



WP 2004/1

**CAPITAL MOBILITY AND
FINANCIAL INTEGRATION IN
EMERGING ECONOMIES**

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I. Introduction

The economic mantra of the 1990s, taught by leading economists and institutions alike, was financial openness and capital account convertibility. The echoes are now dying out after the East Asian crisis and the popular approach prevailing is to go in for a kind of tempered financial liberalization where the flood ports are thrown open only after the domestic economy has been put through the paces of internal financial reforms and judicial prudential regulations.

The point being held aloft is that there are benefits, but also costs associated with financial globalization, and that the costs for the individual economy diminish if the ground is well-prepared prior to opening up.

Put in other words, financial integration is beneficial, just as trade liberalization is, if the sequencing is right – and then it is not just a question of the sequencing of trade and financial reforms. The inference is that financial integration does not mean merely opening up for capital in- and out-flows. Such a distinction between financial ‘openness’ and ‘integration’ is strongly made in Le (2000). He argues, in the context of the crises of the 1990s that unstable capital market developments occur when there is a mismatch between financial openness and financial integration. A stable equilibrium can be re-attained if this gap is removed, which can be achieved in quite different ways. Thus, Malaysia tackled such a problem of financial imbalance by placing restraints on capital movements so that the degree of financial openness was cut down towards the level of financial integration. On the other hand, Thailand and Korea took the harder alternative of undertaking reforms and increasing the level of financial integration to remove the imbalance.

The foregoing discussion implies that a country may find itself at different positions on an international comparison of the extent of financial liberalization depending on which of these two measures of financial liberalization is used. An estimate of financial openness can be obtained by looking at the growth in direct investment and financial flows, and the changes in the regulations – and the barriers – associated with these flows. A measure of financial integration is clearly a more involved one, requiring more information. *This paper makes an attempt to develop and compare indices of financial openness and integration of some 17 emerging or newly industrialized countries.*

It may be noted that even between countries with avowed intentions of a speedy process of financial liberalization, there are considerable differences in actual achievement in these regards. Verdier¹ (1998) makes an enquiry into the characteristics of OECD countries, which have embraced financial globalization most enthusiastically. Some of his results may seem counter-intuitive, but are rigorously derived, and it may be of interest to see whether they are applicable to countries outside the OECD group.

This study seeks to distinguish the factors determining the DEGREE of financial integration of countries. Variables representing the basic economic structure and chosen development paths, as well as characteristics often reflecting political choices or the influence of dominant pressure

¹ Verdier, Daniel (1998); "Domestic Responses to Free Trade and Free Finance in OECD Countries"; European University Institute; Department of Social and Political Sciences, Draft No.3, (July) Italy.

groups are tried out. Such a choice of a broad spectrum of variables is especially crucial in a study involving Asian countries among which inter-country differences reign far more than is the case within the OECD family.

The scheme of the study is as follows: The section that follows makes a comparison of the indices of financial openness and integration, highlighting the fact that the concepts are quite different. This section (II) also includes a brief, but fairly comprehensive survey of earlier work on tests of financial integration. The subsequent section (III) conducts tests for the factors that influence the EXTENT or degree of financial integration, using a sample of 17 emerging economies, working with data for the 1990s. There is a final section, which brings together the conclusions and suggestions for further research.

II Financial Openness and Financial Integration: Concepts and Indices

Le (2000) makes a clear distinction between these concepts of financial liberalization, which seems eminently reasonable, though some may argue that it is all a question of terminology. To begin with, it can be reaffirmed that opening up for international capital flows need not always lead to equalization of domestic and international interest rates, adjusted for expected exchange rate depreciation. The interest rate differential, which may persist after opening up, gives an indication of the *degree* of financial integration. With less than perfect integration, interest rate parity will not hold.

For the purpose of international comparison - of the degree of financial integration - another familiar index may also be used, as Le (2000) has pointed out, and which is used in the tests described in the next section. Increased integration will mean that domestic investment is no longer constrained by the level of domestic saving. This implies that the Feldstein-Horioka (F-H) Coefficient, obtained by regressing investment on saving, is representative of the level of integration.

The F-H coefficient, as is well-known, requires that the country's real interest rate 'r' be tied to the world real rate 'r*' as follows:

$$(1) \quad r - r^* = 0$$

With the investment rate specified as

$$(2) \quad I/Y = a + b * r + u,$$

Where y is GDP and u is a vector of other determinants, it is necessary that all these other determinants be uncorrelated with the national savings rate to conduct the F-H test:

$$(3) \quad I/Y = c + d * (S/Y),$$

Where S represents the level of national savings. A high level of financial integration is expected to be then reflected in a coefficient close to zero.

It may be added that some tests of the Feldstein-Horioka condition are negative (Monteil, 1994, Ghosh, 1995) in the sense that tests of capital mobility / financial integration - as now defined by the respective authors - based on savings-investment correlations do not turn up the expected

results. However, this does not preclude this condition from being a test of financial integration, rather than openness, which could be simply represented by variables such as the ratio of FDI to GDP. Montiel (1994) was the first attempt, perhaps, to perform large-scale testing of financial integration in less developed countries by applying a number of different tests, including the Euler Approach. An important finding in that study is that advanced financial integration is truly rare in developing countries

In fact, earlier literature seems to have dealt with four different measures of financial integration (see Frankel, 1992):

- i. The Feldstein-Horioka Condition
- ii. Covered interest rate parity (capital flows equalize interest rates between countries)
- iii. Uncovered interest rate parity (capital flows equalize expected rates of return on bonds, regardless of exposure to exchange risk: the forward premium equals the expected change in the exchange rate)
- iv. Real interest rate parity, when real interest rates are equalized across countries by capital flows.

Of the interest parity conditions, it is the *covered* parity condition that would be usually reached first as integration proceeds. This condition ought to be now met for most industrialized or newly industrializing countries. The *uncovered* parity condition is more difficult to verify as it incorporates a variable that is not directly observable, the speculative exchange rate premium, and most tests of this condition which use the forward premium as a proxy are not confirmative (Marston, 1994). Uncovered interest rate parity implies that the difference in *nominal* interest rates is equal to the anticipated change in exchange rates. If this condition holds, then expected returns on investments in different currencies are identical when measured in the same currency, with the forward premium equaling the speculative premium, the expected change in the exchange rate. Most tests conclude that uncovered parity does not hold, but this could be due to the inefficiency of the forward premium as a predictor of the exchange rate changes, with the speculative premium being unobservable. Marston (1994) tries to get around this problem by employing survey data on exchange rate expectations as a direct measure of the exchange rate premium.

Moving on to the real interest parity condition, this assumes that uncovered parity holds, together with the additional assumption that the expected change in the exchange rate just offsets the anticipated inflation rate differential, thus maintaining the real exchange rate. While the real interest parity condition is thus unlikely to be satisfied at prevailing levels of global integration, the Feldstein-Horioka Condition with a zero coefficient in the savings-investment regression would imply such parity, since investment decisions are taken based on real interest rates. But in this paper we only undertake tests for financial integration based on covered interest rate parity, which would be what is relevant for emerging economies, and then derive Feldstein-Horioka coefficients which are not restricted to a value of zero. In fact, a coefficient of zero may be regarded as unlikely for emerging economies, against the background of earlier studies - for developed economies - that have reproduced a coefficient closer to one than zero several times.

The reasons for the failure of real interest rate parity, and thus the observed lack of complete financial integration, are numerous. The failures may be more when we look at long-term flows, when differences in traditions, business practices, tax laws and even languages loom importantly. So it may be fair to suggest that international financial integration has proceeded further in terms of short-term flows, whereas international substitutability when it comes to long-term bonds, equities and real investments is still lagging behind.

The Feldstein-Horioka (1980) tests were later used by Bayoumi (1990), Eichengren (1992), Obstfeld (1995), Jones and Obstfeld (1997), Taylor and Obstfeld (1998) and Flandreau and Riviere (1999) to chart the progress of financial integration over the years. It is something of a paradox that cross-section and time series studies – reporting both pre- and post-1973 results – show a rising coefficient, indicating falling financial integration over time.² Such a result emerges in Feldstein (1983), Penati and Dooley (1984), Dooley, Frankel and Matheison (1987), Obstfeld (1986, 1989) and Frankel (1986). A number of subsequent studies have suggested reasons why national savings and investment rates may be highly correlated even if real interest rate parity held. National savings and investment may be responding to growth in income and productivity, or to government policies regarding the current account. The argument that 'endogenous' government policies may be the explanation for the Feldstein-Horioka Coefficient being closer to one than to zero in most countries has been put forward by Fieleke (1982), Tobin (1983), Weatphal (1983), Caprio and Howard (1984), Summers (1988), Roubini (1988) and Bayoumin (1990). However, this critique may be countered by pointing out that the endogeneity problem could be handled by having a data series over a long period of time – so that the cyclical effects are taken care of.

Another view is that large countries that can influence world real interest rates will tend to have positively correlated savings and investment rates. So, if r^* is not exogenous with respect to domestic S/Y , then with r equal to r^* , a shortfall in domestic saving that drives up the world rate will reduce investment at home, showing a non-zero F-H coefficient. However, this situation cannot be expected to prevail for most countries. In fact, one simple explanation for the observed phenomenon that the F-H coefficient has been, in fact, indicating less integration over time, is that real interest rate parity has not been holding in recent years, as pointed out by Mishkin (1984).

Obstfeld (1986, 1989) proposed yet another test to assess the degree of financial integration. His test is based on the Euler Equation, which characterizes inter-temporal consumption and investment. It tries to assess whether residents of different countries have access to the same risk-free asset, and incorporates trade in risk-free as well as risky assets.

Such Euler Equation tests, in contrast with arbitrage tests, bypass the problems associated with the definition and measurement of interest rates and the endogeneity of savings and investment. Having said that, it must be added that these tests are, in fact, closely related to the Feldstein-Horioka method of testing for financial integration. Countries with a lower preference for the present are able to shift their consumption into the future by running current account surpluses, while those with higher preferences for the present can consume more in the present through debt accumulation.

All these studies mentioned above – with the exception of Montiel (1994) - have been mostly only concerned with the OECD countries, and a study that has emerging economies in the limelight seems desirable. Also, the present study is, while involved with tests of financial integration, is also concerned with a comparison of the different concepts of financial liberalization, and the impact of these concepts on international comparisons of the degree of financial integration.

Table 1 provides estimates of the Feldstein-Horioka Coefficient, from equation (5) in section III. It is compared with an index of financial openness that is available for the countries in this study in World Bank (2000).

² One explanation is that real interest rate parity has not been more prevalent recently than in the past.

Table 1: Indices of Financial Openness and Financial Integration

Country	FOP A	FOP B	FE-HO Index
Argentina	1.78	2.06	0.25***
Australia	1.77	1.4	
Brazil	1.19	0.74	0.007
China	1.37	4.8	0.92*
India	1.2	0.5	1.02*
Korea	1.42	2.2	0.15*
Malaysia	1.34	5.2	0.39**
Pakistan	1.31	1.0	0.18**
Thailand	1.46	4.7	0.15
Philippines	1.59	2.8	-2.56
México	1.69	2.6	0.36*
Singapore	1.78	7.0	-0.36**
Turkey	1.52	0.9	
Venezuela	1.84	3.4	0.05
Indonesia	1.46	5.3	
South Africa	1.44	2.8	-0.35

In the table, FOP Index A and B represent indices of financial openness, while the FE-HO index is the Feldstein-Horioka Coefficient, used to represent the degree of financial integration.

The level of financial openness represented by the FOP A index in the table is derived, based on the following criteria (see World Bank, 2000)

- Law and / or regulation on particular transactions such as licenses or reserve regulations which completely or partially forbid such transactions
- Law and / or regulations requiring registration and / or approval for a particular transaction, or subjecting it to taxation of different kinds.
- The absence of such stipulations or laws.

The index of financial integration, the Feldstein-Horioka Coefficient, is derived in section III, by estimating equation (5) for all countries in the study. It must be noted, however, while comparing the different indices in table 1, that the financial openness indices are presented for a period in time, while the FE-HO Index is obtained for a whole decade, the 1990s.

FOP B index is based on openness to capital flows as measured by the ratio of foreign direct investment inflows to GDP.

How close are the different indices in the sense of providing a similar ranking of countries? A quick glance is enough to show that the ranking of the countries does not coincide for the indices of financial openness and integration, confirming the assertion that these concepts are not identical. A formal ranking is provided in Table 2 in the next section.

III Tests for the Degree of Financial Integration

The degree of financial integration will be reflected in the interest rate premium over the international interest rate, which will depend on the gap between domestic wealth and capital accumulation per capita. Quite intuitively, the wider the gap between capital accumulation and the wealth level, the higher the premium that has to be paid to be able to borrow abroad, since the level of indebtedness is also higher.

For the sake of estimation, this gap can be proxied by the current account deficit. Since private transfers may be responsive to, and caused by interest rate differentials, we also use the current account excluding these transfers as a determinant, and also try out the primary current account deficit, which excludes debt interest payments.

In all estimations, quarterly data is used. Earlier work in this vein has depended on annual data, which may not be the best choice, especially when working with volatility indices; Le (2000) has also pointed out the desirability of using data of higher frequency. The equations below are estimated for the sample of 17 countries, for the period 1991-2000.

$$(4) r - r^* = e + f^* (CA)$$

$$(5) r - r^* = g + h^* (CA - T)$$

$$(6) r - r^* = j + k^* PCD$$

In equations (4) – (6), r is the domestic interest rate, while r^* is the international (U.S) interest rate. CA is the current account deficit, while 'T' stands for private transfers and PCD the primary current account deficit.

As discussed in the previous section, the Feldstein-Horioka Coefficient is representative of the level of financial integration, and can be used in related tests. It would be interesting to see if domestic interest rates have become less (or more) volatile following increased integration. To test this, we first obtain the FE-HO index using equation (7) for all countries in the sample. For the 1990s:

$$(7) i = m + q^* (s)$$

The coefficient 'q' is the FE-HO index, with 's' representing total domestic saving and 'i' investment (both as ratios to GDP).

Now the Fe-HO index is used in equation (6) to test for the influence of financial integration on domestic interest rate instability.

$$(8) rv = n + p^* (q)$$

rv is interest rate volatility, derived as the standard deviation of percentage changes.

One would expect that interest rates would be more volatile with *less* integration, as then the domestic interest rate will be more strongly responding to domestic policies, and this may be occurring under a regime of non-flexible exchange rates.

Now, the independent variables used in the equations above may be themselves the outcomes of some broader policy and even political choices. Verdier (1998) argues that the degree of financial globalization may be less for countries, which have a relatively decentralized structure, with local

institutions playing major roles. He uses the inflows of foreign direct investment as a percentage to represent financial globalization or openness, and the share of central government revenues in total public revenues to capture the degree of centralization of the economy. It may be noted that he is not conducting a comprehensive study of the *determinants* of FDI inflows; rather, the purpose of the study is to analyze the influence of some broad country characteristics on the process of globalization.

Equation (9) conducts such a study for the influence of decentralization on financial globalization. To represent (proxy, rather) decentralization in the banking sector, *fass*, the share of foreign assets in total assets is used. A population variable (*POP*) is also included, under the premise that centralization tends to be more in large countries – based on the observation that huge countries like India and Brazil have been slow off the mark in embracing globalization. In addition, the other determinants of integration from equation (4) - (6) are also tested out. Equation (10) tests for the influence on such country characteristics on the degree of financial *integration* embedded in interest rate premiums:

$$(9) \quad FDI / Y = k + l * (fass) + t * (POP) + v * (CA)$$

$$(10) \quad r - r^* = w + x * (fass) + y * (POP) + z * (CA)$$

The following statement provides a list of variables used in the estimations for easy reference.

r	Domestic interest rate
r*	U.S interest rate
Rv	Interest rate volatility
CA	Current account deficit
PCD	Primary current account deficit
T	Private transfers
FDI	Foreign direct investment inflow
S	Domestic saving to GDP ratio
I	Domestic investment to GDP ratio
Fass	Foreign assets as percentage of total bank assets
POP	Population

IV Empirical Results

The estimated results of equation (5) are reported first, since the coefficient obtained there has further use in other estimations. This equation, testing whether domestic investment levels are constrained by the level of domestic savings, was run for each of the country in the sample, using quarterly data for the period 1991 – 2000. For estimating this equation as well as for the others in the study, data was obtained from International Financial Statistics, country pages, of the International Monetary Fund.

Table 2 provides the results of the individual country estimations of equation (5). “t” statistics are given within brackets. A single star (*) represents significance at 1% level, ** significance at 5% level, and *** significance at 10% level. Autocorrelation corrections have been done for all the country regressions.

TABLE 2: Results of the Individuals Country Estimation

Country	Coeff, Savings	Constant	Adj R sq.	F-H Coeff.
Argentina	0.24995 (1.807)***	12.76 (4.75)	0.72	0.25***
Brazil	0.0073 (1.108)	19.45 (12.40)	0.72	0.0073
China	0.9166* (6.402)	-0.311	0.89	0.92*
India	1.024* (23.62)	1.27 (1.23)	0.98	1.02*
Korea	0.1528* (3.304)	20.664 (10.34)	0.68	0.15*
Malaysia	0.3898** (1.96)	27.07 (4.84)	0.82	0.39**
Mexico	0.3597* (3.00)	13.26 (5.775)	0.80	0.36*
Pakistan	0.1825** (2.047)	12.75 (5.95)	0.91	0.18**
Philippines	-0.0565 (0.782)	22.88 (16.12)	0.50	-0.06
Singapore	-0.3598** (3.43)	47.02 (14.15)	0.74	-0.36**
South Africa	-0.3455 (0.82)	8.08 (6.41)	0.79	-0/35
Thailand	0.1824 (1.25)	26.75 (2.66)	0.92	0.18
Venezuela	0.051 (0.648)	1.604 (0.65)	0.68	0.051

Referring to back to Table 1, the differences in the country ranking for openness under different concepts is obvious. Table 3 provides a comparison of these rankings, adding also the country ranking when the inflow of portfolio capital as a percentage of GDP, FOP C, is considered.

Table 3

Country	FOP A Rank	FOP B rank	FOP C Rank	F-H Cft Rank
Argentina	2	10	3	4
Australia	3	11	1	
Brazil	14	13	8	Not significant
China	10	4	12	7
India	13	14	13	8
Korea	9	9	6	2
Malaysia	11	3	14	6
Mexico	4	8	12	5
Pakistan	12	12	13	3
Philippines	5	7	11	Not significant
Singapore	2	1	5	1
South Africa	8	7	4	Not significant
Thailand	7	5	7	Not significant
Venezuela	1	6	10	Not significant
Turkey	6	11	9	Not Available
Indonesia	7	2	2	Not Available

As can be seen from the table, the country rankings are not consistent across concepts, except, possibly, for Singapore, which scores more or less at the top always. Korea is seen to do better when the concept of financial integration, represented by the F-H Index, is used. The east and Southeast Asian countries, Korea, Malaysia and Thailand, rank higher in terms of openness to FDI flows, than to portfolio flows, whereas it is the reverse situation for the South American countries Argentina and Brazil. . China is also seen to be more financially open in terms of FDI flows.

Singapore and Korea seem to be the countries in the sample, which have driven the process of financial integration furthest.

The results of the cross-country regressions for financial openness using plausible determinants such as the current account deficit CA (see discussion in the previous section), share of foreign assets in bank portfolios, Fass, etc., are provided in Table 4. The current account deficit is used as a proxy for the gap between domestic wealth and capital accumulation, implying that a larger deficit, representing greater indebtedness, requires a larger interest rate premium to be able to attract international funds.

The variables, share of foreign assets in bank portfolios, and the country population are used as proxies to represent the degree of centralization, which should be affecting the degree of globalization, more centralized countries being slow on the take-off.

The dependent variables in these regressions are the interest rate premiums and the FDI share of GDP, both representing the process of globalization. The overall estimating power of these cross-section regressions are, understandably, very low, and low R squared figures are not reported. What is being ascertained is whether any of the individual independent variables come out with explanatory powers.

Table 4

Equation Number	Dependent Variable	CA	Constant	Fass	POP
9	FDI/Y	0.098** (2.628)	0.9203 (12.53)	0.0065 (2.053)*	
10	r-r*	-0.6271 (1.3376)	12.81 (2.95)	0.0919** (2.378)	
10	r-r*	-0.3031 (0.6729)	17.80 (2.08)		-0.00803 (1.524)
10	r-r*		14.095 (2.795)	0.81103** (2.075)	-0.0055 (1.019)

It can be seen from the tabulated results that the country population is not significant, so that it cannot be presumed that large countries invariably lag behind in embracing globalization. The foreign asset variable comes out significant in all the regressions. Current account deficits are seen to be significant only in the run with the FDI share of GDP as the dependent variable. It also has the right sign, and would be expected, if significant, to have a positive sign in the regressions with the interest rate premium as the dependent variable.

The estimation for equation (8), which relates interest rate volatility (rv) to financial integration, did not produce any significant results:

Table 5

Equation Number	Dependent variable	F-H Coefficient	Constant	Adj R Squared
8	rv	-2.756 (-0.6)	7.64 (4.4)	0.1

Thus it seems that differences in volatility of interest rates across countries cannot be related to the varying degrees of financial integration attained by these economies.

V. CONCLUDING REMARKS

The extent of an economy's globalization and that of financial integration clearly depends on which definition is used. It has been shown in this study that countries obtain different rankings in an international comparison on financial integration, as opposed to that of financial openness, which relates chiefly to capital mobility across borders. An interesting result of the empirical analysis is that Southeast and East Asian countries fare better than the South American nations when the concept of financial integration is used as the measuring yardstick. Put simply, this would mean that the latter group of countries encourages capital mobility, with laws favourable to short and long-run financial flows but are still faced with a foreign exchange constraint, which prevents adequate inter-temporal smoothing of consumption and investment.

Now, the well-known two-gap models in development economics literature highlight two important constraints faced by developing countries: one of (a shortage of) domestic savings and the other of a lack of adequate foreign exchange - for imported capital goods inputs. It would seem that while all the countries in the study sample here may have traversed beyond the constraint of inadequate domestic savings level, the shortage of foreign exchange continues to pose problems for many, as is seen in the fact that investment levels are still inexorably tied to domestic savings levels. It would seem that countries like Korea which are financially integrated with the global economy to a great extent may have surpassed even this second gap of a foreign exchange constraint on development. It is possible that such a feat is related to superior export performance as well and not merely to the facilitation of international financial flows. Such a reasoning may be justified by pointing out that with excellent export performance, the risk of capital flight may be less as there would be greater trust entertained by international investors on the prospects of the domestic economy.

There is no evidence that increased financial integration reduces interest rate volatility, something that would augur well for positive investor sentiments and growth. This result could be due to the inclusion in the sample of countries with administered interest rates over long periods, quite unresponsive to the needs of optimum resource allocation in the economy.

This paper has not attempted to make suggestions about any 'optimal' degree of financial integration. What *is* implied from the discussion is that true financial integration would not be limited to financial "openness", but would, importantly, include the enforcement of prudential regulations and laws which would make the domestic economy's financial sector comparable to that of the leaders in the global financial community. In other words, domestic financial reform forms an integral part of the financial integration process. It would be also required, as is stressed always by multilateral financial bodies such as the International Monetary Fund, that developing countries, despite the demands of the growth process, should nevertheless follow policies which maintain macroeconomic stability. However, this need not rule out - as these financial institutions would seem to suggest - dirigiste capitalism of the East Asian type, which does not balk at favouring and nurturing selected industries with subsidized lending.

It has also been suggested that large foreign exchange reserves could serve as a protection against financial upheavals, quoting the example of China, but this seems doubtful given the immense magnitudes of short-run capital flows. What may be more of a buffer against financial crises is for the newly industrialized countries to traverse gradually and cautiously on the road to full capital account convertibility, retaining selected capital controls while going ahead with domestic financial reforms and thus progressing on the path to true financial integration. Thus it may be fair to posture that the optimal degree of financial openness and extent of capital controls would not be identical across countries, varying, among other things, with the state of the domestic financial sector, the nature of industrial policies, and the strength of their export sector.