The Peso Problem and the Test of Market Efficiency Under the Flexible Exchange Rate System**

Jai Sheen Mah*

CONTENTS

I. Introduction

Since the introduction of the flexible exchange rates system in the early 1970s and the subsequent increase in the variability of exchange rates, the accuracy of the forecasts of the exchange rates, in particular the ability of the forward exchange rate to predict the future spot exchange rate, has been an interesting issue in international finance literature. Many researchers have tried the tests of the efficient market hypothesis in the foreign exchange market using the forward exchange rate. In case forward forecast bias (defined as the difference between the forward exchange rate and the actual future spot exchange rate) is observed, conventional tests concluded that the foreign exchange market is not efficient. In some recent periods, we can observe the existence of those biases. This raises the question whether we can say that, despite our observations of the forward forecast bias, the foreign exchange market works efficiently. We can consider several factors that may deter the conventional tests of the efficient market hypothesis from producing a correct answer in the foreign exchange market. This paper concentrates on one of these possible factors – the peso problem – and tries to devise a method for testing the market efficiency based on the assumption that people consider the possibility of a drastic policy change in a furture date.

The structure of this paper is as follows. First, the possible reasons why the conventional test of market efficiency may lead to the wrong conclusion are explained. We concentrate on the peso problem among the possible reasons for the forward bias and explain what are the difficulties

* Fellow of the Institute of Industrial studies, Assistant Professor, Department of International Trade, Dankook University.

** I would like to express my deep appreciation to Professors Peter Garber, Jun Il Kim, Akio Yasuhara and, especially, George Borts for their invaluable comments. Of course, I am solely responsible for remaining errors.

in the research on the peso problem under the flexible exchange rate system. Second, considering the effect of the peso problem on the exchange rate determination under rational expectations, the path of the forward forecast bias before and right after the policy change announcement is derived, assuming market efficiency. Finally I compare the derived paths of the forward forecast bias with the actually observed paths, using as the test cases Oct. 1979 U.S. monetary policy change whose switch to the contractionary posture was announced immediately and Sep. 1985 Group of Five decision of lowering dollar.

II. The Peso Problem and Failure of Conventional Tests of EMH

Efficient market is usually defined as a market where prices fully reflect all available information. If we restrict our attention to test of the efficient market hypothesis (EMH) in the foreign exchange market, it implies that the forward exchange rate at t reflects all available information at that period and the conventional test of EMH has been to regress the future spot exchange rate on the current forward exchange rate.

$$S(t+1) = f_t(t+1) + e(t+1) \tag{1}$$

where $S(t+1)$ is the log spot exchange rate (units of domestic currency per unit of foreign currency), $f_t(t+1)$ is the log forward exchange rate determined at t, maturing at t+1, and $e(t+1)$ is the forward forecast error.

If, in eq. (1), the forward exchange rate is an unbiased predictor of future spot exchange rate and there is no serial correlation in the forward forecast errors, then conventional test of EMH says that the forward exchange market is efficient. If there is a serial correlation of errors, however, it is regarded as a way of making profits on the forward exchange market. Some empirical test results concluded that they could not reject the EMH, but others showed rejection of it. When forward forecast biases are observed, investigators usually look at the risk premium as the reason for the observed bias. Under some conditions, risk premium is not required even if people are risk averse (see Frankel (1979)); however, in more general cases, risk premium is needed. Though risk premium can be one plausible factor, we can also think of the other factors as the plausible sources of the bias; for example, the peso problem and the confusion between permanent and transitory shocks (see Cukierman and Meltzer (1984)). If any one or combination of some of these factors have significant effects actually, we cannot rely on the conventional test of EMH and we are driven to consider methods that incorporate these other effects.

Among the factors that may be plausible reasons for the forward forecast bias, risk premium has received spotlight most often (e.g. Dooley and Isard (1982), Koraczyk (1985)); however, as for other factors, few, if any, investigations have been done. The aim of this paper is to concentrate on the pseo problem factor carefully among these factors. Peso problem has usually been studied within the context of fixed exchange rate regime. However, it can also be considered under the flexible exchange rate system. As Frenkel (1984) explains, the peso problem refers to a

situation in which agents anticipate a drastic change in regime or policy in a future date. Many observations will be made of trading days where people anticipated a regime (policy) change with no actual occurrence of the anticipated events. However, there will be only a small number of observations of days in which the anticipated events actually occur. In conventional models, error term e(t+1) is assumed to be independent of the information set at t. However, in case that we incorporate the effect of the peso problem, the error term depends on the information set. That is, depending on the information set, the probabilistic assessment of the occurrence of drastic event is made and, consequently, the direction of the forward forecast bias is determined depending on whether the anticipated event occurred or not at that period. We can presumably consider the foreign exchange market as one strongly influenced by the anticipation of furture events of future policies, and, since current anticipations of future change in policies are based on probabilistic evaluations, the peso problem seems to be especially relevant as a source of bias in the foreign exchange market.

Though most studies on the peso problem in the international finance litterature (e.g. Krugman (1979), Connolly and Taylor (1984), Obstfeld (1984), Flood and Garber (1984), Blanco and Garber (1986)) deal with the situation (the possibility of devaluatlon) under the fixed exchange rate system, Krasker (1980) used German hyperinflation data to explain the phenomenon of the forward forecast bias under the floating exchange rate system in terms of the peso problem. He shows that the conventional test of the efficient market hypothesis is not valid when the peso problem affects the determination of the exchange rates, and he presents a test method incorporationg it. During the German hyperinflation period, since highly expansionary monetary policy resulted in the hyperinflation, people might have had the anticipation that the government would adopt a contractionary monetary policy in the future to remove the hyperinflation. Due to this anticipation of possible policy change in a future date, the sampling distribution of the forward forecast error becomes different from the normal distribution, which is assumed in the papers adopting the conventional approach, making the conventional test invalid. However, his method is inconclusive in the sense that the probability of policy change is not a derived one, though his test of the efficient market hypothesis depends crucially on the exact value of that probability. Likewise, Frankel (1980) attributed one of the possible sources of the bias observed in the floating exchange rates system after 1973 to the effect of the peso problem, though he did not present an alternative procedure of testing the market efficiency in this situation.

Under the fixed exchange rates system, in calculating the timing of speculative attack or the one period ahead probability of regime change, "foreign exchange reserve" plays the crucial role as the triggering mechanism of analysis. However, the foreign exchange reserve that supplied the analysis of the fixed exchange rate system with the crucial analytical tool is not useful under the flexible exchange rate system. Due to this, we cannot derive the probability of policy change under the flexible exchange rate regime endogenously by using the method that was used in obtaining the probability of devaluation under the fixed exchange rate system.

III. Test of EMH and the Path of Forward Bias

To know how investors' anticipation of policy chahge at a future date affects the exchange rates and the forward forecast bias, the following monetary model of exchange rate determination expressed in equations (2) – (8) (e.g. Mussa (1976), Frenkel and Mussa (1985) is useful for explanation. The result shown in e.g. (7) and (8) allows a key role for investors' expectations concerning future money supply policy and money demand in determining the current spot as well as the forward exchange rates. Though investors do not know the exact timing of policy change, they are assumed to know the average growth rate of money in each possible policy that might be adopted. In the following equations, superscript asterisk denotes the relevant variable for the foreign country.

Money Market Equilibrium Conditions;

$$p(t) - p^*(t) = m(t) - m^*(t) + l^*(t) - l(t) \tag{2}$$

where m(t) is the domestic money supply and l(t) is the demand for real balances at period t.

Purchasing Power Parity;

$$p(t) = s(t) + p^*(t) \tag{3}$$

Money Demand;

$$\begin{aligned} l(t) &= k + dy(t) - ai(t) \\ l^*(t) &= k^* + d^*y^*(t) - a^*i^*(t) \end{aligned} \tag{4}$$

where y(t) is the income and i(t) is the nominal interest rate.

Interest Rate Parity Theorem;

$$i(t) - i^*(t) = f_t(t+1) - S(t) \tag{5}$$

Assuming risk neutrality,[1)]

$$f_t(t+1) = E_tS(t+1) \tag{6}$$

From equations (2) through (6) with the additional assumption of the equality of the coefficients between domestic and foreign country in eq. (4) for simplicity of expostion, we can show the forward looking solution of the monetary model of exchange rate determination condensed in eq. (7).[2)]

---

1) Using a utility maximization model with the stochastic price assumption, Frenkel and Razin (1980) show that the expected future spot exchange rate can differ from the forward exchange rate even under the neutrality assumption. To avoid complications, we assume that possibility of deviation ignorable.

2) Though the monetary model of exchange rate determination is useful for expository purposes, the results of some empirical works (e.g. Meese and Rogoff (1983), Hoffman and Schlagenhauf (1985) show poor predictive power of the existing structural exchange rate determination models like this one. Many factors for the possible misspecification have been noticed; existence of volatile time varying risk premium, deviation from PPP in the 1970s and instability of the underlying money demand specification. In addition to these, negligence of the consideration for the peso problem may be another reason, too.

$$S(t) = 1/(1+a)\ \Sigma_{i=0}^{\infty} (a/(1+a))^{i+1}\ E_t(m(t+i)-m^*(t+i) - (d/(1+a)\ \Sigma_{i=0}^{\infty} (a/1+a))^{i+1}\ E_t(y(t+i)-y^*(t+i)) \quad (7)$$

As eq. (7) shows, current spot exchange rate is determined by the current and expected future relative money supply and money demand. Forward exchange rate is determined by the expectation of future relative money supply and money demand, as is shown in eq. (8).

$$f_t(t+1) = (1/(1+a))\ \Sigma_{i=0}^{\infty} (a/(1+a))^{i+1}\ E_t(m(t+1+i)-m^*(t+1+i)) - (d/(1+a))\ \Sigma_{i=0}^{\infty} (a/(1+a))^{i+1}\ E_t(y(t+1+i)-y^*(t+1+i)) \quad (8)$$

To concentrate on the domestic money supply side, let's assume that people know the foreign money supply, domestic and foreign real income streams perfectly. Then, eq. (7) and (8) tell us the crucial role of future monetary policy in determining the spot and forward exchange rates. As for the domestic monetary policy, we assume that one of the two possible monetary policies (expansionary or contractionary) will be adopted in the next period by the monetary authroity. Investors are assumed to know the respective average growth rate of money (g^e and g^c) and, of course, g^e is bigger than g^c. Therefore, the only thing investors do not know is whether the monetary policy will change in the next period or not. Think of an economy where expansionary monetary policy has continued. First, suppose that the contractionary menetary policy will be adopted in the next period and will continue. Denote the spot exchange rate at t+1 in this case as $S^c(t+1)$ with its expected value as S^*. Likewise, suppose that the expansionary monetary policy will continue in the next period. Denote the spot exchange rate in this case as $S^e(t+1)$ with its expected value S^o. Surely, $S^o > S^*$, as can be seen from eq. (7). Since investors do not know for sure at t which of the two policies will be adopted at t+1, forward exchange rates will be determined by the investors' probabilistic assessment of the policy that will be adopted in the next period. Suppose that they attach probability a(t) to policy change in the next period.

We can think of the basic determinants of the investors' anticipation of monetary policy change as continuing (or accelerating) inflation in case of continued expansionary monetary policy and deepening recession in case of continued contractionary one, respetively. As publications of the indicators of the current economy (e.g. unemployment rate, GNP growth rate, inflation rate, recent weekly money growth rates and other indicators) accumulate over time, investors' probabilistic assessment of policy change in the next period will change, reflecting the change in the information set that they have. In addition to the publication of the above indicators, other news such as the appointment of new FRB chairman, speeches of FOMC members concerning the current state of the economy, etc. may effect the foreign exchange market investors who are very sensitive to new information that might be related with the occurrence of furture drastic event.

For the purpose of clarification, we think of the situation that people perceive the current policy correctly.[3] Since we assumed risk neutrality, we remove the possibility of risk premium

3) The case of lagged announcement of the policy change decision and consequent imperfect perception of the current policy is explained in chapter 2 of my dissertation (Mah (1987)).

as the possible reason for the forward forecast bias. So there is no ex ante bias. When people think of the possibility of policy change in the next period, the forward exchange rate will be determined as

$$f_t(t+1) = E(S(t+1)|I(t)) = a(t)S^* + (1-a(t))S^0 \tag{9}$$

where a(t) is the probability at t of policy change at t+1 and I(t) is the information set that people have at t, which contains all public information; in this sense, when we talk about a specific type of the EMH test, we refer to the semi-strong form of EMH (Fama (1970)). Thus, eq. (9) shows that the forward exchange rate is a weighted sum of exchange rates reflecting the possibilities of continuation of the current expansionary monetary policy and change to the contractionary one.

Now we can show, first, that the conventional EMH test is not valid when we accept the condition that the forward exchange rates are determined following eq. (9) and, second, what will be the path of forward forecast bias if the market is efficient. In case that the expansionary monetary policy has continued for some previous periods, the ex post forward forecast bias would generally show negative sign (eq. (10));

$$f_t(t+1) - S^e(t+1) = f_t(t+1) - S^o - u(t+1) = a(t)(S^* - S^0) - u(t+1) \tag{10}$$

where u(t+1) is the unexpected random deviation from the expected spot exchange rate at t+1.

Suppose the monetary policy changes to the contractionary one at T (which is not the unanticipated, but the partly anticipated change according to eq. (9)). The forward exchange rate determined at T-1 does not fully reflect the policy change occurring at T; however, the actual spot exchange rate at T fully reflects such a change. Therefore, as eq. (11) shows, the continued negative bias jumps to a positive bias.

$$f_{T-1}(T) - S(T) = f_{T-1}(T) - S^* - u(T) \tag{11}$$

In case we pick a period in which one monetary policy continues and the investors anticipate policy change in an unknown future period over the interval of observation, the above described ex post forecast bias will be observed, even if foreign exchange market is efficient. Application of the conventional EMH test will lead to the conclusion that the market is inefficient because it demonstrates negative serial correlation. In this sense, the conclusion derived from the conventional test of EMH may give us a wrong answer.

Now, we can summarize the plausible daily path of forward forecast bias around the event day. Though we cited the monetary policy change as the relevant event, we can also think of the major country central bank's intervention in the foreign exchange market as the additional event. I explain the path of bias using one month maturity forward exchange rates, which is used in the empirical section. I choose one month rate to finish the phenomenon of the continuation of bias after the decision day by checking the smallest number of observations, because one month forward exchange is the shortest maturity forward contract which is traded actively.

(1) Before the event day (i.e. before T), as a (t) increases over time with the accumulation of information on the current economy, negative bias is likely to become bigger in the absolute value.

(2) At the day when the decision of policy change is made (at T), the bias jumps to the positive one.

(3) During the period between the day of decision and one month after, though spot exchange rates reflect the changed policy, forward exchange rates determined one month ago do not reflect it yet. So, as a(t) increases over time, magnitude of the positive bias is likely to become smaller.

(4) After one month from the day of decision, positive bias disappears and random errors without significant bias will be observed.

IV. Empirical Results

In this section, I present the empirical results of testing the EMH, comparing the conventional test of market efficiency and the test that checks through the paths of forward forecast bias around the event day. As for the data period, 84 business days' (i.e. 4 months) observation of the exchange rates are used. Since I adopt one month (which usually consists of 21 business days) as the maturity of the forward exchange, 63 daily observations of the forward bias around the event day are used. I choose, first, the Oct. 1979 FOMC decision of monetary policy change, which was announced immediately following the decision and, second, the Sep. 1985 G-5 decision of central banks in the foreign exchange market which seems to have played a crucial role in changing the volume of U.S. dollar.

1. Oct. 1979 monetay policy change decision

To reduce the double digit inflation rate arising from the second OPEC oil shock, the possibility that U.S. policy would change to a contractionary posture may have been considered to some extent before Oct. 6, 1979. Actually, the Committee decided to pursue the objective of decelerating growth of money stock. FOMC announced its decision immediately to the public, unlike the usual cases of lagged announcement. By choosing this period, we can avoid the problem of the imeprfect perception of the current policy between the day of policy change decision and the day of announcement of that decision.

When we regress eq. (1) following the conventional test of the efficient market hypothesis, use of daily data makes the sampling interval (one business day) shorter than the forecast interval (one month). Due to this mismatch between the intervals there arises the problem of the serial correlation of forecase errors and the non-strict exogeneity of the forward exchange rates. Using Hansen and Hodrick technique (i.e. running OLS regression with modified standard errors), we can get consistent estimates using data sampled more finely than the forecast interval. The result, as

shown in Table 1, indicates that, for most currencies that are explained, the coefficients in eq. (1) are significantly different from the hypothesized values at the 1 percent level. Therefore, the conventional test of OLS regression as modified by the Hansen and Hodrick technique concludes that the foreign exchange market is inefficient. However, of course, the conclusion from this test does not reflect the peso effect on the forward forecast bias.

Table 1. Regression result around Oct. 1979 FOMC policy change decision.

Currency	a_0	a_1	R^2
British pound	.183	.745**	.395
	(.198)	(.063)	
Canadian dollar	-.226**	-.424**	.074
	(.076)	(.481)	
French franc	-1.699**	-.183**	.036
	(.481)	(.334)	
German mark	-.596**	-.209**	.001
	(.180)	(.306)	
Japanese Yen	3.775**	1.707**	.857
	(1.041)	(.193)	
Swiss franc	-.603**	-.240**	.040
	(.149)	(.308)	

* significantly different from the hypothesized value at the 5% level
** significantly different from the hypothesized value at the 1% level

Next, we look at the peso effect on the actual paths of the forward forecast bias. Figures 1 through 6 record the observed forward bias paths for six major exchange rates (British pound, Canadian dollar, French franc, German mark, Japanese yen and Swiss franc against U.S. dollar). The relevant hypothesized path in this situation is the change from the negative to the positive bias at the time of the event day. The observed forward bias paths for Canadian dollar, French franc, German mark and Swiss franc are fairly consistent with the hypothesized path. This confirms foreign exchange market efficiency under the peso effect, a conclusion different from that obtained throughout the conventional test of the efficient market hypothesis. Negative blas continues before Oct. 6, 1979, increases abruptly at the event day, followed by fairly positive bias until about one month after the policy change decision. As for British pound and Japanese yen, the observed paths are not consistent with the hypothesized path. In case of British pound,

for the same reason as U.S., U.K. announced a contractionary monetary policy at Nov. 16 by raising the Bank of England's minimum lending fee to financial institutions to a record 17 percent from 14 percent. If investors' anticipation of British policy change to the contractionary one dominated that of U.S. policy change, then we hypothesize positive forward bias continue before the U.K. policy change. Therefore, the generally positive forward bias observed before the U.K. policy change announcement is not inconsistent with the hypothesized forward bias path. In case of Japanese yen, Bank of Japan adopted tight monetary policy to control inflation arising from the second oil price hike; the official discount rate was raised to 6.25 percent from 5.25 percent at Dec. that year. Therefore, the continuing positive forward bias might be due to the domination of people's anticipation of change to the tight monetary policy in Japan.

2. Sep. 1985 G-5 central banks intervention

Faced with the continuing strong dollar (and continuing U.S. trade deficits accumulation) process in th early 1980s, foreign exchange market investors might have anticipated a drastic event which can change strong dollar process to weak dollar process. That was materialized at Sep. 1985 in the form of Group of Five meeting decision after months of secret negotiation among these countries. The coordinated program adopted was these countries' central banks' intervention designed to force down dollar value against other major currencies. It was decided at the meeting that these central banks would sell U.S. dollar and purchase their own currencies. Decision was announced immediately without lag.

When 63 daily observations on the spot and one month forward exchange rates are used as the samples (24 observations before and 38 observations after the decision of G-5 central banks' intervention), Table 2 shows the conventional test results of EMH using Hansen and Hodrick technique. The results show that the null hypothesis in the conventional test of EMH is rejected in cases of U.K. pound and French franc, but that is not rejected in cases of Deutche mark and Japanese yen. However, when the path of forward bias are checked following our procedure of testing the market efficiency which incorporate the peso effect, Figures 8 through 10 generally confirm the market efficiency with the peso effect.

Central banks' sale of U.S. securities continued for a few weeks following this decision. Reflecting peoples' anticipation of the central bansk' behavior of these major countries, all four figures show positive and increasing forward bias before the decision day, abrupt drop to negative bias at the first business day following the decision, evidently negative bias continuing until 1 month after that day, and generally no significant bias observed afterwards. Overall, the paths of the forward biases observed around the G-5 decision show that the foreign exchange market anticipation of such a drastic event was incorporated in the forward exchange rates increasingly previous to the decision, confirming the foreign exchange market efficiency incorporating the peso effect.

Table 2. Regression result around Sep. 1985 G-5 intervention.

Currency	a_0	a_1	R^2
U.K. pound	.260**	.237*	.049
	(.101)	(.310)	
French franc	-1.287**	.386**	.104
	(.348)	(.237)	
Deutche mark	-.661	.331	.078
	(.454)	(.444)	
Japanese yen	-1.072	.795	.339
	(2.521)	(.462)	

V Conclusion

We considered the effect of the peso problem on the path of the forward forecast bias. In addition to the implications on the test of the efficient market hypothesis in the foreign exchange market, the research on the peso problem can shed light on the tests of the monetary model of exchange rate determination. That is, if the peso problem has significant effect on the exchange rate determination, usual tests of the monetary model of exchange rate determination which do not incorporate the peso problem aspect might lead the researchers to the wrong conclusion.

To check the peso effect on the test of the efficient market hypothesis in the foreign exchange market, I chose the forward bias paths around Oct. 6, 1979 FOMC meeting when policy change decision was announced immediately and those around Sep. 1985 G-5 decision of central banks intervention in the foreign exchange market. Though the conventional test of the efficient market hypothesis concluded that the hypothesized coefficients under the market efficiency are rejected at the 1 percent level in most cases, the test incorporating the peso effect through checking the forward bias paths shows us that the foreign exchange market is fairly efficient.

Figure 1. U.K. pound forward bias path (Oct. 1979).

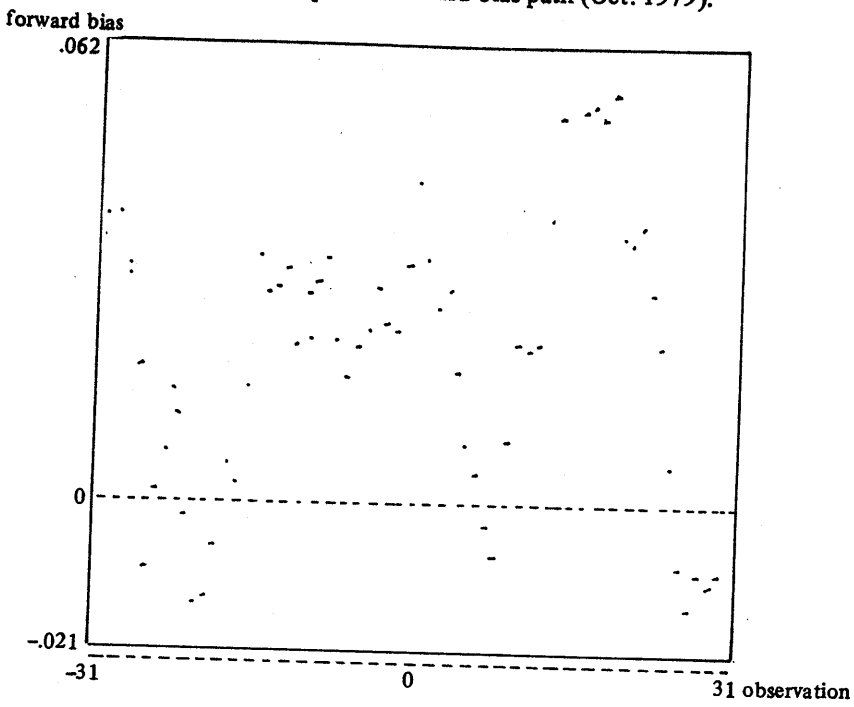


Figure 2. Canadian dollar forward bias path (Oct. 1979).

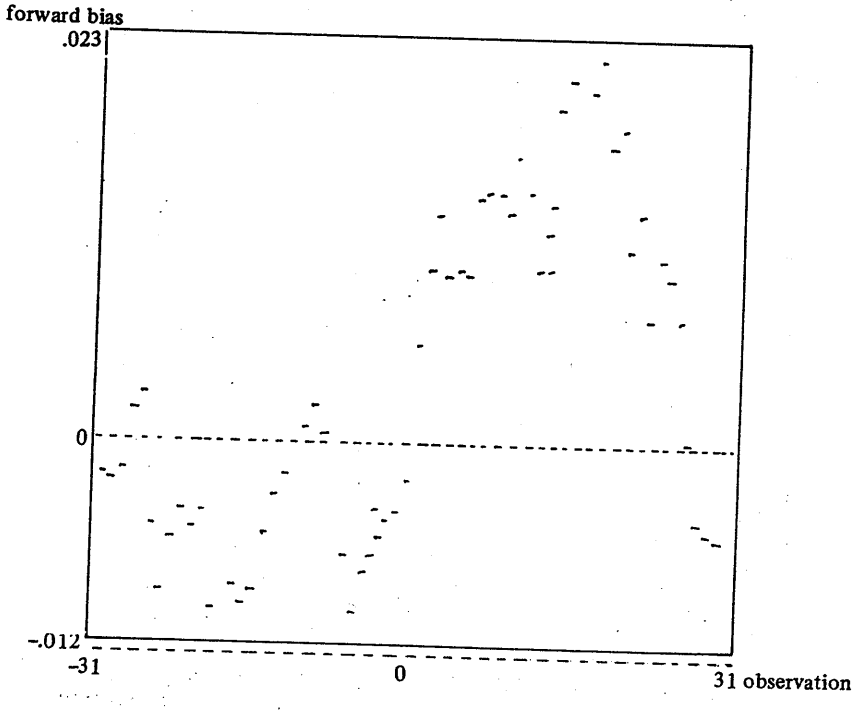


Figure 3. French franc forward bias path (Oct. 1979).

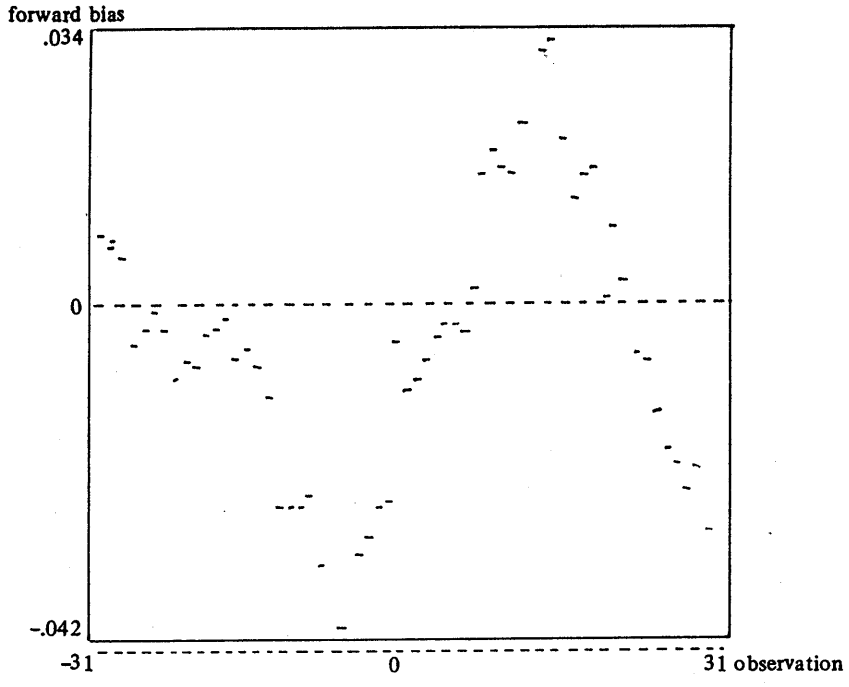


Figure 4. German mark forward bias path (Oct. 1979).

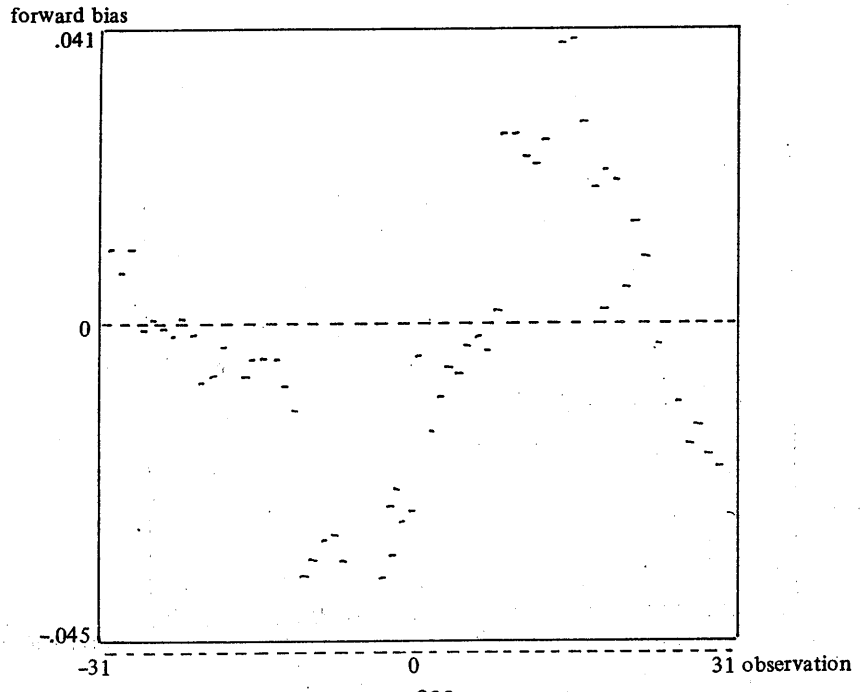


Figure 5. Japanese yen forward bias path (Oct. 1979).

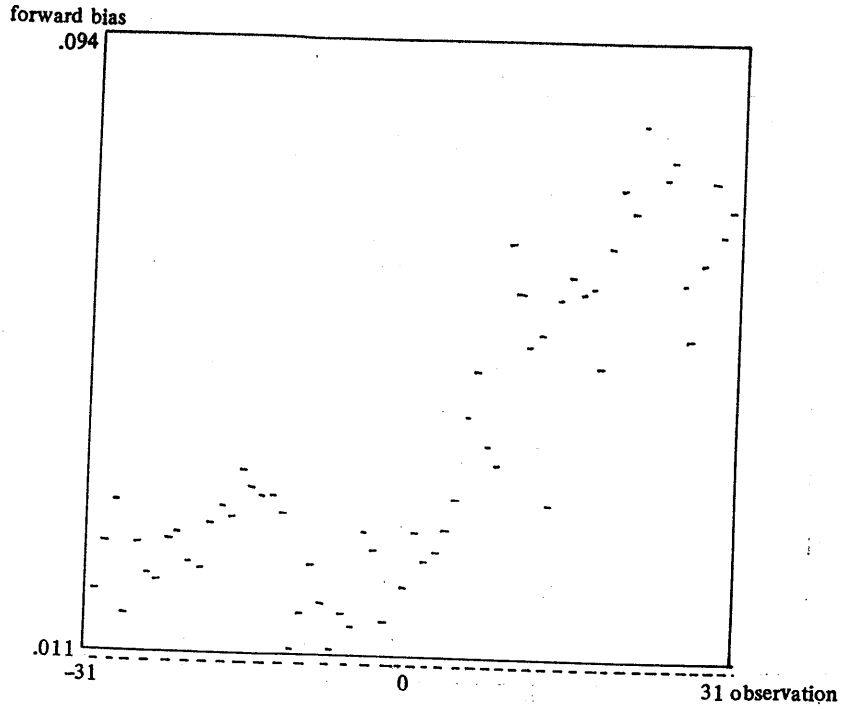


Figure 6. Swiss franc forward bias path (Oct. 1979).

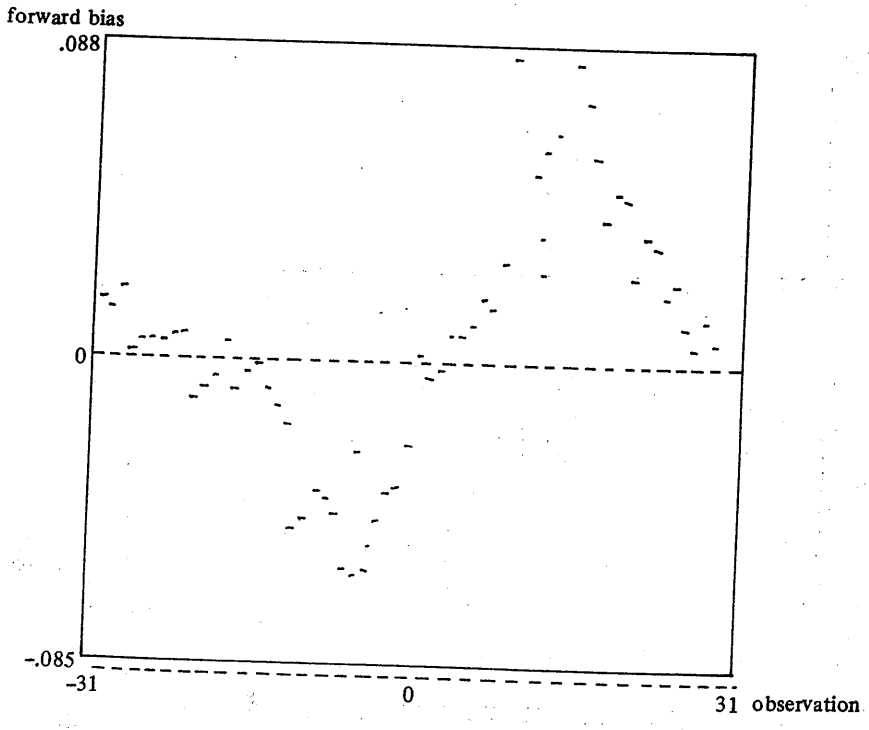


Figure 7. U.K. pound forward bias path (Sep. 1985).

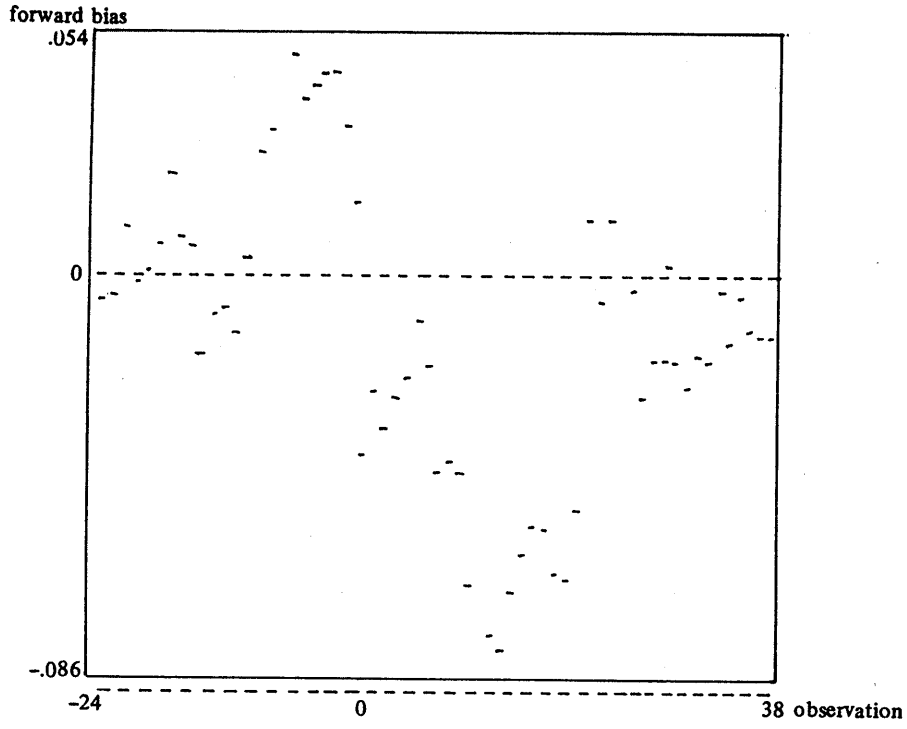


Figure 8. French franc forward bias path (Sep. 1985).

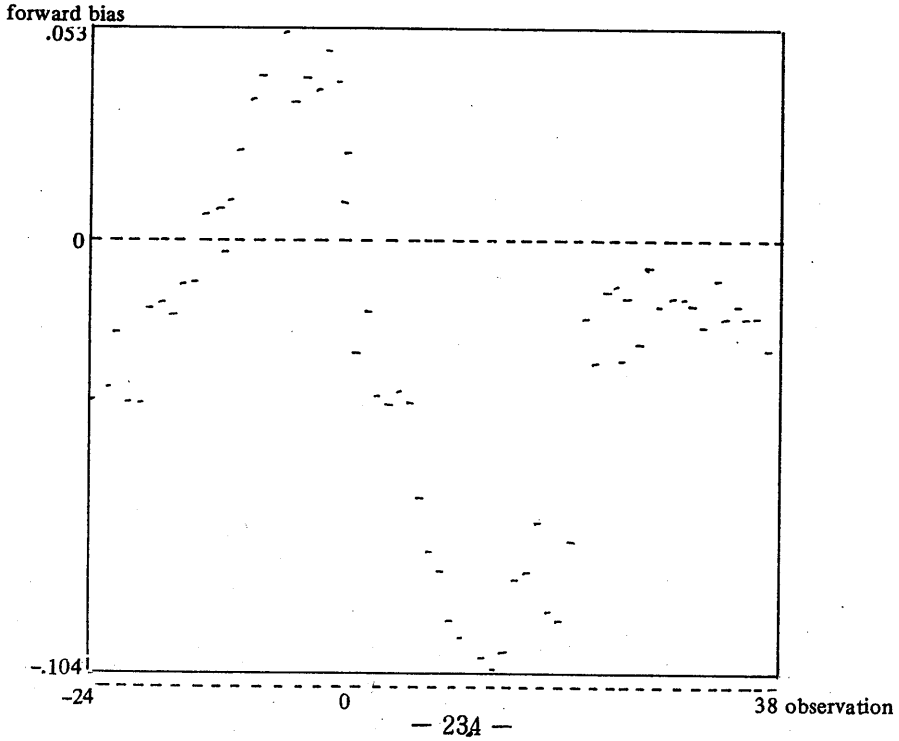


Figure 9. German mark forward bias path (Sep. 1985).

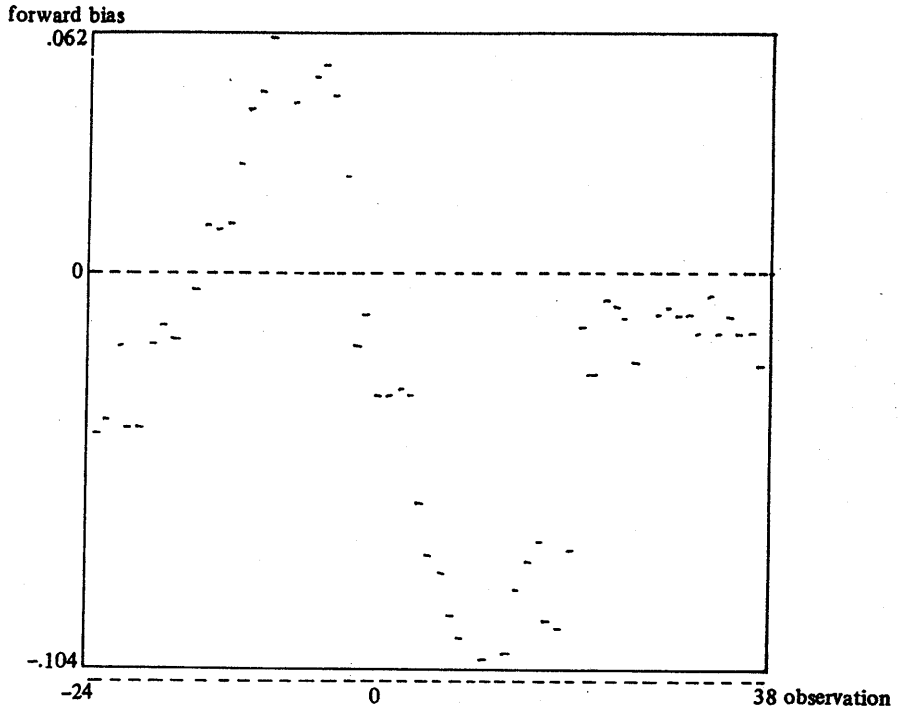
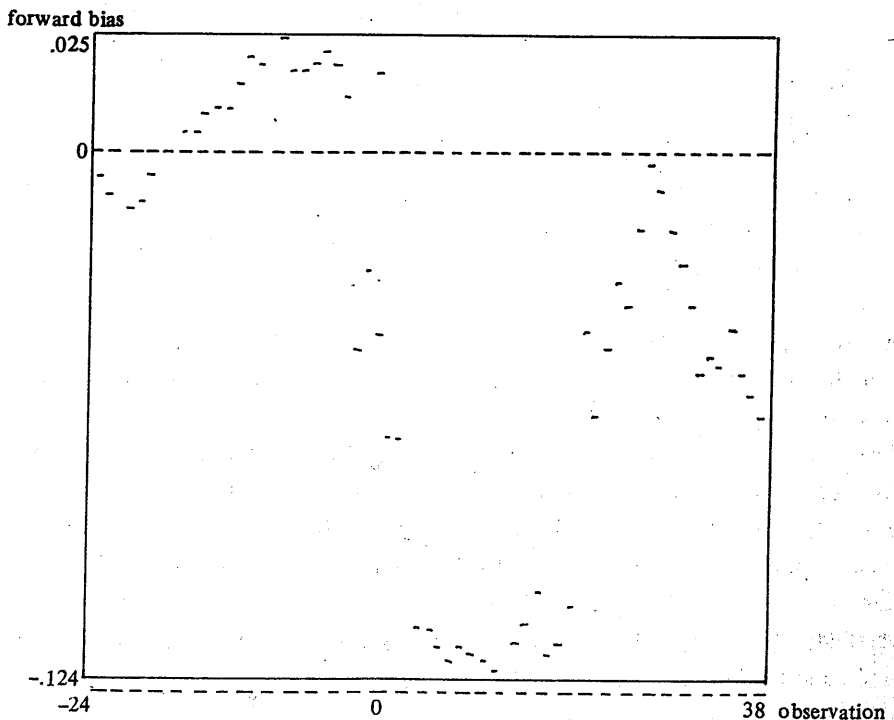


Figure 10. Japanese yen forward bias path (Sep. 1985).



<References>

1. Blanco, Herminio and Peter M. Garber, 1986, Recent Devaluation and Speculative Attacks on the Maxican Peso, Journal of Political Economy 94, 148-66.
2. Connolly, Michael B. and Dean Taylor, 1984, The Exact Timing of the Collapse of an Exchange Rate Regime and Its Impact on the Relative Price of Traded Goods, Journal of Money, Credit and Banking 16, 194-207.
3. Cukierman, Alex and Allan H. Meltzer, 1984, What Do Tests of Market Efficiency in the Presence of the Permanent-Transitory Confusion Show?, mimeo.
4. Dooley, Michael P. and Peter Isard, 1982, The Protfolio-Balance Model of Exchange Rates and Some Structural Estimates of the Risk Premium, IMF Staff Papers 29, 683-702.
5. Fama, Eugene F., 1970, Efficient Capital Markets, Journal of Finance 35, 383-417.
6. Flood, Robert P. and Peter M. Garber, 1984, Collapsing Exchange Rate Regimes; Some Linear Examples, Journal of International Economics 17, 1-13.
7. Frankel, Jeffrey A., 1980, Tests of Rational Expectations in the Forward Exchange Market, Southern Economic Journal 46, 1083-1101.
8. Frenkel, Jacob A., 1984, Comment, in: John F. Bilson and Richard C. Marston eds., Exchange Rate Theory and Practice (University of Chicago Press).
9. Frenkel, Jacob A. and Michael L. Mussa, 1985, Asset Markets, Exchange Rates, and the Balance of Payments, in: Ronald W. Jones and Peter B. Kenen eds., Handbook of International Economics, Vol. 2, (North-Holland).
10. Frenkel, Jacob A. and Assaf Razin, 1980, Stochastic Prices and tests of foreign exchange markets, Economics Letters 6, 165-70.
11. Hansen, Lars P. and Robert J. Hodrick, 1980, Forward Exchange Rates as Optimal Predictors of Future Spot Rates; An Econometric Analysis, Journal of Political Economy 88, 829-53.
12. Hoffman, Dennis L. and Don E. Schlagenhauf, 1985, The Impact of News and Alternative Theories of Exchange Rate Determination, Journal of Money, Credit and Banking 17, 328-46.
13. Koraczyk, R., 1985, The Pricing of Forward Contracts for Foreign Exchange, Journal of Political Economy 93, 346-68.
14. Krasker, William S., 1980, The Peso Problem in Testing the Efficiency of Forward Exchange Markets, Journal of Monetary Economics 6, 269-76.
15. Krugman, Paul R., 1979, A Model of Balance of Payments Crises, Journal of Money, Credit and Banking 11, 311-25.
16. Mah, Jai S., 1987, Essays in International Finance, unpublished Ph.D. dissertation, Brown University.
17. Meese, Richard A. and Kenneth Rogoff, 1983, Empirical Exchange Rate Models of the Seventies: Do they fit out of sample? Journal of International Economics 14, 3-24.
18. Mussa, Michael L., 1976, The Exchange Rate, the Balance of Payments and Monetary and Fiscal Policy under a Regime of Controlled Floating, Scandinavian Journal of Economics 78, 229-48.
19. Obstfeld, Maurice, 1984, Balance of Payments Crises and Devaluation, Journal of Money, Credit and Banking 16, 208-17.

The Poso Problem and the Test of Market Efficiency Under the Flexible Exchange Rate System.

〈國文要約〉

페소問題와 變動換率制度下의 效率市場假說 檢證

馬 在 信

페소問題가 개입되는 경우, 통상적인 效率市場假說檢證은 연구자들로 하여금 그릇된 결론으로 이끌게 한다. 이 글에서 필자는 變動換率制度下에서 페소問題가 개입되는 경우 效率市場假說을 檢證하는 새로운 방식을 제시한다. 연구대상기간에 대해 통상적인 檢證法을 적용하면 대부분 外換市場은 非效率的이라는 결론으로 이끌어지게 된다. 그러나 페소問題가 결부되는 대표적인 사건으로 1979년 10월 미국금융정책의 변화결정일과 1985년 9월 G-5에 의한 外換市場개입결정일을 잡아 필자가 제시하는 새로운 檢證방식을 적용한 결과, 통상적인 방식 적용결과와는 달리 外換市場은 매우 效率的으로 움직인다는 결론을 도출할 수 있었다.