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SPOT SPECULATION, FORWARD SPECULATION AND ARBITRAGE: A CLARIFICATION AND REPLY

by

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Spot Speculation, Forward Speculation and Arbitrage: A Clarification and Reply

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Mr. Stokes' comment on my paper seems to be based on a misinterpretation of a passage of my 1959 article, which perhaps calls for further clarification. He asserts that I said somewhere in my paper that "the return to spot speculation was equal to the return to forward speculation plus the return to interest arbitrage,"[1/] but he does not bother to point out where I am supposed to have said this.

Searching through that article, which I wrote fourteen years ago, however, I could not find any sentence to that effect. What I said there in this connection was the following:

> "Thus a speculator who speculates on the spot exchange market may, in fact, be regarded as acting implicitly in the combined capacity of an interest arbitrager and a forward exchange speculator. If he speculates by buying spot foreign exchange (instead of buying forward exchange), what he is doing is in fact equivalent to acting first as an interest arbitrager in buying spot exchange against a sale of an equal amount of forward exchange, and then as a forward speculator in buying the forward exchange from himself (in the former capacity) in the expectation that the future spot rate will rise higher than the current forward rate and yield him a pure speculative gain. If he speculates by selling spot exchange (instead of forward exchange), he is in fact acting

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[1/] See Stokes' comment, opening paragraph.

first as an interest arbitrager in selling spot exchange against an equal amount of forward purchase, and then as a forward speculator in selling the forward exchange to himself in the former capacity in the expectation that the future spot rate will turn out to be lower than the current forward rate."[2/]

This statement is tautologically always true, even though the statement which Stokes attributed to me may not always be true.

There are no difficulties in the first two cases which he depicted in Fig. 1 and Fig. 2, i.e., $F^*>F>S^e$ and $S^e>F>F^*$, where F is forward exchange rate, $F^* = \frac{S(1+i^d)}{(1+i^f)}$ is the forward rate that would correspond to the interest parity (S being defined as the current spot rate and i^d and i^f the domestic and foreign interest rates, respectively), and S^e is the speculators' expected future spot rate. Stokes thinks that in the absence of government intervention these are the only cases possible. This is open to question, but I shall postpone its discussion until later. In four other possible cases, he claims that I was wrong. For instance let us take the case $F>F^*>S^e$, i.e., his inequality (9).

In this case arbitragers would presumably hold spot foreign exchange and cover the holdings by selling equal amount forward. The profit of arbitrage per unit of foreign exchange would be $F - F^*$ if we neglect the convenience yields of spot funds on hand. The spot speculator would go short on spot exchange and expect to make the profit of $F^* - S^e$ per unit of foreign exchange. The forward speculator would go short on forward exchange

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[2/] Tsiang, "The Theory of Forward Exchange . . . ", IMF Staff Papers, Vol. VII (April 1959), p. 92.

and expect to make the profit of $F - S^e$ per unit. Thus obviously the return to spot speculation is not equal to the return to forward speculation plus that to covered interest arbitrage. Rather it is the difference between the return to forward speculation and that to covered interest arbitrage. Therefore, he claims that I am wrong.

However, if he had read me more carefully, he should have seen that what said in the quotation above is literally correct even in this anomalous case. For what I said was that "if he (the speculator) speculates by selling spot exchange, he is in fact acting first as an interest arbitrager in selling spot exchange against an equal amount of forward purchase, and then as a forward speculator in selling the forward exchange to himself..." It is clear from this sentence, that speculative selling of spot foreign exchange implies an arbitrage operation of selling spot covered by buying forward and then a speculative sale of forward exchange. In this anomalous case, however, the implied arbitrage operation in the direction I specified would incur a loss of $(F^* - F)$. So the spot speculator's expected return from his spot selling is equal to the expected return to forward speculative selling minus the loss from the implied arbitrage operation. The arithmetic would then come out exactly right. Stokes' difficulty arises because he misinterprets my statement to mean that a spot speculator's expected return is equal to the expected return to forward speculation plus the return to interest arbitrage in whichever direction that is profitable at the time. Had he read my paper more carefully, he would have noticed that the arbitrage operation and accompanying forward speculation implied in a spot speculative sale (or purchase) should be in the specific direction clearly specified in the above paragraph, not just any pair of such operations in the directions that is

profitable under the circumstances.

All the four cases in which he claims that he has caught me wrong can be explained in this way.

Stokes might perhaps shift his ground of criticism and go on to protest that if I claim my theory to be general, how can I assume that the spot speculators would implicitly do obviously irrational things, such as arbitraging in a direction opposite to what the interest parity and forward premium would indicate, or selling forward exchange for speculation when his own expected future spot rate is higher than the forward rate. The answer to this paradoxical question is that in all those 4 anomalous cases, it is in fact irrational for any one to undertake spot speculation. The fact that when spot speculation is decomposed into two implicit actions, one of these would obviously be irrational, merely reflects the inherent irrationality of such activity in those cases. For instance, in the case of his (9) $F>F^*>S^e$, the speculator who sells spot is obviously acting irrationally if he has equal access to the forward market as I assumed. For why should any one incur additional net interest cost in selling spot forward exchange in order to speculate, if he can sell forward exchange and expect to make a greater profit while running exactly the same risk arising from the uncertainty of expected future rate.

Readers with patience can easily reason out why in the other three anomalous cases also, spot speculation would itself be an irrational behavior. To decompose spot speculation into two implicit component acts, one of which is in the irrational direction, does not mean that we are imputing some irrationality upon a rational behavior. It merely bring out

in stronger relief the inherent irrationality of spot speculation under those circumstances.

The reason why I wanted to subsume spot speculation under forward speculation and covered interest arbitrage is to simplify the theory of the joint determination of forward and spot exchange rates such that these rates can be said to be determined by actions of only three groups of participants: forward speculators, arbitragers and commercial coverers, apart from government authorities who might intervene from time to time. Reviewing this theory after the lapse of 14 years, it is gratifying to find that this theory is indeed quite general as I claimed then. For in the two normal cases, spot speculation can certainly be split into two implicit activities, covered arbitrage and forward speculation, each following its own rational principles of behavior. In the 4 anomalous cases, which Stokes listed, spot speculation is an irrational behavior and can therefore be ruled out.

Having answered Stokes' criticism, it is my turn to offer him some comments in return. Stokes thinks that in the absence of governmental intervention the only cases possible are the two normal ones, i.e., $F^*>F>S^e$ and $S^e>F>F^*$. No explicit reason is given for this, but one might perhaps guess that the reason at the back of his mind is that he somehow regards that without governmental intervention his equation (8) would hold. i.e.,

$$\left|C_{st}\right| = \left|C_{at}\right|$$

by which he probably meant the desired stock of forward contracts held by forward speculators must equal the desired stock of forward contracts held

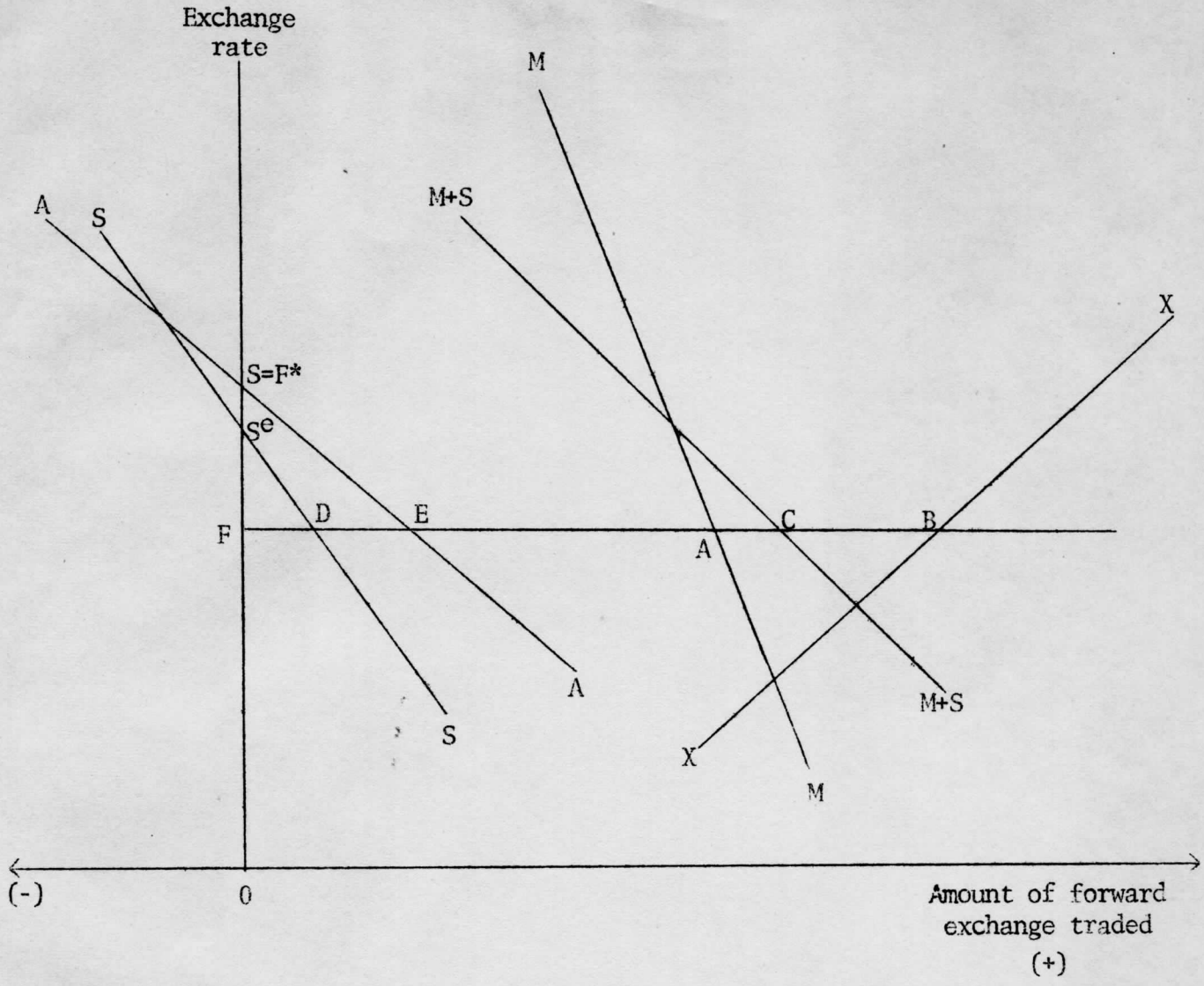
by arbitragers in the opposite direction, i.e., $C_{st} = -C_{at}$.

Why should this be true is a mystery to me. Certainly my theory would not lead to such a conclusion at all. Stokes apparently thought that, without government intervention, forward speculators and arbitragers would be the only groups of operators on the forward exchange market, so that the demand of the one must be matched by the supply of the other.

This is patently not true; for he has left out a most important group of operators on the forward market, viz., traders seeking covering for their foreign exchange commitments. The chief social function of a forward exchange market is essentially to provide hedging or covering to traders. If traders do not deal in forward exchange at all, forward exchange market would lose its main raison d'être. When commercial coverers operate in forward market, there is no reason why Stokes' equation (8), or rather $C_{st} = -C_{at}$, should hold at all. I cannot see any reason why Stokes should abandon my diagram 1 on p. 96 in favor of his grossly simplified and incomplete diagram to show the forces at play on the forward exchange market and the determination of the forward rate. Had he used my diagram on p. 96, he would see that it is not impossible to have, say, a situation like (10) $F^* > S^e > F$, without any government intervention at all. As illustrated in the following diagram, there might be an excess supply of forward exchange on the part of commercial coverer (because of an export surplus). The excess supply may be absorbed by both the arbitragers and the speculators who for some reasons or other might expect only a mild appreciation. Thus the export surplus AB, which, under the assumption that traders cover all their trade commitments, would coincide with the excess supply of forward exchange on the part of commercial traders, is divided

between forward speculators, who absorb AC = FD, and the interest arbitragers, who absorb CB = EF.

In this case, the generality of my theory still stand; viz., that both the forward and the spot rates of exchange can be said to be determined by the actions of three groups of participants: the commercial coverers, the arbitragers, and the forward speculators. For in this case, spot speculation, which would use up spot funds just as interest arbitrage, but which would yield a return that is not only uncertain and risky but also expected to be smaller than the sure return of interest arbitrage, is certainly irrational and therefore can be ignored.


Exchange rate
M
M+S
A
S
X
S=F*
Se
D
E
C
B
F
A
A
M+S
S
X
M
(-)
0
Amount of forward exchange traded
(+)

AC = FD

CB = FE