Go with the Flow: An Emergent, Free Banking Perspective on Stabilizing Nominal Spending

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Abstract: Market Monetarists and free bankers tend to agree on the theoretical desirability of having a monetary system that stabilizes the flow of nominal spending in an economy. However, their ideas diverge on two related issues: (1) how should we *conceive* of the process in which total spending is generated, and (2) what are the best *means* for stabilizing the flow of total spending, however defined. In this paper, I argue that the free banking approach is superior on both accounts. Free banking theory brings to the forefront of its analysis the all-important role that individuals acting within naturally evolved monetary institutions play in facilitating microeconomic coordination. This coordination, in turn, has the unintended yet desirable consequence of producing a stable flow of spending. In this sense, free banking theory is more consistent with an "emergent-dynamic" approach to understanding macro-phenomena, as discussed in Wagner (2010, 2012). Although I argue that free banking is superior means of stabilizing the total flow of spending, I conclude that combining free banking reforms with a strict monetary rule that adjusted the supply of base money to stabilize the flow of spending in the economy as Market Monetarist propose would serve as an effective remedy for the potential problems in a free banking system stemming from changes in the demand for base money.

Keywords: Market Monetarism; Free Banking; Monetary Disequilibrium; Austrian Economics; Market Process; NGDP Targeting; Monetary Institutions

JEL Codes: B53, E42, E50

I. INTRODUCTION

Is monetary equilibrium more likely to be achieved through a free banking system or by having central banks explicitly target nominal spending? Monetary economists have long debated what type of monetary policy does the best job of maintaining equilibrium between the supply of and demand for money balance, thereby keeping money as neutral as possible with respect to real variables. Since the onset of the Great Recession, support for a fairly new approach has gained traction amongst many in the Monetarist tradition. But unlike traditional Monetarists who recommended the monetary authority target a steady growth rate of some monetary aggregate (historically, M2), they argue that it should instead target the level of nominal spending in the economy, or NGDP.[1]

Their proposal has gained some theoretical support from scholars in the modern free banking school, which explores how a truly laissez faire money and banking system would operate in the absence of central banks or special legal restrictions on the banking sector.[2] One of the core findings of free banking theory is that, holding constant the supply of and demand for outside (or reserve) money, banks in a free banking system would have a direct incentive to offset changes in the demand for bank-issued money with changes in its supply. In so doing, the system would exhibit a natural tendency to stabilize the flow of total spending in an economy, as Market Monetarists desire.

Many leading thinkers in both schools derive an enormous influence from the monetary equilibrium tradition as laid out by Warburton (1950) and Yeager (1986). This shared intellectual heritage explains why they tend to agree that stabilizing the flow of nominal spending is the best proxy for maintaining monetary equilibrium. However, the two schools tend to diverge on two related issues: (1) how should we *conceive* of the process whereby NGDP is generated and (2) what is the best *means* for stabilizing it. On the one hand, Market Monetarists rely on a more mechanistic

or "top-down" approach to NGDP, viewing it as an "object of choice" for monetary authorities (Salter 2013). This view necessarily requires central bankers to play some active role—even if that role is strictly limited (Sumner 2014a). Free bankers, in contrast, take an emergent or "bottom-up" approach to understanding NGDP. They argue that when the monetary system is shorn of unnecessary restrictions, the flow of spending will *automatically* be stabilized as an unintended byproduct of profit-seeking private bankers adjusting their issuance of money in response to changes in customer demand in a decentralized manner. As such, they see no need for any nonmarket entity to deliberately target or "fine tune" NGDP.

In this paper, I argue that the free banking approach is superior both as a way of conceiving of the process that generates a stable flow of nominal spending and as a means of achieving it. Free banking theory does the best job of highlighting the all-important role that individuals acting within naturally evolved monetary institutions play in maintaining monetary equilibrium and coordinating the intertemporal plans of savers and investors. It is this *micro*-economic coordination that spontaneously generates the desirable outcome of stabilizing the flow of total spending. Free banking theory therefore provides a theoretically richer "bottom up" description of how more complex macroeconomic phenomena like aggregate spending can be generated through the self-interested actions of individuals at the micro-level without relying on any sort of "top down" aggregate demand management. In this sense, free banking theory is more consistent with an "emergent-dynamic" approach to understanding macro-phenomena like the total level of spending in an economy as discussed in Wagner (2012). Although I argue that free banking is a superior means of stabilizing the total flow of spending in an economy, I don't deny that such a system might potentially face some serious drawbacks. The most notable are stem from unanticipated changes in the public's demand for outside money. Luckily, these potential drawbacks create an opportunity for free bankers and Market Monetarists to join forces in their call for monetary reform. I ultimately conclude that combining free banking reforms with a strict monetary rule that adjusts the supply of money to stabilize the flow of spending in the economy as Market Monetarist propose would ameliorate many of the gravest threats that a free banking system might face.

II. MARKET MONETARISM

Monetary equilibrium theory lies at the heart of the recent proposals by Market Monetarists to have central banks target NGDP. Though many attribute this theory to the pioneering work of Warburton (1950) and Yeager (1956), the theoretical foundations of monetary equilibrium theory and NGDP targeting can in fact be traced all the way back to the Cambridge cash balance approach originally formulated by Alfred Marshall more than a century ago. According to this formulation, individuals chose to hold a certain percentage of their income, k, in the form of liquid cash balances. Generalizing this result to the entire economy, we arrive at the behavioral equation:

$$M^D = k\text{Py}, \qquad (1)$$

where M^D represents the total nominal demand for money, P represents the price level, and y represents real income/output. The product of the price level, P, and real income, y, yields nominal income, or Y. Since under the current monetary framework the supply of reserve, or outside, money (M0) is exogenously controlled the central bank and is invariant to changes in the purchasing power of money (represented by the inverse of P, 1/P), the money supply is at all times represented by the equation: $M^S = M$.

From these two equations we can define the monetary equilibrium condition:

$$M = k\text{Py}, \qquad (2)$$

That is, *monetary equilibrium* occurs when the supply of money is equal to the demand to hold it at the prevailing price level (Horwitz 2000, p. 70). This is shown graphically in Figure 1 at the intersection of MS and MD at 1/P. As Salter and Hogan (2015, pp. 5-6) argue, when this condition holds, the existence of money does not alter the structure of relative prices—and hence resource allocation—in the economy. That is to say when monetary equilibrium holds, money is *neutral* with respect to real variables.

Figure 1: Market for Money Balances
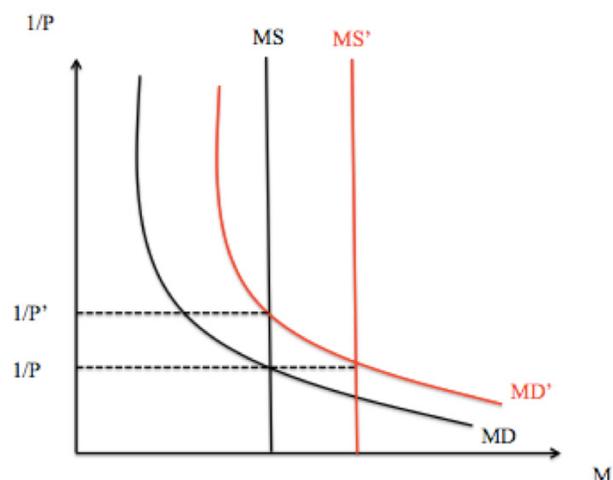
From a normative standpoint, monetary equilibrium theorists argue that many economic downtowns arise when individuals attempt to build up their money balances (denoted in equation 2 by a rise in k). This situation is depicted in Figure 1 where the money demand curve, MD, shifts to the right. In this case, the economy temporarily experiences an excess demand for real money balances. Under these circumstances, monetary equilibrium can be restored in one of two ways. The first is through the classical remedy of allowing prices to adjust downward. This would be depicted in Figure 1 by the unchanging money supply curve, MS.[3] In this situation, monetary equilibrium can only be restored by allowing the overall price level to fall, or equivalently allowing the purchasing power of money, 1/P, to rise until real money balances are restored to their desired levels.[4] However, monetary equilibrium theorists often argue that many prices in the economy (especially wages) are only imperfectly flexible, or "sticky." As a result, this downward price adjustment is associated with a potentially sharp (and often times unnecessarily painful) rise in unemployed factors and a decline in real output. A far less costly alternative for restoring monetary equilibrium, these authors contend, would be for monetary authorities to expand the money supply, as shown by the rightward shift of MS in Figure 1, to offset the rise in money demand at the existing price level. The effect of this demand-elastic monetary policy would be to stabilize nominal spending, Y.

We can write the monetary equilibrium condition in a more familiar form by making a few minor adjustments to the Cambridge cash balance equation. Most notably, k, the fraction of nominal income individuals desire to hold as cash balances, can also be defined as the inverse of velocity,

$k = 1/V$. Substituting this condition into our earlier equation, we arrive at the more familiar Fisherian version of the equation of exchange:

$$MV_y = Py,$$

Monetary equilibrium theory implies that central banks should offset changes in the income velocity of money, V_y (i.e. the inverse of changes in the demand to hold their money) with changes in the money supply. The result of stabilizing the product MV_y is that the level of nominal income and spending Py is also stabilized. In the familiar Keynesian AS-AD framework, this translates into using monetary policy to stabilize aggregate demand (AD), $Y = C + I$, where C and I denote consumption and investment spending, respectively. In this case, as alluded to earlier, a rise in the public's demand to hold its savings in the form of central bank-issued money (associated with a corresponding fall in present consumption) should lead the central bank to expand its balance sheet by issuing a more reserves, or "high powered money," to the banking system. Assuming the banking system fulfills its role in intermediating the increase in loanable funds into productive investments, the fall in C can by fully offset by a rise in I, thereby stabilizing the level of aggregate demand in an economy.[5]

Though the blackboard rationale of NGDP targeting is fairly straightforward, Market Monetarists acknowledge that achieving this result isn't quite so easy in practice. For starters, monetary authorities often lack to real-time knowledge to accurately diagnose and appropriately respond to changes in nominal spending stemming from changes in the velocity of (and demand for) money. Data on NGDP is only reported quarterly, so central bankers cannot always respond in a timely manner. Even once it is reported, the reliability of the data is also an issue, as it is often subject to measurement error and undergoes frequent revisions. Because of the delay in collecting accurate data, monetary policy would be inherently "backwards-looking" (Sumner 2011, p. 17).

Due to these epistemic and practical constraints, many Market Monetarists argue that central banks should adopt a "forward-looking" policy stance that incorporates the expectations of market actors in order to give monetary policy a "compass" (*ibid*.). Their preferred approach would be for central banks to create an *NGDP futures markets* (Sumner 1989; 2006; 2014). The mechanics of how these markets might work vary, but the broad strokes are fairly similar. The central bank would first be respon-

sible for choosing a target trajectory for NGDP growth (say, 5 percent per annum). It would then set up a futures market for trading NGDP-denominated contracts, using the market price of these contracts to gauge market expectations about the future level of NGDP. From then on the central bank would be responsible for adjusting the money supply until the market forecast of NGDP matched its explicit target. The result, they argue, would be a truly "market-based monetary policy."

The preceding discussion of Market Monetarism has two important implications for my analysis. The first has to do with the *means* they advocate using to achieve their policy goals. Though their rule-based approach would significantly limit its discretion, most Market Monetarists would maintain the central bank as a tool for establishing and executing their paramount objective: an explicit NGDP target. This highlights an interesting tension in the Market Monetarists' literature. Though they typically believe in the superiority of markets over central planning, they are very reluctant to take the final step of closing the central bank and leaving the money supply entirely to market forces.

The second implication flows directly from the first: in a system where central banks actively adjust the money supply to stabilize the growth of NGDP, it cannot be said that NGDP represents the spontaneous outgrowth of unfettered market activity; instead it becomes an "*object of choice*" for the central bank. In its ideal form, the central bank is still responsible for setting the target growth path for NGDP and then actively buying and selling NGDP futures contracts at a fixed price. In its crudest form, the central bank must continually intervene and "fine tune" the economy to stabilize aggregate demand. As this emphasis on end-states illustrates, Market Monetarists predominantly speak in terms of the *macroeconomic* implications of NGDP targeting. This aggregative level analysis certainly makes it easier for them to converse with the mainstream of the economics profession. But this marketing advantage comes at a high cost: namely, by focusing only on aggregates, Market Monetarists tend to overlook the all-important *institutional* and *microeconomic processes* that give rise to a stable level of NGDP.

III. FREE BANKING

Although free bankers are fellow travelers in the monetary equilibrium tradition, they take a fundamentally different approach to understanding how best to maintain monetary equilibrium. Unlike Market Monetarists and most main-

stream economists who typically assume the existence of a central bank and frame their entire analysis on macro-level aggregates, they begin by asking: "How Would the Invisible Hand Handle Money?" (Selgin & White 1994). Their answer provides the basis for the theory of free banking.

A free banking system is, in effect, an institutional framework where government plays no active role in money and banking outside its basic function of protecting private property and upholding contracts and the rule of law. Banks are free to enter and exit the industry as they wish, competing on a coequal legal status. They are also free to issue their own debt and equity claims in whatever form they wish without any restrictions on the quantity, types, or mix of assets they may hold as backing. In general, there are no restrictions on the contractual terms made between banks and their customers beyond the requirement that they adhere to the standard legal principles governing all business contracts (1994, pp. 1718-1719). Since no bank or group of banks enjoys any special legal privileges, there is no state-sponsored central bank with a monopoly on currency issue, no official lender of last resort, and no government deposit guarantees.

In theory, a free banking system can be built on the foundation of any monetary standard. However, free banking scholars typically begin their theoretical analysis by assuming that the ultimate form of money in such a system consists either of some commodity like gold or silver, as has historically been the case, or a frozen (or computer controlled) stock of fiat money (Selgin 1988b). Since the types of money that banks hold as reserves are produced *outside* the private banking system, they are often referred to as "outside" money, the supply of which is taken as exogenous by private banks. Moreover, scholars typically assume that the public in a mature free banking system is confident enough in the private banking system to hold the vast majority their monetary wealth in the form of privately issued notes, deposits, or other forms of private bank liabilities—that is, the demand to hold their wealth in the form of this basic or outside form of money is virtually zero. The demand for these outside forms of money, therefore, stems almost entirely from bank's demand for reserves for interbank clearings.

In my analysis in this section, I will take as given that the public holds the vast majority of its monetary wealth in the form of privately issued bank notes and deposits, so that there is virtually no variation in the public's demand for outside forms of money. I also assume either that the economy is on a commodity standard such as gold or silver (as has historically been the case) or a frozen stock of fiat mon-

ey or computer-managed stock of that grows at some predetermined rate as its reserve medium, as Selgin (1988b, 2015) discusses. In either case, variations in the supply of basic money are minimal and fairly predictable, so any resulting changes in nominal spending would be minor.

Free banking scholars readily admit that no country has ever fully embraced all the elements of a "pure" free banking system. Nevertheless, scholars have analyzed case studies from a number of "lightly regulated" banking systems that meet the basic criteria of a free banking system: a fair degree of bank freedom, multiple note issuers, and the absence of any sort of government-sponsored lender of last resort (Dowd 1992, p. 2).[6] The evidence from these episodes suggests that these relatively free banking systems generally avoided the pitfalls that many scholars are quick to attribute to an unregulated banking system. Contrary to the concern that free banking would lead to anti-competitive concentration in the banking sector or that the supply of money was a natural monopoly, these systems showed no tendency towards monopolization; in each case where there was relatively free entry and exit and nationwide branching, the banking system supported multiple note issuing banks ranging in size from large banks to community banks (Dowd 1993; Schuler 2002). Moreover, freer banking systems experienced far fewer financial crisis and bank failures than their more highly regulated counterparts (White 1999 ch. 5).

One key stage in the development of these historical free banking systems was the emergence of private clearinghouse associations (CHA). These CHA's allowed member banks to return each other's liabilities, settle clearing imbalances with rival banks, and economize on the cost of holding non-interest bearing reserves (White 1999 pp. 16-17). Indeed, many historical clearinghouses assumed roles that are commonly attributed to modern central banks by serving as a "banker's bank" in holding reserves in a centralized location, managing the payment system, monitoring the activities of its member banks, and occasionally even serving as private "lenders of last resort" in the rare case of a systemic liquidity crisis (White 1999, pp. 71-79). The emergence of these CHAs proved to be a critical component in the stability and efficiency of these historical free banking systems.

Why do the operations of a free banking system matter from the standpoint of maintaining monetary equilibrium? The reason is that one desirable aspect of mature free banking systems with developed interbank CHAs that scholars stress is that the supply of bank-issued, or "inside," money,

which consists of private bank notes and deposits that serve as the economy's primary circulating media of exchange, tends to automatically adjust to accommodate changes in the public's demand.

The easiest way to see this is by analyzing the actions of individual profit-maximizing banks within a free banking system. Each individual bank in its effort to maximize profits and satisfy its customer's monetary demands faces a direct incentive to offset changes in the demand for its money with changes in its supply (White 1999, pp. 60-67). For instance, if the demand for a particular bank's liabilities unexpectedly rises (i.e. its velocity falls), that bank will enjoy positive net clearings. The resulting increase in its reserves over and above the level it demands as a precaution against variations in negative or "adverse" clearings in the interbank clearing market sends a direct signal to the bank that its customers are more willing to hold (i.e. abstain from spending) its IOUs, thereby providing it with additional loanable funds.[7] The bank can intermediate these otherwise idle savings into productive investments by expanding its portfolio of interest-bearing loans or purchasing securities. By putting more of its money into circulation, the flow of the bank's liabilities entering the clearing system eventually rises to its normal level, bringing its actual reserves back in line with its desired reserves. The reverse holds when a bank faces a fall in the demand to hold its liabilities. Such a bank suffers from "adverse clearings," forcing them to contract their liabilities to restore actual reserves to their desired level. In this way, the supply of money issued by each bank is *demand-elastic*, and monetary equilibrium is maintained at the level of each individual bank.

We can extrapolate from the case of the individual bank to see what happens to the entire banking *system* when there is a *general* rise in the demand to hold inside money. In this case, no bank on average gains reserves relative to its competitors. However, the decline in gross clearings reduces the variance in the size of reserve losses thereby causing each bank to reduce its demand for precautionary reserves (Selgin 1988b, pp. 73-78). Since banks can safely expand their issuance of inside money without the risk of dipping below their now lower desired level of precautionary reserves, they can increase their profits by reducing their reserve ratios (i.e., increasing their money multiplier) and issuing more liabilities in exchange for interest-bearing loans. In this way, the supply of money for the banking system as a whole is *demand-elastic* (White 1999, p. 66).[8]

Generally speaking, then, all profit-maximizing banks in a free banking system face a direct incentive to offset chang-

es in the *transactions* velocity of their monetary liabilities with opposite changes in their quantity in circulation. In terms of the original equation of exchange, $MV_T = PT$, changes in the total transactions velocity of inside money, V_T, are met with offsetting changes in its supply, M. For this reason, free banking scholars claim that the a competitive banking system with well-functioning interbank clearinghouses has a built-in mechanism for adjusting the supply of bank-issued money in the face of shocks in the public's demand, maintaining monetary equilibrium both at the individual bank level and for the system as a whole. In so doing, the system displays an automatic tendency to stabilize the total volume of nominal spending in an economy.

This tendency for both an individual bank and the banking system is shown in Figure 2, where total payments (MV_T) is depicted on the y-axis and the stock of bank reserves is depicted on the x-axis. The vertical line R^S depicts the supply of reserves in the banking system, which at any time is exogenously to the banking system since it is produced outside the banking sector. The line R^D plots the banking sector's demand schedule for reserves. The line is upward sloping because as the total volume of payments rises—that is, as more payments filter through the interbank clearing system—each bank's precautionary demand for reserves rises at an increasing rate. As the figure shows, for a given stock of bank reserves and demand schedule there is an equilibrium level of total payments (MV*) in an economy. If total payments exceed that equilibrium level, banks will increase their demand for precautionary reserves to account for the larger variance of reserve losses. The opposite holds when total payments dip below the equilibrium level, implying that banks have excess reserves that they can safely lend out.

Figure 2: Bank Reserve Demand
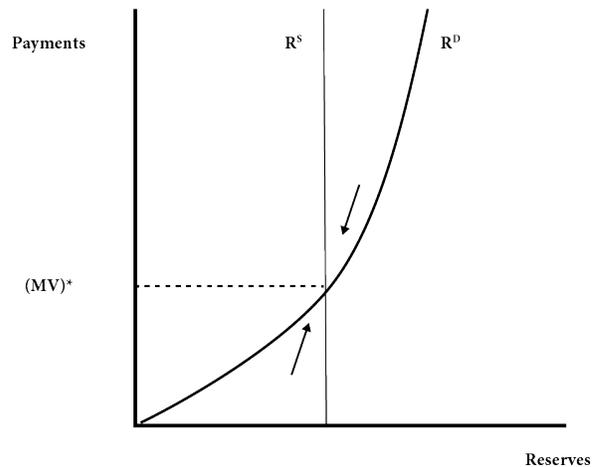
Mirroring the discussion in the previous section, there are two key implications we can draw from the preceding analysis. First, in a free banking system there is no need for a central bank or any extra-market monetary authority to deliberately target a stable path for nominal spending. This socially beneficial outcome emerges as the unintended result of the decentralized actions of profit-seeking bankers. This efficient outcome of a free banking system therefore represents what Hayek (1946) refers to as a *spontaneous order*—"the result of human action, but not the execution of any human design."

The second implication follows logically from the first. Since there is no central bank in a free banking system, the flow of spending, or NGDP, in the economy does not represent an "object of choice" for any nonmarket institution. Rather, the level of NGDP at any given moment instead represents the *emergent* outcome of the competitive market process. The free banking narrative, therefore, does not suffer from any internal tension. The invisible hand that works so well in other markets also extends to money.

IV. TARGETING VS. STABILIZING NGDP: TWO DIFFERENT CONCEPTIONS

4.1 Methodological Differences

A key takeaway from the previous sections is that Market Monetarism and free banking represent two fundamentally different approaches to *conceptualizing* NGDP. Using De Grauwe's (2010) distinction between "top-down" and "bottom-up" conceptions of macro phenomena, Market

16

Monetarists offer a "top-down" explanation of NGDP. The best way to approximate monetary equilibrium in the aggregate, they argue, is by having the central bank explicitly *target* NGDP. Since this analysis takes place exclusively at the aggregative level, the microeconomic processes that generate these macro-level phenomena are largely concealed within their analytical framework.

Free bankers, in contrast, offer what we might consider a "bottom-up" explanation for how macroeconomic variables like NGDP are generated. Their theory highlights the fact that central bankers face an enormous epistemic challenge in trying to achieve their macroeconomic objectives (Selgin 1988b). Under these constraints, they note that it is highly unlikely that central bankers would have access to the sort of knowledge and information that would be required for them to maintain monetary equilibrium. Even if central bankers could somehow access all the requisite information, it remains doubtful that they would be able to fully insulate themselves from the special interest groups and political incentives that might influence its monetary policy.

A free banking system largely avoids these problems. In such a system, there is no reliance on the omniscience or benevolence of the monetary authority to centrally plan the money supply in order to achieve stable economic growth. Instead, monetary and loanable funds market equilibrium is maintained organically through the decentralized actions of private bankers using their localized knowledge to equate supply and demand for their own monetary liabilities. It is this micro-level coordination that spontaneously generates the socially desirable macro-level outcome of *stabilizing* the total flow of spending in an economy. Unlike Market Monetarism, then, free banking analysis is solidly rooted in *microfoundations* that serve to illuminate the dynamic process whereby macro phenomena *emerge* from an intricate web of microeconomic interactions.[9]

This "top down" vs. "bottom up" dichotomy roughly corresponds to the insightful contrast that Wagner (2010, pp. 141-42) draws between "centralized" and "emergent" approaches to understanding macro phenomena. By speaking purely in terms of one macro variable (some money aggregate) acting on another (NGDP), Market Monetarists all too often employ what Wagner calls the "centralized" approach to macro theorizing. The flaw with this, he argues, is that these aggregate variables are depicted as being the products of outside intervention rather than of internal emergence.[10] This stands in stark contrast to the "emergent-dynamic" approach that Wagner endorses and that free bankers consistently (albeit perhaps unwittingly) employ. Under this ap-

proach, "[macroeconomic] aggregates do not act directly upon each other" but are instead "intermediated through interactions among various individuals within a society" (*ibid*.).[11]

Importantly, by highlighting the fact that the complex macro phenomena of NGDP ultimately arises from the simple interactions between private agents (in this case, bankers and their customers), free banking theory is consistent with in what Wagner (2010) elsewhere refers to as the "generative" or "Neo-Mengerian" mode of analysis. According to this approach, complex social configurations like the level of total spending in an economy emerge from—or are generated through—interaction among simpler micro-level entities. As such, these variables cannot be properly analyzed in isolation from the market process that generates them. It is therefore only desirable to track these macro-level aggregates insofar as they tell us something about how well they facilitate micro-level coordination between individuals. In this sense, free banking represents a "radically micro-centric approach" to macroeconomic theorizing (Wagner 2010, p. 145)—one that restores *methodological individualism* to the forefront of all subsequent analysis.

It is worth noting that the desire amongst free banking advocates to achieve a stable flow of nominal spending doesn't stem from any sort of Keynesian fixation on removing any and all aggregate volatility as the be-all and end-all of monetary policy. Rather, it stems from their recognition that a stable flow of spending is desirable only insofar as it reflects successful *micro*-level coordination between savers and investors in the banking system's role as a financial intermediary. For instance, when the public decides to increase its savings by holding relatively larger balances of bank-issued money, achieving the theoretical ideal of full intermediation of savings into investment requires that banks expand their balance sheets by issuing more of their liabilities. When this occurs, what would otherwise have been idle savings are funneled into productive investments, and the gains from financial intermediation are more fully realized.

From the standpoint of understanding the competitive market process, this free banking perspective is superior to the Market Monetarist approach precisely because it brings into focus the all-important *microeconomic processes* that occur between individuals and banks and acknowledges that it is these processes, when taken in their totality, that generate the macroeconomic outcomes that Market Monetarists desire. Perhaps most importantly, free banking theory highlights the crucial role monetary *institutions*

across the economy play in bringing about monetary and loanable funds market equilibrium. This institutional focus helps highlight the fact that private bankers not only have better access to the sort of specialized knowledge that is needed to maintain monetary equilibrium but that they also have a direct financial incentive to swiftly accommodate changes in the public's demand for money. Hence, so long as the general protections for private property and the rule of law are in place, there will be a natural tendency for these systems to avoid being the source of money-induced (i.e. nominal) economic shocks. Finally, free banking theory also helps illuminate some of the negative unintended consequences of government interventions into the money and banking system that prevent banks from being able to respond to changes in the public's demands such as reserve requirements and restrictions on branch banking, currency issue, capital and asset holdings, and deposit interest rates. While Market Monetarists relegate these factors to the background of their analysis, free bankers bring them to the forefront.

4.2 Practical Differences

Of course, these methodological differences in the way that free bankers and Market Monetarists view the processes that produce a stable flow of nominal spending wouldn't be of much practical relevance if the two systems generated the exact same outcome. However, as other economists have noted in recent years, there are not only conceptual but *substantive* differences in the nominal spending that is generated by the two regimes.

Though Market Monetarists and free bankers generally agree on the desirability of having a monetary system that achieves a stable flow of spending, many scholars all too often gloss over the fact that there are in fact many different ways to measure total spending in an economy. One advantage of the free banking approach is that it tends to automatically stabilize the most *comprehensive* measure of nominal spending. As White (1999, p. 67f) notes, "[t]he turnover of its liabilities a bank must worry about is not only from spending on final goods and services, but from *all transactions*" [emphasis added]. In terms of the equation of exchange, $MV_T = PT$, this is represented by the term V_T, or transactions velocity of money. Free banking therefore tends to stabilize the total volume of nominal *transactions*, PT, which can be viewed as the total amount of spending that is generated in the economy from *all* sales of goods and services, not just final sales.

Market Monetarists would presumably have the central bank target this broader measure of nominal spending precisely because it includes *all* spending, including intermediate transactions and a variety of other economic activities. However, as economists have long noted, it is exceedingly difficult to reliably measure the total number and value of all transactions in an economy. So instead they of this broader measure they substitute a variable that they can fairly easily derive: nominal spending on final goods and services. NGDP targeting thus aims to offset changes in the income velocity of money, V_y, with changes in M in order to stabilize nominal spending on only final output, Py. Unfortunately, since GDP only includes total income from *final* sales of goods and services, NGDP targeting fails to capture a large share of total economic activity (roughly two-thirds, by most estimates). This implies that real GDP might *not* be the most reliable proxy for total spending in the economy—especially when the public shifts its time preferences away from final goods and services by deciding to save more.[12]

The free banking version of MV stabilization is most consistent with the constant MV norm that Friedrich A. Hayek (1935, pp. 123-131) supported in principle earlier in his career (see: White 1999b). Using Hayek's analysis of the economy's capital structure, free banking would allow banks to respond to, say, a decrease in the public's time preferences (i.e. an increase in their savings rate) by intermediating their additional savings into productive investments. Since the outward shift in loanable funds provided by the public to banks would tend to put downward pressure on interest rates, these investments would tend to be more highly concentrated in intermediate and capital good expenditures in the earlier stages of production. Since this increased spending on intermediate goods is only captured in GDP after some delay as they move closer to the final stage, a free banking regime that stabilizes PT might necessitate a temporary but perfectly healthy decline in total spending on final goods and services, or Py. An NGDP targeting regime, in contrast, wouldn't permit any such decline in spending. It would instead inject more money into the system to stabilize the flow of final spending, thereby lowering the market interest rate below its natural rate and disrupting the capital structure. A well-functioning free banking system would therefore be more likely to avoid the sort of intertemporal discoordination that Hayek warned about in his business cycle theory.[13]

Of course, this potential problem largely disappears if we assume that changes in transaction velocity are always

matched one for one by changes in income velocity. In this case, we can treat both regimes as tending to stabilize both measures of nominal spending (White 1999, p. 67f). Even so, Market Monetarists and free bankers might still clash on what the most desirable *growth rate* of NGDP should be. On one extreme, Hayek's proposal to stabilize the "total stream of spending" would entail a zero percent NGDP growth rate, requiring annual deflation at approximately the rate of real output growth (1935, p. 131). On the other, Sumner has long argued that the Fed should target 5 percent annual NGDP growth to stay roughly on pace with its recent historical trend.

Most free bankers would likely prefer a rate somewhere in between these two extremes. Selgin (2009), for instance, has argued that Sumner's 5 percent target rate is "unnecessarily and perhaps dangerously high." But like Sumner, he fears that a perfectly stable NGDP like Hayek proposed would involve some harmful deflation—especially in a world where total factor growth is typically positive and where prices—particularly factor prices—tend to be "sticky." His ideal rate, therefore, would be something closer to 2-3 percent in order to offset *extensive* or real factor growth, allowing for on average zero inflation and even mild deflation in times during times of *intensive* growth when productivity is rising.[14] As Selgin (1997) notes, this idea that the price level should be allow to move inversely to changes in productivity—rising in response to negative supply shocks and falling in response to positive supply shocks—has a long history in economic thought, particularly amongst scholars in the monetary equilibrium tradition. Indeed, the notion of a productivity norm is embedded in the very nature of a NGDP targeting regime. In such a system, any attempt to insulate the price level from changes in final output prices that stem from changes in firms' per unit costs of production would cause total spending to rise above or below its target rate. In terms of the AS-AD framework, a productivity norm implies that monetary authorities should only attempt to offset shifts in AD but otherwise allow the price level to adjust in response to supply-side factors such as higher or lower rates of productivity (denoted by shifts in the SRAS and LRAS curves).[15]

Another benefit of free banking over NGDP targeting by a central bank is that it helps minimize the sort of "injection effects" that Austrian economists in particular stress. The eighteenth century economist Richard Cantillon (1755) famously elucidated how the way new money enters an economy has a ripple effect on the structure of relative prices (Lastrapes 2006). This observation has important impli-

cations for diagnosing the differences between the stable spending flow achieved by a free banking system relative to that of a central bank managed regime. Virtually any central bank that targets NGDP would tend to provide a far more unitary, top-down injection point for new funds than under free banking (Salter 2013). So while in theory it's true that a central bank could approximate monetary equilibrium by providing enough liquidity to stabilize the flow of aggregate spending, in practice there'd be no guarantee the new money would swiftly enter the hands of the individuals who most urgently demand it.[16] However, this is an impossible task for any NGDP targeting regime to achieve. Central bankers—no matter how intelligent or well-intentioned—lack the sort of localized knowledge that is required to inject money directly where it is in highest demand. Consequently, as new money slowly filters through the system the array of relative prices and patterns of resource allocation will differ from what they would've been under free banking—even if the two regimes stabilize nominal spending equally well (Salter 2013).[17]

When NGDP emerges in the institutional context of a free banking system, on the other hand, there is no need to rely on any sort of non-market entity or "top-heavy" operating structure to regulate how and when money is injected into an economy. Instead, individual banks provide the injection/absorption points for money (Salter 2013, p. 47). Private bankers can therefore take advantage of their localized knowledge to allocate funds to where they are most demanded in a way that no central bank—no matter how well equipped its staff or "market-driven" its monetary policy—could possibly emulate. A key reasons for this superior outcome is that private bankers are disciplined by profit and losses to make certain they supply the right amount of liquidity into the right hands. They are also disciplined by both profit and loss and interbank clearings signals to avoid squandering their customer's savings or under or over-issuing their liabilities. By in effect dispersing regulatory authority over the supply of money amongst a dense network of private agents, this sort of market regulation, or "private ordering," serves as a stricter constraint on opportunistic behavior than any sort of externally imposed "public ordering" can possibly provide (Wagner 2010, p. 129). The pattern of economic activity that results from this private ordering is therefore much more likely to align with consumer preferences and have the desirable yet unintended effect of promoting macro stability.

Central bankers, on the other hand, since they are not residual claimants and since they enjoy a currency monop-

oly and implicit government guarantee of their debts, are largely exempt from this strict discipline of the competitive market. Because the costs of their mistakes are borne by the public, they are more likely to poorly invest the public's wealth and allocate credit on the basis of political favoritism. A strictly enforced NGDP targeting rule might mitigate these pressures, but it is unlikely to eliminate them entirely. In short, because the money supply in a free banking system is controlled by a decentralized network of private agents who have access to localized knowledge and who fully internalize the costs and benefits of their decisions, it is far better suited to handle deviations from perfect knowledge and incentives. It therefore does a better job meeting the criteria of "robust political economy" (Leeson & Subrick 2006; Pennington 2011).[19]

Arguably the greatest advantage of the stable NGDP achieved under free banking is that it is entirely *market-generated*.[20] There is no need for a central bank or any non-market entity to play a heavy-handed role in managing the economy. In their role as money suppliers, private banks are responsible for providing a stable and reliable exchange media for the economy. In their role as financial intermediaries, they are compelled by market forces to use their specialized knowledge to efficiently allocate scarce capital amongst competing entrepreneurial visions. This sort of savings-led cycle lies at the heart of what Roger Garrison (2001) calls the process of "sustainable growth."

This analysis of the relative benefits of free banking therefore has broader implications for how we understand the causal role that monetary institutions play in promoting economic growth and prosperity. Many economists have argued that financial liberalization plays a critical role in accelerating economic growth and development.[21] One of the cardinal virtues of a free banking system noted as early as Adam Smith (1776) is that it maximizes the amount of loanable funds at the disposal of private banks. In the professional jargon, free(r) banking systems contribute to *financial deepening*, defined as the ratio of private bank liabilities to GDP. When banks are free to supply *all* types of circulating money, they are able to use their specialized knowledge to more efficiently intermediate the public's savings into loans and productive investments.[22]

This beneficial effect is diminished when central banks monopolized a large share of the public's money holdings—as they would if central banks merely switched to targeting NGDP without relinquishing their currency monopoly. Central banks tend to be relatively inefficient intermediaries of the public's savings.[23] In the "sustainable growth"

example given above it's important to note that in a free banking system, banks can expand their lending activities no matter what *form* of money the public desires to hold its wealth in. This would not be the case for central banking regimes in most countries, regardless of whether they targeted NGDP. In these cases, if the rise in savings came in the form of an increase in the public's demand for hand-to-hard currency (a high powered, or reserve, form of money) relative to checkable deposits, the *central bank* is required to increase the supply of base money to prevent an "internal drain" of reserves and thereby maintain monetary equilibrium. Maintaining monetary equilibrium in a free banking system absent these legal restrictions, in contrast, does not require an omniscient central bank. Rather, it arises naturally through the actions of private bankers.[24]

This analysis hopefully also serves to clarify the true relationship between stable NGDP and economic prosperity. By focusing on macro-level aggregates like the level of NGDP, it's easy for Market Monetarists to slip into implying that having central banks stabilize the growth path of NGDP is sufficient for ensuring economic prosperity.[25] What they neglect—and what free bankers admirably bring to the fore—is that the *composition*, or quality, of NGDP at any given moment matters much for economic prosperity than its nominal quantity.[26] Free bankers do a far better job of stressing this point because their analysis places a strong emphasis on the importance of political and monetary institutions and the micro-level processes that help comprise a given level of NGDP.

The free banking approach is therefore much more firmly rooted in sound economic theory about the real factors that contribute to economic growth and prosperity. New Institutional economists have long argued that economic prosperity is primarily a function of institutional frameworks that protects private property, contracts, and the rule of law (Coase 1960; Alchian 1961 [2006]; Demsetz 1967; North 1990). Conveniently, this constitutional foundation is all that is needed for free banking to flourish (Horwitz 2011; Salter 2013, 2014). It's true that one desirable consequence of a free banking system is that it tends to stabilize the flow of spending. However, we should avoid confusing cause and effect: the stable NGDP produced by a free banking system is not itself the *cause* of economic prosperity; rather, it is an *effect* of the underlying rules and institutions that foster free banking. Salter (2013, p. 46) summarizes this insight nicely:

The important point here is the constitutional framework of society that results in an environment wherein individuals, acting on the basis of their localized knowledge, pursue their self-perceived interest by behaving in a manner that results in money approach neutrality at the macro level. In this scenario, *stable nominal spending is not the cause of economic prosperity; it is the consequence of the same institutions that produce prosperity* [emphasis added].

V. ROOM FOR RECONCILIATION? MERGING NGDP TARGETING AND FREE BANKING

In the previous section, I outlined some of the major reasons why the free banking approach to stabilizing the flow (or growth rate) of nominal spending in the economy was superior to the Market Monetarists approach both in theory and in practice. These distinctions are especially vital to bear in mind when we engage in comparative analysis and ask which of the two approaches is better suited to achieve both schools' desired end: maintaining monetary equilibrium.

Although both theory and history suggests that moving towards a free banking system would confer considerable economic benefits, proposals for free banking are widely viewed as being far more radical than the proposals made by Market Monetarists. Scholars who have studied free banking episodes have done extensive work to combat the most common myths about the alleged perils of these lightly regulated systems. As noted earlier, they have shown that contrary to the concern that it would lead the emergence of banking monopolies and cartels, free banking systems showed no tendency towards anti-competitive behavior or concentration (Dowd 1993; Schuler 2002). They have also extensively shown that historical free banking systems like the ones in 18th and early 19th century Scotland and 19th century Canada were markedly more stable and robust than their more highly regulated counterparts in England and the United States, suffering from far fewer bank failures. Even in the rare instances where bank failures occurred, like the failure of the Ayr Bank in Scotland in 1772, no financial contagion ensued, and the spillover effects on the rest of the banking system were very minimal (Goodspeed 2011). Indeed, free banking scholars argue these systems enjoyed such great stability not in spite of but *because of* the absence of repressive regulations and moral hazard inducing deposit insurance or lender of last resort schemes spon-

sored by the government. Despite these efforts, most economists today would nevertheless maintain that the idea of an unregulated monetary and financial system remains too risky, too heterodox, and too politically unpalatable to warrant serious consideration.

Luckily, there are many areas where scholars with sympathies for free banking and/or a rules-based monetary regime can join forces to promote practical reforms that help further their shared goal of having a more stable, market-oriented monetary system. Indeed, I maintain that elements of free banking and NGDP targeting can and should be viewed—not as competing alternatives—but as *complementary* steps towards reform.

Perhaps the most notable drawback of a free banking system without any sort of central bank capable of making the supply of base (or "outside") money perfectly elastic is that it would potentially be vulnerable to excessive bouts of inflation or deflation stemming from unexpected shocks to either the supply of or demand for the underlying form of money that banks hold as reserves for their outstanding monetary liabilities. For instance, suppose a fractional reserve free banking system operating on a gold or silver standard (which was historically the most common case) experienced a sudden and unexpected increase in the demand for gold or silver.[27] Since gold and silver specie serve as a form of reserve, or "high-powered," money in such a system, any sudden rush on these reserve assets—the ultimate form of redemption and, hence, most liquid form of money in the economy—would force banks to contract their balance sheets and call in their outstanding loans and security purchases. This, in turn, would reduce the supply of liquid funds available to investors, thereby putting a significant damper on investment spending. In the absence of swift international inflows of specie under a commodity-based free banking system or some sort of domestic or international lender of last resort, these shocks could cause NGDP to plummet and result in a fairly prolonged economic downturn. If such monetary shocks were fairly common, a free banking system could in theory be less stable than one with a central bank that targets NGDP or inflation.

Most free banking scholars acknowledge that this sort of perverse monetary shock is at least possible in a free banking system—particularly one based on a commodity standard or frozen stock of fiat money reserves, as we assumed earlier, where the supply of money is relatively inelastic at least in the short run. Nevertheless, they maintain that the historical episodes of free banking systems indicate that such negative shocks were virtually non-existent. In fact,

the most common cause of such liquidity crises stemmed from either a sudden *contraction* of money and credit by the central bank, as occurred in the United States and many other countries whose central banks violated the implicit "rules of the game" of the gold-exchange standard in the early stages of the Great Depression (Johnson 1997),[28] or from a previous *over-expansion* of credit initiated by central banks that resulted in reserves flowing out of the country, as David Hume explained in his price-specie flow mechanism (Hume 1752). These central bank-induced "boombust" cycles were characteristic of many of the financial panics in 19th century Britain and even the collapse of the Bretton Woods system in 1971 (Bagehot 1873).

Even in the rare theoretical case where such an increase in the demand for outside money occurred in the absence of destabilizing central bank or government policies, it is perfectly conceivable that a free banking system that emerged from of our current fiat money system could avoid these potential problems by having the central bank or whatever remained of the former monetary authority adopt some sort of demand-elastic money growth rule that would allow it to adjust the supply of the basic reserve media to accommodate changes in the public's demand. Given the complications with returning to any sort of non-fiat standard such as the classical gold standard following decades where gold has been demonetized by central banks around the world, this is precisely the sort of reform that many prominent free banking scholars propose today. In light of this, the debate today largely centers on the question: what would be the optimal money growth rule for the supply of base money under a fiat-backed free banking system?

The free banking scholar who has dedicated the most time to this question is George Selgin. In the closing chapter of *The Theory of Free Banking* (1988b), Selgin argued that the simplest and least costly path towards a free banking system given the current state of monetary and financial systems would be for the central bank, prior to closing up shop for good, to freeze the stock of basic (fiat) money and for the government to implement the extensive banking deregulations that are outlined throughout his book. In light of new theoretical and technological developments over the past few decades, however, Selgin has updated his ideal proposals for monetary reform. Today, he argues that the best first step away from having a discretionary central bank and towards a more free banking system would be to have central banks—to the extent they exist at all—adopt some strict rule directing its conduct of monetary policy.

Although there are many rules that would be superior to unbridled discretion, Selgin stresses that his ideal rule for monetary policy would be one that would secure a stable flow (or growth rate) of nominal spending in the economy, just as would tend to occur naturally in a well-functioning free banking system. In practice, he argues that this would mean adopting some sort of NGDP targeting rule where the supply of base money adjust only to changes in money demand and to offset extensive growth in the economy's factors of production. In his 2009 article "Between Fulsomeness and Pettifoggery: A Reply to Sumner," he explicitly aligns himself with Scott Sumner and other Market Monetarists' arguments for why targeting the flow of NGDP growth is a far better indicator of the stance of monetary policy than focusing solely on interest rates, inflation, unemployment, or any combination of these macroeconomic measures. He writes:

> Like [Scott Sumner], I believe that monetary policy should strive, not to achieve any particular values of interest rates, employment, or inflation, but simply to *maintain a steady growth rate of overall nominal spending*. Such a policy seems to me, after all, the most straightforward, practical counterpart of the textbook ideal of keeping an economy's "aggregate demand schedule" from shifting, or at least from shifting in an unpredictable manner, so as to keep output at its long-run or "natural" value… [Emphasis Added][29]

Although it would certainly be possible for central banks to explicitly target NGDP growth rate, Selgin (and, to some degree, Sumner) argues that thanks to technological innovations it would be entirely feasible today to entirely replace the FOMC and the Board of Governors role in conducting monetary policy with a simple computer algorithm or protocol designed to adjust the money supply so as to maintain a target level of total spending. In his article "Synthetic Commodity Money" (2009), Selgin outlines in detail how such a modern manifestation of Milton Friedman's "k percent rule" might be designed today to target NGDP growth or some other money growth rule in light of more recent innovation in computer technology.[30] Indeed, Selgin derived his idea from innovations in block chain technology that allow crypto-currencies like bitcoin to grow at a perfectly predictable predetermined rate. Sumner's proposal for establishing an NGDP futures market where market actors help determine the growth rate of the money supply based on their forward-looking expectations of NGDP provides

22

yet another example of how the money supply could be determined without any hint of central bank discretion. A major benefit of having the money supply governed by such an automatic protocol, Selgin (2015b) contends, is that in the same way driverless cars are expected to largely eliminate the vast majority of accidents that are attributable to human error, "driverless money" would go a long way towards eliminating the economic fluctuations that could be attributed to monetary malpractice on the part of central bankers.

Both Market Monetarists and free bankers would agree on the virtues of moving away from our current discretionary monetary regime and towards a rules-based regime. Nevertheless, we will not reap the full benefits of financial liberalization until additional deregulations such as the ones outlined in free banking theory are enacted that give banks more freedom to offer both currency and deposit liabilities, set their reserve and capital requirements, and remove the perverse incentives that are created by government deposit insurance and the policy of "too big to fail." Even still, transitioning to a rules-based regime remains a critical first step towards achieving the shared goal of both Market Monetarists and free bankers: having a market-oriented money and banking system.

VI. CONCLUSION

Although I've endorsed the theoretical approach taken by the free banking school in this article, one of the most important implications of my analysis is that there are many margins of policy reform that both free bankers and Market Monetarists can join forces on. The most important first step would be to eliminate central bank discretion and instead have the monetary authority adopt some sort of strict rule governing the behavior of the money supply, preferably one that targets some reasonable growth rate of NGDP. However, once this step is taken it is very likely that free bankers could convince Market Monetarists and perhaps others of the virtues of further banking deregulation and movements in the direction of free banking. Such a series of reform would serve not only to create a more stable and predictable environment for monetary policy but also help create a more robust banking system that could, in turn, contribute to more rapid and sustainable economic growth and development.[31]

NOTES

1 The term "Market Monetarism" was coined by Lars Christensen (2011). The school of thought largely arose out of the blogosphere through the works of Scott Sumner, Nick Rowe, David Beckworth, Joshua Hendrickson, William Woolsey, and others. For more information, see: Sumner (1989, 1995, 1997, 2011), McCallum (2011), Hendrickson (2012), Christensen (2012).

2 For more work on the modern free banking school, see: White (1984, 1999), Selgin (1988b), Selgin and White (1987, 1994), Schuler (1988), and Dowd (1992).

3 It is worth noting that the MS schedule in Figure 1 need not be vertical if the central bank is determined to maintain some particular price level. In this case, the MS schedule would technically be horizontal.

4 It is worth noting that an increase in the demand for money that is not met by a corresponding change in the supply of money does not necessarily imply a decrease in the demand for present consumption goods. A higher demand for real money balances can be accommodated either by a decrease in the demand for present consumption goods or by a decrease in the demand to hold bonds relative to cash.

5 In fact, many economists in the monetary equilibrium tradition have argued that Say's law—the notion that production is the source of demand in an economy or, as Keynes (1936 [1973]) crudely put it, "supply creates its own demand"—finds its most accurate expression in monetary equilibrium (Sechrest 1993, p. 49ff; Horwitz 2000, p. 86; Leijonhufvud 1981, ch. 5). This is because when monetary equilibrium holds, the banking system has effectively done its job of translating 'potential productivity' into 'effective demand' at the intersection of aggregate supply and aggregate demand.

6 For more on the mechanics and performance of historically free banking systems, see: White (1984), Schuler (1988, 2002), Briones & Rockoff (2005), and Dowd (1992).

7 It is worth noting that the question of whether or not banks engage in pure financial intermediation or artificial credit creation when they hold fractional reserves and expand their issuance of fiduciary media (that is, notes or deposit liabilities that function as money and are not fully backed by outside money reserves) in response to a change in the public's

liquidity preferences has been hotly contested, particularly from some economists in the Austrian tradition. Citing the work of authors like Murry N. Rothbard, Hernando de Soto, Hans Herman Hoppe, Guido Hulsmann, and Walter Block, Cochrane et al. (1999) argue that the money creation that occurs under a fractional reserve banking system constitutes a form of "credit creation." As such, it causes the Wicksellian natural rate to fall below the market rate of interest, setting the stage for the Austrian business cycle. In contrast, both free bankers and Market Monetarists, working in the monetary disequilibrium tradition, view fractional reserve banking as a form of financial intermediation. The ability of private banks to adjust their composition of monetary liabilities in response to their customer's demand is not only legally permissible but absolutely critical to both maintaining monetary and loanable funds market equilibrium. As Selgin (1988b, p. 60) explains, private banks do not "create" credit by expanding their issue of inside money when the public demands to hold more of their wealth in the form of inside money balances; rather, by abstaining from spending they "transfer" credit to the private banks, which can use these savings as the basis for issuing more loans for investments. Although this disagreement about whether the public's holding of inside money balances constitutes a form of saving (where money balances are viewed as claims to future goods) or a form of dissaving (where money is viewed as a present good) has sparked vigorous debate, it is ultimately beyond the purview of this paper because the two camps I address here—the free banking school and Market Monetarists—agree on the financial intermediation view, arguing that the public's holdings of money constitute a form of saving. For a detailed overview of this debate, see Selgin and White (1996).

8   In Monetary Theory and the Trade Cycle (1933), Hayek famously argued that the private banking system could itself cause an investment boom independent of any errors by the central bank by issuing too much credit in response to a larger demand for credit that stemmed, for instance, from more efficient production methods or new innovations. He argued that during the "upward phase of the cycle" when loan demand increases, "the risks of borrowing are less; and therefore a smaller cash reserve may suffice to provide the same degree of security." As a result, banks might hold the market interest rate below the now-higher natural level,

thereby stimulating an investment boom. However, White (1999b, p. 757) notes that Hayek's argument here is based on "confusion between two very different types of reserves." A reduction in cash reserves, White argues, can indeed finance an expansion of loans, an alternative asset category. However, "a bank does not hold cash reserves against the risk of borrower default (which is what Hayek appears to mean by "the risks of borrowing")…it holds them against the risk of adverse clearings and other redemption demands. Reduction in the risk of borrower default allows a bank to reduce its loan loss reserves, which are not an asset but a subset of the book value of equity" [emphasis added]. White concludes that a reduction in loan loss reserves is therefore not a source of financing for new loans and so does stimulate an investment boom as Hayek suggests. Even in the case where more productive production methods increase firms' demand for credit, banks will still be forced to ration their scarce supply of credit by raising interest rates because, given that these firms demand credit to spend on factors of production, any unwarranted expansion of credit would result in a higher flow of claims against the bank in the interbank clearing market. These adverse clearings would hence compel banks to rein in any excess supply of money and credit by increasing interest rates. For more on this "interest rate brake", see White 1999c.

9   This "bottom up" perspective is more consistent with the evolutionary, non-equilibrium theorizing of Lachmann (1973), Potts (2000), De Grauwe (2010), Wagner (2010, 2012), and Bilo & Wagner (2012).

10   Wagner (2012, p. 434) discusses this second way of theorizing about the relationship between macro and micro entities in more detail, arguing that: "[m]acro phenomena emerge out of…interactions among micro units within the ecology of plans that constitute an economy." He also distinguishes "primitive" variables, like micro-level plans and interactions, from their "derived" macro-level variables, like total spending.

11   A key virtue of this "emergent" approach to macro-theorizing, Wagner notes, is that it connects praxeology (which is the source of individual plans) to catallaxy (which brings these plans together into an ecology of plans). Since macroeconomic phenomena are products of spontaneous emergence and not products of individual choice, Wagner (2010, p. 145) argues, there can be no choice-theoretic foundations for macro-theory. This notion runs contrary to the Market

24

Monetarist approach, which treats NGDP as a choice variable for the central bank. However, it is entirely consistent with the free banking approach, which treats the catallactic phenomenon of total spending as emerging from the deliberate choices and actions of individuals acting at the level of praxeology.

12 Elsewhere, Cachanosky (2014) has noted that because Market Monetarists and free bankers often rely on these two different versions of the quantity theory, they in fact tend to stabilize two different measures of nominal spending. It is an open question, he concludes, as to whether Py (nominal income from final sales, or NGDP) or PT (nominal income from all transactions) is a better proxy for monetary equilibrium.

13 Any nominal spending targeting regime that seeks to most closely replicate the outcome of a free banking system would therefore have to target a measure like Gross Output (GO) that comprises both intermediate and final goods expenditures (Skousen 1990).

14 Selgin (1997, pp. 64-69) outlines his support for a labor or total factor productivity norm version of NGDP targeting. Such a policy would, in effect, serve to stabilize nominal factor payments. In allowing the supply of base money and NGDP growth path to fluctuate to allow for changes in "extensive" factors of production (such as, say, an increase in the labor force), this type of rule would most closely proxy the supply schedule for monetary gold under an ideal gold standard than his earlier proposal to permanently freeze the monetary base, which would likely require some "undesirable" deflation as real factors rose.

15 Though he worries that we're "not ready for deflation yet," Sumner (2009) largely accepts Selgin's theoretical case for a productivity norm. He argues for a more gradual four step reform before we can safely settle on a "mild deflation productivity norm." So even though the NGDP variation between the two extremes is nontrivial, it's at least conceivable that all sides might converge towards a consensus on an ideal growth rate. In any case, the precise growth rate is ultimately far less important than credibly committing to a reasonably steady path. Henceforth, I'll make the simplifying assumption that both camps can agree on a desirable rate.

16 This is especially critical in the real world where the demand for money is non-uniform. As Veetil and Wagner (2015, p. 14) argue, monetary equilibrium doesn't merely require an aggregate equality between the supply of and demand for money; it also requires that equality hold for each individual in the system.

17 Wagner (2010, p. 148) summarizes this point in his discussion of the non-neutral effects of money injections when he argues that these effects do not necessarily show up in any kind of aggregate magnitude, but rather through "changes in the structural pattern of economic activity."

18 For more on the Fed's poor track record of adhering to sound operating principles and avoiding political influence, see: Selgin (2012), Hogan, et al. (2015), and Boettke and Smith (2014).

19 To put it differently, monetary equilibrium is better maintained in a free banking system in large part because of its polycentric governance structure, which allows the supply of money to be controlled by a decentralized network of functionally independent banks instead of the monocentric order characterized by central banking (Salter & Tarko 2015).

20 In his Nobel address, "The Pretence of Knowledge" (1989), Hayek warned of the follies of what he called 'scientism.' In the realm of economics, this meant treating the complex phenomena that are the objects of study in the social sciences as if they could easily be measured and manipulated like the simpler objects of inquiry in the natural sciences. He specifically cited the profession's obsession with identifying quantifiable aggregates like aggregate demand and trying to manage them as a perilous symptom of this fallacious way of thinking. True appreciation of the market process, he argued, required appreciating the key role relative prices play in guiding incentives and communicating dispersed knowledge.

21 For more research on the causal relationship between financial liberalization and growth, see: Cameron (1967, 1972), Goldsmith (1969), McKinnon (1973), Shaw (1973), King and Levine (1993a), and Fry (1995).

22 For a more detailed analysis of the critical role monetary institutions play in mobilizing society's savings into productive investments, see Schumpeter (1911 [1982]), King and Levine (1993b), and Bertocco (2007).

23 The relative inefficiency of relying on governments or central banks over private sector intermediation is also noted by King & Levine 1993a,b; Levine 1997; Sullivan 2002; Williamson 2002.

24 As Selgin and Lastrapes (2012) show, the positive growth effects of allowing competing note issue are

especially prominent in less developed countries that have suffered from high rates of financial repression.

25 Nunes and Cole (2013) in fact title their book Market Monetarism: A Roadmap to Economic Prosperity.

26 In his article "Not all NGDP is created equal," Alex Salter (2013) warns that although both NGDP targeting and free banking tend to achieve stable NGDP, the process that generates this flow of spending is critical. Using this process-oriented approach, he shows that the composition, or quality, of economic activity can differ between two regimes that both stabilize NGDP. He therefore rejects the notion that free banking and NGDP targeting are merely two interchangeable technologies for achieving the same outcome.

27 Earlier in his career, Friedman (1951) famously argued that the resource costs that would be required to maintain a gold standard would consume roughly 2.5 percent of GDP annually. This was one of his major reasons for supporting central banks and fiat money. However, White (1999, pp. 43-49) rebuts Friedman's claims by showing that by ignoring the historical evidence and assuming 100 percent reserve system drastically overstates the resource costs of a gold standard by a factor of 100. Friedman later recanted his earlier estimate of the resource costs of the gold standard and acknowledged that given the poor track record that central banks and governments have with fiat money, it is entirely plausible a commodity standard would be less costly. Even if the resource costs are nontrivial under a commodity-based free banking system, it is far more likely any future free banking system would adopt the existing fiat standard.

28 Selgin (1988b) argues that many of the financial panics that the United States experienced in the late 19th and early 20th century were attributable to government restrictions and interventions under the National Banking System that prevented banks from branching and issuing their own paper currency without first purchasing a dwindling supply of federal government debts as backing for their note issue. Although the Fed was created to remedy these crises by furnishing an "elastic currency," he also maintains that it was the Fed's refusal to accommodate the liquidity rush in the early stages of the Great Contraction that set the stage for the Great Depression. For more information, see Selgin (1992, 1994).

29 Elsewhere, Selgin (2009) clarifies that he considers "final sales of domestic product" to be a better measure of overall demand than nominal GDP, but concedes this is a relatively minor point in the grand scheme of things because the two measures are closely related. With the BEA starting to report "gross output" back in 2013, some might be drawn to stabilizing that broader measure of spending for the reasons outlined above.

30 As noted earlier, it is entirely possible that scholars—particularly those who are influenced by Austrian business cycle theory and free banking theory—might prefer to have a money growth protocol aimed at stabilizing a broader measure of total spending. As Mark Skousen (2013) argues, the BEA's new measure of "Gross Output," which includes total spending on both intermediate (producer) and final (consumer) goods would be preferable to simply targeting total spending on final goods and services, or NGDP.

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