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New Evidence on the US Excess Return on Foreign Portfolios*

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Abstract

We provide new estimates of the return on US external claims and liabilities using confidential, high-quality, security-level data. The excess return is positive on average, since claims are tilted toward higher-return equities. The excess return is large and positive in normal times but large and negative during global crises, reflecting the global insurance role of the US external balance sheet. Controlling for issuer's nationality, we find that US investors have a larger exposure to equity issued by Asia-headquartered corporations than reported in the aggregate statistics. Finally, equity portfolios are concentrated in 'superstar' firms, but for US liabilities foreign holdings are less concentrated than the overall market.

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1. Introduction

Portfolio returns play an important role in global wealth dynamics. A key stylized fact, first established by Gourinchas and Rey (2007a), is that the return on US external claims consistently exceeds that on US external liabilities, the so-called 'exorbitant privilege.'[1] A positive excess return helps to stabilize the US external asset position and makes US current account deficits more sustainable. It is often mentioned in connection with a dominant role of the dollar in the international monetary system (Caballero et al. (2008), Goldberg and Tille (2009), Gourinchas et al. (2019), Ilzetzki et al. (2019), Gopinath and Stein (2021), Bianchi et al. (2021), Chahrour and Valchev (2022), Sauzet (2023) or Kekre and Lenel (2024) are few recent contributions).

In the absence of security-by-security data, previous estimates used top-down approaches based on highly-aggregated data, either exploiting balance of payment accounting relationships or approximating returns with market indexes.[2] We improve on these earlier estimates by constructing the excess return using a bottom-up approach. Specifically, we use a confidential, security-level dataset of holdings from the official filings of custodians and investors through the Treasury International Capital (TIC) system available from 2005 to 2022. These security-level data have never been used in this type of study. Our detailed data allow us to examine the returns across time samples, regions, type of assets, return components (e.g., capital gains versus dividends), issuer type, and nationality of parent firm. We confirm some of the previous findings in the literature and shed new light on determinants of the US excess return.

We establish five results. Our first finding is that the US excess return on portfolio (equity and bond) assets averages a modest 0.5% per year over the full sample. It is significantly higher, averaging 1.7% per year, when we exclude the pandemic period (2020-22). These estimates are similar to those obtained by top-down approaches over the same periods. Our security-level data

1 Often attributed to French president de Gaulle, the term exorbitant privilege was in fact coined by his finance minister Giscard d'Estaing in 1965 when he expressed his unhappiness about the ability of the US to run large direct investment surpluses financed by holdings of dollar reserves at the Banque de France.

2 See Gourinchas and Rey (2007a, 2014) for examples of the former, and Curcuru et al. (2008) for an example of the latter.

allow us to delve into the components of returns (e.g., price changes, dividends, exchange rates). Over the sample period, dollar appreciation subtracted 0.8% per year from claims returns on average.

Second, we show that the positive US excess return arises largely because of the asymmetry in the composition of claims versus liabilities, with claims tilted toward equity and liabilities more balanced between equity and bonds. The share of equity in the total equity and bond claims portfolio was stable throughout our sample at around 75%, while the equity share in liabilities increased from 36% in 2005 to 51% in 2022 as Asian and European investors increasingly held US equities. The return on equities is on average 5.3 percentage points higher than the return on bonds over our sample, and thus the higher equity share in claims is an important driver of the positive US excess return. Decomposing the excess return into a composition effect –reflecting the asymmetry in portfolios with claims tilted towards equities– and a return effect –reflecting the difference in returns within asset classes– we find that the composition effect contributed 1.9 percent to the excess return while the return effect contributed -1.4 percent, largely because of a lower return on equity claims relative to equity liabilities since 2010, as documented also by Atkeson et al. (2022).

Third, we document that the US excess return becomes large and negative, equal to -3.1 percent, during global crises, such as the global financial crisis of 2008-09, the European sovereign debt crisis of 2010-12, and the global pandemic of 2020-22. Outside of global crises, the excess return is large and positive, equal to 3.3 percent. This is consistent with theories highlighting the global insurance provided by the US external balance sheet to the rest of the world (see Gourinchas and Rey (2022), Faia (2007) and Valchev (2020)). During global crises both the composition effect and the return effect decline or turn negative, the former as equities under-perform bonds (as in the global financial crisis), the latter as claims under-perform liabilities (as in the European debt crisis or the pandemic). External portfolios reflect the balance between cross-border asset demands and relative asset supplies. Our findings confirm a larger net demand for risky assets from US investors relative to foreign ones. The 'exorbitant privilege' in good times is matched with an 'exorbitant duty' in crises times (Gourinchas and Rey (2022)).

Fourth, our security-level data allows us to identify the issuer of each security, and thus to remap

the securities to the country of the parent of the issuing firm. This remapping is important as a large and growing share of securities held by US investors are issued in offshore financial centers, at times by firms with US parents (see also Zucman (2013) and Coppola et al. (2021)). Growth in global profits, as well as of potential for profit shifting by US firms, is explored in Chodorow-Reich et al. (2024) using a novel firm level tax returns dataset. In our data, the remapping reveals that US investors hold a larger share of securities issued by firms in emerging Asia than reported in the residence-based aggregate statistics. The effect of this remapping on the US excess return is small, however.

Finally, we document that equity holdings are concentrated in superstar technology and pharmaceutical firms. This concentration is much larger in equity liabilities, where the large tech-related US firms known as the Magnificent 7 comprise 16.2% of equity liabilities holdings in 2022.[3] The concentration in equity claims holdings is less extreme, with 7.4% of holdings invested European GRANOLAS firms plus the Taiwan firm TSMC.[4] Relative to the shares of total market capitalization, US equity investment abroad is more highly concentrated in superstar firms than the overall market, while foreign investment in the US is less concentrated.

Our paper adds to the long-standing debate on the size of the US excess return and the implication for global imbalances. Early papers noted the evidence of a positive excess return accruing to US investors on their external asset holdings, including Lane and Milesi-Ferretti (2004), Obstfeld and Rogoff (2005), Meissner and Taylor (2006), Gourinchas and Rey (2007b), Eichengreen (2011), Gourinchas and Rey (2014) or Gourinchas et al. (2019).

These papers infer the aggregate returns and their differentials from the changes in net foreign asset positions and transactions reported in the US International Investment Position (IIP). We refer to this procedure as the Bureau of Economic Analysis or 'BEA' method. Valuation changes are a key component of the US excess return, but in the BEA method they are imputed by subtracting Balance-of-Payment capital flows from changes in reported holdings. Because the capital flows are

3 The term was coined in May 2023 by Michael Hartnett, the Chief Investment Strategist and Managing Director at Bank of America Global Research. It includes Alphabet, Amazon, Apple, Meta, Microsoft, Nvidia and Tesla.

4 The term was coined in 2020 by Goldman Sachs to refer to a group of 11 European companies with strong earnings growth, low volatility, and stable profit margins. It includes GSK, Roche, ASML, Nestle, Novartis, Novo Nordisc, L'Oreal, LVMH, Aztrazeneca, SAP, Sanofi.

collected from different reporting agencies and at a different frequency than the surveys used to collect the holdings information, the BEA method of estimating valuation changes is quite imprecise.[5] Works by Curcuru et al. (2008) and Curcuru et al. (2013) computed returns using market indexes and highlighted the importance of asset composition in explaining the return differential.[6] However, this method is also imprecise as the commercial indexes will have a different composition than actual asset holdings.

In sum, our use of security-level data moves the literature forward in a number of ways. First, it improves accuracy over top-down approaches which have to make a number of assumptions about the underlying holdings. Second, the dis-aggregated nature includes dividends and coupons so we can calculate income directly rather than estimating it, and allows us to decompose the portfolio returns across asset classes, issuers, and the various return components (capital gains versus exchange rates), and to assess the degree of concentration in holdings. [7] Third, because we know the identity of the issuer of each security we can determine the issuer's nationality using the methodology developed by Bertaut et al. (2019). The importance of correctly imputing the nationality of the parent holding for the allocation of global wealth and profits has been highlighted in Hines and Rice (1994), Bernard et al. (2006), Zucman (2013) or Coppola et al. (2021). The comparison of the portfolio weights by residence and nationality allows us to capture any change in the portfolio composition attributable to issuance in offshore financial centers to get a more accurate picture of the geographical exposure of investors and the effect of offshore issuance on the excess return.

5 An additional source of measurement error in the BEA method is that liabilities survey data is collected as of each end-June, while the BEA publishes estimated positions as of end-December, using market indexes to estimate the valuation changes between June and December.

6 In that context the authors discuss other potential measurement issues of the BEA positions. They refer in particular to the asymmetric adjustment between the flow and the stock positions which creates a difference between the valuation channel measured through aggregate net foreign asset positions and the returns' differentials measured through more granular data.

7 For the period under consideration, price returns and dividends are based on the values reported by the survey respondents. As detailed in Appendix A, those returns are also frequently benchmarked to those from external sources.

2. Portfolio Returns and Their Decomposition

A unique feature of our data is that we are able to compute cross-border returns from the underlying securities collected by the highly confidential and legally-mandated, hence highly reliable, Treasury International Capital (TIC) surveys.[8] We report averages for the entire period, 2005-2022, as well as returns across sub-periods. We study the asset and geographic composition of the underlying claims and liabilities portfolios and their role in driving the returns. We further decompose bond returns by bond type (i.e, high-grade sovereigns versus corporate), and decompose equity returns into its components (i.e., capital gains, exchange rates, and dividends).

2.1. Methodology

Portfolio returns are computed with the usual formula, weighting the return of each security in the portfolio by its share. For instance the return r_t^p on portfolio p (e.g., US equities held by foreign investors located in a specific region) is the sum of the products of lagged asset weights and current returns across the J individual assets j in portfolio p, while the mean return $E[r^p]$ is estimated as the simple time-average of these returns:

$$r_t^p = \sum_{j=1}^{J} w_{j,t-1} r_{j,t} \quad ; \quad E[r^p] = \frac{1}{T} \sum_{t=1}^{T} r_t^p \tag{1}$$

where $w_{j,t-1}$ is the weight of asset j in portfolio p at the end of period $t-1$, and $r_{j,t}$ is the US dollar return on asset j between $t-1$ and t. This return consists of a capital gain and a yield (dividend or coupon):

$$r_{j,t} = \frac{p_{j,t} - p_{j,t-1} + \text{div}_{j,t}}{p_{j,t-1}}, \tag{2}$$

where $p_{j,t}$ denotes the US dollar price of security j at time t and $\text{div}_{j,t}$ denotes the dollar dividend or coupon. Our dataset contains security-level information on holdings, prices, and dividends or

8 Securities custodians are legally-mandated to complete the TIC survey both for foreign securities owned by US investors and US securities held by foreign investors. The asset values and other survey information are regularly cross-checked with commercial data sources to verify their accuracy. More details on the data are provided in Appendix A.

coupons (see AppendixA) from which we can construct $r_{j,t}$, r_t^p, and r^p. The main object of interest is the mean return on claims, $E[r^A]$, and that on liabilities, $E[r^L]$.

To illustrate the importance of using security-level data we also provide estimates of the returns calculated by the top-down methods used in previous literature. We refer to estimates using the method described above as the 'security-level' results. In the second 'index' method, we first aggregate the equities or bonds at the country level and then use commercially available country-level equity and bond indexes weighted by the share invested in each country. This is the method followed by Curcuru et al. (2008). The third approach, the 'BEA' method, infers the returns from the wealth and income components of the US IIP published by the BEA. More details on the computation of the returns in each method, and the mapping between wealth and returns under the BEA method, are reported in Appendix B.

2.2. Returns and their Components

Table 1 reports the returns using each of the three methods described above, separating equity and bond portfolios, and across different time samples. The average US excess return over the full sample, 2005-2022, is 0.5% per year but this result is heavily impacted by the pandemic years 2020-2022. Excluding these years, the excess return is significantly higher, averaging 1.7% per year.

The results are similar across the different methods, with slightly higher average excess returns using the BEA method. The index and BEA bond return estimates are noticeably different than the security-level estimates in some periods. For bond claims this is likely because US investors hold a material amount of dollar-denominated and floating-rate bonds issued by foreign entities and these are typically excluded from country return indexes; thus return estimates based on indexes will have a larger effect of exchange rates and lower interest rate volatility. Similarly, on the liabilities side, foreign investors hold floating-rate US bonds and a substantial amounts of asset-backed securities, especially before the financial crisis. As explained more in detail in Appendix B the difference between the security-level and the BEA returns is also due to the timing of the data collection

mentioned earlier and to the 'other components' category of the IIP which includes changes in coverage and other items.

As expected, equity returns are larger than bond returns, with the difference averaging 5.3% per year, a reasonable estimate of the equity premium. Before 2010 the dollar return on equity claims was higher than that on equity liabilities, but since 2010 equity liabilities have substantially outperformed equity claims, as documented also by Atkeson et al. (2022). Bond claims outperformed bond liabilities in all pre-pandemic samples, possibly reflecing the convenience yield associated with US Treasury bonds. Looking across sample periods, bond claims and liabilities returns both peaked in the 2010-12 period and have been much smaller since.

Part of the difference in returns can be attributed to exchange rate moves. The top panels of Table 2 provide a breakdown of equity returns into the contributions of (local currency) price changes and dividends, and exchange rates and the bottom part does the same for bond claims and liabilities. Before 2008, exchange rate moves helped boost the return on equity claims and bond returns because of dollar depreciation, but in the subsequent sample periods the contribution of exchange rates has been small or negative.

Table 1: **Average portfolio returns over different time sample periods and construction methods. Security-Level returns are calculated from positions and returns reported on TIC surveys. Index returns are calculated from positions reported on TIC surveys and the relevant return index obtained from Bloomberg; for equities, the country-level MSCI equity total USD return indexes; for foreign bonds, country-level Bloomberg bond total USD return indexes; for US bonds, the Bloomberg US Treasury 1-5 Year Total Return Index, Bloomberg US Corporate Total Return Index, Bloomberg US Agency Index . BEA calculated from the International Investment Position (IIP)on the BEA website. The return combines the valuation adjustments from BEA IIP table 1.3 plus the income from BEA transactions table 4.1. Security-level and index liabilities returns are as of end of June each year because they use the holdings from the end of June liabilities survey, while claims are as of end-December. The differential, which is the return on claims minus the return on liabilities, is calculated from using average of current and following year liabilities returns because of this timing difference. The BEA returns are by calendar year so no adjustment is needed. Additional details in Appendix B.**

Security-Level	2005-2007	2008-2009	2010-2012	2013-2019	2020-2022	2005-2022	2005-2019
Equity claims	20.3	-4.0	5.7	9.0	0.2	**7.4**	8.9
Equity liabilities	11.6	-15.7	15.1	13.8	13.0	**10.3**	9.7
Bond claims	5.2	5.6	7.8	3.4	-1.2	**3.9**	4.9
Bond liabilities	4.3	3.5	6.6	2.6	-0.3	**3.2**	3.8
Total claims	16.6	-2.6	6.2	7.4	-0.1	**6.4**	7.7
Total liabilities	6.8	-2.8	8.9	6.9	5.4	**5.9**	6.0
Total differential	9.8	0.2	-2.8	0.6	-5.5	**0.5**	1.7
Index	2005-2007	2008-2009	2010-2012	2013-2019	2020-2022	2005-2022	2005-2019
Equity claims	20.9	-1.3	5.6	7.9	3.0	7.8	8.8
Equity liabilities	12.1	-19.4	17.0	14.2	12.7	10.3	9.8
Bond claims	6.2	4.8	7.8	1.5	-4.8	2.6	4.1
Bond liabilities	3.6	5.6	5.9	2.4	-0.2	3.1	3.7
Total claims	17.2	-1.0	6.0	6.1	1.2	6.4	7.4
Total liabilities	6.5	-2.5	9.0	6.8	5.4	5.9	6.0
Total differential	10.7	1.5	-3.0	-0.7	-4.1	0.5	1.4
BEA	2005-2007	2008-2009	2010-2012	2013-2019	2020-2022	2005-2022	2005-2019
Equity claims	20.7	-9.8	7.4	8.2	2.4	7.2	8.1
Equity liabilities	9.4	-13.8	11.3	11.5	15.0	8.9	7.7
Bond claims	5.1	5.4	8.1	4.9	-2.4	4.3	5.6
Bond liabilities	3.9	4.5	5.6	1.9	1.3	3.1	3.4
Total claims	16.9	-6.1	7.6	7.3	1.3	6.5	7.5
Total liabilities	5.8	-1.1	7.3	5.7	8.0	5.6	5.1
Total differential	11.1	-5.0	0.3	1.6	-6.7	0.9	2.4

Table 2: Subcomponents of Equity Returns. Average contributions of price changes, dividends, and exchange rates to total equity returns constructed from security-level TIC survey data.

	2005-2007	2008-2009	2010-2012	2013-2019	2020-2022	2005-2022
Total equity claims	20.3	-4.0	5.7	9.0	0.2	7.4
Price	15.0	-6.4	2.3	8.5	-0.1	5.4
Dividend	3.0	3.2	3.0	2.8	2.0	2.8
Exchange rate	2.3	-0.7	0.4	-2.3	-1.6	-0.8
Total equity liabilities	11.6	-15.7	15.1	13.8	13.0	10.3
Price	10.0	-17.6	13.0	11.9	11.6	8.4
Dividend	1.7	1.9	2.1	1.9	1.4	1.8
Total bond claims	5.2	5.6	7.8	3.4	-1.2	3.9
Price	-1.1	1.0	2.9	0.0	-4.5	-0.4
Coupon	5.9	4.8	5.0	4.2	3.7	4.6
Exchange rate	0.4	-0.3	-0.1	-0.7	-0.5	-0.3
Total bond liabilities	4.2	3.6	6.5	2.5	-0.3	3.2
Price	-0.5	-1.4	3.0	-0.1	-2.5	-0.2
Coupon	4.4	4.8	3.6	2.7	2.3	3.4
Exchange rate	0.4	0.2	-0.1	-0.1	-0.1	0.0

2.3. The Role of Asset Composition.

One driver of the positive average US excess return is differences in the composition of claims and liabilities, with claims tilted toward equities and liabilities tilted toward bonds. The first panel of Figure 1 shows the evolution of the equity share in the combined equity and bonds claims and liabilities portfolios. The shares for each region is shown in the remaining panels. Equity shares in claims are much higher than equity shares in liabilities overall and in most regions, with the immediate implication that bond shares are relatively high in liabilities. The bias is persistent in claims ranging from 70% to 80% and averaging 75% over the full sample. The equity share in liabilities increased from 36% to 51% over the sample period. The increase is widespread geographically, and in the case of Asian investors coincides with the slowdown in reserve accumulation, which had been largely in the form of US Treasury and agency securities.

To measure more precisely the impact of the asymmetric portfolio composition, we use the following exact decomposition of the mean excess return between claims $E[r^A]$ and liabilities $E[r^L]$:

$$E[r^A - r^L] = E[\bar{\mu}_E(r_E^A - r_E^L)] + E[\bar{\mu}_B(r_B^A - r_B^L)] + E[(\bar{r}_E - \bar{r}_B)(\mu_E^A - \mu_E^L)], \tag{3}$$

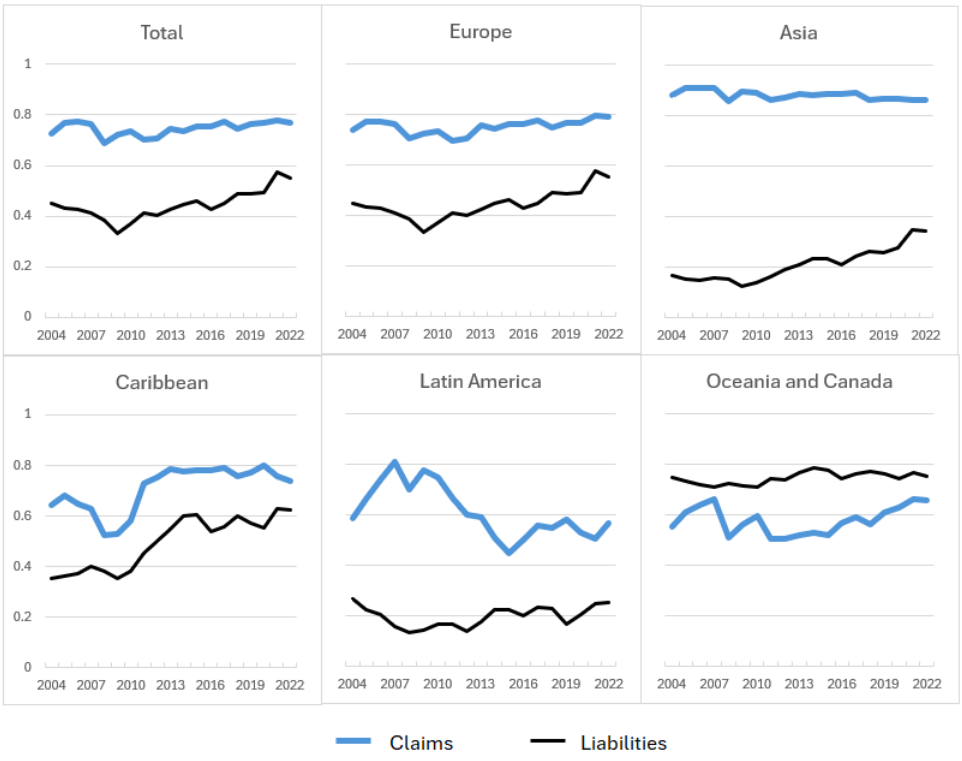
where μ_i^A (resp. μ_E^L) denotes the share of asset class i in claims (resp. liabilities), r_i^A (resp. r_i^L) denote the returns on asset class i in claims (resp. liabilities), $\bar{\mu}_i = (\mu_i^A + \mu_i^L)/2$ denotes the average share of asset class i, while $\bar{r}_i = (r_E^A + r_E^L)/2$ denotes the average return. The first two terms in eq. (3) capture the return effect, i.e. the difference in returns within asset class. The last term captures the composition effect, i.e. the tilt in the claims portfolios towards equities. Using this decomposition, we find that the composition effect is large and positive, at 1.9% while the return effect is -1.4%, mostly coming from a higher return on equity liabilities, shown in Table 3. The negative return effect on equities since 2010, although not sufficient to eliminate the overall excess return, significantly eroded it in recent years.[9]

2.4. Crisis Periods.

The sample period is characterized by three significant crises periods: the global financial crisis (2008-2010), the European sovereign debt crisis (2010-2012) and the global pandemic (2020-2022). Inspecting Table 1 we observe that the US excess return is small or negative in each of these crisis periods. Table 3 averages the returns of each asset over these three crisis periods and separately over the non-crisis periods. Excess returns are large and negative on average during crisis periods, at -3.1%, and are large and positive during non-crisis periods, at 3.3%. Equity returns are higher during non-crisis periods, more so for equity claims. The picture is different for bonds. We leverage our security-level data to split bond claims into 'high grade' debt and other debt. We classify sovereign debt which receives the highest bond rating from at least one major credit ratings firm in a given year as 'high grade'. The bond claims return is similar in crisis and non-crisis periods

9 This result complements Atkeson et al. (2022) who do not compute the excess return on claims versus liabilities but document the deterioration of the US IIP since 2007.

Figure 1: Equity Share of Total Equity and Bond Portfolio. Equity share of total equity plus bond portfolio for claims and liabilities in each region from security-level TIC survey data. Europe includes Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, United Kingdom, Guernsey, Jersey, Isle of Man, Czech Republic, Hungary, Poland, Russia; Asia includes China, Hong Kong, India, Indonesia, Israel, Japan, Korea, Kuwait, Malaysia, Pakistan, Philippines, Qatar, Saudi Arabia, Singapore, Taiwan, Thailand; Caribbean includes Bermuda, British Virgin Islands, Cayman Islands, Curacao; Latin America includes Argentina, Brazil, Chile, Colombia, Mexico, Panama, Peru; Oceania and Canada includes Australia, Marshall Islands, New Zealand, Canada



for both high grade sovereign and other debt. For bond liabilities, Treasury and agency debt has a higher return during crisis periods, while US corporate debt performs better during non-crisis periods. However, taken together, the combined return on bond liabilities is similar during crisis and non-crisis periods. Looking across claims and liabilities, the return on Treasury and agency debt is similar to that on other high grade sovereign debt during non-crisis periods, 2.3% vs 2.2%, but outperforms during the three crisis periods, 3.9% vs. 1.8%. The contribution of dollar appreciation to the claims returns during both crisis and non-crisis periods is relatively small.

The table also reports our decomposition into return and composition effects during crisis and non-crisis. We find that both the composition effect and the return effect deteriorate during crisis,

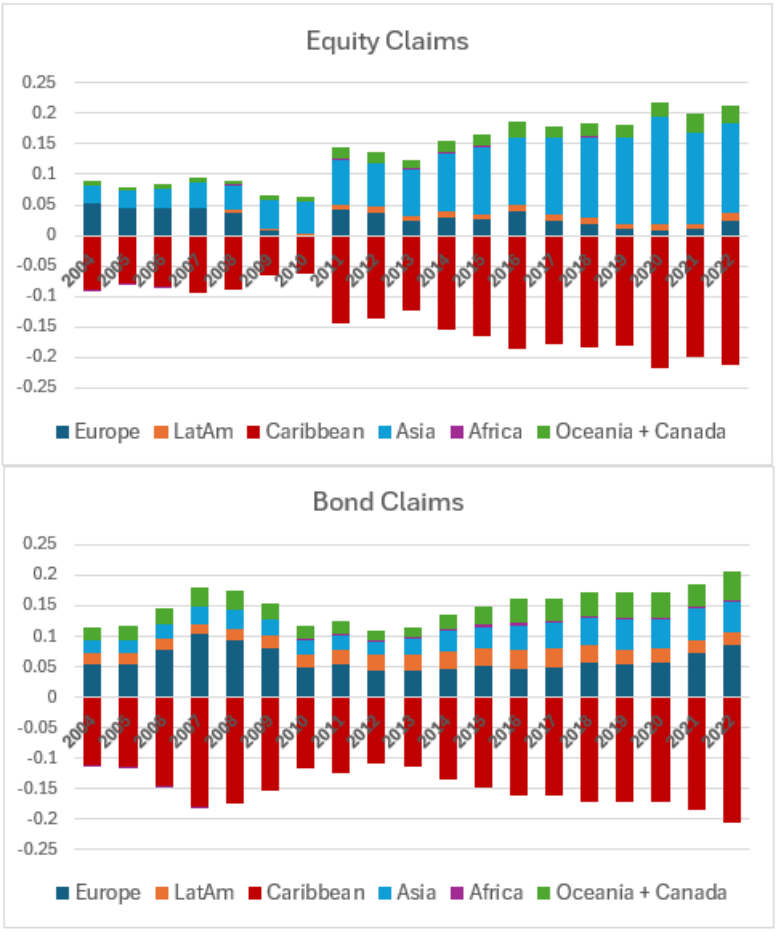
Table 3: Returns in Crisis and Non-crisis Periods. Average returns over crisis and non-crisis periods. Crisis periods include the global financial crisis 2008-2009, the European sovereign debt crisis 2010-2012, and the pandemic 2020-2022. The high grade bond sample includes sovereign debt which receives the highest grade from at least one of the three major US ratings agencies (S&P, Moody's, Fitch) by year. Ratings obtained from Bloomberg.

	Crisis	Non-crisis	Total
Equity claims	1.2	12.4	7.4
Equity liabilities	6.6	13.2	10.3
Bond claims	3.9	4.0	3.9
High grade sovereign	1.8	2.2	2.0
Other	5.7	5.6	5.6
Bond liabilities	3.2	3.1	3.2
Treasury/agency	3.9	2.3	3.0
Corporate	2.5	4.6	3.7
Total claims	1.6	10.2	6.4
Total liabilities	4.7	6.8	5.9
Total differential	-3.1	3.3	0.5
Composition	0.0	3.5	1.9
Return	-3.1	-0.2	-1.4
Exchange rate contributions:			
Equity claims	-0.6	-0.9	-0.8
Bond claims	-0.3	-0.4	-0.3

the former because equities under-perform bonds in bad times and the latter because equity claims under-perform relative to equity liabilities.

In sum, during crisis periods, US equities outperform foreign equities, and US Treasury and agency bonds outperform highly-rated sovereign debt from other countries. One interpretation is that US assets are generally seen as safer during periods of large uncertainty, and hence are in high demand (see Gourinchas and Rey (2022)). US Treasuries may serve as a form of insurance during crisis periods, and other US assets might receive positive spillovers from this insurance effect.

Figure 2: Change in Region Share of Total, Nationality vs Residence. Change in equity share of total equity in each region when issuers are classified on a nationality basis less the share on a residence basis; and a similar difference in bond shares. Appendix C provides details on the procedure for the nationality remapping.



2.5. Issuer Residence versus Nationality.

With our security-level data, we can remap each security from the as-reported residence basis of the issuer to the country of nationality of the parent firm. Appendix C provides details on the procedure for the nationality remapping. This allows us to see through the distortion introduced by offshore issuance to better understand the geographic exposure of US investors. Figure 2 plots the difference in the regional equity share of total equity when issuers are classified on a nationality basis versus on a residence basis and a similar difference in bond shares. For equity claims, the similarly-sized positive values for Asia and negative values for the Caribbean indicates that most of the equity in the Caribbean is issued by Asian firms, largely Chinese technology firms. For bonds,

the securities issued in the Caribbean are remapped to a more diverse set of countries. Almost all securities issued in the Caribbean have a non-Caribbean parent firm and thus are remapped to other countries. The effect of this remapping on the US excess return is small, however, lowering it from 0.5% to 0.2% over the full sample period as a few US firms which issue securities using foreign subsidiaries are remapped to US firms, and so are dropped from the external claims sample when they are remapped to the parent firm.

2.6. 'Superstar' Firms.

Our detailed data allow us to examine holdings and returns by issuer. Given the recent attention on superstar technology and pharmaceutical firms (see Autor et al. (2020)), the growth in concentration (see De Loecker et al. (2020) or Gutiérrez and Philippon (2019)), we examine the cross-border holdings of the largest firms and their impact on returns. For the US liabilities we zoom in on the Magnificent 7 – Alphabet, Amazon, Apple, Meta, Microsoft, Nvidia, and Tesla. For claims, we combine the European GRANOLAS – GSK, Roche, ASML, Nestle, Novartis, Novo Nordisc, L'Oreal, LVMH, Aztrazeneca, SAP, Sanofi – with Taiwan's TSMC.

At the end of June 2022, equity liabilities were concentrated in the Magnificent 7 stocks, which made up 16.2% of equity liabilities. However this is less concentrated than the broader US equity market, as the Magnificent 7 comprised 20.0% of the Bloomerg's US equity market capitalization measure. Even though liabilities are less concentrated in superstars than the overall market, they have an outsized effect on the returns at the end of the sample. The return on the Magnificant 7 averaged 29.6% between 2020 and 2022, much higher than the average 13.0% on the full sample of equity claims. So foreign investors could have done even better if their Magnificent 7 holdings matched their weight in the US market.

Equity claims are also concentrated, with the GRANOLAS/TMSC comprising 7.4% of US equity claims at year-end 2022. This is more concentrated than the market, as these superstars constitute 4.5% of Bloomberg's non-US market capitalization measure. The relative returns on GRANOLAS/TMSC versus other equity claims are also higher than other equities, averaging 12.9%

between 2020 and 2022 versus 0.2% for the full claims sample. So during the pandemic, US investors appeared to benefit from their concentrated foreign equity holdings.

3. Conclusions

The US excess return plays an important role in global wealth allocation and the prospects for global exchange rates and other asset market prices. We take a new approach to estimating the size of the excess return using high quality security-level data for US external equity and bond claims and liabilities over the period 2005-2022. We employ the unique, highly dis-aggregated nature of this data and provide various decompositions across time- samples, asset classes, regions, and type of issuers to shed light on the determinants of the international portfolio returns as well as their changes over time. Our use of security-level data improves accuracy over top-down approaches which have to make a number of assumptions about the underlying holdings.

We find that the US excess return on portfolio holdings averages 0.5% per year over the full sample, confirming earlier results of a positive US external return. We confirm that this excess return arises largely because of the asymmetry in the composition of claims versus liabilities, with claims tilted toward equity and liabilities more balanced. The excess return is near-zero or negative during crisis periods, and significantly positive in other periods hence confirming the global insurance component of the US external ban. Our security-level data also allows us to identify the issuer of each security, and a remapping of securities to the country of the parent of the issuing firm results in higher estimated exposure to Asian equities. Finally, we document that equity holdings are concentrated in superstar mega-cap technology and pharmaceutical firms for both claims and liabilities.

Our excess return estimate is smaller than other earlier estimates, which could have implications for the sustainability of the US current account deficit. However, our relatively low estimate is driven by substantially negative excess returns in the last three years of the sample, as the global economy experienced the pandemic and the US equity market strongly outperformed amid an AI

and broader technology market rally. How long this outperformance can persist is an open question, and so the excess return could return to its longer run, more strongly positive average.

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A. TIC System Data and Measures of Returns

Overview of the TIC system. The TIC (Treasury International Capital) system collects data on US cross-border banking and securities positions and transactions. These data form the basis for the Bureau of Economic Analysis (BEA)'s official US balance-of-payments and international-investment-position data on portfolio investment, and are also used in the Federal Reserve's Financial Accounts data (Z.1 release) on rest-of-world portfolio positions and flows, and in the IMF's Coordinated Portfolio Investment Survey (CPIS).

Responsibility for the TIC system is shared by the US Treasury, the Federal Reserve Bank of New York, and the Federal Reserve Board of Governors. The Treasury oversees the TIC system and publishes a wide variety of tables and reports. The Federal Reserve Bank of New York is responsible for the primary collection and review of the data, and the Federal Reserve Board of Governors is responsible for additional data review, data adjustments, and production and dissemination of TIC tables and reports. Board of Governors staff with direct oversight and responsibility for TIC production have access to much more detailed breakdowns of the data than are available in published form, and much of the data used in this paper rely on these unpublished breakdowns.

Annual TIC surveys of portfolio investment. The dataset used in this paper is primarily drawn from the annual TIC portfolio surveys, which collect data at the security level on foreign securities held by US residents (claims) and on US debt and equity securities held by foreign residents (liabilities). Survey response is required by law under the authority of the International Investment and Trade and Services Survey Act and Executive Order 11961 of January 19, 1977. Data reported by individual respondents cannot be publicly disclosed, and published data must be aggregated in a way that does not reveal positions reported by individual respondents or investments of individual clients. Survey reports are published annually to provide aggregate information on cross-border holdings by country and by type of security, along with some details on security characteristics such as currency and industry of issuer; reports are available at this link.

Claims surveys. The annual TIC SHC form collects detailed security-by-security data on foreign securities held by US residents. These data have been collected for December 31, 1997,

December 31, 2001, and annually as of December 31 since 2003. The report forms and instructions for the claims surveys are available at https://ticdata.treasury.gov/resource-center/data-chart-center/tic/Documents/shca2022in.pdf. Reporting institutions for US claims include US-resident custodians and end investors such as financial and non-financial bank and financial holding companies; pension fund managers; insurance companies; endowments and trusts; and managers and administrators of mutual, hedge, private equity, and other funds. Securities are reported based upon the country of residence of the issuer of the securities. Reportable securities include equities and related assets such as ADRs, fund shares, and both short- and long-term debt securities including asset-backed securities. For each security, firms must report a security ID (i.e. CUSIP or ISIN), description, issuer name, country of residence of the issuer, security type, currency, type of US owner, market value held, and fair value held (for debt) or number of shares held (for equity). For debt securities, firms must also report the issue data and maturity date.

Liabilities surveys. The annual TIC SHL form collects detailed security-by-security data on the US securities holdings of foreign residents. These data have been collected for December 31, 1994, December 31, 1997, March 31, 2000, and annually as of June 30 since 2002. The report form and instructions for the liabilities survey is available at https://ticdata.treasury.gov/resource-center/data-chart-center/tic/Documents/shla2020in.pdf. Reporting institutions for US liabilities include US-resident custodians, brokers and dealers, and US central securities depositories, and US-resident issuers. Institutions must report all US securities they hold in custody for the account of foreign residents including their own foreign branches, subsidiaries, and affiliates. US-resident issuers must report all securities issued by US-residents which are not held at a US-resident custodian or central securities depository. Firms must report a security ID (CUSIP or ISIN), description, issuer name, security type, currency, market value, fair value, and number of shares (for equity), and country of residence of the foreign investor. For debt securities, firms must also report the issue data and maturity date.

Data Validation and Additional Security Details. The Federal Reserve Bank of New York and the Federal Reserve Board validate several aspects of the reported securities such as the price of each security by comparing them against security prices provided by outside data sources such

as Bloomberg. Additional information on dividends and coupon payments are also obtained from commercial data sources. Because individual securities can be reported by different firms under different security IDS (for instance, by CUSIP or by ISIN), matching security IDs are "rolled up" to ensure that consistent pricing and coupon or dividend information is applied.

Confidential Securities Level Data. Our exercise makes use for the first time of the confidential underlying security level data from the surveys to construct annual portfolio returns for both claims and liabilities. By using the security level data, we can accurately account for individual security price changes and coupon or dividend payments as well as the contribution from exchange rate changes for securities denominated in foreign currency. We then aggregate the individual security returns measures to construct the total returns per year. Our sample covers the period for which annual surveys have been consistently collected, thus we can calculate returns for 2005-2022.

B. Computation of Portfolio Returns Across Methods

We compute portfolio returns in three ways, namely by security, using external indexes, and from the BEA published reports.

Security-Level. The annual return on each security is calculated using a standard calculation and the security level information on prices, interest payments, and dividend payments associated with each underlying security in the TIC annual survey data: Return (security-level) = (price end – price start + interest or dividend payments)/price start. The returns are aggregated by asset type using weights calculated from holdings at the start of each survey year. The liabilities returns are as of June 30 of each year to match the liabilities surveys, claims returns are as of December 31 of each year to match the claims surveys. Prices are expressed in US dollars. For foreign currency denominated securities, we can back out the contribution of exchange rate changes using (exchange rate end - exchange rate start)/exchange rate start.

Index. The index-based returns use country-level MSCI equity and similar bond total return indexes to estimate the annual returns. Following Curcuru et al. (2008), indices are chosen by comparing security-level holdings with publicly available returns indices. The returns on a country's

US bond portfolio uses a weighted average of Lehman Brothers US Treasury, corporate, and agency bond indices, with the weights taken from individual country's portfolio weights in each respective bond type. It is important to use the actual weights of foreign investors in the four types of bonds to produce an accurate measure of their returns on US bonds, as those weights may actually vary substantially from weights in a market-capitalization benchmark. For returns on US equities we use the return on the gross MSCI US index, a market-capitalization-weighted index composed of roughly 300 large and liquid US equities, as typically held by international investors. Returns on foreign equities are proxied using dollar returns on the gross MSCI equity index for each country. As already argued in Ammer et al. (2004) MSCI firms represent almost 80% of US investors' foreign equity investment. For returns on foreign bonds, a currency bias has already been noted in the past (see Burger and Warnock (2007)). For this reason we choose returns of local bonds in dollars. For developing countries this means the JPMorgan's EMBI+ indices (which are composed of dollar-denominated bonds). For developed countries we distinguish those in which US investors do not hold significant amounts of bonds, and for those countries we choose the MSCI bond index (which is an index of local-currency- denominated bonds). For developed countries where US 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 US holdings of each country's bonds. Aggregates are constructed by weighting the index returns by the share invested in each asset in each country. The liabilities returns are as of June 30 of each year to match the liabilities surveys, claims returns are as of December 31 of each year to match the claims surveys.

BEA. The method is based on inferring the returns from an approximation of the net foreign asset positions at time t, NFA_t; that is, the difference between foreign assets and liabilities. The latter can be written as:

$$NFA_{t+1} = R_{t+1}NFA_t + NX_{t+1} \tag{4}$$

where the first term on the right side is the return on foreign investment and the second term is the

trade balance. eq. (4) states that the net foreign position increases with net exports and with the total return on the net foreign asset portfolio Rt+1. Dividing through by GDP at time t, and using lower case letters to denote normalized variables one obtains:

$$nfa_{t+1} = \frac{R_{t+1}}{g_{t+1}} nfa_t + nx_{t+1} \tag{5}$$

where g_{t+1} represents the growth rate of output between t and $t+1$. Gourinchas and Rey (2007b) employ the above relation both in the steady state and in forward iterations to examine the long run returns and also how the adjustment follows a shock to exchange rates. Data from BEA NFA as well as financial market indexes are used to compute some of the relations.

Specifically, we use published BEA data to compute returns by asset class, using BEA's valuation adjustment calculations to compute capital gains: Return (BEA ret) = (valuation adjustment + income) / holdings (start). The valuation adjustments are taken from BEA IIP table 1.3 and income from BEA transactions table 4.1. Holdings are from BEA IIP table 1.2. Both the liabilities and claims returns are as of December 31 of each year because BEA data are reported annually at year end.

Reconciliation. One reconciliation challenge is that the BEA method is based on data with a different timing convention than the index or security level approaches. The TIC claims survey is as-of December 31 of each year, while the TIC liabilities survey is as-of June 30. Accordingly, the annual returns constructed under the index and security-level approaches are staggered by 6 months. Over long samples this staggering is unlikely to matter. However, for IIP purposes the BEA creates year-end estimates of the TIC liabilities survey positions. As a result, the security-level and index portfolio returns could differ in any given year from the BEA method estimates because of this extrapolation, in addition to other data and methodological differences.

C. Remapping residence-based holdings to firm nationality

We use the method by Bertaut et al. (2019) to remap the securities from their country of residence to the country of nationality of the issuer, or else the firms' parent holding. We use security-level identifiers and text-matching techniques to map each common stock and corporate bond security to the country of exposure for each firm as assigned by commercial products designed for international investors, thus converting these holdings to a "nationality" basis. Despite efforts to "roll up" security IDs in the underlying survey data, information on security identifiers is at times inconsistent in our data, especially in earlier years. We extensively clean security names and then use exact and fuzzy matching techniques to assign security IDs as needed.

For common stock equity holdings, we rely primarily on the constituent information for Morgan Stanley Capital International (MSCI) country-focused equity indexes, supplemented with information on the primary location of operations for firms that are not included in the MSCI indexes. For common stock, we manually assign the ultimate MSCI country designation for securities of companies that have not yet been included in an MSCI index. For example, we assign any US holdings of Chinese firms such as Alibaba, Tencent, and Baidu (incorporated in the Cayman Islands) to China for years prior to 2015, although these firms were not included in the MSCI China/Emerging Markets indexes until 2015.

For bonds, we also rely on information about the ultimate parent company obtained from Moody's Investors Service, and, for asset-backed securities, about the underlying assets to map holdings of corporate bonds to a nationality basis. Our reassignment primarily affects corporate debt. Although sovereign bonds of many countries are issued as international debt securities, their country assignment typically will not be distorted in residence-based statistics in the same manner as corporate bonds, because they are not issued via subsidiaries that are legally incorporated in offshore financial centers. Because our underlying data are from the surveys of US portfolio holdings of foreign securities collected on a residence basis, we are not able to include US investor holdings of bonds issued by US financing arms of foreign firms.

We remap US cross-border fund shares and other equity holdings using "mirror data" on the

portfolio assets of countries that account for the majority of such US cross-border holdings, most notably the Cayman Islands, Ireland, and Luxembourg. For fund share and other equity allocations, we rely primarily on country allocations of financial center reporting to the IMF Coordinated Portfolio Investment Survey (CPIS), as their outward CPIS statistics will largely reflect the underlying securities of investment funds incorporated in those locations.