Economic Policy Effectiveness in Hicksian Analysis: A Reply

By George S. Tavlas, Washington, D.C.

Klaus Jaeger[1] makes the following two points in reference to my article: (1) that my assumption that instantaneous money-market adjustment does not affect the stability conditions of a *Hicksian* system with an upward sloping IS-curve is incorrect; and, (2) that, as a result, the policy implications of my paper with regard to the *Silber-Burrows* positively-sloped IS-curve system are not valid.

In my paper, I sought to demonstrate that the interest elasticity of the demand for money — or the slope of the LM-curve — involves differing consequences as to the timing aspect of two upward-sloping IS-curve models which have appeared in the literature, and the ability of each respective model to absorb exogenous shocks. For this purpose I assumed that the money market was always in a state of equilibrium. By so doing, I put the remaining model into linear and homogeneous form so as to yield a single characteristic root for the entire system. An examination of the properties of that root with regard to the interest sensitivity of the demand for money allowed me to reach my policy conclusions as summarized in the two propositions which *Jaeger* restates.

Jaeger follows a somewhat different procedure in that he assumes that money market adjustment does not take place instantaneously. Hence, his initial adjustment process is:

$$\frac{dY}{dt} = k\,[I\,(Y, i) + C\,(Y, i) - Y] \tag{1}$$

$$\frac{di}{dt} = m\,[L\,(Y, i) - M_0] \tag{2}$$

where m and k are positive constants. I implicitly assumed that m and k are equal to unity, although as long as they are both greater than

[1] *Klaus Jaeger*, Economic Policy Effectiveness in Hicksian Analysis: A Reply, *Kredit und Kapital*, 14. Jg. 81, S. 177 ff.

zero, the values of m and k do not directly bear upon *Jaeger's* arguments with respect to my paper. However, they do allow him to reach the interesting observation regarding the conditions under which the disequilibrium — adjustment process is likely to result in a saddle point. What does bear upon *Jaeger's* analysis is my explicit assumption that $\frac{di}{dt} = 0$, so that the money market is always assumed to be in equilibrium (i.e. the system is always on a point along the LM-curve).

Following *Jaeger*, the system he develops can be shown to be stable if the characteristic roots of the matrix A, where

$$A = \begin{bmatrix} k(I_y + C_y - 1) & k(I_i + C_i) \\ m L_y & m L_i \end{bmatrix} \tag{3}$$

have negative real parts. The *Ruth-Hurwitz* theorem then leads to the following two stability conditions as stated by *Jaeger:*

$$(I_y + C_y - 1) L_i - (I_i + C_i) L_y > 0 \tag{4}$$

and (omitting constants k, m),

$$(I_y + C_y - 1) + L_i < 0 \tag{5}$$

Inequality (4) represents the condition for stability as derived in my paper. *Jaeger* correctly points out that in a more general system inequality (5) also should be taken into account. I should note that to insure that the system is both locally and *globally* stable, a third sufficiency condition as derived by *Olech* (1963) should be added. Thus *Olech* demonstrates that in addition to inequalities (4) and (5) the following condition must be satisfied for general stability to obtain:

$$(C_y + I_y - 1) L_i \neq 0 \tag{6}$$

or

$$(C_i + I_i) L_y \neq 0$$

The importance of (6) is that it sets a limit to the interest elasticity of the demand for money: when $L_i = 0$ (the LM-curve is vertical), the system is unstable.

Jaeger, however, adds a further limit to the value to which the interest sensitivity of the demand for money can tend. Specifically, the upper limit is $L_i < -(I_y + C_y - 1)$, or, the negative value of L_i must not exceed the margin by which the marginal propensity to spend $(I_y + C_y)$ exceeds unity. Should $(I_y + C_y)$ exceed unity in real world

situations, it is not likely to be by much. Nevertheless, *Jaeger* has made an important point. Previous writers, including *Dernburg* and *McDougal* (1969), *Silber* (1971), *Teigen* (1972), *Cebula* (1976) and *Tavlas* (1979; 1980) have argued that stability in an upward-sloping IS-curve model requires that the slope of the LM-curve to be greater than the slope of the IS-curve without regard to the limiting value of L_i. *Olech's* condition (6) adds the requirement that L_i cannot equal zero. *Jaeger's* caveat is that L_i must not only not equal zero, but must fall short of zero, as determined by the marginal propensity to spend.

Given *Jaeger's* caveat, his further argument that my policy conclusions regarding the *Silber-Burrows* framework are negated, does not follow. For given satisfaction of *Jaeger's* inequality (5) (and of the *Olech* condition (6)), the timing aspect of the *Silber-Burrows* model, as well as its ability to absorb shocks still is dependent on the value of the characteristic root:

$$K = (I_y + C_y - 1) - \frac{L_y}{L_i}(I_i + C_i) \tag{7}$$

which is equivalent to condition (4). Stability requires that K be negative. The more negative is K, the quicker does the system react to shocks and the wider the stability range. The relation of K to L_i can be expressed as:

$$\frac{\partial |K|}{\partial L_i} = \frac{(I_i + C_i) L_y}{(L_i)^2} < 0 \tag{8}$$

Hence, the higher the interest sensitivity of the demand for money, the less the absolute value — the less negative — is the root of (7). Alternatively, the less the interest sensitivity of the demand for money — subject to the limit established by *Jaeger* — the higher the absolute value of K (the more negative it becomes). The system continues, therefore, to react with greater speed and with increased ability to absorb exogenous shocks.

Klaus Jaeger has made a valuable contribution by demonstrating that there is a limit as to how vertical the LM-curve can become for stability to obtain in a *Silber-Burrows* model. Given the satisfaction of that limit, however, the policy conclusions derived in my paper continue to hold.

References

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Zusammenfassung

Die Wirksamkeit der Wirtschaftspolitik in der Hicksschen Analyse Eine Erwiderung

Es ist bereits gezeigt worden, daß — in einem System positiv geneigter IS-Kurven — je geringer die Zinsempfindlichkeit der Geldnachfrage ist, desto größer die Geschwindigkeit der Anpassung an exogene Erschütterungen ist. Diese Mitteilung zeigt, daß der Annäherung der LM-Kurve an einen vertikalen Verlauf eine Grenze gesetzt ist, wenn die Stabilität des untersuchten Modells erhalten bleiben soll. Explizit ausgedrückt, wird diese Grenze durch die Forderung gesetzt, daß die Zinselastizität der Geldnachfrage nicht größer sein darf als der Betrag um den die Grenzneigung, Geld auszugeben, den Wert 1 übersteigt.

Summary

Economic Policy Effectiveness in Hicksian Analysis: A Reply

It has previously been demonstrated that in a positively-sloped IS-curve system, the less the interest sensitivity of the demand for money, the greater is the speed of adjustment to exogenous shocks. This notes argues that there is a limit as to how verticle the LM curve can become for stability to obtain in the model under consideration. Specifically, that limit is set by the requirement that the interest elasticity of the demand for money must not be greater than the difference by which the marginal propensity to spend exceeds unity.

Résumé

L'efficience de la politique économique dans l'analyse de Hicks: Une réplique

Il a déjà été démontré que — dans un système de courbes IS à propension positive — plus faible est la sensibilité aux taux d'intérêt de la demande monétaire, plus élevé est re rythme d'ajustment à des secousses exogènes. La présente communication montre que l'approximation de la courbe LM en déroulement vertical se heurte à une limite si l'on entend préserver la stabilité du modèle observé. Pour s'exprimer explicitement, l'on dira que cette limite résulte de l'obligation pour la souplesse de la demande monétaire à l'égard des taux d'intérêt de ne pas excéder le montant-seuil à partir duquel la propension à dépenser de l'argent dépasse la valeur 1.