Dual Exchange Markets Under Incomplete Separation
An Optimizing Model

JAGDEEP S. BHANDARI and CARLOS A. VÉGH*

An optimizing model of dual exchange markets that are incompletely separated owing to the presence of fraudulent transactions is analyzed. The model is used to examine the implications of unanticipated and permanent changes in the commercial exchange rate and government spending. It is shown that these disturbances generate nonmonotonic responses in both the spread between the commercial and the financial rates and in capital flows. These results are contrasted with those obtained under complete market separation. [JEL 431, 432]

THERE HAS been renewed interest recently in the operation of multiple exchange rate regimes, as represented by the number of recent contributions in this area (see Bhandari (1988) and Guidotti and Végh (1988) for detailed bibliographies). Typically, dual exchange markets encompass a fixed rate for trade transactions (“commercial rate”) and a flexible rate for financial transactions (“financial rate”). An important feature of some of the new literature is the recognition that such multiple rate regimes often involve “leakage” between the two exchange markets. The presence of cross-transactions implies that despite the flexi-

* Jagdeep S. Bhandari is an economist in the European Department. He is currently on leave from West Virginia University where he is a Professor of Economics. He received his Ph.D. in economics from Southern Methodist University. He also holds a J.D. degree from Duquesne University and an LL.M. degree from Georgetown University.

Carlos A. Végh is an economist in the Research Department. He holds a doctorate in economics from the University of Chicago.

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bility of the financial exchange rate, the capital account of the economy in question is nonzero, and net accumulation or decumulation of foreign assets may thus occur. This process was noted in the early literature (for example, Lanyi (1975)) and has been explicitly incorporated in non-optimizing models such as those found in Bhandari and Decaluwe (1987), Lizondo (1987), and Guidotti (1988).

The incorporation of the phenomenon of cross-transactions between the two markets has apparently not been extended to optimizing models. Thus, recent analyses of dual exchange markets incorporating optimizing behavior continue to assume that exchange markets can be, and in fact are, perfectly segmented (see, for example, Obstfeld (1986) and Guidotti and Végh (1988)). In large part, this omission in optimizing models is due to the analytical difficulties encountered in attempting to deal with leakage in such a context.

The present paper is an attempt to incorporate leakages into an optimizing framework. Specifically, the model we construct is a fully optimizing one and similar in some respect to the complete separation model proposed by Guidotti and Végh (1988). At the same time, intermarket leakage is explicitly introduced into the framework. Although such leakage is examined in nonoptimizing models, as in Bhandari and Decaluwe (1987), the present approach to this phenomenon is somewhat more realistic in its treatment of overinvoicing and underinvoicing associated with fraudulent transactions. Another contribution is the analytical characterization of the solution to a fourth-order differential equation model with two state variables using the technique originally suggested by Calvo (1987b).

The framework is used to examine the effects of certain domestic disturbances: specifically, devaluation and real expenditure changes. When the commercial exchange rate is devalued, a spread emerges, with the financial rate being relatively appreciated compared to the commercial rate. Thus, foreign currency is available at a discount in the financial market. With the passage of time, the discount diminishes progressively, turning into a premium in the financial market. The final phase of adjustment involves a declining premium until the steady state with a zero spread is ultimately restored. This nonmonotonic response is due to the presence of intermarket leakage, and other optimizing models that abstract away from leakage (for example, the models of Obstfeld (1986) and Guidotti and Végh (1988)) are incapable of generating this type of

\[1\] The possibility of intermarket transactions is briefly noted in Flood and Marion (1988). Tornell (1988) also recognizes the possibility of leakage; however, the model he uses abstracts from consumption-savings decisions, and illegal transactions are carried out by risk-neutral investors.