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Money Multipliers and the Slopes of IS and LM: Comment

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30 January 1984

Online at <https://mpra.ub.uni-muenchen.de/51515/>
MPRA Paper No. 51515, posted 17 Nov 2013 16:59 UTC

Money Multipliers and the Slopes of IS and LM: Comment*

I. Introduction

In a recent issue of this Journal, Meyer [3] develops a model in which he examines the impact of the relative slopes of the IS and LM curves on economic policy effectiveness when the IS curve is negatively sloped. This brief note extends Meyer's analysis by examining the same issue under the condition that the IS curve is positively sloped.¹

II. Analysis

Following Meyer [3], we deal for simplicity with linear relationships. The commodity market is described by:

$$Y = (A_0 - ei - fi)/(1 - b - d) \quad (1)$$

where A_0 is autonomous spending, b is marginal propensity to consume, d is the marginal propensity to invest, Y is real income, i is the interest rate, $(-e)$ is the interest responsiveness of investment, and $(-f)$ is the interest responsiveness of consumption. The present model differs from that in Meyer [3] by its inclusion of the marginal propensity to invest and the interest responsiveness of consumption. The slope of the IS curve is given by:

$$S_{IS} = -(1 - b - d)/(e + f) \geq 0 \quad \text{as} \quad d \geq (1 - b). \quad (2)$$

The money market is given by:

$$M_0 = h + kY - ji \quad (3)$$

where M_0 is the autonomous money supply, h is a constant, $(-j)$ is the interest responsiveness of money demand, and k is the transactions coefficient. The slope of the LM curve is given by:

$$S_{LM} = k/j > 0. \quad (4)$$

For the case where the slope of the IS curve is positive, stability requires that:

$$k/j > -(1 - b - d)/(e + f) \quad (5)$$

Such stable equilibria are represented in Figure 1.

Refer in Figure 1 first to the LM curve labelled LM' . The given IS curve intersects LM' at income level Y_0 and interest rate i_0 . Now let the money stock increase. This policy

*The author is indebted to an anonymous referee for very helpful comments and suggestions.

1. The case of the positively sloped IS curve has received considerable attention in recent years. See Burrows [1], Cebula [2], Silber [4], Steindl [5] and Wang [6].

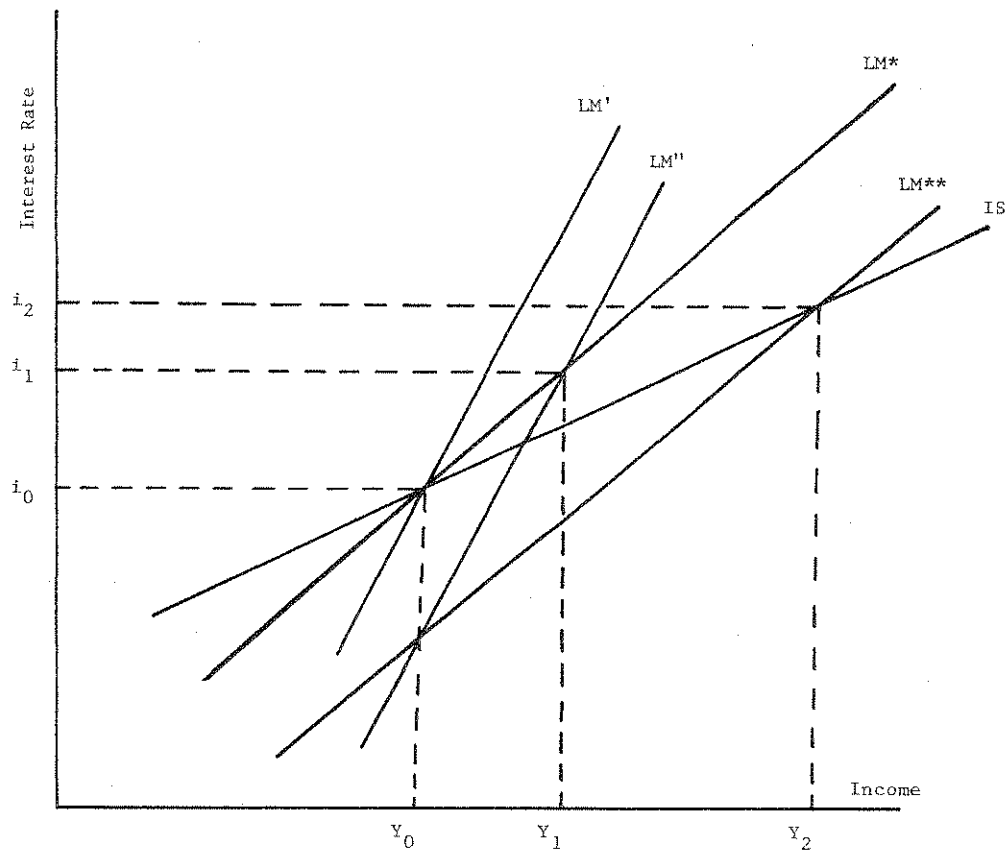


Figure 1

action shifts the LM curve downwards from LM' and to LM'' and raises the income level to Y_1 and the interest rate to i_1 .

Refer now to the curve LM^* , which (like LM') intersects the IS curve at income Y_0 and interest rate i_0 . Let the money stock increase by identically the same amount as above. The impact of this policy is to shift the LM curve from LM^* to LM^{**} . The monetary policy in question in this case raised the income level from Y_0 to Y_2 and the interest rate from i_0 to i_2 .

Clearly, the results above illustrate that, in the case of the positively sloped IS curve, the effectiveness of monetary policy *always rises* as the slope of the LM curve *declines*. That is, the value of dY/dM_0 (and of di/dM_0) *always increases* as the slope of the LM curve *decreases* so long as (a) the sign of $-(1 - b - d)/(e + f) > 0$ and (b) the IS/LM equilibrium is stable. This finding actually is compatible with the results for the *negatively* sloped IS curve in Meyer [3, 228], who asserts that:

The money multiplier is positively related to the slope of the LM curve only if the absolute value of the product of the slopes of the LM and IS curves *exceeds unity*. A flatter LM curve actually increases the money multiplier when the slope of the LM curve is less than the absolute value of the inverse of the slope of the IS curve . . . a steeper LM curve increases the money multiplier only if the . . . angle between the IS and LM curves exceeds 90° .

In other words, in the case of a *positively* sloped IS curve, the difference between the slopes of the IS and LM curves is less than 90° ; hence, in this circumstance, Meyer's [3] argument can be extended beyond the case of the *negatively* sloped IS curve.

The finding derived above can be confirmed mathematically. Solving the system (1) through (4) for the general equilibrium level of income yields:

$$Y = [jA_0 - (e+f)(h - Mo)]/[j(1-b-d) + k(e+f)]. \quad (6)$$

In turn, the money multiplier is

$$dY/dM_0 = (e+f)/[j(1-b-d) + k(e+f)]. \quad (7)$$

Finally, the impact of the slope of the LM curve upon the money multiplier is provided by the following:

$$\begin{aligned} d(dY/dM_0)/dS_{LM} = & (e+f)(1-b-d)[- (e+f)/(1-b-d) + k/j] \\ & /j[j(1-b-d) + k(e+f)]^2 < 0. \end{aligned} \quad (8)$$

Thus, as argued above, for the case of the positively sloped IS curve, the effectiveness of monetary policy always *rises* as the slope of the LM curve *declines*.²

III. Conclusion

For the case of the positively sloped IS curve (and a stable IS-LM equilibrium), it can also be shown that the effectiveness of monetary policy always is greater if the slope of the IS curve is greater, i.e., dY/dM_0 (and di/dM_0) rises as the slope of the IS curve rises. This finding also is compatible with Meyer [3]. Finally, in the case of the positively sloped IS curve, it can be illustrated that *fiscal policy* effectiveness is greater the flatter the LM curve or the steeper the IS curve: that is, dY/dA_0 (and di/dA_0) rises as the slope of the LM curve decreases or the slope of the IS curve increases. Thus, in the case of fiscal policy effectiveness with a positively sloped IS curve, Meyer's [3] arguments apply for the LM curve but *not* for the IS curve.

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2. In (8), the denominator is clearly positive. Given a positively sloped IS curve and stability, the bracketed term in the numerator also is positive. Since the IS curve is positively sloped, the term $(1-b-d)$ is negative. Given $(e+f) > 0$, the negative value in (8) is thus unequivocal.

References

1. Burrows, Paul, "The Upward Sloping IS Curve and the Control of Income and the Balance of Payments." *Journal of Finance*, June 1974, 955-61.
2. Cebula, Richard J., "A Brief Note on Economic Policy Effectiveness." *Southern Economic Journal*, October 1976, 1174-76.
3. Meyer, Paul A., "Money Multipliers and the Slopes of IS-LM." *Southern Economic Journal*, July 1983, 226-29.
4. Silber, William L., "Monetary Policy Effectiveness: The Case of the Positively Sloped IS Curve." *Journal of Finance*, December 1971, 1023-31.
5. Steindl, Frank, "Giffen Goods, IS Curves, and Macroeconomic Stability." *Metroeconomica*, June 1970, 165-69.
6. Wang, Leonard F. S., "IS-LM Stability and Economic Policy Effectiveness: Further Observations." *Journal of Macroeconomics*, Spring 1980, 181-83.