Speculation and the Forward Foreign Exchange Rate: A Note

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ONE OF THE MOST widely used models dealing with the effects of speculation on the forward foreign exchange rate is the so-called "Modern Theory of the Forward Foreign Exchange Rate" which stresses the role of both interest arbitrage and speculation in the determination of the forward rate (see Grubel [2]). Traditionally, the reduced form of the model expresses the forward foreign exchange rate as a weighted average of the covered interest-parity exchange rate on one hand and of the future spot rate expected to prevail at the maturity date of the forward contract on the other hand. Empirical work based on this reduced form is found in Stoll [6], Kesselman [4], Haas [3], and McCallum [5].

This specification, in which speculation on the forward foreign exchange market is implicitly analyzed in terms of the current forward exchange rate and the expected future spot exchange rate only, is unduly restrictive. The options facing the speculator are indeed much broader. The speculator does not need to get out of his speculative position by buying or selling the relevant currency on the spot market at the date of delivery. He can take his gain at any time between the date of the initial contract and the delivery date by entering into an offsetting transaction on the forward market for the same delivery date as soon as the corresponding forward rate is lower than the rate at which he sold forward initially. For example, a speculator expecting a depreciation of sterling and having sold forward sterling in January at $2.00 for delivery in July may take his gain by buying the sterling forward in April if at that time the three-month forward rate of sterling is, say, $1.85.

The possibility to speculate by combining two offsetting forward transactions contracted at two different moments in time but for the same delivery date, without any operation on the spot market at that date, has an important implication: the expected future spot rate is not the only key variable determining speculators' decisions. Speculators can decide to speculate on a future forward rate, following exactly the same principles as when speculating on the future spot rate. They will thus sell forward foreign exchange if the current forward exchange rate is higher than the expected value of a future forward rate for contracts involving the same delivery date, and buy forward in the opposite case. If, for example, speculators anticipate that, in three months, the three-month forward exchange rate for sterling will be lower than the present forward exchange for six-month contracts, they expect to make a speculative gain by selling sterling today on the six-month forward foreign exchange market and buying sterling forward

three months later on the three month forward market. Their expectations regarding the future spot exchange rate six months ahead is irrelevant to determine the expected gain from that set of transactions.

Under the parity-exchange rate regime, it is reasonable to expect speculation on the future forward rates to be more important than speculation on the future spot rate, as far as its effects on the current forward rate are concerned, for two reasons:

1. During normal circumstances when no changes in the parity are expected, the fluctuations of the forward exchange rate are potentially much larger than the fluctuations of the spot rate, the movements of which are legally maintained by the monetary authorities within a band not exceeding 1% around the parity. The speculative gains per unit committed in the speculative transactions are thus potentially greater in case of speculation on the future forward rate and minor errors in the forecast will not wipe out entirely the expected profits.

2. It is relatively easy to forecast changes in the interest rate differential between two countries by assessing what their respective economic policies are likely to be in the future, on the basis of available information on the balance of payments of each country and on their position on the trade cycle. In addition, as interest arbitrage is the main determinant of the forward premium or discount, a forecast of the future interest rate differential can be readily used to form a forecast of the future premium or discount on the forward foreign exchange markets. If the institutional arrangements are such that in the future exchange rates will be kept approximately at their present level, as is the case in a parity regime, then it is easy to form a forecast of the relevant future forward exchange rate on the basis of the expected forward premium or discount. In a regime of flexible exchange rates, on the contrary, in addition to the fact that it is more difficult to predict the changes in interest rates as the monetary authorities have more freedom in the choice of their policy instruments, a correct forecast of the future premium or discount on the forward foreign exchange market is not sufficient to predict correctly the corresponding future forward rate because the same forward premium or discount is consistent with any forward rate, depending on the value of the spot rate which will obtain at the relevant date.

To assess the empirical relevance of this argumentation, we have estimated two alternative specifications of the reduced form of the "Modern Theory" for the Pound Sterling under the parity regime, using the procedure suggested by McCallum [5][1]. The results are reported in Table I. In the first set of equations,

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[1] McCallum's procedure is based on the "rational expectations" hypothesis and consists in estimating the unobservable "expected future exchange rates" by the exchange rates which did happen to prevail at the relevant dates. As this measurement technique implies the introduction of "errors in the variables", the appropriate estimation method is the instrumental variable method. Assuming rational expectations, legitimate instrumental variables are provided by the fitted values of the expected future rates on any variables representing information available at the time the expectation is formed. In this note the instrumental variables are constructed variables obtained by regressing the relevant speculative variable on the current forward parity rate and on the current and 14 lagged values of the spot or the forward exchange rate.

Table I

Dependent Variable: 90 day forward exchange rate of the Pound Sterling.
Period: January 1960–June 1972

	Constant	Parity Rate (based on the UK-US Treasury Bill Differential)	Expected future spot rate	Expected future forward rate	ρ (Cochrane Orcutt)	DW	Number of observations	R^2	Standard error of regression
(1) Untransformed Variables	-0.0741 (3.72)	0.9375[a] (30.59)	0.08996 (2.68)	—	0.82	2.16	636	0.9991	0.0055
(1') Variables in log.	-0.0295 (3.84)	0.9378[a] (28.39)	0.0918 (2.53)	—	0.82	2.17	636	0.9990	0.0023
(2) Untransformed Variables	-0.0781 (3.67)	0.8880[b] (32.20)	—	0.1409 (4.73)	0.83	2.08	636	0.9990	0.0060
(2') Variables in log.	-0.0313 (3.76)	0.8822[b] (29.44)	—	0.1493 (4.61)	0.83	2.09	636	0.9988	0.0025

[a] Significantly different from 1 at the 10% level.
[b] Significantly different from 1 at the 1% level.
Data: weekly data, January 1960–June 1972, recorded on Fridays.
Source of the data:—90 Days Treasury Bills: *Federal Reserve Bulletin*
—exchange rates (spot and 90-Day-forward): *Wall Street Journal*

we follow the traditional specification and use the expected future spot rate as the relevant speculative variable. In the second set, we use as the relevant variable the future 30-day forward rate expected to prevail one month before the maturity date of the forward contract whose rate is the dependent variable.

As can be seen from Table I, the coefficient of the speculative variable is higher and more significant when the expected future forward rate is used as speculative variable than when the expected future spot rate is used. Furthermore, the former specification yields a coefficient of the parity rate which is simultaneously smaller and more significant in terms of its t value suggesting a reduction in the level of colinearity among explanatory variables.[2]

We conclude that the evidence supports our contention that, under the parity regime, speculation on the forward foreign exchange market is mainly the speculation on the future forward rate (for shorter contracts) expected to prevail before the maturity date of the speculative commitments of the speculators, who expect thus to be able to secure their speculative gains before the maturity date of the initial commitments. Studies which have overlooked this component of speculation may well have underestimated the effect of speculation on the forward foreign exchange rate, at least under a regime of parity spot rates.

References

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[2] Although the following remark is irrelevant to the main point of this note, it is worth pointing out that our results contradict the simplest version of the "Modern Theory" on two points:

1. the constant terms are significantly different from zero;

2. the sum of the coefficients of the independent variables is significantly different from unity, although the deviations are relatively small (the t values of the deviations of the sum of the coefficients from unity fall between 3.37 and 3.71 for the 4 equations reported here). Elsewhere, we argue that these findings can be explained by non-pecuniary yields on the U.K. Treasury Bills resulting from the institutional framework of monetary policy in the United Kingdom and by official interventions on the forward foreign exchange market seen as a substitute for domestic interest rate manipulations in order to attract or discourage capital flows (see Callier [1], pp. 137–141).