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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, using a monthly dataset on the foreign equity and bond portfolios of U.S. investors and the U.S. equity and bond portfolios of foreign investors, we find that the returns differential for portfolio securities is near zero, far smaller than previously reported. Examining all U.S. claims and liabilities (portfolio securities as well as direct investment and banking), we find that previous estimates of large differentials are biased upward. The bias owes to computing implied returns from an internally inconsistent dataset of revised data; original data produce a much smaller differential. We also attempt to reconcile our finding of a near zero returns differential with observed patterns of cumulated current account deficits, the net international investment position, and the net income balance. Overall, we find no evidence that the U.S. can count on earning substantially more on its claims than it pays on its liabilities.

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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 remains 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 (2005a), 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 percent of GDP, a one percent differential will result in a one 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 (2005a).

and Sturtzeneger, 2007). 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) (henceforth GR) 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, GR reports that since 1973 returns on U.S. investors' foreign equity and bond portfolios have exceeded foreigners' U.S. returns by 6.1 percent and 3.7 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. We proceed in three steps. First, we note that for the two types of assets that have readily observable data on returns—bonds and equities—the returns embedded in GR are exceptionally high for foreign equities and exceptionally low for U.S. bonds. We realize that portfolio returns can differ from value-weighted returns, so our second step is to examine returns differentials for portfolio investments using the Bertaut and Tryon (2007) dataset of monthly international equity and bond portfolios. The dataset contains the cross-country composition of U.S. equity and bond investments abroad and the equity and bond composition of foreign investments in the United States, including the composition of foreign investments across U.S. Treasury, Agency and corporate bonds. During 1994-2005 we find no evidence of a substantial positive return

differential within each asset class and an overall differential on portfolio investments that is close to zero.

In the third step, we extend our analysis to all asset categories and identify the source of the bias in the existing literature. We show that existing estimates use data that are not internally consistent. These estimates typically calculate implied capital gains as the difference between the change in positions and capital flows. While in principle this could lead to an accurate estimate of capital gains, in practice it does not because the data on positions and flows are collected from different sources at different frequencies and are often out of sync with each other. For example, for portfolio debt and equity, flow data are collected on a monthly basis and remain more or less as originally reported *even when reporting errors become apparent* because it is difficult for the firms reporting cross-border transactions to go back and restate past flows. In contrast, portfolio debt and equity positions, initially estimated using flows and estimates of capital gains, are often substantially revised years later when measures from infrequent but high quality surveys become available. The difference in revision policies leads to a disconnect between the revised position and flow series.

The inconsistency between revised positions and flows is responsible for a good portion of the returns differential bias. Revisions to U.S. claims positions tend to be large and positive, as portfolio surveys have frequently identified much larger holdings of foreign assets than originally estimated. Large positive revisions to claims positions with only limited corresponding upward revisions to flows produce large implied capital gains on U.S. claims. The opposite bias exists for U.S. liabilities. While there is nothing pristine about the original data series, they are internally consistent and, we argue, produce a more accurate measure of the returns differential. In contrast, because flows are only partially revised, the *revised* data on positions are not consistent with the *revised* data on flows.[2]

[2] The agency responsible for publication of these data is the Bureau of Economic Analysis (BEA). From our discussion of original and revised BEA datasets the reader might infer that we find fault with BEA

We show that the returns differential is not only much smaller using the original data (1.0%) than using the revised data (3.4%), but that it 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. In contrast, the original data produce a much smaller aggregate differential that owes almost entirely to foreign direct investment returns, with—similar to our results from the monthly portfolios—an essentially zero differential in stocks and bonds.

Our finding of a very small aggregate returns differential might appear inconsistent 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. 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. We also 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. However, about two-thirds of the gap between the net IIP and the cumulative current account cannot be reconciled with our returns estimates.

One implication of our results is that inflows into U.S. securities are overestimated, outflows into foreign securities are underestimated, and, hence, net financial inflows into the United States are overestimated. This in turn suggests that one or more other components of the

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revision policies—this is not true. 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. With essentially no revisions to the underlying source data for flows, BEA has very little to base revisions on.

U.S. balance of payments is mismeasured. One prominent candidate is the current account deficit. Indeed, that we can only partially reconcile our returns with the paths of net IIP and the cumulated current account suggests the possibility that the current account might be mismeasured. While a careful examination of this possibility is far beyond the scope of this paper, we refer the reader to U.S. Census Bureau (1998), which argues that in the past U.S. goods exports were systematically underestimated by as much as 10 percent, or 0.8 percent of GDP. It is plausible that such a mismeasurement could be the current account counterpart to our findings.

The paper proceeds as follows. In the next section we utilize a monthly dataset on cross-border bond and equity portfolios to construct an estimate of the returns differential for portfolio securities. In Section 3 we compute returns differentials for all U.S. claims and liabilities and for a longer time period using BEA's revised and original annual data. In Section 4 we compare the returns differentials for debt and equity computed from different datasets (monthly portfolios, BEA revised data, BEA original data, and GR) for an identical period, 1994-2003. In Section 5 we attempt to reconcile our finding of a near zero returns differential with observed patterns of cumulated current account deficits, the net IIP, and the net income balance. Section 6 provides concluding remarks.

2. Returns Differentials for Portfolio Debt and Equity

Returns differentials found in the literature are typically calculated from implied returns—that is, returns implied by BEA's revised data on flows and positions, perhaps with some adjustments—rather than measured. Extant returns differentials, calculated over different time periods, are quite large at 3.1 percent from 1983 to 2003 (Obstfeld and Rogoff, 2005), 3.2 percent from 1981 to 2003 (Meissner and Taylor, 2006), 3.3 percent from 1973 to 2004Q1 (GR), and 3.9 percent from 1980 to 2004 (Lane and Milesi-Ferretti, 2005a). Of these papers, only GR breaks out the differential by asset class. For portfolio securities, embedded in the overall GR differential are differentials of 6.1 percent on equities (19.8 percent average annual return on U.S.

investors' foreign equity positions less 13.7 percent return on foreigners' U.S. positions) and 3.7 percent on bonds (8.3 percent on U.S. assets less 4.6 percent on U.S. liabilities).

Returns on portfolio securities can be measured, so backing out implied returns from BEA's revised position and flow series is not necessary. A simple comparison with market returns suggests that GR returns are too high for U.S. equity assets and too low for bond liabilities. For example, MSCI World ex U.S. equity returns for the 1973 to 2004Q1 period were 11.8 percent, 800 basis points per year lower than the returns embedded in GR. On the liabilities side, U.S. bonds returned roughly 8 percent per year over that period, more than 300 basis points per year higher than GR returns suggest.

Such discrepancies with readily observed market returns are troubling, but it could be that cross-border portfolios differ substantially from the composition of value-weighted indices. For example, Thomas, Warnock, and Wongswan (2006) show that the country composition of U.S. investors' foreign equity portfolios differs from the global benchmark in a way that enabled U.S. investors to beat the benchmark by about 100 basis points per year from 1977 to 2001. While this is far less than the 800 basis points embedded in GR, it suggests that an examination of actual cross-border portfolio holdings should be useful.

Thus, in this section we compute returns differentials using a dataset of monthly bilateral international portfolio positions in bonds and equities. The methodology we use is to observe portfolio weights and calculate returns using indices that mimic (to the extent possible) the composition of those portfolios. Note that, compared to most existing studies on the returns differential, the analysis in this section is for a relatively short time period (the bilateral positions data begin in 1994) and includes a more limited set of assets (only portfolio debt and equity).[3]

2.1 Monthly Bilateral Bond and Equity Portfolios

Bertaut and Tryon (2007), following Thomas, Warnock, and Wongswan (2006), present monthly bilateral positions of U.S. investors in the equities and bonds of a large set of foreign

[3] In Section 3 we extend the analysis using a dataset that covers a longer time period and includes all assets.

countries and of foreigners in U.S. bonds and equities. The country-level dataset includes, for example, a monthly time series of U.S. holdings of German equities (as well as the holdings of equities in 37 other foreign countries). Armed with time-varying monthly portfolio weights, in this subsection we calculate the monthly returns of U.S. investors abroad and of foreigners in the United States.

Specifically, we calculate the average return on portfolio *p* (of, for example, foreign equities) as the time series average of the sum of the products of lagged asset weights and current returns:

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

where $w^{p}_{j,t-1}$ is portfolio weight of asset *j* (for example, German equities) at the end of period *t-1*, $r^{p}_{j,t}$ is the period *t* return on asset *j* in portfolio *p*, and *N* is the number of assets (countries) in the portfolio. For actual returns to deviate substantially from returns calculated using equation (1), international investors would have to either (i) within asset classes, have securities weights that differ substantially from those in major indices or (ii) earn substantial (positive or negative) returns from intra-month trading.

Crucial to this exercise is the selection of returns indices to calculate $r^{p}_{j,t}$. We use returns indices whose securities composition closely mimic the composition of U.S. and foreign cross-border holdings. Specifically, indices were chosen by comparing security-level holdings with publicly available returns indices. For example, we compute the returns on a country's U.S. bond portfolio using a weighted average of Lehman Brothers U.S. Treasury, corporate and agency bond indices, with the weights being that country's portfolio weights in each respective bond type. Within their U.S. bond portfolios, countries' weights can vary substantially from the weights in 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, a market-capitalization-weighted index comprised of roughly 300 large and liquid U.S. equities (the type of equities international investors tend to hold). For returns on foreign equities we use dollar returns on the gross MSCI equity index for each country. MSCI indices 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); and, 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 Eurodollar Credit index (which is an index of dollar-denominated bonds), with the weight on the Eurodollar index being the share of dollar-denominated bonds in U.S. holdings of each country's bonds.[4] 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 A.I.

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 monthly data on U.S. foreign asset positions, which are available through December 2005. We include the 38 countries (nineteen developed countries and nineteen emerging markets) for which we have at least fifty monthly observations on both equity and bond returns between January 1994 and December

[4] 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.

2005. These countries account for the majority of U.S. portfolio investment abroad as well as the majority of foreign investment in the United States.[5] 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 A.I). 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.

2.2 U.S. Portfolio Claims and Liabilities: Characteristics and Returns

Table I shows the descriptive statistics for aggregate equity weights in U.S. cross-border portfolio claims and liabilities (Panels A and B) and portfolio returns on U.S. and foreign bonds and equities (Panels C and D). The "venture capitalist" capital structure of the U.S. external balance sheet, as pointed out by GR, is evident from Panels A and B: U.S. claims (that is, U.S. investors' portfolios of foreign securities) are weighted heavily toward equities, while U.S. liabilities (foreigners' portfolios of U.S. securities) are weighted toward bonds. 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 emerging market portfolios (60:40). By contrast, the equity-to-bond ratio in U.S. liabilities is 42:58, roughly that (46:54) for developed countries investor' positions, but much lower for emerging markets investor' portfolios (9:91). We also note, but do not tabulate, that emerging markets investors' U.S. bond portfolios are heavily weighted toward Treasury bonds and near substitutes (Agency bonds), with only 4 percent of their U.S. bond portfolio being in corporate bonds. In contrast, corporate bonds comprise 31 percent of developed countries investors' U.S. bond portfolios.

Panels C and D show that over the period from 1994 through 2005 data from monthly portfolios indicate that for equities foreign investors earned higher returns in the United States

[5] In 2004, the countries in our sample account for 84% and 80% of U.S. equity and bond investment abroad and 77% and 73% 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.

(11.88% per year) than U.S. investors earned abroad (9.59% overall, with 9.99% in developed countries and 10.68% in emerging markets). This is despite the fact that as in Thomas et al. (2006) the foreign equity portfolios of U.S. investors outperformed the MSCI All Country World Index ex U.S., over this particular time period by almost one and a half percentage points.[6] For bonds (Panel D), average annual returns on U.S. investors' foreign bond portfolios (6.08%) were slightly higher than returns on foreign investors' U.S. bond portfolios (5.89%). Foreign investors' U.S. bond portfolios underperformed the Lehman Aggregate U.S. bond index by 51 basis points per year, perhaps because of their overweighting of low-yielding Treasury securities.

2.3 Returns Differentials from the Monthly Portfolios

From Table I it is clear that the monthly portfolio data show no evidence of substantial positive returns differentials within each asset class. However, because equities return more than bonds and U.S. claims are weighted towards equity while its liabilities are weighted towards bonds, there can be a positive returns differential on the combined portfolio of equities and bonds even if there is no differential within each asset class. In addition, as shown in Curcuru, Dvorak, and Warnock (2007), foreign investors' ill-timed switching between equities and bonds within their U.S. portfolio contributes positively to the overall differential. In fact, the first column of Table II shows that the portfolio returns differential for the 1994 to 2005 is 0.72 percent per year, greater than zero but still much smaller than the differentials found in the existing literature. The actual value of the differential depends on the time period, so to better enable a comparison with existing estimates we also show the differential computed from the monthly portfolios together with the differentials in GR for the same time period of 1994 through 2004Q1 (the end date of the GR data).[7] We leave until Section 3 a more complete discussion of the GR returns, but for now we note that when examining identical time periods the monthly portfolios indicate much smaller

[6] The MSCI All Country World ex U.S. returned 8.13% per year over this period.

[7] Throughout our paper, for GR returns we convert their real returns to nominal using the PCE deflator. For 1973-2004Q1, we use their published data. For shorter periods we calculate real returns using data from http://socrates.berkeley.edu/~pog/academic/WB_data.xls, which was accessed on 15 August 2007.

differentials for equities (-4.66% vs. -1.92%), bonds (0.00% vs. 3.36%), and portfolio debt and equity as a whole (-1.16% vs. 4.64%). As expected, the difference between the two sets of returns owes primarily to a large discrepancy between returns on U.S. investors' foreign equity positions (7.76% per year in the monthly portfolios, compared to 12.32% in GR) and in foreign investors' U.S. bond positions (6.65% compared to 1.89% in GR).[8]

Returns differentials from the dataset on monthly bond and equity portfolios are much smaller than representative differentials found in the literature. However, the portfolio dataset is necessarily limited in terms of assets (only bonds and equities) and the length of the sample. In the next section, to be more comparable to existing work, we use BEA data on all assets (bonds, equities, direct investment, and other assets such as bank deposits) for a much longer time period.

3. Returns Differentials Using BEA Data

In this section we extend our analysis to all asset categories and follow the literature by utilizing BEA data to calculate differentials from implied returns. We identify that the source of the bias in existing estimates stems from using internally inconsistent data on flows and positions.

3.1. Revised and Original Series Methods

There are two methods to calculate implied 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 uses the original flow and position data published by BEA in each annual release of the U.S. IIP and balance of payments, and the corresponding original income data reported in the annual IMF *Balance of Payments Statistics Yearbook.*

[8] We note that the returns differential on portfolio securities is perhaps abnormally low over this period as U.S. equities outperformed non-U.S. equities. Over longer time periods the relative performance of U.S. and non-U.S. equity markets is closer to zero—for example, from 1973 to 2004Q1 they both returned roughly 12 percent per year—and so the differential for equities and, thus, portfolio securities as a whole would likely be slightly higher.

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

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

where A^R_t is the position (claims or liabilities) at the end of period *t*, $FLOW^R_t$ is flows (U.S. flows abroad or foreign flows into the U.S.) during period *t*, and INC^R_t is interest and dividend income during period *t*.[9] The superscript R denotes *revised*, indicating that all variables are of the latest vintage. The first term in (2) 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 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. As we explain in Section 5, these "other" changes in the *revised* series can be quite large and including them in the capital gains may not be appropriate.[10]

We can use a similar methodology to compute implied 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

[9] Using A^R_t or A^R_{t-1} +1/2 $FLOW^R_t$ in the denominator of (2) would have no material effect on our results.
[10] For the revised series, BEA reports the breakdown between price, exchange rate and "other" changes for aggregate claims and liabilities but not for individual asset categories. Thus, when using BEA's revised data, the "other" category can be excluded from the calculation of *aggregate* capital gains but it cannot be excluded from *individual asset* categories. Perhaps it is for this reason that existing work includes the "other" category as part of capital gains. Note that Lane and Milesi-Ferretti (2007) propose a method to break out the "other" component for individual asset categories.

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:[11]

$$r_t^O = \frac{A_t^O - A_{t-1}^O - FLOW_t^O}{A_{t-1}^O} + \frac{INC_t^O}{A_{t-1}^O} \qquad (3)$$

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. The superscript *O* denotes *original*, indicating that all variables are as initially reported.

3.2. Revised and 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 III shows that using annual data from 1990 through 2005 the differences are substantial. The aggregate returns differential using the *revised* series is 3.4 percent, in line with calculations found in the literature.[12] The aggregate returns differential using the *original* series is substantially lower at 1.0 percent. 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).

[11] 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. In addition, the "other" changes in the original series are quite small.

[12] As noted earlier, returns differentials calculated over relatively long time periods range from 3.1% for 1983 to 2003 (Obstfeld and Rogoff, 2005) to 3.9% for 1980 to 2004 (Lane and Milesi-Ferretti, 2005a). 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.II lists the sources of data as well as table and line numbers. Over shorter time periods, returns differentials can be substantial, owing mostly (but not entirely) to short- to medium-run exchange rate movements; see Lane and Milesi-Ferretti (2005b) and Forbes (2007).

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 percent, while the original series imply only a 1.6 percent differential. All of the difference between revised and original returns is driven by capital gains, as yield differentials using the two methods are identical. One striking difference is in capital gains on U.S. bond liabilities. The original series imply that capital gains on bond claims and liabilities are nearly identical at 70 and 50 basis points per year, respectively. In contrast, the revised series imply, somewhat implausibly, *negative* capital gains (-1.4%) on U.S. bond liabilities. In other words, even in an environment of a secular decline in U.S. interest rates—when all foreign investors needed to do to achieve positive capital gains was to hold their U.S. bond positions for some time and then sell—the revised series suggests losses of 140 basis points per year over the sample period. A similar capital gains disconnect 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 IV).[13] As in the 1990-2005 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

[13] 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 percent per year, while over the same time period the MSCI World ex U.S. returned only 12.9 percent per year, nearly identical to the 12.8 percent return implied by the original series.[14]

3.3 Patterns in Revisions

We have shown that the large returns differentials computed using the current vintage of revised data do not exist in the original data releases. In this subsection we show that this is the result of systematic patterns in revisions to positions and flows.

3.3.1 Revisions to Flows and Positions

Figure 1 depicts the magnitude of revisions to U.S. net cross-border financial flows and net international investment positions. It is immediately apparent that there tends to be substantial positive revisions to net positions with much smaller (and at times negligible) revisions to net capital inflows. For example, the 1994 net position was revised upward $424 billion, while flows were revised by only $36 billion. As long as there are not one-for-one level shifts in positions across all previous years—and Figure 1 shows no evidence that revisions to positions are carried back one-for-one—large revisions to positions with only very minor revisions to flows will substantially impact implied capital gains calculated using equation (2). Over our sample period, the large upward revisions to positions combined with minor revisions to flows to produce overly large implied capital gains.

We can be more exact with this by combining equations (2) and (3) to 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, all expressed relative to the end of the previous year's position:

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

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

An upward revision to year-end assets (i.e., $A^R_t - A^O_t > 0$) owes to some combination of revisions to the preceding year's position ($A^R_{t-1} - A^O_{t-1} > 0$), 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 V shows this decomposition of revisions for U.S. claims and liabilities and their components.[15] Focusing first on the aggregates, average revisions are positive for both claims and liabilities but are substantially larger for claims (10.3%) than for liabilities (1.4%). As noted in conjunction with Figure 1, there was not a level shift in past positions, but revisions to the year-end positions are associated with somewhat more modest revisions to the previous year's positions (7.4 of the 10.3% for claims and 1.2 of the 1.4% for liabilities). Year *t* flows are revised slightly on average (1.0% and 0.6% for claims and liabilities, respectively). Overall, these patterns in revisions to A_t, A_{t-1}, and $FLOW_t$ translate into revisions to the residual (implied year *t* capital gains) of 2.0 percent per year for claims and -0.4 percent per year for liabilities. Thus, built into estimates of the aggregate returns differential calculated using the current vintage of revised BEA data is a roughly 2.4 percent differential that owes primarily to the pattern of revisions to positions and flows.

3.3.2 Revision Policies

To better understand these systematic patterns in revisions, we next focus on revision policies for bond and equity claims. Initial estimates of U.S. positions in foreign bonds and foreign equities were revised upward an average of 24.6 percent and 46.3 percent per year from 1990 to 2005 (Table V). Figure 2 shows the times series behind these averages. For U.S. positions in foreign equities, the incorporation of the first security-level measurement of U.S. portfolios

[15] Normalizing by period *t* positions instead of period *t-1* positions would not materially change the numbers in Table V.

abroad (from the Treasury Department's 1994 benchmark survey) resulted in particularly large upward revisions of 90 percent per year from 1990 to 1995. Prior to the 1994 benchmark survey, positions were not measured but were estimated from capital flows data and approximations of capital gains. The enormous revisions that were prompted by the benchmark survey were described by BEA in Bach (1997, p. 47) as follows:

> "The differences between the two estimates can be attributed both to incomplete coverage of these transactions in the Treasury source data upon which BEA's position estimates are based and to inexact valuation of price and exchange rate adjustments applied to BEA's estimated positions. *However, it is not possible to determine the amount of underestimation attributable to each part of the estimation process*." (emphasis added)

Because of the inability to definitively attribute the newly discovered claims to flows or valuation adjustments, BEA made *no* revisions to flows (the "transactions in the Treasury source data")—financial flows are completely absent from Table 2 in Bach (1997), which shows all revisions for the balance of payments and international investment positions—and put the difference between estimated and measured positions in the residual "other" valuation adjustment category.

These large upward revisions to positions without corresponding revisions to flows results in an upward bias in the implied returns calculated with revised data. This is most easily seen from the substantial upward revisions to implied capital gains for equity claims in Table V. As noted, for U.S. positions in foreign equities, benchmark surveys led to revised estimates that were on average 46.3 percent higher than initial estimates. BEA had to decide how to account for these very large upward revisions to equity positions, which arose from new information on positions at a particular point in time from high quality benchmark surveys. In the absence of additional information on the reason behind these higher claims, it was attributed in some part to the previous year's position (revised up 34.6% on average from 1990-2005), some part to

revisions to flows (up 1.2%), and the rest to 'other changes' (up 10.5%). When equation (2) is used by researchers to calculate implied returns, these other changes show up as implied returns.[16]

Why does BEA only partially revise flows? One answer is that they do not collect securities flows data and are, in a sense, downstream users of data compiled by the Treasury International Capital Reporting System (TIC, the "source data" in the above quote). The underlying TIC flows are often not revised even when it is known that newly found claims should be attributed to capital flows because it is often unfeasible for the entities reporting cross-border transactions to turn back the clock and revise their reported history. For example, a problem with the reporting of the underlying TIC capital flows data on long-term foreign debt claims was identified after the 2003 comprehensive benchmark survey:

> "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."[17]

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 (Dept. of Treasury et. al., 2005), but to this day the revised TIC data for 2002 and 2003 still show $61 billion in net U.S. *sales* of foreign bonds. As reported in Bertaut et. al. (2006), an in-depth investigation revealed under-reporting of U.S. investors' purchases of newly issued foreign debt. While this reporting problem was resolved starting in 2004, the majority of reporting entities did not revise their TIC reports for 2002 and 2003 to correct past omissions.

In the absence of revisions to the TIC flows data to accompany unexpected survey results, BEA is left with a dilemma: Deviate substantially from the underlying source data or put

[16] A similar pattern is evident in revisions to bond claims, with revisions to 'other changes' producing on average a 6.1 percent upward revision to implied capital gains.
[17] Dept. of Treasury et. al. (2005, p. 8).

much of the changes in the "other" category. In the past, BEA tended not to deviate much from the TIC flows data:

> "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."[18]

Even when BEA substantially revised flows—for example, from roughly $60 billion in net sales to roughly $60 billion in net purchases in 2002 and 2003—they still attributed much of the change in the year-end positions to "other changes".

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

> "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 (an average of 1.4%) 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 had tended 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 outflows but are not recorded by the existing transactions reporting system because they do not involve the typical data reporters (brokers and dealers). 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.

Thus, the use of the current vintage of data on positions and flows to calculate implied returns very likely overstates the size of the returns differential. The large capital gains on U.S. claims implied by the revised series are a result of systematic gaps in statistical coverage and the

[18] Bach (2000, p. 71-72).

BEA practice of attributing unexpected position changes to the 'other' category in the absence of corresponding revisions to the TIC 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 GR exorbitant privilege.

4. Comparison of Returns Differentials for Debt and Equity

We showed in Section 2 that returns differentials computed using monthly portfolios are quite small. In Section 3.2 we showed that returns differential using original BEA data releases are also quite small, while those computed from readily available revised BEA data are quite large. However, our analysis of monthly portfolios used a different sample period. In this section we compare returns differentials for debt and equity from the different methods as well as from GR using an identical sample period, 1994-2003.

In the first column of Table VI we present aggregate returns differentials calculated using the monthly portfolios. As noted in Section 2, there is no evidence that U.S. claims have substantially higher returns than U.S. liabilities; over this time period (1994-2003) the differential on bonds is a negligible two basis points per year and the differential on equities is negative 5.1 percent per year.[19] The second column shows that returns calculated using the BEA original series closely match those using the monthly portfolios, with a very similar negative differential on equity (-5.27%) and a differential on bonds that is close to zero (0.63%). The third column shows that the revised series again imply much larger returns differentials: a very large positive differential for bonds (6.74%) and a more modest negative differential for equity (-3.84%). That the returns from monthly 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

[19] As noted earlier, the recent period is somewhat abnormal. Over longer periods the differential on equities is likely closer to zero.

better reflection of the actual returns differential.[20] Arriving at a close to zero returns differential on U.S. portfolio investment using two independent sources of data strengthens our conclusion that the United States 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 GR, who use combination of the approaches discussed 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 VI report GR returns on equities and bonds for 1994-2003 and, for completeness, for 1973-2004Q1.

For the 1994-2003 period GR returns differentials are closer to BEA revised than to BEA original or those from monthly portfolios. Compared to the monthly portfolios and the original series, for both claims and liabilities GR report higher equity returns and lower bond returns. This could be 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, so 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.

The most significant difference between our returns (and those from original BEA data) and GR returns is that their return on U.S. bond liabilities is much lower (6.57% or 6.47% vs. 1.73%). This gives rise to GR's 3.53 percent differential for bonds compared to 0.02 percent using the monthly portfolios and 0.63 percent 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

[20] Note that we are not implying that original *positions* are more accurate than revised *positions*. Rather, our point is that original positions and flows at least form an internally consistent dataset, which is vital if one wants to back implied returns out of BEA data.

yielding corporate bonds make up as much as 42 percent of U.S. long-term debt liabilities (see Table 1 in Dept. of Treasury et al, 2006), so excluding them will understate foreigners' returns on U.S. bonds. For example, had we treated all corporate and Agency bonds as Treasury bonds, the average annual return on U.S. bond liabilities would have decreased almost a full percentage point. However, the exclusion of corporate bonds explains only part of the low return on U.S. bonds reported by GR. Even when we consider only Treasury bonds, GR estimates fall short of standard measures of returns on U.S. bonds. For example, for the 1994-2003 period Ibbotson's *Stocks, Bonds, Bills, and Inflation* reports total returns of 4.2, 6.6 and 8.7 percent per year for short-, medium- and long-term Treasury bonds, respectively. This is significantly higher than GR's 1.73 percent per year. And, for the 1973-2004Q1 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 (shown in the final column of Table VI). This is substantially lower than standard measures of returns on U.S. bonds for that period; for that period Ibbotson's reports total returns of 6.2, 8.3 and 9.0 percent per year for short-, medium- and long-term Treasury bonds, respectively.[21]

The implication of this and the previous two sections 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. For the broader set of assets and longer time periods, any differential that exists is small and concentrated in foreign direct investment. A large positive returns differential, and the stabilizing influence that it would lend to the global economic system absent

[21] For equities, we believe that the GR equity differential for the 1973-2004Q1 period is biased upward due to their use of fixed country weights in the 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 1973-2004Q1 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 1994-2005 average annual return on U.S. equity claims in the monthly portfolios would have jumped from 9.6 percent (reported in our Table I) to 11.6 percent. There are also other more minor differences in the calculation of returns on U.S. equity assets. For example, we use information on 38 countries, whereas GR use only 12. Also, we use MSCI indices which tend to include the large firms that international investors tend to hold, whereas GR use local market indices that tend to be broader than the MSCI.

a sustained dollar depreciation, is not apparent when one examines actual bond and equity portfolios or original BEA data releases.

5. Cumulated Current Account Deficits and the Net Foreign Position

There are two empirical stylized 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 stylized fact that reinforces the perception of a large U.S. returns differential is shown in Figure 3: The cumulative current account deficit (CCA) is much more negative than the net IIP, which suggests high *capital gains* on claims relative to liabilities. This is at odds with the evidence in Section 3 that the capital gains differential is on average zero. Lane and Milesi-Ferretti (2007) provide one analysis of the wedge between the CCA and the net IIP. In particular, they depict the implications of different assumptions about "other" changes, an innocuous sounding but vital component of the IIP presentation that is described in some detail below, on reconciling the wedge. In the rest of this section we first show that some wedge is consistent with a zero average capital gains differential, but that most of wedge owes to "other" changes brought about by mismeasured flows.

5.1 Relationship Between the Net Foreign Position and the Current Account

We can write the net IIP at time *t* as the initial position plus the cumulative current account and cumulative net capital gains on cross-border 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.[22] Superscript *R* indicates that all series—including the capital gains rates kg^A and kg^L—are revised.[23] Multiplying the revised capital gains rates by revised positions produces $2.2 trillion of cumulative net capital gains from 1990 to 2005—exactly the amount needed to close the wedge between the cumulated current accounts and the revised net position in Figure 3.

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 $0.7 trillion. These cumulative net capital gains are not zero—even though the *average* capital gain rate differential is zero—because 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 current accounts should be $0.7 trillion, but Figure 3 shows that the gap is far wider at $2.2 trillion.

5.2 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, as also noted by Lane and Milesi-Ferretti (2007) and Kitchen (2007), "other" changes play an important role in the divergence of the net IIP and cumulated current accounts. This is apparent in Figure 3, where a dashed line shows that without "other" changes the net position would be much lower and very close to the CCA plus

[22] We omit the cumulative net capital account and statistical discrepancy from the right hand side as it is negligible. We also exclude financial derivatives, which BEA started reporting as of end of 2005.
[23] The capital gains rates in equation (5) are exactly what we calculated in Section 3 using the revised series. Note that the revised series capital gains match the pattern of revised net positions and revised current accounts by construction.

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 (implied) 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.

In our opinion, the cumulative capital gains implied by "other" changes are not capital gains but most likely represent mismeasured flows. As pointed out by Lane and Milesi-Ferretti (2007), the "other" changes could in principle represent three things: mismeasured flows, mismeasured initial positions, or mismeasured capital gains. Their analysis suggests that more than three quarters of the "other" changes represent mismeasured flows.[24] This is consistent with our evidence presented in Section 3 that U.S. purchases of foreign securities and foreign sales (redemptions) of U.S. securities have been systematically underestimated. In fact, the $1.4 trillion of "other" consists of two parts. The first part is $1.0 trillion of *positive* "other" changes made to claims—suggesting that U.S. purchases were initially underestimated. The second part is $0.4 trillion of *negative* "other" changes made to liabilities—suggesting that foreign sales of U.S. securities were initially underestimated. Furthermore, our calculations in Section 2 using monthly portfolios and market returns suggest that for portfolio investment a substantial portion of these "other" changes should not be attributed to capital gains.[25]

[24] The Lane and Milesi-Ferretti (2007) analysis of BEA documents describing various revisions concludes that the allocation of "other" changes depends on the asset category. They argue that for portfolio claims and liabilities "other" changes represent mismeasured flows, for FDI they represent mismeasured capital gains, and for bank and non-bank lending they represent mismeasured initial positions. However, according to their calculations in Tables 3 through 6 (last row and last two columns), more than three quarters of "other" changes can be attributed to portfolio claims and liabilities.

[25] 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.

The overestimation of net financial inflows, a point also made earlier by Warnock and Cleaver (2003), has the additional implication that some other part of the balance of payments is mismeasured. For example, it could be that the current account deficit has also been overestimated; Lane and Milesi-Ferretti (2007) note that results such as ours suggest that the current account deficit has been overestimated by as much as 0.6 percent per year. Such mismeasurement in the current account might seem unsettling to those who believe that the trade data are the most accurate part of the balance of payments.

Does the fact that our results suggest that the current account deficit might be overstated, which some would find incredulous, invalidate our results? Not at all, in part because it is entirely plausible that the current account deficit has been overstated. For example, the collector of U.S. merchandise trade data carefully shows in U.S. Census Bureau (1998) that in the past U.S. exports were systematically underestimated by as much as 10 percent, or 0.8 percent of GDP. Moreover, there are strong parallels between mismeasurements in financial flows and merchandise trade. Data on merchandise imports are rather accurate, in large part because these goods must, for taxation purposes, go through customs. In contrast, for most countries U.S. tracking of exports relies not on customs data but rather on less accurate survey data. For financial flows, countries tend to care more about what foreigners own of their securities rather than what their residents own abroad. Accordingly, detailed surveys of U.S. liability positions—which help identify problems in flows data—have been conducted regularly since 1974, while the first post-war survey of claims positions was not undertaken until 1994. And just as financial flows data are not revised substantially because of an inability to recollect source data, historical revisions to goods trade tend to be for short periods; even when holes in the reporting system are found, it is impossible to go back in time and recollect the data.

In summary, in this section we note that it is true that U.S. net position did not decline by as much as implied by current account deficits. However, in our opinion this apparent stability of the revised net IIP relative to cumulative current accounts is not because the U.S. experienced a

high return on its claims relative to liabilities, but rather is primarily caused by the systematic patterns to revisions in positions without corresponding revisions to flows that we highlighted in Section 3. The independent analysis of Lane and Milesi-Ferretti (2007) supports this opinion. Moreover, while a likely counterpart to our results is the potential overstatement of the current account deficit, a more complete assessment of this issue is beyond the scope of this paper.

6. Conclusion

We argue that existing papers overstate the size of the returns differential between U.S. cross-border claims and liabilities. We show that the bias in existing estimates, which is particularly pronounced for portfolio investment, owes to the practice of calculating implied returns using fully revised positions data and partially revised flows data. Returns calculated using original data releases do not suffer from this bias, and using these returns we find a 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—the U.S. capital flows data are in some sense not revisable—but rather that the practice of using a combination of fully and partially revised data produces estimates of implied capital gains that are biased in explainable ways.

Our results have important implications along many dimensions. For example, there are implications for 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 weaker than previously believed. Moreover, a differential that is 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 implications 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.

Our results 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.

We caution the reader on two points about returns differentials. First, our work does not infer that returns differentials are always small. Over shorter time periods, returns differentials can be substantial, owing mostly (but not entirely) to short- to medium-run exchange rate movements; see, for example, Lane and Milesi-Ferretti (2005b) and Forbes (2007). Second, over longer time periods, even if returns within portfolio asset classes are roughly equal, the venture capitalist nature of the U.S. external position highlighted by GR means that as long as bonds return less than equities there can be a long-lasting (albeit somewhat small) positive differential on portfolio securities.

Finally, our results raise the point that various theories concerning the sustainability of large U.S. current account deficits hinge on different views of the relative reliability of the many components of the international accounts. For example, we showed that implicit in the view that sizeable returns differentials exist and can keep the current situation from unwinding in a malign manner is the belief that the IIP and the financial account are accurately measured and form a

consistent dataset. Similarly, the “dark matter” view of Hausmann and Sturzennegger (2007) also hinges on a view of the relative reliability of components of the international accounts, in particular that income streams in the BOP presentation are more accurate than measures of service exports. While the validity of this assumption is not entirely clear, if it is true then it follows that service exports are underestimated and U.S. current account deficits are overestimated. Further study on the relative reliability of various components of the international accounts is necessary to shed light on these and other theories of current account sustainability.

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Table I
Characteristics of U.S. Foreign Equity and Bond Claims and Liabilities

Returns on foreign investors' U.S. equity portfolios are from the U.S. MSCI gross return equity index. Returns on foreign investors' U.S. bond portfolios are foreign-portfolio-weighted averages of Lehman Brothers Treasury, Agency and corporate bond indices. Returns on U.S. investors' foreign equity portfolios are U.S.-portfolio-weighted averages of each country's dollar return on its MSCI gross return equity index. Returns on U.S. investors' foreign bond portfolios are U.S.-portfolio-weighted averages of each country's bond returns, with each developed country's bond returns given by the weighted average of U.S. dollar returns on the country's MSCI bond index and the MSCI Eurodollar Credit index (with, for each developed country, the weight on the Eurodollar index being the share of dollar-denominated bonds in U.S. investors' holdings of its bonds) and each emerging market country's returns given by the EMBI+ U.S. dollar index. All data are from January 1994 through December 2005, unless otherwise noted in Appendix Table AI. All returns are annualized.

	Mean	Median	St.Dev.	Min	Max
Panel A: Equity Weight in U.S. Investors' Foreign Portfolios (%)					
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 Foreigner Investors' U.S. Portfolios (%)					
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: Portfolio Equity Returns (%)					
Return on Foreigner Investors' U.S. Equity Portfolios					
	11.88	14.92	65.85	-83.41	213.30
Return on U.S. Investors' Foreign Equity Portfolios					
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: Portfolio Bond Returns (%)					
Return on Foreigner Investors' U.S. Bond Portfolios					
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 U.S. Investors' Foreign Bond Portfolios					
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 II
Returns on U.S. Claims and Liabilities from Monthly Portfolios

This table shows annualized average percent returns using the monthly portfolios and Gourinchas and Rey (2007a) data. Gourinchas and Rey (2007a) quarterly *real* returns were converted to *nominal* using the PCE deflator and annualized.

	Monthly Portfolios (1994-2005)	Monthly Portfolios (1994-2004q1)	Gourinchas and Rey (1994-2004q1)
Equity			
Claims	9.59	7.76	12.32
Liabilities	11.88	12.42	14.24
Differential	-2.29	-4.66	-1.92
Bonds			
Claims	6.08	6.65	5.25
Liabilities	5.89	6.65	1.89
Differential	0.19	0.00	3.36
Combined Bonds and Equity			
Claims	8.32	7.08	10.69
Liabilities	7.60	8.24	6.05
Differential	0.72	-1.16	4.64

Table III

Returns and Returns Differentials Using BEA's Revised and Original Series, 1990 – 2005

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

	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 IV

Returns and Returns Differentials Using BEA's Revised and Original Series, 1984 – 2005

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

	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 V

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 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 implied 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	Implied 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 VI
Returns on U.S. Claims and Liabilities Using Various Data Sources

For comparison purposes, the first four columns all use the same sample period: 1994-2003. The first column shows annualized average monthly returns using monthly portfolio weights and market returns described in Section 2.1. The second and third columns show average annual returns using BEA original and revised series, respectively, calculated using equations (2) and (3). The fourth and fifth columns show average annualized quarterly returns using Gourinchas and Rey (2007a) data from 1994 through 2003 and 1973 through 2004Q1, respectively. Gourinchas and Rey (2007a) *real* returns were converted to *nominal* using the PCE deflator.

	Monthly Portfolios (1994-2003)	BEA original (1994-2003)	BEA revised (1994-2003)	Gourinchas and Rey (1994-2003)	Gourinchas and Rey (1973-2004)
Equity					
Claims	7.48	7.95	11.46	12.72	19.84
Liabilities	12.58	13.22	15.30	14.67	13.73
Differential	-5.10	-5.27	-3.84	-1.95	6.11
Bonds					
Claims	6.59	7.10	11.18	5.26	8.35
Liabilities	6.57	6.47	4.44	1.73	4.62
Differential	0.02	0.63	6.74	3.53	3.73

Figure 1
Revisions to Net Positions and Net Financial Flows

This figure depicts the net international investment position (solid lines), calculated as U.S. positions abroad less foreigners' positions in the United States, and net financial outflows (dashed lines), calculated as U.S. flows abroad less foreign flows into the United States. For both, thick lines denote the current vintage of revised data and thin lines denote the originally released data. All data are in billions of U.S. dollars.

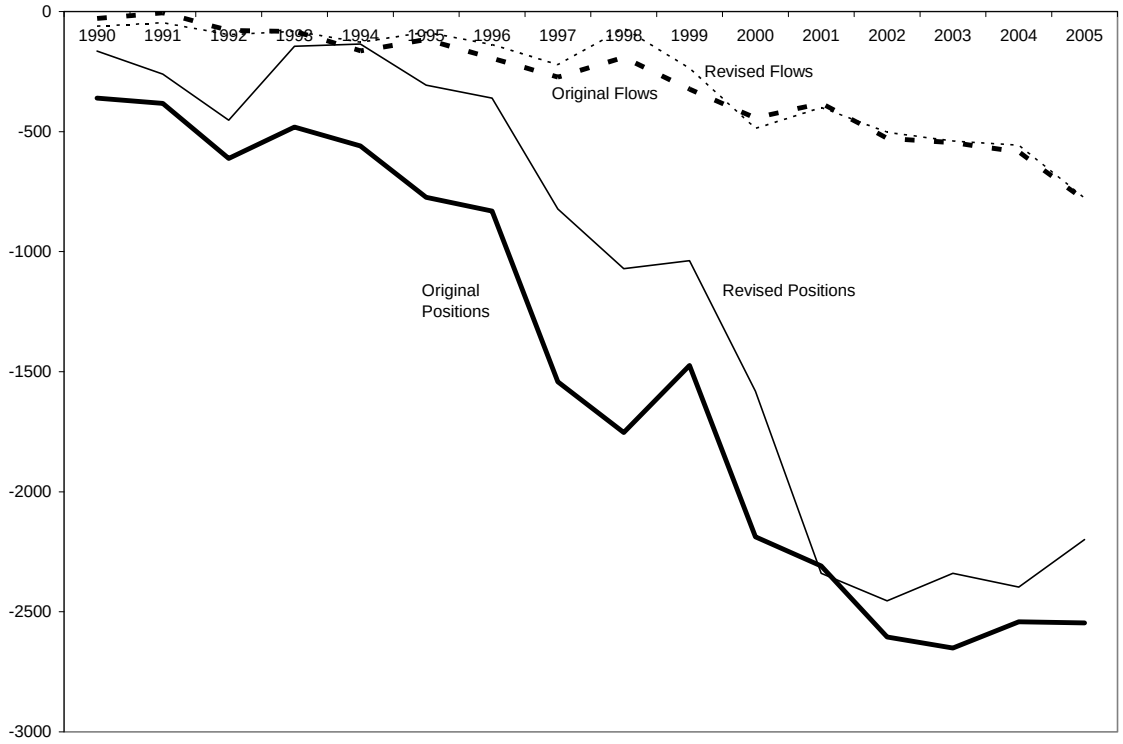

Figure 2
Revisions to U.S. Positions in Foreign Bonds and Equities

The figure depicts the percentage revision to the initial estimates of U.S. positions in foreign bonds and foreign equities as reported in BEA's International Investment Position presentation.

Figure 3
Net International Investment Position Estimates

"IIP" is the revised net investment position published by BEA as of July 2007. By construction, the series equals the revised net position in 1989 plus revised cumulative current account balance plus cumulative revised capital gains. "IIP less 'other'" is the revised net position excluding revised "other" changes as published in BEA's International Investment Position Table 3. "CCA plus original capital gains" is the revised net position in 1989 plus revised cumulative current account balance plus cumulative original capital gains. The original capital gains are calculated by applying original capital gains rates from Section 3 to revised gross positions. "CCA" is the revised net position in 1989 plus the revised cumulative current account balance.

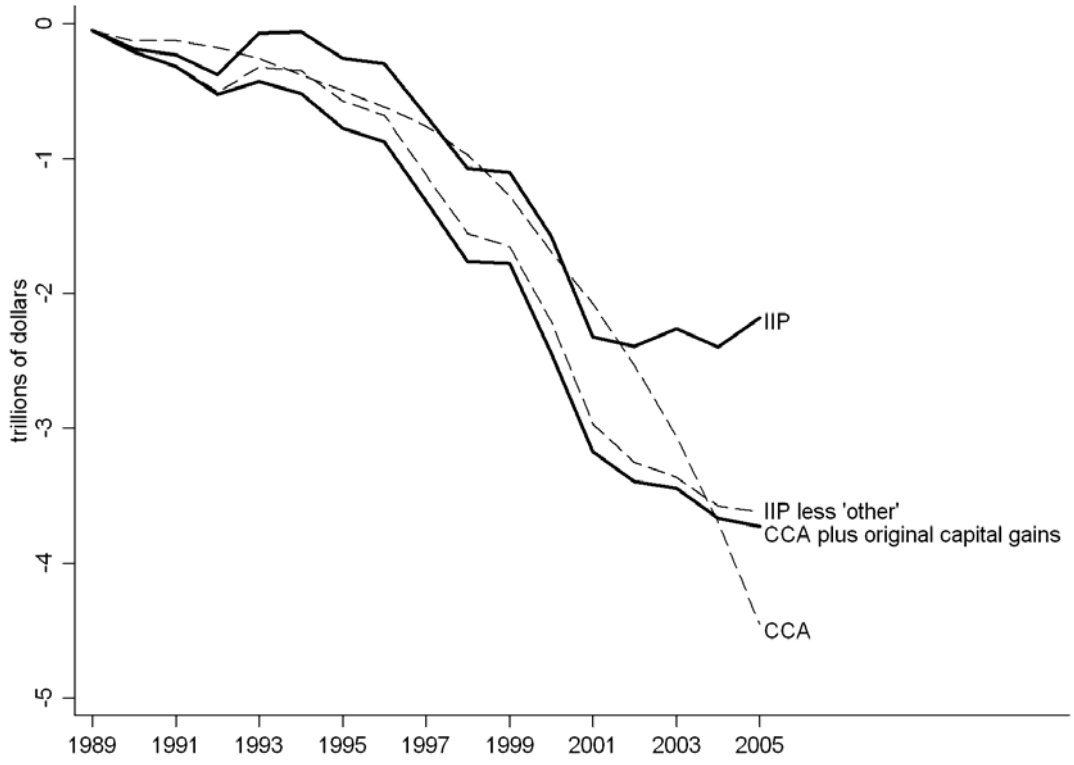

Table A.I: Country Composition of U.S. Portfolio of Foreign Equity and Foreign Bonds

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 annualized average of simple monthly returns on MSCI gross U.S. dollar total return index expressed in percent. Developed countries' bond returns are the annualized weighted averages of simple monthly U.S. dollar returns on the country's MSCI bond index and the MSCI Eurodollar Credit index, where for each country the weight on the Eurodollar index is the share of dollar-denominated bonds in U.S. holdings of its bonds. Emerging markets' bond returns are simple monthly returns on the EMBI+ U.S. dollar index. The time period begins in January 1994, unless otherwise noted in the last column, and ends in December 2005.

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	13.70	0.037	7.02	Jan '94
Austria	0.003	11.87	0.005	7.42	Jan '94
Belgiumlux	0.010	13.73	0.022	7.40	Jan '94
Canada	0.071	15.73	0.227	7.11	Jan '94
Denmark	0.006	15.92	0.016	8.07	Jan '94
Finland	0.023	27.17	0.009	7.44	Jan '94
France	0.076	12.20	0.049	7.10	Jan '94
Germany	0.056	11.30	0.092	6.99	Jan '94
Greece	0.002	17.40	0.003	8.99	Jun '97
Ireland	0.013	12.29	0.010	8.10	Jan '94
Italy	0.029	14.91	0.036	9.38	Jan '94
Japan	0.158	4.02	0.072	3.19	Jan '94
Netherlands	0.081	12.27	0.051	6.99	Jan '94
Norway	0.007	15.75	0.010	7.94	Jan '94
Portugal	0.003	11.66	0.002	8.74	Jan '94
Spain	0.024	17.36	0.018	8.59	Jan '94
Sweden	0.026	19.63	0.025	8.71	Jan '94
Switzerland	0.055	13.42	0.002	6.73	Jan '94
U. K.	0.213	10.20	0.136	7.67	Jan '94
Argentina	0.006	14.19	0.029	-4.09	Jan '94
Brazil	0.018	26.32	0.027	7.72	Jan '94
Chile	0.003	12.21	0.010	2.71	Jun '99
China	0.003	-1.03	0.004	1.84	Apr '94
Colombia	0.000	24.71	0.006	2.54	Mar '97
Hungary	0.002	30.22	0.001	-0.23	Feb '99
India	0.006	12.60	0.001	1.15	Mar '96
Korea	0.019	18.97	0.015	0.69	Jan '94
Malaysia	0.007	4.07	0.007	1.79	Nov '96
Mexico	0.026	15.42	0.050	2.73	Jan '94
Morocco	0.000	12.42	0.001	4.06	Jan '95
Peru	0.001	21.24	0.002	12.60	Jan '94
Philippine	0.003	-1.51	0.006	2.59	Jan '94
Poland	0.001	13.53	0.003	5.75	Jan '94
Russia	0.004	49.47	0.007	18.06	Jan '95
South Africa	0.009	16.31	0.004	3.02	Jun '94
Thailand	0.005	4.05	0.004	1.57	Jun '97
Turkey	0.002	29.34	0.003	4.34	Jul '96
Venezuela	0.001	17.03	0.010	7.85	Jan '94

Table A.II: 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 refers to 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 '99-'05: Table 7a, line A4	'90-'98: Table 7b, line B2+M4 '99-'05: Table 7a, line B4+M4
Bonds	'90-'98: Table 7b, line A13 '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