Elasticity Pessimism, Expectations, and Stability of the Foreign Exchange Market

By

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I. Introduction

The purpose of this note is to analyze stability of the foreign exchange market under conditions of elasticity pessimism. The motivation for this study flows from two sources. First, a recent article by Magee [1975] has pointed out that recent empirical estimates of import and export elasticities, most of which support elasticity optimism, may be biased upwards. Furthermore, he notes that there is consistent evidence of possible elasticity pessimism for at least one major industrial economy, the United Kingdom. Second, the advent of flexible exchange rates may have reduced the trade elasticities for two reasons. One is the distinction between “permanent” and “temporary” exchange rate changes. If an exchange rate change is perceived as a temporary deviation from a permanent or trend value, then exporters and importers, because of adjustment costs, may not adjust physical trade flows. A second reason is that small exchange-rate changes may elicit only small quantity responses — the “quantum effects” emphasized by Orcutt [1950]. Taking everything into consideration, then, it seems wise to maintain an agnostic view at least as concerns the possibility of elasticity pessimism.

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Magee re-examines Orcutt’s [1950] famous list of reasons for downward biases, and proposes a counterlist. His main point is that the bias may go either way.

Niehans [1975] makes this distinction.

As Magee [1975] points out, there is an alternative possibility — that inventory purchases in the face of short-run price changes may make the elasticities higher. The point here, though, is that we don’t know which effect will dominate.
Two types of stability are analyzed in this paper. First is intra-period stability, or what Williamson [1973] has called stability of the short-run price determination process. This refers to the market-clearing tâtonnement process which occurs within a market period, and is the traditional flow-market Walrasian stability problem of whether the supply curve is steeper than the demand curve. Second is dynamic stability, which refers to the period-by-period movement of the exchange rate, and whether or not it wanders ever farther from a long-run equilibrium value. This is the traditional stability analysis of dynamic models which involves analysis of the characteristic roots of equations of motion.

The basic results of this analysis are as follows. First, intra-period stability of the foreign exchange market may be obtained when speculators expect the exchange rate to return to its long-run equilibrium value and are sensitive "enough" to expected capital gains arising from this expected rate change. With this expectational scheme, however, dynamic stability is not obtained; the exchange rate wanders ever farther from its long-run value. What does provide dynamic stability, though, is perfect myopic foresight on the part of speculators.

II. The Model

The three building blocks of the model are a speculative demand function for stocks of foreign currency, a "perverse" trade balance function, capturing the assumption of elasticity pessimism, and a market-clearing equation:

\[ S_t = \eta (e^x_{t+1} - e_t) \quad \eta > 0 \]  
\[ T_t = -\alpha e_t \quad \alpha > 0 \]  
\[ \Delta S_t = T_t \]

where \( S_t \), which may be positive or negative, is the stock demand for foreign currency, \( T_t \) is the trade balance, measured in units of foreign currency, \( e_t \) is the log of the exchange rate, measured as deviations from its fixed, known equilibrium value, and \( e^x_t \) is the expected exchange rate. The assumption of a stock demand by speculators is in line with both inventory speculation theory and the portfolio theory of asset demand.\(^2\)

\(^1\) Britton [1970] was the first to analyze the problem of dynamic stability. His analysis differs from that developed here in two respects: (i) His speculative demand functions were flow demands, while ours are stock demands; (ii) he was concerned with short-run elasticity pessimism and long-run elasticity optimism. It is interesting to note, though, that his stability condition (p. 95) does not depend on long-run elasticity optimism.

\(^2\) Muth [1961] used a speculative demand function essentially the same as what we will use. Black [1972] also treats speculative demand as a stock demand.