# Cross-Border Returns Differentials*

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Abstract

Were the U.S. to persistently earn substantially more on its foreign investments ("U.S. claims") than foreigners earn on their U.S. investments ("U.S. liabilities"), the likelihood that the current environment of sizeable global imbalances will evolve in a benign manner increases. However, we find that the returns differential of U.S. claims over U.S. liabilities is far smaller than previously reported and, importantly, is near zero for portfolio equity and debt securities. For portfolio securities, we confirm our finding using a separate dataset on the actual foreign equity and bond portfolios of U.S. investors and the U.S. equity and bond portfolios of foreign investors; in the context of equity and bond portfolios we find no evidence that the U.S. can count on earning more on its claims than it pays on its liabilities. Finally, we show that our finding of a near zero returns differential is consistent with observed patterns of cumulated current account deficits, the net international investment position, and the net income balance.

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## 1. Introduction

Substantial global imbalances are a central influence on the current international economic order. Whether and how these imbalances might unravel have important implications for economic stability in general and for the future path of the U.S. dollar in particular.

One aspect of this situation that has attracted a great deal of attention recently is the returns differential, the difference between the rate that the United States earns on its foreign claims and the rate it pays on its foreign liabilities. It is presumed that the returns differential is sizeable, in large part because of two pieces of evidence: (i) the fact that the U.S. net international investment position is not as negative as the large, persistent U.S. current account deficits would suggest (and, relatedly, that even with a negative net international investment position the income balance remained positive), and (ii) the striking finding—most explicit in Gourinchas and Rey (2007a) but also found in Obstfeld and Rogoff (2005), Lane and Milesi-Ferretti (2005), and Meissner and Taylor (2006)—that over the past few decades the United States has enjoyed the 'exorbitant privilege' of paying foreign investors roughly 3 percent *per year* less than it receives on its foreign investments.[1]

Understanding the size and source of the returns differential is important in part because the returns differential plays an important role in determining the path of the net international investment position. For example, with gross claims and liabilities positions each at roughly 100% of GDP, a one percent differential will result in a 1 percent of GDP improvement in the net position. Indeed, a positive U.S. returns differential vis-à-vis the rest of the world would be a source of stability in the presence of large U.S. current account deficits. In the model of Cavallo and Tille (2006) a more positive returns differential impacts the dynamics of current account adjustment in a way that lessens the probability of a disorderly unraveling of global imbalances. Similarly, for a given size of the returns differential, its likely persistence is important (Hausmann

[1] Although each uses a different sample period, the average annual returns differentials across these papers are very similar, ranging from 3.1% from 1983 to 2003 in Obstfeld and Rogoff (2005) to 3.9% from 1980 to 2004 in Lane and Milesi-Ferretti (2005).

and Sturtzeneger, 2006). Should a positive returns differential exist, the likelihood of a relatively benign continuation of global imbalances would increase. In its absence, one barrier to an unsavory adjustment in the world economic order would be removed.

In some sense, a sizeable and persistent exorbitant privilege would not be surprising. For example, it is well known that U.S. claims are weighted toward equities and U.S. liabilities are weighted toward debt. Because equity returns tend to be higher than bond returns, this portfolio composition naturally produces a somewhat higher return for U.S. claims. But in Gourinchas and Rey (2007a) a large portion of the exorbitant privilege (2.45 of the overall 3.32 percent) owes not to this composition effect but to what is termed a return effect: *Within each asset class*, U.S. investors earn more abroad than foreigners earn on their U.S. investments. For example, Gourinchas and Rey report that since 1973 returns on U.S. investors' foreign equity and bond portfolios have exceeded foreigners' U.S. returns by 6.21 percent and 3.72 percent, respectively, *per year*. They attribute this result to the U.S. position as the major issuer of the international currency. As discussed more fully in Portes and Rey (1998), this prominent position results in a liquidity premium that enables the exorbitant privilege.

In this paper we argue that existing estimates of the returns differential are biased upward. The primary source of the bias comes from calculating returns using *revised* BEA data on U.S. international positions and flows. Comprehensive data on *positions* occasionally indicate errors in the separately collected *flows* data. However, data on positions are collected at a substantial lag and, because it is difficult for the financial services firms reporting cross-border transactions to go back and restate past flows, even when reporting errors become apparent the data on flows remain more or less as originally reported. Since revisions to U.S. claims tend to be large and positive, with only limited corresponding upward revisions to flows, the revised series imply large capital gains on U.S. claims. The opposite bias exists for U.S. liabilities. We argue that using data from the *original* statistical releases produces a more accurate measure of the returns differential because flows and positions in the original releases are more internally

consistent. In contrast, because flows are only partially revised, the *revised* data on positions are not consistent with the *revised* data on flows.[2] Hence, calculating returns differentials using the revised data will produce an estimate that is biased upward.

We show that the returns differential is not only much smaller using *original* data (1.0 percent) than using the *revised* data (3.4 percent) but also has a different composition. The revised data produce an aggregate differential that arises primarily from a large differential in returns on portfolio bond and equity investment, as in Gourinchas and Rey (2007a). In contrast, the original data produce a much smaller aggregate differential that owes almost entirely to foreign direct investment returns, with an essentially zero differential in stocks and bonds. This evidence is inconsistent with a conclusion in Gourinchas and Rey (2007a) that the exorbitant privilege owes to the presumably persistent Portes and Rey (1998) liquidity premium of U.S. portfolio securities.

We confirm the finding of no returns differential for equities and bonds using a separate, high quality dataset of *actual* international portfolios. To do this, we match the actual asset class and country portfolio weights to corresponding market returns and recalculate the returns differential. That is, instead of using revised or original BEA data on positions and flows, we use actual portfolios and market returns to calculate capital gains and income yields. We find that returns calculated using the actual portfolios closely match those calculated using the original BEA data. This provides additional evidence that the returns calculated using the revised data are biased. The monthly portfolio data also allow us to more accurately observe three underlying components of the differential: the composition, return, and timing effects. We find a positive composition effect, as do Gourinchas and Rey (2007a), Obstfeld and Rogoff (2005), and Lane and Milesi-Ferretti (2005), as all over the world equities had higher returns than bonds, U.S. claims are weighted toward equities, and U.S. liabilities are weighted toward debt. But the

[2] We should note at the outset that we do not necessarily find fault with BEA revision policies. Flows are only partially revised in large part because data providers (such as banks and broker dealers for debt and equity flows) find it very difficult to recreate or revise historical capital flows data.

composition effect is mostly offset by a *negative* return effect (U.S. equity markets performed relatively well over the period studied, while developed country bond returns were more or less equal around the world) and a negative timing effect (foreign countries have exhibited poor skill in shifting between bonds and equities within their U.S. portfolios).

Our findings of a very small aggregate returns differential might seem counterintuitive because a large differential would appear to be consistent with two empirical facts: the U.S. net international investment position (IIP) is not as negative as the large, persistent U.S. current account deficits would suggest and, relatedly, even with a negative net IIP the income balance has remained positive. We reconcile these facts with our finding of a very small differential in three ways. First, because the overestimation of the returns differential owes almost entirely to an overestimation of capital gains rather than income yields, our results are entirely consistent with the observed relationship between the IIP and the income balance. In both the revised and original series, the large yield differential on direct investment offsets the net payments the U.S. makes on debt and equities. Second, we show that the net position can deviate substantially from cumulative current account balances even if the *average* differential is zero. As long as the differential is negative when gross positions are small and positive when gross positions are large, cumulative total returns can be positive even if the *average rates of return* on claims and liabilities are equal. Finally, we document that to a large extent the deviation of the paths of the net position and cumulative current account balances is driven by changes in statistical coverage rather than actual returns.

The paper proceeds as follows. In the next section we compute returns differentials using BEA's revised and original data. In Section 3 we utilize an alternative data set to construct another estimate of the returns differential and to delve more deeply the composition, return, and timing effects. In Section 4 we reconcile our returns with the paths of current account balances and the net international investment position. Section 5 concludes.

## 2. Returns differentials using BEA data

### *2.1. Revised vs. original series methods*

There are two methods to calculate returns differentials using BEA data. The first, which uses revised series of U.S. international positions, capital flows, and income flows, is straightforward to implement because the revised historical data is readily available on BEA's website. The second method, which uses the original series as published by BEA in each annual release of the U.S. IIP and balance of payments, requires the collection of 'as issued' historical data.

Existing studies use the readily available revised series to calculate the returns differential. The total return on U.S. claims or liabilities using the revised series can be calculated as follows:

$$r_t^R = \frac{A_t^R - A_{t-1}^R - FLOW_t^R}{A_{t-1}^R} + \frac{INC_t^R}{A_{t-1}^R} \qquad (1)$$

where $A^R_t$ is the position (claims or liabilities) at the end of period $t$, $FLOW^R_t$ is flows (U.S. flows to abroad or foreign flows into the U.S.) during period $t$, and $INC^R_t$ is interest and dividend income during period $t$. The superscript R denotes *revised*, indicating that all variables are of the latest vintage. The first term in (1) is returns owing to capital gains, while the second term is the income yield. Capital gains are calculated as the change in positions minus the corresponding flows. Note, though, that measuring capital gains in this way includes changes due to price and exchange rate changes (as one would expect) but also "other" changes in positions. These "other" changes—analyzed in more detail later—are primarily changes in statistical coverage but also other adjustments to the value of assets and liabilities.[3]

[3] For the revised series, BEA reports the breakdown between price, exchange rate and "other" changes only for aggregate claims and liabilities not for individual asset categories. This means that when using revised

We can use a similar methodology to compute returns using the series as originally reported in individual IIP releases that are published every year in the June or July issue of the *Survey of Current Business*. The IIP release indicates the position as of the end of the previous year ($A^O_{t-1}$), the sources of the change in the position during the year, and the resulting preliminary estimate of the current year-end position ($A^O_t$). The total return on U.S. claims or liabilities using the original series can be calculated as follows:[4]

$$r_t^O = \frac{A_t^O - A_{t-1}^O - FLOW_t^O}{A_{t-1}^O} + \frac{INC_t^O}{A_{t-1}^O} \qquad (2)$$

where $A^O_{t-1}$, $A^O_t$, and $FLOW^O_t$ are all as reported in the original year $t$ IIP release and $INC^O_t$ is the corresponding year $t$ income flow as reported in the original balance of payments release.

*2.2. Revised vs. original series results*

If revisions follow no systematic pattern we should not expect a substantial difference in average returns (and average returns differentials) calculated using the revised or original series. However, Table I shows that using annual data from 1990 through 2005 the differences are substantial. The aggregate returns differential using the *revised* series is 3.4%, in line with calculations found in the literature.[5] The aggregate returns differential using the *original* series is

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data the "other" category can be excluded from the calculation of *aggregate* capital gains, but it is not possible to exclude it from *individual asset* categories. Perhaps it is for this reason that existing work includes the "other" category as part of capital gains.

[4] The original IIP releases include the breakdown between price, exchange rate and "other" changes not just for aggregate claims and liabilities but also for individual asset categories. Therefore, when we use original series we could in principle exclude the "other" category from the calculation of capital gains and still calculate returns differentials for individual asset categories. We chose not to do so in order highlight the impact of revisions on the calculation of the returns differential.

[5] Obstfeld and Rogoff (2005) calculate the aggregate differential to be 3.1% using 1983 to 2003 data. Meissner and Taylor (2006) compute 3.2% using 1981-2003 data. Gourinchas and Rey (2007a) find 3.3% for 1973 through 2004:Q1. Lane and Milesi-Ferretti (2005) compute 3.9% from 1980 to 2004. Forbes (2007) computes 4.0% from 2001 to 2005. For our purposes, we begin in 1989 since it is only then that the *original* IIP releases began reporting direct investment at market value. Revised estimates of direct investment at market value, as used by others, are available from 1982. Appendix Table A.I lists the sources of data as well as table and line numbers.

substantially lower at 1.0%. The difference is driven not by income yields, as the income yield differentials are similar (1.2% using the revised series and 0.9% using the original series), but by differences in capital gains (2.2% using the revised series but zero using the original series).

The large discrepancy in capital gains differentials owes to the fact that, relative to the original series, the revised series imply much larger capital gains on U.S. claims (4.2% vs. 2.4%) and somewhat smaller capital gains on U.S. liabilities (2.0% vs. 2.4%). This discrepancy in capital gains is especially evident in portfolio equities and bond investment . For bonds, the revised series imply a total returns differential of 8.2%, while the original series imply only a 1.6% differential. All of the difference between revised and original returns is driven by capital gains, as yield differentials using the two methods are identical. Global interest rates have fallen over the past few decades, so one would expect that for bonds capital gains on both claims and liabilities should be positive. The revised series imply positive capital gains on U.S. bond claims (5.4%) but—somewhat implausibly—*negative* capital gains (-1.4%) on U.S. bond liabilities. In contrast, the original series imply that capital gains on bond claims and liabilities are nearly identical. A similar pattern is evident for equities: The yield differential on equities is the same using the revised and original series (0.3%), but the revised series implies very large capital gains on U.S. equity claims (13.1% vs. 7.7% in the original series).

The discrepancy between revised and original capital gains is not unique to the 1990-2005 sample period. Because BEA began reporting direct investment at market value only in 1989, we cannot extend our sample back any further for all asset classes. We can, however, recalculate returns differentials for equities and bonds beginning in 1984 (Table II).[6] As in the 1989-2005 sample, the revised series imply large positive capital gains on U.S. bond claims and slightly negative capital gains on U.S. bond liabilities while the original series imply modest capital gains of similar magnitudes on bond claims and liabilities. That the revised series returns

[6] IMF data on cross-border equity and debt income, needed to compute total returns, are not available prior to 1984.

are likely biased is evident from returns on U.S. equity claims: The revised series average annual return is 23.2% per year, while over the same time period the MSCI Ex U.S. returned only 13.5% per year, much closer to the 12.1% return implied by the original series.[7]

*2.3 Pattern of revisions*

We have provided evidence that capital gains computed using revised series are implausibly large for equity claims and implausibly small for bond liabilities. To further explore the role of capital gains, *KG*, in explaining the discrepancies in returns differentials calculated using revised and original series, equations (1) and (2) can be used to express the revision in capital gains (as percent of the end of the previous year's position) as

$$\frac{KG_t^R - KG_t^O}{A_{t-1}^O} = \frac{\left(A_t^R - A_t^O\right) - \left(A_{t-1}^R - A_{t-1}^O\right) - \left(FLOW_t^R - FLOW_t^O\right)}{A_{t-1}^O} \qquad (3)$$

Rearranging, we can express revisions to the end-of-year position as the sum of the revisions to the end of the previous year's position, revisions to current-year flows, and revisions to capital gains:

$$\frac{A_t^R - A_t^O}{A_{t-1}^O} = \frac{\left(A_{t-1}^R - A_{t-1}^O\right) + \left(FLOW_t^R - FLOW_t^O\right) + \left(KG_t^R - KG_t^O\right)}{A_{t-1}^O} \qquad (4)$$

Equation (4) decomposes the revisions to positions into the underlying sources. For example, an upward revision to year-end assets (i.e., $A^R_t - A^O_t > 0$) could owe to some combination of the incorporation of assets that existed prior to the current year ($A^R_{t-1} - A^O_{t-1} > 0$),

[7] The large difference between average annual returns on equity claims from 1990-2005 reported in Table 1 (15.8%) and those for 1984-2005 (23.2%) owe to the sharp depreciation of the dollar in the late 1980s.

unrecorded purchases during the current year ($FLOW^R_t - FLOW^O_t > 0$), and unrecorded current year capital gains ($KG^R_t - KG^O_t > 0$).

Table III shows the average of these revisions for U.S. claims and liabilities and their components. The average aggregate revisions in claims and liabilities are both positive but are substantially larger for claims (10.3%) than for liabilities (1.4%). Most, but not all, revisions in the year-end positions are associated with revisions in the previous year's positions (7.4 of the 10.3% for claims and 1.2 of the 1.4% for liabilities). This means that, when new assets are incorporated into the IIP, BEA deems that most of these assets had existed all along and thus the corresponding revisions to flows are smaller (1.0% for claims and 0.6% for liabilities). Importantly, Table III also shows that especially for *U.S. claims* the substantial upward revisions in positions are not fully matched by corresponding revisions in past positions or in flows, implying upward revisions to capital gains of a substantial 2% per year. In contrast, capital gains revisions to U.S. liabilities are smaller and negative (-0.4% per year).

Revisions to capital gains account for 2.2% of the 3.4% differential computed using the revised series. The question is whether the capital gains implied by the revised data are truly capital gains. In practice, it is difficult to determine whether newly found claims should be attributed to capital gains, flows or initial positions. But even when it is known that newly found claims should be attributed to capital flows, the revisions are often not made because it may be unfeasible for the entities reporting cross-border transactions to turn back the clock and revise their reported history. For example, when a problem with the reporting of the underlying Treasury International Capital Reporting System (TIC) capital flows data on long-term foreign debt claims was identified after the 2003 comprehensive benchmark survey, Dept. of Treasury et. al. (2005, p. 8) stated:

> "As measured by the survey, U.S. holdings of foreign securities were considerably higher than would have been estimated using the estimation procedure discussed above, particularly for U.S. holdings of foreign long-term debt securities...It is now believed that incomplete information on monthly transactions in foreign long-term debt securities was a significant source of the observed difference."

The problem in the flows data was identified, but the flows were never substantially revised.[8] In the absence of revisions to flow history, prior to 2000 BEA tended not to revise flows when new claims were found. Speaking of U.S. claims, Bach (2000, p. 71-72) states:

> "When BEA adjusted its international investment positions estimates last year using preliminary benchmark results, it attributed all of the discrepancy to valuation changes and none to the less than complete coverage of transactions…BEA is now changing that practice and attributing a large part of the discrepancy to transactions."

This discrepancy is particularly pronounced for U.S. portfolio claims. For example, a major revision to U.S. portfolio claims took place in 1997 when results were incorporated from the first benchmark survey of U.S. holdings of foreign equities and bonds. The benchmark positions estimate for the end of 1994 was 60% higher than the existing BEA estimate, leading to revisions in positions for the years between 1985 and 1994. The description of these revisions in Bach (1997) makes no mention of corresponding revisions to flows, and it appears that only small revisions to flows were made: For the period from 1985 through 1994 the cumulative revisions to flows amount to only $26 billion, or less than 8% of the newly found claims. This means that nearly all of the revisions were attributed to previously unrecorded valuation and "other" changes rather than unrecorded flows. This, of course, has serious implications for calculating capital gains. If the newly found claims were due to unrecorded purchases rather than unrecorded valuation and "other" changes, use of BEA's revised estimates would seriously overstate capital gains.

The tendency not to fully revise corresponding flows when revisions to positions are made exists not only for U.S. claims but also for U.S. liabilities. Speaking of U.S. liabilities, Bach (2002, p. 37) states:

[8] The extent of the inconsistency can be gleaned from the fact that the TIC system originally reported U.S. net *sales* of foreign bonds in 2002 and 2003 that totaled $55 billion, whereas security-level benchmark surveys showed that over that period U.S positions in foreign bonds actually *increased* by $317 billion; see Table 5 in Dept. of Treasury et. al. (2005). While the above quote indicates that the problem in the flows data was recognized, the underlying flows data were never substantially revised; the revised TIC data for 2002 and 2003 currently show $61 billion in net U.S. sales of foreign bonds.

> "In the past, BEA has assigned nearly all of the differences between the two estimates of the positions to either the prices change or the 'change in statistical coverage' components of the investment position accounts, leaving data on financial flows as reported by the transactions reporting system little changed."

In contrast to U.S. claims, the revisions to liabilities position were much smaller and, for some asset categories such as bonds, negative. Downward revisions in liabilities positions without a corresponding downward revision in flows imply low capital gains. According to Bach (2002, p. 38-39), BEA tends to overestimate U.S. liabilities because the transaction reporting system underestimates redemptions and paydowns of principle on mortgage-backed securities. These redemptions should be recorded as flows but because they do not involve the typical data reporters (brokers and dealers), they are not recorded by the exiting transactions reporting system. As the above quote indicates, as a matter of practice BEA tended to revise positions but not flows, implying low or negative capital gains on U.S. liabilities.

*2.4 Summary*

In summary, the revised series very likely overstate the size of the returns differential. The capital gains on U.S. claims implied by the revised series are a result of systematic gaps in statistical coverage and past BEA practice of revising positions without the data required to make corresponding revisions in flows. A similar bias on the liabilities side leads the revised series to understate capital gains on U.S. liabilities. These biases are particularly large for bonds and equities, the two types of securities that are at the heart of the Portes and Rey (1998) liquidity discount and the Gourinchas and Rey (2007a) exorbitant privilege.

In the next section we re-calculate returns on bonds and equities using data that do not rely on estimating capital gains from BEA data. We confirm that revised series overstate the returns differentials on bonds and equities and find that those differentials are in fact close to zero.

## 3. Returns Differentials from Actual Portfolios

In this section we compute returns differentials using monthly data on bilateral international portfolio positions in bonds and equities. We first describe the bilateral positions and returns data before turning to the calculation of returns differentials.

*3.1 Positions*

We use the highest quality data set available on the portfolio debt and equity investment positions of U.S. investors abroad and foreign investors in the United States. This data was designed in Thomas, Warnock, and Wongswan (2006), used in Warnock and Warnock (2006), and refined in Bertaut and Tryon (2007). Monthly bilateral investment positions are constructed using two components of data reported by the Treasury International Capital Reporting System (TIC): infrequent but highly accurate benchmark surveys of holdings (both foreign holdings of U.S. securities and U.S. holdings of foreign securities) and net monthly transactions (both net purchases of U.S. assets by foreigners and net purchases of foreign assets by U.S. residents). The technique to construct the monthly positions data is detailed in Appendix A. The end result is high-quality estimates of monthly positions of foreigners in U.S. securities ("U.S. liabilities") and U.S. positions in foreign securities ("U.S. claims").

The data cover portfolio investment in long-term securities, specifically debt instruments with greater-than-one-year original maturity ("bonds") and equities.[9] While the TIC system includes most countries of the world, we include only those countries for which we have at least fifty monthly observations on both equity and bond returns between January 1994 and December 2005. This leaves us with nineteen developed countries and nineteen emerging markets. These

[9] We exclude bank lending, which would not affect our analysis because short-term deposits earn, if anything, near zero returns and cross-border holdings of short-term securities are very small at less than 20 percent the size of holdings of long-term debt (Treasury et al. 2006a, 2006b).

countries account for the majority of U.S. portfolio investment abroad as well as the majority of foreign investment in the United States.[10]

*3.2 Returns*

We select the returns series that most closely correspond to actual international holdings. For U.S. securities, for returns on U.S. bonds we use the weighted average of Lehman Brothers U.S. Treasury, corporate and agency bond indices, with the weights being foreigners' positions in each respective bond type. Foreign investors, especially those from emerging markets, tend to overweight Treasury and Agency bonds relative to a market-capitalization benchmark such as the Lehman Brothers Aggregate U.S. bond index, so it is important to use the actual weights of foreign investors in the three types of bonds to produce an accurate measure of their returns on U.S. bonds. For returns on U.S. equities we use the return on the gross MSCI U.S. index. The index is market capitalization weighted and, with roughly 300 large and liquid U.S. firms, is comparable to the S&P 500 (which we do not use because it includes some foreign firms).

For returns on foreign equities we use dollar returns on the gross MSCI equity index for each country. MSCI indexes are appropriate because MSCI firms represent almost 80 percent of U.S. investors' foreign equity investment (Ammer et al. 2006). For foreign bonds, to a large extent U.S. investors tend to hold local currency bonds in developed countries and dollar-denominated bonds in emerging markets (Burger and Warnock, 2007). Thus, for developing countries we use J.P. Morgan's EMBI+ indices (which are comprised of dollar-denominated bonds). For those developed countries in which U.S. holdings of local currency bonds are predominant, we use the MSCI bond index (which is an index of local-currency-denominated bonds). In those developed countries where U.S. holdings of dollar-denominated bonds are significant we calculate returns as the weighted average of the MSCI bond index and MSCI

[10] In 2004, the countries in our sample account for 84 percent and 80 percent of U.S. equity and bond investment abroad and 77 percent and 73 percent of all foreigners' equity and bond investment in the United States. Of the international investment that we do not cover, Caribbean financial centers account for more than half.

Eurodollar Credit index (which is an index of dollar-denominated bonds), with the weights on the Eurodollar index being the shares of dollar denominated bonds in U.S. holdings of foreign bonds.[11] When calculating returns on the aggregate foreign bond and foreign equities portfolios, we weight each country according to U.S. bond (or equity) holdings in that country. The average weight of each country in U.S. foreign equity and bond portfolios and the average returns on each country's equities and bonds appear in Appendix Table AII.

Our sample period covers the 144 months between January 1994 and December 2005. The starting point is determined by the availability of MSCI bond indices, which begin in December 1993. The ending point is determined by the availability of U.S. foreign asset positions, which are available through December 2005. For some countries, equity or bond returns data begin after January 1994. We add these countries to the U.S. asset and liability portfolios when the data for both equity and bond returns become available (see the last column in Appendix Table AII). Countries added after January 1994 tend to have very low weights in both U.S. claims and liabilities portfolios, so our results are nearly identical if we restrict our study to countries with returns data for the entire sample period.

*3.3 Characteristics of U.S. foreign claims and liabilities*

Table IV shows the descriptive statistics for aggregate equity weights in U.S. claims and liabilities and aggregate returns on U.S. and foreign bonds and equities. It is evident from Panels A and B that U.S. claims (that is, U.S. investors' foreign portfolios) are weighted heavily toward equities, while U.S. liabilities (foreigners' portfolios in the U.S.) are weighted toward bonds. This resembles the "venture capitalist" capital structure of the U.S. external balance sheet as pointed out by Gourinchas and Rey (2007a). Specifically, the equity-to-bond ratio in U.S. claims is 71:29 across all countries, with equities having a higher weight in U.S. investors' developed country portfolios (72:28 equity-to-bond ratio) than in the emerging market portfolios (60:40). By

[11] The developed countries where U.S. holdings of dollar denominated bonds are significant include Australia, Belgium, Canada, Finland, France, Germany, Ireland, Netherlands, Sweden, and the United Kingdom.

contrast, the equity-to-bond ratio in U.S. liabilities is 42:58, roughly that (46:54) for developed countries' positions, but much lower for emerging markets' portfolios (9:91).

Returns are shown in Panels C and D. Panel C shows that over the period from 1994 through 2005 data on actual portfolios indicate that returns were higher on U.S. equities (11.88 percent per year) than on foreign equities (9.59 percent overall, with 9.99 in developed countries and 10.68 in emerging markets). For bonds (Panel D), returns on developed country bonds (7.02 percent per year) were somewhat higher than returns on U.S. bonds (5.89), while returns on emerging market bonds were much lower (2.39). Overall, there is no evidence in Panels C and D that U.S. claims have substantially higher returns than U.S. liabilities. If we consider all countries, the differential on bonds is negligible 19 basis points per year, while the differential on equities is actually negative 2.3% per year. Thus, consistent with our results using the original BEA data, data on actual portfolios do not produce an exorbitant privilege for U.S. portfolio investments.

*3.4 Comparing returns from actual portfolios to BEA and other estimates*

The first two columns in Table V compare the 1994-2005 returns calculated using the actual portfolios as described in the previous subsection and those calculated using the original series described in Section 2. Returns using the actual portfolios closely match those using the original BEA data, with both showing a negative differential on equity (-2.32% and -2.77%) and a differential on bonds that is close to zero. The third column shows that the *revised* series again imply much larger returns differentials: a large positive differential for bonds and a more modest negative differential for equity. That the returns from actual portfolios agree with returns from the original BEA series gives us confidence that the revised series returns are biased, and that the original series returns are a better reflection of the actual returns. It is worth emphasizing that when we calculate returns using the actual portfolios we no longer use BEA transactions data to infer capital gains or income yields. Arriving at close to zero returns differential on U.S. portfolio investment using two independent sources of data strengthens our conclusion that the U.S. does not enjoy a sizeable return effect or, hence, an exorbitant privilege.

Our finding that the United States does not earn substantially higher returns within each asset class contrasts with that of Gourinchas and Rey (2007a), henceforth GR, who use combination of the approaches presented above. Specifically, capital gains are calculated in GR by matching each asset class to corresponding market returns and adding income yield from BEA data. The last two columns in Table V report GR returns on equities and bonds for 1994-2004 and, for completeness, for 1973-2004.[12]

For the 1994-2004 period GR returns differentials are between ours and those computed from the revised series. Compared to our returns, for both claims and liabilities GR report higher equity returns and lower bond returns. This is a result of GR's distribution of income streams across asset classes. Because income is not always available separately for each asset class, GR distribute aggregate income according to the share of each asset class in total assets. However, the coupon yield on bonds is generally much higher than the dividend yield on equities. Therefore, allocating income according to asset class share will understate the income yield on bonds and overstate the income yield on equity. While this biases the returns on each asset class, the bias is the same for claims and liabilities and therefore should not materially affect the return differential. Indeed, GR's *equity* differential for the 1994-2004 period is not that different from ours (-2.32% vs. -1.92%).[13]

The most significant difference between our returns and GR returns is that their return on U.S. bonds is several times lower (5.89% vs. 1.89%). This gives rise to GR's 3.36% differential

[12] Returns for 1973-2004 are as published in GR. The 1994-2004 GR returns are calculated using data from http://socrates.berkeley.edu/~pog/academic/WB_data.xls, which was accessed on 15 August 2007.

[13] We believe that the equity differential for the 1973-2004 period in GR is biased upward due to their use of fixed country weights in U.S. foreign equity portfolio. GR use constant country weights as of 1997, although country weights in U.S. investors' equity portfolios can change dramatically over time (Kho, Stulz, and Warnock 2006; Thomas et al. 2006). Applying 1997 weights to their entire 1973-2004 period will naturally overstate returns, as all else equal 1997 weights will tend to be larger in countries that experienced high returns prior to 1997. For example, had we used fixed weights from the end of 2003, the return on U.S. equity claims in Column 1 would have jumped from 9.6 to 11.6% per year. There are also other more minor differences in the calculation of returns on U.S. equity assets. For example, we use information on 39 countries, whereas Gourinchas and Rey use only 12. Also, we use MSCI indices which tend to include the large firms that international investors tend to hold, whereas they use local market indices that tend to be broader than the MSCI.

for bonds compared to our 0.19% using the actual portfolios and 0.66% using the original series. The low return on U.S. bonds reported by GR is in part due to the underestimation of income yield, as discussed above, and in part due to the exclusion of corporate bonds from GR's calculation of returns. Higher yielding corporate bonds make up as much as 42% of U.S. long-term debt liabilities (see Table 1 in Treasury et al, 2006a), so excluding them will understate returns on U.S. debt liabilities. For example, had we treated all corporate and agency bonds as Treasury bonds, the return on U.S. bond liabilities would have dropped from 5.9 to 5.2% per year. However, the exclusion of corporate bonds explains only small part of the low return on U.S. bonds reported by GR. Even when we consider only Treasury bonds, GR's estimates fall short of standard measures of returns on U.S. bonds. For example, for the 1994-2004 period Ibbotson's *Stocks, Bonds, Bills, and Inflation* reports total returns of 3.9%, 6.0% and 8.1% per year for short-, medium- and long-term Treasury bonds, respectively. This is significantly higher than GR's 1.89% per year.[14]

*3.5 Decomposition of the portfolio returns differential*

The previous subsections showed that neither foreign equities nor foreign bonds earn substantially more than their U.S. counterparts. However, it is possible that the U.S. *portfolio* of foreign equities and bonds earns more than the foreign *portfolio* of U.S. equities and bonds. This is because U.S. claims are weighted more heavily towards equities than are its liabilities. Using the actual portfolio data described in this section, the return on the U.S. *portfolio* of foreign equities and bonds is 8.3% per year while the return on the foreign *portfolio* of U.S. equities and bonds is 7.6% per year. This gives rise to a positive returns differential of less than 70 basis points per year, or 5.6 basis points per month (Table VI). In this section we formally show that

[14] For the 1973-2004 period, GR report total real return on U.S. bonds of 0.32% per year which implies nominal return of about 4.6% per year, again substantially lower than standard measures of returns on U.S. bonds for that period. Over the same period Ibbotson's *Stocks, Bonds, Bills, and Inflation* reports total returns of 6.2%, 8.3% and 9% per year for short, medium and long term Treasury bonds, respectively. CRSP returns on Treasury securities are 6.7%, 7.7% and 8.8% for bills, notes and bonds, respectively.

this differential is due in part to the composition of the portfolio but also to the poor timing of foreign investors' reallocations between U.S. asset classes.

The exact methodology of our decomposition is presented in Appendix B. Briefly, the composition effect is the weighted sum of the differences between the average weights of each asset class in U.S. claims and liabilities. If U.S. investors put a higher weight on higher yielding asset classes, the composition effect would be positive. The return effect is the weighted sum of the differences between returns on U.S. claims and liabilities within each asset class. If average returns in each asset class tend to be higher for U.S. claims than for U.S. liabilities, the return effect will be positive. The timing of U.S. investors abroad (and of foreign investors in the United States) is the sum of sample covariances between investors' weights on each asset class and subsequent returns on that asset class. If U.S. investors put relatively high weights on assets that have subsequent high returns, these covariances will be positive and will contribute positively to the aggregate returns differential between U.S. claims and liabilities. In contrast, positive covariances between foreign investors' weights and subsequent returns will contribute negatively to the aggregate returns differential: The better the timing of foreign investors in the United States, the lower the return on U.S. claims relative to U.S. liabilities.

As shown in Table VI, the composition effect is positive because U.S. claims are on average weighted toward equities, which have high average returns.[15] The return effect is *negative*, indicating that within asset classes U.S. claims tend to have *lower* returns than U.S. liabilities. While U.S. investors earn slightly more on foreign bonds than foreigners earn on U.S. bonds, U.S. investors earn much less on foreign equity. The foreign timing effect is negative and statistically significant, indicating that foreign investors have relatively high weights on assets

[15] Because the composition effect is a product of two averages, its distribution is unknown. In order to assess statistical significance of the composition effect, we calculate its standard error using bootstrapping. We obtain 1000 different samples by drawing 144 observations from our data with replacement 1000 times. Using these samples we calculate 1000 compositions effects. The standard error of our original composition effect is the standard error of these 1000 composition effects. The z-statistic reported in the table is the original composition effect divided by the bootstrapped standard error.

that subsequently have low returns. The magnitude of the effect is about 0.06 percentage points per month. Thus, poor timing by foreign investors reduces their U.S. return by 70 basis points per year and positively contributes to the returns differential. The U.S. timing effect is also negative, but is considerably smaller and statistically insignificant.[16] In summary, the positive composition effect is offset by a negative returns effect and poor foreign timing. One implication of these calculations is that over the period from 1994 to 2005 there is no evidence that U.S. portfolio claims provided substantially higher returns than U.S. portfolio liabilities. A positive returns differential, and the stabilizing influence that it would lend to the global economic system absent a sustained dollar depreciation, is not apparent when one examines actual bond and equity portfolios.

**4. Cumulated Current Account Deficits and the Net Foreign Position**

There are two facts that reinforce the perception that the U.S. earns a higher return on its claims than on its liabilities. The first is that despite a negative net IIP the U.S. continues to earn positive net investment income, suggesting high *yields* on claims relative to liabilities. This is easily addressed: Our results are completely consistent with a positive income balance, as income yields using the revised and original series are similar in magnitude. In both, a large income differential on direct investment offsets negative payments on bonds and equities.

The second fact that reinforces the perception of a large U.S. returns differential is shown in Figure 1: The cumulative current account deficit is much more negative than the net IIP, which suggests high *capital gains* on claims relative to liabilities. This is seemingly at odds with the evidence in Section 2 that the capital gains differential is on average zero. In the rest of this

[16] We have also computed (but do not table) the returns differential vis-à-vis foreign private investors (that is, excluding foreign official holdings), developed countries, and emerging markets. The returns differential is always small, sometimes negative, and the poor timing is apparent for private foreigners and investors from developed countries.

section we reconcile a zero average capital gains differential with the relationship between the net IIP and cumulative current account balances.

*4.1 Relationship between the net foreign position and the current account*

We can write the net international investment position at time *t* as the initial position plus the cumulative current account and cumulative net capital gains on international investment positions:

$$NIIP_t^R = NIIP_0^R + \sum_{s=1}^{t} CA_t^R + \sum_{s=1}^{t} \left( A_{s-1}^R kg_s^{R,A} - L_{s-1}^R kg_s^{R,L} \right) \qquad (5)$$

where *CA* is the current account, *A* are gross claims, *L* are gross liabilities, $kg^A$ and $kg^L$ are capital gain rates on claims and liabilities.[17] Superscript *R* indicates that all series—including the capital gains rates $kg^A$ and $kg^L$—are revised.[18] Multiplying the revised capital gains rates by revised positions produces $2.2 trillion of cumulative net capital gains by 2005—exactly the amount needed to close the wedge between the cumulated current accounts and the revised net position in Figure 1.

Some of this wedge can be explained by applying capital gains calculated using original rather than revised series. Multiplying our *original* series capital gains rates by revised positions produces cumulative net capital gains of only $0.7 trillion. These cumulative net capital gains are not zero—even though the *average* capital gain rate differential is zero—because as it happens there were positive differentials when gross positions were large and negative differentials when gross positions were small. Applying negative differentials to small gross positions and positive differentials to larger gross positions can yield positive cumulative net capital gains even if the *average* capital gains differential is zero. That said, we are still left with a puzzle. Capital gains rates calculated using original series suggest that the wedge between the net IIP and cumulated

[17] We omit the cumulative net capital account from the right hand side as it is negligible. We also exclude financial derivatives, which BEA started reporting as of end of 2005.

[18] The capital gains rates in equation (5) are exactly what we calculated in Section 2 using the revised series. Note that the revised series capital gains match the pattern of revised net positions and revised current accounts by construction.

current accounts should be $0.7 trillion, but Figure 1 shows that the gap is far wider at $2.2 trillion. We reconcile this next.

*4.2 Role of "other" changes*

"Other" changes sound innocuous enough. BEA defines these "other" changes as (i) changes in coverage, (ii) capital gains and losses of direct investment affiliates, and (iii) other adjustments to the value of assets and liabilities. In fact, "other" changes are the primary reason behind the divergence of the net IIP and cumulated current accounts. This is apparent in Figure 1, where a dashed line shows that without "other" changes the net position would be much lower. In fact, the net position would be very close to the net position implied by our original series capital gains. While there are some "other" changes in the original series, they are small and produce cumulative capital gains of only $0.2 trillion. In contrast, in the revised series "other" changes produce $1.4 trillion of cumulative capital gains. Therefore, if we exclude "other" changes from both revised and original series, net cumulative capital gains are fairly similar ($0.8 trillion for revised series and $0.5 for the original series). Excluding "other" changes, the original capital gains series match the net IIP fairly well.[19]

In our opinion, the cumulative capital gains implied by "other" changes are not capital gains but are in fact just changes in statistical coverage. BEA typically makes "other" changes when results from benchmark surveys disagree with earlier estimates. While the gap between earlier estimates and the benchmark surveys could in principle be due to mismeasured capital gains, mismeasured flows or changes in statistical coverage, our calculations in Section 3 using actual portfolios and market returns suggest that for portfolio investment "other" changes should not be attributed to capital gains. The most likely source of "other" changes is mismeasured flows. The $1.4 trillion of "other" changes consists of $1.0 trillion of positive "other" changes made to claims and $-0.4 trillion of negative "other" changes made to liabilities. Positive "other"

[19] Our original capital gains differential would only have to increase from zero to 0.3% for the original capital gains to exactly match the revised net position.

changes to claims suggest than claims were initially underestimated while negative "other" changes to liabilities suggest that liabilities were initially overestimated. This is consistent with the evidence we presented in Section 2 that U.S. purchases of foreign securities and foreign sales (redemptions) of U.S. securities are underestimated.

One might think that one component of "other" changes—capital gains and losses of direct investment affiliates—should indeed be counted as capital gains. We agree. But on net that component contributes very little to cumulative capital gains. The cumulative value of the original "other" changes due to direct investment is $0.1 trillion. The capital gains on direct investment using the revised and original series are nearly identical (about $0.4 trillion). This means that revised "other" changes due to direct investment contribute at most $0.1 trillion to cumulative capital gains. Even that amount is unlikely due to capital gains but rather to reclassification of portfolio investment as direct investment.[20]

In summary, it is true that U.S. net position did not decline by as much as implied by current account deficits. However, this apparent stability of the revised net IIP relative to cumulative current accounts is not because U.S. experienced a high return on its claims relative to liabilities, but rather mostly because BEA found new claims that very likely existed all along or were a result of unrecorded financial flows.[21]

## 5. Conclusion

We argue that existing papers overstate the size of the returns differential between U.S. claims and liabilities. Perhaps as important, the small differential that does exist is not due to a

[20] For more on "other" changes, see Lane and Milesi-Ferretti (2007).

[21] Our argument, also made in Warnock and Cleaver (2003), that net U.S. net purchases of foreign securities and foreign sales (redemptions) of U.S. securities are underestimated implies that net capital inflows are lower than reported. This means that as long as the current account remains "as reported", the statistical error in the balance of payments is larger than currently reported. Understanding the sources of this error is an important question for future research.

return discount privilege on U.S. portfolio liabilities, but rather to higher income yields on U.S. direct investment abroad.

We identify that the bias in existing estimates, which is particularly pronounced for portfolio investment, owes to the practice of calculating returns using fully revised positions data and partially revised flows data. Returns calculated using original series do not suffer from this bias and using these we find significantly lower aggregate differential that is almost entirely driven by direct investment. To be clear, we do not claim that BEA revision policies are flawed—capital flows data are in some sense not revisable and, in the case of asset-backed prepayments, are not intended to capture all changes in positions other than those associated with market movements—but rather that the practice of using a combination of fully and partially revised data produces estimates of capital gains that are biased in explainable ways.

Our results have important implications for current global imbalances. In theoretical models (e.g., Cavallo and Tille 2006), a positive returns differential would decrease the likelihood of a disorderly adjustment in the U.S. current account and the dollar. Our finding of a relatively small returns differential between U.S. claims and liabilities means that one stabilizing aspect of the current international economic system is less evident than previously thought. Moreover, a differential that is solely due to a high yield on U.S. direct investment abroad—which, according to Gros (2006) and Bosworth et al. (2007) is due to tax shifting—has different implication than a differential that is due to liquidity discount on U.S. portfolio investment. That U.S. issuers of portfolio securities enjoy a significant discount is simply not apparent in the data. Finally, in recent years the U.S. has enjoyed a relatively stable net position despite large current account deficits. We show that a large part of that stability is due to systematic changes in statistical coverage rather than an actual returns differential.

Our results also have implications for theoretical work, which has recently been influenced by the presumption of a sizeable and persistent returns differential. For example, the returns differential figures prominently in the models of Mendoza, Quadrini and Rios-Rull

(2006), Ghironi, Lee, and Rebucci (2006), Devereux and Saito (2006), and Obstfeld and Rogoff (2005). In the model of Tille and van Wincoop (2007), a persistent returns differential is shown not to have an important role and the authors sound almost apologetic in noting that their "model can therefore not account for empirical findings by Gourinchas and Rey (2007b) that net external debt is to some extent financed by differences in expected returns" (Tille and van Wincoop 2007, page 31). Our findings suggest that while it might be desirable for theoretical models to allow for returns differentials, the assumption of persistent and sizeable differentials in asset classes other than direct investment is on shaky footing.

## Appendix A. Position Estimates

To estimate cross-border securities positions, one can utilize the method developed in Thomas et al. (2006) and refined in Bertaut and Tryon (2007).[22] This appendix provides a summary of the methodology and necessary data.

*A.1 Data*

Data on cross-border portfolio holdings of securities and monthly transactions are collected as part of the TIC system, available at http://www.treas.gov/tic. The methodology to estimate monthly asset and liability positions combines, for each security type and country, holdings information collected on the periodic benchmark surveys with data on capital flows, valuation adjustments, asset-backed repayments, and merger-related stock swaps. For claims, the methodology effectively deals with the financial center bias identified in Warnock and Cleaver (2003) and discussed further in Griever, Lee, and Warnock (2001) and Bertaut, Griever, and Tryon (2006). For liabilities, the custodial center bias in the benchmark holdings data means that any geographic bias is not completely alleviated.

*Benchmark surveys*. The starting point for the position estimates is the information on cross-border securities holdings collected as part of the periodic TIC benchmark asset and liability surveys. Our estimates of the foreign securities holdings of U.S. investors use information available from the asset surveys conducted in March 1994 and year-end 1997, 2001, 2003, 2004, and 2005; for U.S. securities holdings of foreign investors we use information available from the liability surveys conducted as of December 1994, December 1997, March 2000, and June of 2002, 2003, 2004, 2005, and 2006. This information includes the unique security-level identifier, so asset type and country of issuer are accurately identified.

[22] See also Warnock and Warnock (2006).

*Valuation adjustments*. The position estimates are adjusted for valuation changes using price indices related to the total return indices closely associated with each security type. For equities, the MSCI index for each country is used. For foreign bonds, MSCI indexes are used for developed countries, while EMBI or GBI is appropriate for developing countries. At times a country does not have an EMBI or GBI, but bond returns might be available on Bloomberg. Survey data indicate that U.S. investors hold significant amounts of dollar-denominated debt in several developed countries. For these countries the valuation adjustment is a weighted average of the MSCI bond index, which is denominated in the local currency, and the MSCI Eurodollar Credit index, which is denominated in U.S. dollars. The average is weighted by the fraction of dollar-denominated debt held by U.S. investors in each country. For U.S. bonds, Lehman price indices are used: for Treasuries, government indices appropriate for the maturity structure; for corporates, ABS for asset-backed and corporate debt for non-ABS; and for agencies, MBS for asset-backed and government-sponsored agency for non-MBS. Some liabilities are not in USD, so the returns are adjusted for exchange rate changes.

*Bilateral capital flows*. The position estimates incorporate the cross-border securities transactions occurring each month. The TIC system collects the market value of gross purchases and sales of securities by asset type and location of the foreign counterparty to the transaction. U.S. domestic securities types reported include U.S. Treasury debt, U.S. government agency debt, debt issued by corporations and other institutions, and equity. Foreign securities are classified simply as debt or equity.

*Asset-backed repayments.* Many asset-backed securities, including some U.S. agency and corporate debt, include periodic principal repayments. While the correct market value of these securities is recorded on the benchmark surveys, the flows associated with principal repayments

are not recorded in the TIC system. However, estimates of these repayments are published on the TIC website and used to construct the monthly position estimates.

*Stock swaps*. The TIC data also do not include equities acquired through merger-related stock swaps. As with asset-backed principal repayments, this information is available on the TIC website and used to construct the monthly position estimates.

*A.2 Methodology*

Using these data sources, the monthly cross-border position estimates are constructed in two steps: a naïve estimate and then a benchmark-consistent estimate. For cross-border portfolio holdings of U.S. investors, position estimates are constructed by asset type (equity or debt) and country. For the U.S. holdings of foreign investors, positions estimates are constructed for each country and equity or debt type (U.S. Treasuries, U.S. agency bonds, or corporate debt).

*Naïve estimates*: Naïve estimates of monthly positions are constructed for the period between adjacent pairs of benchmark surveys. Starting with a benchmark survey position, there is an adjustment for price and exchange rate changes and the current month's capital flows. Reported flows data are adjusted; U.S. corporate and agency debt positions are adjusted for flows from asset-backed principal repayments, and equity positions are adjusted for net purchases and sales acquired through stock swaps. Specifically, the resulting naïve position estimates of each security type *i* evolve according to the equation:

$$nh_{i,t} = nh_{i,t-1}(1 + r_{i,t}) + gp_{i,t} - gs_{i,t} + ab_{i,t} + ss_{i,t} \qquad \text{(A1)}$$

where:

$nh_{i,t}$ naive estimate of the net position in security *i* at the end of month *t*
$r_{i,t}$ return of security *i* from period *t-1* to *t*, computed from the appropriate price index
$gp_{i,t}$ gross purchases of security *i* during month *t*
$gs_{i,t}$ gross sales of security *i* during month *t*

$ab_{i,t}$ net flows from principal repayments on security $i$ during month $t$
$ss_{i,t}$ quantity of security $i$ acquired through stock swaps during month $t$ .

Using (A1), naïve position estimates are constructed through the date of the next benchmark survey. The naïve estimate as of the next survey date, $nh_{i,T}$, generally differs from the holdings reported on the subsequent benchmark survey, $h_{i,T}$. The next step is to adjust the naïve position estimates for this difference.

*Benchmark-consistent estimates:* To construct benchmark-consistent monthly position estimates, the naïve estimates are adjusted to be consistent with the positions recorded on each benchmark survey. As previously mentioned, the naïve baseline estimate generally differs from the benchmark survey holdings by an amount $gap_{i,T}$, such that:

$$gap_{i,T} = h_{i,T} - nh_{i,T} \qquad \text{(A2)}$$

Our estimates use an adjustment that assumes that this gap is caused by errors in the capital flow data or returns and that these errors are larger in months with greater trading activity. With this adjustment, the benchmark-consistent position estimates between each pair of benchmark surveys evolve according to:

$$h_{i,t} = h_{i,t-1}(1 + r_{i,t}) + gp_{i,t} - gs_{i,t} + ab_{i,t} + ss_{i,t} + adj_i * va_{i,t} \qquad \text{(A3)}$$

where $adj_i$ is the constant adjustment factor for security $i$ between each pair of benchmark surveys, and $va_{i,t}$ is the proportion of inter-survey trading activity that occurred in that month, such that:

$$va_{i,t} = \frac{gp_{i,t} + gs_{i,t}}{\sum_{k=1}^{T} gp_{i,k} + gs_{i,k}}.$$

Combining (A1), (A2) and (A3), the survey gap can be expressed:

$$gap_{i,T} = h_{i,T} - nh_{i,T} = (h_{i,T-1} - nh_{i,T-1})(1 + r_{i,T}) + adj_i * va_{i,T}. \qquad \text{(A4)}$$

The initial naïve holdings estimates are equal to the benchmark-consistent position estimates (i.e., $h_{i,1} - nh_{i,1} = 0$). Thomas et. al. (2006) use a grid search method to solve for $adj_i$. Alternatively (and equivalently), Bertaut and Tryon (2007) show that the assumption that errors are greater in months of greater trading volume $va_{i,t}$ allows for an explicit solution of (A4) for $adj_i$, such that:

$$adj_i = \frac{gap_{i,T}}{\sum_{k=1}^{T}\left[ va_{i,k} \prod_{m=k+1}^{T}(1 + r_{i,m}) \right]}. \qquad \text{(A5)}$$

In effect, the end-of-period gap can be distributed between inter-survey months using each month's share of total transactions, discounted appropriately. Incorporating (A5) into (A3) provides a benchmark-consistent position estimate for each month. In our work we use a prelimary version of the soon to be publicly released Bertaut and Tryon (2007) data.[23]

[23] Compared to Thomas et al. (2006), the other innovation of Bertaut and Tryon (2007) is the use of more-refined returns indices (described above) to estimate the positions. This is important—a big source of improvements in holdings estimates will come from ever more-precise and more-specific returns data—but for now this is still a second-order improvement; the resulting estimates are nearly identical to those in Thomas et. al. (2006), with correlations as high as 0.999. Also, Bertaut and Tryon (2007) show that, for the purpose of forming monthly positions, estimates including an adjustment for transactions costs as in Thomas et. al.(2006) is unnecessary because it can be folded into the adjustment. For forming restated flows data as in Warnock and Warnock (2006), an adjustment for transaction costs is necessary.

**Appendix B. Methodology for Returns Decomposition**

The average return on any portfolio *p* can be written as the time series average of the sum of the products of lagged asset weights and returns:

$$\bar{r}^{\,p} = \frac{1}{T}\sum_{t=1}^{T}\sum_{j=1}^{N} w_{j,t-1}^{p} r_{j,t}^{p} \tag{B1}$$

where $w^{p}_{j,t-1}$ is portfolio weight of asset *j* at the end of period *t-1* (the beginning of period *t*), $r^{p}_{j,t}$ is the period *t* return on asset *j* in portfolio *p,* and *N* is the number of assets in the portfolio. Note that equation (1) can be also written as:

$$\bar{r}^{\,p} = \sum_{j=1}^{N} \bar{w}_{j}^{\,p} \bar{r}_{j}^{\,p} + \frac{1}{T}\sum_{t=1}^{T}\sum_{j=1}^{N} (w_{j,t-1}^{p} - \bar{w}_{j}^{\,p}) r_{j,t}^{p} \tag{B2}$$

where $\bar{w}_{j}^{\,p}$ and $\bar{r}_{j}^{\,p}$ are the time-series averages of the weights and returns on asset *j*. Equation (B2) shows that the average portfolio return depends on two components: (1) average returns and average holdings, and (2) the covariance of portfolio weights with subsequent returns. For investors whose portfolio weights and future returns move together, these covariances will tend to be positive. Note that if either returns or weights remain constant, the second term in (2) is zero and portfolio return will depend only on average weights and average returns. If, as is more likely, investors change their portfolio weights and returns are not constant, the second term is potentially important.

Using equation (B2) to express the average return on U.S. claims, $\bar{r}^{\,c}$, and liabilities, $\bar{r}^{\,l}$, the returns differential can be written as:

$$
\begin{aligned}
\bar{r}^{c} - \bar{r}^{l} = & \sum_{j=1}^{N} \frac{(\bar{r}_j^{c} + \bar{r}_j^{l})}{2} (\overline{w}_j^{c} - \overline{w}_j^{l}) \\
& + \sum_{j=1}^{N} \frac{(\overline{w}_j^{c} + \overline{w}_j^{l})}{2} (\bar{r}_j^{c} - \bar{r}_j^{l}) \\
& + \frac{1}{T} \sum_{t=1}^{T} \sum_{j=1}^{N} (w_{j,t-1}^{c} - \overline{w}_j^{c}) r_{j,t}^{c} \\
& - \frac{1}{T} \sum_{t=1}^{T} \sum_{j=1}^{N} (w_{j,t-1}^{l} - \overline{w}_j^{l}) r_{j,t}^{l}
\end{aligned}
\tag{B3}
$$

Each line in equation (B3) represents a component of the decomposition of the difference between the returns on U.S. claims and liabilities. The first line, the composition effect, is the weighted sum of the differences between the average weights of each asset class in U.S. claims and liabilities. The weight for each asset class is the average return of the asset class in claims and liabilities. If both U.S. and foreign investors put the same average weight on each asset class, the composition effect is zero. Should U.S. investors put a higher weight on higher yielding asset classes, the composition effect would be positive.

The second line, the return effect, is the weighted sum of the differences between returns on U.S. claims and liabilities within each asset class. The weight for each asset class is the average weight of the asset class in claims and liabilities. If each asset class has the same average return in both claims and liabilities, the return effect is zero. If average returns in each asset class tend to be higher for U.S. claims than for U.S. liabilities, the return effect will be positive.

The timing of U.S. investors abroad is captured by the third line, while the fourth captures the timing of foreign investors in the United States. Both lines are the sum of sample covariances between investors' weights on each asset class and subsequent returns on that asset class. This is a version of Grinblatt and Titman's (1993) measure of portfolio performance.[24] If

[24] In general, the Grinblatt and Titman (1993) measure can be written as $\frac{1}{T}\sum_{t}\sum_{j}(w_{j,t-1} - E[w_{j,t-1}])r_{j,t}$ where $E(w_{j,t-1})$ is the expected weight on asset j at t-1 that needs to be estimated. As discussed in Wermers (2006) there are many approaches to estimating this expected weight. One possibility is to use the time-series average weight as an estimate of the expected weight. Our timing effect uses this approach. Another

U.S. investors put relatively high weights on assets that have subsequent high returns, these covariances will be positive and will contribute positively to the aggregate returns differential between U.S. claims and liabilities. In contrast, positive covariances between foreign investors' weights and subsequent returns will contribute negatively to the aggregate returns differential: The better the timing of foreign investors in the United States, the lower the return on U.S. claims relative to U.S. liabilities. Therefore, foreign timing enters equation (B3) with a negative sign.

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possibility, suggested by Ferson and Khang (2003), is to use buy-and-hold weights as an estimate of expected weights.

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**Table I**

**Returns and returns differentials using BEA's revised and original series, 1990 – 2005**

Total return is the sum of yield and capital gains. All returns are expressed in percent per year. Yield is investment income divided by previous year position. Capital gains is the difference between end of the year position, corresponding flows and previous year position, all divided by previous year position. The revised series use all positions as reported in the July 2007 release of U.S. international positions (BEA Table 2). Revised flows are from July 2007 release of balance of payments (BEA Tables 1, 7a and 7b). Revised income is from the 2007 issue of IMF's *Balance of Payments Yearbook*. Original series use positions and flows from the original BEA releases of international positions published in each year's June or July issue of the *Survey of Current Business* (Table 1). Original income is from each year's issue of the IMF's *Balance of Payments Yearbook*.

| | Revised Series | | | Original Series | | |
|---|---|---|---|---|---|---|
| | Claims | Liab. | Diff | Claims | Liab. | Diff |
| **Aggregate** | | | | | | |
| **Total Return** | **9.4** | **6.0** | **3.4** | **7.4** | **6.4** | **1.0** |
| Yield | 5.2 | 4.0 | 1.2 | 5.0 | 4.1 | 0.9 |
| Capital Gains | 4.2 | 2.0 | 2.2 | 2.4 | 2.4 | 0.0 |
| **Direct Investment** | | | | | | |
| **Total Return** | **11.1** | **7.3** | **3.8** | **10.4** | **7.9** | **2.5** |
| Yield | 7.2 | 2.3 | 4.9 | 6.9 | 2.4 | 4.5 |
| Capital Gains | 3.9 | 5.1 | -1.2 | 3.6 | 5.5 | -1.9 |
| **Bonds** | | | | | | |
| **Total Return** | **12.7** | **4.5** | **8.2** | **8.3** | **6.7** | **1.6** |
| Yield | 7.3 | 5.9 | 1.4 | 7.6 | 6.2 | 1.4 |
| Capital Gains | 5.4 | -1.4 | 6.8 | 0.7 | 0.5 | 0.2 |
| **Equities** | | | | | | |
| **Total Return** | **15.8** | **13.7** | **2.1** | **10.2** | **12.1** | **-1.9** |
| Yield | 2.7 | 2.4 | 0.3 | 2.5 | 2.2 | 0.3 |
| Capital Gains | 13.1 | 11.3 | 1.8 | 7.7 | 9.9 | -2.2 |
| **Other** | | | | | | |
| **Total Return** | **5.2** | **4.5** | **0.7** | **4.3** | **4.0** | **0.3** |
| Yield | 4.4 | 4.4 | 0.0 | 4.0 | 4.2 | -0.2 |
| Capital Gains | 0.8 | 0.1 | 0.7 | 0.2 | -0.2 | 0.4 |

## Table II

### Returns and returns differentials using BEA's revised and original series, 1984 – 2005

Total return is the sum of yield and capital gains. All returns are expressed in percent per year. Yield is investment income divided by previous year position. Capital gains is the difference between end of the year position, corresponding flows and previous year position, all divided by previous year position. The revised series use all positions as reported in the July 2007 release of U.S. international positions (BEA Table 2). Revised flows are from July 2007 release of balance of payments (BEA Tables 1, 7a and 7b). Revised income is from the 2007 issue of IMF's *Balance of Payments Yearbook*. Original series use positions and flows from the original BEA releases of international positions published in each year's June or July issue of the *Survey of Current Business* (Table 1). Original income is from each year's issue of the IMF's *Balance of Payments Yearbook*.

| | Revised Series | | | Original Series | | |
|---|---|---|---|---|---|---|
| | Claims | Liab. | Diff | Claims | Liab. | Diff |
| **Bonds** | | | | | | |
| **Total Return** | **14.0** | **6.9** | **7.1** | **9.9** | **8.2** | **1.7** |
| Yield | 8.4 | 7.1 | 1.3 | 8.6 | 7.4 | 1.2 |
| Capital Gains | 5.6 | -0.2 | 6.8 | 1.2 | 0.8 | 0.4 |
| **Equities** | | | | | | |
| **Total Return** | **23.2** | **14.4** | **8.8** | **12.8** | **13.1** | **-0.3** |
| Yield | 3.6 | 2.5 | 1.1 | 2.5 | 2.2 | 0.3 |
| Capital Gains | 19.6 | 11.8 | 7.8 | 10.3 | 10.9 | -0.6 |

## Table III

### Pattern of revisions in BEA's international investment positions

Revisions to end-of-year positions is the difference between the revised position as reported by BEA as of July 2007 and the end-of-year position as reported in the right-most column of Table 1 of each original release of international investment position. Revisions to beginning-of-year positions gains are defined analogously. Revisions to flows is the difference between flows reported in the July 2007 vintage of the balance of payments and the original flows reported in Column (a) of Table 1 in each original release of international investment position. Revisions to capital gains is the difference between capital gains implied by the revised data (change in position minus corresponding flows) and the capital gains plus other changes (Columns b, c and d of Table 1) as reported in each original release of international investment position. All differences are expressed as percent of the original beginning-of-year position. Averages from 1990 through 2005 are reported.

| | Revisions to | | | |
|---|---|---|---|---|
| | End-of-year Positions | Beginning-of-year Positions | Flows | Capital Gains |
| **Claims** | | | | |
| **Aggregate** | **10.3** | **7.4** | **1.0** | **2.0** |
| Direct Investment | 4.4 | 3.1 | 0.9 | 0.5 |
| Bonds | 24.6 | 14.9 | 3.6 | 6.1 |
| Equities | 46.3 | 34.6 | 1.2 | 10.5 |
| Other | 5.4 | 4.5 | 0.4 | 0.5 |
| **Liabilities** | | | | |
| **Aggregate** | **1.4** | **1.2** | **0.6** | **-0.4** |
| Direct Investment | 0.6 | -0.2 | 1.2 | -0.5 |
| Bonds | -8.4 | -5.6 | -1.0 | -1.8 |
| Equities | 4.8 | 2.8 | -0.0 | 2.0 |
| Other | 10.4 | 8.2 | 1.9 | 0.3 |

**Table IV**
**Characteristics of U.S. foreign claims and liabilities**

Equity weight in U.S. claims is the share of foreign equities in U.S. investors' foreign bond and equities portfolio. Equity weight in U.S. liabilities is the share of U.S. equities in foreign investors' U.S. bond and equities portfolio. Returns on U.S. equities are the monthly simple returns on the U.S. MSCI gross return equity index. Returns on U.S. bonds are foreign-portfolio-weighted averages of Lehman Brothers Treasury, Corporate and Agency bond indices. Returns on foreign equities are U.S.-portfolio-weighted averages of each country's simple monthly dollar return on its MSCI gross return equity index. Returns on foreign bonds are U.S.-portfolio-weighted averages of each country's bond returns. Developed countries' bond returns are the weighted averages of simple monthly U.S. dollar returns on the country's MSCI bond index and the MSCI Eurodollar Credit index where the weights on the Eurodollar index are the shares of dollar denominated bonds in U.S. holdings of foreign bonds. Emerging markets' bond returns are simple monthly returns on the EMBI+ U.S. dollar index. All data are from January 1994 through December 2005, unless otherwise noted in Appendix Table AII.

| | Mean | Median | St.Dev. | Min | Max |
|---|---|---|---|---|---|
| Panel A: Equity Weight in U.S. Claims (%) | | | | | |
| All Countries | 70.8 | 71.1 | 3.8 | 62.7 | 78.3 |
| Developed Countries | 72.3 | 72.7 | 4.5 | 62.1 | 81.1 |
| Emerging Markets | 60.2 | 60.6 | 6.7 | 44.9 | 75.9 |
| Panel B: Equity Weight in U.S. Liabilities (%) | | | | | |
| All Countries | 41.7 | 39.4 | 5.9 | 33.9 | 54.4 |
| Developed Countries | 45.8 | 42.8 | 6.0 | 39.0 | 59.1 |
| Emerging Markets | 9.0 | 9.4 | 2.8 | 4.0 | 14.5 |
| Panel C: Equity Returns (% annualized monthly returns) | | | | | |
| Return on U.S. Equities | 11.88 | 14.92 | 65.85 | -83.41 | 213.30 |
| Return on Foreign Equities | | | | | |
| All Countries | 9.59 | 14.97 | 66.13 | -85.35 | 239.62 |
| Developed Countries | 9.99 | 14.44 | 63.25 | -81.21 | 232.84 |
| Emerging Markets | 10.68 | 25.75 | 136.40 | -99.13 | 519.15 |
| Panel D: Bond Returns (% annualized monthly returns) | | | | | |
| Return on U.S. Bonds | | | | | |
| By All Countries | 5.89 | 3.19 | 11.64 | -28.61 | 41.86 |
| By Developed Countries | 5.97 | 3.30 | 12.07 | -30.17 | 42.79 |
| By Emerging Markets | 5.55 | 2.75 | 9.96 | -22.70 | 34.52 |
| Return on Foreign Bonds | | | | | |
| All Countries | 6.08 | 5.61 | 21.27 | -43.46 | 90.73 |
| Developed Countries | 7.02 | 5.56 | 21.05 | -35.26 | 82.67 |
| Emerging Markets | 2.39 | 13.16 | 56.41 | -95.53 | 175.80 |

**Table V**

**Returns on U.S. claims and liabilities using various data sources**

The first column shows annualized average monthly returns from January 1994 through December 2005 using actual portfolio weights and market returns described in Sections 3.1 and 3.2. The second and third columns show average annual returns from 1994 through 2005 using BEA original and revised series, respectively, calculated using equations (1) and (2). The fourth column shows average annualized quarterly returns using Gourinchas and Rey (2007a) data from 1994 through 2004. Their *real* returns were converted to *nominal* using consumer price expenditure deflator.

| | Actual Portfolios (1994-2005) | BEA original (1994-2005) | BEA revised (1994-2005) | Gourinchas and Rey (1994-2004) | Gourinchas and Rey (1973-2004) |
|---|---|---|---|---|---|
| Equity | | | | | |
| Claims | 9.56 | 9.73 | 13.57 | 12.32 | 19.84 |
| Liabilities | 11.88 | 12.50 | 14.53 | 14.24 | 13.73 |
| Differential | -2.32 | -2.77 | -0.96 | -1.92 | 6.11 |
| Bonds | | | | | |
| Claims | 6.08 | 6.47 | 10.69 | 5.25 | 8.35 |
| Liabilities | 5.89 | 5.81 | 3.97 | 1.89 | 4.62 |
| Differential | 0.19 | 0.66 | 6.72 | 3.36 | 3.73 |

## Table VI
## Decomposition of the Monthly Returns Differential into

## Composition, Return and Timing Effects

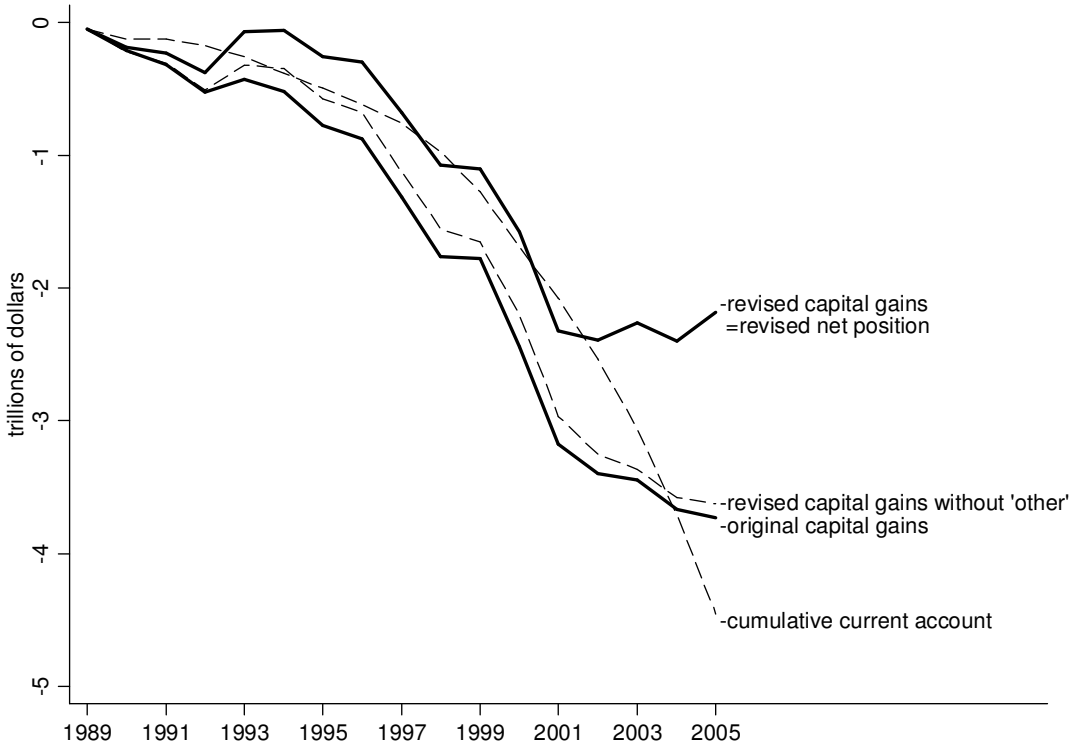
*Difference*, the difference between the average monthly percentage return on the portfolio of U.S. claims (foreign equities and U.S. bonds) and the return on U.S. liabilities (U.S. equities and U.S. bonds), equals *Composition Effect* plus *Return Effect* minus *Foreign Timing Effect* plus *U.S. Timing Effect*. The composition, return and timing effects are defined in Section 3.5. Standard t-statistics are in parentheses. Bootstrapped z-statistics based on 1000 draws are in brackets. Statistical significance at the 1, 5, and 10 percent levels are denoted by ***, **, and *, respectively.

| Difference (claims-liabilities) | Composition Effect | Return Effect | Timing Effects | |
|---|---|---|---|---|
| | | | Foreign | U.S. |
| 0.056 | 0.107 | -0.091 | -0.058** | -0.018 |
| (0.31) | [1.07] | [-0.60] | (-2.67) | (-1.48) |

## Figure 1

## Net International Investment Position Estimates

"Revised capital gains" is the revised net investment positions estimates published by BEA. "Revised capital gains without 'other'" is the revised net position excluding revised "other" changes as published in BEA's International Investment Position Table 3. "Original capital gains" is the net position implied by capital gains rates calculated using the original series as described in Section 2. "Cumulative current account" is the initial 1989 net position plus the revised cumulative current account.



## Table A.I: Data sources for revised positions, flows and income

Table and line numbers are as of August 2007 and may have differed in previous years. In Panel A, Table 2 is from the International Investment Position section of BEA's website. In Panel B, table numbers refer to tables from the International Transactions Accounts, Detailed Estimates section of BEA's website. In Panel C, IMF codes refer to codes from the IMF's *Balance of Payments Statistics Yearbook*.

| | | |
|---|---|---|
| **Panel A: Positions** | | |
| | Claims | Liabilities |
| Aggregate | Table 2, lines 6-18+43 | Table 2, lines 26-35+44 |
| Direct Investment | Table 2, line 43 | Table 2, line 44 |
| Stocks | Table 2, line 21 | Table 2, lines 39+0.5*33 |
| Bonds | Table 2, line 20 | Table 2, lines 28+36+38+0.5*33 |
| Other | Table 2, lines 7+12+22+23 | Table 2, lines 31+32+40+41+42 |
| **Panel B: Flows** | | |
| | Claims | Liabilities |
| Aggregate | Table 1, line 40 | Table 1, line 55 |
| Direct Investment | Table 1, line 51 | Table 1, line 64 |
| Stocks | '90-'98: Table 7b, line A2<br>'99-'05: Table 7a, line A4 | '90-'98: Table 7b, line B2+M4<br>'99-'05: Table 7a, line B4+M4 |
| Bonds | '90-'98: Table 7b, line A13<br>'99-'05: Table 7a, line A18 | Table 1, line 57+62+65+66 minus stocks |
| Other | Table 1, line 40 minus direct investment, stocks and bonds | Table 1, line 60+61+67+68+69 |
| **Panel C: Income** | | |
| | Claims | Liabilities |
| Aggregate | Table 1, line 13 | Table 1, line 30 |
| Direct Investment | Table 1, line 14 | Table 1, line 31 |
| Stocks | IMF Code 2340 | IMF Code 3340 |
| Bonds | IMF Code 2350 | IMF Code 3350 |
| Other | Table 1, line 13 minus direct investment, stocks and bonds | Table 1, line 30 minus direct investment, stocks and bonds |

**Table A.II: Country composition of U.S. portfolio of foreign equity and foreign bonds**

Country's weight in U.S. equity (bond) portfolio is the U.S. equity (bond) position in the country divided by the total U.S. equity (bond) position in all 38 countries included in the sample. Country's equity return is the average of simple monthly returns on MSCI gross U.S. dollar total return index expressed in percent. Developed countries' bond returns are the weighted averages of simple monthly U.S. dollar returns on the country's MSCI bond index and the MSCI Eurodollar Credit index where the weights on the Eurodollar index are the shares of dollar denominated bonds in U.S. holdings of foreign bonds. Emerging markets' bond returns are simple monthly returns on the EMBI+ U.S. dollar index. The time period is from January 1994 through December 2005 unless otherwise noted in the last column.

| Country | Country's Avg. Weight in U.S. Equity Portfolio | Country's Avg. Equity Return | Country's Avg. Weight in U.S. Bond Portfolio | Country's Avg. Bond Return | Country Included from |
|---|---|---|---|---|---|
| Australia | 0.030 | 1.076 | 0.037 | 0.567 | Jan '94 |
| Austria | 0.003 | 0.939 | 0.005 | 0.598 | Jan '94 |
| Belgiumlux | 0.010 | 1.078 | 0.022 | 0.597 | Jan '94 |
| Canada | 0.071 | 1.225 | 0.227 | 0.574 | Jan '94 |
| Denmark | 0.006 | 1.239 | 0.016 | 0.649 | Jan '94 |
| Finland | 0.023 | 2.023 | 0.009 | 0.600 | Jan '94 |
| France | 0.076 | 0.964 | 0.049 | 0.573 | Jan '94 |
| Germany | 0.056 | 0.896 | 0.092 | 0.565 | Jan '94 |
| Greece | 0.002 | 1.346 | 0.003 | 0.720 | Jun '97 |
| Ireland | 0.013 | 0.971 | 0.010 | 0.651 | Jan '94 |
| Italy | 0.029 | 1.165 | 0.036 | 0.750 | Jan '94 |
| Japan | 0.158 | 0.329 | 0.072 | 0.262 | Jan '94 |
| Netherlands | 0.081 | 0.969 | 0.051 | 0.565 | Jan '94 |
| Norway | 0.007 | 1.226 | 0.010 | 0.639 | Jan '94 |
| Portugal | 0.003 | 0.923 | 0.002 | 0.701 | Jan '94 |
| Spain | 0.024 | 1.343 | 0.018 | 0.689 | Jan '94 |
| Sweden | 0.026 | 1.505 | 0.025 | 0.698 | Jan '94 |
| Switzerland | 0.055 | 1.055 | 0.002 | 0.544 | Jan '94 |
| U. K. | 0.213 | 0.813 | 0.136 | 0.618 | Jan '94 |
| Argentina | 0.006 | 1.112 | 0.029 | -0.347 | Jan '94 |
| Brazil | 0.018 | 1.966 | 0.027 | 0.622 | Jan '94 |
| Chile | 0.003 | 0.965 | 0.010 | 0.223 | Jun '99 |
| China | 0.003 | -0.086 | 0.004 | 0.152 | Apr '94 |
| Colombia | 0.000 | 1.857 | 0.006 | 0.209 | Mar '97 |
| Hungary | 0.002 | 2.225 | 0.001 | -0.019 | Feb '99 |
| India | 0.006 | 0.994 | 0.001 | 0.095 | Mar '96 |
| Korea | 0.019 | 1.458 | 0.015 | 0.057 | Jan '94 |
| Malaysia | 0.007 | 0.333 | 0.007 | 0.148 | Nov '96 |
| Mexico | 0.026 | 1.202 | 0.050 | 0.225 | Jan '94 |
| Morocco | 0.000 | 0.980 | 0.001 | 0.332 | Jan '95 |
| Peru | 0.001 | 1.618 | 0.002 | 0.994 | Jan '94 |
| Philippine | 0.003 | -0.127 | 0.006 | 0.213 | Jan '94 |
| Poland | 0.001 | 1.063 | 0.003 | 0.467 | Jan '94 |
| Russia | 0.004 | 3.406 | 0.007 | 1.393 | Jan '95 |
| South Africa | 0.009 | 1.267 | 0.004 | 0.248 | Jun '94 |
| Thailand | 0.005 | 0.331 | 0.004 | 0.130 | Jun '97 |
| Turkey | 0.002 | 2.167 | 0.003 | 0.355 | Jul '96 |
| Venezuela | 0.001 | 1.319 | 0.010 | 0.632 | Jan '94 |