A Brief Note on Economic Policy Effectiveness

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12 October 1974

A BRIEF NOTE ON ECONOMIC POLICY EFFECTIVENESS

I. INTRODUCTION

It has been commonplace in conventional macro-models to assume that consumption demand and/or investment demand is inversely related to the rate of interest. Two recent studies, however, appear to cast doubt upon the validity of these assumptions. Professor Weber [2], for example, has examined the responsiveness of consumption spending to interest rate changes and found consumption spending to be (on balance) *directly* related to the rate of interest:

When the rate of interest increases, consumers have the opportunity to maintain the same level of consumption in the future with less saving today. Consequently, they increase current consumption in response to the interest rate increase [2, 600].

In a more recent paper (in this Journal), Professor Yarrow [3, 582] has argued that

. . the growth rate of the firm, and hence its level of investment, may be an *increasing* function of the rate of interest . . .

Such behavior is said to be a characteristic of the growth-maximizing firm (as opposed to the profit-maximizing firm).

The purpose of this Note is to analyze the implications of the above two findings for the effectiveness of monetary policy and of fiscal policy in pursuing full employment in a closed economy.

II. MODEL

The economic system consists of the following two equations:

(1) $\qquad Y = C(Y, i) + I(Y, i) + G_0$

commodity market equilibrium condition

(2) $\qquad M_0 = L(Y, i)$

money market equilibrium condition

where Y = income
I = investment
C = consumption
i = interest rate
G_0 = government spending
M_0 = money stock
L = money demand

Using subscripts to indicate partial differentiation, we impose the following restrictions on our system:

(3) $\quad 1 > C_y > 0, 1 > I_y > 0, L_y > 0,$

$$C_i > 0, I_i > 0, L_i < 0.$$

The assumption that $C_i > 0$ is in accord with the results in Weber [2], while the assumption that $I_i > 0$ is consistent with Yarrow [3].[1]

The slope of the LM curve is given by

(4) $\qquad -\dfrac{L_y}{L_i} > 0$

The slope of the IS curve is given by

(5) $\qquad \dfrac{(1 - C_y - I_y)}{(C_i + I_i)}.$

Given this system, it is necessary to ascertain the condition for IS-LM stability.

Taking the differentials of (1) and (2) and rearranging the terms yields

(6) $(C_y + I_y - 1)dY + (C_i + I_i)di = -dG_0$

(7) $\qquad L_y dY + L_i di = dM_0$

The Routh-Hurwitz stability condition requires that

(8) $\begin{vmatrix} C_y + I_y - 1 & C_i + I_i \\ L_y & L_i \end{vmatrix} > 0$

The expanded determinant is given by

(9) $\quad L_i(C_y + I_y - 1) - L_y(C_i + I_i) > 0$

This may be rewritten as

(10) $\quad L_i(1 - C_y - I_y) + L_y(C_i + I_i) < 0$

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[1] Related to the notion that $C_i > 0$, see also Musgrave [1, 264–5].

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Observe that if $(C_i + I_i) > 0$, given the conventional other assumptions in (3), the necessary and sufficient conditions to guarantee condition (10) are

(a) $(1 - C_y - I_y) > 0$

and

(b) $\left| L_i(1 - C_y - I_y) \right| > \left| L_y(C_i - I_i) \right|$

If conditions (a) and (b) are both satisfied, we may rewrite stability condition (10) as

(11) $L_i(1 - C_y - I_y) < - L_y(C_i + I_i)$

or, simply, as

(12) $\dfrac{(1 - C_y - I_y)}{(C_i + I_i)} > - \dfrac{L_y}{L_i}$

The left-hand side of (12) is the slope of the IS curve, while the right-hand side is the slope of the LM curve. Thus, the following has been demonstrated:

Given $(C_i + I_i) > 0$, IS-LM stability requires the slope of the IS curve to be algebraically greater than that of the LM curve.

III. GRAPHICAL ANALYSIS

There are important policy implications which follow from the above analysis. For simplicity, let "fiscal policy" refer simply to exogenous changes in the level of government spending and "monetary policy" refer simply to exogenous changes in the nominal money stock.

First, consider the case of fiscal policy. Observing that the LM curve has its conventional positive slope [see equation (5)], stability requires that the IS curve be (a) positively sloped and (b) algebraically steeper than the LM curve. Such a situation is shown in Figure 1, where the original IS curve IS' intersects LM curve LM' at point **A**.

To examine the effectiveness of fiscal policy, we hold the money stock unchanged and, say, increase the level of government spending. An increase in the level of government spending shifts the IS curve *downwards*, say from IS' to IS". As the level of govern-
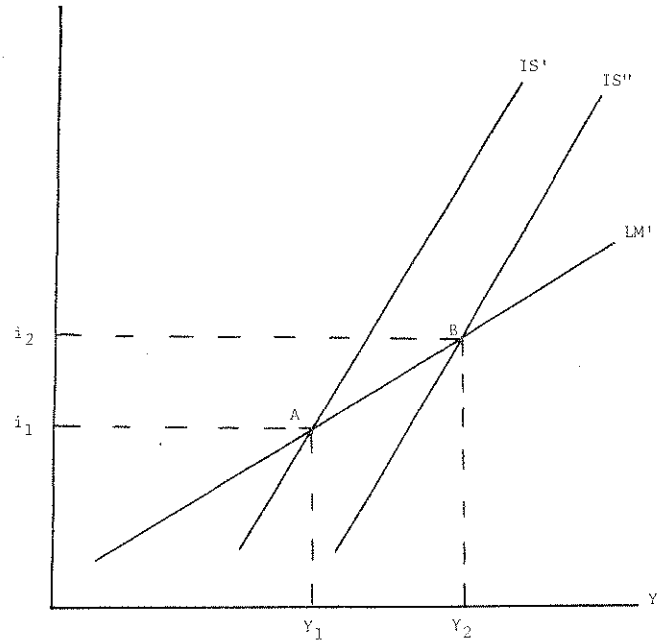

FIGURE 1

ment spending rises, the interest rate is forced upward, and as this occurs, the level of consumption and investment also rises. Ultimately, the economy gravitates from point **A** to point **B**. Thus, there is an unequivocal rise in the level of income and in the interest rate.[2] This result conforms qualitatively to the "conventional wisdom" regarding the impact of fiscal policy on the level of income in a stable environment.

Next, consider the case of monetary policy. Refer to Figure 2, where the economy is shown in a stable equilibrium at point **A'**, at the intersection of curves IS' and LM'.

To examine the effectiveness of monetary policy, we hold the level of government spending unchanged. An increase in the nominal money stock shifts the LM curve *downwards*, from LM' to LM". Thus, as the

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[2] These results can be confirmed mathematically. Holding $dMo = 0$, the qualitative effects of fiscal policy are described by

$$\frac{dY}{dGo} = \frac{L_i}{(1 - C_y - I_y)L_i + (C_i + I_i)L_y} > 0$$

and

$$\frac{di}{dGo} = \frac{-L_y}{(1 - C_y - I_y)L_i + (C_i + I_i)L_y} > 0$$

ioney supply is increased, the rate of inter-
st is depressed. As the interest rate falls, so
io do consumption and investment. As con-
imption and investment decline, so in turn
oes the income level. The economy ulti-
iately gravitates from point **A'** to point **B'**,
ith a final decline in both the income level
id the rate of interest.[3] This result is clearly
i contrast to the "conventional wisdom"
garding the effectiveness of monetary pol-
y in a stable environment.

IV. CONCLUSION

In conclusion, then, the policy implication
' this analysis is that while (1) conventional
ical policy has its usual effects on the econ-
ny's income level, (2) standard monetary
ilicy has a perverse impact on the level of
come. This implies that under conditions
here $(C_i + I_i) > 0$ and stability obtains,

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[3] These results can also be confirmed mathematically.
ilding $dGo = 0$, the impacts of monetary policy are
scribed by

$$\frac{dY}{dMo} = \frac{(C_i + I_i)}{(1 - C_y - I_y)L_i + (C_i + I_i)L_y} < 0$$

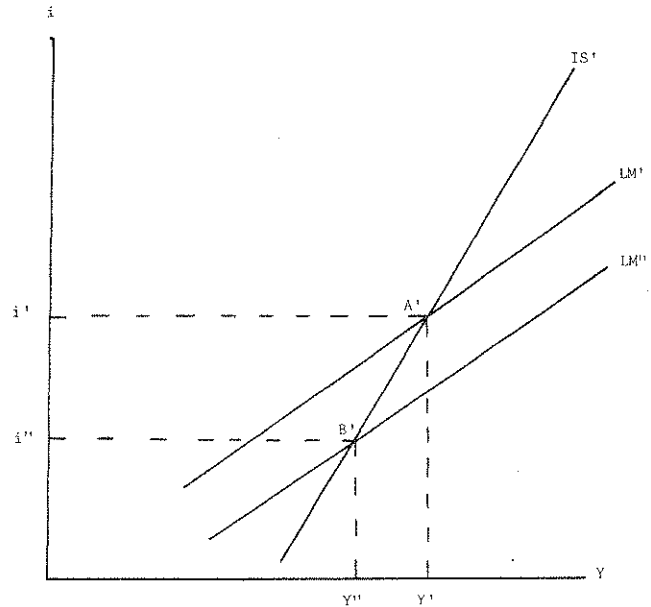$$\frac{di}{dMo} = \frac{(1 - C_y - I_y)}{(1 - C_y - I_y)L_i + (C_i + I_i)L_y} < 0$$

FIGURE 2

fiscal policy may be a superior policy tool for
pursuing domestic full employment.

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