REAGANOMICS AND REPUTATION REVISITED

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This paper considers a reformulation of Backus and Driffill's model of credibility following a change in regime. Following Tabellini, we alter their model to better fit macroeconomic policymaking as it is formulated in the U.S. where monetary and fiscal policies are made by independent policymakers. By assuming that policymakers of divergent views have recently entered office and so have no track record, the game's equilibrium corresponds to the U.S. experience during the first years of the Reagan administration.

I. INTRODUCTION

Following a period of sustained high inflation and unemployment rates, a newly elected president and members of Congress, and a recently appointed Chairman of the Board of Governors of the Federal Reserve take their respective offices. Given the recent state of the economy, the president, Congressional leaders and the chairman call for changes in both monetary and fiscal policy designed to improve the economy's performance. Specifically, the president announces that he will seek lower taxes and interest rates to reduce unemployment whereas the chairman (speaking for the majority of the Board) states that he will seek lower monetary growth rates and net of interest government deficits (hereafter referred to as primary government deficits) to avoid rekindling high inflation rates. Congressional leaders, citing the new president's mandate, announce their willingness to cooperate on matters of fiscal policy and to support his position on monetary policy. Despite this cooperation, since the Federal Reserve System is independent of both the president and Congress, neither the Fed Chairman nor the president can unilaterally achieve his announced policy. Furthermore, assuming that tax reductions are not matched by reductions in spending so that changes in taxes generate equal changes in the primary deficit and that short-run reductions in monetary growth rates cause interest rates temporarily to increase, then the two announced policies cannot be realized simultaneously. This leads to three questions: (i) What combination of monetary and fiscal policies will actually follow such announcements? (ii) After they are implemented, will these policies persist? (iii) What impact will these policies have on the stock of government debt held by the private sector?

In order to answer these questions we analyze a version of Tabellini's [1987] model of a monetary-fiscal authority game with incomplete information. This

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model is a useful starting point since it contains many features which closely parallel the most pertinent aspects of the above story. First, the model assumes independent monetary and fiscal authorities each of whom has a utility function whose optimal mix of monetary and fiscal policies is inconsistent with that of the other. With the Congress in agreement with the president, this framework exactly corresponds to the situation in the story. Second, due to the announcement of a new and as yet unproven monetary regime, Tabellini models the fiscal authority as having incomplete information about the monetary authority's utility function. This form of incomplete information can also represent the fiscal authority's uncertainty about a newly installed monetary authority who has announced his intended policies, but as yet has no track record to support his announcement. Finally, Tabellini exploits the combination of inconsistent utility functions and incomplete information to show how the monetary authority's reputation for non-accommodation determines the time path of both policy instruments, the primary deficit and changes in the monetary base financed through open market operations in federal government debt. Since these two instruments jointly determine the time path for privately held government debt, Tabellini's model suggests that the desire for reputation can provide the answers that I seek.

Unlike Tabellini, I assume that both the monetary and fiscal authorities are newly installed. Consequently, I extend the same type of incomplete information to both. Thus, each authority can benefit from establishing a reputation for a particular type of behavior. In order to simplify the model to emphasize the role that dual reputation building plays, we replace Tabellini's dynamic game with a repeated game of the type used by Backus and Driffill [1985a; 1985b]. In their model, Backus and Driffill consider a policy game where one [1985a] or both [1985b] players, a newly installed government (or at least its central bank) and the private sector (which they model as a competitive labor market), find reputation building beneficial. Neither of their formulations, however, can address the issues raised above, namely the implications of policy differences within the government. Indeed, as the authors point out, their model is better suited to describing the effects of policymaking in a parliamentary system where the party in power can coordinate the actions of both the monetary and the fiscal authority than it is to a country like the United States where such decisions are made by independent branches of the government.[1]

Game theoretic models of macroeconomic policymaking where reputation plays a role in determining the model's equilibrium began with attempts to overcome the non-optimal, non-cooperative equilibrium of Kydland and Prescott's [1977] policy game. Early contributions by Barro and Gordon [1983a; 1983b] showed that the cost of losing reputation could be large enough to prevent the monetary authority from creating unanticipated inflation. Rogoff [1985] resolves the problem by changing the monetary authority's incentive

1. Backus and Driffill [1985b] cite the newly-elected Thatcher government as an example where their model applies.

structure. Canzoneri [1985] extends Barro and Gordon, and Rogoff by assuming that the monetary authority has private information. The addition of private information provides an incentive for the monetary authority to behave in a strategic fashion not found in either Barro and Gordon, or Rogoff's work. Kreps and Wilson [1982] provide an alternative model of reputation, one which incorporates private information, but drops the problematic "punishment" mechanism supporting the equilibria in the models of the previously mentioned authors. They assume instead an equilibrium where at every date each agent behaves rationally in light of his perceptions of the other agent's behavior. This provides a means for reputation to be determined endogenously rather than occur due to exogenous constraints. Backus and Driffill [1985a; 1985b], Barro [1986], Tabellini [1987], and others have successfully incorporated the Kreps-Wilson reputation model into macroeconomic policy models.[2] By merging the work of Backus and Driffill, and Tabellini, the following represents a contribution to this branch of the macroeconomic policymaking literature.

In the next section I propose utility functions for each authority that are consistent with the announced policies given in the above story. I then apply Kreps and Wilson's analysis for the case where each authority is uncertain about the utility function of the other and describe the model's equilibrium. Section 3 uses the model to answer the three questions posed earlier and to provide support to Sargent's [1985] claim that U.S. monetary and fiscal authorities were engaged in a game of chicken during the early years of the Reagan administration. The final section offers some concluding comments and provides a caveat on interpreting the model's equilibrium.

II. REPUTATIONAL EQUILIBRIUM

In order to simplify the model to concentrate on its reputation effects, yet require that it correspond to the story in the introduction, I assume that at each point in time both the monetary authority (M) and the fiscal authority (F) must choose between two possible settings of his respective instrument. Specifically, M chooses between large (L) and small (S) changes in the monetary base (m), which are accomplished through open market operations in U.S. Treasury securities, while F chooses between like settings for the primary deficit (f).

The utility of each authority is assumed to be a function of both instruments. Consequently, we are assuming that each authority believes there is an invariant relationship between his ultimate macroeconomic goals and changes in the other authority's instrument. Representing S as 0 and L as 1, let

$$u_M(f, m) = -\alpha m^2 - \beta f^2 - \gamma(f - m)^2 \qquad (1a)$$

$$0 < \alpha < \gamma,\ 0 \leq \beta$$

2. For further references to the policy game literature, see the references in the cited papers as well as the surveys by McCallum [1984b], Cukierman [1986], Fischer [1986] and Rogoff [1987a; 1987b].

$$u_F(f, m) = -\delta(m - 1)^2 - \epsilon(f - 1)^2 - \zeta(f - m)^2 \qquad (1b)$$
$$0 < \epsilon < \zeta,\ 0 \leq \delta$$

be the utility functions of M and F. Since u_M is maximized when $f = m = 0$ and u_F is maximized when $f = m = 1$, each authority's preferred policy corresponds to his announcement. Furthermore, since both γ and ζ are positive, each policymaker prefers monetary and fiscal policies which adjust the level of monetary accomodation to the size of the deficit to a policy where large deficits are not accommodated. Such preferences represent each authority's recognition that persistent large primary deficits which are not accommodated can lead to explosive growth in the stock of privately held government debt, a situation that Sargent and Wallace [1981] and others have shown can be infeasible in a dynamic economy.[3]

These utilities are usefully summarized in the following payoff matrix. Listing F's utility level first we have

		M: S (=0)	M: L (=1)
F	S (=0)	$-(\delta + \epsilon)$, 0	$-(\epsilon + \zeta)$, $-(\alpha + \gamma)$
	L (=1)	$-(\delta + \zeta)$, $-(\beta + \gamma)$	0, $-(\alpha + \beta)$

where, for example, if $m = f = S = 0$, then $u_F = -(\delta + \epsilon)$ and $u_M = 0$. Unlike the models of Backus and Driffill [1985a; 1985b], and Canzoneri [1985], here when both authorities move simultaneously, the game permits two Nash equilibria, *LL* and *SS*, and no cooperative equilibrium. To resolve this multiplicity, I assume that at every stage the game is played sequentially. Without a loss of generality I let F choose first followed by M, this order being closer to the U.S. experience than is the reverse.

Uncertainty enters the model in the following way. Since M has no track record, his announced monetary policy carries little information as to how he will behave should F's choice of fiscal policy be different from that which M has announced. Therefore, if F chooses a large primary deficit, then he does not know whether M will behave according to (1a) and so will accommodate the deficit through increased growth of the monetary base (henceforth referred to as "weak") or will hold to his announced monetary policy and choose not to accommodate (henceforth referred to as "strong"). Likewise M does not know whether F follows (1b) and so will reduce the primary deficit when

3. Since my model is a repeated rather than a dynamic game, there is no role for a government budget constaint, a necessarily dynamic relationship. Thus the impact of unaccommodated persistent large primary deficits on the stock of privately held government debt can only be described qualitatively. The analogue of this case in dynamic economies provides a natural description. For other examples of dynamic economies where explosive growth arises see Blinder and Solow [1973; 1976], Turnovsky [1977], Christ [1979], McCallum [1984a], Scarth [1982] and Smith [1982]. Darby [1984] and Buiter [1982; 1983] provide counterexamples.

faced with non-accommodation (i.e., "weak") or will choose not to renege on tax cuts regardless of M's action (i.e., "strong").

Following Kreps and Wilson [1982, sec. 4], I study the equilibrium of the model in continuous time, this being simpler to analyze than is discrete time. The game begins at time 0 and evolves continuously until time T. We allow F and M to discount future returns at the (possibly distinct) rates of r_F and r_M respectively.[4]

At time t, let p_t be the probability that F attributes to the event that M is strong. Likewise, let q_t be the probability that M attributes to the event that F is strong. Since p_t and q_t summarize the behavior of M and F from the beginning of the game through time t, they represent the reputations of M and F. The reputation priors of M and F, ϕ and ψ respectively, are known by both players. Turning next to mixed strategies, during any time interval of length h, $[t, t + h]$ say, let $y_t h$ be the conditional probability that M accommodates (i.e., plays L) given that he is weak and $z_t h$ be the conditional probability that F reneges on tax cuts (i.e., plays S) given that he is weak.[5]

Using the above definitions, the joint probability table governing F's behavior during the interval $[t, t + h]$ is given by

	F weak	F strong	
F concedes	$(1 - q_t)z_t h$	0	$(1 - q_t)z_t h$
F fights	$(1 - q_t)(1 - z_t h)$	q_t	$1 - (1 - q_t)z_t h$
	$1 - q_t$	q_t	

with a like table governing M's behavior.[6] Applying Bayes' rule to determine how reputations evolve over time yields, in the limit,

$$p' = p_t(1 - p_t)y_t \tag{2}$$
$$q' = q_t(1 - q_t)z_t \tag{3}$$

where p' and q' represent the time derivatives of p_t and q_t respectively.[7]

Assuming both authorities are weak, the equilibrium strategy of each is determined as follows. If, up to time t, M has yet to accommodate and F has yet to renege on tax cuts, then each will randomize between L and S using the mixed strategies represented by y_t and z_t, respectively. Consider the case

4. We might also posit that the authorities have distinct time horizons. However, since distinct discount rates have the same qualitative effects as distinct time horizons, we need assume only the former.

5. The presence of mixed strategies is due to the manner in which uncertainty enters the model. Following Kreps and Wilson, I assume that each policymaker knows that the other's behavior is determined by one of two possible types, either "weak" or "strong." In contrast, Milgrom and Roberts [1982] show that if each player knows that the other's behavior is determined by one out of a continuous distribution of types, then only pure strategies are needed. Such a result would likely obtain here as well.

6. See Kreps and Wilson [1982].

7. For a complete derivation see Kreps and Wilson [1982] or Backus and Driffill [1985a].

of M first. Over the interval $[t, t + h]$, M does not accommodate with probability $1 - y_t h$. With probability $1 - (1 - q_t)z_t h$, F responds with a small deficit yielding M a payoff of $-(\beta + \gamma)h$ plus the present value of continuing. Should F renege on tax cuts, then F is revealed to be weak and M receives 0 for the rest of the game. On the other hand, should M accommodate, then M is revealed to be weak and F holds to his tax cut providing M with $-(\alpha + \beta)$ for the rest of the game. Letting $V_M(t)$ be the expected present value of M's utility at time t, we have

$$\begin{aligned} V_M(t) = (1 - y_t h)\{&[1 - (1 - q_t)z_t h][-(\beta + \gamma)h \\ &+ \exp(-r_M h)V_M(t + h)] \\ &+ (1 - q_t)z_t h(0)R_M(T - t)\} \\ &+ y_t h[-(\alpha + \beta)]R_M(T - t) + o(h) \end{aligned}$$

where $R_M(T - t) = \int_0^{T-t} \exp(-r_M \tau)\, d\tau$.

In equilibrium the value from randomizing must equal that from playing the pure strategy of accommodating so that $V_M(t) = -(\alpha + \beta)R_M(T - t)$ and $V_M(t + h) = -(\alpha + \beta)R_M(T - t - h)$. Making these substitutions and letting $h \to 0$ gives F's equilibrium mixed strategy as

$$z_t = r_M w/\{(1 - q_t)[1 - \exp(-r_M(T - t))]\} \tag{4}$$

where $w = (\beta + \gamma)/(\alpha + \beta) > 1$, a measure of the relative cost to M of maintaining his reputation for non-accommodation.

Similarly we can write $V_F(t)$ as

$$\begin{aligned} V_F(t) = (1 - z_t h)\{&[1 - (1 - p_t)y_t h][-(\delta + \zeta)h \\ &+ \exp(-r_F h)V_F(t + h)] \\ &+ (1 - p_t)y_t h(0)R_F(T - t)\} \\ &+ z_t h[-(\delta + \epsilon)]R_F(T - t) + o(h) \end{aligned}$$

where $R_F(T - t) = \int_0^{T-t} \exp(-r_F \tau)\, d\tau$. Imposing the equilibrium condition that $V_F(t) = -(\delta + \epsilon)R_F(T - t)$ and letting $h \to 0$ gives M's equilibrium mixed strategy as

$$y_t = r_F x/\{(1 - p_t)[1 - \exp(-r_F(T - t))]\} \tag{5}$$

where $x = (\delta + \zeta)/(\delta + \epsilon) > 1$, a measure of the relative cost to F of maintaining his reputation for holding to tax reductions.

For computational convenience, let $T \to \infty$.[8] This permits us to write (4)

8. Letting $T \to \infty$ has the effect of removing the direct influence of t on y_t and z_t. In addition, the reputation building behavior comes in the early stages of the game and (probabilistically speaking) will always end before any T (finite) occurs. As the solution will then be *LL* or *SS* from that point on, little is lost in letting $T \to \infty$. See also Backus and Driffill's comments [1985b, 216].

and (5) as

$$y_t = r_F x/(1 - p_t) \tag{6}$$

$$z_t = r_M w/(1 - q_t) \tag{7}$$

Substituting (6) and (7) into (2) and (3) yields the model's laws of motion

$$p' = r_F x p_t \tag{8}$$

$$q' = r_M w q_t \tag{9}$$

Equations (8) and (9) determine a curve in (p, q)-space along which equilibrium play progresses until one or the other authority concedes. From (8) and (9) we have that $dq/dp = q'/p' = (r_M w q_t)/(r_F x p_t)$ so that $q_t = k p_t^{\sigma}$ where $\sigma = r_M w/r_F x > 0$ and k is an integration constant which must equal one to insure that p and q equal one simultaneously should that event occur (see Kreps and Wilson [1982, sec. 4]).

Given F's initial belief that M is strong, ϕ, ϕ^{σ} represents the maximum value of M's initial belief that F is strong such that F finds it necessary to begin the game by randomizing. Therefore, if M's actual initial belief ψ exceeds this maximum, then F chooses the pure strategy L and M then randomizes between S and L using the probabilities $1 - y_0$ and y_0, respectively. If M chooses S, then because he does not accommodate, his reputation for such behavior rises to p_0 where $p_0 = \psi^{1/\sigma}$. As the game has now reached the curve defining equilibrium play, F and M continuously randomize, moving up the curve until one or the other concedes. If M chooses L, then because he is revealed to be weak, his reputation immediately falls to zero and LL occurs for the remainder of the game. These outcomes are illustrated in Figure 1; given F plays L, M randomizes away from the initial position A to either B (by choosing S) or to C (by choosing L).

If $\psi \leq \phi^{\sigma}$, then M's initial belief is not large enough to prevent F from immediately randomizing between S and L using the probabilities z_0 and $1 - z_0$, respectively. If F chooses L, then because he does not reduce the deficit, his reputation for such behavior rises to q_0 where $q_0 = \phi^{\sigma}$. The game now proceeds with both policymakers continuously randomizing along the curve as before. If F chooses S, then he is revealed to be weak thereby causing his reputation to fall to zero and SS to occur for the remainder of the game. Figure 2 illustrates F randomizing away from the initial position A′ to either B′ (by choosing L) or to C′ (by choosing S).[9]

III. THE EFFECTS OF REPUTATION BUILDING

We are now in a position to answer the three questions posed earlier. Since both authorities are recently installed and hence have no policy track record,

9. The presence of pooling equilibria is due in part to having restricted each policymaker to choose between two actions. If instead each were permitted to choose their action out of an interval, then it may be that no pooling equilibrium is possible. As an example, if F can choose a sufficiently large deficit, then M may always find his best choice is the pure strategy accommodate. An approximation to this behavior occurs here whenever ψ greatly exceeds ϕ^{σ} since this causes the probability of accommodation to be approximately one.

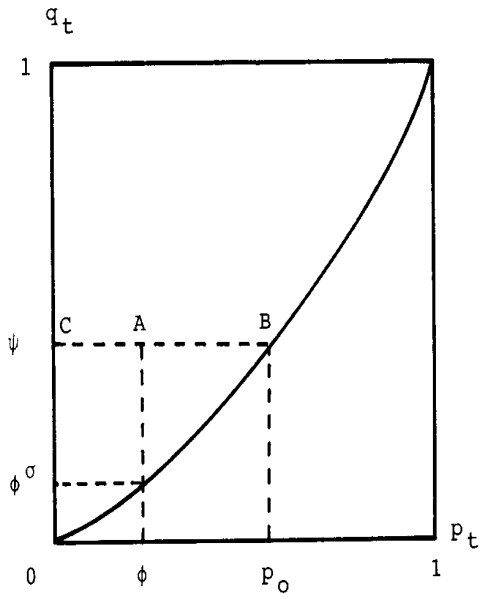

FIGURE 1

each is likely to have a low reputation prior. In such a case the model implies that both authorities will find it worthwhile to increase their respective reputations. Thus the Nash equilibrium in the early stages of the game will likely be large primary deficits which are not accommodated. Although both authorities find this outcome less desirable than either *SS* or *LL*, each is willing to continue with it in the hope that the other concedes first. Consequently, a game of chicken will ensue in which the effect on the stock of privately held government debt is that it grows more rapidly than under any of the other three possible outcomes.[10]

The above model also supports Sargent's claim that U.S. monetary and fiscal authorities played a game of chicken during the early years of the Reagan administration. Following his election, President Reagan announced and then held firm to a position of reducing taxes. Congress approved these tax cuts but maintained spending levels to produce large primary deficits.[11] In addition, Reagan called on the Federal Reserve to lower interest rates, a position Congressional leaders supported. Consequently, the U.S. fiscal authority had preferences consistent with (1b). As for the Board of Governors, from the time of his appointment, Chairman Volker called for reduced monetary growth

10. This result represents evidence that Tabellini is correct when he conjectures that if incomplete information is extended to the monetary authority in his model, then a game of chicken will arise in which privately held government debt grows explosively. See Tabellini [1987, sec. 6].

11. Sargent [1986] suggests that these large primary deficits were themselves the result of a game of chicken, one played by Congress and the Reagan Administration over tax and spending reductions. Since adding this gaming behavior to the model requires a three person game with its attendant complications, I simply take the outcome of a Congressional-Reagan Administration chicken game, large or small primary deficits, as given. For examples which do model large deficits as a gaming outcome see Alesina and Tabellini [1987], and Persson and Svensson [1987].

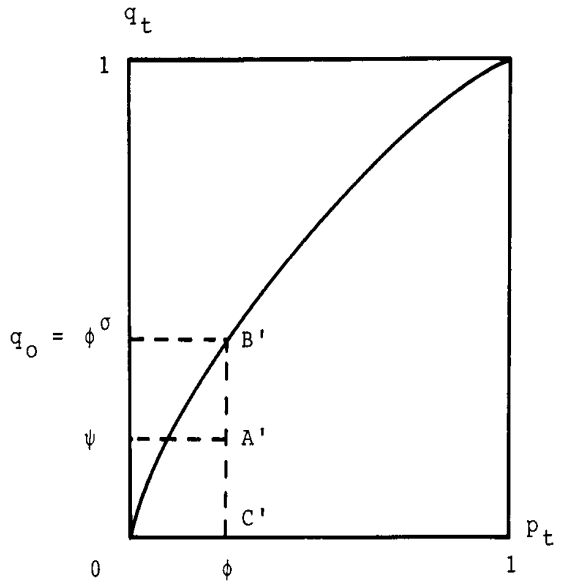

FIGURE 2

and argued against moving towards a permanent increase in the primary deficit, a position a majority of the Board of Governors appears to have upheld. Consequently, the U.S. monetary authority had preferences consistent with (1a). Furthermore, since Reagan had no track record and Volker had not previously dealt with a Republican president and Senate, the assumption in the story that neither authority has a track record was effectively true. Therefore, the model predicts that President Reagan and Chairman Volker would likely seek to enhance their reputations as "tax cutter" and "inflation fighter" respectively. This seems to have been the case since the primary deficit grew and was not accommodated during the initial months of Reagan's Presidency. Since neither authority wanted this outcome to persist given its impact on the growth rate of privately held government debt, as reputations built, so too did the probability that someone would concede. This appears to have been the Board of Governors since by the summer of 1982 it abandoned its monetary targeting strategy and increased the growth rate of the money supply.[12]

IV. CONCLUDING REMARKS

Kreps and Wilson's [1982] game of chicken model, when cast to model macroeconomic policymaking in the U.S., provides a qualitative description of how the desires of President Reagan and Chairman Volker for reputations as "tax cutter" and "inflation fighter" may have led them to pursue fiscal and monetary policies that combined to produce an undesirable policy mix. In

12. Even though such decisions are made by the Federal Open Market Committee rather than by the Board of Governors, since the latter comprises a majority of the former and Federal Reserve Bank Presidents often side with the chairman, there is no loss in crediting the Board with the change in monetary policy.

particular, the model implies that as they built their reputations, privately held government debt would grow at a rapid rate and eventually one of the two would concede and accommodate the policy of the other. This result describes the U.S. experience during the first two years of the Reagan administration.

We conclude with a caveat in the spirit of that offered by Backus and Driffill [1985a; 1985b]. The model's descriptive strengths notwithstanding, it lacks any formal economy or dynamics of the sort found in Tabellini [1987]. Therefore, the appearance of large primary deficits and no monetary accommodation cannot be interpreted as meaning that the model is on a dynamically infeasible time path. Instead, one should view our results as a first step towards explaining how a dynamic economy might place itself on such a path and later move onto some other feasible time path. Tabellini's work suggests that such a model can be found.

REFERENCES

Alesina, Alberto and Guido Tabellini. "A Positive Theory of Fiscal Deficits and Government Debt in a Democracy." UCLA Working Paper #435, 1987.

Backus, David and John Driffill. "Inflation and Reputation." *American Economic Review*, June 1985a, 530–38.

——— and ———. "Rational Expectations and Policy Credibility Following a Change in Regime." *Review of Economic Studies*, May 1985b, 211–21.

Barro, Robert. "Reputation in a Model of Monetary Policy with Incomplete Information." *Journal of Monetary Economics*, January 1986, 3–20.

——— and David Gordon. "A Positive Theory of Monetary Policy in a Natural Rate Model." *Journal of Political Economy*, August 1983a, 589–610.

——— and ———. "Rules, Discretion and Reputation in a Model of Monetary Policy." *Journal of Monetary Economics*, July 1983b, 101–21.

Blinder, Alan and Robert Solow. "Does Fiscal Policy Matter?" *Journal of Public Economics*, November 1973, 133–68.

——— and ———. "Does Fiscal Policy Still Matter?: A Reply." *Journal of Monetary Economics*, November 1976, 501–10.

Buiter, Willem. "Comment on T. J. Sargent and N. Wallace: 'Some Unpleasant Monetarist Arithmetic'." National Bureau of Economic Research Working Paper #867, 1982.

———. "Deficits, Crowding Out and Inflation: The Simple Analytics." National Bureau of Economic Research Working Paper #1078, 1983.

Canzoneri, Matthew. "Monetary Policy Games and the Role of Private Information." *American Economic Review*, December 1985, 1056–70.

Christ, Carl. "On Fiscal and Monetary Policies and the Government Budget Restraint." *American Economic Review*, September 1979, 526–38.

Cukierman, Alex. "Central Bank Behavior and Credibility: Some Recent Developments." Federal Reserve Bank of St. Louis *Economic Review*, May 1986, 5–17.

Darby, Michael. "Some Pleasant Monetarist Arithmetic." Federal Reserve Bank of Minneapolis *Quarterly Review*, Spring 1984, 15–19.

Fischer, Stanley. "Time Consistent Monetary and Fiscal Policies: A Survey." photocopy, MIT, 1986.

Kreps, David and Robert Wilson. "Reputation and Imperfect Information." *Journal of Economic Theory*, August 1982, 253–79.

Kydland, Finn and Edward Prescott. "Rules Rather than Discretion: The Inconsistency of Optimal Plans." *Journal of Political Economy*, June 1977, 473–91.

McCallum, Bennett. "Are Bond Financed Deficits Inflationary?: A Ricardian Analysis." *Journal of Political Economy*, February 1984a, 123–35.

———. "Credibility and Monetary Policy," in *Price Stability and Public Policy*. Kansas City: Federal Reserve Bank of Kansas City, 1984b, pp. 105–28.

Milgrom, Paul and John Roberts. "Predation, Reputation, and Entry Deterrence." *Journal of Economic Theory*, August 1982, 280–312.

Persson, Torsten and Lars Svensson. "Why a Stubborn Conservative Would Run a Deficit: Policy with Time-Inconsistent Preferences." University of Rochester Working Paper #71, 1987.

Rogoff, Kenneth. "The Optimal Degree of Commitment to an Intermediate Monetary Target." *Quarterly Journal of Economics*, November 1985, 1169–90.

———. "Reputation, Coordination and Monetary Policy." Hoover Institution Working Paper #E-87-14, 1987a.

———. "Reputational Constraints on Monetary Policy: Credible Rules or Incredible Theories?" *Carnegie-Rochester Conference Series on Public Policy*, Spring 1987b, 141–82.

Sargent, Thomas. "Interpreting the Reagan Deficits." Federal Reserve Bank of San Francisco *Economic Review*, Fall 1986, 5–12.

———. "Reaganomics and Credibility," in his *Rational Expectations and Inflation*. New York: Harper and Row, 1985, pp. 19–39.

——— and Neil Wallace. "Some Unpleasant Monetarist Arithmetic." Federal Reserve Bank of Minneapolis *Quarterly Review*, Fall 1981, 1–17.

Scarth, William. "Friedman's Framework for Economic Stability and the Government Budget Constraint." *Manchester School of Economics and Social Studies*, September 1982, 231–47.

Smith, Gary. "Monetarism, Bondism and Inflation." *Journal of Money, Credit and Banking*, May 1982, 278–86.

Tabellini, Guido. "Central Bank Reputation and the Monetization of Deficits: The 1981 Italian Monetary Reform." *Economic Inquiry*, April 1987, 185–200.

Turnovsky, Stephen. *Macroeconomic Analysis and Stabilization Policies*. Cambridge, England: Cambridge University Press, 1977.