in stabilizing the economy: "Because traders' expectations are based on a wide variety of different structural models, their forecasts will be similarly diverse. As with any futures market, in equilibrium there will be traders taking both long and short positions. Unlike ordinary futures markets, however, equilibrium is not established by movements in the market price (which is fixed by the Fed at its policy goal). Instead, equilibrium would be established as trades of . . . futures contracts shifted monetary policy" (Sumner 2006, 11). In this system, the monetary authority has only two jobs: (1) create and destroy base money at a rate dictated by the trading preferences of nominal-income speculators and (2) pick the pegged value at which it will buy and sell the contract before the system is set up.

Rather than relying on the expertise of the small handful of individuals to make monetary-policy decisions, this approach would disband the committee responsible for deciding the proper course of monetary policy—or, to put it more colorfully, it would expand the "committee" to include anybody in the world who has sufficient capital to speculate in this market.

Sumner's proposal is simple, elegant, and founded on well-established theoretical insights on what microlevel conditions must prevail in order for the macroeconomy to remain stable. Had it been in place in the years preceding the financial crisis, the crisis might never have materialized. Because the monetary authority's sole job would be managing the day-to-day operations of the nominal-income futures market, it would be unable to engage in discretionary policy, meaning there would be no chance that an excessively loose policy would fuel an unsustainable boom. It also means that there would be no possibility of moral hazard because there would be no possibility of (central-bank-aided) bailouts for irresponsible financial organizations.

However, this rosy narrative overlooks some conceptual difficulties with the proposal. The first and most significant difficulty is that this system, radical as it may seem, still vests a single, nonmarket institution with the sole authority to create money. As long as the monetary authority has a monopoly on the provision of legal tender, there

will be the temptation among policy makers to overstep their mandate and harness this privilege to fulfill their own interests. The second difficulty is that the market must be sufficiently capitalized in order for it to function as an effective stability-enhancing instrument. Markets normally become increasingly capitalized over time as they grow. Because this market would be created ex nihilo, the monetary authority would probably have to engage in special subsidization of the market. The potential for political interests to influence this practice, too, is a point of concern. The third difficulty is that there are technical problems with regard to the timing at which individuals would buy and sell the contracts. Individuals would wait to trade in the nominal-income futures market until they had, in their minds, good enough information to predict the level of future nominal income. They would therefore want to wait as long as possible to buy or sell the contracts, and the majority of trading would take place in a short time period preceding the execution of the contracts. As a consequence, this system might still result in sudden, unexpected swings in nominal income, as Roger Garrison and Lawrence White (1997) have noted.[17] Sumner discusses ways around this problem (2006, 17–22), but they are not ironclad.

Free Banking with Commodity "Outside" Money

Free banking, also called laissez-faire banking (i.e., subject only to ordinary contract and property laws), is the final system under consideration here. Under free banking, anyone may open a bank and issue notes and checkable deposits, which serve as liabilities that fund the bank's long-term asset portfolio. Thus, there is no monopoly on the issuance of legal tender. The right of issue is open to any bank that can secure public demand for their notes and checkable deposits. The spread between the interest earned on this portfolio and the interest paid to note holders and deposit holders is the bank's profit. Free banking may seem a radical system, and by today's standards it is. However, this system existed and persisted for a century or more in some places. The most successful occurrences were in Scotland during the eighteenth and early nineteenth centuries, in Sweden during the nineteenth century, and in Canada for virtually all its history up until World War I (Selgin 1988; White 1989, 1995; Dowd 1992; Selgin and White 1994; Fink 2014).

A free-banking system is really a special type of commodity-money system.[18] Gold was historically the commodity that typically served as "outside" money in free-banking systems. Banks were in the business of issuing notes and checkable deposits that were *claims* to gold. These bank liabilities were "inside" money. This system grew out of the warehousing system of the Middle Ages, where owners of gold

17. This critique is made in the context of price-level futures targeting rather than of nominal-income targeting, but the critique is generalizable to any nominal variable.

18. Commodity standards are largely out of favor with mainstream theorists. White (2008) considers the standard list of objections to the most prominent commodity standard, the gold standard, and shows them to be overblown.

would keep their stocks with smiths or other artisans for safekeeping. These warehouse keepers eventually realized that not all the gold owners would be redeeming all their gold at once. Therefore, the warehouse keepers could make a profit by loaning out the money-gold until their customers sought redemption. As long as they kept enough physical gold on premise to meet the public's expected redemption demand in any given time period, they would remain liquid. Thus, modern banking—borrowing short to lend long, necessitating fractional reserves—was born.

In a mature free-banking system, as existed in Scotland, Sweden, Canada, and many other places, the day-to-day medium of exchange was the banks' claims to gold. These liabilities on the banks typically took the form of notes (which usually paid no interest) and checkable deposits (which usually paid some interest). The physical exchange of gold was rare, usually taking place only between banks that wanted to settle their account balances with each other. In the ordinary course of business, the Bank of A would acquire notes drawn on the Bank of B, and vice versa. When they cleared these balances with each other, the exchange was done in gold reserves.[19]

At first, it seems as if there is no way that a free-banking system can be stable. Once the public is willing to accept the Bank of A's notes, doesn't that bank have an incentive to print up as much money as possible, acquiring lots of wealth in physical goods and services in the short term? And because it makes sense for all banks to do this, shouldn't the result of free banking be permanent and rampant inflation? Fortunately, persistent inflation in free-banking systems was exceedingly rare.[20] Each bank in reality was constrained in the amount of notes that it could profitably issue. What constrained them was the interbank clearing system. If a bank issued more notes and checkable deposits than the public was willing to hold, these liabilities would eventually find themselves deposited back within the financial system, usually at another bank. The recipient bank would then present the overissuing bank's liabilities for redemption, causing the overissuing bank to experience gold-reserve drains. The overissuing bank would be forced to contract its liabilities in order to stay afloat. A check on any bank's tendency to overissue would thus be provided.

The mechanism that would prevent banks in a free-banking system from overissuing notes makes the system appealing from the standpoint of macroeconomic stability. Imagine an increase in the public's demand for money. Banks would eventually notice that, as a consequence of individuals' willingness to hold more notes and checkable deposits for longer periods, adverse clearings would fall and banks' gold

19. Banks had a profit-maximizing incentive to accept each other's notes at par, provided that the banking system was sufficiently well developed that transaction costs were low. For the theory behind this incentive, see Selgin 1988.

20. For a detailed analysis of the behavior of familiar macroeconomic variables, such as inflation, under free banking, see Selgin 1994 and Sechrest 2008.

reserves would not drain as quickly. This situation would signal to a bank that the public is more willing than previously to give the bank a low-interest loan of its gold. The bank would respond by issuing more notes and checkable deposits, which would enter the stream of total nominal expenditures as banks use these newly created instruments to buy additional assets for their portfolios. Once again, we would have a system where demand-side changes in the money market are offset by market participants' profit-seeking behavior. A similar story holds for a decrease in the demand for money. Banks would see that individuals were less willing to loan to banks than previously, and they would contract their supply of notes and checkable deposits as a consequence. Thus, free banking, in both theory and practice, is conducive to monetary stability due to its tendency to offset changes in money demand with appropriate changes in money supply.[21] It can be thought of as a fully privatized nominal-income-targeting regime, and it has the same stabilization properties. Like other nominal-income targets, a free-banking regime would have prevented the financial crisis in 2007–2008 by eliminating both overly loose monetary creation and moral hazard.

What are the downsides of free banking, though? Frankly, it is so radical a departure from the current monetary-institutional order that obtaining the necessary consent and actually affecting the transition would be incredibly costly. It is not clear a priori that the benefits of this system would be worth the transition costs. In particular, free banking has no need for a monetary authority because each bank can issue its own notes and checkable deposits. A monetary authority of the conventional type would more likely be a danger to this system and would be best done away with, but that would be incredibly difficult to achieve.[22]

Conclusion: From Macromanagement to the Rule of Law

Table 1 summarizes this survey of proposed rules and reforms. The most important takeaway is that the radical proposals dominate any of the within-current-institutions proposals. Regardless of whether the financial crisis was ultimately caused by money mischief or moral hazard or both, the institutional foundations underlying the radical proposals prevent these issues from arising in the first place.[23] The radical proposals are, alas, politically inexpedient.

21. Those familiar with U.S. banking history would point to this history as an obvious counterexample. But the U.S. banking experience was not remotely free. There were many regulations that prevented banks from adjusting the money supply in a way consistent with macroeconomic stability (Smith 1990).

22. A less costly possibility would be to eliminate the monetary authority but use existing fiat national currency as the monetary base, upon which the new free banks can issue their notes and checkable deposits. George Selgin (1985) discusses this possibility in more detail.

23. Such radically transformed systems may still be susceptible to importing the effects of money mischief or moral hazard in countries that retain modern central banking, but it is unclear that any system existing alongside free capital flows is robust against these kinds of problems.

Table 1
Comparative Properties of Monetary Rules

Rule (Existing Central Banks)	Parameter Sensitive?	Prevented the Crisis?	Mitigated the Crisis?
Friedman's rule	Yes	Uncertain	Uncertain
Taylor rule	Yes	Uncertain	No (zero lower bound)
McCallum's rule	Yes	Uncertain	Yes
Inflation targeting	Yes	Uncertain	Yes
Rule (Reforming/Replacing Central Banks)	**Parameter Sensitive?**	**Prevented the Crisis?**	**Mitigated the Crisis?**
Nominal-income futures market	No	Yes	Yes
Free banking	No	Yes	Yes

The political inexpediency of these proposed reforms, however, suggests an important path forward for political economy analyses of monetary policy. With a few notable exceptions, current macroeconomic theory and practice are predicated on control. Understanding macroeconomic systems requires a clear analysis of the causal relationship between variables of interest, ideally for the purposes of shoring up the perceived defects of market processes. So long as this is the dominant paradigm, lasting reform that satisfies the political-economic criteria presented in this paper will in all likelihood never come about. Proponents of political economy analyses of monetary policy must instead use their findings as a springboard from which to bring the rule of law to the conversation on money and macroeconomic considerations. As White (2010) notes, modern central banking is antithetical to a monetary regime founded on the rule of law. In addition to facilitating the needs of trade, such a regime must be stable, predictable, and unsusceptible to tampering for short-term gain. Money is the grammar of commercial relationships (Wagner 2010); discretionary interference with the regime by which money is governed undermines the ultimate contractual foundations of a commercial society. It is certainly reasonable to argue that an institution as fundamental to the public welfare as money be judged by the same standard as other bedrock institutions of liberal society. Both of the radical reforms discussed here fulfill the requirements for lawful monetary institutions (Salter 2014a); such results can and should be compiled to push for an effective and nondiscriminatory regime. With this switch in emphasis, political inexpediency can become a point in favor of such proposals: that these regimes are politically inexpedient is primarily a function of the huge gulf between these proposals and actually existing monetary institutions, but, given that current institutions fail to satisfy the rule-of-law constraint, the gulf can highlight how profoundly inadequate current institutions are as well as point the way for reform.

References

Barro, Robert J., and David B. Gordon. 1983. A Positive Theory of Monetary Policy in a Natural Rate Model. *Journal of Political Economy* 91, no. 4: 589–610.

Beckworth, David. 2012. How the Fed's Mishandling of the Productivity Boom Helped Pave the Way for the Housing Boom. In *Boom and Bust Banking: The Causes and Cures of the Great Recession,* edited by David Beckworth, 27–54. Oakland, Calif.: Independent Institute.

Bernanke, Ben. 2003. Constrained Discretion and Monetary Policy. Remarks before the Money Marketeers of New York University. New York, February 3. At http://www.federalreserve.gov/BOARDDOCS/Speeches/2003/20030203/default.htm.

Bernanke, Ben, and Frederic Mishkin. 1997. Inflation Targeting: A New Framework for Monetary Policy? *Journal of Economic Perspectives* 11, no. 2: 97–116.

Boettke, Peter J., and Daniel J. Smith. 2014. Federal Reserve Independence: A Centennial Review. *Journal of Prices & Markets* 1, no. 1: 31–48.

Brennan, Geoffrey, and James M. Buchanan. 2000. *The Reason of Rules: Constitutional Political Economy.* Vol. 10 of *The Collected Works of James M. Buchanan.* Indianapolis, Ind.: Liberty Fund.

Buiter, Willem H. 2008. Central Banks and Financial Crises. Paper presented at the Federal Reserve Bank of Kansas City symposium "Maintaining Stability in a Changing Financial System." Jackson Hole, Wyoming, August 21–23.

Cargill, Thomas F., and Gerald P. O'Driscoll Jr. 2013. Federal Reserve Independence: Reality or Myth? *Cato Journal* 33, no. 3: 417–35.

Dowd, Kevin, ed. 1992. *The Experience of Free Banking.* London: Routledge.

———. 1994. A Proposal to End Inflation. *Economic Journal* 104, no. 425: 828–40.

———. 2009. Moral Hazard and the Financial Crisis. *Cato Journal* 29, no. 1: 141–66.

Fink, Alexander. 2014. Free Banking as an Evolving System: The Case of Switzerland Reconsidered. *Review of Austrian Economics* 27, no. 1: 57–69.

Friedman, Milton. 1960. *A Program for Monetary Stability.* New York: Fordham University Press.

———. 1968. The Role of Monetary Policy. *American Economic Review* 58, no. 1: 1–17.

Garrison, Roger W., and Lawrence H. White. 1997. Can Monetary Stabilization Policy Be Improved by CPI Futures Targeting? *Journal of Money, Credit, and Banking* 29, no. 4: 535–41.

Hayek, F. A. 1948. *Individualism and Economic Order.* Chicago: University of Chicago Press.

Hetzel, Robert L. 2012. *The Great Recession: Market Failure or Policy Failure?* Cambridge: Cambridge University Press.

Hogan, Thomas, Linh Le, and Alexander William Salter. 2015. Ben Bernanke and Bagehot's Rules. *Journal of Money, Credit, and Banking* 47, nos. 2–3: 333–48.

Horwitz, Steven, and William Luther. 2011. The Great Recession and Its Aftermath from a Monetary Equilibrium Theory Perspective. In *The Global Financial Crisis: What Have We Learnt?* edited by Steven Kates, 75–92. Cheltenham, U.K.: Edward Elgar.

Kydland, Finn E., and Edward C. Prescott. 1977. Rules Rather Than Discretion: The Inconsistency of Optimal Plans. *Journal of Political Economy* 85, no. 3: 473–92.

Mankiw, N. Gregory. 2006. *The Macroeconomist as Scientist and Engineer.* Working Paper no. 12349. Cambridge, Mass.: National Bureau of Economic Research.

McCallum, Bennett T. 1989. *Monetary Economics: Theory and Policy.* New York: Macmillan.

Meltzer, Alan H. 2012. Federal Reserve Policy during the Great Recession. *Cato Journal* 32, no. 2: 255–63.

Nikolsko-Rzhevskyy, Alex, David H. Papell, and Ruxandra Prodan. 2013. *(Taylor) Rules versus Discretion in U.S. Monetary Policy.* Working paper. Houston: Department of Economics, University of Houston.

Orphanides, Athanasios, Richard D. Porter, David Reifschneider, Robert Tetlow, and Frederico Finan. 2000. Errors in the Measurement of the Output Gap and the Design of Monetary Policy. *Journal of Economics and Business* 52, nos. 1–2: 117–41.

Pennington, Mark. 2011. *Robust Political Economy: Classical Liberalism and the Future of Public Policy.* Cheltenham, U.K.: Edward Elgar.

Ravier, Adrian, and Peter Lewin. 2012. The Subprime Crisis. *Quarterly Journal of Austrian Economics* 15, no. 1: 45–74.

Roberts, Russell. 2010. Gambling with Other People's Money: How Perverted Incentives Caused the Financial Crisis. Mercatus Center, George Mason University, April 28. At http://mercatus.org/publication/gambling-other-peoples-money.

Salter, Alexander William. 2013. Robust Political Economy and the Lender of Last Resort. Working paper. At http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2246176.

———. 2014a. Is There a Self-Enforcing Monetary Constitution? *Constitutional Political Economy* 25, no. 3: 280–300.

———. [2012] 2014b. A Theory of the Dynamics of Entangled Political Economy with Application to the Federal Reserve. *Journal of Public Finance and Public Choice* 30, nos. 1–3: 77–102.

Sechrest, Larry J. 2008. *Free Banking: Theory, History, and a Laissez-Faire Model.* Auburn, Ala.: Ludwig von Mises Institute.

Selgin, George A. 1985. *The Case for Free Banking: Then and Now.* Cato Policy Analysis no. 60. Washington, D.C.: Cato Institute. At http://www.cato.org/pubs/pas/pa060.html.

———. 1988. *The Theory of Free Banking: Money Supply under Competitive Note Issue.* Totowa, N.J.: Rowman and Littlefield.

———. 1994. Free Banking and Monetary Control. *Economic Journal* 104, no. 427: 1449–59.

———. 2010. The Futility of Central Banking. *Cato Journal* 30, no. 3: 465–73.

———. 2012. L Street: Bagehotian Prescriptions for a 21st-Century Money Market. *Cato Journal* 32, no. 2: 303–32.

Selgin, George A., and Lawrence H. White. 1994. How Would the Invisible Hand Handle Money? *Journal of Economic Literature* 32, no. 4: 1718–49.

Simons, Henry C. 1936. Rules versus Authority in Monetary Policy. *Journal of Political Economy* 44, no. 1: 1–30.

Smith, Vera C. 1990. *The Rationale of Central Banking and the Free Banking Alternative.* Indianapolis, Ind.: Liberty Fund.

Stewart, James B. 2009. Eight Days: The Battle to Save the American Financial System. *New Yorker,* September 21.

Sumner, Scott. 1989. Using Futures Instrument Prices to Target Nominal Income. *Bulletin of Economic Research* 41, no. 2: 157–62.

———. 2006. Let a Thousand Models Bloom: The Advantages of Making the FOMC a Truly "Open Market." *Contributions to Macroeconomics* 6, no. 1: 1–27.

———. 2011. Re-targeting the Fed. *National Affairs* 9 (Fall). At http://www.nationalaffairs.com/doclib/20110919_Sumner.pdf.

———. 2012. How Nominal GDP Targeting Could Have Prevented the Crash of 2008. In *Boom and Bust Banking: The Causes and Cures of the Great Recession,* edited by David Beckworth, 129–64. Oakland, Calif.: Independent Institute.

Taylor, John B. 1993. Discretion versus Policy Rules in Practice. *Carnegie-Rochester Conference Series on Public Policy* 39, no. 1: 195–214.

———, ed. 1999. *Monetary Policy Rules.* Chicago: University of Chicago Press.

———. 2012. Monetary Policy Rules Work and Discretion Doesn't: A Tale of Two Eras. *Journal of Money, Credit, and Banking* 44, no. 6: 1017–32.

Wagner, Richard E. 2010. *Mind, Society, and Human Action: Time and Knowledge in a Theory of Social Economy.* New York: Routledge.

White, Lawrence H. 1989. *Competition and Currency: Essays on Free Banking and Money.* New York: New York University Press.

———. 1995. *Free Banking in Britain: Theory, Experience, and Debate, 1800–1845.* 2nd ed. London: Institute of Economic Affairs.

———. 1999. *The Theory of Monetary Institutions.* London: Blackwell.

———. 2008. *Is the Gold Standard Still the Gold Standard among Monetary Systems?* Briefing Paper no. 100. Washington, D.C.: Cato Institute.

———. 2010. The Rule of Law or the Rule of Central Bankers? *Cato Journal* 30, no. 3: 451–63.

———. 2012. Monetary Policy and the Financial Crisis. In *Boom and Bust Banking: The Causes and Cures of the Great Recession,* edited by David Beckworth, 13–26. Oakland, Calif.: Independent Institute.

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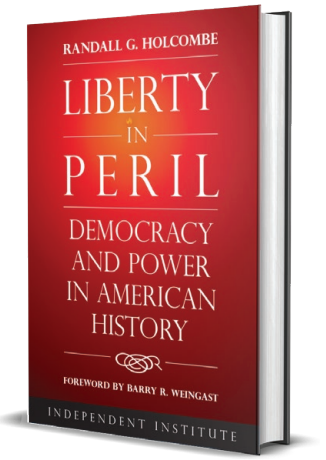

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