

# UNANSWERED QUIBBLES WITH FRACTIONAL RESERVE FREE BANKING

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## Introduction

WE ARE HONORED THAT GEORGE SELGIN, a prominent defender of fractional reserve free banking (FRFB), has replied to our recent article “Fractional Reserve Free Banking: Some Quibbles” (Bagus and Howden 2010a). Our goal was to open a dialogue concerning some “quibbles” remaining in the theory of how a FRFB system will operate. We hope that our exchange can bring more light upon these questions. Such an exchange is important, since free market economists are expected to offer an alternative when they criticize central banking. A FRFB system, by one measure, can only be preferred to the current central banking system if it can be shown to operate with a greater level of stability than its centralized alternative. In this reply we aim to clarify some misunderstandings, point out some additional problems in FRFB theory and restate some of the key issues left unanswered in Selgin (forthcoming).

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## Limits for credit expansion

Selgin's original innovative argument in his *The Theory of Free Banking* was to outline a new limit for credit expansion in a FRFB system (Selgin 1988). An in-concert credit expansion by a free banking system, according to Selgin, faces a strict limit on the ability to increase the credit supply: the increase in precautionary reserve demands under credit expansion. While the average reserve demands net out to zero in the long run in a coordinated credit expansion, in a given clearing period a bank may have a debit or credit balance. The variance of these debits and credits increases with credit expansion. Thus, in a concerted expansion banks increase their precautionary reserve demands, limiting their credit expansion (Selgin 1988, 80-82).<sup>1</sup>

In our article we argue that if banks truly wanted to cooperate, Selgin's limit for credit expansion—the precautionary reserve demand—can become ineffective. In other words, the possibility of an unlimited coordinated credit expansion exists. To our satisfaction Selgin has admitted that we are correct (forthcoming, 3), and that his limit becomes ineffective with true coordination of banks. Selgin then proceeds to defend FRFB by stating that true coordination in credit expansion, although possible, would not be likely (forthcoming, 3).

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<sup>1</sup> Selgin's analysis finds the FRFB system stabilizing, yet our original article introduced three reasons why precautionary reserves alone may be insufficient to constrain credit creation. To briefly reiterate, banks can: 1) lengthen the clearing period, 2) use credit clearing balances as loan collateral instead of redeeming them (i.e., interbank loans could ease temporary reserve restraints), or 3) use credit expansion to increase reserve negotiability, thus reducing the risk of illiquidity. If any one of these three measures is effective in reducing the need for precautionary reserves, the FRFB system will not be stable. As a consequence, one would expect the economic time series associated with such systems to be nonstationary (in econometric parlance), in which case it is meaningless to speak of unconditional statistics, only conditional statistics. (For equilibrating processes, which we can generically view as stationary, it does make sense to speak of unconditional statistics.) Roughly speaking, if the effects of a credit expansion can "out-pace" the amount by which the banks risk-adjust their reserves, then there is no reason to think such actions by the banks can serve as a limit on coordinated expansion. Put differently, if every credit expansion is categorically different (i.e., there is no equilibrium we can expect reversion to), then there is no history that can be appealed to in any sense by means of which the bankers could form an assessment of how much they need to risk-adjust their reserve holdings. This is not to say they could not risk-adjust, only that we should be very skeptical that they can do so reliably, especially in light of the fact that their very actions impact the realized variance of the reserve needs they are supposedly insuring against. The banking system faces an uncertain situation instead of a risky one. Thus, there is no way to calculate adequately precautionary reserves. We would like to thank an anonymous referee for bringing this point to our attention.

However, if we make the mundane assumption that banks strive to maximize profits, and acknowledge that credit expansion is a very lucrative business, it is difficult to see why it would not be in the banks' "best interest" to expand credit through cooperation.<sup>2</sup> Granted, bank cooperation is inherently unstable. But this is another matter which explains the pressure to install a central bank or creates the strong incentive for banks to merge, a point which we shall return to later.<sup>3</sup> We (2010a: 34-36) mentioned three ways that banks can cooperate to reduce adverse clearings and hence decrease the need for precautionary reserves. All three ways remain largely unaddressed by Selgin, who instead relies on his original analysis (which largely excludes these possibilities) to rebuke these claims.

First, banks could choose to not present notes or demand liabilities of other banks for redemption but expand credit on top of them.<sup>4</sup> Second, borrowing in the interbank market can render precautionary reserves obsolete. Third, the interval of the clearing periods can be lengthened, eventually resulting in a long run with no reserve losses in a coordinated credit expansion. Any one of these three methods can potentially limit the need for precautionary reserves. Given that Selgin relies on precautionary reserves as the limit to credit expansion, it is unclear why he repeatedly fails to thoroughly address these pertinent cooperative measures.<sup>5</sup>

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<sup>2</sup> Indeed, Selgin briefly discusses how the practice of note dueling ceased through cooperation: "[Banks] may *formally* agree to engage in regular note exchange and refrain from purchasing rivals' notes except as they are brought to them for deposit or exchange" (1988, 26). And while Selgin believes that cooperation to implement a central bank is unlikely, he notes (1988, 27-28) that banks voluntarily joined clearinghouses as they sprung up due to advantages that membership brought. We are unsure why it is unlikely that banks would *not* cooperate to implement a central bank to reap benefits, while they evidently *did* cooperate in joining clearinghouses for the same reason. Early clearinghouses closely resembled the coordinating central bank that our theory calls for, a point which Selgin must realize as he quotes Cannon (1908, 97) to this effect: "[Clearinghouses became] instruments for united action among the banks in ways that did not exist even in the imagination of those who were instrumental in [their] inception."

<sup>3</sup> On the incentive of instable cartels to merge, see Rothbard (2001, 579).

<sup>4</sup> A pertinent example is the Bank of China's accumulation of U.S. Treasuries as reserves. The Bank of China does not redeem its reserves for goods and services from the U.S., but rather chooses to inflate on top of these dollar reserves. We do not claim that this is an instance of FRFB. We use it as an example to demonstrate the incentives to coordinate during credit expansion.

<sup>5</sup> Selgin does briefly address the possibility of interbank lending as a method for banks to expand in unison. He quickly dismisses the notion, as banks "may or may not" choose to lend their excess reserves to other banks if there are more profitable alternatives to be had (1988, 117).

We maintain that credit expansion itself increases the *negotiability* of bank assets while Selgin (forthcoming, 5) incorrectly claims that we maintain that the *value* of cash reserves increases. We argue that credit expansion makes assets such as mortgage-backed securities or government bonds more liquid. Assets become less costly to liquidate as their negotiability increases. (The recent boom is a case in point.) A bank may reduce, therefore, its precautionary reserve demands for cash because the assets it acquires during a credit expansion become increasingly negotiable, i.e., they tend to progressively approximate cash.

Finally, Selgin (forthcoming, 5) claims that the value of bank assets in a credit induced boom does not rise, because *nominal* interest rates tend to increase.<sup>6</sup> Yet the artificial reduction of nominal interest rates below the level they otherwise would have taken is what initially triggers the boom. Money is created and flows to asset price markets, the values of these ever more marketable assets tend to increase. This phenomenon may also reduce precautionary reserve demand as credit expansion progresses.

### **Demand for bank liabilities**

We argued in Bagus and Howden (2010a) that the demand for bank liabilities is dependent of the actions of the banking system. When banks expand credit through lower interest rates, the money supply is increased which may increase individuals' consequent demand for money; this increased demand for money results in an increase in deposits. It is not necessary that the causality runs only one way—from a change in the demand for money to a resultant banking system reaction of increasing or decreasing the money supply. Rather banks can induce an increased demand for money by lowering interest rates. In other words, the banking system can endogenously change the demand to hold money through credit expansion. Selgin seems to realize this, as he writes that the “relevant chain of causation *generally* runs” from changes in the demand for inside money to a monetary expansion or contraction (1988, 79, our emphasis).

Selgin evades this question by stating that in his model endogenous credit expansion is impossible because banks have already reached their limit

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<sup>6</sup> To support his claim that nominal interest rates rise during a *boom*, Selgin gives the example of the S&L *crisis* of the late 1980s and early 1990s. Using the S&L crisis to explain interest rate phenomenon during a boom makes considerably less sense than, say, using the S&L *boom* of the mid 1980s—a period of falling nominal and real interest rates. The dotcom boom of the late 1990s, as well as the housing boom of the mid 2000s, fit our example equally well.

of credit issuance, as determined by precautionary reserves (forthcoming, 6). A bank is consequently unable to increase the money supply without a prior increase in the demand for money. This again raises the initial question as to how controlling precautionary reserves are in limiting credit expansion. Our three previously mentioned methods to reduce the need for these reserves—through the voluntary nonredemption of reserves, interbank loans, and lengthened clearing periods—demonstrate that there are theoretical reasons why precautionary reserves may not serve as an effective limit for a coordinated credit expansion (and Selgin himself agrees with this possibility).

### Money proper and money substitutes

In our original paper we write: “Selgin starts his analysis by assessing changes in the demand for money, not distinguishing between the demand for commodity money (money proper) and money substitutes (Rallo, 2009b).” Selgin takes issue with this claim and goes on for more than two pages stating that we misrepresent him. He maintains that he is well aware of the differences between money proper and money substitutes, and provides several citations to this effect from *The Theory of Free Banking*. Indeed, it appears that Selgin misleads the reader on this point. To clarify: We never said that he does not know the difference between the demand for money proper and the demand for money substitutes. We *did* claim that his analysis in this case lacks this clear distinction.

Selgin aims to prove that a FRFB system is stable, stating:

In a mature free banking system, commodity money does not circulate, its place being taken entirely by inside money. Such being the case, the unqualified expression “demand for money” used in this study will henceforth mean demand for inside money. For example, an increase in the public’s demand for money means an increase in the aggregate demand to hold bank liabilities. (1988, 54)

By assuming that the FRFB system is stabilizing, Selgin proceeds to look at changes in the demand to hold bank liabilities and how the FRFB system would react in a supposedly stabilizing way. There is no demand for money proper in his advanced FRFB system.<sup>7</sup>

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<sup>7</sup> Selgin takes issue with our original (Bagus and Howden 2010: 36-38) claim that he merely “assumes” inside money to circulate in his free-banking system. As evidence, he draws the reader’s attention to pages 23-26 of Selgin (1988). The reader who doubts our original claim is invited, indeed, encouraged to read the book in its entirety. Besides the dubious theoretical reasons, contained herein as well as in Bagus and Howden (2010; forthcoming a), Selgin (1988) himself maintains that the exclusive circulation of inside

If a FRFB system is not stabilizing but creates business cycles, there will be recessions that entice shifts in the composition of individuals' money holdings—the demand to hold money proper increases while the demand to hold bank liabilities decreases. Selgin, thus, commits a *petitio principii*. He initially (and implicitly) assumes that the FRFB system is stabilizing, that recessions do not occur, and that no consequent increases in the demand to hold money proper result.<sup>8</sup> He then proceeds to show that the FRFB system reaches a stable equilibrium after exogenous shocks to the demand for money (understood as only the demand for bank liabilities).

Since Selgin thinks that the empirical evidence is one-sided in support of the stability of the free banking system he envisions, one where there is demand only for inside money, we ask why option clauses have historically been utilized by such systems. In Selgin's analysis, an equilibrium obtains where the demand for commodity money falls to zero and all demand for money is the demand for inside money. If this were true we should not see historical incidences where a free banking system was subject to runs on its commodity money reserves. Historical examples of “nearly” free banking systems with periodic runs to commodity money include the late years of America's free banking episode (when note convertibility was suspended), and the well-documented Scottish experience. The track record clearly shows that stability was not the norm, and that banks resorted to legal interventions (or privileges) in the form of redemption restrictions to maintain their solvency. Another way to put it is that fractional reserve banking systems have historically not been stabilizing to the point where demand for money proper has subsided, and customers only demand inside money. We think it is not surprising that some historical examples point to the same results that our theory predicts can occur in a FRFB system.

### Saving and cash holding

In Bagus and Howden (2010a) we claimed that free bankers confuse an increase in the demand to hold money with an increase in real savings. This is

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money is only by assumption. For example, while discussing the different types of credit that may circulate, Selgin affirms that “[s]ince base money is assumed not to circulate under free banking (where bank notes supply demands for currency) this type of credit expansion is not relevant to it” (1988: 60fn18; see also p. 37 and *passim*).

<sup>8</sup> Of course, Selgin *thinks* that he has demonstrated that the FRFB system reaches a stable equilibrium, with precautionary reserves acting as the brake on credit expansion. The demonstration of the attainment of this stable equilibrium is incomplete until, at the very least, it can be shown that *all* three methods of cooperation that we (2011a, 34-26) list are unable to entirely counteract the ability to expand credit in unison.

perhaps the most crucial point determining whether a FRFB system à la Selgin is self-destabilizing or not. It is here, at this most crucial point, that Selgin's response is the most evasive. In our original article (2010a, 40) we wrote: "Changes in time preference rates are independent of the demand to hold money as a cash balance." The demand for money may increase even though time preference has not changed and there has been no increase in real savings. As one example, divestment from real capital projects may be used to increase cash balances.

We make a similar point shortly thereafter, writing:

Let us assume that individual  $A$  holds a quantity of money proper, such as gold coins (or fiat paper money), under his mattress for safekeeping. Now he decides to transfer the coins to a bank—there has been a crime in his neighborhood recently and he regards the bank as a more secure warehouse than his mattress. Following the free bankers' reasoning, bank reserves and the willingness to hold bank liabilities now increase, and banks can and should expand credit in response. Yet there is no increase in  $A$ 's savings in this example; the coins (cash holdings) have just changed location. (2010a, 43)

Selgin briefly dismisses this point, which he regards as "tilting at wind mills" (forthcoming, 9). He replies by citing a passage from his book *The Theory of Free Banking* (1988, 54): "The aggregate demand to hold balances of inside money is a reflection of the public's willingness to supply funds through the banks whose liabilities are held. To hold inside money is to engage in voluntary saving."<sup>9</sup>

This statement quite literally says that cash holding is identical to, or indistinguishable from, saving. It implies that to hold more inside money is to engage in more voluntary saving. Selgin replies that he does not say that overall saving increases: it might well be that saving in the form of inside money increases and saving in the form of other financial assets, such as bonds, decreases (2001a, 11). For Selgin the manner of saving changes but not at all the overall level. To elaborate, suppose that an individual is repaid

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<sup>9</sup> Selgin is not the only free banker who is clear on this point: "The connection between the two conditions is that demanding bank liabilities is an act of saving, while the supply of bank liabilities is equal to the supply of funds for investment. By holding bank liabilities (i.e., not redeeming them for base money), the holder permits the bank to have control over the reserves that back them up, which is equivalent to a very short term act of saving (Brown 1910).... Given that the supply of bank liabilities represents investment (the demand for loanable funds) and that the demand for bank liabilities represents savings (the supply of loanable funds), equilibrium in the money market implies equilibrium in the market for time" (Horwitz 1996, 299).

the principal of a bond that he has held for 10 years and deposits the proceeds into his bank account. The bank proceeds to issue credit on this new deposit, and overall saving is constant in Selgin's view. Selgin's analysis is unsatisfactory for several reasons.

First, we must point out that Selgin has conveniently ignored our argument concerning the changing *location* of savings. An individual merely shifting the location of their savings (i.e., from under their mattress to a bank account) results in a change in the amount of fiduciary media under fractional reserve banking. It remains unclear what has changed in the savings rate to entice banks to expand credit on top of the fresh deposit. Real savings necessary of sustain investment processes have not change at all. Note also that this example faces only a change in location of cash holding, and not a shift from one financial asset, such as bonds, to another. The demand for bank liabilities may consequently increase without any increase in saving if someone merely deposits his cash holdings previously held under his mattress. Suppose an individual has held a sum of money in his in-house vault, and decides to transmit these savings to his bank. Has saving increased? Evidently not. However, the FRFB system now has more reserves and may expand credit not sustained by an increase in real savings. Interest rates are reduced artificially, with a subsequent distortion of the real structure of the economy.

We must also take into account that due to the bank multiplier and depending on the reserve ratio, the FRFB system will create and lend out more money than has merely changed its location. If an individual deposits 1,000 gold coins in his bank, the banking system as a whole may well create substantially more than 1,000 monetary units through its fiduciary facilities. The opposite scenario is also possible. If an individual withdraws savings from his bank to hold in a different non-bank location (at home in his vault, for example), bank lending must actually contract by a multiple of that amount. A fractional reserve free banker probably would consider this reduction of lending as bad. In fact, Selgin (forthcoming, 9) admits as much: "holding money proper only leads to prohibitively high interest rates when it involves cashing in bank IOUs, which of course means that lending (though not saving) declines."

This case is omitted, incidentally, from Selgin's analysis as the demand to hold outside money is assumed (though Selgin rather believes it is largely proved) to be stable in the mature FRFB system. Yet, for reasons that we have outlined earlier, there are three significant reasons to believe that the "mature" FRFB system will not only *not* be stable, and may not even reach a stable maturity on its own (and the existence of the option clause largely provides historical evidence to this effect).



Second, and here we see one of our more fundamental theoretical differences with Selgin, our analysis recognizes that not all savings are created equally. Holding a bond is not the same as holding equity, a time deposit or a demand deposit. Only a too highly aggregative approach could treat savings as a homogenous fund that just changes the means through which it occurs. Compare two scenarios. What is the significant difference between an individual purchasing a) a \$1,000 bond, and b) depositing \$1,000 in a deposit account? In the first scenario, \$1,000 is made available to a firm to use over a given period of time. The second scenario involves, at least in a FRFB system, an expansion of credit in excess of the original deposit. While an individual has only originated \$1,000 of savings in each instance, the deposit will result in a greater amount of credit (and resultant investment), as determined by the money multiplier. What is the difference between the two original sums of \$1,000?

One significant difference between the two is the time dimension of savings. The time dimension—specifically, the time the lender pledges to abstain from consumption—is of vital importance for the sustainability of investment projects (Bagus and Howden 2010b). If people save for a defined term and want to increase consumption thereafter, engaging in investment projects that mature only after a longer term will not be feasible, or sustainable. Maturity transformation resulting from borrowing short and lending long may thus lead to distortions in the structure of production (Bagus 2010).

Let us take Selgin's example of a reduction of bond holdings (forthcoming, 9). A person saves via a 10-year bond. After 10 years he gets his money back plus interest. He may then reinvest in a bond of an equal, longer or shorter maturity. From Selgin's point of view the individual's choice does not make any difference.

If a person decides to increase his cash balance (i.e., demand more bank liabilities), for Selgin an equivalent amount of savings (actually more through the multiplier) is available for investment projects. Selgin deems the banking system stable if the bank lends out this money in the form of a 10-year loan; we cannot see our way clear to agreeing. Perhaps the individual increased his cash balance as he expected higher spending during an imminent summer vacation, or because in 3 months he wants to buy a television set. More likely, he just does not know what he wants to increase spending on—there is an increase in his felt uncertainty increasing his demand to hold a cash balance today. At some point in the future his expenditures will increase, drawing down his cash balance prior to the maturity of the 10-year investment project. Demand for consumption goods will rise before the investment project is completed, pushing up consumer goods' prices. There results a

discoordination between saving and investment. While Selgin is quite correct that the FRFB system can detect when an individual has increased his demand for bank liabilities, it cannot know exactly when that individual will spend his higher cash balance.<sup>10</sup>

Third, one can also increase real cash holdings via divestment from real capital projects (Bagus and Howden 2010a, 41). Note that this need not only be divestment from financial assets, but also from physical capital. Assume that an individual owns 10 machines that yield him \$100 every year. One machine fully depreciates each year. He spends \$50 for consumption and he saves \$50 to buy a new machine to replace the depreciated one. This progresses for a period, until, for whatever reason, the individual's perceived uncertainty increases and he chooses to increase his cash holdings. The following year he spends \$50 on consumption and saves \$20 by buying a much smaller machine. He increases his cash holdings by \$30. What is the economic interpretation of this example from our point of view? Nominal saving has been reduced from \$50 to \$20. Cash holdings increase. Consumption spending rises relative to real saving. Consumer goods prices rise relative to prices in the higher stages of production. Real consumption increases and fewer goods are available to sustain existing investment projects. The individual's time preference rate increases, and the structure of production becomes less capital intensive.

What is the reaction of the FRFB system to such a scenario? Holdings of bank liabilities have increased by \$30, leaving a bank with excess reserves. The value of financial assets has not decreased, yet Selgin believes that overall savings have increased. The FRFB system regards the \$30 deposit as an additional loan to expand upon to reduce its excess reserves. Additional investment projects will be consequently financed. As real savings have decreased, the result must be a distortion of the structure of production. Of

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<sup>10</sup> Indeed, the individual himself likely does not know when he demands to use his cash balance. This is the reason why he has made a deposit: to guarantee the availability of his savings at that unknown future date (Bagus and Howden 2011b). One might respond that entrepreneurial foresight could deal with this kind of knowledge problem. Banks would try to anticipate entrepreneurially when depositors would withdraw their money. The issue is that credit expansion triggers an artificial boom allowing for inflated profits. How banks would not respond to the profit incentive of participating in the boom, and exercise sound entrepreneurial judgment that rules out credit expansion (and hence, keeps a prudent level of reserves on hand for redemption requests) remains to be seen. In a prisoner's dilemma scenario, banks have an incentive to participate in a credit expansion because during the boom important profits can be made (Huerta de Soto 2009, 667; Howden 2010). The strategy is profitable provided the banks exit the boom before the recession sets in.

particular interest is that the result of the individual's increased cash balance has been an increase in investment, while his original motive for increasing his cash balance was to reduce his investment exposure.

One area of contention is what constitutes the stock of savings, and what adds to it via the flow of saving. Selgin (9, original emphasis) maintains that "holding money proper *is* saving." As we point out (2011a, 43), cash holding is a stock variable while saving is a flow variable. Think of the following example: Person *A* has a cash holding of \$10,000 and a yearly income of \$1,000. *A* consumes his income completely year after year. Does *A* have cash holdings (i.e., savings)? Yes. Is *A* saving? No. To consider money holdings as saving is to confuse a flow with a stock variable.

In contrast to Selgin we regard saving not as merely holding money but as that portion of real income that is unconsumed. A certain number of goods are produced each period. The portion of these real goods that is not consumed is what we regard as real savings. These real savings can be used to sustain the owners of the factors of production engaged in lengthy investment projects. When the portion of unconsumed goods rises from one period to the next, we see an increase in real savings making additional investment project feasible. We distinguish between the portion of unconsumed real income and the stock of monetary savings. There is no necessary correlation between the portion of unconsumed real income of an individual, and his cash balance (i.e., between our definition of savings and that of Selgin). The individual may consume a larger portion of his real income when he disinvests while simultaneously holding constant or even increasing his cash balance.<sup>11</sup>

In our approach, an increase in cash holdings may or may not go along with an increase in real savings. Cash holdings in the form of bank liabilities may increase because new money is produced, or because formerly hoarded outside money ends up as additional bank reserves. In neither case is there an increase in real savings. Cash holdings at banks may also increase because less money is spent on investments. Selgin would respond that overall savings

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<sup>11</sup> Selgin regards saving to mean holding cash. Yet holding fiduciary media entails not only not spending, but also not redeeming (for commodity or "base" money). Evans and Horwitz (forthcoming, 7) claim that the two sides of the debate have a common definition of saving, namely, *non-consumption*. Thus, it seems that not even the free bankers can agree on what constitutes savings. We thank an anonymous referee for bringing this point to our attention. Please note that Evans and Horwitz refer to this as their definition of "savings", although we think this to be a typographical error, and that they do, in fact, mean "saving".

have not changed as bank deposits are loans and as such also investments. Under his view, only the form of savings has changed.

In contrast, we do not regard adding to one's cash balance as saving. That portion of goods that is unconsumed in a given period and can be used to sustain investment projects is a separate factor. Adding to one's cash balance does not imply that the portion of unconsumed goods has increased (or is even held constant), because the spending on consumer goods can rise relative to the spending on capital goods, thus implying an increase in real consumption.

A final clarification relates to the distinction between the real and nominal demands for cash holdings. We state that an increase in the nominal money supply does not imply an increase in real savings (2011a, 39). Selgin responds (forthcoming, 10): "I am also careful throughout my book to stipulate that by increased demand for money I mean an increase in the demand for *real* and not merely nominal money balances." Yet, a FRFB system responds to increases in the nominal demand for bank liabilities. When nominal reserves increase, the FRFB expands credit. As an example, imagine a FRFB system fully loaned out. A counterfeiter prints \$1,000. He deposits the money in his bank (or the counterfeiter spends it and the receiver deposits it at his bank). The nominal demand to hold bank liabilities has increased, as have nominal reserves. There has been no increase in real savings. Nevertheless, the FRFB system will expand credit accordingly to finance new investment projects. Again, the fiduciary facilities of the fractional reserve free banking system distort the structure of production.

### **Getting Money Where it is Wanted**

We originally argued that the market process itself does satisfy an increased demand to hold real cash balances, and does so more directly than a FRFB system. While the price system achieves this in a full reserve banking system, the FRFB system creates new money in response to an increased demand for money. Selgin describes the process thusly (forthcoming, 11):

[F]irst, a bank's clients choose to accumulate its IOUs, by refraining from spending its notes or drawing on their bank balances; then the bank, finding that it has excess reserves, lends more and by so doing expands its liabilities. In so doing the bank's only concern is to lend where the prospective (risk adjusted) returns are highest. It does not have to find the persons who want more money balances: they have already found it; and it is their decision to hold on to its money, and not the bank's decision concerning where to lend, that sees to it that money balances end up just where they are needed.

Selgin is clear that he thinks that the money is already where it is most needed.<sup>12</sup> However, let us revisit the path prices take when banks create new money and lend it out. Borrowers of this money spend it. This causes a tendency for prices to increase, frustrating the original desire for higher real cash balances as the new money does not necessarily go directly to the individuals who want the higher real cash balance. Instead, prices rise on those goods purchased by the borrower, thus frustrating his goal of a higher *real* cash balance.

Let us illustrate this with a simple example. Individual  $A$  wants to increase his real cash balance. He abstains from spending and prices tend to fall. He stores the money at home. He keeps on cutting spending until he reaches his desired real cash balance. We regard this as a “direct” way to achieve the desired real cash balance. Selgin (forthcoming, 14) takes issue with us for calling this a “direct” adjustment of cash balances. Yet, we fail to see any more straightforward and immediate way for  $A$  to increase his real cash balances.<sup>13</sup>

Selgin proceeds to claim that: “It appears that Bagus and Howden want to have it both ways: every ‘individual’ gets all the real balances he or she wants, ‘immediately’” (forthcoming, 14). Selgin’s claim is false.

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<sup>12</sup> Elsewhere Selgin comments that the increase in demand for inside money will be met through the issuance of loans (or other bank liabilities), and that “[i]n general such newly issued liabilities do not at first come into the hands of those person who happen to desire to hold more of them” (1988, 65). Indeed, more recently he has reaffirmed that not only does the new money not get to the people who demand it, but also that it does not have to: “[T]he new money doesn’t go to the demanders because it doesn’t have to” (see his comment on November 2nd in Boettke 2010). Financial intermediation supposedly allows for the original saver to be compensated by the increased issuance of fiduciary media. But it is unclear how intermediation will allow the original individual who wished to increase his cash balance to increase it in anything other than nominal terms. Although the intermediation *does* allow him to increase his cash holdings, the lending out of this sum through banking intermediation places upward pressure on prices, thus frustrating the very process.

<sup>13</sup> When all individuals simultaneously increase their demand for real cash balances, adjustment requires a general fall of prices. Highly flexible prices will fall quickly, thereby increasing real cash balances. In other words, it is not necessary that all prices are flexible to increase real cash holdings. More flexible prices may fall more than less flexible prices and thereby increase real cash balances. An overly aggregative analysis may induce Selgin to think that all prices have to fall to the same extent in order to satisfy the demand for an increase in real cash balances. This, again, results from relying on the mechanistic equation of exchange to guide analysis. How long could prices remain “sticky” if the demand to hold cash balances increases unexpectedly? An increase in selling efforts results in falling prices, as does a reduction in purchases. It is difficult to see why real cash balances would not increase quickly through either (or both) of these activities.

To expand on a previous example, what happens if  $A$  takes his money from home and puts it into a bank account? Bank reserves increase and the bank grants a loan to entrepreneur  $B$  who spends the additional money. Prices tend to increase again (“ $MV$ ” is stabilized).  $A$  suddenly sees his real cash balance reduced again. His attempt to increase his real cash balance has been frustrated (because he brought his cash balance to the bank), and he must further continue to abstain from spending. This is so because the newly created money spent by entrepreneur  $B$  does not necessarily directly end up with  $A$ . Herein lays the crux of the problem. In contrast to Selgin’s claim, the money is not already there where it is needed.<sup>14</sup>

These specific disagreements lead us to our more general disagreement with Selgin. He conjectures that we do not understand basic monetary economics (forthcoming, 1). Giving ourselves the benefit of the doubt here, it may be more productive to recognize that we start from a different basic monetary economics than he does. It is unfortunate that Selgin does not consider this alternative prior to jumping to the tenuous conclusion that we wrote (and had accepted at a refereed journal that he has also published in) a paper on a topic we lacked basic knowledge of.

Selgin’s monetary reasoning is based on an aggregative approach to money. He subscribes to the neoclassical equation of exchange and bases his theory on it: FRFB stabilizes  $MV$ . In fact, in his response he refers to “ $MV$ ” six times. On the contrary, we employ an approach to monetary theory based on methodological individualism and marginal utility. The demand to hold money is always the demand by *individuals* for *real* cash balances, not an aggregate demand on the part of all to hold  $M$ .

The equation of exchange is highly problematic for several reasons. Our main critique of it is that it is too aggregate and mechanical to allow for fruitful analysis of the specifics of changes in the demand to hold money.<sup>15</sup> Broad-based variables make it difficult to see the microeconomic causes and consequences of disequilibria. The problem of “getting the money where it is wanted” is a case in point. It conceals the most important aspects and

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<sup>14</sup> Consider an investment fund manager who believes the market to be in a bubble and sells his assets to increase his cash balances. His plan is to buy back later when the bubble deflates to a lower level. As he increases his cash balance, his bank can expand credit, thus continuing to promote in the asset price bubble. Asset prices are kept from falling, undermining the fund manager’s intentions. We thank Toby Baxendale for providing this example.

<sup>15</sup> Huerta de Soto (2009, 522-35), Anderson (1917; 1979, 70-71), Mises (1980, 154; 1998, 410), Hazlitt (1968), Rothbard (2001, 727-37), and Bagus (2009, 31fn8) provide further critiques of the equation of exchange.

consequences of changes in the money supply: alterations in relative prices, changes in desired and actual individual real cash balances, flows of money units, distortions to the real structure of production and the redistribution of income.

### **Stability of FRFB**

Another field where Selgin ignores our arguments is the stability of the FRFB system.

The kernel of the Austrian business cycle theory is that credit expansion unbacked by real savings leads to an artificial boom. We (2011a, 47-50) proposed three scenarios through which a FRFB system may expand credit unbacked by real savings. Selgin does not address any of these scenarios.

First, there is an increase in base money (commodity or fiat) that finds its way into banks. As the new money is deposited, increases of reserves allow banks to expand credit without a prior increase in real savings. The bank multiplier allows banks to expand credit by a multiple of the newly produced base money.

Second, if banks truly cooperate they can coordinate credit expansion without reserve losses. The coordinated credit expansion brings the expectation of high profits. Selgin (forthcoming, 3), as we have seen, concedes this possibility. We thus agree that credit expansion unbacked by real savings is possible.

Third, unbacked credit expansion occurs when the demand for real cash balances increases. As we have seen this is possible without an increase in real savings. When bank reserves rise in response to the increase in demand for real cash balances, the FRFB system may expand credit even though real savings have not increased.

In all three scenarios there will not only be a redistribution involved in the creation of new money, but also an artificial boom. Interest rates tend to fall due to the credit expansion even though real savings to sustain production processes have not increased.

### **Central banking as a response to demands of an unstable FRFB system**

In our original paper we argue that the coordinated credit expansion is unstable. Bankers thus have an incentive to institutionalize this coordination to increase its stability (and hence, its odds of success). They also become

aware of problems in recurring recessions lacking a lender of last resort if their banking system becomes unstable.<sup>16</sup> Thus, there is an incentive for the banking system to push for the introduction of a central bank or to merge to internalize its coordination. Moreover, banking clients may push for state interventions against their banks during times of crisis, while the government cannot resist using the FRFB system's powers to create money for its own benefit. Selgin (forthcoming, 15) calls this "an interesting theory." He does not say what is wrong with it but goes on to take recourse in history asking if ever banks have demanded a central bank.

One must get the theory correct before the history can be any use. History can be interpreted in multiple ways depending on the underlying theory.<sup>17</sup> If your theory says that FRFB is stable you tend to interpret history differently than when your theory says it is unstable. Thus, the theory of free banking is particularly important to understanding its historical cases.<sup>18</sup>

Instead of asking for a history of the emergence of central banks, one could just as easily ask: Have fractional reserve banks ever asked for central bank loans? Banks could just ignore a central bank if it existed, and not make use of its lender of last resort functions. As they do demand loans from it, especially during banking crises, they demonstrate that they seem to benefit from this institution. Alternatively, one could ask if FRFB systems have ever implemented measures to halt shifts from inside to commodity money (something that, as we have seen, Selgin views as being not a feature of a mature FRFB system). Options clauses, as only one example, provide

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<sup>16</sup> This also raises a problem for the transition from a central banking to a FRFB system. If the central bank is eliminated there would most probably result a general bank run. This is, not necessarily a problem with a FRFB system but rather in the transition to one from our current monetary system.

<sup>17</sup> We assess some of the ambiguities of the historical record of free and nearly-free banking in Bagus and Howden (forthcoming b).

<sup>18</sup> On the difference and connection between theory and history see Selgin's (1990) excellent *Praxeology and Understanding*. Another, more fundamental aspect of the debate on FRFB concerns both the ethics and the legality of such a practice. Curiously, Selgin did not criticize us for not dealing with the other margins of the FRFB debate besides the historical one—the ethics or legal margins, as examples. (Also interesting is that in their own response, Evans and Horwitz (forthcoming) criticized us for unexplored aspects of the economics of free banking, but not for our neglect of touching upon these ethical or legal aspects of the same; perhaps their implicit agreement with us on the latter explains their lack of comment on the issues.) In fact we have at other places analyzed the both the ethical and legal problems of FRFB (Bagus and Howden 2009, Bagus, Block and Howden forthcoming). When the analyses of all four areas—theory, history, law and ethics—point to the same direction, one becomes increasingly assured that there is something not "right" about the fractional reserve free banking system.



evidence of measures fraction reserve free banks have had to resort to in order to stave off reserve draining runs on their supply of commodity money.

Suffice it to say that all FRFB systems have collapsed without the eventual introduction of a central bank. Historical case studies illustrating the instability and systematic failure of fractional reserve banks include Bogaert's (1968) work on banking in ancient Greece, Bogaert's (1968) and Mueller's (1997) studies on banks in Venice, Cipolla's (1982) analysis of Florentine banks in the fourteenth century, Usher's (1943) work on banking in Catalonia, and Huerta de Soto's (2009, ch. 2.4) report on banking in 16<sup>th</sup> century Sevilla. The most common illustration of the alleged stability of FRFB mentioned by fractional reserve free bankers is Scotland based on the work of Lawrence White (1995). Even there, the evidence is not so clear, as Rothbard (1988) and Sechrest (2008) show. In cases where a central bank was not implanted, at least initially, banks gained special legal privileges to "stabilize" their operations. In Scotland, banks exerted strong pressure on customers to not demand redemption in specie, even gaining the special legal privilege to halt these redemptions through option clauses. Indeed, according to Checkland (1975: 185), "[t]he Scottish system was one of continuous partial suspension of payments." In the 19<sup>th</sup> century American free banking period, commercial-bank clearinghouses took on the managerial decision of when and whether banks would suspend the convertibility of deposits, an action that "amounted to default on the deposit contract, and was in violation of banking law" (Gorton and Mullineaux 1993: 326).

As Selgin asks for an historical case where bankers pushed for the introduction of a central bank we may refer him to the case of the Federal Reserve as discussed in Rothbard's (1994) *The Case against the Fed* and Edward Griffin's *The Creature from Jeekyll Island* (1998). In the case of the Fed there was a confluence of interest between not only the government and banks as such, but investment banks as distinct from commercial banks. Investment banks, even though, they do not hold fractional reserves, also have an interest in fostering an institution (like central banking) that facilitates government debt, which these banks primarily market. Fractional reserve banks can successfully cartelize because they are traditionally the financiers of governments and thereby stronger than lobby groups of other industries making the same request.

Indeed, much evidence points to the institutionalization of central banking as a natural outgrowth of actions that the private (and in some cases free) banking sector had previously implemented. Some evidence suggests that the creation of the Fed was really no more than the nationalization of a private clearinghouse (Gorton 1985). The process of issuing clearinghouse loan certificates is the origin of the Fed's discount window of today, and

served the same function (Gorton and Huang 2003: 188-89). Of course, the Fed also assumed roles in addition to those related to the existing payments system. In particular, the Fed gained the power to issue and fully control the money supply under the auspices of acting as a lender of last resort. One reason for a lack of public backlash at that decision, as Timberlake (1984: 14) documents, is that the clearinghouses at the time “were associated with the restriction or suspension of cash payments.” Growing tired of problems with the redemption of commodity money from bank-created inside money, the general American public made little objection to a lender of last resort being assumed by the Fed. Indeed, Congress itself saw the creation of the Fed as the mere formalization of a largely informal operating procedure. In the words of Robert Owen, Senate sponsor of the Federal Reserve bill: “This bill, for the most part, is merely putting into legal shape that which hitherto has been illegally done” (U.S. Congress 1913: 904).

The historical evidence that Selgin believes shows the FRFB system to be completely innocent from creating the central banking system (or at least incentivizing others to demand its creation) is far less certain than he would lead the reader to believe.

### **The Business Cycle and Sluggish Price Adjustments**

Selgin argues that the propagation of the Austrian Business Cycle depends on sluggish price adjustments. Therefore, it would be inconsistent for us to argue that the most direct way to satisfy an increased demand to hold money would be to allow prices to fall instead of his preferred method of expanding credit. As Selgin (forthcoming, 15) states:

Consequently, critics of fractional reserve banking must make up their minds. They cannot have their cake and eat it, too. They cannot maintain that prices are sufficiently flexible to allow for rapid restoration of monetary equilibrium, with no change in the money stock, following, say, a sharp decline in money’s velocity, while simultaneously maintaining that prices are sufficiently *inflexible* to allow over-rapid monetary expansion to result in a persistent, boom-inducing reduction of interest rates below their natural levels.

There are important differences between the two cases cited.

First, monetary equilibrium theory is based on the equation of exchange and the *general* price level. Its adherents regard the general price level ( $P$ ) as too sticky to maintain equilibrium when velocity ( $V$ ) changes, hence, better to adjust the supply of money ( $M$ ). ABCT does not depend on the stickiness of the general price level but rather on the distortion of relative prices. The interest rate is reduced artificially leading to relative price

maladjustments, which result in malinvestment along the temporal length of the real structure of production.

Second, the demand for money in a free market is rather stable. In contrast, credit expansion and contraction is erratic and more difficult to forecast. Additionally, credit expansions and contractions are magnified through the fractional reserve credit facilities of the FRFB system. Rare as they may be, even in a free market erratic changes could occur. Sudden shocks—wars and natural disasters—may sharply reduce the demand to hold money as panic buying occurs. In a free market, prices for medicine and food will rise sharply in such a situation. Prices may fall again when the danger is averted (or when the supply has sufficiently responded). What is important is that the demand for money will change more erratically in a fractional reserve system, as there are additional sources of change in the demand for money stemming from boom bust cycles and banking crises. In an economic recession after an artificial credit-induced boom or during a banking crisis, the demand to hold base money may increase sharply, while it had fallen during the boom time.<sup>19</sup>

Third, the supposed price stickiness in monetary equilibrium theory is not based on an illusion. According to its proponents, price stickiness results from a piecemeal adjustment process of all goods trading with money that defines money's purchasing power. Money's "'price' tends to be sticky for reasons almost inherent in the very concept of money", according to some free bankers (Yeager 1968: 103-104). There is no illusion at work here—prices really are sticky.<sup>20</sup>

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<sup>19</sup> Huerta de Soto (1998, 27fn9) holds a similar view, emphasizing that there can be an increase in the demand for money in the face of a disaster: "It is curious to observe how the modern theorists of the Free-Banking School, like the Keynesians and the monetarists, seem obsessed by short-term unilateral changes in the demand for money. However, such changes historically have been produced over an economic cycle—during the last stages of booms and in crises—which almost always begins as the result of *previous* changes in the supply of new money created by the banking system. Apart from this, only exceptional disasters like wars and other catastrophes—natural or otherwise—could explain a sudden increase in the demand for money. Seasonal variations in the demand for money are comparatively of minor importance and a 100-percent-reserve free-banking system could easily adjust to them through some seasonal movements of gold and variations of prices."

<sup>20</sup> The collection of essays in Yeager (1997) remains the best overview of the rationale behind the sticky price doctrine. We critically assess whether adjusting the money supply is a less harmful response to declines in money's velocity—and defend the price adjustment process as the best alternative to mitigate these shocks—in Bagus and Howden (forthcoming a).

In contrast, an Austrian Business Cycle created through credit expansion induces entrepreneurs into *thinking* that there are more real savings available than there really are. There prevails the general illusion that credit expansion is beneficial and capable of inducing sustainable growth.

Huerta de Soto (2009, 535-542) and Howden (2010) make an even stronger point by saying that economic agents cannot possibly have the necessary information to anticipate the effects of credit expansion (i.e., that the availability of an increased supply of savings need not only be illusory). Economic agents do not all agree or understand ABCT. Nor do they know the particular circumstances of the credit expansion, for instance, its extension or the specific places where the new loans impact the economy or the reaction of their fellow citizens.

Lastly, even if entrepreneurs *did* have perfect knowledge of the effects of credit expansion and its extension they would still make use of the newly created money. They will try to profit from credit expansion and invest in new projects trying to withdraw from the boom in time, before the market values of the new projects drop. Thus, ABCT does not depend on the sufficient inflexibility of the general price level as Selgin maintains but rather on knowledge and incentive problems concerning the credit expansion caused by a fractional reserve banking system.

## Conclusion

After reviewing Selgin's arguments we come to the conclusion that our original quibbles remain: FRFB still proves to be destabilizing. Yet important questions persist. Why does Selgin come to a different conclusion than us? Why does he regard a FRFB as stabilizing? We hope that this article has shed some light on these questions.

We respect Selgin for his theoretical work done in *The Theory of Free Banking*. In this response we looked through different theoretical lenses on his theory. Selgin subscribes to the aggregative equation of exchange. Selgin's approach impedes him from seeing the microeconomic problems that the stabilization of "MV" by a FRFB system causes. Instead of aggregates, we use marginal utility and subjectivism. Using this different theory we arrived at different conclusions.

We have also different views on the nature of savings. Selgin regards holding cash as saving. We focus on real savings that are necessary to maintain investment projects. Real savings are the unconsumed real income. Variations in real savings are not necessarily equal to variations in cash holdings.

We have further shown that coordinated credit expansion in a FRFB system à la Selgin is possible and consequently that precautionary reserves do not pose a necessary limit. Interestingly this was the most important contribution of our original article, and the one that Selgin decided to side step most thoroughly in his response (although he did accept its possibility). We have shown three instances in which a FRFB system may expand credit without a prior increase in real savings. These facets all demonstrate why a fractional reserve banking system—even a free banking one—is inherently unstable, and incentivized to impose a stabilizing central bank.

## References

- Anderson, Benjamin M. [1917] 1999. *The Value of Money*. Repr. Grove City, Penn.: Libertarian Press.
- . 1979. *Economics and the Public Welfare: A Financial and Economic History of the United States, 1914-1946*. Indianapolis, Ind.: Liberty Press.
- Bagus, Philipp. 2009. “The Quality of Money.” *Quarterly Journal of Austrian Economics* 12 (4): 22-45.
- . 2010. “Austrian Business Cycle Theory: Are 100 Percent Sufficient to Prevent a Business Cycle.” *Libertarian Papers*, 2 (2):
- Bagus, Philipp and David Howden: 2009, ‘The Legitimacy of Loan Maturity Mismatching: A Risky, but not Fraudulent, Undertaking’, *Journal of Business Ethics* 90(3), 399–406.
- . 2010a. “Fractional Reserve Free banking: Some Quibbles.” *Quarterly Journal of Austrian Economics* 13(4): 29-55.
- . 2010b. “The Term Structure of Savings, the Yield Curve, and Maturity Mismatching.” *Quarterly Journal of Austrian Economics* 13(3): 64–85.
- . 2011. The Economic and Legal Significance of “Full” Deposit Availability. Unpublished manuscript.
- . forthcoming a. Monetary Equilibrium and Price Stickiness: Causes, Consequences and Remedies. *The Review of Austrian Economics*.
- . forthcoming b. Still Unanswered Quibbles of Fractional Reserve Free Banking. *The Review of Austrian Economics*.

- Bagus, Philipp, David Howden and Walter E. Block. forthcoming. 'Deposits, Loans and Banking: Clarifying the Debate', *American Journal of Economics and Sociology*.
- Bogaert, Raymond. (1968). *Banques et Banquiers dans les Cités Grecques*. Leyden, Holland: A.W. Sijthoff.
- Boettke, Peter J. 2010. Fearing Deflation Producing Inflation: Why Hayek Wasn't Milton Friedman. *Coordination Problem blog*, Nov. 2<sup>nd</sup>. [Available] <http://www.coordinationproblem.org/2010/11/fearing-deflation-producing-inflation-why-hayek-wasnt-milton-friedman.html>
- Cannon, James G. 1908. Clearing Houses and the Currency. In (ed.) E. R. A. Seligman, *The Currency Problem and the Present Financial Situation*. New York: Columbia University Press.
- Checkland, Sidney G. 1975. *Scottish Banking: A History, 1695-1973*. Glasgow: Collins.
- Cipolla, C.M. 1982. *The Monetary Policy of Fourteenth-Century Florence* (Berkeley: University of California Press.
- Evans, Anthony J. and Horwitz, Steven. forthcoming. An Appeal for Better Scholarly Discourse: How Bagus and Howden Have it Wrong on Free Banking. *The Review of Austrian Economics*.
- Griffin, Edward J. 1998. *The Creature from Jekyll Island: A Second Look at the Federal Reserve*. 3rd. ed. Los Angeles, Ca.: American Media.
- Gorton, Gary. 1985. Clearinghouses and the origin of central banking in the United States. *The Journal of Economic History* 45(2): 277-83.
- Gorton, Gary, and Lixin Juang. 2003. Banking Panics and the Origin of Central Banking, in (eds.) David R. Altig and Bruce D. Smith, *Evolution and Procedures in Central Banking*, pp. 181-219. Cambridge: Cambridge University Press.
- Gorton, Gary, and Donald J. Mullineaux. 1987 [1993]. The Joint Production Confidence: Endogenous Regulation and Nineteenth Century Commercial-Bank Clearinghouses. Reprinted in (ed.) Lawrence H. White, *Free Banking, Volume II: History*, pp. 318-29. Aldershot, UK: Edward Elgar.
- Hazlitt, Henry. 1968. "The Velocity of Circulation", available at <http://mises.org/daily/2916>
- Horwitz, Stephen. 1996. "Capital Theory, Inflation, and Deflation: The Austrians and Monetary Disequilibrium Theory Compared." *Journal of the History of Economic Thought* 18(2): 287-308.

- . 2000. *Microfoundations and Macroeconomics: An Austrian perspectives*. New York: Routledge.
- . 2010. Knowledge Shifts and the Business Cycle: When Boom Turns to Bust. *Review of Austrian Economics* 23(2): 165-182.
- Hülsmann, Jörg Guido. 1998. Toward a General Theory of Error Cycles. *Quarterly Journal of Austrian Economics*, 1 (4): 1-23.
- Huerta de Soto, Jesús. 1998. A Critical Note on Fractional Reserve Free Banking. *Quarterly Journal of Austrian Economics*, 1 (4): 25-49.
- . 2009. *Money, Bank Credit, and Economic Cycles*. 2<sup>nd</sup> ed. Auburn, Ala.: Ludwig von Mises Institute.
- Mises, Ludwig von. 1980. *The Theory of Money and Credit*. Indianapolis, Ind.: Liberty Classics.
- . 1998. *Human Action*. Scholar's Ed. Auburn, Ala.: Ludwig von Mises Institute.
- Mueller, Reinhold C. 1997. *The Venetian Money Market: Banks Panics, and the Public Debt, 1200-1500*. Baltimore, Maryland: John Hopkins University Press.
- Rallo, Juan Ramón. 2009b. "George Selgin: La Confusión entre Dinero y Ahorro." Instituto Juan de Mariana. [Available] <http://www.juandemariana.org/comentario/3526/george/selgin/confusion/dinero/ahorro/>
- Rothbard, Murray N. 1988. "The Myth of Free Banking in Scotland," *Review of Austrian Economics*, Vol. 2: 229-245.
- . 1994. *The Case Against the Fed*. Auburn, Ala.: Ludwig von Mises Institute.
- . 2001. *Man, Economy, and State*. Auburn, Ala.: Ludwig von Mises Institute.
- Sechrest, Larry J. 1993 [2008] *Free Banking: Theory, History, and a Laissez-Faire Model*. Auburn, AL: Ludwig von Mises Institute.
- Selgin, George. 1988. *The Theory of Free Banking: Money Supply under Competitive Note Issue*. New Jersey: Rowman and Littlefeld.
- . 1990. *Praxeology and Understanding. An Analysis of the Controversy in Austrian Economics*. Auburn, Ala.: Ludwig von Mises Institute.

- . forthcoming. *Mere Quibbles: Bagus and Howden's Critique of The Theory of Free Banking. The Review of Austrian Economics*. <http://ssrn.com/abstract=1800813>
- U.S. Congress. 1913. Congressional Records of the 63<sup>rd</sup> Congress, 2<sup>nd</sup> session.
- Usher, A.P. 1943. *The Early History of Deposit Banking in Mediterranean Europe*. Cambridge, Mass.: Harvard University Press.
- White, Lawrence H. 1995. *Free Banking in Britain*. 2nd. ed. London: Institute of Economic Affairs.
- Yeager, Leland B. [1968] 1997. Essential Properties of the Medium of Exchange. Reprinted in *The Fluttering Veil: Essays on Monetary Disequilibrium*, (ed.) George Selgin, pp. 87-110. Indianapolis: Liberty Fund.
- . (1997). *The fluttering veil: essays on monetary disequilibrium*, (ed.) George Selgin. Indianapolis: Liberty Fund.