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A Note on Philippine Financial Openness

by

*Jose Antonio Tan III and Cayetano Paderanga, Jr.**

*Bank Officer and Member of the Monetary Board, respectively, Bangko Sentral ng Pilipinas.

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ABSTRACT

In 1991, the Philippines launched a series of foreign exchange reforms which partially opened the capital account. These set of reforms, if completed, will result in the financial integration of the economy with the global financial markets, thus, would complete the sequence of economic liberalization and integration. This study examines the degree of financial integration of the Philippines with the international economy. In particular, two questions are to be answered. First, how financially integrated is the Philippines with the rest of the world? And, second, how has foreign exchange liberalization contributed to Philippine financial openness? Philippine financial openness is examined using the gross capital flows ratio, the Feldstein-Horioka regressions and variations of tests based on uncovered interest parity. While the results confirm the substantial increase in gross capital flows, evidence using investment-saving correlation and arbitrage tests suggest that the degree of financial openness is still low. The empirical evidence also suggests that capital account liberalization has not contributed much to financial integration.

JEL Classification: Monetary Policy; Central Banks and Their Policies; Financial Aspects of Economic Integration

A NOTE ON PHILIPPINE FINANCIAL OPENNESS

Jose Antonio Tan III and Cayetano Paderanga, Jr.[1]

1. Introduction

In 1980, the Philippines was among the earliest economies to embark on a financial liberalization program, first with the introduction of universal banking, followed by the deregulation of interest rates. These series of economic reforms were implemented alongside trade reforms, i.e., import liberalization and tarrification. The intention of these reforms was to remove the distortions which hamper the efficient mobilization of resources. Also, these reforms were supposed to set the foundations for the eventual integration of the Philippine economy with the rest of the world.

In 1991, the Philippines launched a series of foreign exchange reforms which partially opened the capital account. These set of reforms, if completed, will result in the financial integration of the economy with the global financial markets, thus, would complete the sequence of economic liberalization and integration. Complete financial integration means that capital is perfectly mobile across borders. With unimpeded capital flows, exchange rate-adjusted asset prices and returns between comparable domestic and foreign assets should equalize. If a nonzero differential (arising from capital controls and perceived risks, including political and other "non-economic" risks) exist between the domestic interest rate and exchange rate-adjusted foreign interest rate, then the integration is incomplete.

While a substantial number of studies have been written on trade and financial liberalization, much is still needed to be done on capital account liberalization. The

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[1] Bank Officer VI and Monetary Board Member of the Bangko Sentral ng Pilpinas, respectively. The views, opinions and errors in this paper are solely of the authors.

liberalization of the capital account opens an entirely new research area concerning the Philippine financial sector. This study examines the degree of financial integration of the Philippines with the international economy, and tries to answer two questions. First, how financially integrated is the Philippines with the rest of the w ow has foreign exchange liberalization contributed to Philippine financial openness?

2. Previous empirical work on Philippine financial openness

The deregulation of foreign exchange transactions initiated and implemented starting in 1992 was intended to integrate the Philippine financial market with the international market. Under such liberalization efforts, it is expected that domestic interest rates become strongly linked with international rates.

Haque and Montiel (1991) provide one of the earliest estimates of financial openness for the Philippines. Capital mobility is measured by estimating a financial openness index derived from the uncovered interest parity condition. The index is between zero (0) and one (1), with perfect capital mobility indicated by an index equal to one and zero indicating a financially closed economy. Using International Financial Statistics annual data from 1969 to 1987, they found that the Philippines had an index of 0.577. Statistical tests on the index found it to be significantly different from zero and insignificantly different from one suggesting that perfect capital mobility may not be ruled out.

However, a subsequent work by Montiel (1994), using Philippines had a low degree of financial integration. Several measures of financial integration were applied, namely, the gross capital flow ratio, the Feldstein-Horioka coefficient, the uncovered interest parity differential and the Euler equations. Montiel had divided his sample into five modal groups with Group 1 having the most open capital

accounts and Group 5 having the most closed capital account. With a gross capital flow ratio of 7.94, the Philippines was classified into Group 4 together with Malaysia and Thailand. The Euler equation tests rejected the null hypothesis of financial integration. Tests using the Feldstein-Horioka regressions rejected the null hypothesis of perfect financial integration. While Montiel had estimates for the uncovered interest parity differential, he did not consider this in his final assessment of the Philippines.[2]

In a more recent study, Sakai (1995), observed that Philippine interest rate generally moved together with international interest rates, plus some premium, particularly in the post-foreign exchange liberalization period. In a regression which related the Philippine treasury bill rate with the US treasury bill rate, he found that the coefficient for the US treasury bill rate was significant at 5 percent. He also noted that movements of these two variables coincided for most quarters from the first quarter of 1992 to the first quarter of 1994. From these results, he concluded that the Philippine treasury bill rate is linked to the euro-dollar rate. The Sakai result suggests that the Phillippines has become more financially integrated with international capital markets.

Using monthly data from 1975 to 1994, de Brouwer (1996) applied several tests of financial integration to selected East Asian economies, including the Philippines. He found that the mean uncovered interest differential for the Philippines was negative and significantly different from zero,[3] and he attributes this to the existence of risk premia and capital controls. De Brouwer, however, noted that while the Philippines has not achieved complete financial integration, the degree of financial openness has been increasing in the most recent years. He found that even if full-sample cointegration test between domestic and foreign interest rates failed, sub-period tests from 1990 to 1994 did not reject

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[2] Montiel did not explicitly explain the omission. Perhaps, he found the interest rate data for the Philippines inappropriate for such tests.

[3] No tests using covered interest parity was done for the Philippines.

cointegration. His variance decomposition of the domestic interest rate also indicated that the proportion of innovation due to foreign interest rates has been increasing over time.

3. Measures of financial integration

An empirical study needs to be done to ascertain the degree of financial openness of the Philippines under a liberalized foreign exchange regime. The two studies written covering the post-foreign exchange decontrol period do not clearly establish this. The co-movement of interest rates established by Sakai (1995) is not enough to prove financial openness. On the other hand, de Brouwer (1996) was only able to show the direction towards more financial openness. Besides, the use of cointegration tests over a short sample period greatly diminishes the power of the test. Moreover, the data that he uses ends in 1994 which is barely two years after foreign exchange deregulation.

This study contributes to existing literature by estimating the measures used by Montiel (1994) and Haque and Montiel (1991) with more current data. Three measures of financial openness are used in the study, namely, the gross capital flows ratio, the Feldstein-Horioka coefficients and the uncovered interest parity differential.[4]

3.1 The gross capital flow ratio

The most simple indicator of financial integration is the magnitude of capital flows as measured by the gross capital flow ratio. This is computed as the ratio to Gross Domestic Product of the sum of all inflows and outflows in the capital account of the Balance of Payments divided by two. A higher gross capital flow ratio is indicative of more cross-border capital mobility. However, as in most simple indicators, the gross capital

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[4]Only the test based on the uncovered interest parity is implementable since the forward markets necessary for the computation of the forward premia for covered interest parity is unavailable.

flows ratio has conceptual and empirical limitations.[5] Conceptually, any arbitrage between financial assets prices in financially integrated economies is only temporary and capital flows must cease when the financial asset prices equalize. Hence, while it is true that there are no capital flows with financial autarky, capital will remained immobile if the equalization of financial asset prices persists, thus, leaving no room for arbitrage. Empirically, the indicative significance of the ratio is highly sensitive to the degree of disaggregation of the capital accounts, i.e., highly disaggregated inflows and outflows data is preferred to minimize the information loss arising from the netting of accounts.[6] Tests using the capital flow ratio must be undertaken with these qualifications in mind.

3.2 Feldstein-Horioka regressions

The Feldstein-Horioka framework tests whether investment and saving rates for an economy is correlated. This is based on the concept that changes in domestic saving do not have any effect on the rates of return of domestic agents since the these returns are determined in the international financial markets. Consequently, domestic investment is not affected (Montiel, 1994). To measure the degree of financial integration, the following equation is estimated:

$$\left(\frac{I}{Y}\right)_t = a + b\left(\frac{S}{Y}\right)_t + \mu_t \qquad (1)$$

where *I/Y* is the ratio of domestic investment to GNP, *S/Y* is the national saving to GNP, and μ is the random error term. For small economies, the smaller the coefficient *b* is, the more financially integrated is the economy.

There are, however, some limitations to the Feldstein-Horioka framework. While it is true that under financial autarky, the investment and saving rate are highly correlated,

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[5] This discussion is based on Montiel (1994).

[6] Netting understates the gross capital flows ratio.

the converse may not hold. Nothing prevents a high investment-saving correlation with financial openness. Montiel (1994) enumerates several reasons for this. First, investment and saving may be dependent on the business cycle, hence, will tend to move together. Second, government could respond to current account deficits brought about by positive investment-saving gaps with contractionary fiscal policy which in turn increases national saving through its public component. Third, if the economy is a major player in world financial markets, then shocks to its national saving will affect international interest rates, thus affecting domestic investment. Lastly, for countries whose pattern of shocks to domestic investment and national saving replicates the shocks to world investment and saving, saving and investment are likely to exhibit high correlations since world saving and investment have a 100 percent positive correlation.

3.3 Tests using uncovered interest parity

The arbitrage conditions for determining financial openness is rooted in financial asset price equalization that should result from unimpeded capital flows. There is a menu of arbitrage conditions and the most common tests are based on the covered interest parity (CIP) and the uncovered interest parity (UIP). However, for the Philippines only the test based on the UIP is implementable since the forward markets necessary for the computation of the forward premia (for CIP) are not present. The UIP consists of the assertion that arbitrage equalizes the returns of domestic and foreign financial assets of the same type, as in:

$$1 + i_t = (1 + i_t^*)\frac{E(e_{t+1})}{e_t} \qquad (2)$$

where i is the return of the domestic financial asset, i^f is the return of the foreign financial asset, e is the exchange rate, and $E(e_{t+1})$ is the expected exchange rate at period $t+1$. Equation (2) can be reexpressed as:[7]

$$i_t = i_t^f + \frac{E(e_{t+1}) - e_t}{e_t} \quad (3)$$

If expectations are rational (i.e., there is perfect foresight), then the expectation of the exchange rate will equal the *ex post* exchange rate,

$$E(e_{t+1}) = e_{t+1}. \quad (4)$$

Therefore, equation (3) becomes

$$i_t = i_t^f + e_{t+1} \quad (5)$$

where $e_{t+1} = (e_{t+1} - e_t)/e_t$.

There are, however, several limitations to the UIP when it is applied to developing countries.[8] First, UIP assumes that the domestic and foreign financial assets are of the same type and identical. Second, there is a variety of financial assets available in both domestic and international markets. Hence, the degree of cross-border equalization of returns may vary among various assets. Third, most developing countries might be faced with the "peso problem." This refers to instances when market players perceive, with a high probability, that a currency depreciation will occur, but does not take place because

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[7] The cross term ($i_t^f e_{t+1}$) is assumed to be close to zero.

[8] Montiel (1994) points out several weaknesses of UIP as a basis for measuring financial openness.

monetary authorities will not permit the adjustment. Consequently, expectations[9] will systematically exceed the future spot rate. Hence, the null hypothesis of UIP will tend to be rejected more often than not.

There are several approaches to testing financial integration using the UIP. Two are adopted in this study. The first approach is by Ha[illegible] f financial openness is estimated by regressing an equation based on money demand and supply.[10] The other approach which can be implemented is the one used by Lizondo (1983), Khor and Rojas-Suarez (1991), and Montiel (1994). Their approach tests the differential between the domestic return and the exchange rate-adjusted foreign return for conformity with uncovered interest parity and rational expectations.

Estimating an index of financial openness

The observed domestic interest rate, i, can be expressed as a combination of the uncovered interest parity rate, i^* $(= i + \dot{e})$ and the domestic market interest rate if the private capital account is completely closed, i':

$$i_t = \phi i_t^* + (1-\phi) i'_t \qquad (6)$$

ϕ is the index of financial openness ranging from 0 to 1. ϕ=1 indicates complete financial integration while ϕ=0 holds when there is financial autarky. The index approaches unity as the country becomes integrated with international financial markets. The task, therefore, is to estimate ϕ. However, i' is not observable. This can be circumvented by

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[9]This will be the forward rate if the forward market exists.

[10]Fisher and Reisen (1993) adopts a related methodology for estimating the index of financial openness.

using the money supply-money demand framework in a partial equilibrium context.[11] Suppose money demand is given by the function:

$$\ln\left(\frac{M^D}{P}\right)_t = \alpha_0 + \alpha_1 i_t + \alpha_2 \ln Y_t + \alpha_3 \ln\left(\frac{M}{P}\right)_{t-1} \quad (7)$$

where Y is real output, P is the domestic price level, M is money stock, $\alpha_1<0$, $\alpha_2>0$, $\alpha_3>0$. Equilibrium in the money market is given by:

$$\ln\left(\frac{M}{P}\right)_t = \ln\left(\frac{M^D}{P}\right)_t \quad (8)$$

This equilibrium condition is consistent with the observed domestic interest rate i. From equations (7) and (8), an expression for i would be:

$$i_t = -\frac{\alpha_0}{\alpha_1} + \frac{1}{\alpha_1}\ln\left(\frac{M}{P}\right)_t - \frac{\alpha_2}{\alpha_1}\ln Y_t - \frac{\alpha_3}{\alpha_1}\ln\left(\frac{M}{P}\right)_{t-1} \quad (9)$$

With equation (9), an expression for the unobservable interest rate, i'_t, can be obtained by substituting M with the money stock under a counterfactual scenario of zero private capital flows.

Money supply, M, is given by the expression,

$$M_t = R_t + D_t \quad (10)$$

where R is the domestic currency value of foreign exchange reserves and D denotes domestic credit. But R is really the sum of the beginning inventory of foreign exchange reserves (R_{t-1}) plus the sum of the current account balance (CA), the public capital account (KA^G) and the private capital account (KA^P).

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[11] This implies that only money and interest rates are endogenous. Prices and income are exogenized.

$$R_t = R_{t-1} + CA_t + KA_t^O + KA_t^P. \quad (11)$$

Taking into consideration equations (10) and (11), money supply under a closed private capital account, denoted by M', is given by:[12]

$$M'_t = M_t - KA_t^P. \quad (12)$$

The unobservable interest rate, i', is the interest rate which satisfies the equilibrium condition:

$$\ln\left(\frac{M'}{P}\right)_t = \ln\left(\frac{M^D}{P}\right)_t. \quad (13)$$

Haque and Montiel (1991) derives the expression for i' by simply substituting M' for M in equation (9), as in:

$$i'_t = -\frac{\alpha_0}{\alpha_1} + \frac{1}{\alpha_1}\ln\left(\frac{M'}{P}\right)_t - \frac{\alpha_2}{\alpha_1}\ln Y_t - \frac{\alpha_3}{\alpha_1}\ln\left(\frac{M}{P}\right)_{t-1} \quad (14)$$

Notice that the above equation uses lagged actual money supply rather than the hypothetical money stock. Haque and Montiel reason out that "... the current demand for money ... depends on actual money stock in the previous period rather than on the money stock that would hypothetically have emerged with zero cumulative private capital mobility up to the previous period."[13]

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[12]Note that this implicitly assumes that the private capital account is closed for period t and not dur... the same token, at time t+1, only the private capital account for tha... period is dedu...

[13]Footnote 5 of Haque and Montiel (1991).

Substituting equation (14) in equation (6), and substituting the resulting expression for i on equations (7) and (8), the following equation is obtained:

$$\ln\left(\frac{M}{P}\right)_t = \pi_0 + \pi_1 i^*_{t+1} + \pi_2 \ln\left(\frac{M'}{P}\right)_t + \pi_3 \ln Y_t + \pi_4 \ln\left(\frac{M}{P}\right)_{t-1} \qquad (15)$$

where $\pi_0 = \alpha_0\phi$, $\pi_1 = \alpha_1\phi < 0$, $\pi_2 = 1 - \phi, 0 \leq \pi_2 \leq 1$, $\pi_3 = \alpha_2\phi > 0$, and $\pi_4 = \alpha_3\phi > 0$. All variables in equation (14) are observable, hence, the parameters can be estimated by using nonlinear least squares. The use of nonlinear methods allows the direct estimation of the financial openness index ϕ.[14]

By assuming that money demand is dependent on lagged actual money stock, the Haque-Montiel model preserves the effects of previous period private capital flows in the generation of the counterfactual i^*. A more appropriate assumption is for money demand to be a function of lagged money stock under the hypothesis of zero cumulative private capital flows. This means that in the generation of i^*, the effects of private capital flows in both current and previous periods are removed.

A modification of the Haque-Montiel model can be operationalized by changing the method by which M' is derived. If M' is defined to exclude the cumulative private capital flows, then i^* depends not only on the absence of current private capital flows but also on a zero cumulative private capital flow. This means that the foreign exchange reserve component of money stock will simply consist of the accumulation of the current account balance and public capital accounts. Instead of using equation (12), the following expression for M' is employed:

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[14] Instead of exactly following the Haque-Montiel approach, Fisher and Reisen (1993) devised a variant approach by estimating equation (9). This equation is then used to generate the closed-economy interest rate. The index of financial openness is estimated using a rearrangement of equation (6). However, the Fisher-Reisen approach cannot be implemented in this study due to the inability to estimate a satisfactory interest rate equation.

$$M'_t = M_t - \sum_{n=1}^{t} KA_n^P \quad (16)$$

With this modification, equations (14) and (15) becomes:

$$i'_t = -\frac{\alpha_0}{\alpha_1} + \frac{1}{\alpha_1}\ln\left(\frac{M'}{P}\right)_t - \frac{\alpha_2}{\alpha_1}\ln Y_t - \frac{\alpha_3}{\alpha_1}\ln\left(\frac{M}{P}\right)_{t-1} \quad (17)$$

and

$$\ln\left(\frac{M}{P}\right)_t = \pi_0 + \pi_1 i_t^* + \pi_2 \ln\left(\frac{M'}{P}\right)_t + \pi_3 \ln Y_t + \pi_4 \ln\left(\frac{M'}{P}\right)_{t-1} + \pi_5 \ln\left(\frac{M}{P}\right)_{t-1} \quad (18)$$

where $\pi_0 = \alpha_0\phi$, $\pi_1 = \alpha_1\phi < 0$, $\pi_2 = 1-\phi$, $0 \le \pi_2 \le 1$, $\pi_3 = \alpha_2\phi > 0$, $\pi_4 = -\alpha_3(1-\phi)$ and $\pi_5 = \alpha_3$.

Joint Test for UIP and rational expectations

It can be seen from equation (2) that the $E(e_{t+1})$ is not observable. Hence, following Montiel (1994), Khor and Rojas-Suarez (1991) and Lizondo (1983), empirical tests on the UIP need to be jointly tested with hypotheses on how the unobservable expectations are formed. With rational expectations, expectations of *e* formed at time *t* which are based on available information must correctly anticipate the realized *e* at time *t+1*. Thus, given the *ex post* exchange rate and the equation:

$$(1+i^f)\frac{e_{t+1}}{e_t} = (1+i^f)\frac{E(e_{t+1})}{e_t} + \varepsilon_t \quad (19)$$

the prediction error ε must have a zero mean. Also, the content of the available information depends on the efficiency of the foreign exchange market. For rational expectations, the markets need to be "weakly" efficient (Montiel, 1994). Weak market efficiency means that expectations of the future exchange rate incorporate all information contained in past forecast errors of the exchange rate. In terms of equation (19), this means that ε is serially uncorrelated. Let the *ex post* return differential be

$$d_t = 1 + i_t^{\prime} - (1 + i_t^{\prime})\frac{e_{t+1}}{e_t}. \qquad (20)$$

The joint hypothesis of UIP and rational expectations is tested by examining whether d_t has zero mean and is serially uncorrelated.

The conclusions derived from the test, however, needs some qualifications. First, the approach is a test for strong financial openness since a part of the null hypothesis implies perfect financial integration. Rejection of the null hypothesis may suggest the absence of perfect financial integration but not of financial integration *per se*. Second, since the test involves a joint hypothesis, rejection means that at least one of hypotheses does not hold, this may not necessarily be UIP. Lastly, the test is dependent on the state of the economy. There is always the possibility that in periods of high instability, shocks may cause large but offsetting return differentials resulting in a zero mean differential. Likewise, macroeconomic instability may also cause the differential to be somewhat random, hence, serially uncorrelated.

4. Evidence from gross capital flows

To derive the gross capital flow ratio, annual data from 1979 to 1995 are obtained from the Balance of Payments and National Income Accounts. Gross capital flows is defined as the sum of capital inflows and outflows divided by two. The ratio is obtained by dividing the said value of gross flows by nominal GDP. Gross capital flows consist of medium and long-term (MLT) loans, foreign investment[1], purchase of collateral and errors and omissions. Disaggregated inflows and outflows data are available for MLT loans and

[1] Includes both direct and portfolio investment.

foreign investment. Short-term capital which consists mainly of trade credit was excluded due to unavailable inflows and outflows disaggregation. Ratios of MLT loans and foreign investments to GDP were also computed to highlight the change in composition of capital flows.

Table 1 and Figure 1 show that there has been a substantial increase in the gross capital flow ratio since 1979. From 6.41 percent in 1979, the ratio has increased to 13.52 percent in 1995. This suggests that capital has been more mobile compared to previous periods. There are also some indications that the more recent increases in the gross capital flow ratio are attributable to strong foreign investment flows. The ratio of foreign investment flows to GDP has increased from an average of 1.02 percent from 1986 to 1991 to an average of 5.64 percent from 1992 to 1995.[16] By 1995, the ratio of gross foreign investment to GDP has reached 7.68 percent while the MLT ratio has fallen to 4.38 percent.

[16]Foreign exchange de-control was signaled by the increase of allowable foreign exchange receipts retention limit by exporters to 40 percent effective January 1992.

Table 1

Gross Capital Flow Ratio and Selected Components

As % of GDP

As % of GDP	Gross MLT Loans	Gross Foreign Investment	Gross Capital Flows
1979	5.58	0.49	6.41
1980	3.28	0.52	3.97
1981	3.94	0.45	4.96
1982	4.74	0.50	5.74
1983	4.94	0.60	6.12
1984	3.25	0.41	3.91
1985	8.36	0.38	9.77
1986	7.50	0.39	7.94
1987	7.58	0.83	8.61
1988	7.02	1.54	9.11
1989	6.12	1.27	7.84
1990	9.33	1.06	11.05
1991	6.96	1.04	8.17
1992	13.41	1.88	16.29
1993	6.99	5.68	12.68
1994	5.79	6.91	12.85
1995	4.38	7.68	13.52
1979-1985	4.87	0.48	5.84
1986-1991	7.42	1.02	8.79
1992-1995	7.64	5.54	13.83

Source of basic data: BSP, NSCB

The extent of financial openness, however, cannot be deduced from the magnitude of gross capital flows alone. In the case of the Philippines, much of these capital flows are investment portfolio in character, indicating that a considerable arbitrage opportunity persists in the Philippines. Such persistence apparently conflicts with the notion

that arbitrage opportunities are only temporary in highly financially integrated economies.[17] To verify the extent of Philippine financial integration, it is necessary to use other measures of financial openness.

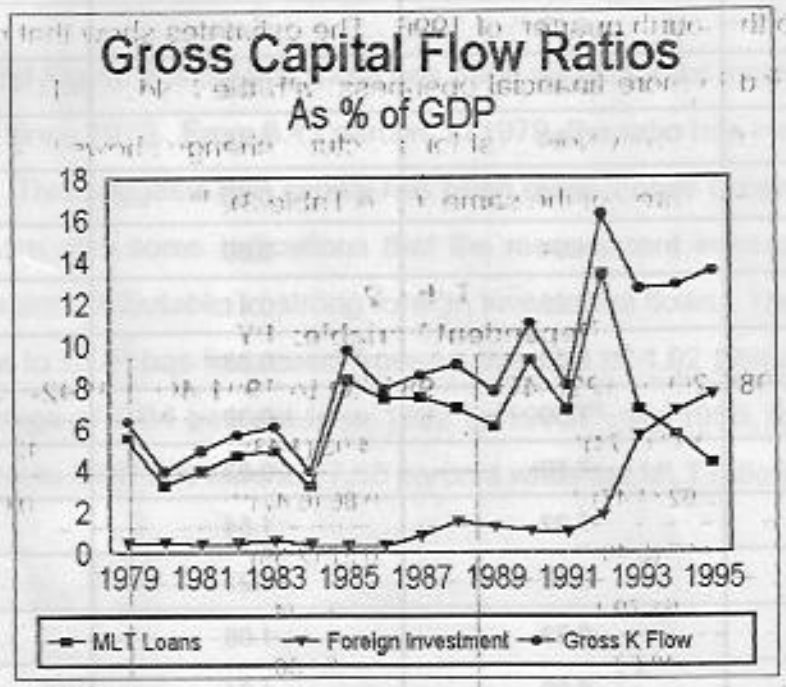

Figure 1

5. Evidence from the Feldstein-Horioka regressions

Deseasonalized quarterly data for Gross Domestic Capital Formation, Gross National Saving and Gross National Product from the second quarter of 1981 to the fourth quarter of 1996 were used to estimate the Feldstein-Horioka equation (see equation (1)). Table 2 shows the estimation results. The Feldstein-Horioka coefficient, *b*, for the entire

[17]The persistence of arbitrage may indicate that the Philippines is able to adopt an interest rate policy that is independent of the prevailing exchange rate-adjusted foreign interest rates. Such independence cannot be exercised with financial integration.

period is estimated to be 0.62, indicating low financial integration. To examine the impact of capital account liberalization, the sample is divided to two sub-periods, pre- and post-capital account liberalization. The pre-liberalization sub-period is from the second quarter of 1981 to the fourth quarter of 1991 while the post-liberalization sub-period is from the first quarter of 1992 to the fourth quarter of 1996. The estimates show that capital account liberalization has led to more financial openness with the Feldstein-Horioka coefficient falling from 0.86 to 0.61. The Chow test for structural change shows that the regression between the two periods are not the same (See Table 3). [18]

Table 2
Dependent Variable: I/Y

	1981-2Q to 1996-4Q	1981-2Q to 1991-4Q	1992-1Q to 1996-4Q
Constant	10.62 (3.74)**	4.03 (1.43)	12.72 (2.67)*
SY	0.62 (4.47)**	0.86 (6.47)**	0.61 (2.10)*
dum1	0.57 (5.40)**	0.57 (2.59)*	
dum2	61.79	72.34	19.71
dum3	48.52	52.36	4.42
DY(-1)	2.86 (0.09)	0.23 (0.63)	0.003 (0.95)
DY(-2)	3.23 (0.20)	0.67 (0.71)	0.206 (0.90)
DY(-3)	3.24 (0.36)	1.67 (0.64)	0.374 (0.94)
DY(-4)	4.82 (0.24)	2.63 (0.62)	0.439 (0.97)

* and ** indicate significance at 1 percent and 5 percent, respectively.

[18] The Chow test is valid asymptotically for nonlinear regressions.

Breusch-Godfrey lagrange multiplier tests, figures in parentheses denote the

Table 3
Test for Structural Change (Chow): Feldstein-Horioka

Period	Statistic
1981-2Q to 1991-4Q	
Sum of Squared Residual	305.64
N	43
K	3
1992-1Q to 1996-4Q	
Sum of Squared Residual	76.56
N	20
K	2
1981-2Q to 1996-4Q	
Sum of Squared Residual	463.05
N	63
K	3
F Statistic	4.02
Probability	0.01

A drawback of the Chow test is that the difference in the regression cannot be pinpointed (since it is a test of a joint hypothesis). To remedy this, the Feldstein-Horioka equation was estimated recursively to show the evolution of *b* from the first quarter of 1986 to the fourth quarter of 1996.[20] The coefficient is plotted in Figure 2. It is shown that there has been a substantial decrease in the Feldstein-Horioka coefficient since 1986, although the end-of-period coefficient is still indicative of low financial integration. It is also observed that *b* has remained almost flat since 1995. The sharp fall from 1989 to 1991 may be due to the slowdown during that period. It is possible that the fall in saving is sharper compared to that of investment, resulting in a lower saving-investment correlation. The further decline in 1992 until 1994 may be partly attributed to foreign exchange liberalization. However, this does not discount the possibility that the influx of foreign saving may be independent of liberalization.

[20]The full-period was used in the estimation. The recursive regression was started in 1986 to allow for enough degrees of freedom.

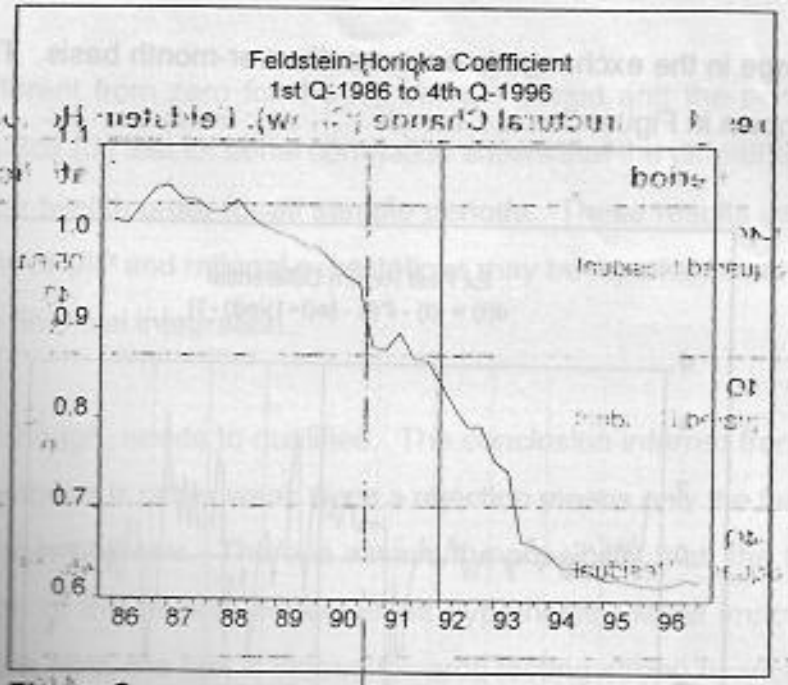

Figure 2

6. Evidence from uncovered interest parity tests

Monthly data from March 1986 to January 1997 was used to compute for the *ex post* return differential

$$d_{t+n} = i_t - (i^*_{t+n} + \dot{e}_{t+n}) \qquad (21)$$

The 91-day Treasury Bill rate, net of tax, is used as the domestic interest rate i and the 90-day LIBOR is used as the foreign interest rate i^*.[22] All interest are quoted on a *per* mont

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[22] The cross term $i^* \cdot e_{t+n}$ is close to zero, hence, will not affect the empirical results.

[23] The 91-day TB rate was chosen because it is used as the benchmark for most transactions in the Philippines. Libor and the 91-day US TB rate yielded similar results.

h basis.[23] Change in the exchange is on a month-over-month basis. The *ex post* return differential is shown in Figure 3.

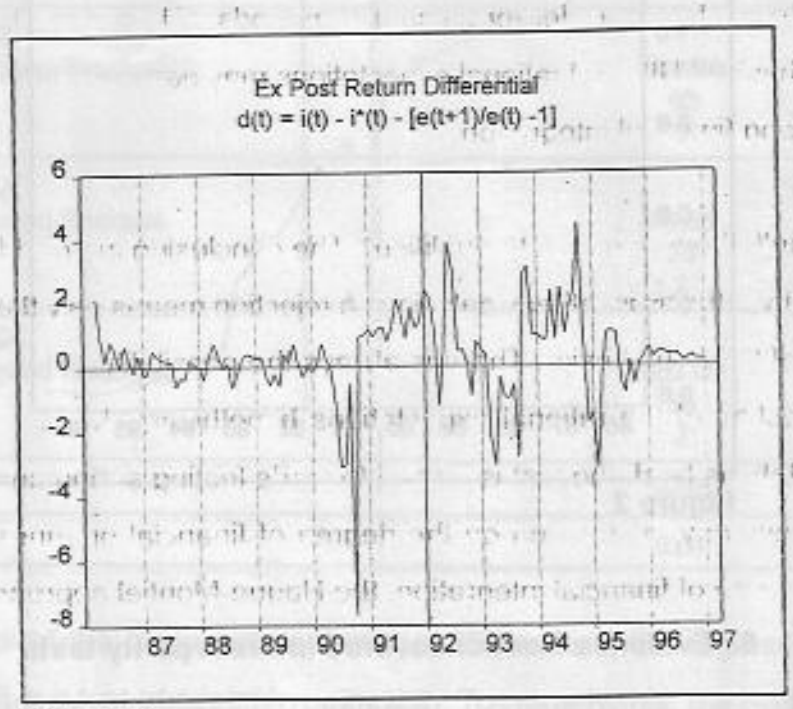

Figure 3

Noticeably, the differential moved within a narrow band between 1986 and 1989. It started to have larger fluctuations starting 1990 until mid-1995. It was only after this period that the stability of the return differential was restored. In fact, the differential remained positive and hardly fluctuated in 1996.

Montiel's (1994) approach is applied on the *ex post* return differential. Table 4 shows the mean return differentials, and the tests for serial correlation. The tests are done for the full period, and for the sub-period 1986 to 1991 for pre-liberalization period and for the succeeding post-liberalization sub-period of 1992 to 1997. The mean return differential

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[23]Although monthly data on the 91-day TB rate is available prior to 1986, these rates may not be reflective of market rates particularly during the crisis years when some of primary sales were negotiated.

is significantly different from zero for the full sample period and the post-liberalization period. The Ljung-Box (Q) test for serial correlation shows that the differentials are serially correlated up to the twelfth order for all sample periods. These results indicate that the joint null hypothesis of UIP and rational expectations may be rejected, thereby suggesting absence of strong financial integration.

This result, though, needs to qualified. The conclusion inferred from the rejection of the joint null hypothesis is rather weak since a rejection means only the failure of at least a component of the hypothesis. There is always the possibility that the test statistic is implying a rejection of the rational expectations hypothesis. More important, even if rational expectations hold, the test is biased towards testing strong financial integration. It does not reveal any information on the degree of financial openness. Therefore, to measure the degree of financial integration, the Haque-Montiel approach is utilized.

Table 4
Joint Test of UIP and Rational Expectations

	Mar 1986 to Jan 1997	Mar 1986 to Dec 1991	Jan 1992 to Jan 1997
Mean	0.276396*	0.126543	0.446359*
S.D.	1.404451	1.292256	1.515597
Q(1)[24]	22.629**	6.8256**	13.923**
Q(2)	30.647**	15.906**	14.548**
Q(3)	33.315**	21.000**	14.559**
Q(4)	33.646**	21.402**	14.595**
Q(5)	34.831**	21.543**	16.010**
Q(6)	35.949**	21.687**	16.834**
Q(7)	35.965**	21.942**	17.043**
Q(8)	35.980**	22.135**	17.602**
Q(9)	38.080**	23.199**	21.216**
Q(10)	39.158**	24.853**	22.849**
Q(11)	39.182**	26.049**	23.042**
Q(12)	41.924**	29.792**	25.889**

*Rejects the null hypothesis of a zero mean differential at 5 percent
**Rejects the null hypothesis of no serial correlation

In addition to the interest rate and exchange rate data above, deseasonalized monthly data on monetary aggregates (i.e., M1, M2 and M3), GDP and the consumer price index are used.[25] Private capital flows are computed as current account less medium and long-term foreign loan flows

[24]Figure in parentheses denotes the order of serial correlation.

[25]Quarterly GDP is converted to monthly using the repetition method.

Table 5 shows a replication for the Philippines of the Haque-Montiel approach (see equation (15)) using monthly data from March 1986 to October 1996.[26] Haque and Montiel (1991) uses M1 as the relevant monetary aggregate and estimates the index of financial openness for the Philippines to be 0.577 for the period 1969-1987. Replicating their method for the period March 1986 to October 1996 and likewise using M1, the financial openness index is estimated to be 0.782 and statistically different from zero (See Table 5). Breaking the sample to pre- and post-foreign exchange liberalization shows a slight improvement in financial openness from 0.754 to 0.804. However, the Chow test indicates that there is no statistically significant change in structure between the two periods (See Table 6).

The high estimated ϕ suggests that the Philippines has a high degree of financial openness, completely opposite of the previous conclusions. However, the inference from the regression results may be misleading considering that M1 is the narrowest monetary aggregate and much financial innovation has been occurring with financial liberalization. Non-M1 monetary aggregates such as time and saving deposits and deposit substitutes have an impact on interest rates, and these are not taken into account in the estimation. Also, the monetary authorities use M3 as its intermediate target rather than M1. Furthermore, a better counterfactual scenario is to remove the effect of private capital flows not just in the current period but in previous periods as well. Instead of regressing equation (15), equation (16) is estimated. Also, instead of using M1, M2 and M3 are used. All cumulative private capital flows starting 1981 were deducted from M2 and M3 to get the closed private capital account money stocks, M2' and M3'.

[26] Nonlinear least squares was used for estimation.

Table 5
Index of Financial Openness, ϕ
Haque-Montiel Approach, Using M1

M1	Mar 1986 to Oct 1996	Mar 1986 to Dec 1991	Jan 1992 to Oct 1997
ϕ	0.782 (24.29)**	0.754 (12.83)**	0.804 (21.18)**
α_0	-2.536 (-3.93)**	-2.034 (-2.43)*	-4.910 (3.63)**
α_1	0.001 (0.91)	0.003 (1.01)	0.0008 (0.46)
α_2	0.370 (3.85)**	0.304 (2.45)*	0.697 (3.62)**
α_3	0.823 (16.43)**	0.850 (11.37)**	0.677 (7.16)**
R^2	98.99	97.18	98.29
Adj R^2	98.95	97.01	98.16
LM(lag=1)[27]	1.89 (0.17)	1.37 (0.24)	0.002 (0.96)
LM(lag=2)	3.44 (0.18)	3.08 (0.21)	0.32 (0.85)
LM(lag=3)	3.98 (0.26)	3.77 (0.29)	1.05 (0.79)
LM(lag=4)	5.25 (0.26)	6.25 (0.18)	1.98 (0.74)
LM(lag=5)	6.58 (0.25)	6.53 (0.26)	2.02 (0.85)
LM(lag=6)	3.66 (0.35)	7.07 (0.31)	2.22 (0.90)
LM(lag=7)	8.56 (0.28)	9.04 (0.25)	2.67 (0.91)
LM(lag=8)	8.90 (0.35)	9.39 (0.31)	3.83 (0.87)
LM(lag=9)	9.99 (0.35)	9.45 (0.40)	4.88 (0.84)
LM(lag=10)	12.41 (0.26)	11.10 (0.35)	5.14 (0.88)
LM(lag=11)	12.45 (0.33)	11.17 (0.43)	5.77 (0.89)
LM(lag=12)	12.46 (0.41)	11.44 (0.49)	5.81 (0.95)

"**" and "*" indicate significance at 1 percent and 5 percent, respectively.

[27]Breusch-Godfrey lagrange multiplier tests; figures in parentheses denote the upper tail areas.

Table 6
Test for Structural Change (Chow): Haque-Montiel, M1

Period	Statistic
March 1986 to Dec 1991	
Sum of Squared Residual	0.0301
N	70
K	4
Jan 1992 to Oct 1996	
Sum of Squared Residual	0.0148
N	58
K	4
March 1986 to Oct 1996	
Sum of Squared Residual	0.0463
N	128
K	4
F Statistic	0.99
Probability	0.42

Tables 7 and 8 give the result of the re-estimation using M3 and M2, respectively. Not that the results for the two aggregates are almost identical. This is expected since the difference between the two consists of deposit substitutes which is substantially small. The re-estimation indicates that the Philippines still has a low degree of financial openness, roughly at 0.34 for the whole sample period. The results also suggest that the foreign exchange liberalization initiated in 1992 did not significantly help improve the degree of financial openness. Although the estimated index increased from 0.27 in pre-1992 to 0.40 in post-1992, the Chow test using M3 suggests that there is no statistical difference between the two regimes (See Table 9).

Table 7[28]
Index of Financial Openness, ϕ
Modified Haque-Montiel Approach, Using M3

M3	Mar 1986 to Oct 1996	Mar 1986 to Dec 1991	Jan 1992 to Oct 1997
ϕ	0.336 (11.84)**	0.270 (6.20)**	0.408 (9.18)**
α_0	-2.923 (-2.59)**	-6.180 (-4.89)**	-4.107 (-1.55)
α_1	0.0007 (0.41)	0.0001 (-0.07)	0.002 (0.85)
α_2	0.296 (2.66)**	0.574 (5.42)**	0.465 (1.55)
α_3	0.949 (51.06)**	0.940 (141.58)**	0.878 (10.63)**
AR(1)	0.28 (3.03)**	0.04 (0.33)	0.291 (1.81)
AR(2)	-0.31 (-3.21)**	-0.41 (-3.37)**	
AR(3)	0.25 (2.45)*	0.02 (0.14)	
AR(4)	-0.24 (-2.35)*	-0.46 (-3.37)**	
AR(5)	0.21 (2.09)*	-0.001 (-0.008)	
AR(6)	-0.15 (-1.56)	-0.39 (-2.79)**	
AR(7)	0.28 (2.93)**	0.12 (0.94)	
AR(8)	-0.05 (-0.48)	-0.25 (-1.93)	
AR(9)	0.17 (1.77)	0.002 (0.02)	
AR(10)	-0.16 (-1.64)	-0.18 (-1.39)	
AR(11)	0.16 (1.83)	0.04 (0.41)	
AR(12)	-0.20 (-2.36)*	-0.24 (-2.30)*	
R^2	99.88	99.74	99.73
Adj R^2	99.86	99.63	99.70

"**" and "*" indicate significance at 1 percent and 5 percent, respectively.

[28]See Table A-1 for serial correlation test results.

Table 8[25]
Index of Financial Openness, ϕ
Modified Haque-Montiel Approach, Using M2

M2	Mar 1986 to Oct 1996	Mar 1986 to Dec 1991	Jan 1992 to Oct 1997
ϕ	0.343 (11.67)**	0.275 (5.20)**	0.389 (8.08)**
α_0	-2.842 (-2.50)*	-6.123 (-4.09)**	-3.38 (-1.73)
α_1	0.0008 (0.50)	0.0006 (0.27)	0.0002 (0.09)
α_2	0.287 (2.59)**	0.577 (4.52)**	0.374 (1.73)
α_3	0.949 (51.77)**	0.939 (102.08)**	0.908 (15.83)**
AR(1)	0.26 (2.82)**	0.04 (0.28)	
AR(2)	-0.30 (-3.15)**	-0.32 (-2.39)*	
AR(3)	0.26 (2.64)**	0.07 (0.50)	
AR(4)	-0.26 (-2.56)*	-0.40 (-2.90)**	
AR(5)	0.20 (1.98)*	0.009 (0.06)	
AR(6)	-0.13 (-1.33)	-0.26 (-1.94)	
AR(7)	0.28 (2.89)**	0.16 (1.21)	
AR(8)	-0.04 (-0.36)	-0.14 (-1.10)	
AR(9)	0.16 (1.63)	-0.008 (-0.06)	
AR(10)	-0.16 (-1.61)	-0.12 (-0.94)	
AR(11)	0.12 (1.43)	-0.008 (-0.07)	
AR(12)	-0.17 (-2.06)	-0.20 (-1.83)	
R^2	99.88	99.74	99.69
Adj R^2	99.86	99.66	99.67

** and * indicate significance at 1 percent and 5 percent, respectively.

[25] See Table A-2 for serial correlation test results.

Table 9
Test for Structural Change (Chow): Modified Haque-Montiel, M3

Period	Statistic
March 1986 to Dec 1991	
Sum of Squared Residual	0.0033
N	70
K	17
Jan 1992 to Oct 1996	
Sum of Squared Residual	0.0058
N	58
K	6
March 1986 to Oct 1996	
Sum of Squared Residual	0.0092
N	128
K	17
F Statistic	0.06
Probability	1.00

Recursive regression was implemented to find out how the index of financial openness behaved from 1990 until 1996. Figure 4 shows that the index has been increasing over the years but not very substantially, from 0.21 in 1990 to 0.34 in 1996.[30] Much of increase occurred even prior to foreign exchange liberalization and continues on until 1993. Since then, there has been no improvement in the index. If fact, there appears to be a deterioration starting mid-1995.

[30]The choice of upper and lower bounds in the Y-axis makes the movement in ϕ very sharp, particularly in the early nineties. However, if the Y-axis is re-scaled with 0 and 1 as the lower and upper bounds, respectively, the picture is drastically changed. See Appendix Figure A-1.

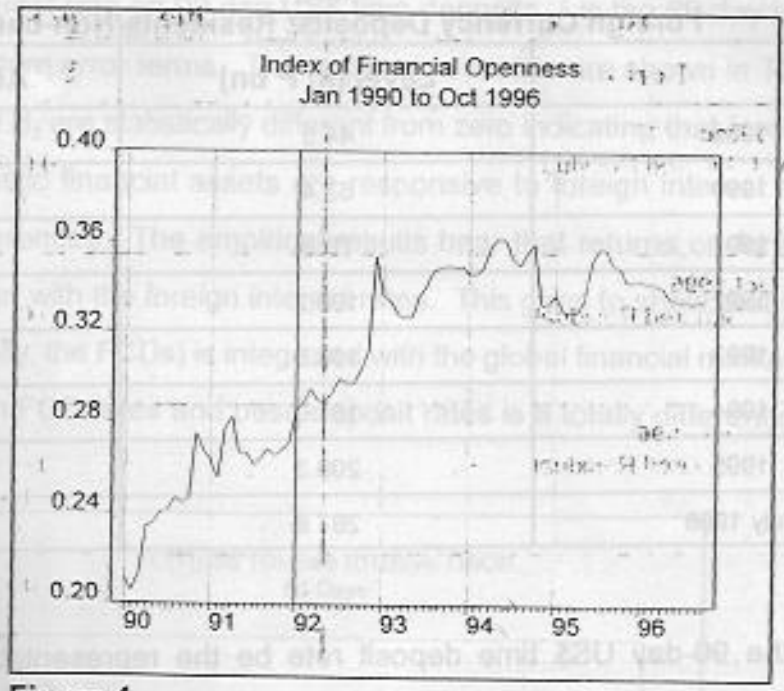

Figure 4

7. Evidence from Foreign Currency Deposits

In 1971, by virtue of the Foreign Currency Deposit Act of the Philippines (R.A. No. 6426), the holding of deposits in foreign currency was allowed in the Philippines. However, it was only after the foreign exchange deregulation that the volume of foreign currency deposits (FCD) gained momentum. Apparently, the removal of retention limits on foreign currency receipts was among the factors that gave impetus to this development. Bangko Sentral statistics show that the peso value of FCDs residents and non-banks has risen six-fold from P44.5 billion in 1989 to P267.8 in July 1996 (See Table 10). As of July 1996, the annual growth rate of FCDs has reached 48.7 *percent*. Does the surge in foreign currency deposits indicate a higher degree of financial integration with global financial markets? The behavior of FCD returns should give the answer to this question.

Table 10
Foreign Currency Deposits: Residents/Non-banks

	Level (in P bn)	Annual Growth
1989	44.5	
1990	63.4	42.4
1991	76.8	21.1
1992	100.2	30.4
1993	138.5	38.3
1994	161.0	16.2
1995	209.3	30.0
July 1996	267.8	48.7

Source: BSP

Let the 90-day US$ time deposit rate be the representative FCD rate. It is interesting to note while there is a differential between the 90-day US$ time deposit rate and the 90-day LIBOR, both interest rates tend to move together (see Figure 5). The correlation coefficient between first differences of the 90-day US$ time deposit rate and the 90-day LIBOR is found to be 82.8 *percent*. This is further confirmed by the results of the regressions of the 90-day US$ time deposit rate on the 90-day LIBOR. Using monthly data from January 1992 to January 1997, the following regression equations were estimated:

$$i_t^{fcd} = \beta_1 + \beta_2 i_t^{f} + \epsilon_t \qquad (22)$$

$$\Delta i_t^{fcd} = B_1 + B_2 \Delta i_t^{f} + E_t \qquad (23)$$

where i^{fcd} is the interest rate on 90-day US$ time deposits, i is the 90-day LIBOR, and ε and E are the random error terms. The regression results are shown in Table 11. The estimates for β_2 and B_2 are statistically different from zero indicating that foreign currency-denominated domestic financial assets are responsive to foreign interest rates, both in levels and first differences. The empirical results bear that returns on foreign currency deposits tend to align with the foreign interest rates. This goes to show that a segment of the economy (namely, the FCDs) is integrated with the global financial markets. However, the linkage between FCD rates and peso deposit rates is a totally different matter.

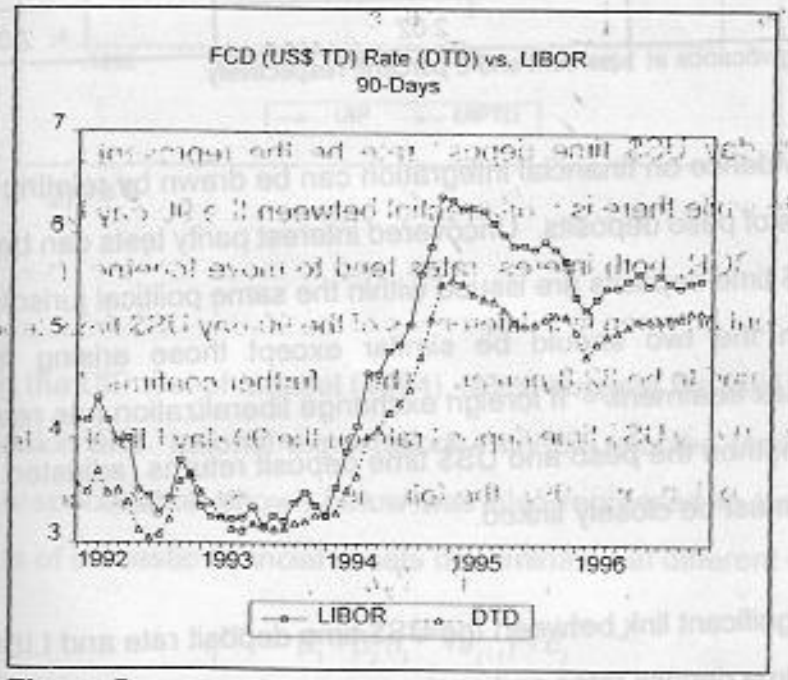

Figure 5

Table 11
90-day FCD Rates vs. 90-day LIBOR

Dependent Variable	i^{fcd}	Δi^{fcd}
Constant	1.82 (2.70)**	0.01 (1.39)
i^{l}	0.61 (11.46)**	
Δi^{l}		0.60 (11.27)**
AR(1)	0.97 (26.03)**	
R^2	0.993	0.686
Adj R^2	0.992	0.681
F	3935.80**	127.00**
DW	2.02	2.03

"**" and "*" indicate significance at 1 percent and 5 percent, respectively.

Empirical evidence on financial integration can be drawn by relating the returns to FCDs to the returns of peso deposits. Uncovered interest parity tests can be applied since both peso and US$ time deposits are issued within the same political jurisdiction. Hence, the risks between the two should be similar except those arising from currency denomination and tax treatment.[31] If foreign exchange liberalization has really resulted in financial integration, then the peso and US$ time deposit returns (adjusted for exchange rate expectations) must be closely linked.

Unlike the significant link between the US$ time deposit rate and LIBOR, no such link between peso time deposit rates and exchange rate-adjusted US$ time deposit rates can be established. The *ex post* differential between LIBOR and the 90-day Treasury Bill rate is almost entirely replicated by that between the 90-day peso and 90-day US$ time deposit rates (see Figure 6).

[31] Tax treatment also includes aspects concerning required reserves held against deposit liabilities.

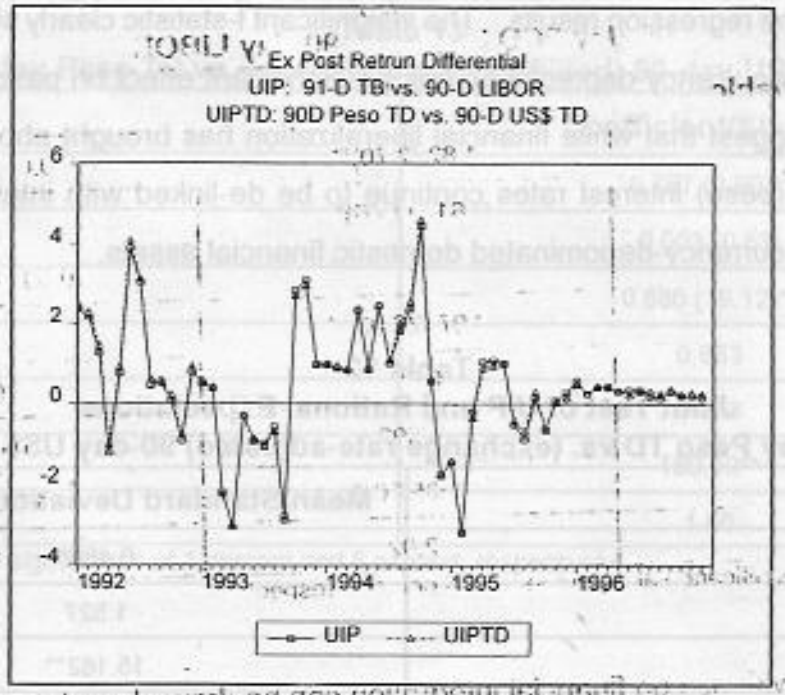

Figure 6

Applying the UIP test of Montiel (1994), result suggest the joint null hypothesis of financial integration and rational expectations may be rejected (see Table 12).[32] An equation of the specification shown below was also regressed to test the relationship between returns of domestic financial assets denominated in different currencies:

$$i_t^{pfd} = \beta_1 + \beta_2 (i_t^{fcd} + e_{t+1}) + \epsilon_t \qquad (24)$$

where i^{pfd} is the interest rate on 90-day peso time deposits, i^{fcd} is the interest rate on 90-day US$ time deposits, e is the change in the exchange rate, and ϵ is the random error term.[33]

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[32]Khor and Suarez-Rojas (1991) applies a similar procedure to Mexico when they tested for CIP and UIP using interest rates of treasury bills denominated in Mexican pesos (CETES) and in US dollars (PAGAFES).

[33]Interest rates are quoted on a per month basis.

Table 13 shows the regression results. The insignificant t-statistic clearly shows that FCD rates adjusted for currency depreciation has no significant effect on peso deposit rates. These results suggest that while financial liberalization has brought about the surge in FCDs, domestic (peso) interest rates continue to be de-linked with international rates, including foreign currency-denominated domestic financial assets.

Table 12
Joint Test of UIP and Rational Expectations
90-day Peso TD vs. (exchange rate-adjusted) 90-day US$ TD

	Mean/Standard Deviation/Q-Statistic
Mean	0.486*
S.D.	1.527
Q(1)[34]	15.162**
Q(2)	16.219**
Q(3)	16.229**
Q(4)	16.229**
Q(5)	17.650**
Q(6)	18.317**
Q(7)	18.635**
Q(8)	19.355**
Q(9)	23.027**
Q(10)	24.590**
Q(11)	24.855**
Q(12)	28.157**

*Rejects the null hypothesis of a zero mean differential at 5 percent
**Rejects the null hypothesis of no serial correlation

[34]Figure in parentheses denotes the order of serial correlation.

Table 13

90-day Peso TD vs. (exchange rate-adjusted) 90-day US$ TD

	Coefficient/Statistic
Constant	0.757 (9.90)**
$i^{fcd} + \dot{e}$	0.003 (0.53)
AR(1)	0.880 (19.12)**
R^2	0.863
Adj R^2	0.858
F	180.10**
DW	1.66

"**" and "*" indicate significance at 1 percent and 5 percent, respectively.

8. Concluding Remarks

The empirical results of this paper shed light on two important issues, namely, the extent of financial openness and the impact of foreign exchange liberalization on financial openness. While indeed capital flows have been quite strong in recent years, these alone are not enough evidence to be able to that Philippines has attained a high degree of financial integration. Evidence using investment-saving correlation and arbitrage tests suggest that the degree of financial openness is still low. The Feldstein-Horioka coefficient computed for 1981 to 1996 is 0.62. Likewise, the estimated index of financial openness using the uncovered interest parity is at a low of 0.34. The failure of asset prices to equalize indicates that policymakers continue to determine domestic interest rates independent of foreign interest rates. Theoretically, this does not occur in financially integrated economies. Further evidence from foreign currency deposits also show that while interest rates on foreign currency-denominated financial assets tend to move together with foreign interest rates, movements in peso interest rates are independent of FCD rates as well.

With regard to the second issue, empirical evidence suggests that capital account liberalization has not contributed much to financial integration. Tests of structural change based on [illegible]ude no statistically significant difference between the pre- and post-liberalization periods. Recursive regressions were also suggestive of minimal gains in the post-1992 period. There are several possible explanations for this and could be possible areas for further research. First, capital account liberalization needs to be given more time before its full beneficial effects are felt. The early nineties were really stabilization years, therefore, the risk premia led to larger return differentials. Then, after stabilization, it takes time to improve perceptions, hence, the differential will tend to remain large. It is only in the more recent periods that perceptions were formed in the country's favor. Also, the capital account liberalization was only partial. Some restrictions still exist. There might still be a need to undertake more foreign exchange reforms.

Second, the financial markets in the Philippines are still shallow. While it is true that financial liberalization has encouraged financial innovation, the menu of instruments that are comparable to those in foreign markets is quite limited. The most attractive financial assets to foreign capital are mainly equities, and indeed much of the capital flows involve portfolio capital. There appears to be no efficient secondary market for securities. The absence of an attractive portfolio, even with a liberalized environment, will definitely not encourage cross border flows.

Lastly, while capital account liberalization theoretically entails the relinquishment of the ability to conduct independent monetary policy, it does not prevent the monetary authorities from undertaking strategies to preserve the independence of monetary policy, at least over a limited period. Take the case of capital inflows arising from the arbitrage opportunities brought about by high domestic interest rates. To prevent a currency appreciation, the monetary authorities purchases the inflows. However, such action brings about monetary expansion. The monetary authorities may respond by sterilizing, i.e., reducing/selling its domestic securities to bring down money supply. These series of

actions result in the maintenance of the exchange and interest rates in their pre-inflows levels. Thus, the arbitrage remains, and it precipitates another round of capital inflows. As long as the monetary authorities have the capacity to sterilize, this cycle is expected to continue. Monetary independence is only lost once the monetary authorities exhaust their stock of domestic securities. It is only then that asset returns can equalize.

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Appendix A

Table A-1
Breusch-Godfrey LM Test for Serial Correlation
Modified Haque-Montiel Approach, Using M3

M3	Mar 1986 to Oct 1996	Mar 1986 to Dec 1991	Jan 1992 to Oct 1997
LM(lag=1)[35]			
LM(lag=2)			2.35 (0.31)
LM(lag=3)			3.78 (0.29)
LM(lag=4)			4.10 (0.39)
LM(lag=5)			4.76 (0.44)
LM(lag=6)			4.76 (0.58)
LM(lag=7)			6.64 (0.47)
LM(lag=8)			10.70 (0.21)
LM(lag=9)			11.35 (0.25)
LM (lag=10)			12.64 (0.24)
LM (lag=11)			13.02 (0.29)
LM(lag=12)			15.10 (0.24)
LM (lag=13)	11.27 (0.59)	9.80 (0.71)	15.24 (0.29)

[35]Figures in parentheses denote the upper tail areas.

Table A-2
Breusch-Godfrey LM Test for Serial Correlation
Modified Haque-Montiel Approach, Using M2

M2	Mar 1986 to Oct 1996	Mar 1986 to Dec 1991	Jan 1992 to Oct 1997
LM(lag=1)[36]			3.23 (0.07)
LM(lag=2)			4.55 (0.10)
LM(lag=3)			6.78 (0.08)
LM(lag=4)			7.66 (0.10)
LM(lag=5)			8.67 (0.12)
LM(lag=6)			8.81 (0.18)
LM(lag=7)			11.60 (0.11)
LM(lag=8)			13.64 (0.90)
LM(lag=9)			13.70 (0.13)
LM (lag=10)			15.08 (0.13)
LM (lag=11)			15.41 (0.16)
LM(lag=12)			16.58 (0.16)
LM (lag=13)	11.03 (0.61)	11.03 (0.61)	16.80 (0.21)

[36]Figures in parentheses denote the upper tail areas.

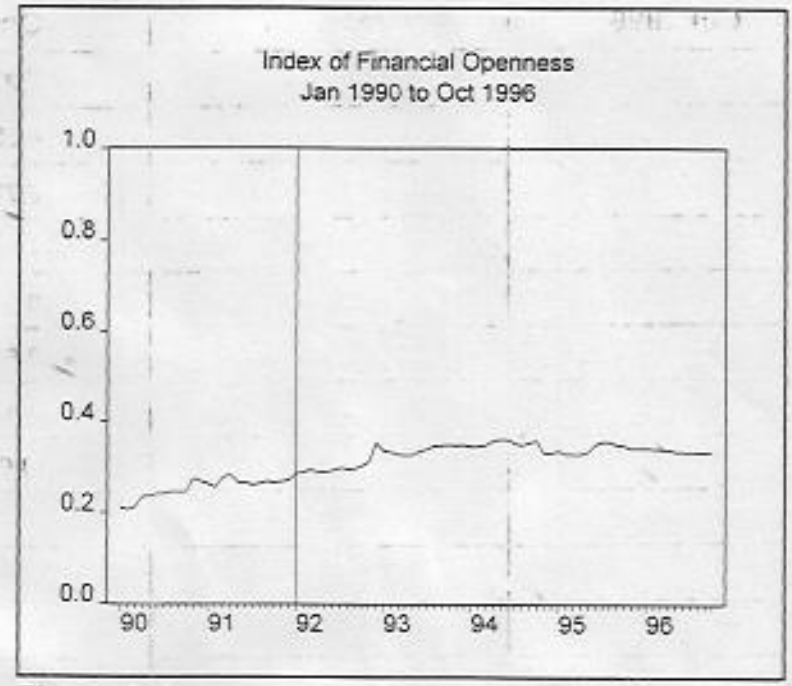
Index of Financial Openness
Jan 1990 to Oct 1996
1.0
0.8
0.6
0.4
0.2
0.0
90
91
92
93
94
95
96

Figure A-1