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**MEASURING INTERNATIONAL CAPITAL  
MOBILITY: RECENT EVIDENCE FROM  
ALTERNATIVE TESTS**

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## Measuring International Capital Mobility: Recent Evidence from Alternative Tests\*

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### Abstract

This paper updates some of the evidence on the extent of international capital mobility. It firstly examines the law of one price implication for financial assets when capital is perfectly mobile by investigating onshore-offshore differentials of three-month interbank interest rates for five OECD countries. The evidence from these differentials suggests that international financial flows are much more mobile now than they were at the beginning of the 1980s, but still not perfectly mobile as defined in the literature. Secondly, we briefly summarise the results from some of the recent studies which investigated the extent of international portfolio diversification. This latter set of evidence point out that there is still a strong preference for home-assets among most of the OECD countries investigated which would suggest that capital may be less mobile than indicated by the narrowing of onshore-offshore differentials. Finally, by investigating more current financial flow data on the composition of financial assets/liabilities of a group of OECD countries we provide up-to-date evidence on the pattern of international financial investment flows for these countries.

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## Introduction

The deregulation of financial markets, the relaxation and abolition of capital controls, the creation of new financial products, and the advances in communication and transaction technologies have all contributed to the increased international trade in financial assets over the last two decades. This huge increase in cross-border financial transactions, some would argue, is ample evidence that capital is highly mobile internationally. But, unfortunately however, there is no such consensus among economists.

On the one hand, there are those economists who argue that capital is much more immobile internationally than the recent growth in the trade in international financial assets superficially suggests. To support their case, they point to two facts in the global economy. First, available evidence on international investment portfolios shows that these portfolios are not as internationally diversified as a high degree of international capital mobility would infer.<sup>1</sup> For example, only ten percent of the value of the assets in the five hundred largest institutional portfolios in the world are invested in foreign securities (Feldstein (1995)). We review some of the evidence on the extent of international portfolio diversification in a later section of the paper.

Second, the strong correlation between the rates of domestic savings and investment (particularly among OECD countries), which was first pointed out by Feldstein and Horioka (1980), has been interpreted as indicating low international capital mobility because most domestic savings are retained in the domestic economy to finance domestic investment. If capital were free to move internationally, there would be no reason for domestic savings and investment to be associated because funds would flow from countries with high savings to those with the best investment opportunities. This highly controversial result has generated a very extensive literature as several economists have challenged both the *result* itself and the *interpretation* of the result.<sup>2</sup>

For the supporters of a high degree of global capital mobility, the evidence on the closeness in prices of comparable financial assets which are traded in different locations is usually cited. Thus the fact that the rate of return on German deposits in Frankfurt is identical to the return on the same German deposit being traded in the London Eurocurrency market is taken as evidence that the international financial markets are highly integrated and that capital is highly mobile internationally.

The purpose of this paper is primarily to update some of the available evidence on the degree of international capital mobility. More specifically, we examine recent data on domestic (onshore) and Eurocurrency (offshore) interest rates for five OECD countries to assess how close these rates are. We also briefly summarise some of the findings on the extent of international portfolio diversification, update some of this evidence.

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<sup>1</sup> See Feldstein (1995).

<sup>2</sup> For excellent reviews of the literature on the "saving-investment correlation", see Obstfeld (1995), and Coakley, *et. al.* (1995).

The paper is organised as follows. Section one provides some definition and theory pertaining to international capital mobility. Section two presents the evidence on the relationship between onshore and offshore domestic interest rates, and section three provides a brief review of the literature on the degree of international portfolio diversification. Additionally, we present additional evidence on the extent of international portfolio diversification. Section 4 concludes the paper.

## 1. International Capital Mobility: Definition and Some Theory

Following Obstfeld (1995) capital can be said to be freely mobile within the global economy when the following two conditions are met:

- (a) economic agents, irrespective of their country of residence, are not impeded in either the negotiation or execution of financial transactions anywhere and with anyone within the global economy by any kind of barriers/restrictions erected by national governments, and
- (b) economic agents are confronted with identical transactions costs throughout the global economy regardless of their country of residence so that these costs are no greater for economic agents residing in different countries within the global economy than for economic agents living in the same country.

The implication of this definition is that national governments treat financial transactions between their residents and non-residents in much the same way as they do financial transactions between their own residents. Thus governments do not intervene in the financial transactions between their residents and the residents from different countries - that is, foreign or external financial transactions -, other than through the provision of a legal framework for the enforcement of these financial contracts which does not discriminate against any economic agents because of their country of residence.

Reality may differ, however, from this ideal of free capital mobility because governments may impose discriminatory cross-border taxes on capital flows, capital controls and other quantitative restrictions which serve to disrupt the free movement of capital.

One way of assessing the extent to which international capital mobility in the real world approximates this ideal case is to compare the actual international capital movement to the benchmark of *perfect* capital mobility. Under perfect capital mobility, capital will be free to move internationally, and transactions costs will be zero.

### 1.1. The Law of One Price: Onshore-offshore Interest Rate Differential

The simplest implication of perfect capital mobility is that the price of an asset must be identical irrespective of its location of sale - that is, the law of one price holds for financial assets. The pound sterling price of £1 to be delivered in country M one period from today is  $1/(1 + i_t^M)$ , where  $i_t^M$  is the one-period nominal pound interest rate in country A. On the same date in country N, the pound price of £1 to be delivered in country B the same period from today is given by  $1/(1 + i_t^N)$ , and  $i_t^N$  is the one-period nominal pound sterling interest rate in country B. Under perfect capital mobility  $i_t^M = i_t^N$  holds.

Previous empirical studies (for example, Obstfeld (1986, and 1994) and Frankel (1993)) have examined this implication of perfect capital mobility by comparing onshore (domestic) and offshore (London Eurocurrency market) nominal interest rates on loans for the same currency. This is clearly the most direct and comparatively unambiguous measure of the extent of international capital mobility.

Here, we essentially follow Obstfeld (1995) by examining the information on both interbank bid and ask rates. The interbank bid interest rate ( $i_{jB}^M$ ) is the rate at which banks are prepared to pay on a deposit denominated in currency  $j$  and located in country (financial centre)  $M$ , and the interbank ask interest rate ( $i_{jA}^M$ ) is the rate at which banks are willing to lend funds denominated in currency  $j$  in  $M$ . The use of both bid and ask rates allows the examination of a wider range of implications under free capital mobility.

## 1.2. International Portfolio Diversification

If capital is freely mobile in the sense described previously then one may expect that economic agents will take the opportunities available to diversify their asset portfolios internationally. Thus it may be the case that, as economic agents take advantage of the possibilities to diversify their consumption risks which are available as a result of the free mobility of capital, this might be reflected in an increase in the proportion of foreign assets held in their portfolios. In other words, one might expect that with free capital mobility, asset portfolios might be “internationalised” and more foreign assets will be held by the residents of a particular country. We report below, in section 3, the findings of some recent studies which have investigated the extent of international portfolio diversification. We also examine this implication of free international capital mobility by investigating the share of the cumulated net flows in the total assets and liabilities of a group of OECD countries which is attributed to the cumulated changes in external assets and liabilities. Our analysis follows Golub (1990), and can be viewed as a revision and update of the evidence presented in his paper.

## 2. The Law of One Price: Evidence on Onshore-offshore Interest Rate Differential

When capital is free to move internationally, bank borrowers can make use of the cheapest market, and bank lenders can place their funds where the (net) return is most lucrative. This implies that:

- (a) bank borrowing rates should be identical across financial centres - ( $i_{jB}^M = i_{jB}^N$ );
- (b) bank lending rates should be identical across financial centres - ( $i_{jA}^M = i_{jA}^N$ );
- (c) arbitrage opportunities are eliminated, so that it is impossible for an arbitrageur to make riskless profits by borrowing in one financial centre at the ask rate and lending in another financial centre at the bid rate - ( $i_{jB}^M - i_{jA}^N < 0$  and  $i_{jB}^N - i_{jA}^M < 0$ ); and
- (d) the ask rate-bid rate spread should be identical across financial centres - ( $[i_{jA}^M - i_{jB}^M] = [i_{jA}^N - i_{jB}^N] = \lambda$ , and  $\lambda > 0$ ).

It should be pointed out that the implications (a) to (d) are not independent of each other. For example, the ask rate - bid rate spread must be identical across financial centres if bid rates are identical everywhere, as are ask rates - i.e. (d) follows trivially from (a) and (b). Similarly, arbitrage profits must be negative if an arbitrageur were to

borrow in one financial centre at the ask rate prevailing there and invest the funds borrowed in another financial centre to earn the bid rate prevailing in this centre - i.e. (c) follows trivially from (a), (b) and (d). Thus, a hypothetical arbitrage operation, which is undertaken by an arbitrageur, involving borrowing in financial centre N at the ask rate and lending the funds in financial centre M at the bid rate can only be profitable if the bid rate in financial centre M is higher than that prevailing in financial centre N and the ask-bid spread in financial centre N is smaller than the difference between the two bid rates. In other words, using the notation of the implications,  $i_{jB}^M - i_{jA}^N > 0$ , if  $i_{jB}^M - i_{jB}^N = \tau$ ,  $\tau > 0$ ,  $i_{jA}^N - i_{jB}^N = \lambda$ ,  $\lambda > 0$ , and  $\tau > \lambda$ .

## 2.1. The Data

We examine daily three-month domestic and Eurocurrency interbank bid and ask interest rates for France, Germany, Japan, the Netherlands, and the United Kingdom over the period 1 January, 1981 to 1 September, 1995.<sup>3</sup> (The data for Japan is incomplete: there are only data on the domestic ask rate, and both Euroyen bid and ask rates, and the domestic ask rate data commences from 30 December, 1985 and not on 1 January, 1981 as for the other countries). The data were obtained from DATASTREAM.

The sample is segmented into five sub-periods.<sup>4</sup> Period 1 runs from 1 January, 1981 and extends to the end of January, 1987. The termination of this period coincides with the establishment of the Single European Act in January 1987. The second period goes from 1 February, 1987 to the end of June 1990. Period 3 commences on the 1 July 1990 - the deadline for the abolition of French capital controls under the Single Market Programme- and extends to the end of May 1992. Period 4 begins on 1 June, 1992 (the month of the initial Danish referendum on the Maastricht treaty on European monetary and political union) and goes to the 31 July, 93. This period covers the recent turbulence in the ERM, which began with the September 1992 crisis which witnessed the withdrawal of the Italian lira and British pound from the ERM, and the subsequent events in 1993 which finally lead to the widening of the bands of the exchange rate system in August 1993. Finally, the fifth period begins on 1 August 1992 and extends through to 1 September, 1995 and covers the present regime of wider exchange rate bands in the ERM.

## 2.2. The Results

Table 1 presents the results for the group of OECD countries, France (panel A), Germany (panel B), Japan (panel C), the Netherlands (panel D), and the United Kingdom (panel E). The first two columns compute the period averages of differences between the onshore and offshore bid and ask rates (with the corresponding standard deviations in parenthesis). The next two columns compute the period average arbitrage profits (with the corresponding standard deviations in parenthesis) from hypothetical arbitrage operations respectively involving borrowing in the Eurocurrency market at

<sup>3</sup> Obstfeld (1995) provides data for the France, Italy, Germany, and Japan for the period 1 January, 1982 to 30 April, 1993. Our results for France, Germany, and Japan can be viewed as updating those presented by Obstfeld, whilst here, we additionally provide evidence from Dutch and British data.

<sup>4</sup> The segmentation of our sample is a modification of Obstfeld's (Obstfeld (1995)): our first sub-period starts one year earlier than his; sub-periods two and three are identical to his; our sub-period four is three months longer than his sub-period four; and our period is the new updated sub-period.

the ask rate and lending in the domestic market at the bid rate, and borrowing in the domestic market at the ask rate and lending in the Eurocurrency market at the bid rate. The last two columns contain the period average domestic ask rate-bid rate spread and the Eurocurrency ask rate-bid rate spread respectively. The results are expressed in basis points at an annual rate.

### *France*

For France, period one contains evidence of substantial barriers to capital mobility. The offshore bid and ask rates are on average much higher than those onshore, and average offshore ask-bid spread is substantially higher than that onshore. Further, the average profitability from a hypothetical arbitrage operation involving onshore borrowing at the domestic ask rate and offshore lending at the eurofranc bid rate is substantial. These findings confirm that France maintained controls on capital outflows that essentially held domestic interest rates below eurofranc rates (Obstfeld (1995), and Giavazzi and Pagano (1985)).

Periods 2 and 3 witnessed a sharp fall in both average French franc onshore-offshore bid and ask differentials (relative to period 1) and a narrowing of the gap between the onshore bid-ask spread and its offshore counterpart. Arbitrage opportunities have (on average) been eliminated. The standard deviations of the differentials are also much lower in these two periods than those in period 1. These results (particularly those for period 3) clearly reflect the French removal of capital controls as part of the Single Market Programme.

A small increase in the French franc average onshore-offshore bid differentials (relative to period 2), a widening in the gap between the average onshore ask-bid spread and the average offshore ask-bid spread and larger standard errors (relative to those in both periods 2 and 3) are suggestive of the turbulence in period 4 caused by the crises in the ERM. However, as in the previous two periods, there is still an absence of arbitrage opportunities (on average).

The final period witnessed the further general tendency in the convergence in the French average onshore-offshore bid and ask differentials. The gap between the onshore ask-bid spread and the offshore ask-bid spread has narrowed considerably in this period that they are almost identical. Moreover, we witness yet again the absence of positive arbitrage profits in this period. This period is also impressive in that it throws up the smallest average differentials in both onshore-offshore bid and ask rates for the entire sample. (Figure 1.A.2 depicts the onshore-offshore bid differential for this period).

Overall, it is clear that since 1987, there has been a general proclivity towards the average convergence in the French domestic rates with those in the eurofranc market, and this process has continued since the widening of the exchange rate bands in the ERM in August 1993. Thus, on the basis of this evidence, the integration of the French franc onshore and offshore markets is much higher today than it was prior to February, 1987. (Figure 1.A.1 depicts the onshore-offshore bid differential for the entire sample period).

### *Germany*

During Period 1, German onshore interest rates were marginally higher than those offshore which seems to suggest that the government, prior to February 1987, opted for measures to dissuade capital inflows. Average onshore ask-bid spread is also bigger than that offshore. Additionally, a small average profitability exists from a hypothetical offshore borrowing - onshore lending arbitrage operation for this period, which may not be that surprising given that onshore rates were higher than those offshore.

From February, 1987 to 1 September, 1995 we observe a general narrowing of the average onshore-offshore bid and ask differentials and the gap between the mean onshore ask-bid spread and the offshore ask-bid spread. There is also an absence of average arbitrage opportunities through these latter four periods as the mean arbitrage profits are consistently negative. And in contrast to the French rates, we do not observe the same increase in the standard errors of the differentials during the period from the 1 June, 1992 to the end of July, 1993, although these standard deviations are marginally larger than those for period three.

The period since the widening of the ERM bands displays the smallest mean onshore-offshore bid and ask differentials for the entire sample ( this is similar to the results for the French interest rates) as well as the lowest standard errors for the entire sample. Hence the narrowing of the onshore-offshore differentials is clearly enhanced in this latter period (see Figure 1.B.2).

With the exception of period three, both the domestic bid and ask rates are higher than those in the euromark market, though these average differentials fall appreciably after February 1987. Once again the pattern is clear: German onshore and offshore three-month interbank markets are much more integrated now than they were prior to 1987 (Figure 1.B.1 summarises this pattern).

### *Japan*

As was pointed out earlier, the data for Japan is not complete, but the available information also lends support to the general tendency of a fall in the onshore-offshore differentials over time (see Figure 1.C.1).

The Japanese data, in common with the French and German data, shows that the mean onshore-offshore ask differential narrows over time as well as the mean offshore ask-bid spread. From July, 1990, the mean onshore-offshore ask differential remains quite small (relative to the preceding two sub-periods) at about one basis point. But we also find that in periods 1 and 3 respectively there does exist positive (and small) mean arbitrage profits from borrowing onshore and lending offshore. The standard errors on the Japanese onshore-offshore ask differential did not increase during the turbulence in the ERM, perhaps reflecting, as one might expect, that there were no spillover effects from the problems being faced in the exchange rate system onto the domestic interbank yen market and the euroyen market.

### *Netherlands*

Throughout the entire sample period, the Dutch mean onshore-offshore bid (see Figure 1.D.1) and ask differentials, and the gap between average onshore ask-bid spread and average offshore ask-bid spread were remarkable minuscule - although the offshore



ask-bid spread was, in general, slightly bigger than that onshore. The closeness of these onshore and offshore rates demonstrates how highly integrated the Dutch domestic interbank market is with the euroguilder interbank market. Additionally, mean arbitrage profits were negative throughout the entire sample period, reflecting the absence of (average) arbitrage opportunities.

#### *United Kingdom*

The findings for the United Kingdom are very similar to those for the Netherlands, in that throughout the entire sample period both mean onshore-offshore bid (see Figure 1.E.1) and ask differentials are quite small, and mean arbitrage profits are consistently negative. However, unlike the Dutch case, the British average onshore bid-ask spread is generally larger than the mean offshore ask-bid spread throughout the entire sample.

As was depicted in the French data, the turbulence in the ERM during the fourth sub-period is once again reflected in the comparatively large standard errors for the British onshore-offshore differentials, and the widening of the gap between the average onshore bid-ask spread and the mean offshore ask-bid spread. The standard errors for the onshore-offshore differentials for this sub-period are much higher than those for any other sub-period in the entire sample. And similar also to the French scenario, we observe once again a fall in these standard errors and the narrowing of the gap between the average onshore bid-ask spread and the mean offshore ask-bid spread, in the period following the widening of the ERM bands.

#### *General comments*

The picture painted by the comparison of onshore three-month interbank interest rates with those offshore for our five OECD countries is quite clear: there has been a noticeable fall in the differentials between the two sets of interest rates and this tendency has continued since the widening of the ERM bands in August 1993. Thus, on the strength of this evidence we can conclude that international capital mobility (among OECD countries) has undoubtedly increased since the beginning of the 80s, though it still does not satisfy precisely the theoretical condition of perfect capital mobility.

### **3. The Evidence on International Portfolio Diversification**

With free international capital movement, the assets issued in one country will not in general be held solely by the residents of that country - particularly if the country is small - as non-residents will have the same opportunities to acquire these assets in order to diversify their portfolios and their consumption risks.

Recent studies by Cooper and Kaplanis (1991), French and Porteba (1990, 1991), Golub (1990, 1991), Howell and Cozzini (1990, 1991) and Tesar and Werner (1992, 1995) have all pointed out that there is substantial "home-bias" in the investment portfolios of investors in OECD countries, despite the potential gains to be had from international diversification. Thus it appears that investors in OECD countries are not as diversified as standard models of portfolio choice would suggest.

Given the evidence from onshore-offshore interest rate differential, and the high rate of turnover in foreign assets relative to domestic assets, it is frequently pointed out that neither transactions costs (Tesar and Werner (1995)) nor government restrictions (French and Porteba (1991)) are sufficiently large to explain this preference for domestic assets displayed by investors. Hence there is somewhat of an *international diversification puzzle* (Obstfeld (1995)).

More plausible explanations seem to rely on investors' behaviour. French and Porteba (1991) argued that investors might have different perceptions of the riskiness of foreign assets relative to domestic ones because of the problem of asymmetric information. Moreover, investors may also hold irrational expectations concerning the relative return on domestic and foreign assets. Whatever the reasons, the low degree of international asset diversification is evidence which is uncomfortably juxtaposed with the evidence on onshore-offshore interest rate differentials, from the point of view of assessing the degree of international capital mobility.

### 3.1. Another Look at the Degree of International Portfolio Diversification

The extent of international capital mobility may be evaluated by comparing the relationship between assets issued in a given country and asset holding of the same country. In order to facilitate this comparison we employ the benchmark employed by Golub (1990). The annual changes in a country's gross positions in foreign financial assets and liabilities can provide useful insights into the extent of international capital mobility. This is because such annual changes capture both the changes in investors' portfolio preferences and transactions costs (as implied by the degree of turnover). Given a country's size in the world financial market, we assess the extent to which the share of its gross flows in foreign assets/liabilities are correlated with its size.

Consider a two-country world in which the residents of country M are both borrowers and lenders in their domestic financial markets and the foreign financial markets, as are the residents of country N. Let  $B_j^M$  and  $B_j^N$  be the value of borrowing (expressed in currency j) undertaken by the residents of country M and N, and let  $L_j^M$  and  $L_j^N$  represent respectively the value of lending undertaken by the residents of country M and N. Lenders in country M may lend to domestic borrowers (denoted  $L_j^{mm}$ ) or foreign borrowers ( $L_j^{mn}$ ), and similarly, lenders in country N may lend to domestic borrowers ( $L_j^{nn}$ ) or foreign borrowers ( $L_j^{nm}$ ). We can now summarise the world's flow of funds by the following two financial-market clearing conditions, for the total assets of country M and N respectively:

$$(1) \quad B_j^M = L_j^{mm} + L_j^{nm}$$

$$(2) \quad B_j^N = L_j^{nn} + L_j^{mn}$$

Let  $s^m$  represent the share of country M in global lending - that is,  $s^m = L_j^M / (L_j^M + L_j^N)$  - , and  $s^n (= 1 - s^m)$ , the share of country N in global lending. Then under perfect capital mobility, and with the absence of home-bias in assets preference, there will in essence be a single global capital market, and the share of asset issues held by the

residents of either country will be dependent only on the relative size of each country in the global financial market. Formally, we have

$$(3) \quad s^m = L_j^{mm}/B_j^M = L_j^{mn}/B_j^N$$

$$(3a) \quad s^n = L_j^{nm}/B_j^M = L_j^{nn}/B_j^N$$

For small countries ( $s^m \rightarrow 0$ ), one would expect to see its lenders holding a large proportion (relative to the country size) of foreign assets in their investment portfolios and its borrowers obtaining a substantial share of their total liabilities from lenders. On the other hand, for large countries ( $s^m \rightarrow 1$ ), the share of domestically-issued assets would be large but we do not expect it to significantly exceed the country's share of the global financial market.

Assuming a current account balance of zero or zero net foreign lending ( i.e.  $L_j^{nm} = L_j^{mn}$ ), then (3a) implies

$$(4) \quad s^n = L_j^{nm}/B_j^M = L_j^{mn}/B_j^M$$

Equation (4) provides us with a simple framework for assessing the extent of international capital mobility. The ratios of foreign capital inflows and outflows to total domestic asset flows of the country can be used to ascertain the degree of international capital mobility.<sup>5</sup>

### 3.2. The Data and Results

We utilise the annual flow data from the OECD *Financial Statistics*, Tables 21F and 34F for the period 1970 -1991.<sup>6</sup> The sample is further segmented into three sub-period: 1970-1979, 1980-1986, and 1987-1991. The results for all financial flows are presented in Table 2. Table 3 presents the results for disaggregated flows in the bond market, and Table 4 summarises the results for the disaggregated flows in the equity market.

The first column of each sub-period in Table 2 gives the ratio of each country's total gross cumulated domestic financial flows to the total gross cumulated domestic flows for all the OECD countries appearing in Table 2 (expressed in percentage). Thus this ratio is equivalent to each country's size in the global financial market (i.e.  $s^i$ ,  $i =$

<sup>5</sup> Note that although (4) is derived under the assumption of current account balance, the ratio of foreign inflows (foreign borrowing by the domestic residents) to total domestic asset flows ( $L_j^{nm}/B_j^M$ ) is independent of this assumption (as in (3a)). The ratio of foreign outflows (domestic lending to non-residents) to total domestic asset flows  $L_j^{mn}/B_j^M$  is not. Thus in the context of large current account imbalances it may be more appropriate to use  $L_j^{nm}/B_j^M$ . Additionally, the comparison of  $L_j^{nm}/B_j^M$  to  $s^n$  will tend to understate the extent of capital mobility for countries with large current account deficits and accentuate it for those with the large current account surpluses. For these reasons one may wish to give more emphasis to the comparison of  $L_j^{nm}/B_j^M$  to  $s^n$ .

<sup>6</sup> See the statistical appendix in Golub (1990) for the details of the derivation of the various categories in Tables 2 - 4.

1,...,m, n). The second and third columns in each sub-period respectively give the ratio of each country's cumulated changes in its foreign liabilities to its gross cumulated changes in its total domestic assets ( $L_j^{nm}/B_j^M$  in the model), and the ratio of each country's cumulated changes in foreign assets to its gross cumulated changes in its total domestic assets ( $L_j^{mn}/B_j^M$  in the model). (The columns in Tables 3 and 4 are similarly defined in terms of bond and equity flows respectively).

*Table 2: Aggregated Flows*

For all countries appearing in Table 2, both  $L_j^{nm}/B_j^M$  and  $L_j^{mn}/B_j^M$  are much smaller than  $s^n$  as would be expected from equation (4). This suggests that capital mobility is far from perfect. Nonetheless, capital mobility appears to have increased since 1970, as both the sample averages of  $L_j^{nm}/B_j^M$  and  $L_j^{mn}/B_j^M$  have respectively risen from 11.6 percent and 11 percent in 1970-79 to 19.1 percent and 17.6 percent by 1987-91. Further, all of the countries, with the exception of the USA and the UK, have individually witnessed an increase in both  $L_j^{nm}/B_j^M$  and  $L_j^{mn}/B_j^M$  in the sub-period 1987-1991 relative to the 1970s.

*Table 3 and 4: Bond and Equity Flows*

It might be more meaningful to consider the disaggregated flows in both bonds and equities because the aggregate flows contain large flows between banks which might, in practice, be difficult to distinguish between domestic and foreign capital flows.

The results for the disaggregated bond flows (Table 3) are quite similar to those for the aggregated flows presented in Table 2. By the criterion in equation (4) bonds flows are not characterised by perfect mobility. However, international capital mobility in bonds has increased since 1970. Both the sample averages of  $L_j^{nm}/B_j^M$  and  $L_j^{mn}/B_j^M$  have respectively risen from 14 percent and 3 percent in 1970-79 to 35.2 percent and 10.9 percent by 1987-91. Capital mobility has increased individually for most countries in the periods 1980-1986 and 1987-1991 relative to the 1970s.

For most countries, equity flows appear to be much more internationalised than those for both bonds and total financial flows. But the results in Table 4 may reflect more the high turnover rates in both domestic and foreign equity markets (see Tesar and Werner (1995)) rather than the extent of international capital mobility in equities. The large cumulated ratios for both equity inflows and equity outflows in the USA in 1987-1991 is a good example of this. These ratios are exaggerated by the increases in both equity inflows and outflows which are related to large decreases in the total domestic equity flows during this period. (Note that the USA's share of the total OECD equity flows is quite small). Based on these figures, the USA satisfies the conditions (given in equation (4)) for perfect capital mobility (as does Germany, UK, Holland, and Sweden based only on the  $L_j^{nm}/B_j^M$  ratios) and displays no trace of home-bias in its investment portfolio flows. But these figures contradict the generally held perception of domestic bias in asset portfolios which is supported by the evidence from stock data. Despite this however, the sample averages of  $L_j^{nm}/B_j^M$  and  $L_j^{mn}/B_j^M$  have risen spectacularly from 19.5 percent and 32.7 percent respectively in 1970-79 to 46.7 percent and 118.3 percent by 1987-91.

The overall picture given by Tables 2 - 4 is that capital mobility (among the group of the OECD countries) had indeed increased since 1970s but there is still a substantial

home-bias in the overall portfolio of these countries' investors. Gross external inflows and outflows, though increasing still remain comparatively small.

#### 4. Conclusion

The evidence on onshore-offshore differentials presented in this paper has highlighted how closely integrated international financial markets are. On the other hand, the evidence on the share of foreign assets and liabilities flows in total domestic flows, though rising throughout the 1980s and the first couple of years in the 1990s (relative to the 1970s) remains relatively small. The predominant view is that this relatively low degree of international portfolio diversification has more to do with the attitudes of the investors than with impediments in the global financial markets.

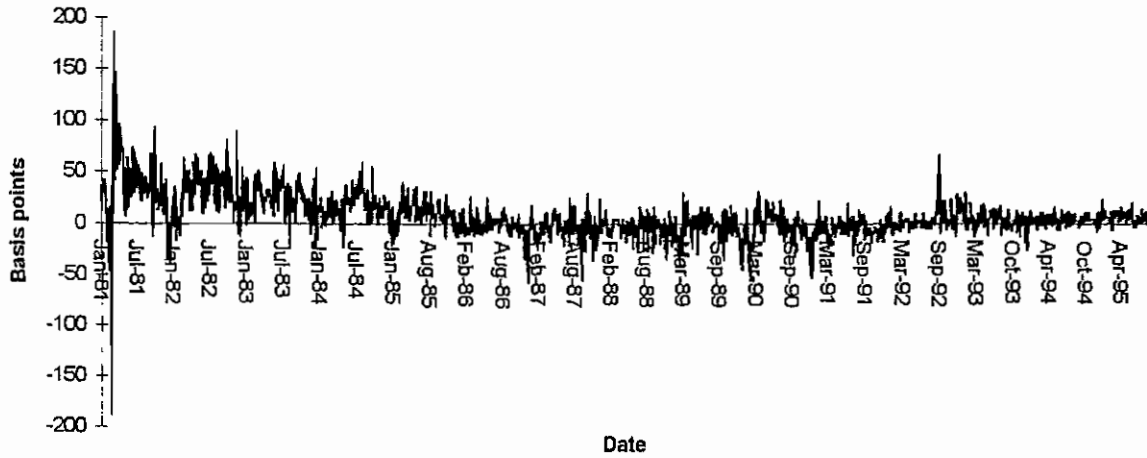
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**Table 1**  
**Three-Month Domestic Interbank-Eurocurrency Interest Rate Differentials: Daily Data,**  
**1 January, 81 to 1 September, 1995 (basis points at an annual rate)**

<b>A. France</b>						
<b>Period</b>	<b>BIDDIF</b>	<b>ASKDIF</b>	<b>OFBONL</b>	<b>ONBOFL</b>	<b>ONASKBID</b>	<b>OFASKBID</b>
1.1.81 - 31.1.87	-225 318	-261 370	-276 372	210 317	15 9	51 68
1.2.87 - 30.6.90	-11 17	-11 18	-24 18	-2 17	12 4	13 4
1.7.90 - 31.5.92	1 6	0.3 6	-12 6	-13 6	12 2	13 3
1.6.92 - 31.7.93	-7 26	1 27	-32 41	-26 33	33 35	25 28
1.8.93 - 1.9.95	-0.3 12	-0.3 12	-15 14	-15 13	16 8	16 8
<b>B. Germany</b>						
<b>Period</b>	<b>BIDDIF</b>	<b>ASKDIF</b>	<b>OFBONL</b>	<b>ONBOFL</b>	<b>ONASKBID</b>	<b>OFASKBID</b>
1.1.81 - 31.1.87	19 23	21 27	6 23	-34 27	15 16	12 4
1.2.87 - 30.6.90	9 23	10 11	-3 22	-23 10	13 20	12 1
1.7.90 - 31.5.92	-5 9	-5 8	-17 9	-7 8	12 3	13 1
1.6.92 - 31.7.93	6 10	4 11	-7 10	-16 11	11 2	13 2
1.8.93 - 1.9.95	3 5	1 5	-9 5	-13 5	10 1	12 1
<b>C. Japan</b>						
<b>Period</b>	<b>BIDDIF</b>	<b>ASKDIF</b>	<b>OFBONL</b>	<b>ONBOFL</b>	<b>ONASKBID</b>	<b>OFASKBID</b>
1.1.81 - 31.1.87	n.a.	-12 9	n.a.	4 10	n.a.	13 6
1.2.87 - 30.6.90	n.a.	-10 9	n.a.	-2 9	n.a.	12 4
1.7.90 - 31.5.92	n.a.	1 6	n.a.	10 7	n.a.	9 3
1.6.92 - 31.7.93	n.a.	1 4	n.a.	-8 4	n.a.	7 2
1.8.93 - 1.9.95	n.a.	1 4	n.a.	-8 4	n.a.	7 2
<b>D. Netherlands</b>						
<b>Period</b>	<b>BIDDIF</b>	<b>ASKDIF</b>	<b>OFBONL</b>	<b>ONBOFL</b>	<b>ONASKBID</b>	<b>OFASKBID</b>
1.1.81 - 31.1.87	1 10	0.3 10	-13 11	-14 9	13 5	13 6
1.2.87 - 30.6.90	6 7	4 7	-7 7	-16 8	10 4	13 2
1.7.90 - 31.5.92	4 9	-2 8	-10 8	-11 9	8 1	14 4
1.6.92 - 31.7.93	0.1 10	-6 9	-15 9	-9 10	9 1	15 8
1.8.93 - 1.9.95	2 8	-3 6	-12 6	-8 6	9 2	11 3
<b>E. UK</b>						
<b>Period</b>	<b>BIDDIF</b>	<b>ASKDIF</b>	<b>OFBONL</b>	<b>ONBOFL</b>	<b>ONASKBID</b>	<b>OFASKBID</b>
1.1.81 - 31.1.87	-3 12	2 12	-15 12	-15 12	18 11	13 8
1.2.87 - 30.6.90	-3 7	2 7	-13 8	-13 7	16 8	11 4
1.7.90 - 31.5.92	-2 8	3 7	-11 8	-12 7	14 5	9 4
1.6.92 - 31.7.93	-2 8	8 47	-13 8	-19 48	21 45	11 3
1.8.93 - 1.9.95	-2 8	3 5	-11 6	-12 6	14 5	9 3

**Figure 1.B.1: German Mark Onshore-Offshore Bid Differential: 1.1.81 - 1.9.95**



**Figure 1.B.2: German Mark Onshore-Offshore Bid Differential: 1.8.93 - 1.9.95**

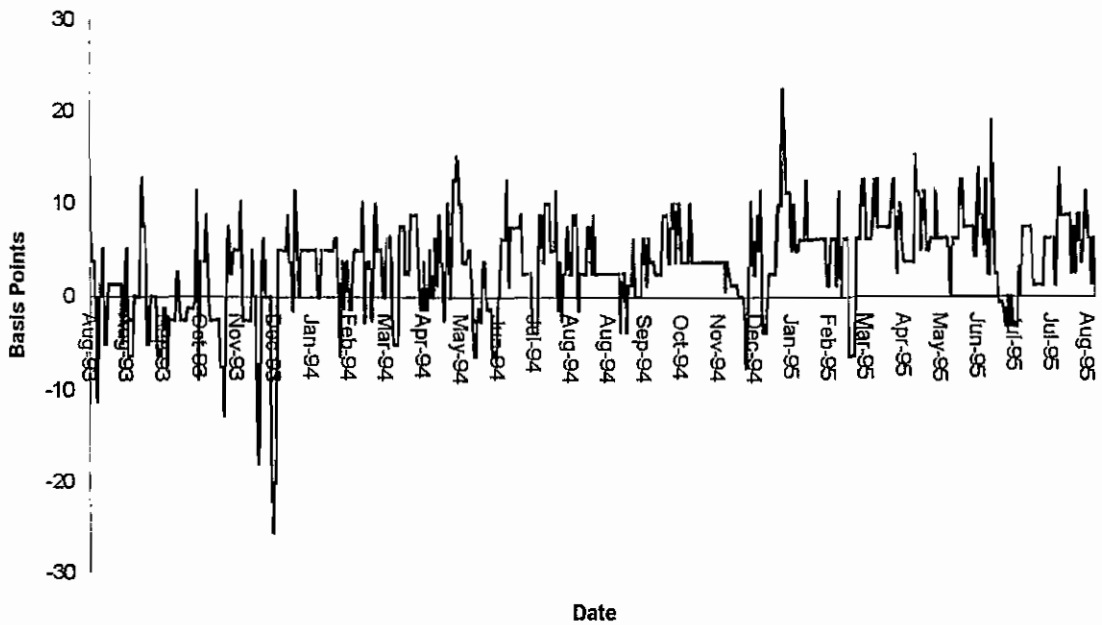


Figure 1.A.1: French Franc Onshore-Offshore Bid Differential: 1.1.81 - 1.9.95

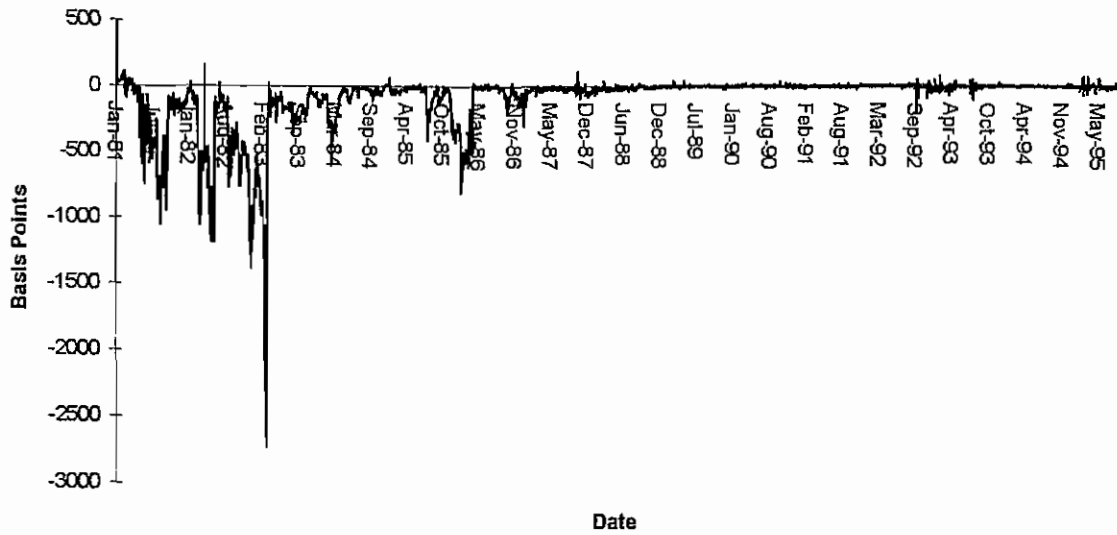
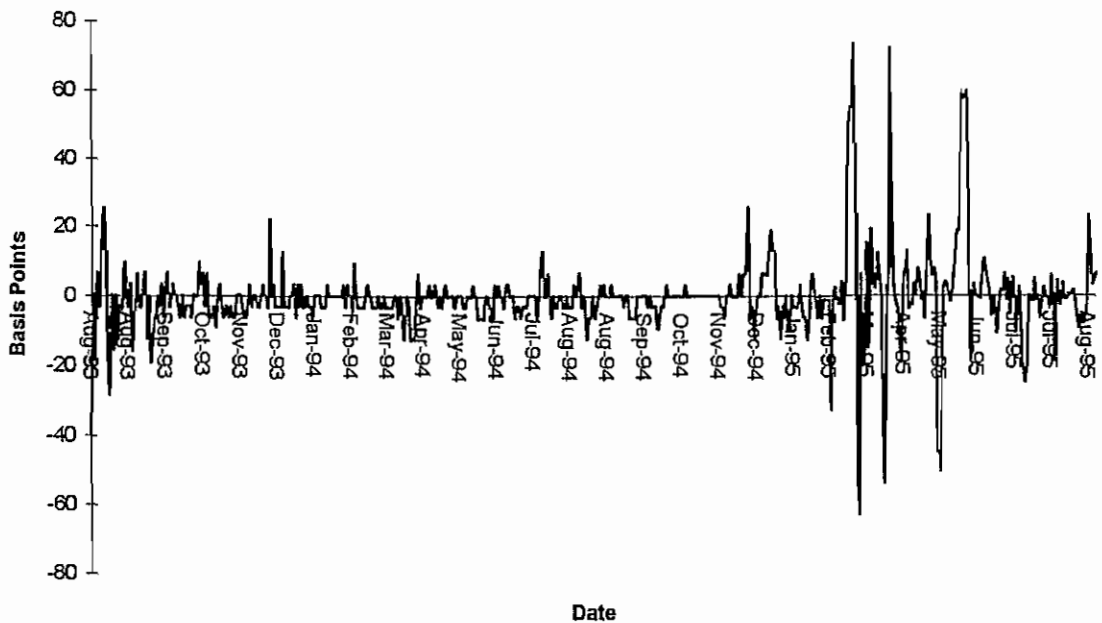
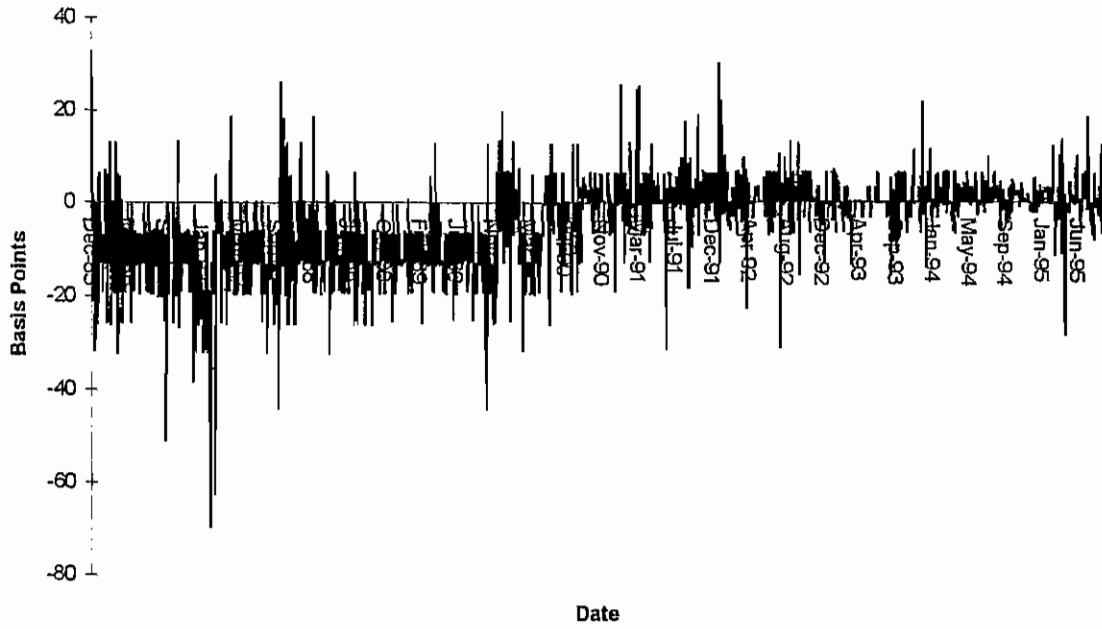


Figure 1.A.2 : French Franc Onshore-Offshore Bid Differential: 1.8.93 - 1.9.95





**Figure 1.C.1: Japanese Yen Onshore-Offshore Ask Differential: 30.12.85 - 1.9.95**



**Figure 1.C.2: Japanese Yen Onshore-Offshore Ask Differential: 1.8.93 - 1.9.95**

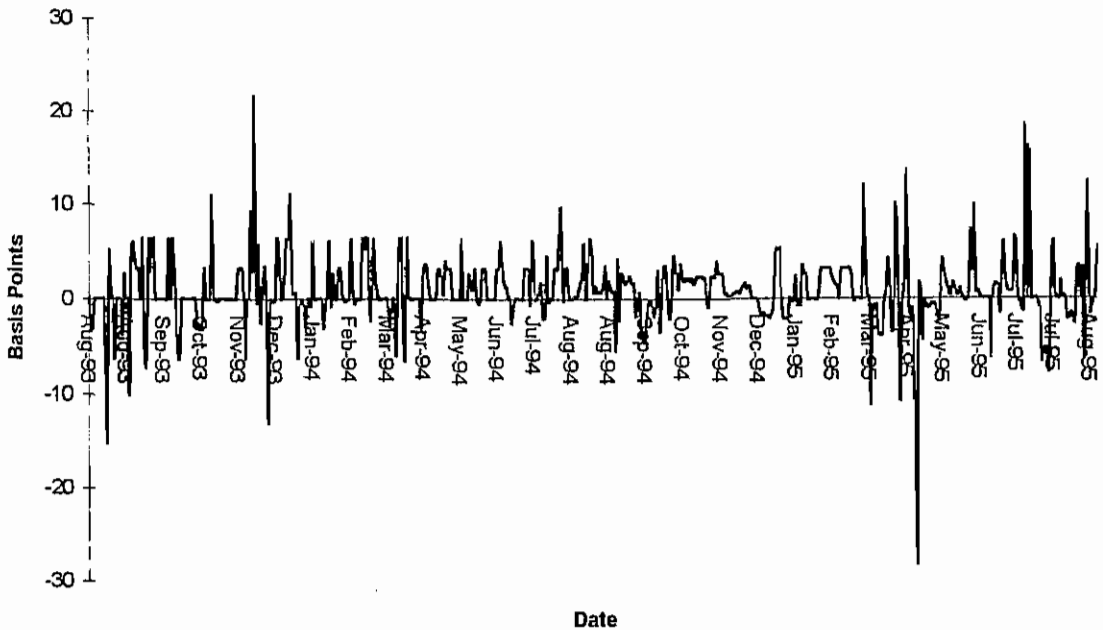


Figure 1.D.1: Dutch Guilder Onshore-Offshore Bid Differential: 1.1.81 - 1.9.95

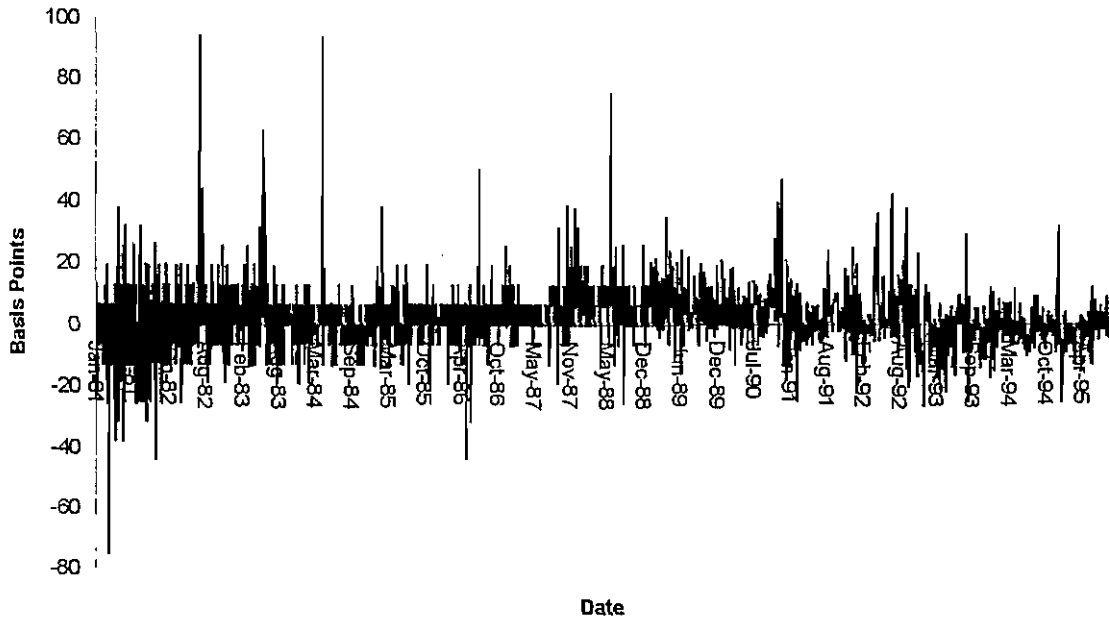
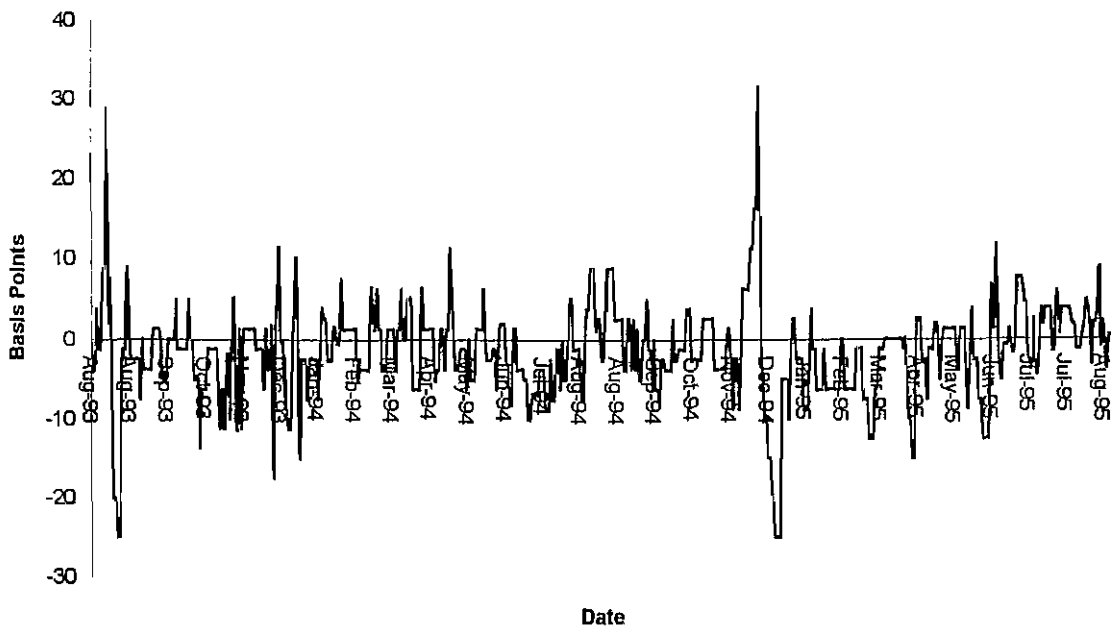


Figure 1.D.2: Dutch Guilder Onshore-Offshore Bid Differential: 1.8.93 - 1.9.95





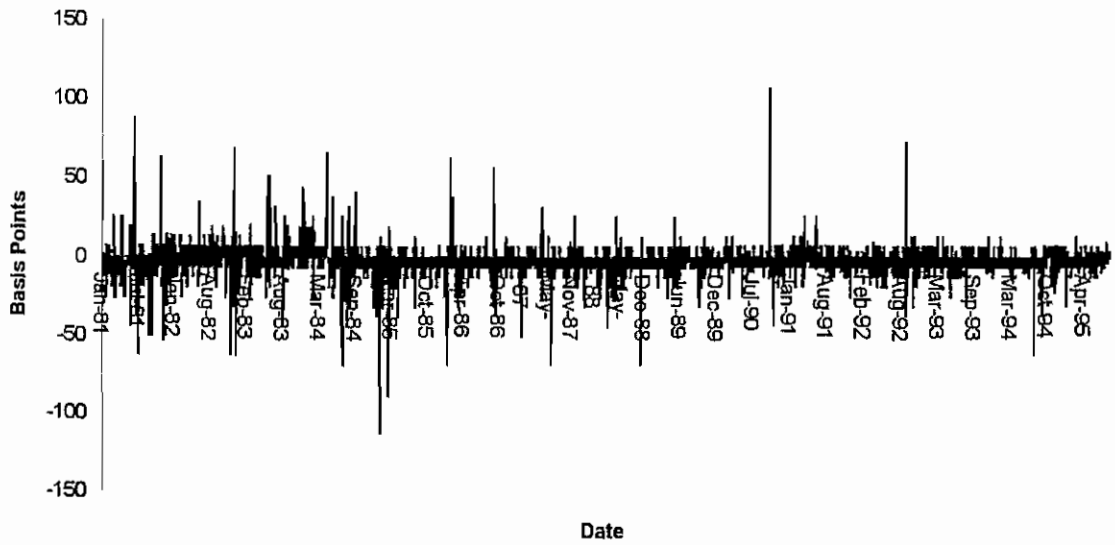


**Table 4: Equity Flows: Cumulative Foreign Assets and Liabilities Flows as a Ratio of Gross Cumulative Domestic Equity Flows (per cent).**

Country	1970-79			1980-1986		
	Share of OECD Gross Domestic Equity Flows	Foreign Liability flows/ Gross Domestic Equity Flows	Foreign Asset flows/ Gross Domestic Equity Flows	Share of OECD Gross Domestic Equity Flows	Foreign Liability flows/ Gross Domestic Equity Flows	Foreign Asset flows/ Gross Domestic Equity Flows
USA	15.8	25.9	1.7	11.0	28.3	9.8
Japan	11.7	-2.2	N.A.	6.5	9.8	N.A.
Germany	5.9	38.0	60.2	3.1	56.4	82.3
France	14.1	24.2	24.1	19.6	11.7	12.6
UK	6.1	36.9	70.8	19.4	38.0	151.4
Italy	10.4	9.6	8.0	9.1	4.3	16.5
Canada	15.1	7.2	15.3	16.5	13.0	41.3
Netherlands	2.6	72.3	163.9	1.2	93.1	148.7
Belgium	2.1	0.1	14.2	0.7	55.8	35.5
Sweden	0.8	1.2	21.9	2.1	6.8	19.6
Spain	5.7	17.5	7.0	2.1	37.7	11.4
Finland	2.7	2.7	5.6	1.7	7.3	12.5
<b>AVERAGE</b> (unweighted)	-	19.5	35.7	-	30.2	49.2
Country	1987-91					
	Share of OECD Gross Domestic Equity Flows	Foreign Liability flows/ Gross Domestic Equity Flows	Foreign Asset flows/ Gross Domestic Equity Flows			
USA	1.6	182.8	553.8			
Japan	16.2	-0.3	N.A.			
Germany	4.6	33.3	94.7			
France	25.6	17.2	25.1			
UK	18.3	66.2	81.2			
Italy	4.9	33.8	37.6			
Canada	8.8	21.3	26.4			
Netherlands	2.6	73.0	264.4			
Belgium	1.6	63.0	43.5			
Sweden	2.9	6.3	259.4			
Spain	2.9	58.3	13.7			
Finland	2.8	5.3	19.4			
<b>AVERAGE</b> (unweighted)	-	46.7	118.27			

Source: OECD Financial Statistics

**Figure 1.E.1 : British Pound Onshore-Offshore Bid Differential: 1.1.81 - 1.9.95**



**Figure 1.E.2: British Pound Onshore-Offshore Bid Differential: 1.8.93 - 1.9.95**

