THE DEVELOPMENT OF AGGREGATE ECONOMIC TARGETING

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Beginning with the 1980s, there has been a renewed interest in monetary policy rules aimed at directly targeting economic aggregates. Members of the "new monetary economics" (NME) school, such as Black (1981), Fama (1983), Hall (1983), and Greenfield and Yeager (1983), have proposed nondiscretionary price level stabilization policies. Taylor (1985) and McCallum (1984) proposed monetary policy rules aimed at nominal GNP stabilization. Even more complex policy targets have recently been suggested by Hall (1984, 1986).

This renewed interest in economic aggregate targeting follows a 50–year hiatus, during which time the policy debate focused on interest rate and monetary aggregate targeting. Although both Keynesian and monetarist policy proposals include macroeconomic stabilization as one goal of monetary policy, the more recent NME proposals have gone a step further by directly targeting nominal GNP (Taylor, McCallum), the price level (Fama, Black), or by defining the unit of account in terms that would result in approximate price stability (Hall, Greenfield and Yeager).

Many of these recent proposals bear strong similarities to Irving Fisher's (1920) "Compensated Dollar Plan" to stabilize the price level. In fact, during the period from the 1820s to the 1930s there was great interest in developing a monetary standard with a stable unit of account.[1] Yet despite recent developments in this area, there remains a good deal of misunderstanding as to how these early

Cato Journal, Vol. 10, No. 3 (Winter 1991).

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[1]In their survey of the precursors of the new monetary economics, Cowen and Kroszner focused heavily on the proposals of populists such as Kitson (1917) and Meulen (1934). Although both writers suggested that their systems would result in a stable unit of account, Sumner (1990) showed that neither system had the sort of nominal anchor required to make their plans operational.

proposals relate to recent developments in this area. For instance, it will be shown that Fisher's compensated dollar plan (CDP) has been widely misunderstood and that recent economic aggregate targeting proposals often suffer from the same faults as Fisher's plan.

This paper will begin by tracing the history of economic aggregate targeting proposals. It is not meant to be a comprehensive survey but rather will focus on two key issues. We will examine the problems created by targeting an economic aggregate when that aggregate is measured with an information lag. We will also examine recent theoretical work on how monetary policy could be made more efficient by incorporating market expectations into the money supply process. Under these policy regimes, the only role for policymakers is to decide which unit of account is most consistent with macroeconomic stability. The issues involved in defining the unit of account in terms of a macroeconomic aggregate also will be examined.

Early Stabilization Proposals

During the period from the 1820s to the 1930s, the gold standard represented the basis against which proposals for monetary reform were judged. The prevailing view among business leaders was that in order to insure that money had a stable value it was necessary to link the unit of account to a fixed weight of gold (or silver). Within the economics profession, however, support for the gold standard gradually declined as it appeared unable to prevent fluctuations in the purchasing power of money. By the 1920s it was seen less as a bulwark against governmental abuse of fiat currency than as an independent source of economic instability.

A gold standard is, at its most fundamental level, a price rule, albeit one aimed at stabilizing the price of a single commodity rather than an index of prices. Changes in the real price of the standard commodity (gold) are associated with (inverse) movements in the price level. Nineteenth-century economists saw these price level fluctuations as aggravating the business cycle, and also contributing to "unfair" transfers of wealth between debtors and creditors

Jevons (1876) proposed a "tabular standard" that would involve indexing all long-term contracts to the price level. Although his proposal would produce a stable standard of deferred payment, it would do nothing to prevent changes in the purchasing power of media of exchange. The unit of account would continue to be expressed in terms of a fixed weight of gold.

Other economists suggested that the problems created by fluctuations in the real price of gold could be alleviated by linking the unit of

account to a basket of commodities. One plan, dubbed symmetallism, would tie the unit of account to a specified weight of gold plus a specified weight of silver. Symmetallism should not be confused with bimetallism where *either* gold or silver serves as the unit of account. It is symmetallism that would become the precursor of all modern price rule proposals.

Both Marshall and Edgeworth agreed that while symmetallism would be preferable to a simple gold standard, stabilizing the price of a more comprehensive basket of commodities would be better still. As one expands the number of commodities in the unit of account, however, the problem of convertibility becomes more difficult. Milton Friedman (1951) argued that for goods to be included in the currency unit, they needed to be "standardized, traded in broadly based markets, supplied under reasonably competitive conditions, and physically and economically storable." Unfortunately, the list of commodities that would meet these restrictive criteria is not necessarily representative of the much larger basket of commodities from which the Consumer Price Index (CPI) is computed.

Perhaps the most ingenious of the prewar price rules was Fisher's compensated dollar plan. Fisher proposed that the price of gold be periodically adjusted to offset changes in the price level. For each 1 percent increase in the price level, there would be a 1 percent increase in the number of grains of gold in the unit of account (i.e., a 1 percent decrease in the price of gold). This would insure that the purchasing power of one dollar's worth of gold would remain stable over time. A major advantage of the CDP over symmetallism is that the commodities composing the standard of value need not be storable.

Although Fisher was unaware of it at the time, a number of earlier economists had anticipated his proposal. The CDP of Aneurin Williams (1892a) differed from Fisher's plan in that it targeted a relatively narrow range of commodity prices. Giffen (1892) noted that Williams' plan could lead to destabilizing speculation prior to the announcement of changes in the index. In response to Giffen's comments, Williams (1892b) suggested that the government could compute a new price index each night. He also noted that "it does not follow that every figure must be changed every night. Those which could not be ascertained afresh would be put in at the same as last time" (p. 748).

Fisher (1920) went even further than Williams by proposing that the Wholesale Price Index (WPI) as calculated by the Bureau of Labor Statistics be used as the basis for (bimonthly) adjustments in the gold value of the dollar. Because the WPI is not continuously

updated, its use in the CDP would result in discrete jumps in the price of gold. For instance, if market participants expected a decrease in the price level, then there would be a huge speculative demand for gold immediately prior to the announcement of the WPI. To prevent this sort of destabilizing speculation, Fisher suggested that a "brassage" charge of 1 percent be imposed on gold transactions with the mint.

In 1922 Congressman Goldsborough introduced a bill that would implement a CDP essentially identical to the Fisher proposal. In his testimony at the hearings, Willford King suggested that a retail, rather than a wholesale, price index be used to adjust the price of gold. He also suggested that the brassage charge should be set at a level to insure that it was always larger than the change in the gold weight of the dollar (or the price level).[2]

Hawtrey (1947) saw the brassage charge as the Achilles' heel of the CDP. He argued that under Fisher's proposal "price movements, however, might be much more rapid than 1 per cent. per month, and if the gap between buying and selling prices were made wide enough to offset any probable price movement, the plan would cease to work automatically" (pp. 225–26). Sumner (1990) showed that if the brassage charge were made large enough to avoid destabilizing speculation, then the CDP would essentially become a money supply rule with feedback. Adjustments in the price of gold would play no role in the process. The brassage charge would allow the official price to diverge from the free market (or foreign) price of gold. Although Fisher's CDP has been compared to a crawling peg exchange rate regime, that comparison is actually more applicable to the Williams proposal.

During the interwar years a number of prominent economists such as Hawtrey (1919) and Cassel (1921) advocated a price stabilization plan that would involve central bank cooperation in the context of a gold exchange standard. As deflationary pressures intensified, however, more and more economists came over to support the concept of a completely managed currency such as Wicksell (1919) and Keynes (1923) had proposed. Fisher seems to have been aware of the redundancy of including gold in his plan, but believed that without any metallic backing, political pressures would have led governments to overissue currency.

There are a number of misconceptions regarding the operation of a CDP. Giffen suggested that Williams was proposing the adoption

[2]*Hearings* before the Committee on Banking and Currency, 67th Congress, 4th Session on H.R. 11788, p. 61.

of a tabular standard along the lines of the Jevons plan. While both systems would provide a stable standard of deferred payment, only the CDP would also stabilize the purchasing power of the unit of account. The tabular standard would simply adjust contracts for changes in the price level. In contrast, the CDP was designed to eliminate the need for indexation.

The New Monetary Economics

The 1920s represent the high point of the stable money movement. Many contemporary economists believed that the sharp deflation of 1920–21 had aggravated the depression of the same year.[3] A poll of economists in 1927 showed that 252 of 281 respondents supported the concept of price level stabilization, while 70 favored adoption of a CDP.[4]

One would have expected the sharp deflation of the early 1930s to give the stable money movement a boost. Yet despite President Roosevelt's support for the concept of price level stabilization, interest in price rules declined sharply after the mid-1930s. This lull lasted until the 1980s, when the ideas of Fisher were revived by the proponents of the NME.

In retrospect, it seems clear that the length of the depression contributed to the demise of the stable money movement. Although the deflation ended in 1933, full recovery from the depression took eight more years. The extremely low nominal interest rates during this period further reinforced the view that monetary policy was ineffectual.

Along with the resurgence of inflation during the 1970s came a renewed interest in monetary policy rules. Monetarist policy proposals differed from earlier stable money plans in that they involved the targeting of monetary aggregates rather than price indices. Milton Friedman (1961) argued that even though price or output stabilization may be intrinsically more desirable than stable monetary growth, the problem of lags rendered a money supply rule the most effective method of reaching these broader policy goals.

During the early 1980s, financial deregulation and unstable interest rates contributed to erratic fluctuations in the velocity of

[3]De Long and Summers (1986) argued that greater price flexibility may actually be destabilizing. They also argued that several interwar theorists including Fisher had reached a similar conclusion. This interpretation seems to confuse price flexibility with price instability. Although Fisher supported monetary policies aimed at achieving price level stability, he opposed price-fixing schemes such as the National Recovery Act, which he termed the "National Retardation Affair" (Fisher 1956, p. 282).

[4]See Fisher (1928, p. 201).

circulation. This led to some dissatisfaction with monetary targeting and a renewed interest in price targets. Hall (1982) advocated a symmetallist system, in which the four commodities backing the currency (aluminum, copper, plywood, and ammonium nitrate) were selected because their composite price closely mirrored the overall cost of living during the postwar period.

Black (1981) proposed a CDP similar to the Fisher proposal. Black's plan called for the government to hold "near zero reserves" of gold, an implicit recognition of the redundancy of gold in Fisher's system. Fama (1983) suggested deregulating the banking system and controlling the price level through a feedback rule for the currency stock. As noted earlier, this would be operationally equivalent to a CDP with a prohibitive brassage charge.

Greenfield and Yeager (1983) dubbed the proposals of Black, Hall, and Fama the "BHF system." They went somewhat further in arguing for complete deregulation of the monetary system, and the creation of an abstract unit of account that would be separate from the (privately issued) media of exchange. The unit of account was to be linked to the price of a broadly defined basket of commodities, measured on a given day.

In a more recent paper Greenfield and Yeager (1989) argue that, even with an abstract unit of account, a determinate (and stable) price level could be assured as long as the dollar's gold content was adjusted in proportion to changes in the price of the standard commodity bundle.[5] They went even beyond Williams in arguing that, with modern technology, these adjustments could occur almost continuously. It is not clear, however, whether Greenfield and Yeager propose stabilizing an index of actively traded commodities (as with the CDP of Williams) or a broad index such as the CPI, which might be difficult to measure continuously.

The central dilemma of targeting economic aggregates such as the price level is that if the currency is directly backed by a commodity reserve, then the real value of that commodity reserve may fluctuate. If the government attempts to target the general price level, then the existence of an information lag will necessitate the adoption of a monetary feedback rule. And even if the CPI could be monitored continuously, the information lag would continue to be a problem

[5]Greenfield and Yeager (1989, p. 419) argue that "adjustments in the dollar's gold content should be made in view not only of incipient changes in the target price index but also of changes in the price of gold itself." This statement appears to involve a redundancy since adjustments based on incipient changes in the target price index should, by themselves, be sufficient to maintain price level stability.

for proposals aimed at targeting more complex aggregates, such as nominal GNP.

A seminal paper by Hall (1983) proposed a way out of this dilemma. Under his system, interest-bearing reserve certificates (RCs) would serve as the unit of account. What makes Hall's proposal distinctive is that the interest on the RCs would contain two components. One part would be fixed at a rate slightly below the T-Bill rate. The second component would be indexed to the price level. This would cause the demand for RCs to be highly sensitive to changes to the price level. An increase in the expected future price level would increase the demand for RCs and, since RCs also serve as the unit of account, automatically tend to offset the inflationary impulse. Hall's paper also contains several other items on the NME agenda, such as the abolition of reserve requirements and the legalization of private currency issue.

Unfortunately, the radical nature of Hall's proposals seems to have obscured his most important innovation: a policy rule capable of stabilizing a comprehensive price index without the need for policy feedback by the monetary authority. In a comment on the paper, Stockman (1983) noted an inconsistency in Hall's argument. Hall had argued that efficiency gains could be realized by saturating the economy with monetary instruments. Yet if RCs served as the medium of exchange, then the transactions costs of paying interest would become burdensome. And if only a few institutions held RCs, then the "optimum quantity of money" argument would have little relevance. Fortunately, these micro-efficiency issues can be easily separated from the problem of targeting the price level.

The advantage of Hall's proposal lies in its utilization of market expectations of future inflation. Sumner (1989) showed that this improvement could be achieved with relatively little modification of our current monetary system if the monetary authority were simply to target a futures price linked to future values of the economic aggregate being targeted. For instance, suppose the monetary authority wishes to target next month's CPI at 100. One approach would be to create a futures instrument with a face value equal to next month's CPI, and a maturity date at the government announcement of the index (which, due to the information lag, would occur during the following month). The Fed would then agree to buy or sell unlimited quantities of CPI futures, on demand, at a price of 100. If market expectations of next month's CPI rose above 100, then investors would purchase additional CPI futures. This would represent an open market sale by the Fed, and would continue until the money supply was reduced enough to bring the expected price level back

down to 100. Similarly, the expectation of a lower price would lead the public to sell CPI futures, and would automatically expand the money supply.

If the Fed were to attempt to peg prices that had already been measured, then the money supply would become indeterminate. Therefore, trading on this contract would continue until the government began collecting price data for the target month. At that time the Fed would repeat the procedure for the following month. If the market expectation of next month's price level were equal to the price of CPI contracts, then it would also be equal to the target CPI. Thus, one criterion for an efficient monetary policy would be to construct the futures market in such a way as to minimize the risk premium in the price of the CPI contract. One way the risk premium could be reduced would be to have the Fed undertake parallel open market operations in Treasury securities to avoid having the public take a significant net long or short position.

As would Hall's proposal to use indexed RCs, Sumner's futures instrument price targeting scheme would use market expectations to help control the price level. The difference is that under a system of futures targeting, market expectations would affect the price level through shifts in the money supply, rather than money demand.

These futures targeting proposals provide support for Benjamin Friedman's (1975) finding that intermediate targeting is generally inefficient. Friedman's conclusion, however, was based on the improbable assumption that the monetary authority is able to identify the optimal money supply feedback rule. Neither futures instrument price targeting nor Hall's RC standard would rely on the Fed's having any special knowledge regarding the structure of the economy. Monetary policy would be determined by the marketplace.

There remain a number of issues relating to policy credibility that could hamper the operation of a price rule. Most of these issues, however, must be faced by any policy proposal that aims to provide a nominal anchor to the economy. And futures targeting could actually improve policy credibility by allowing individuals the opportunity to profit from discrepancies between the announced goals and the performance of policymakers.

Alternative Economic Aggregate Targets

In adddition to the largely technical problem of dealing with the information lag, there is also a more fundamental theoretical problem of choosing the economic aggregate target most closely linked to the goals of monetary policy. Although the price level is the most

frequently proposed economic aggregate target, a number of other aggregates have been receiving increasing attention.

John Rooke (1824) anticipated Fisher's CDP by nearly a century. As with the Fisher plan, Rooke advocated varying the weight of the currency unit (the pound sterling) inversely to changes in the value of money. Because Rooke believed that commodity prices were subject to too many nonmonetary influences to provide a stable unit of account, he suggested targeting an index of wage rates rather than prices. It is worth noting that comprehensive price indices such as the CPI did not exist in 1824. And even if they had, it is not at all clear that the optimal price index for measuring the cost of living would also represent the optimal policy target.

Rooke's plan would allow the price level to move inversely to the marginal product of labor. Selgin (1990) surveyed a number of early proposals to establish a "productivity norm." The term "productivity norm" includes a variety of closely related policies that would allow the price level to vary inversely to either the marginal product of labor (a wage target), the average product of labor, or the level of real GNP (a nominal GNP target).

Selgin showed that during the interwar period the productivity norm was a popular alternative to the price rule. Hawtrey (1930) argued that a productivity norm would provide greater macroeconomic stability as increases in productivity would not be allowed to boost "consumer outlay" (i.e., aggregate demand), and vice versa. He also argued that a productivity norm would allow for greater debtor-creditor equity since individuals on fixed incomes would share the gains and losses from productivity changes.

From a modern perspective it is clear that the productivity norm would be more accommodative to aggregate supply shocks than would a simple price rule. For instance, under a productivity norm the price level would be allowed to increase when an adverse supply shock occurred. This attribute has made the idea of a productivity norm popular among modern economists who worry about wage and price inflexibility. For instance, Taylor (1985) and McCallum (1984) advocated using monetary policy rules to target nominal GNP. Barro (1986) noted that price rules tend to be preferred by New Classical economists on micro-efficiency grounds, whereas economists who believe that wage and price stickiness contributes to the business cycle tend to prefer nominal GNP targeting.

It is interesting to compare the modern GNP targeting proposals of Taylor and McCallum to Rooke's wage targeting proposal. One potential disadvantage of Rooke's plan is that, unlike the Taylor-McCallum approach, under wage targeting nominal GNP would

presumably be procyclical (assuming employment was also procyclical). Yet Rooke's plan also would offer some advantages to economists who worry about wage stickiness.

Consider an economy described by Fischer's (1977) model featuring overlapping nominal wage contracts. If long-term wage contracts are the source of suboptimal employment fluctuations, then policymakers may want to use monetary policy to minimize the difference between the actual aggregate wage and its (Walrasian) equilibrium value. When the economy is subject to an adverse supply shock, the equilibrium real wage will usually decline. If the monetary authority is targeting the price level, then nominal wage rigidity will cause the aggregate real wage to remain higher than its equilibrium value, thus increasing unemployment. Under a wage-targeting scheme, the monetary authority would allow the price level to increase enough so that bargaining units would negotiate new wage contracts at the (constant) aggregate nominal wage target. By targeting nominal wages, Rooke's plan would minimize the adjustment costs of moving the aggregate nominal wage rate to a new equilibrium value. By allowing the price level to fluctuate, real wages would be able to adjust smoothly to macroeconomic disturbances, even if nominal wages were sticky.

Hall (1984) also uses a disequilibrium model to analyze the tradeoff between the twin goals of price stability and employment stability. He described a policy frontier that represented the lowest combination of price level and unemployment variability. (The frontier describes variances and should not be confused with a Phillips Curve.) A policy was defined as "efficient" if it placed the economy on the policy frontier.

Hall went on to advocate a policy of "elastic price targeting" whereby the Fed would peg ($P - A^*U$) at a constant level. (P represents the price level and U represents the unemployment rate.) The coefficient on unemployment (A) could be varied depending on the relative preferences of the policymaker toward price and unemployment stability. (Given Okun's Law, a value of 2.5 to 3.0 would be equivalent to a nominal GNP target. Hall argued that there was no particular reason to suppose that a nominal GNP target was optimal and instead proposed that the coefficient on unemployment be set at 8.0.) Those who worry more about inflation, or who do not believe that any perceived monetary policy can affect U, are called "hawks" by Hall, and would prefer a low coefficient on unemployment.

In a comment on Hall's 1984 paper, Tobin (1984) argued that this type of policy might prove inadequate if the slope of the Phillips Curve were flatter than what Hall had estimated. Yet under Hall's

system, if unemployment variability turns out to be higher than had been estimated, so will price variability. Hall (1986) noted that if the unemployment coefficient accurately reflects the slope of a social indifference curve relating price and unemployment variability, and if these curves are homothetic, then new information pertaining to the slope of the Phillips Curve should not necessitate a revision of the policy target.

It would be possible to construct an elastic price target even if the social indifference curves were not homothetic. If the social indifference curves became steeper at higher levels of price and unemployment variability, then the target could be set at $(P - A*U - B*U^2)$. In principle, the target should reflect the social loss function associated with price and unemployment variability.

Conclusion

The last 165 years have seen the development of both simple and "elastic" price level targets. Although price stability is one goal of almost all policy proposals, neither traditional Keynesian (interest rate) nor monetarist (money supply) policy tools provide an efficient means of keeping the price level at a predetermined level.

The existence of an information lag complicates the operation of a price rule. Symmetallist standards avoid this problem by restricting the standard to those commodities whose price is observable contemporaneously. Unfortunately, fluctuations in the real price of the standard commodity bundle would then generate aggregate price level fluctuations.

Most proposals for targeting the overall price level have relied on a money feedback rule (albeit sometimes well disguised as in the case of the CDP with a prohibitive brassage charge). Because they ignore market expectations, policy feedback mechanisms are inefficient. Either Hall's plan to link the unit of account to indexed RCs, or futures instrument price targeting, would provide a method of incorporating expectations into policy.

One advantage of these new, market-oriented, policy proposals is that they clearly separate the strategic issue of which variable to target from the technical issue of how best to target the variable. Because these proposals are more efficient than intermediate targeting policies, they would allow policymakers to focus on the question of which aggregate is the most appropriate target of monetary policy. In principle, the targeted futures contract could be linked to any nominal economic aggregate.

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