

Topics Concerning the Effectiveness of Stabilization Policies

Bennett T. McCallum

Carnegie Mellon University

and

National Bureau of Economic Research

July 12, 2005

This paper was prepared for presentation as a keynote speech at the Bank of Korea International Conference 2005, held May 27, 2005, at the Lotte Hotel, Seoul.

1. Introduction

It is a pleasure and an honor to be participating in this conference on “the effectiveness of stabilization policies.” Since this is a keynote talk, not a research paper, my objective is to review some specific topics regarding the effectiveness of monetary and fiscal policy that have been of interest recently among academic and central bank researchers. Because my own research has been concerned primarily with monetary theory and policy, the emphasis will be on monetary policy issues. Some attention will be devoted, however, to a topic relating to policy coordination known as the “fiscal theory of the price level.”

2. Shocks vs. Systematic Monetary Policy

I would like to begin with an issue that is not been prominent recently but is of perennial interest—one that is touched upon in a different manner (but with similar conclusions) by Rasche and Williams (2005). This concerns the practice of trying to determine whether monetary policy is effective, in the sense of having significant effects on the evolution of output and/or inflation rates, by means of vector-autoregression studies that purport to measure the contribution of monetary policy shocks that have been identified in some way (by ordering or some more sophisticated identification strategy). It is my belief that such a procedure is highly inappropriate. To see why, consider today’s rather standard framework used for monetary policy analysis, which in its simplest form is a three-equation model that includes (i) an optimizing “IS” function, (ii) a price-adjustment relation such as the “New Keynesian” Phillips curve, and (iii) a Taylor-style policy rule for setting an interest-rate instrument (so as to stabilize inflation and output around their target values). These three structural equations are designed to explain the period-to-period movements of the model’s three endogenous variables, inflation (Δp_t), the output gap (x_t), and the interest rate (R_t).

There may be some lagged values of Δp_t and x_t in the structure, depending upon whether the specification assumes the existence of habit formation in consumption behavior and/or some type of rule-of-thumb or “indexed” price setting. In any event, the reduced-form rational expectations (RE) solution to this model will express the three endogenous variables in terms of lagged values of themselves and of current (and possibly lagged) values of the shock or disturbance terms in each of the three structural equations.

Now suppose that the actual economy is well represented by such a model, as most current analysis presumes. Then the RE solution just mentioned is what the VAR equations mentioned above are intended to represent, in principle. Given the structure of the economy as typically represented by models of this type—as in Clarida, Gali, and Gertler (1999), Goodfriend and King (1997), and Woodford (2003a), for example—it is the case that inflation fluctuates randomly around the central bank’s target value. Thus average inflation, over any extended period, is determined entirely by the monetary policy rule. But this fact would not be revealed by the role of shocks to the policy rule. In fact, this argument could be applied even in the extreme case in which there are no monetary policy shocks at all; nevertheless, monetary policy would be determining the average inflation rate!

Now consider real variables. The average value of the output gap would not be influenced (in many such models) by the monetary policy rule, but the stochastic cyclical properties of the output gap would be influenced—perhaps strongly—by the nature of the systematic component of the policy rule. In other words, monetary policy can in this imaginary setting be crucial in determining the behavior of both inflation and the output gap—and yet the VAR procedure, based on the notion that it is monetary policy shocks that are important, will reveal nothing about that determination. And this conclusion is for a setting in

which it is assumed that the VAR is specified and estimated perfectly!

A more mundane way of putting the point at hand is as follows. It is not monetary shocks that are of importance for the behavior of output and inflation, but the systematic portion of monetary policy behavior. In principle this situation could be different, if instrument variability was much greater, but in recent research estimated interest-rate policy rules have very little unexplained variability, implying that the variability of shocks is quite small in relation to the variability of the systematic part of monetary policy in economies such as those of the United States, the U.K., or the euro area. That being the case, studies of “shocks” measured from VAR residuals tell us little or nothing about some facts of importance.

3. The Concept of Potential Output

A second point, which I have argued in several papers, is that it is important for analysis of monetary policy to be based on plausible assumptions about the information that is available to actual central bankers when setting their policy instruments, period by period. To be concrete let us think of a “period” as one quarter.¹ Then I would argue that it is highly unrealistic to suppose that central banks have knowledge of a period’s output gap when setting policy-instrument values for that period. In part this is because they do not know the value of the actual output (e.g., real GDP) level for the quarter, but the more important missing information is the value of the reference level, often termed “potential output,” that is used in defining the output gap. What this reference value must be, for a policy analysis to be cogent, is the one that makes the output-gap measure identical to the variable that appears in the price adjustment equation (“Phillips curve”) of the model in question. Measures of output reference

¹ The argument would be even stronger if a period was interpreted as a month.

values are not, in most countries, reported as part of the official statistics. Accordingly, many economists have argued that measurement errors are especially likely for this variable. Much very interesting work in this area has been conducted by Orphanides (2000, 2003).

In my view, nevertheless, that the nature of the problem is even more serious than is suggested by the term “measurement error.” Rather than reflecting merely a lack of current information, the problem is largely conceptual—that is, it stems from the existence of various different concepts of the relevant reference value (which I have been calling “potential output”). That there are several distinct concepts in use is implicit in the terminology used by different researchers and practitioners. In addition to the term “potential,” which is frequently used by practitioners, others involve the words “trend,” “capacity,” “NAIRU,” “market-clearing,” “flexible-price,” and “natural-rate.” There are perhaps fewer distinct concepts than terms, but there seem to be at least three fundamentally different ones: trend, NAIRU, and flexible-price concepts. And of course there are many ways of measuring trend output that are quite different in their implications. Crucially, since reliance on any particular concept will be continued over time, differences will not possess the properties of pure “noise” and will not disappear quickly.

Which of the various concepts is most appropriate theoretically? From the perspective of dynamic, optimizing analysis, the answer is the flexible-price concept—i.e., the output level that would prevail in the absence of nominal price stickiness. There have been very few attempts to implement this type of concept quantitatively, but there is one in McCallum (2001b).² In that study I assume that the flexible-price concept is appropriate but that the central bank bases its policy on a trend-based concept, as most actual central banks do in practice. Then I conduct simulations with a typical contemporary macro model of the

² A more sophisticated version is developed by Neiss and Nelson (2003).

optimization-based type and calculate the effects of using the wrong concept in responding to the output gap. The results are that there is very little loss in stabilization potential when the central bank applies a small response coefficient to the output gap measure, but strong responses to that variable tend to produce extremely large fluctuations in inflation and/or interest rates. The obvious conclusion for policy practice suggested by this exercise is that central banks should respond only slightly, if at all, to measures of the output gap (or their unemployment counterparts) in conducting stabilization policy. Instead, the central bank should seek primarily to keep inflation close to its target value—with the latter being low enough to constitute effective price level stability.

4. Economies with Very Little Money

One of the more prominent concerns relating to monetary policy effectiveness reflects a view that the continuing rapid development of information technology (IT) could lead to the disappearance of money as more IT-intensive methods for conducting transactions come to predominate in industrialized economies. Closely related is the suggestion that central banks could lose the ability to influence aggregate demand and, therefore, inflation and cyclical macro-economic conditions.³ In particular, notable papers by Benjamin Friedman (1999) and Mervyn King (1999) have suggested that ongoing improvement in information-processing technologies could lead in the foreseeable future to the near-disappearance of money and the possible loss of central bank control over aggregate demand. Reactions to these suggestions by Charles Goodhart (2000), Charles Freedman (2000), and Michael Woodford (2000) were featured in a special issue of International Finance, published in July 2000, together with a response by Friedman (2000).⁴

³ The following discussion is based on McCallum (2004).

⁴ Also included were three papers on related but distinct topics by me, Richard Cooper, and Otmar Issing.

Let us take up some of the concerns voiced by Friedman (1999) regarding possible loss of central bank control (over aggregate demand conditions) as the role of money—i.e., a tangible medium of exchange—diminishes. The basic idea is that central banks' control depends upon their position as monopoly suppliers of government-sanctioned currency, which serves as an economy's primary medium of exchange upon which other monies are claims. So, as the role of tangible media of exchange diminishes in favor of bookkeeping transactions that do not require money, a central bank's leverage over private spending will—so the argument goes—progressively decline and finally disappear.

There are various points that deserve to be made concerning this line of argument. One fairly obvious one is that the pace of technological innovations, which serve to reduce the demand for money, is significantly endogenous and can be expected to be slower in an era in which inflation is lower than over (say) 1965-1985. More dramatically, Woodford (1998) has shown analytically⁵ that when monetary policy is conducted by means of an interest rate instrument, then the behavior of the price level approaches a well-behaved limiting function as the fraction of transactions conducted with money approaches zero. He therefore argues that:

Analysis of the cashless limit ... makes it clear that improvements in the efficiency of financial arrangements that reduce or destabilize the demand for the monetary base need not be a source of macroeconomic instability. Once one specifies monetary policy in a way that makes the cashless limit well behaved, it becomes possible to separate the problems of the desirable regulation of the payments system [from] the desirable conduct of monetary policy (Woodford, 1998, p. 218).

An objection to Woodford's conclusions has been expressed by Buiter (1998), who considers his limiting process inappropriate to the issue at hand because it concerns sequences with progressively smaller fractions of exchange being intermediated via money—which amounts

⁵ For a specific model, of course, but one that is representative of much current analysis.

to a sequence of different economies, not a sequence proceeding through time for a single economy. I have argued, however, that this point seems correct but not to constitute a telling objection. What we do want to know, in this context, is how an economy operates (through time) when it has a very small (but positive) reliance on monetary transactions. In other words, we want to know what its stochastic steady-state behavior is like; what its “operating characteristics” are. And Woodford’s analysis would seem quite relevant to that question. Specifically, the limiting case should in principle provide a good approximation to the behavior of an economy with a very small fraction of monetary transactions.⁶

Nevertheless, I would suggest that Woodford’s “cashless limit” does not provide a model of how an economy would function in the complete absence of monetary transactions.⁷ Such an economy would not be a monetary economy, even if its computerized accounting system of exchange is highly efficient. The “price level” in such a system cannot be the inverse of the purchasing power of money, as it is in a monetary economy with only a small fraction of transactions conducted by money, since by assumption there is no money. Nor is the k -period nominal interest rate the relative price of using money for k periods. Nor is it the case that “the central bank controls [the one-period nominal interest rate] by intervening in the market for short-term nominal debt ... by simply [standing] ready to exchange debt for money in arbitrary quantities at the price level that it has decided upon” (Woodford, 1998, pp. 193-4). This position is, I believe, much like Friedman’s.

Somewhat more recently, a long paper by Woodford (2001) and short comments by King (2001) and Robert Hall (2001) appeared in a 2001 conference volume from that year’s

⁶ This statement presumes that the model used by Woodford (1998) does not bias the outcome. It might, however, since it does not recognize the existence of various types of one-period claims. It might be that the linkage between the one-period instrument rate and long-term rates of return on capital would be less secure in conditions approaching the cashless limit. Analysis of that issue would require a more disaggregated model.

Kansas City Fed symposium at Jackson Hole, Wyoming. With respect to Friedman's argument, Woodford (2001) contends that the magnitude of required reserves is in principle irrelevant. As he emphasizes, several central banks—including those of the United Kingdom, Sweden, Canada, New Zealand, and Australia—now operate successfully with systems that involve no reserve requirements. Overnight interest rates in these economies are controlled by means of “channel” arrangements, involving standing facilities that put both a floor and a ceiling on overnight rates.⁸ These arguments apply to economies in which there are reserve balances that banks hold with the central bank, not because reserves are legally required, but because they are useful for settlement purposes (and in some cases may earn interest).

Woodford's argument does not assume the existence of currency or reserve requirements so it applies quite generally, to any economy in which final payment settlements are mediated through balances held with the central bank (assuming that these balances serve as the medium of account).⁹ There is no necessity for currency to be used for transactions or for non-bank firms to be excluded from supplying transaction accounts.

A related but alternative arrangement involves central bank payment of interest on reserves. This possibility is discussed by Woodford (2000, pp. 242-244, 254-255) and is treated extensively by Goodfriend (2002). If settlement reserves with the central bank are held by banks, along with overnight securities, then the interest rate on the latter will equal the sum of the interest rate paid on reserve balances plus the marginal service yield provided

⁷ In this regard, Buiters's (1998) comments seem more appropriate.

⁸ The upper limit is established by the central bank's standing offer to make loans to any bank (with satisfactory collateral) at a rate that is (say) 25 basis points above the central bank's current rate target, while the lower limit comes from a standing offer to accept deposits from banks at a rate (say) 25 basis points below the target. See Woodford (2000, pp. 245-6).

⁹ I am presuming that these balances should be considered the economy's medium of exchange and therefore serve as its medium of account (although the latter conclusion is not strictly implied).

by these balances.¹⁰ By adjusting the interest paid on reserves, then, the central bank can exert near-direct control over the overnight interest rate. The marginal service yield might adjust when the reserve rate is changed, but Goodfriend (2002, p. 78) points out that this complication can be eliminated if the central bank induces banks to hold reserves of such a large magnitude that the marginal (not average!) service yield has been driven down to zero (i.e., past the point of satiation). Then the overnight rate will adjust upward or downward point-for-point with the reserve-balance rate.¹¹ Goodfriend discusses several advantages, relative to current U.S. practice, of this approach to monetary policy implementation.

5. The Zero Lower Bound on Interest Rates

One of the most prominent and interesting topics in monetary economics over the past several years has been the challenge to policy effectiveness posed by the zero lower bound (ZLB) on nominal interest rates. Some leading analysts have argued that the ZLB does not pose any drastic problem for actual central banks, whereas others have argued that, to the contrary, the ZLB constitutes a “liquidity trap” that prevents monetary policy from providing any stimulus whatsoever when short-term nominal rates are close to zero. Quite recently, for example, Auerbach and Obstfeld (2003, 2004) and Eggertsson and Woodford (2003, 2004) have generated theoretical results that would appear, at a first reading, to be contradictory despite their development in models that are quite similar in specification. I have argued, however, that the reason for the apparently contradictory findings is that crucially different policy experiments are considered. In particular, Auerbach and Obstfeld consider the effects

¹⁰ Assuming, as before, that overnight securities provide no transaction-facilitating services.

¹¹ Note that the interest-on-reserves method of interest rate control does not require that there be no currency in the economy. If currency is held, then it will be held in sufficient amount that the marginal service yield of currency (which will be a decreasing function of the real quantity held) equals the overnight interest rate. (This statement presumes that no explicit interest is paid on currency.)

of a change from one policy rule to another while the Eggertsson and Woodford analysis investigates the effects on an equilibrium path of alternative specifications of an unusual non-linear component in a single ongoing rule.

In McCallum (2005), I develop this last argument more fully and also devise a single monetary policy rule that would be effective whether or not the economy is in a ZLB situation. This rule calls for adjustment period by period of an “instrument” or “indicator” variable that is a weighted average of a short-term nominal interest rate and the rate of appreciation of the economy’s nominal foreign exchange rate. This composite variable is adjusted each period in response to deviations from target of the inflation rate and (subject to qualifications mentioned above in Section 3) the output gap—just as with a Taylor rule. The weight attached to the exchange rate appreciation should, I argue, be much smaller than the one attached to the interest rate (e.g., 1/40 times as large). Then, when the economy is in a ZLB situation the rule-indicated movements in the composite variable can be effected only by large (negative) changes in the rate of appreciation. Assuming, realistically, that exact uncovered interest parity does not hold, but rather a variant that includes some portfolio-balance effects, the resulting depreciation in the exchange rate will affect aggregate demand and thereby tend to (e.g.) stimulate output and prices when they are below target values. Thus monetary policy has desirable effects under this rule when the economy is in a ZLB situation. If, on the other hand, the economy is away from the ZLB situation, then the small weight on the exchange-rate term in the composite indicator variable will lead to policy actions that are almost the same as would be called for by an ordinary Taylor-style interest rate rule.¹²

¹² Interest rate smoothing can easily be accommodated and, in fact, appears to be helpful.

The proposed rule has some similarities to a “monetary conditions” index, but is designed to be more coherent theoretically and to have very different weights than have been presumed in the literature. Whatever the terminology, it would appear that such a rule could be used in economies in which it is believed that ZLB problems are likely to be of importance. My paper argues that the rule’s reliance on an exchange rate variable, as in McCallum (2000) and Svensson (2001), does not constitute beggar-thy-neighbor policy. Instead, expansions in income that will be generated when the exchange rate is depreciated tend strongly to induce imports thereby decreasing the economy’s net export balance.

There are, of course, alternative strategies available for escape from a ZLB situation. Two interesting possibilities have been discussed by Goodfriend (2000, 2005). Another proposal has been to engage in “helicopter drops of money,” i.e., money-financed gifts (transfer payments) to individuals. If an economy has Ricardian properties, however, such a policy would be as ineffective as the purchase (by the central bank) of government bonds. The reasoning for this result is developed in McCallum (2005) as follows. The payment of a money-financed transfer is equivalent to a money-financed tax reduction. But the latter is equivalent to a bond-financed tax reduction plus a money-financed reversal of the bond sale. But the first of these two components has no effect on macro variables (such as output, the price level, or interest rates) in a Ricardian economy, as is well known. And the second component has no effect in a ZLB situation because, when the interest rate equals zero, bonds become perfect substitutes for money (in standard Ricardian models of the type used in most monetary policy analysis).

6. Exchange Rate Policy

It is important to note that the composite rule of the previous section does not represent a policy that features targets for the exchange rate. Instead, the exchange rate is, together with the short-term interest rate, adjusted to whatever value is needed to achieve targets for inflation and (possibly) the output gap.¹³ The rule represents, therefore, a method of implementing a monetary policy regime of a type that might be termed “inflation targeting,” if the inflation target is quantitatively specified and the central bank chooses to adopt that label. It would, of course, be possible for a central bank to include the exchange rate as another target variable on the right-hand side of its policy rule (or as a third variable appearing in its objective function). A policy described by a rule with that feature would not normally be regarded as an inflation-targeting regime, in my judgement.

Does it make sense for a smallish, highly open economy to have a policy regime that does not specifically include objectives pertaining to the exchange rate? I tend to share in the widely-held view that a country’s exchange rate should be left to float rather freely except in those cases—of which there could be many—that it chooses to join a wider common-currency area. Intermediate arrangements implying fixed-but-adjustable exchange rates have self-destructive features that became well known during the 1990s. It is my impression that some nations have adopted fixed exchange rates primarily (although implicitly) because such an arrangement makes it easier to attract foreign capital, i.e., to borrow from abroad and thereby keep both consumption and investment relatively high. Too often, however, such arrangements result in excessive borrowing and subsequent financial crises that are very costly in terms of lost economic growth.

7. The Fiscal Theory of the Price Level

In this penultimate section, I would like to consider a highly technical line of inquiry that has been quite prominent in academic circles in recent years, though less so among central bankers or central-bank economists. The “fiscal theory of the price level” (FTPL) is an innovative and highly unorthodox body of analysis that was developed and introduced primarily by Leeper (1991), Sims (1994), and Woodford (1994, 1995, 2003a).¹⁴ Whether it represents a useful or even valid body of analysis is a more contentious matter, with dissenting views developed principally by Buiter (1998, 1999, 2002) and McCallum (1999, 2001a, 2003).¹⁵ The dispute has been discussed by several reviewers including Kocherlakota and Phelan (1999), while an important theoretical contribution has been provided recently by Evans and Honkapohja (2004). Interestingly, the FTPL arguments are conducted in the context of Ricardian models, of the type mentioned above, in which fiscal policy is usually regarded as irrelevant for monetary policy analysis. This fact makes the entire discussion even more striking—but also more confusing—than it would be if (for example) overlapping generations models were used.¹⁶

A major stumbling block to the understanding of this literature is the absence of agreement over what the FTPL is, i.e., what are its essential messages of potential relevance for policy. In my judgement it seems clear that the FTPL has attracted much attention largely because it is typically interpreted as constituting a theory that determines the value of money (the inverse of the price level) in a manner that is fundamentally different from the

¹³ It is true that the appreciation term could be moved, algebraically, to the right hand side of the policy rule. But in this case the rule would become one with an interest rate instrument and would not provide the automatic stabilizing feature emphasized in the paper.

¹⁴ Cochrane (1999) is another strong adherent, but his views are substantially different, as Woodford’s (1999) comment clearly demonstrates.

¹⁵ A notable recent argument is that of Niepelt (2004).

¹⁶ In the very recent paper by Iwamoto (2005), the role of income taxes makes the model non-Ricardian.

traditional monetarist view. Furthermore, it gives different predictions about the behavior of the price level under a substantial range of conditions, including plausible (and empirically significant) specifications of monetary and fiscal policy behavior. In this spirit, McCallum (2003, p. 645) suggests that “the essence of the fiscalist [i.e., FTPL] position is ... a prediction that the price level will, under some [nontrivial] circumstances, behave like nominal bonds and very differently than the nominal money supply. It is that type of prediction that has made the fiscalist theory striking and prominent.” Under this view, the FTPL aspires to be significant practically, not to be merely an ingenious but policy-irrelevant theoretical curiosity.¹⁷

Proponents of the FTPL, by contrast, have been concerned with issues resulting from the unfortunate mathematical fact that in dynamic rational expectations (RE) models, of the type used by most researchers, there is usually more than one RE solution to the model, i.e., more than one implied path of variables that could be considered as reflecting the model’s implications (or predictions) about economic outcomes. Often in standard models there are two solutions, one of which conforms to the predictions of traditional monetary analysis, and a second one that differs sharply. In what follows, these two types of solutions will be referred to as “monetarist” and “fiscalist,” respectively.¹⁸ In this context, emphasis by FTPL proponents has been on the possibility that some combinations of fiscal and monetary policy rules may serve to guarantee analytical “determinacy,” where determinacy means that there exists only a single solution that is dynamically stable (non-explosive). In particular, fiscalists have put forth examples in which (i) strict exogenous control of the money supply

¹⁷ The FTPL is not equivalent to the well-known position developed by Sargent and Wallace (1981), which merely assumes that when fiscal and monetary policy clash, the fiscal position dominates (for political reasons).

¹⁸ This does not mean that the proponents of the FTPL would adopt the fiscalist solution in all cases; which they would adopt depends upon the active-passive specification discussed below.

may result in indeterminacy of the price level unless certain fiscal policies are followed (so “coordination” is needed) and that (ii) a monetary policy regime that literally “pegs” a nominal interest rate (i.e., holds it fixed through time) may result in a determinate price level.¹⁹ For example, Woodford (2003b) has stated that “the central contention” of the FTPL is “that under certain policy regimes consistency of the inflation rate with intertemporal government solvency should be an important factor in determining inflation, in addition to the specification of monetary policy.” More specifically he says “I would regard the leading example of fiscalist analysis to be the analysis given in ... [Woodford (1995)] of price-level determination under an interest-rate peg (or bond-price support program) when the real primary government budget surplus is exogenously specified. This is a limiting case of the kind of regime treated (locally) under Leeper’s analysis of passive-monetary/active-fiscal regimes” (2003b, pp. 1184-1185). In both cases, Woodford’s conclusion is based on determinacy findings. From the policy-relevant point of view, the forgoing positions suggest that the key FTPL prediction is that under a “passive-money/active-fiscal” policy regime the price level will behave in a manner that agrees with the fiscalist solution and differs from the predictions of traditional monetary economics.

To understand the policy relevance of all this it is necessary to be clear about the “passive vs. active” terminology introduced by Leeper (1991). It presumes that monetary and fiscal policy are conducted by rules that in their simplest form can be written as

$$(1) \quad R_t = \mu_0 + \mu_1 \Delta p_t$$

and

$$(2) \quad tx_t = \tau_0 + \tau_1 b_t$$

¹⁹ For relevant statements, see Leeper (1991, pp. 131-132), Sims (1994, p. 381), and Woodford (1994, pp. 345-346; 1995, pp. 1-2).

i.e., with the central bank conducting policy via an interest rate instrument (R_t) that is set in response to current inflation (Δp_t) and with the treasury's (lump sum) real tax collections (tx_t) being set in response to the real stock of government bonds outstanding (b_t). To avoid perverse policy, both μ_1 and τ_1 would need to be positive, so that monetary policy is tightened when inflation is high and fiscal policy is tightened when the level of government debt is high. Under that restriction, Leeper's terminology is that monetary policy is active if $\mu_1 > 1 + \rho$, where ρ is the public's rate of time-preference defined such that the discount factor is $\beta = 1/(1 + \rho)$. (Thus ρ is closely related to the long-run average real rate of interest.) This condition is almost the same as that specified by the "Taylor principle," which states that monetary policy should respond to inflation strongly enough that the real rate of interest is raised when inflation exceeds its target value. Virtually all monetary specialists now recommend that policy should conform to the Taylor principle, so they are also implicitly suggesting that monetary policy should be "active."²⁰

For fiscal policy Leeper's terminology is in a sense reversed, for fiscal policy is called passive if $\rho < \tau_1 < 1 + \rho$ and active otherwise. But the range $\rho < \tau_1 < 1 + \rho$ is exactly the range such that fiscal policy tends to retire a positive fraction of government debt each period (in the absence of government revenue provided by monetary policy)—i.e., to be stabilizing. In this case, fiscal policy would be behaving sensibly, so as to stabilize the amount of government debt outstanding—rather than letting it grow explosively (if $\tau_1 < \rho$) or paying off all outstanding debt in one period ($1 + \rho < \tau_1$). Thus we see that sensible fiscal policy is called "passive" while sensible monetary policy is called "active."

²⁰ Traditional monetary analysis has central banks controlling money supply growth, not interest rates. This is much like having a rule of form (1) with an extremely large value of μ_1 .

Now, as noted above, much of the emphasis by FTPL supporters has been on conditions necessary for determinacy, that is, existence of a single stable RE solution to the model economy as opposed to cases in which no solution is stable or more than one solution is stable (the latter “indeterminacy” being regarded as highly undesirable because the economy might end up in the poorer equilibrium or fluctuating erratically between the two). Recently, however, it seems to be agreed that the more fundamental analytical condition is the learnability of equilibria, a property that is arguably necessary for an equilibrium in question to be regarded as plausible. Specifically, this is the position tacitly taken by Woodford (2003a, 2003b). Since it is also the position taken by McCallum (2003), it seems to be emerging as one on which some pro-FTPL and anti-FTPL analysts can agree. Accordingly, the results regarding learnability developed by Evans and Honkapohja (2001, 2004) are of great significance, since they have determined what values of the μ_1 and τ_1 policy parameters give rise to learnability for one or the other of the fiscalist and monetarist solutions.

For policy rules of the class (1) and (2) Evans and Honkapohja (2004) have derived learnability results for positive values of μ_1 and τ_1 , limiting themselves to these ranges because negative values would represent perverse policy responses. For the most part, the learnability criterion is consistent with Leeper’s determinacy results, so that in an active-money/passive-fiscal regime the “monetarist” solution is learnable and the “fiscalist” solution is not, whereas in an active-fiscal/passive-money regime the fiscalist solution is learnable (and the monetarist solution is not), and in a passive-money/passive-fiscal regime neither solution is learnable. In the case of the active-monetary/active-fiscal regime with $0 < \tau_1 < \rho$ and $\mu_1 > 1 + \rho$, however, Evans and Honkapohja (2004) find that there is a very small set of

policy parameter values for which the fiscalist solution is learnable and a much larger set for which the monetarist solution is learnable.²¹ In fact, the monetarist solution is learnable for all values of μ_1 greater than $(1 + \rho)^2$ in this region. And the monetarist solution implies that inflation is stable around the central-bank's target value. Thus even with the fiscal irresponsibility implied by $0 < \tau_1 < \rho$, a resolute central bank can have its way with regard to inflation. That agrees with a major message of traditional monetary analysis.

There are some ways in which the Evans and Honkapohja results described above might appear to be inconsistent with traditional monetarist teachings; there is, for example, a sizeable region of policy parameter values (with both policy rules passive) in which there is no equilibrium that is learnable. But reflection indicates that this finding actually is not inconsistent with monetarist analysis, for the latter was invariably expressed in terms of policy rules for control of the money supply, not short-term interest rates. In this spirit, the argument developed in McCallum (1999, 2001a) is concerned with whether the monetarist prediction or the FTPL prediction would be more valid if the central bank were to resolutely maintain money stock control while the fiscal authority is following a policy that is basically inconsistent with that policy. So, what are the Evans and Honkapohja results regarding this situation? The answer is that the monetarist solution—the prediction of traditional monetary analysis—is supported by the learning analysis, whereas the FTPL solution receives no support.²²

If one considers the case (i) emphasized by Woodford in which passive monetary policy is combined with active fiscal policy, the Evans and Honkapohja results do imply that

²¹ These are local results for a linearized version of the system; see Evans and Honkapohja (2004, pp. 20-21).

²² See Evans and Honkapohja (2004, pp. 8-12 and 25-26). Furthermore, this situation would be somewhat like an active/active case of Leeper's in which the monetary policy parameter μ_1 approaches $+\infty$ with the fiscal policy parameter τ_1 approaching zero (with private agents choosing to hold no government bonds).

the fiscalist, and not the monetarist, solution would be learnable. That case represents a very small portion of the relevant policy parameter space, however. Furthermore, if monetary policy is made strongly active, as with a money stock policy rule, then the monetarist not the fiscalist solution would be learnable. Thus it is not necessarily the case that if fiscal policy is irresponsible, then monetary policy should also be irresponsible, as the FTPL seems to suggest.

In any event, the main conclusion for the issue of fiscal-monetary coordination is as follows. Suppose that both monetary and fiscal policymakers are behaving sensibly, i.e., that the central bank is following an interest rate rule such as (1) with $\mu_1 > 1 + \rho$ and the fiscal authority is setting tax rates as in (2) with $\rho < \tau_1 < 1 + \rho$. Then for any value of these policy parameters within this specified “sensible” region, there is a unique RE solution that is learnable and it is the monetarist solution. Thus the behavior of inflation and output is determined by the central bank’s policy rule regardless of the fiscal setting of τ_1 . Accordingly, there is no need for policy coordination; neither policy authority needs to take the behavior of the other into account in designing its own (sensible) policy rule.

8. Conclusion

In the foregoing sections I have touched briefly on a number of distinct topics in monetary policy. Briefly and bluntly stated, the main policy-relevant conclusions are as follows. (i) Analysis of monetary policy effectiveness should focus upon the systematic portion of policy behavior, not policy “shocks.” (ii) Monetary policy should be directed primarily toward keeping inflation close to a target value that is low enough to represent price-level stability. (iii) Continuing development in the information technology area may lead to a diminished role for medium-of-exchange money in advanced economies, but central banks

will be able to reliably affect aggregate demand for the foreseeable future. (iv) The zero lower bound on nominal interest rates does entail a problem for management of monetary policy in certain circumstances, but various means for enhancing aggregate demand exist nevertheless. (v) Exchange-rate policy is not a distinct tool from monetary policy; countries with market economies should either join currency unions or let their exchange rates float rather freely. (vi) The fiscal theory of the price level is an ingenious academic doctrine that arguably has few if any practical implications. In particular, it does not provide significant analytical support for the notion that coordination of monetary and fiscal policies is desirable.

References

Auerbach, A.J., and M. Obstfeld (2003) "The Case for Open-Market Purchases in a Liquidity Trap," NBER WP 9814.

_____ (2004) "Monetary and Fiscal Remedies for Deflation," American Economic Review Papers and Proceedings 94, 71-75.

Buiter, W.H. (1998) "The Young Person's Guide to Neutrality, Price Level Indeterminacy, Interest Rate Pegs, and Fiscal Theories of the Price Level," NBER Working Paper 6396.

_____ (1999) "The Fallacy of the Fiscal Theory of the Price Level," NBER Working Paper 7302.

_____ (2002) "The Fiscal Theory of the Price Level: A Critique," Economic Journal 112, 459-480.

Clarida, R., J. Gali, and M. Gertler, "The Science of Monetary Policy: A New Keynesian Perspective," Journal of Economic Literature 37 (December 1999), 1661-1707.

Cochrane, J.H. (1999) "A Frictionless View of U.S. Inflation," NBER Macroeconomics Annual 1998 (Cambridge, MA: MIT Press).

Eggertsson, G.B., and M. Woodford (2003) "Optimal Monetary Policy in a Liquidity Trap," NBER WP 9968.

_____ (2004) "Policy Options in a Liquidity Trap," American Economic Review Papers and Proceedings 94, 76-79.

Evans, G.W., and S.Honkapohja (2001) Learning and Expectations in Macroeconomics. (Princeton: Princeton Univ. Press).

_____ and _____ (2004) "Policy Interaction, Learning, and the Fiscal Theory of Prices," Working Paper, April.

Freedman, C. (2000) "Monetary Policy Implementation: Past, Present and Future—Will Electronic Money Lead to the Eventual Demise of Central Banking?" International Finance 3, 211-227.

Friedman, B.M. (1999) "The Future of Monetary Policy: The Central Bank as an Army with Only a Signal Corps?" International Finance 2, 321-338.

_____ (2000) "Decoupling at the Margin: The Threat to Monetary Policy from the Electronic Revolution in Banking," International Finance 3, 261-272.

Goodfriend, M. (2000) "Overcoming the Zero Bound on Interest Rate Policy," Journal of Money, Credit, and Banking 32, 1007-1035.

_____ (2002) "Interest on Reserves and Monetary Policy," Federal Reserve Bank of New York Economic Policy Review 8, 77-84.

_____ (2005) "Narrow Money, Broad Money, and the Transmission of Monetary Policy," working paper. (Forthcoming in Fed conference volume)

Goodfriend, M., and R. G. King (1997) "The New Neoclassical Synthesis and the Role of Monetary Policy," NBER Macroeconomics Annual 1997, MIT Press, 231-295.

Goodhart, C. (2000) "Can Central Banking Survive the IT Revolution?" International Finance 3, 189-209.

Hall, R.E. (2001) "Commentary," Economic Policy for the Information Economy. Federal Reserve Bank of Kansas City.

Iwamoto, Y. (2005) "Interaction Between Monetary and Fiscal Policy and a Policy Mix," Paper for Bank of Korea international conference, May 2005.

King, M.A. (1999) "Challenges for Monetary Policy: Old and New," New Challenges for Monetary Policy. Federal Reserve Bank of Kansas City.

_____ (2001) "Commentary," Economic Policy for the Information Economy. Federal Reserve Bank of Kansas City.

Kocherlakota, N., and C. Phelan (1999) "Explaining the Fiscal Theory of the Price Level," Federal Reserve Bank of Minnesota Quarterly Review 23(4), 14-23.

Leeper, E.M. (1991) "Equilibria Under 'Active' and 'Passive' Monetary and Fiscal Policies," Journal of Monetary Economics 27, 129-147.

McCallum, B.T. (1999) "Issues in the Design of Monetary Policy Rules," in Handbook of Macroeconomics, J.B. Taylor and M. Woodford, eds. (Amsterdam: North-Holland Pub. Co.).

McCallum, B.T. (2000) "Theoretical Analysis Regarding a Zero Lower Bound on Nominal Interest Rates," Journal of Money, Credit, and Banking 32, 870-904.

_____ (2001a) "Indeterminacy, Bubbles, and the Fiscal Theory of Price Level Determination," Journal of Monetary Economics 47, 19-30.

_____ (2001b) "Should monetary policy respond strongly to output gaps?" American Economic Review Papers and Proceedings 91, 258-262.

_____ (2003) "Is the Fiscal Theory of the Price Level Learnable?" Scottish Journal of Political Economy 50, 634-649.

_____ (2004) "Monetary policy in economies with little or no money," Pacific Economic Review 9, 81-92.

_____ (2005) "A Monetary Policy Rule for Automatic Prevention of a Liquidity Trap," NBER Working Paper 11056.

Meltzer, A.H. (2005) "Origins of the Great Inflation," Federal Reserve Bank of St. Louis Review 87, 145-175.

Neiss, K.S., and E. Nelson (2003) "The Real Interest Rate Gap as an Inflation Indicator," Macroeconomic Dynamics 7, 239-262.

Niepelt, D. (2004) "The Fiscal Myth of the Price Level," Quarterly Journal of Economics 118, 277-300.

Orphanides, A. "Monetary Policy Rules Based on Real-Time Data," American Economic Review 91, September 2001, 964-985.

_____ "The Quest for Prosperity Without Inflation," Journal of Monetary Economics 50, April 2003, 633-663.

Rasche, R., and M.M. Williams (2005) "The Effectiveness of Monetary Policy," Paper for Bank of Korea international conference, May 2005.

Sargent, T.J., and N. Wallace (1981) "Some Unpleasant Monetarist Arithmetic," Federal Reserve Bank of Minneapolis Quarterly Review 5 (No. 3), 1-17.

Svensson, L.E.O. (2001) "The Zero Bound in an Open Economy: A Foolproof Way of Escaping from a Liquidity Trap," Bank of Japan Monetary and Economic Studies 19, 277-312.

Sims, C.A. (1994) "A Simple Model for the Study of the Determination of the Price Level and the Interaction of Monetary and Fiscal Policy," Economic Theory 4, 381-399.

Woodford, M. (1994) "Monetary Policy and Price-Level Determinacy in a Cash-in-Advance Economy," Economic Theory 4, 345-380.

_____ (1995) "Price-Level Determinacy Without Control of a Monetary Aggregate," Carnegie-Rochester Conference Series on Public Policy 43, 1-46.

_____ (1998) "Doing Without Money: Controlling Inflation in a Post-Monetary World," Review of Economic Dynamics 1, 173-219.

_____ (1999) “Comments” NBER Macroeconomics Annual 1998, 390-417.

_____ (2000) “Monetary Policy in a World Without Money,” International Finance 3, 229-260.

_____ (2001) “Monetary Policy in the Information Economy,” Economic Policy for the Information Economy, Federal Reserve Bank of Kansas City.

_____ (2003a) Interest and Prices: Foundations of a Theory of Monetary Policy. Princeton University Press.

_____ (2003b) “Comment On: Multiple-Solution Indeterminacies in Monetary Policy Analysis,” Journal of Monetary Economics 50, 1177-1188.