

COMMUNICATIONS

THE SEARCH FOR MACROECONOMIC STABILITY: COMMENT ON SUMNER

W. William Woolsey

In a recent issue of the *Cato Journal*, Scott Sumner (1991) discussed the development of proposals to stabilize economic aggregates. He described early proposals to stabilize the price level by using a compensated dollar and a problem with those schemes due to an "information lag." He proposed a solution to that problem using index future convertibility and discussed alternative targets that have been developed by modern macroeconomists.

Sumner briefly discussed the BFH system of free banking and claimed that it too would be subject to difficulties caused by the information lag. While his specific argument fails because he misunderstood BFH, the information lag could create a serious problem. Fortunately, that problem could be solved by combining BFH with his proposal for index future convertibility.

Sumner on the BFH System of Free Banking

Sumner's discussion of the BFH system is marred by two small errors and one serious misunderstanding. First, Robert L. Greenfield and Leland B. Yeager named the BFH system to credit ideas borrowed from Fischer Black (1970), Eugene Fama (1980), and Robert Hall (1982). But BFH was not their name for the various proposals of Black, Fama, and Hall (Sumner 1991, p. 752). It is a different, though related, proposal (Greenfield and Yeager 1983, p. 302). Further, Sumner emphasized proposals and cited papers (such as Black 1981, Fama 1983) different from those emphasized by Greenfield and Yeager.

Second, Greenfield and Yeager never described the BFH dollar as being abstract (Sumner 1991, p. 752). An abstract unit of account

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would be *undefined*; independent of any medium of account. The BFH dollar would be defined, but not as a unit of money. In contrast to a conventional monetary system, a nearly comprehensive bundle of goods and services would serve as medium of account (Greenfield and Yeager 1983, p. 303). (While dollar-denominated checks, deposits, banknotes, and token coins would surely exist in BFH, none of those items would serve to define the dollar.)

How BFH Differs from the Compensated Dollar

More serious than those small errors was Sumner's misunderstanding of indirect convertibility. He apparently confused BFH with a privatized version of Fisher's compensated dollar. In the BFH system, dollar-denominated checks, deposits, banknotes, and token coins would be redeemed with an amount of gold (or other agreed redemption medium) having a market value equal to that of the bundle of goods defining the dollar (Yeager 1985; Greenfield and Yeager 1986, 1989). That institution is significantly different from a compensated dollar: redeemability with gold at a temporarily fixed price that is adjusted periodically in response to changes in a price index.

In a footnote (1991, p. 752), Sumner criticized Greenfield and Yeager (1989, p. 419) for stating that the dollar's gold content should be adjusted in view of changes in the price of gold. He argued that adjustments in the gold content of the dollar based on incipient changes in the price level should be sufficient to provide price level stability. His argument would be correct if BFH were a compensated dollar that utilized extremely rapid (or even preemptive) adjustments to the price of gold. According to his understanding of BFH, a change in golds' supply or demand conditions would imply redemptions (or deposits) at its temporarily fixed price, a change in the quantity of money, and a change in the price level. That incipient change in the price level would prompt a preemptive change in the price of gold. Price level stability would, therefore, be maintained.

Greenfield and Yeager's statement, however, suggests that a quite different market process applies to BFH. (The process outlined below is described in more detail in Woolsey and Yeager 1992.) Unlike Fisher's compensated dollar (or a conventional gold standard), the BFH system would not interfere with the normal workings of the gold market. There would be no official price of gold; it would not be fixed even temporarily. Assuming the sum of the market prices of the items in the bundle remained at the defined price of \$1, the banks would charge the going market price of gold to those redeeming

checks, deposits, notes, or coins. Both the price on the market and at the banks' redemption windows would respond directly to shifts in the supply or demand conditions for gold. BFH would *not* involve changing the gold content of the dollar (i.e., a targeted dollar price of gold) to pre-empt incipient changes in the price level.

The BFH system would allow incipient changes in the price level to be preempted, but without any change in the gold content of the dollar. First, suppose no such preemption occurred and some aggregate supply or demand shock caused the price of the bundle to *actually* rise above \$1. The banks' redemption obligation would compel them to sell gold at their redemption windows at a price that would be less than the current market price of gold in inverse proportion to the rise in the price of the bundle. Gold's market price would continue to adjust freely according to its supply and demand conditions, but a bank would be forced to provide gold to those redeeming its checks, deposits, notes, or coins at a slightly lower price. To stop the financial losses caused by buying gold on the market high and then selling it low, banks would sell bonds, contract loans, and raise their deposit interest rates. The consequent contraction in spending would return the price of the bundle to its defined price while simultaneously allowing the banks to again charge the market price of gold at their redemption windows.

Since the *difference* between gold's market price and its price at the banks' redemption windows would prompt the corrective deflationary forces, the gold content of the dollar would be unimportant. It could be changing simultaneously because of conditions peculiar to the gold market. Given the relative price of gold, however, selling gold for something other than its market price during any period when the price of the bundle was actually deviating from \$1 would amount to a temporary change in the gold content of the dollar at the banks' redemption windows.

Even temporary changes in the gold content of the dollar could be avoided, however. Banks would have an incentive to avoid financial losses entirely by adjusting credit conditions and deposit interest rates enough to reverse undesirable changes in spending before any changes in the price of the bundle actually occurred. Should banks correctly anticipate changes in the price of the bundle, inflationary or deflationary shocks would be offset without any change in dollar price of gold at the banks' redemption windows.

The BFH System and the Information Lag

Despite his misinterpretation of the BFH system, Sumner makes an important point. The BFH dollar would be defined relative to

something like the market basket used to measure the CPI, WPI, or GNP deflator. (Contrary to Sumner 1991, p. 752, that is *clearly* what Greenfield and Yeager had in mind. Otherwise, BFH would not stabilize the price level.) Sumner explains that an information lag exists because time is needed to measure macroeconomic variables (1991, p. 752). It seems likely, therefore, that the price of the bundle of goods and services defining the BFH dollar would be reported only periodically.

Sumner argues that the information lag would imply problems for BFH, but his rationale is wrong. He describes destabilizing speculation in the context of the compensated dollar (1991, p. 750) and implies the BFH system would suffer from the same difficulty. (He explicitly makes this claim in 1990, p. 116.) If the CPI was to rise above its target, that fact would be apparent to speculators just prior to the announcement. Since the compensated dollar would require the government to decrease the official price of gold in inverse proportion to the increase in the CPI, speculators would sell large amounts of gold to the government at the official, temporarily fixed price just prior to the announcement and then buy it back at a slightly lower price immediately after the announcement. The sale of gold to the government would cause an unwanted increase in the quantity of money. Further, the government's losses could be ruinous.

That type of speculation could not exist in the BFH system, since the market price of gold would adjust freely. If speculators were to sell gold for any reason, the price of gold on the market and at the banks' redemption windows would decrease immediately. There would be no consequence for the quantity of money and no speculative losses for the banks.

The information lag could cause a disaster in the BFH system for a different reason. If the price of the bundle actually rose above \$1, the banks would be obligated to sell gold for less than its market price. But for how long? It would be absurd for banks to suffer the consequent losses on all redemptions occurring between the announcement of a high price for the bundle and the subsequent announcement. In the context of monthly announcements, such a requirement would surely result in the collapse of the banking system.¹

¹The literature on BFH has assumed that continuous measurement of the price of the bundle is possible. In correspondence, however, Yeager has suggested that periodic measurements could be accommodated by redeeming checks, notes, and coins with an estimated amount of gold and then extrapolating between the previous and subsequent measure of the price of the bundle to determine the needed adjustment to the preliminary settlement. His suggestion does amount to a complicated form of index futures convertibility.

Index Future Convertibility

Sumner is proposing an intriguing solution to the problems created by the information lag. An index futures contract would be used as an instrument of monetary policy. He suggests that the Federal Reserve be required to buy and sell unlimited quantities of an index futures contract on the CPI at a target value of 100. (In his 1989 paper, he described a similar scheme using a target for nominal income.) If speculators expected the index to be above target, they would buy futures from the Fed. If they expected the index to be below target, they would sell futures to the Fed (Sumner 1991, p. 753).

Sumner's proposal requires some modification, since the purchase or sale of futures contracts would not be equivalent to ordinary open market operations. Index futures contracts are promises to make payments, so the Fed's trades would have no immediate consequence for the quantity of money. (If the Fed imposed cash margin requirements on the transactions, it would cause a contraction in the quantity of money both when it sold and when it bought futures contracts.)

Sumner (1991, p. 754) solves that problem by proposing a modification aimed at reducing the risk premium on the futures contract. He proposes that the Fed set low margin requirements and use parallel open market operations to avoid taking any significant long or short position. The ordinary open market operations would cause the changes in the quantity of base money needed to keep the expected value of the CPI on target.²

Index Future Convertibility and the BFH System

Index future convertibility could be applied to BFH, thereby avoiding any difficulties due to the information lag. To describe how such a scheme would operate, some detailed assumptions about the payments system must be made. Like all versions of BFH, there would be no government currency or other base money. Suppose banks offered checkable deposits and issued banknotes (notes) and token coins (coins). Those items would be denominated in dollars, but differentiated by issuer. The banks would accept each others'

²Sumner credits Hall (1983) for inspiring his scheme (1991, p. 752). David Glasner proposed a system (for which he credits Earl Thompson 1986) that is equivalent to index future convertibility (1989, pp. 230–36).

items for deposit at par, so checks, notes, and coins drawn on all banks would be generally accepted in exchange.³

The banks would participate in a clearinghouse. Suppose it provided each bank with a clearing account that began with a zero balance. As checks, notes, and coins cleared, the banks would develop net credit or debit balances. The clearinghouse would pay interest on net credit balances and charge interest to net debit balances. Suppose the clearinghouse made the rates it paid and charged unfavorable compared to those on overnight loans, giving banks an incentive to use overnight loans (or some other money market instrument) to offset any excessive or persistent net credit or debit balances.

In the usual BFH scenario, it is assumed that banks would agree to redeem their checks, deposits, notes, or coins with gold equal in value to the bundle of goods that defines the dollar. By the same principle, a bank could insist on collecting on a net credit balance at the clearinghouse by obtaining gold equal in value to the bundle.

Index future convertibility would require that banks accept a slightly different obligation. To make the payments system as consistent as possible with Sumner's proposal (index future convertibility with parallel open market operations), suppose banks agreed to redeem checks, deposits, notes, or coins with T-bills of equal market value and an index futures contract on the CPI. A member of the public could use validly drawn checks, notes, or coins to obtain T-bills and a long position on the CPI futures contract at the issuing bank. The bank would be obligated to provide the T-bills and take the matching short position.

"Deposits" are less obvious, but a plausible rule would have the deposit of T-bills and a short position at a bank imply that a customer has sufficient funds to write a check or withdraw notes and coins of equal value. The bank would be obligated to accept the T-bills and take the matching long position.

As with other versions of BFH, a similar obligation would apply at the clearinghouse. A bank with a net credit balance could insist it be settled with T-bills and a long position on the CPI contract.⁴

³A rationale for banks accepting each others' notes for deposit was provided by Lawrence H. White (1984, pp. 18–21).

⁴As explained above, it could instead do nothing or use conventional liquidity management to offset the balance by adjusting its asset or liability portfolio as it prefers. Continuous clearing with treasury bills and index futures (or gold in the usual BFH scenario) would be inconvenient, since it would require constant monitoring of the price of the settlement medium and some extra calculation cost. (White 1986 emphasized similar difficulties.)

The T-bills would be provided by the banks with the matching net debit balances and they must also take the opposite short positions, presumably in proportion to the sizes of their balances. Similarly, a bank with a net debit balance could insist on settling the balance with T-bills and a short position. The T-bills and matching long positions would be distributed to the banks with net credit balances.

To sum up, this version of BFH would require that banks offering dollar-denominated checkable deposits, notes, and coins provide two-way convertibility with T-bills and the futures contract. Problems due to the information lag would be avoided by having redemptions and deposits during the current month use the futures contract for the next month's CPI. The number of contracts to be transferred would be calculated by dividing the value of the T-bills by the defined value of the index.

For example, the public could redeem checks, notes, or coins in May by using them to purchase T-bills and CPI futures contracts from the issuing bank. Suppose the market price of a T-bill maturing in one year was five percent, the futures contract was defined to be \$50 times the CPI, and the target for the CPI was 100. The bank would go short on 1.9 ($\$9,500/\$5,000$) June CPI contracts for every \$10,000 face value of T-bills it was required to sell. The CPI would be measured in June and announced in July. If the CPI were 105, the bank would pay \$250 ($5 \times \50) per contract. If the CPI were 98, the member of the public would pay the bank \$100 ($2 \times \50) per contract.

Stabilizing Speculation

Index future convertibility implies a market process that would keep the expected value of the CPI on target. Suppose a speculator expected inflation. He would withdraw T-bills from his bank and obtain a long position on the futures contract, anticipating a profit on the futures contract. Assuming risk aversion, his bank would attempt to offset its matching short position, even if it had no expectation that the CPI would deviate from target. It would sell bonds, obtain net repayments of loans, and increase its deposit interest rate to obtain a net credit balance in its clearing account. The speculator's bank would then demand the balance be settled with T-bills and a long position on the CPI contract, effectively shifting its short position to the other banks. Assuming the other banks were also risk-averse, they would attempt to obtain net credit balances to allow them to also offset their short positions.

The withdrawal of T-bills by the speculator and the contraction of credit by the banks would decrease the quantity of money. The increase in deposit interest rates would increase the demand for money. To build money holdings, the public would sell other assets and restrict expenditures on goods and services. The resulting downward pressure on prices would reduce the likely value of the CPI at its next measurement. The contraction of money and credit, the increase in interest rates, and the restraint on spending would continue until some bank or member of the public accepted a short position to match the speculator's long position on the futures contract.

If a single speculator expected deflation, he would deposit T-bills at his bank and obtain a short position on the futures contract. Risk aversion implies his bank would seek a net debit balance by buying bonds, expanding loans, and lowering its deposit interest rates in order to shift its long position to other banks. But the other banks would do the same. The expansion in money and credit, the lower interest rates, and the stimulus to spending would continue until some bank or member of the public accepted a matching long position.

In equilibrium, everyone might agree that credit conditions, the quantity of money, and interest rates are such that the CPI could most probably be on target at its next measurement. The more likely scenario, however, would be for the amount of funds risked by those expecting the CPI to be above target to just match the amount risked by those expecting the CPI to be below target.

Anticipation of the Consequences of Convertibility

The existence of a market process by which index future convertibility would cause the expected value of the CPI to remain on target would be essential. Anticipation of the process, however, would make redemptions and positions on the futures contract unnecessary.

Suppose the CPI was expected to be above target. Speculation using the futures contract would lead to a contraction of credit and an increase in the interest rate. That would imply capital losses on bond portfolios in the near future, so banks and the public would have an incentive to immediately sell bonds on the market in anticipation. The interest rate on bonds would increase immediately, tending to pull up rates on loans and deposits as well. That would depress spending and prices, tending to keep the CPI on target.

Similarly, if CPI was expected to be below target, speculators would buy bonds to obtain the capital gains that would result from

speculation using index futures. As a consequence, however, interest rates would decrease immediately. Spending would increase, again, tending to keep the CPI on target.

Speculation on the bond market would determine interest rates on bonds (and hence on loans and deposits) such that the average expectation would be for the CPI to remain on target. Needed changes in credit, money, and spending could occur without redemptions of T-bills or positions being taken on the futures contract.

Benefits of Combining Index Futures with BFH

Combining index future convertibility with the BFH would free the financial system from dependence on the Fed's issue of base money. That freedom would provide important benefits, even compared to Sumner's proposal that the Fed utilize index future convertibility.

Since keeping the expected value of the CPI on target usually would require a growing quantity of base money, Sumner's scheme usually would require the Fed to make open market purchases. If the Fed's open market purchases were literally parallel, matching its purchases of futures contracts dollar-for-dollar, then it would be left with a long position matching the needed monthly increase in the quantity of base money. Sumner, however, proposed limiting the Fed's and the speculators' risk by giving the Fed discretion to make open market operations in whatever amount it believed necessary to offset its own long or short position.

Rather than making speculators take some position on the futures contract *first* and only then allowing the Fed to respond with needed open market operations, a more reasonable approach would give the Fed further discretion to *initiate* open market operations. If the Fed created a quantity of base money such that the expected value of the CPI remained on target, speculators would have no reason to take positions on the futures contract. If the Fed failed to effectively target the CPI, however, speculators could take long or short positions on the futures contract. The Fed would then be required to use open market operations to offset its short or long position.

The potential benefit of Sumner's proposal, therefore, would be to create corrective market forces that would limit the mistakes of the Fed. Unfortunately, speculators could not profit from correcting the mistakes of the Fed, because it would free ride on their average expectation by adjusting the quantity of base money in a way that made their average expectation wrong. That would have a peculiar consequence. Speculators would correct the Fed's errors only if at

least one speculator anticipated that at least one other speculator underestimated the size of the needed correction. Otherwise, no speculator would have an incentive to take the position on the futures contract needed to force the Fed to make corrective open market operations.⁵ Furthermore, the Fed's free riding would prevent speculators from investing sufficient resources in gathering and interpreting information to effectively target the CPI.

The BFH system of free banking would avoid those difficulties because speculators would cause appropriate changes in money demand and supply, interest rates, spending, and the expected value of the CPI by trading bonds. Successful speculators would avoid capital losses and earn capital gains on their bond portfolios, even if their discretionary activity caused the CPI to remain on target so that no one could profit from long or short positions on the index futures contracts. Since there would be no base money that could change only with discretionary actions by the Fed or in response to transactions with futures contracts, BFH would harness market forces more directly to targeting the CPI.

Sumner explains that index future convertibility could be used to stabilize any of the economic aggregates that have been proposed by modern macroeconomists in place of the CPI (1991, pp. 754–57). Were BFH combined with index future convertibility, free banking also could be combined with targets for nominal income, a wage index, or some function of unemployment and inflation.

Conclusion

Sumner claims that the information lag creates problems for the BFH system of free banking. He advocates index future convertibility as a solution to the information lag. This comment corrects some errors and misunderstandings in his discussion of BFH and argues that combining index future convertibility with the BFH system of free banking would be a superior approach for providing macroeconomic stability.

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⁵If the speculators must first go short on the contract before the Fed could make any open market purchases, that problem would be even more serious.

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INDEX FUTURE CONVERTIBILITY: REPLY TO WOOLSEY

Scott Sumner

W. William Woolsey's critique of my survey of the history of economic aggregate targeting in the *Cato Journal* (Winter 1991) raises a number of interesting issues.¹ I argued that much of the intellectual history of monetary policy rules can be read as an attempt to grapple with the problems raised by information lags in the reporting of economic aggregates. I discussed previous policy proposals from this perspective and ended with a set of proposals by myself, and others,² that would overcome the information lag by targeting the price of futures contracts linked to the relevant economic aggregate.

Woolsey begins by correctly pointing out that I mistakenly described the "BFH" system as having an abstract unit of account and that I also described the system as being a hybrid of proposals by Fisher Black, Eugene Fama, and Robert Hall, whereas it is actually a creation of Robert Greenfield and Leland Yeager (1983).

In my original paper I was unsure as to whether Greenfield and Yeager intended to link their currency to a comprehensive bundle of goods and services, or to a narrower bundle of commodities with contemporaneously available prices. Woolsey argues that the comprehensive bundle was "clearly" what Greenfield and Yeager had in mind. I accept Woolsey's interpretation although I would note that Greenfield and Yeager could have eliminated any ambiguity by

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¹The title of my 1991 paper should have read "The Development of Economic Aggregate Targeting."

²This idea seems to have been independently developed by a number of authors. The proposal in my 1989 paper focuses on overcoming the information lag in the context of a nominal income rule. Glasner (1989) focused on a variant of Fisher's (1920) Compensated Dollar Plan. Glasner credits Earl Thompson for having suggested the idea. Hall's (1983) model stabilizes the price level by allowing expectations to affect money demand, rather than the supply of money. Barro (1979, pp. 30–31) also anticipated certain aspects of the futures targeting approach.