Excess Returns on Net Foreign Assets:
The Exorbitant Privilege from a Global Perspective

Maurizio Michael Habib*

This version: July 2010

Abstract

This paper studies the determinants of differential returns between gross foreign assets and liabilities for a sample of 48 countries between 1981 and 2007. It shows that excess returns on net foreign assets of the United States are indeed exorbitant from a global perspective, only occasionally matched by other countries and mainly accounted for by positive valuation effects. The role of the United States as levered investor did not contribute to its exorbitant privilege. The econometric panel analysis also fails to find a robust positive relationship between leverage and excess returns. Notably, instead, valuation effects are an important determinant of excess returns. For instance, real exchange rate depreciations increase excess returns through capital gains, proportionally to the relative foreign currency exposure. In addition, other variables such as country risk, tax incentives and the international role of currencies do influence excess returns on net foreign assets.

Keywords: net foreign assets, excess returns, exorbitant privilege, leverage

JEL classification: F30, F31, F36

* European Central Bank, e-mail: maurizio.habib@ecb.int. The views expressed in this paper are those of the author and do not necessarily reflect those of the European Central Bank (ECB). I am grateful to Thierry Bracke, Alexander Chudik, Michael Fidora, Angela Maddaloni, Simone Manganelli, Rodrigo Oliveira-Soares, José Luis Peydró-Alcalde, Alexander Popov, Livio Stracca and an anonymous referee for useful suggestions and discussions.

1. Introduction

There is a growing interest in the academia and policy circles on the returns that a country can obtain from its foreign assets and must pay on its foreign liabilities. This interest has been prompted by two separate developments. The first one is the process of international financial integration and capital account liberalisation which was accompanied by the growth in the size of gross foreign assets and liabilities (Lane and Milesi-Ferretti, 2003). In turn, large gross foreign asset and liability positions tend to magnify the impact of small differences in returns on the net external position (Lane and Milesi-Ferretti, 2005a and 2005b). The second development was the accumulation of large external deficits by the United States and the presence of two puzzles in the dynamic of U.S. external accounts. Large current account deficits have been only partly reflected in a deterioration of the international investment position of the United States, a first puzzle. In addition, the income balance of the United States – the net flow of revenues generated by foreign investment positions – has persistently remained positive in spite of an overall negative external stock position. This is because U.S. residents pay relatively low returns on their liabilities to foreigners, while earning relatively high returns on their foreign assets. Economists usually view this second puzzle as the outcome of the central role of the United States in the international monetary system as issuer of the main international currency, where the United States issues relatively safe, low yield dollar liabilities to foreigners, mainly in the form of debt securities, and invest the proceeds in riskier high-yield investment abroad. These two puzzles contribute to the so-called "exorbitant privilege" of issuing an international currency and being the main financial centre of the world, fulfilling the task of and being compensated for transforming savings from the rest of the world in risky capital.[1]

While studies on the excess return on net foreign assets of the United States are now numerous, this exorbitant privilege has been rarely compared to that of other countries. This paper fills this gap, extending and deepening the analysis of the excess returns on net foreign assets to a number of major advanced and emerging economies, covering up to 48 countries between 1981 and 2007. Beyond building a new dataset of excess returns and its components, yields and rates of capital gain, for a large number of countries, the main contribution to the existing literature of this paper is the analysis of the potential determinants of

[1] These two puzzles are conceptually separate but often confused in the literature. The confusion arises form the fact that both valuation gains and investment income, concur to a positive return differential in the case of the United States. Nevertheless, only valuation gains, not investment income, explain the divergence from cumulated current account deficits and the net international investment position, the first puzzle.

excess total returns. In particular, the impact on excess returns of valuation effects stemming from exchange rate and asset price changes is carefully investigated, using for the exchange rate valuation channel the new estimates of foreign currency exposure of Lane and Shambaugh (2007). In addition, the empirical analysis controls for the impact of other explanatory variables, such as leverage, testing the hypothesis of Gourinchas and Rey (2005), country risk, corporate tax rates and the international use of major currencies.

The structure of the paper is as follows. First, I review the literature on the exorbitant privilege and the returns on foreign assets and liabilities (section 2). In the next section, I introduce the data and outline the methodology (section 3). Subsequently, a thorough analysis of excess returns across the countries in the available sample is presented (section 4). For a selected number of countries – including in particular the euro area as a whole – it was possible to obtain disaggregated data by asset class which allow the investigation of leveraged international portfolios on excess returns. Notably, these data are used to show the contribution of each asset class (FDI, equity, debt and other) to excess returns, which are furthermore decomposed in a *return effect* – resulting from excess returns within each asset class – and a *composition effect* – stemming from the relative importance of each asset class in assets and liabilities (section 5). The possible determinants of excess total returns, yields and rates of capital gain on net foreign assets – such as real exchange rates, real share prices, leverage and other control variables – are tested in an econometric panel analysis (section 6). Section 7 presents a number of robustness checks of the main empirical results. Section 8 concludes the paper.

2. Literature review

Much of the recent literature on returns on net foreign assets focussed on explanation, questioning and dissection of the special case of the United States, starting from the provocative contribution of Hausmann and Sturzenegger (2006). The latter maintain that the (positive) income balance of the United States measures the "true value" of its foreign assets, which are therefore positive and not negative as reported by financial statistics. The difference between the fair valuation of U.S. net foreign assets and official statistics is what these two authors call "dark matter". This is in turn accounted by (a) mismeasurement of FDI – with the latter failing to capture export of U.S. intangible capital – and (b) unreported trade of liquidity and insurance services provided by the United States – reflecting seigniorage and a negative risk premium on U.S. dollar reserve assets. These two potential explanations are at the core of the debate on the exorbitant privilege.

Indeed, one of the main reasons why the income balance of the United States has remained in positive territory is due to excess returns from U.S. direct investment abroad relative to returns from FDI made in the United States (Higgins et al., 2005 and ECB, 2006). This in turn has been justified on the grounds of (i) a seniority or maturity premium of U.S. direct investment abroad compared to foreign investment in the United States (Mataloni, 2000); (ii) compensation for the relatively higher risk attached to U.S. investment abroad (Hung and Mascaro, 2004); (iii) tax-induced income shifting of multinational companies (Bosworth et al., 2007); (iv) asymmetries in recorded reinvested earnings (Gros, 2006b).

The role of the United States as provider of international liquidity and safe financial assets is the second main classical rationale for the existence of the exorbitant privilege. The first function – liquidity provision to the rest of the world – is the traditional view dating back to the contribution of Triffin (1960). The second one – the provision of safe financial assets – is the modern version of the Triffin dilemma (Caballero et al., 2008 and Caballero and Krishnamurthy, 2009). Gourinchas and Rey (2005) tried to quantify this latter role of the United States as levered investor, shorting safe low-yield assets to invest in risky high-yield securities. They find that this "composition effect", or "leverage", stemming from the asymmetric structure of U.S. foreign assets and liabilities, increased over time, explaining up to a quarter of the exorbitant privilege, which they estimate at more than 3 percent per year in the post Bretton Woods period.[2] In their view, leverage - measured by the share of risky assets, FDI and equity, in total assets relative to the same share in total liabilities - could be a potential determinant of excess returns.

The existence of an exorbitant privilege, at least as regards portfolio securities, has been challenged by Curcuru et al. (2008). These authors show that there is a bias in the calculation of returns owing to the internal inconsistency of stock data – which are subject to substantial revisions – and flow data – only partly revised. Using original series or, alternatively, returns from portfolios with a similar structure of U.S. foreign assets and liabilities, the return differential disappears. Indeed, Gros (2006a) already pointed to the large size – more than 1 trillion U.S. dollars between 1989 and 2004 – of the category "other changes" in the valuation adjustment of the net international investment position by the U.S. Bureau of Economic Analysis, as the main driver of the divergence between the cumulated U.S. current account deficit and the net international investment position. Lane and Milesi-Ferretti (2008) make a thorough examination of this statistical discrepancy, concluding that it could reflect unrecorded financial flows

[2] It should be borne in mind that this figure refers to total real returns, including both yields from the income balance and capital gains from exchange rate and asset price movements.

in the portfolio category and mismeasured initial positions of non-portfolio holdings of banks and non-banks. In short, there is convincing evidence that statistical adjustments, not the over-performance of U.S. investments or exchange rate effects, would explain large net positive valuation gains by the U.S. and part of the excess return implied in the U.S. net foreign assets.

With the exception of the seminal work of Lane and Milesi-Ferretti (2002, 2003, 2005a and 2005b) returns on net foreign assets of countries different from the United States have received much less attention. In particular, Lane and Milesi-Ferretti (2005a and 2005b) show the importance of valuation effects over the past decade in creating a wedge between net asset positions and cumulated current account balances and find that total real rates of returns are sensitive to exchange rate movements, an important source of valuation gains in conjunction with changes in asset prices. Bracke and Schmitz (2008) compute implied returns on international portfolio equity holdings, a subset of the international investment position, for a sample of industrial and emerging market economies, finding that net capital gain channel appears to be more important than the net investment income channel for risk sharing. Meissner and Taylor (2006) devote some attention to the "excess returns" in other major G7 economies. Notably, they find that also the United Kingdom, France and Japan enjoy a positive return differential, which is however statistically significant only for the latter two countries and only for yield differentials (i.e. from investment income). On the contrary, Canada and Italy have negative yield and total return differentials. Finally, only Portes and Papaioannou (2008) compare the exorbitant privilege between the United States and the euro area since 1999. Differential returns oscillate between positive and negative values for the euro area, suggesting that euro area residents do not enjoy an exorbitant privilege similar to that of the United States.

3. Data and methodology

Data from the IMF Balance of Payments Statistics on the balance of payments and the international investment positions have been collected for 48 countries between 1980 and 2007 on an annual basis. For many countries, in particular emerging markets, stock data are available only for the most recent period. For these countries, the international investment positions have been completed backward to 1980 using the Mark-II dataset on the external wealth of nations of Lane and Milesi-Ferretti (2007). The final dataset includes 20 advanced economies, defined as those countries in the sample which have at least three decades of OECD membership, and 28 major emerging market economies mainly

from eastern Asia, Latin America and central and eastern Europe.[3] A detailed description of the country coverage is available in Appendix A.1.

Returns on foreign assets and liabilities are calculated as in Lane and Milesi-Ferretti (2004, 2005a and 2005b) in nominal and real domestic currency terms. In practice, flow data from the balance of payments in a given year are divided by international investment positions at the end of the previous year to generate returns on foreign positions. The methodology is described below.

As a first step, it is possible to use a simple balance of payments accounting framework to decompose the change in net foreign assets in its main determinants:

$$B_t - B_{t-1} \equiv CA_t + KG_t + (KA_t + EO_t) \tag{1}$$

The change in the net foreign asset position, B_t - B_{t-1}, between time t and t-1 is equal to the current account balance at time t, CA_t, plus capital account transfers, KA_t, (usually a very small item of the balance of payments), errors and omission, EO_t, and finally the capital gain or loss at time t, KG_t, resulting from changes in asset prices and the exchange rate at which assets and liabilities positions are valued at the end of the year. The latter is simply calculated as the difference between net financial flows at time t (i.e. the current account plus other residual items) and the change in net positions. It is useful to further refine the current account in its main components: the balance of trade in goods and services, BGS_t, unilateral transfers (including compensation of employees), UT_t, [4] and the investment income balance, IIB_t, all at time t:

$$B_t - B_{t-1} \equiv BGS_t + UT_t + IIB_t + KG_t + (KA_t + EO_t) \tag{2}$$

Dividing all terms in equation (2) by nominal GDP and rearranging them, we obtain:

$$b_t - b_{t-1} \equiv bgs_t + ut_t + iib_t + kg_t - \frac{\gamma_t}{1+\gamma_t} b_{t-1} + z_t \tag{3}$$

where letters in lower case in italic indicate now ratios to nominal GDP; z_t is the residual term of errors and omission plus the capital account, and γ_t is the growth

[3] The group of advanced economies include all founding members of the OECD with the exception of Belgium, Iceland and Luxembourg. Turkey is also an OECD founding member, but included among the emerging market economies.

[4] In the standard balance of payments presentation, the income balance includes income from labour (compensation of employees), and investment income from direct and financial investment. Here, the labour income is separated in order to highlight the role of investment income and yields on foreign investment positions.

rate of nominal GDP. The term $-\gamma_t/(1+\gamma_t)b_{t-1}$ measures the contribution of positive nominal GDP growth in stabilising the ratio of net foreign assets to GDP.

From equation (3), the next step is to derive implied rates of return. Following a notation only in part similar to Lane and Milesi-Ferretti (2005a and 2005b), returns on net foreign assets are simply calculated as:

$$\bar{i}_t^A = \frac{II_t^A}{A_{t-1}} \text{ and } \bar{i}_t^L = \frac{II_t^L}{L_{t-1}} \quad \text{(yield)} \quad (4a)$$

$$\bar{k}_t^A = \frac{KG_t^A}{A_{t-1}} \text{ and } \bar{k}_t^L = \frac{KG_t^L}{L_{t-1}} \quad \text{(rate of capital gain)} \quad (4b)$$

$$\bar{r}_t^A = \frac{II_t^A + KG_t^A}{A_{t-1}} \text{ and } \bar{r}_t^L = \frac{II_t^L + KG_t^L}{L_{t-1}} \quad \text{(total return)} \quad (4c)$$

where A and L denote gross foreign assets and liabilities, respectively. The superscripts A and L indicate that we use only one side of external statistics to calculate returns. Therefore, II^A are earnings from assets held abroad by domestic residents, whereas II^L are payments to foreigners holding domestic assets. Similarly, capital gains are calculated using only changes in gross assets (ΔA) and capital outflows (F^A) or changes in gross liabilities (ΔL) and capital inflows (F^L). Formally: $KG_t^A \equiv A_t - A_{t-1} - F_t^A$ and $KG_t^L \equiv L_t - L_{t-1} - F_t^L$. Finally, $\bar{i}_t$ is the nominal yield from the investment income; $\bar{k}_t$ is the nominal rate of capital gain; and, $\bar{r}_t = \bar{i}_t + \bar{k}_t$ is the nominal total return at time t. The bar above the variables indicates that these are all *nominal* returns in domestic currency terms. Using the Fisher equation, it is possible to obtain *real* domestic returns:

$$i_t^J = \frac{1+\bar{i}_t^J}{1+\pi_t} - 1 \quad \text{(real yield)} \quad (5a)$$

$$k_t^J = \frac{1+\bar{k}_t^J}{1+\pi_t} - 1 \quad \text{(real rate of capital gain)} \quad (5b)$$

$$r_t^J = \frac{1+\bar{i}_t^J + \bar{k}_t^J}{1+\pi_t} - 1 = i_t^J + k_t^J + \frac{\pi_t}{1+\pi_t} \quad \text{(real total return)} \quad (5c)$$

where the superscript $J = A, L$ indicates whether returns are on assets or liabilities; π_t is the domestic inflation rate at time t; i_t, k_t, r_t are the real yield, real rate of capital gain and real total return, respectively. It is important to note that, by construction, the real total return is not equal to the sum of the real yield and the real rate of capital gain, but it is necessary to add the term $[\pi/(1+\pi)]$, which in any case disappears when calculating excess real total returns as difference between returns on assets and liabilities. Therefore:

$$\frac{\overline{r}_t^A - \overline{r}_t^L}{1+\pi} \quad = \quad r_t^A - r_t^L \quad = \quad (i_t^A - i_t^L) \; + \; (k_t^A - k_t^L) \tag{6}$$

excess real total return = excess real yield + excess real rate of capital gain

This is the key identity that will be analysed throughout the rest of the paper.

Taking equation (3) of the dynamic of the ratio of net foreign assets to GDP in the previous section, adding the balance on goods and services together with transfers under the term, $bgst_t$, noting that:

$$iib_t + kg_t \; = \; \frac{\overline{r}_t b_{t-1}}{1+\gamma_t} \; = \frac{\overline{r}_t^A a_{t-1} - \overline{r}_t^L l_{t-1}}{1+\gamma_t} \tag{7}$$

where a_{t-1} and l_{t-1} denote assets and liabilities, respectively, as a share of GDP at time t-1 and, finally, substituting (7) in equation (3), it is possible to obtain the following:

$$b_t - b_{t-1} \equiv bgst_t + \frac{\overline{r}_t^A - \overline{r}_t^L}{1+\gamma_t} a_{t-1} + \frac{\overline{r}_t^L - \gamma_t}{1+\gamma_t} b_{t-1} + z_t \tag{8a}$$

or, alternatively, using (5c) to deflate nominal returns:

$$b_t - b_{t-1} \equiv bgst_t + \frac{r_t^A - r_t^L}{1+g_t} a_{t-1} + \frac{r_t^L - g_t}{1+g_t} b_{t-1} + z_t \tag{8b}$$

where g_t denotes the real GDP growth rate. Equations (8a) and (8b) highlight that the size of excess returns and their interaction with "gross" asset or liability positions are both important in driving changes in net foreign assets as share of GDP (Lane and Milesi-Ferretti, 2005a and 2005b).[5] Countries with positive excess returns, such as the United States, will find it easier to stabilise the net foreign assets as a share of GDP over the long-run, i.e. they will be allowed to run larger trade deficits or smaller trade surpluses.

Balance of payments data from the IMF and the Mark-II databases are reported in U.S. dollar. For the calculations of real domestic currency returns, U.S. dollar series are converted at end-year exchange rates (stock positions) or average annual exchange rates (flow data) from the IMF International Financial Statistics (IFS). Nominal rates are deflated with the Consumer Price Index inflation to calculate real returns.

[5] In the current presentation, equations (8a) and (8b) are solved to show the interaction of excess returns with the gross "asset" position in the previous period, a_{t-1}; however, it is straightforward to rewrite them in terms of interaction of excess returns with gross liabilities.

4. Excess returns on net foreign assets: an international comparison

The first step of this analysis is to compare differential returns between foreign assets and liabilities across different countries, in order to gauge the size of the exorbitant privilege of the United States from a broader perspective. The set of Charts 1a-1g illustrates the behaviour of excess returns in our sample and its decomposition in excess yields and excess rates of capital gain according to equation (7). Charts 1a, 1c, and 1e, on the left hand-side, show the average excess return for the whole sample and, separately, the group of advanced and emerging countries. Charts 1b, 1d, and 1f on the right hand-side show the excess return of the United States compared to the issuers of major international currencies: Japan and the euro area; where the excess return of the latter is simply calculated as the unweighted average of national data of 10 euro area member states.[6]

Comparing the excess yield with the excess rate of capital gain, it is evident that the latter is much more volatile. Moreover, as the size of spikes in excess capital gains is much larger than average excess yields, the volatility of capital gains is transmitted to total returns, whose plots (1a and 1b) are very similar to those of capital gains (1e and 1f). Indeed, the correlation between excess total returns and excess capital gains is almost equal to one (0.97), whereas the correlation between excess total returns and excess yields is much lower (0.24). Bearing in mind the conclusions of the previous section, it is worth noting that even though excess capital gains are large, they swing around the zero line with gains being followed by losses. In other words, over the long-run, relatively small but stable (excess) yields may have a stronger impact on net foreign assets than large and volatile rates of capital gain. Over the short-run, rates of capital gain drive the behaviour of total returns.

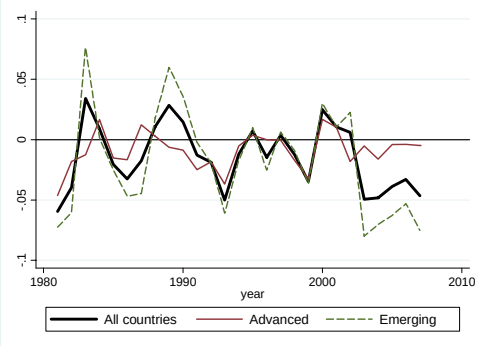
Emerging market economies seem to have more volatile rates of capital gain than advanced economies (plot 1e), resulting in larger spikes in excess total returns (plot 1a). Emerging markets as a whole have an unfavourable yield differential between assets and liabilities, which is consistent with the existence of a risk premium on their foreign liabilities (plot 1c). This risk premium rose starting from 2000, with the negative differential widening to more than 3 percent in 2004; a rather surprising outcome considering the improvement in

[6] In this section, we present the average excess returns of the euro area member states for which it was possible to collect data in order to run a comparison dating back to 1980s. The euro (10) group includes the founding members of the euro plus Greece, excluding Belgium and Luxembourg. The consolidated presentation of the euro area balance of payments and international investment position is available only from 1999. Returns from the consolidated euro area external accounts are analysed in the next section.

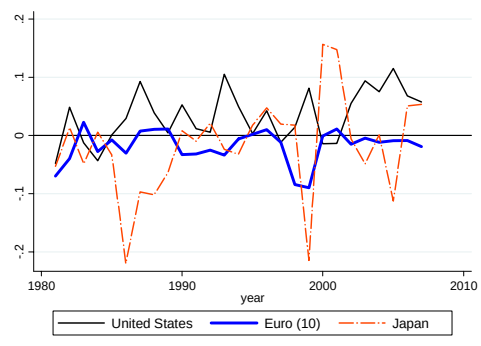
macroeconomic performance experienced by emerging markets over this period. On average, for all countries in our sample, income payments to foreign investors tend to exceed earnings on foreign assets.[7] For the group of advanced economies, this statistical discrepancy is less evident in the second part of the sample and *de facto* disappears since 2005.

Chart 1. Excess real returns, yields and rates of capital gain. 1981-2007

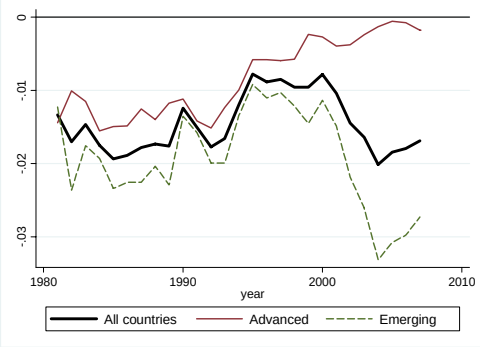
1a – Excess total return



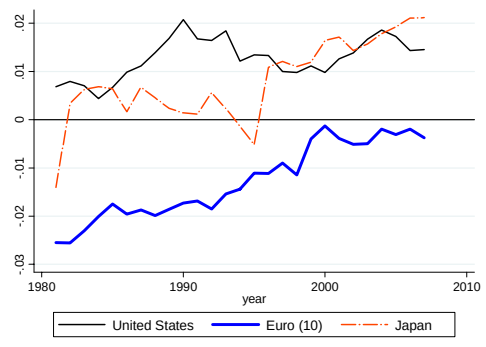
1b – Excess total return



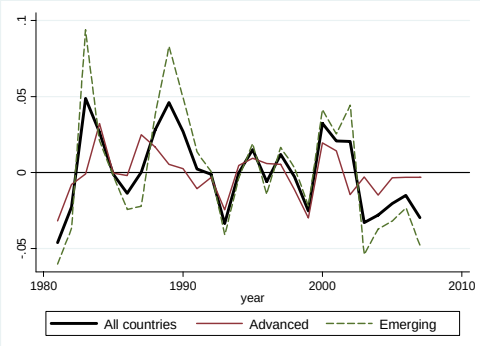
1c – Excess yield



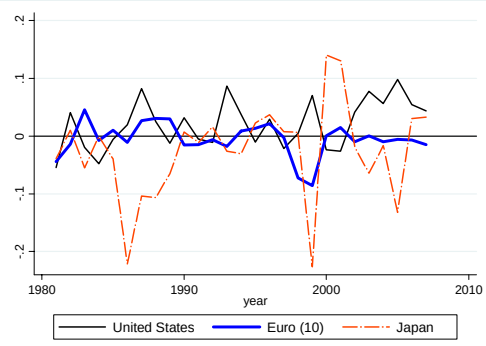
1d – Excess yield



1e – Excess rate of capital gain



1f – Excess rate of capital gain



Notes. Excess real total returns (r^A-r^L), yields (i^A-i^L) and rates of capital gain (k^A-k^L) are calculated according to equations (4) to (6) in the main text. Euro (10) includes Austria, Finland, France, Germany, Greece, Ireland, Italy, Netherlands, Portugal and Spain. See data appendix A.1 for the list of countries and definition of groups.

[7] See also previous section, in particular footnote 8.

The exorbitant privilege of the United States is evident in the Charts 1b, 1d and 1f. The excess total return is rarely negative, peaking in a few occasions to a level close to or above 10 percent, and in most of the years above excess returns in Japan and the euro area. Excess returns in Japan are volatile with three large negative spikes and only a large positive one above 10 percent (plot 1b). Again, all these large annual excess returns are due to capital gains (plot 1f). Yields on foreign assets of the United States have consistently exceeded yields on foreign liabilities by one or two percentage points (plot 1d). Two interesting stylised facts emerge from the comparison with excess yields in Japan and the euro area. First, since the mid-1990s, Japan enjoys a privilege similar or superior to that of the United States. Second, there seems to be a clear upward trend in the excess yield of the euro area. Back in the 1980s, euro area member states had a negative yield differential between foreign assets and liabilities of around two percentage points. Since the 1992 EMU crisis, this negative differential begins to shrink, with the trend accelerating in the run-up to the launch of the euro in 1999 and fading after 2000. This is suggestive evidence of the macroeconomic benefits stemming from the elimination or compression of risk premia of several euro area member states during the convergence process leading to the adoption of the euro.[8] Yet, as regards yields obtained from the income balance, euro area member states do not enjoy a privilege comparable to that of the United States and Japan.

In order to provide a more precise quantification of the previous descriptive analysis, Table 1 reports summary statistics for excess returns. On average, total returns on foreign liabilities exceed returns on foreign assets by around 150 basis points, owing to the negative differential in yields from investment income. These negative excess total returns and yields are statistically different from zero at 1 percent level in the whole cross section and also when splitting the sample between advanced and emerging economies. On the contrary, excess rates of capital gain are virtually close to zero. The latter are however four times more volatile than excess yields (see standard errors) and display a more pronounced excess kurtosis. Indeed, there are a few spikes of excess annual rates of capital gain (and total returns) of more than 70 percent in absolute value. For instance, the largest negative spikes coincide with the Argentinean crisis in 1981-82 and with the tech bubble in Finland in 1998-99, whereas the largest positive peaks correspond to the 1983 debt crisis in Brazil and the most recent Argentinean crises in 1989 and 2002.[9]

[8] See Codogno et al. (2003), for instance, for an analysis of the compression of yield spreads on EMU government bonds.

[9] This is due to the large capitalisation and public foreign ownership of Nokia, compared to the size of Finland's economy, resulting in sizeable capital gains for foreign investors and losses for the Finnish external position before the burst of the dot-com bubble.

The exorbitant privilege of the United States, on the basis of our calculations with IMF data, is 335 basis points on average between 1981 and 2007, of which around two thirds (207 basis points) due to capital gains and one third (128 basis points) to the positive yield differential.[10] Excess returns, yields and rates of capital gain of the United States are significantly different from zero at the usual statistical confidence levels. On the contrary, the euro area and Japan do not enjoy any privilege and, actually, pay more on their foreign liabilities compared with what they receive on their foreign assets. In the case of the euro area, the negative excess total return is on average 176 basis points, significantly different from zero and mainly due to the negative yield differential (128 basis points). For Japan, the negative excess total return is of a similar size (186 basis points), but not statistically different from zero and entirely due to valuation losses.

Table 1. Excess real returns, yields and rates of capital gain on net foreign assets. 1981-2007 (percentage)

	Variable	N. obs.	Mean	St. Err.	Lower Q	Median	Upper Q	min	Max	Skewn.	Kurt.
All countries	$r^A - r^L$	1215	-1.56 ***	0.29	-5.6	-1.4	2.4	-88.0	85.4	-0.3	18.9
	$i^A - i^L$	1215	-1.51 ***	0.07	-2.9	-1.2	0.0	-14.0	20.0	0.5	10.3
	$k^A - k^L$	1215	-0.05	0.29	-3.9	-0.2	3.5	-79.6	90.5	0.2	21.2
Advanced	$r^A - r^L$	540	-0.91 ***	0.34	-4.1	-0.9	2.0	-75.4	46.6	-1.3	24.2
	$i^A - i^L$	540	-0.84 ***	0.08	-1.8	-0.7	0.5	-9.6	6.0	-0.8	5.2
	$k^A - k^L$	540	-0.08	0.33	-3.2	-0.5	2.9	-77.6	56.2	-1.1	29.7
Emerging	$r^A - r^L$	675	-2.07 ***	0.46	-7.8	-2.1	3.1	-88.0	85.4	0.0	15.6
	$i^A - i^L$	675	-2.05 ***	0.11	-3.5	-2.0	-0.6	-14.0	20.0	1.0	11.1
	$k^A - k^L$	675	-0.02	0.44	-4.8	0.0	4.1	-79.6	90.5	0.5	17.1
United States	$r^A - r^L$	27	3.35 ***	0.86	0.1	3.9	6.9	-4.8	11.5	0.0	2.1
	$i^A - i^L$	27	1.28 ***	0.08	1.0	1.3	1.7	0.4	2.1	-0.1	2.2
	$k^A - k^L$	27	2.07 **	0.82	-1.2	2.5	5.4	-5.5	9.8	0.1	2.0
Euro (10)	$r^A - r^L$	270	-1.76 ***	0.50	-4.5	-1.6	0.9	-75.4	36.0	-2.7	30.3
	$i^A - i^L$	270	-1.28 ***	0.11	-2.2	-0.8	-0.1	-7.5	3.8	-0.9	4.1
	$k^A - k^L$	270	-0.49	0.50	-3.3	-0.7	2.1	-77.6	39.3	-2.9	35.4
Japan	$r^A - r^L$	27	-1.86	1.64	-5.3	-0.5	2.0	-22.0	15.7	-0.4	3.9
	$i^A - i^L$	27	0.80 ***	0.16	0.2	0.7	1.6	-1.4	2.1	-0.4	3.0
	$k^A - k^L$	27	-2.66 *	1.60	-6.4	-1.7	1.6	-22.7	14.0	-0.6	4.0

Notes. Excess real total returns (r^A-r^L), yields (i^A-i^L) and rates of capital gain (k^A-k^L) are calculated according to equations (5) to (7) in the main text. Euro (10) includes Austria, Finland, France, Germany, Greece, Ireland, Italy, Netherlands, Portugal, Spain. See data appendix A.1 for list of countries and definition of groups. ***, ** and * denote significance at 1% , 5% and 10% level, respectively.

The excess return on the net foreign assets of the United States is indeed "exorbitant" from a global perspective. Table A.2 in the appendix reports the detailed results for each country in our sample, confirming that the United States is an outlier. Indeed, only a dozen of countries generate on average positive

[10] This is virtually in line with the result of Gourinchas and Rey (2005), which is calculated over the period 1973-2004.

excess total returns on their foreign assets, which are generally much smaller than those of the United States and not significantly different from zero. The United States is also one of the few countries – together with Switzerland, Japan, Korea and India – showing a positive and statistically significant excess yield from the income balance. The median excess yield of the United States is the highest in the sample. As regards capital gains, instead, there are several countries that managed on average to obtain positive differentials larger than that of the United States, but with the exception of Australia and Chile, these excess returns were volatile and not statistically different from zero.

Summing up, over the past decades the United States managed to run positive return differentials on net foreign assets. It is not simply the average level of this differential that is extraordinary, but also the ability of the United States to achieve it in a consistent manner through time from both investment income and capital gains. Other major issuers of international currencies, such as Japan and the euro area, are far from this performance, mainly due to average capital losses. Indeed, when focussing only on the yield differential from investment income, Japan as well as Switzerland – both issuers of international currencies – do not fare much worse than the United States. The euro area member states do not enjoy a privilege similar to other issuers of international currencies. However, a negative yield differential between foreign assets and liabilities of euro area countries was significantly eroded in the run-up to EMU accession. The potential positive impact on excess returns of possessing an international currency shall be properly tested in the empirical analysis (see section 6 and 7).

It has already been discussed (see section 2) whether the positive excess returns on net foreign assets of the United States are the outcome of statistical adjustment, measurement errors or true superior over-performance of U.S. investors. It is important to stress that this work does not provide further direct evidence on this debate. This paper, instead, offers a broader analysis, testing the validity of several potential explanations of the exorbitant privilege, which have emerged in the literature and should hold across many countries, not only for the United States. This testing process starts in the next section, where the contribution of specific asset classes – FDI, equity, debt and other – to excess returns on net foreign assets is investigated in selected economies.

5. Exorbitant privilege: return or composition effect?

Gurinchas and Rey (2005) provide a break-up of excess total real returns in the United States in a *return* and a *composition* effect. The first effect gauges the importance of differential returns between assets and liabilities within each asset

class, i.e. for FDI, equity, debt and other investments, separately. The second effect, instead, measures how the different weight of various asset classes between gross foreign assets and liabilities may generate excess returns assuming different average returns from each asset class. For instance, in the case of the United States, gross foreign liabilities are dominated by low-yield debt and other investment (trade credits, loans, currency and deposits), whereas the composition of gross foreign assets is more balanced between low-yield instruments and risky assets such as FDI and equity, with the latter supposed to generate superior returns.[11] This second effect therefore is supposed to capture the impact of the asymmetric composition of gross assets and liabilities and, in the special case of the United States, the benefit of being a "levered investor". As previously noted, the main finding of Gourinchas and Rey (2005) is that the *composition* effect increased significantly over time in the case of the United States, explaining one quarter (86 basis points) of the average annual excess total real return (332 basis points) between 1973 and 2004.

Formally, the excess return obtained in equation (7) may be decomposed as:

$$r^A - r^L = \underbrace{\frac{\sum_j (\alpha_j + \lambda_j)}{2}\left(r_j^A - r_j^L\right)}_{\text{return effect}} + \underbrace{\sum_j (\alpha_j - \lambda_j)\frac{\left(r_j^A + r_j^L\right)}{2}}_{\text{composition effect}} \qquad (9)$$

where α_j and λ_j are the weights of each asset class, *j*, in total assets and liabilities. The asset classes are FDI, equity, debt and other investment. In the case of gross foreign assets, official reserves are lumped together with other investment.[12] In the calculation of the return effect, differential returns within each asset class are weighted by their average share in total assets and liabilities; when computing the composition effect, instead, average returns by asset class are weighted by the relative composition of assets and liabilities.

We use this formula (9) to extend and deepen the analysis of Gourinchas and Rey (2005). First, we extend this decomposition to other major advanced economies for which it was possible to obtain disaggregated data on both income

[11] The ratio of debt and other investment to total gross foreign *liabilities* in the United States is relatively stable, averaging almost 70 percent between 1980 and 2007. The ratio of debt and other investment to total gross foreign *assets* was equal to 70 percent back in the 1980s, but progressively declined over the years to around 45 percent.

[12] Unfortunately, the breakdown of the income balance does not include a separate item for earnings stemming from the investment of official reserves. In theory, one should include those earnings in the appropriate category (e.g. dividend for equity, debt income or other income); however, in many cases, these earnings are reported by the authorities under "other income" to protect the confidentiality of these data.

flows and investment positions, including in particular the euro area consolidated external position and transactions since 1999. Second, we deepen the analysis further refining the decomposition in the two components of excess total returns: yields from investment income and capital gains from asset price and exchange rate movements (see equation 6). It will be then clear whether, for instance, a positive return effect is due to superior performance in generating earnings from investment abroad compared to payments to foreign investors or due to increases in the domestic currency market value of investment abroad compared to inward investment by foreigners.

Table 2 presents the detailed decomposition of excess returns for the United States, Germany, Japan and the euro area, with annual data averaged over three different periods. Returns by asset class are available from 1986 for the first two countries, from 1996 for Japan and since 2000 for the euro area. According to our calculations, differently from Gourinchas and Rey (2005), it is not possible to identify any positive contribution of the composition effect to total excess real returns in the United States.[13] Between 1986 and 2007, the composition effect is actually negative (-0.8%) and is entirely due to the relative short position in debt securities, which provides a large negative contribution (-1.7%) that is not offset by the positive composition effect of other categories.[14]

The exorbitant privilege of the United States is instead the result of an extraordinary return effect (+5.1%), i.e. the better performance of U.S. investment abroad with respect to foreign investment in the U.S. across all categories. Capital gains explain two thirds of this return effect between 1986 and 2007 (+3.3%), but their contribution is even higher in the most recent period (2000-2007). In turn, capital gains stem principally by superior differential returns in the debt and equity categories. According to Curcuru et al. (2008) this superior performance is only the outcome of measurement errors, in particular in the case of asset-backed securities. Positive yield differentials explain the rest of the return effect (+1.8%). The decomposition emphasises that this return effect for yields is almost entirely due to the income stemming from U.S. direct investment abroad exceeding the income paid to service foreign direct investment in the United States (see section 2 for a discussion).

[13] In this paper, both data and time-dimension are different from Gourinchas and Rey (2005). It is also evident from Table 2 that in some cases results may change significantly across different time-periods.

[14] Indeed, the share of debt securities on total U.S. foreign liabilities is on average 25 percentage points larger than the share of debt securities on total U.S. foreign assets. Average (assets/liabilities) real yields on debt securities hovered between 3 to 4 percent, whereas average *total* returns (including capital gains) stayed between 6 to 8 percent. It is important to note that these average (assets/liabilities) *total* returns on debt securities are indeed lower than those on equity – as expected – but higher than average total returns on FDI.

Table 2. Decomposition of excess returns on net foreign assets: return versus composition effect. Annual averages (percentage)

United States	1986-2007			1996-2007			2000-2007		
	$r^A - r^L$	$i^A - i^L$	$k^A - k^L$	$r^A - r^L$	$i^A - i^L$	$k^A - k^L$	$r^A - r^L$	$i^A - i^L$	$k^A - k^L$
Excess return	**4.3**	**1.4**	**2.9**	**4.7**	**1.3**	**3.4**	**5.5**	**1.5**	**4.0**
Return effect	**5.1**	**1.8**	**3.3**	**4.7**	**1.6**	**3.1**	**6.3**	**1.7**	**4.6**
- FDI	2.1	1.5	0.6	1.9	1.2	0.8	1.7	1.2	0.6
- Equity	0.9	0.1	0.8	0.6	0.1	0.5	1.5	0.2	1.3
- Debt	1.5	0.3	1.2	1.7	0.2	1.5	2.3	0.3	2.0
- Other	0.7	-0.1	0.8	0.4	0.1	0.3	0.8	0.1	0.7
Composition effect	**-0.8**	**-0.3**	**-0.4**	**0.0**	**-0.2**	**0.3**	**-0.8**	**-0.2**	**-0.6**
- FDI	0.3	0.4	-0.3	0.4	0.5	-0.3	0.6	0.5	-0.2
- Equity	0.4	0.0	0.3	1.0	-0.1	0.8	0.6	-0.1	0.4
- Debt	-1.7	-0.9	-0.2	-1.5	-0.7	-0.1	-2.0	-0.6	-0.7
- Other	0.2	0.2	-0.3	0.1	0.1	-0.1	0.0	0.0	-0.1
Germany	1986-2007			1996-2007			2000-2007		
	$r^A - r^L$	$i^A - i^L$	$k^A - k^L$	$r^A - r^L$	$i^A - i^L$	$k^A - k^L$	$r^A - r^L$	$i^A - i^L$	$k^A - k^L$
Excess return	**-1.1**	**-0.3**	**-0.8**	**-0.1**	**-0.2**	**0.1**	**-0.1**	**-0.1**	**0.0**
Return effect	**-1.4**	**-0.1**	**-1.3**	**-0.4**	**0.0**	**-0.5**	**0.3**	**0.2**	**0.1**
- FDI	-1.1	-0.3	-0.9	-0.9	0.0	-0.9	0.6	0.1	0.6
- Equity	-0.3	0.0	-0.3	-0.7	0.0	-0.7	-0.4	0.0	-0.4
- Debt	0.6	0.4	0.2	0.6	0.2	0.4	0.3	0.2	0.0
- Other	-0.6	-0.3	-0.3	0.5	-0.2	0.7	-0.2	-0.1	-0.1
Composition effect	**0.3**	**-0.2**	**0.5**	**0.3**	**-0.3**	**0.5**	**-0.3**	**-0.2**	**-0.1**
- FDI	0.4	0.2	0.1	0.5	0.2	0.3	0.0	0.1	-0.1
- Equity	0.1	0.0	0.1	0.2	0.1	0.1	-0.1	0.1	-0.2
- Debt	-0.6	-0.7	0.4	-0.7	-0.7	0.2	-0.4	-0.5	0.3
- Other	0.4	0.4	-0.1	0.2	0.2	-0.1	0.1	0.1	-0.1
Japan	1986-2007			1996-2007			2000-2007		
	$r^A - r^L$	$i^A - i^L$	$k^A - k^L$	$r^A - r^L$	$i^A - i^L$	$k^A - k^L$	$r^A - r^L$	$i^A - i^L$	$k^A - k^L$
Excess return	**-1.8**	**0.9**	**-2.7**	**1.0**	**1.6**	**-0.6**	**3.0**	**1.8**	**1.3**
Return effect	**…**	**…**	**…**	**1.4**	**0.9**	**0.4**	**3.0**	**1.2**	**1.8**
- FDI	…	…	…	-0.5	-0.2	-0.3	-0.6	-0.2	-0.4
- Equity	…	…	…	0.6	0.6	0.0	1.6	0.7	0.9
- Debt	…	…	…	1.7	0.7	1.1	2.4	0.8	1.6
- Other	…	…	…	-0.5	-0.1	-0.3	-0.4	-0.1	-0.3
Composition effect	**…**	**…**	**…**	**-0.4**	**0.7**	**-1.1**	**0.1**	**0.6**	**-0.5**
- FDI	…	…	…	0.4	0.5	-0.1	0.6	0.5	0.2
- Equity	…	…	…	-1.5	-0.5	-1.0	-1.4	-0.7	-0.7
- Debt	…	…	…	0.7	0.8	0.0	0.8	0.8	0.0
- Other	…	…	…	-0.1	-0.1	0.0	0.0	0.0	0.0
Euro area	1986-2007			1996-2007			2000-2007		
	$r^A - r^L$	$i^A - i^L$	$k^A - k^L$	$r^A - r^L$	$i^A - i^L$	$k^A - k^L$	$r^A - r^L$	$i^A - i^L$	$k^A - k^L$
Excess return	**…**	**…**	**…**	**…**	**…**	**…**	**-0.8**	**-0.1**	**-0.7**
Return effect	**…**	**…**	**…**	**…**	**…**	**…**	**-0.9**	**-0.2**	**-0.8**
- FDI	…	…	…	…	…	…	-0.6	0.0	-0.6
- Equity	…	…	…	…	…	…	-0.2	-0.2	0.0
- Debt	…	…	…	…	…	…	-0.1	0.2	-0.3
- Other	…	…	…	…	…	…	0.0	-0.1	0.1
Composition effect	**…**	**…**	**…**	**…**	**…**	**…**	**0.1**	**0.1**	**0.0**
- FDI	…	…	…	…	…	…	0.1	0.1	-0.2
- Equity	…	…	…	…	…	…	0.0	0.0	0.2
- Debt	…	…	…	…	…	…	0.0	-0.1	0.1
- Other	…	…	…	…	…	…	0.0	0.1	-0.1

Notes. Excess total real returns (r^A-r^L), yields (i^A-i^L) and rates of capital gain (k^A-k^L) are decomposed according to eq. (10):

$$r^A - r^L = \frac{\sum_j (\alpha_j + \lambda_j)}{2}\left(r_j^A - r_j^L\right) + \sum_j (\alpha_j - \lambda_j)\frac{\left(r_j^A + r_j^L\right)}{2}$$

where α_j and λ_j are the weights of each asset class, j, in total assets and liabilities. The first term on the right-hand-side of (10) is the *return effect*, i.e. the weighted impact of excess returns within each asset class, and the second term is the *composition effect*, i.e. the excess return deriving from being long or short in each asset class in relative terms.

Excess total returns in the two other major economies in Table 2, Germany and Japan are negative between 1986 and 2007. It is possible, however, to distinguish an improvement in the most recent period. In Germany, during the period 1986-2007, a negative cross-border differential total return (-1.1%) is explained by the return effect (-1.4%) on the back of net capital losses on FDI, equity and other investment. Interestingly, since 2000, the situation is reversed:

the return effect turned positive whereas the composition effect is slightly negative. In Japan, the decomposition of excess returns is available only starting from 1996. Again, as in the case of Germany, there is a noticeable improvement in the total excess return when focussing on the last decade. In particular, since 2000, Japan enjoyed an "almost exorbitant" privilege of 3 percentage points. It is worth noting how the debt category plays an important role in the case of Japan, with a positive return and composition effect.[15]

Finally, since 2000, it is possible to obtain the excess returns of the euro area as a whole, using consolidated external positions and transactions. Since the introduction of the common currency, the euro area obtained from its investment abroad less than what it pays to foreign investors in the euro area, once capital gains are included (-0.8%). This negative differential total return is almost entirely accounted for by capital losses, whereas the negative pure yield differential is very small. In turn, a negative return effect for FDI and debt securities explains these capital losses. Comparing these losses with gains in the United States and Japan over the same period, one may deduce that a net transfer of wealth across the Atlantic and the Pacific may have taken place since the burst of the dot-com bubble. However, the previous analysis stressed that capital gains and losses are rather volatile and their impact on net foreign assets may be properly gauged only over a long-time span. It is therefore too soon to generalise and extrapolate these short-term trends.

Overall, the detailed decomposition of excess returns showed that the role of the United States as "levered investor" did not contribute to its exorbitant privilege, at least over the past two decades. The privilege is instead fully explained by excess returns within each asset class. The composition effect – i.e. the impact of asymmetries in the composition of foreign assets and liabilities on excess returns – is also relatively smaller than the return effect in the other major economies issuing international currencies. The question of the impact of the composition of net foreign assets on excess returns may be tackled from a different angle, analysing the whole cross-section of excess returns and controlling whether countries with higher leverage – defined as a higher share of risky investment on the asset side compared to liabilities – tend to have higher excess returns. This is the purpose of the next section.

[15] The decomposition of excess returns of other major advanced countries – United Kingdom, Switzerland, Canada and Australia – is available in Table A.3 in the Appendix.

6. The determinants of excess returns on foreign assets and liabilities

The detailed decomposition of the excess returns on net foreign assets in the United States revealed the absence of the role of "leverage" in generating excess returns. Is this still the case from a cross-country comparison? Are there other variables that can explain excess returns? Data limitations do not allow running calculations for all countries in our sample similar to those in the previous section. This limitation may be circumvented through a panel analysis of the potential determinants of excess returns, which allows for the testing of other theories and explanations of the exorbitant privilege that emerged in the literature (see section 2). First of all, valuation effects directly influence returns on foreign assets and liabilities. These valuation effects are generated by swings in the market value of domestic and foreign investment (asset price channel) and changes in the exchange rate at which the foreign currency component of foreign assets and liabilities are valued (exchange rate channel). Second, excess total returns may be affected by the composition of assets and liabilities – the leverage – by the relative risk attached to investing in certain countries, possibly by different tax rates which trigger cross-border profit shifting by multinational corporations and, finally, by the international role of certain currencies. It is useful to explain how these variables may affect excess returns on net foreign assets, including their two components, excess yields and rates of capital gain.

Exchange rate and excess returns

Lane and Milesi-Ferretti (2005a) show that there is negative relationship between the real appreciation of one currency and real returns on foreign assets or liabilities. This is simply the result of higher inflation and the valuation effect of exchange rates changes on foreign assets and liabilities, which are denominated in foreign currency. A nominal appreciation, in fact, reduces the domestic currency return and vice versa in the case of depreciation. This effect is directly proportional to the foreign currency share of total assets or liabilities. The higher the share of foreign assets (liabilities) denominated in foreign currency, the higher the negative impact of exchange rate appreciation on the domestic currency return on assets (liabilities). In theory, the overall impact of exchange rate changes on the "excess" return, i.e. the differential between the return on foreign assets and the return on foreign liabilities, is undetermined, depending on whether the foreign currency *share* of total assets is substantially different from that of liabilities. In practice, however, the foreign currency share of total foreign assets

is generally larger than the foreign currency share of total foreign liabilities.[16] As a consequence of this asymmetry, returns on assets are more sensitive to exchange rate changes than returns on liabilities. A nominal appreciation (depreciation) of the domestic currency reduces (raises) the returns on assets more than the returns on liabilities and decreases (increases) the "excess" return.[17] A simple numerical example will clarify this important point.

Let us assume that a country has both foreign assets and liabilities equal to 100, measured in domestic currency terms.[18] Liabilities are all in domestic currency. Foreign assets are by half denominated in domestic currency (50 units) and by the other half denominated in foreign currency (50 units). For the sake of simplicity, income flows and changes in asset prices are assumed to be absent and the only change is a devaluation of the domestic currency increasing by 10 percent the price of the foreign currency in domestic currency terms. This will bring about a capital gain of +5 in foreign assets (from 50 to 55 units) and a return on total assets of 5 percent. The return on liabilities will remain equal to zero, as there is no exchange rate effect. The "excess" return resulting from the devaluation of the domestic currency is therefore equal to 5 percent; a negative relationship between the exchange rate and excess returns.

A small modification of the previous example shows how the impact of exchange rates movements on excess returns crucially depends on the foreign currency *share* of assets and liabilities. In addition, it clarifies that the relationship holds irrespective of the size of gross foreign assets and liabilities. Similarly to the previous case, one may assume that foreign assets are equal to 100 domestic currency units and 50 percent of them are denominated in foreign currency. Now, however, foreign liabilities are assumed to be much larger and equal to 1000 domestic currency units, of which 200 units denominated in foreign currency. As in the previous example, the foreign currency share of total foreign assets (50%) is

[16] According to the estimates of Lane and Shambaugh (2007), on average, the share of foreign assets denominated in foreign currency is 30 percentage points higher than the share of foreign liabilities denominated in foreign currency. There are only very few instances (e.g. Austria) where the latter is higher than the former. This is because, normally, the bulk of foreign assets are denominated in foreign currency, since only the issuers of international currencies have foreign assets (usually only debt securities, trade credits and deposits) denominated in their own domestic currency. Instead, for foreign liabilities, the portion accounted for by FDI and equity is by definition denominated in domestic currency, whereas the remaining part, debt and other investment, may be potentially denominated in foreign-currency, in particular in the case of dollarized emerging markets. Countries issuing international currencies may have a larger share of domestic currency foreign assets with respect to other countries; however, they also tend to issue an even larger share of liabilities to foreigners in domestic currency. Therefore, eventually, also issuers of international currencies have a larger ratio of foreign currency assets to total foreign assets compared to the similar ratio for foreign liabilities.

[17] In real terms the negative relationship is even stronger due to the impact of domestic inflation.

[18] All figures in this example refer to domestic currency units and domestic currency returns.

greater than the foreign currency share of total foreign liabilities (20%). A depreciation of the domestic currency by 10 percent will generate a return on assets of 5 percent and a return on liabilities of 2 percent (+20 capital gain on liabilities), corresponding to an excess return of 3 percent. The relationship between the exchange rate and excess returns is again negative; even though the effect of the devaluation is lower than in the previous case. Turning to the size of foreign assets and liabilities, in the first example, the country was long in foreign currency (+50) and the overall valuation gain of the devaluation was therefore positive (+5). In this second example, instead, the net foreign currency position is negative (-150), resulting in a valuation loss (-15 = +5 - 20). The devaluation generated a "positive" excess return and a "negative" valuation gain. The sign of the relationship between excess returns and the exchange rate depends on the net *relative* foreign currency exposure, in terms of foreign currency *shares* between assets and liabilities. The sign of the relationship between valuation gains and the exchange rate depends on the net *absolute* foreign currency position. Excess returns and valuation gains are two distinct concepts that should not be confused.

Asset prices and excess returns

Portfolio securities are valued at current market prices at the end of each period, bringing about changes in the valuation of those securities between two time periods. For some countries (e.g. United States or Australia), the position for foreign direct investment is also estimated at market prices or current costs, even though the majority of countries report the value of direct investment at historical costs. An increase in domestic asset prices produces higher returns on foreign liabilities and lower excess returns. Indeed, in order to properly gauge this valuation channel one should compare the relative increase in prices of foreign assets compared to change in prices in foreign liabilities – where the effect would be proportional by the relative size of securities which are valued at market prices and subject to valuation gains. In practice, due to data limitations, this empirical analysis focuses on changes in domestic *share* prices – excluding therefore changes in the valuation of debt securities – affecting equity and FDI valuations in domestic markets. The change in the real stock market price in each country is interacted with the share of FDI and equity in total foreign liabilities, as the impact of price movements shall be proportional to the latter share. One would unequivocally expect a negative impact on excess returns of this variable.

Leverage and excess returns

A levered investor, a country, shorting low-yield securities (debt and other investment in the balance of payments) and taking a long position in risky foreign

assets (FDI and equity) should be able to generate a positive excess return, as long as risk-taking investment is remunerated by higher average returns. In this case, the variable measuring the assumption of risk, i.e. the *leverage*, is the ratio of FDI and equity assets to total foreign assets minus the similar ratio for total foreign liabilities. Formally, assume that foreign assets and liabilities may be divided in two categories: risky assets and liabilities, A^{risk} and L^{risk}, respectively, and safe one, A^{safe} and L^{safe}. The total return on assets, r^A, or liabilities, r^L, is a weighted average of the return on risky investment and that on safe investment:

$$r_t^J = \frac{II_t^{J,risk} + KG_t^{J,risk}}{J_{t-1}^{risk}} \frac{J_{t-1}^{risk}}{J_{t-1}} + \frac{II_t^{J,safe} + KG_t^{J,safe}}{J_{t-1}^{safe}} \frac{J_{t-1}^{safe}}{J_{t-1}} \tag{10}$$

where the letter $J = A, L$ indicates whether the equality refers to assets or liabilities and the other variables are defined as in section 3. The excess return may be rewritten as:

$$r_t^A - r_t^L = \left(r_t^{A,risk}\alpha_{t-1} + r_t^{A,safe}(1-\alpha_{t-1})\right) - \left(r_t^{L,risk}\lambda_{t-1} + r_t^{L,safe}(1-\lambda_{t-1})\right) \tag{11}$$

where the Greek letter, α (λ) denotes the weight of risky assets (liabilities) on total assets (liabilities). Now, assuming that the return on risky (safe) investment is the same on the asset and liability side:

$$\hat{r}_t^{risk} \equiv r_t^{A,risk} \equiv r_t^{L,risk} \quad \text{and} \quad \hat{r}_t^{safe} \equiv r_t^{A,safe} \equiv r_t^{L,safe}$$

then, the terms in equation (12) may be rearranged to obtain:

$$r_t^A - r_t^L = \left(\hat{r}_t^{risk} - \hat{r}_t^{safe}\right)\left(\alpha_{t-1} - \lambda_{t-1}\right) \tag{12}$$

This equation shows that if $\hat{r}_t^{risk} > \hat{r}_t^{safe}$, which is the underlying assumption of the leverage hypothesis, then the higher the *ratio* of risky assets to total assets in the previous period, α_{t-1},compared to the *ratio* of risky liabilities to total liabilities in the previous period, λ_{t-1}, the higher the excess return at time t. In practice, if detailed data on the income balance were to be available for all countries, one would be able to measure returns by major asset classes (FDI, equity, debt and other investment) and compare them, without resorting to any assumption. Unfortunately, disaggregated income balance data are available only for a few countries or the last few years. The country panel regression will indirectly test whether $\hat{r}_t^{risk} > \hat{r}_t^{safe}$ holds in the sample once $\left(\alpha_{t-1} - \lambda_{t-1}\right)$ is changing.

Other control variables

Other control variables have been added to the empirical investigation. Namely, country risk, corporate tax rates and the currency share in foreign official exchange reserves as a proxy for the international use of currencies. First, the U.S.

excess return on net foreign assets has been justified on the grounds of lower overall risk of investing in the United States compared to the rest of the world. It is therefore interesting to check whether lower country risk is associated with higher excess returns and vice versa in our panel of countries. Second, different corporate tax rates across countries may induce multinational companies to shift income, reinvested earnings and capital gains from high to low tax jurisdictions in order to minimise the tax burden. This would boost returns on foreign assets and lower returns on foreign liabilities of countries with relatively high tax rates. Finally, the exorbitant privilege of the United States is usually justified by the function of the U.S. dollar as a store of value for international investors. The latter generate an additional demand for securities issued in international currencies, lowering yields and returns on those securities and, therefore, bringing down the return paid on foreign liabilities by country issuing international currencies.

The empirical model

Following the previous discussion, the relationship to be tested is the following:

$$y_{i,t} = \alpha_i + \lambda y_{i,t-1} + \beta(DRER_{i,t} * FC_{i,t}) + \gamma(RSP_{i,t} * FE_{i,t}) + \delta LEV_{i,t-1} + \eta Z_{i,t} + \varepsilon_{i,t} \quad (13)$$

where the dependent variable, y, is the excess real total return or, alternatively, the excess real yield or the excess real rate of capital gain. One lag of the dependent variable proved to be sufficient to model the autocorrelation (the coefficient λ) within each time series. $DRER_t$ is the difference of the (log) real effective (trade-weighted) exchange rate between time t and t-1. $FC_t = \left(FC_t^A - FC_t^L\right)$ is the difference between the ratio of foreign currency assets to total assets, FC_t^A, and the ratio of foreign currency liabilities to total liabilities, FC_t^L.[19] Following the previous discussion, the sign of the coefficient associated with the change in the real exchange rate interacted with the relative foreign currency share is expected to be negative, β<0. It is important to keep in mind that exchange rate movements should influence the capital gain part of the excess return, whereas excess yields from the income balance may be less sensitive, or perhaps not sensitive at all, to changes in the real exchange rate.

The variable RSP_t*FE_t is the relative change in the real (CPI deflated) stock market price between time t and t-1 (RSP_t) multiplied by the share of FDI and equity in total foreign liabilities (FE_t). The coefficient associated with this variable is expected to be negative, γ<0, since an increase in domestic stock

[19] Data on the currency composition of foreign assets and liabilities are estimates from Lane and Shambaugh (2007), which are available from 1990 to 2004. The foreign currency shares are kept constant at the 1990 value for the period 1980-1989 and at the 2004 value for the period 2005-2007, i.e. for those periods in our sample that are not covered by these estimates.

market prices generate a capital loss on foreign liabilities. $LEV_{t\text{-}1}$ is our measure of leverage at time t-1 $\left(\alpha_{t-1} - \lambda_{t-1}\right)$ and, in particular, is equal to the ratio of FDI and equity assets (the risky investment) to total foreign assets minus the same ratio for total foreign liabilities. The sign of the coefficient for this variable is expected to be positive, $\delta>0$, if leveraged investors are to be compensated for higher risk taking, in particular for excess rates of capital gain.[20]

The vector Z_t includes the additional control variables. In particular, $RiskR_t$ is a risk rating obtained from the International Country Risk Guide (ICRG), which comprises 22 variables in three subcategories of risk: political, financial, and economic. Apart from its rich qualitative dimension, one of the main advantages of this index is to have a rather long time-dimension, being available for all countries in our sample as far as back 1984.[21] The higher the rating, the lower the risk associated to the particular country (see Appendix A.1 for a detailed description of this indicator). The estimated coefficient of this variable is therefore expected to be positive, as low risk countries, or countries improving their risk-profile, are expected to pay relatively lower returns on their foreign liabilities and hence obtain a higher excess return. TAX_t is the statutory corporate income tax rate that is reported by Mintz and Weichenrieder (2010). As previously explained, countries with relatively elevated tax rates are expected to have higher excess returns as income or capital gains are shifted abroad, boosting return on foreign assets. The opposite is true for low tax jurisdictions.[22] The expected coefficient of this variable is therefore positive. Finally, the international role of currencies as a store of value is proxied by the currency share in foreign official exchange reserves, FXR_t, as reported by the IMF COFER database since 1995 and in past IMF annual reports for data before 1995. Also for this variable the expected coefficient is positive. Table 3 summarises the definition of the variables in the empirical model and their expected sign.

[20] As in the case of exchange rate changes, the impact of leverage should be more visible on excess rates of capital gain compared to excess yields from the income balance, since the return on equity is mainly due to capital gains and only residually to dividends, which are recorded in the income balance. Indeed, a casual inspection of yields by asset class, when detailed income balance data are available, shows that average yields on FDI (reinvested earning, distributed dividends and repatriated profits, income on debt) are the highest, followed by yields on debt and other investment. Average yields on equity are usually ranking below all other categories.

[21] The index is kept constant at the 1984 level in the previous years, back to 1981.

[22] It is interesting to note that, among OECD countries, Ireland has the lowest statutory corporate tax rate and the second lowest - after Finland - average excess total return on net foreign assets. Finland has also a very low tax rate starting from 1993.

Table 3. Empirical model. Description of variables and predicted sign

Variable	Description	Expected impact on: $r^A - r^L$	$i^A - i^L$	$kg^A - kg^L$
*DRER*FC*	Log change in the real effective (trade-weighted) exchange rate multiplied by the relative foreign currency exposure	-	+/-	-
*RSP*FE*	Relative change in the real share price (composite stock price index) multiplied by the share of FDI and equity in total foreign liabilities	-	+/-	-
LEV(-1)	Share of risky (FDI and equity) assets in total assets minus share of risky (FDI and equity) liabilities in total liabilities; lagged one period	+	+/-	+
RiskR	Composite (political, financial and economic) risk rating ranging between 0 (riskiest) and 1 (safest)	+	+	+
TAX	Corporate tax rate	+	+	+
FXR	Currency share in foreign official currency reserves	+	+	+

Notes. See Table A.1 in the appendix for data sources

Empirical results

Equation (13) was estimated for our panel of 48 countries over the period 1981-2007 with country fixed-effects (α_i,) through ordinary least squares (OLS) and country clustered variance/covariance matrices to obtain robust standard errors.[23] The panel is strongly balanced with only six transition economies having observations for less than half of the period under examination. Apart from the variables gauging valuation effects, which are always present in the regressions, the other control variables are entered one by one in the estimation procedure and, eventually, jointly estimated.

Table 4 reports the results of these panel estimations. The OLS regressions explain a relatively small fraction of the variability of excess total returns and rates of capital gain (the R^2 is around 9%).[24] Indeed, as noted in the previous sections, total returns and capital gains are very volatile and our model, even though accounting for valuation effects, cannot fully explain the variability "within" each country series. However, the model with fixed-effects explains a good proportion (up to two thirds in some cases) of the "between" variability

[23] The use of country fixed-effects seems the natural choice for a panel with a limited number of groups, N, and relatively large time dimension, T. Generalised least square random-effects estimates are qualitatively similar to those with fixed-effects, but the usual Hausman test rejects the null hypothesis that these two estimates are not statistically different, suggesting the use of country fixed-effects. The F-test rejects the null hypothesis that individual effects are all equal to zero in the fixed-effects estimations.

[24] If one would include only the real exchange rates and share prices not interacted with relative currency and risk exposure, the overall explanatory power would further decline by two to three percentage points. This result - not shown and available from the author - supports the choice of the specification in equation (13).

across countries. In the case of excess yields, instead, the explanatory power comes from the high autocorrelation coefficient, whereas valuation effects and other control variables do not add much information.

Analysing the results, it is possible to note that the signs of the estimated coefficients of the two variables gauging valuation effects, exchange rate and stock price changes, are consistent with theoretical predictions and statistically significant. As expected, the exchange rate and asset price channels work through capital gains (columns 11 to 15), whereas the impact on excess yields turned out to be not significantly different from zero (columns 6 to 10). For a country with a foreign currency share of foreign assets that is 30 percentage points higher than the foreign currency share of foreign liabilities – corresponding to the sample mean of this variable, $FC = 0.3$ – an appreciation by 10 percent (close to one standard deviation) in the real effective exchange rate is associated with a decrease in the excess real total return by around 125 basis points (column 5 of Table 4). The impact of share price movements is estimated to be quantitatively smaller compared to exchange rates. A country with a ratio of FDI and equity to total liabilities which is equal to 30 percent ($FE = 0.3$, which is again the sample mean of this variable) experiencing an annul rise in the stock market index in real terms by 10 percent would be subject to a decline in excess returns by around 50 basis points.

The impact of other control variables is not always statistically significant and consistent with theoretical predictions. Leverage, for instance, do not seem to affect excess total returns and may have a negative influence on excess yields.[25] More surprisingly, country risk rating has a negative and statistically significant impact on excess total returns, which is driven by capital gains but not by yields. Therefore, countries with lower ratings (higher risk) on average tend to record higher excess rates of capital gains and higher excess total returns. As expected, the statutory corporate tax rate is positively associated with excess total returns and rates of capital gain. The estimated coefficient is statistically significant at the 1 or 5 percent level, depending upon the specification, suggesting that countries with higher tax rates do indeed report higher excess returns on foreign assets and liabilities. Finally, the regressions confirm the common perception that countries with international currencies that are used as foreign official exchange reserves enjoy higher excess yields (see columns 9 and 10 of Table 4).

[25] The latter result is not completely unexpected as the yields from equity, dividends, have been historically trending down and are often lower that yields on debt or bank loans.

Table 4. Excess real returns, yields and rates of capital gain. Fixed-effects panel estimations

Dependent variable	$r^A - r^L$					$i^A - i^L$					$k^A - k^L$				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
lambda	0.121***	0.118***	0.122***	0.119***	0.127***	0.687***	0.687***	0.687***	0.680***	0.679***	0.108***	0.106***	0.110***	0.106***	0.113***
	(0.036)	(0.037)	(0.035)	(0.036)	(0.037)	(0.051)	(0.052)	(0.051)	(0.052)	(0.053)	(0.035)	(0.036)	(0.034)	(0.034)	(0.036)
*DRER*FC*	-0.468**	-0.413**	-0.444**	-0.460**	-0.420**	0.029	0.030	0.032	0.032	0.028	-0.485**	-0.430**	-0.466**	-0.479**	-0.435**
	(0.198)	(0.197)	(0.201)	(0.201)	(0.197)	(0.026)	(0.026)	(0.025)	(0.025)	(0.026)	(0.209)	(0.208)	(0.212)	(0.212)	(0.207)
*RSP*FE*	-0.185***	-0.174***	-0.169***	-0.183***	-0.166***	-0.008	-0.007	-0.007	-0.007	-0.008	-0.168***	-0.157***	-0.153***	-0.168***	-0.150***
	(0.049)	(0.048)	(0.047)	(0.048)	(0.048)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.050)	(0.050)	(0.049)	(0.049)	(0.049)
LEV (-1)	-0.020				-0.051	-0.009*				-0.009*	-0.009				-0.037
	(0.029)				(0.032)	(0.005)				(0.005)	(0.027)				(0.031)
RiskR		-0.101***			-0.108**		0.006			0.000		-0.113***			-0.109**
		(0.035)			(0.043)		(0.008)			(0.009)		(0.041)			(0.047)
TAX			0.099***		0.097**			-0.004		0.003			0.102***		0.084**
			(0.036)		(0.039)			(0.006)		(0.007)			(0.035)		(0.038)
FXR				-0.002	0.058				0.016**	0.019***				-0.053	0.001
				(0.050)	(0.050)				(0.007)	(0.006)				(0.046)	(0.048)
R^2 Within	0.078	0.081	0.084	0.078	0.089	0.532	0.530	0.531	0.532	0.535	0.070	0.075	0.077	0.071	0.082
R^2 Between	0.644	0.244	0.447	0.688	0.158	0.963	0.988	0.986	0.978	0.956	0.576	0.332	0.220	0.354	0.226
R^2 Total	0.095	0.089	0.104	0.099	0.088	0.710	0.723	0.719	0.722	0.715	0.087	0.093	0.082	0.083	0.092
N. obs.	1,116	1,116	1,090	1,116	1,090	1,116	1,116	1,090	1,116	1,090	1,116	1,116	1,090	1,116	1,090
Countries	48	48	47	48	47	48	48	47	48	47	48	48	47	48	47

Notes. The table shows the results of the estimation of equations (13) in the main text, with OLS fixed-effects regression. Robust standard errors, allowing for clustering of residuals by country, are reported in parentheses. ***, ** and * indicate significance at the 1%, 5% and 10% level, respectively. See Table 3 in the main text for definition of variables. The variable *TAX* is not available for one country, Israel.

7. Robustness of main empirical results

A number of checks have been performed to test the robustness of the basic static regressions. These include the control for potential dynamic misspecifications and heterogeneity of slope coefficients in the panel, the robustness of results splitting the sample between advanced economies and emerging markets and, finally, the creation and inclusion of an *effective* exchange rate that takes into account currency exposure to measure the valuation effect of exchange rate movements more precisely.

Dynamic specification and heterogeneous slopes

The previous section provided a suggestive and neat picture of the role of potential determinants of excess returns. However, coefficients obtained from traditional static panel one-way estimators are traditionally subject to two types of bias: (i) a bias stemming from residual correlation in a dynamic setting and (ii) a bias deriving from the imposition of homogenous slopes when the time-dimension T is large. The relatively large time-dimension of our sample, on average 25 observations, should lessen the impact of the inconsistency generated by residual correlation, which is of the order $1/T$ (Nickell, 1981). There is however a second type of bias that is generated by the imposition of common slope coefficients across groups in models with lagged dependent variables, when T is large (Pesaran and Smith, 1995). In order to deal with these potential misspecifications of our model, we present a second set of results obtained with the Pooled Mean Group (PMG) estimator of Pesaran, Shin and Smith (1999) allowing for common long-run slope coefficients, but different short-term interactions, across countries.[26]

[26] In our case, equation (13) is transformed in an autoregressive distributed lag model, allowing for one-lag in the dependent and the explanatory variables:

$$y_t = \alpha + \lambda y_{t-1} + \beta_0 x_t + \beta_1 x_{t-1} + \varepsilon_t$$

where, in order to keep the notation simple, we dropped the subscript, *i*, for the individual country and included only one regressor. This equation is reparametrised in the following error correction form and estimated through maximum-likelihood:

$$\Delta y_t = \phi(y_{t-1} - \theta_0 - \theta_1 x_t) - \beta_1 \Delta x_t + \varepsilon_t$$

$$\phi = \lambda - 1; \quad \theta_0 = \frac{\alpha}{1-\lambda}; \quad \theta_1 = \frac{\beta_0 + \beta_1}{1-\lambda}$$

where φ indicates the error-correction term and θ_1 denotes the long-run coefficient for the impact of x on y, whereas β_1 is the short-run coefficient. Long-run coefficients are constrained to be the same across different countries, whereas the short-run coefficients are allowed to vary. It therefore implies a convergence of the model only over the long-run.

Table 5. Excess real returns, yields and rates of capital gain. Dynamic panel estimations

Dependent variable	$r^A - r^L$					$i^A - i^L$					$k^A - k^L$				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
(lambda - 1)	-0.968***	-0.942***	-0.949***	-0.962***	-0.943***	-0.314***	-0.336***	-0.325***	-0.347***	-0.281***	-1.001***	-0.983***	-0.987***	-0.998***	-0.993***
	(0.038)	(0.041)	(0.035)	(0.036)	(0.051)	(0.037)	(0.038)	(0.045)	(0.039)	(0.044)	(0.041)	(0.044)	(0.038)	(0.038)	(0.060)
*DRER*FC*	-0.420***	-0.260***	-0.254**	-0.322***	-0.403***	0.138***	0.140***	0.131***	0.130***	0.151***	-0.442***	-0.336***	-0.288***	-0.381***	-0.355***
	(0.107)	(0.097)	(0.100)	(0.095)	(0.107)	(0.040)	(0.036)	(0.035)	(0.035)	(0.039)	(0.094)	(0.085)	(0.089)	(0.086)	(0.089)
*RSP*FE*	-0.181***	-0.124***	-0.157***	-0.135***	-0.135***	0.017	0.007	0.023**	0.019**	0.026**	-0.135***	-0.104***	-0.115***	-0.120***	-0.110***
	(0.030)	(0.027)	(0.027)	(0.027)	(0.028)	(0.011)	(0.011)	(0.009)	(0.009)	(0.010)	(0.027)	(0.024)	(0.024)	(0.024)	(0.023)
LEV (-1)	0.016				-0.057***	-0.009				-0.000	0.032*				-0.016
	(0.020)				(0.019)	(0.008)				(0.007)	(0.018)				(0.016)
RiskR		-0.167***			-0.268***		0.035**			0.039**		-0.178***			-0.237***
		(0.039)			(0.041)		(0.015)			(0.017)		(0.037)			(0.036)
TAX			0.043*		0.067***			-0.004		0.006			0.062***		0.068***
			(0.023)		(0.024)			(0.006)		(0.007)			(0.021)		(0.020)
FXR				0.012	0.107***				0.015*	0.012				0.004	0.075***
				(0.026)	(0.025)				(0.008)	(0.008)				(0.026)	(0.024)
Log Likelihood	1502.8	1519.4	1464.6	1486.6	1598.2	3811.8	3801.5	3722.5	3776.8	3830.4	1554.4	1572.1	1520.9	1538.2	1659.3
N. obs.	1,108	1,108	1,082	1,108	1,082	1,108	1,108	1,082	1,108	1,082	1,108	1,108	1,082	1,108	1,082
Countries	48	48	47	48	47	48	48	47	48	47	48	48	47	48	47

Notes. The table shows the results of the estimation of equation (13) in the main text with the Pooled Mean Group (PMG) maximum-likelihood estimator of Pesaran, Shin and Smith (1999) with the following reparametrisation of our equations:

$$\Delta y_t = \phi(y_{t-1} - \theta_0 - \theta_1 x_t) - \beta_1 \Delta x_t + \varepsilon_t$$

where the subscript for individual countries and additional regressors have been eliminated to simplify the notation. The PMG estimator imposes common long-run slope coefficients (θ) but different short-term interactions (β) across countries. φ is an error correction term equal to (λ-1), where λ is the first-order autoregressive coefficient. Standard-errors are reported in parentheses. ***, ** and * indicate significance at the 1%, 5% and 10% level, respectively. See Table 3 in the main text for definition of variables. The variable *TAX* is not available for one country, Israel.

Table 5 shows the results of this second set of estimations, reporting the long-run coefficients associated with the explanatory variables. Other short coefficients of the PMG regressions are not reported for reasons of space as they were usually not statistically different from zero. Therefore, it is sufficient to multiply the reported long-run coefficients by the error correction coefficient, λ-1, in the first row of Table 5, inverting the sign, to obtain short-term coefficients comparable to those in Table 4. From this robustness check, it is possible to appreciate a pattern in the sign of the coefficients associated with the variables gauging valuation effects – the change in the real exchange rate and in the real share prices – similar to that in the static model. According to the dynamic model, the quantitative size of the impact of these two variables on excess total returns and rates of capital gains is relatively lower compared to static regressions with a somewhat greater variability in the estimated coefficients across different specifications. At the same time, statistically significance remains very high.

The major difference of dynamic panel estimations compared to static ones lies in the impact and statistical significance of other control variables. In particular, the effect of leverage changes often sign across different specifications, shedding doubts on the impact on excess returns. The negative relationship between country risk rating and excess total returns and rates of capital gains emerges as a robust result of the empirical analysis. Notably, in the dynamic regressions, it is also possible to detect a "positive" and statistically significant relationship between risk ratings and excess "yields", which is in line with theoretical predictions. Finally, both the statutory corporate tax rate and the international role of currencies produce a positive and statistically significant impact on excess returns, which seems to be channelled through the impact on rates of capital gain for tax rates and through the impact on yields for currency shares in foreign official reserves.

Advanced versus emerging economies

As a further robustness check, the sample has been split in advanced and emerging economies, running similar panel regressions, separately, for the two groups of countries. The results for static fixed-effects estimations are reported in the Appendix (see Table A.4) and do not show any dramatic difference with the outcome of regressions across the full sample, in particular as regards the signs of the coefficients.[27] The statistical significance of estimated coefficients although may vary. With a few exceptions, such as the impact of corporate tax rates on excess yields, the sign of those coefficients that are statistically different from

[27] Results of dynamic panel regressions are similar to static models. They are omitted for reasons of space and available from the author.

zero is consistent across the two groups of countries. The transmission of valuation effects to excess total returns is apparently larger for advanced economies compared to emerging markets. However, this may be simply the consequence of larger exchange rate and share price shocks in emerging markets with respect to advanced economies. Indeed, the standard deviation of changes in the real exchange rate for emerging economies (0.141) is almost three times as large as that of advanced countries (0.051), whereas the standard deviation of changes in the real share price (0.409) is around 60 percent higher for emerging market economies than for advanced countries (0.260). Interestingly, focussing on advanced economies, the effect of the risk rating explanatory variable on excess returns is particularly large and significant. This is again the result of two opposite forces. On the one hand, as predicted, larger excess yields are associated with higher ratings (i.e. lower risk); on the other hand, excess rates of capital gain are negatively related with ratings. The second effect is quantitatively larger than the first one and dominates the impact on excess total returns.

Constructing a real finance weighted index

In order to measure the valuation effect of exchange rate movements more precisely, an additional set of regressions has been produced including an *effective* exchange rate that takes into account currency exposure and replaces the variable *DRER*FC*. In the baseline model, the exchange rate is the usual trade-weighted exchange rate, which may only approximate the currency composition of foreign assets and liabilities. These international currency exposures have been estimated by Lane and Shambaugh (2007) and used to create *financial* exchange rates. In a similar fashion, I constructed a real Finance Weighted Index for assets (FWI^A) and liabilities (FWI^L) as a geometric weighted average of bilateral real (CPI deflated) exchange rates against five major international currencies (US dollar, British pound euro, Japanese yen and Swiss franc) and the domestic currency, where the currency weights are derived from the dataset of Lane and Shambaugh (2007).[28] For its part, the domestic currency generates no variation in the index as for a fixed exchange rate. As previously noted, the weight of the domestic currency in total foreign liabilities is higher than in the case of foreign assets. Indeed, the measured standard deviation of FWI^A is approximately 30 percent larger than that of FWI^L. Eventually, in order to estimate the impact of valuation effects on excess returns, the following explanatory variable has been constructed:

[28] Weights are changed and the resulting series chain-linked in 1999 with the introduction of the euro. They are the average currency shares between 1990 and 1998 for the first part of the sample until 1998, and the average currency shares between 1999 and 2004 in the second part of the sample.

$$DFWI_t \equiv DFWI_t^A - DFWI_t^L \quad (14)$$

which is the net change in the (log) real Finance Weighted Index, measured as the difference between the change, between *t* and *t*-1, in the (log) real Finance Weighted Index for assets ($DFWI^A$) and the change in the (log) real Finance Weighted Index for liabilities ($DFWI^L$). This finance-weighted index should better gauge the valuation impact of exchange rate changes on excess returns compared to the real effective, trade-weighted, exchange rate interacted with relative foreign currency exposure.

Table A.5 in the appendix shows the results of this additional robustness check using the net change in the real Finance Weighted Index, instead of the trade-weighted exchange rate. These results are very similar to those reported in Table 4 in the main text. The main difference rests in the size of the coefficient associated with *DFWI* which is smaller than the coefficient for *DRER*FC*. This again reflects simply the different size of the typical shock affecting the two exchange rate measures. The volatility of the former, the Finance Weighted Index, is indeed about one third higher than the volatility of the latter exchange rate indicator. The reported R^2 of this latter set of estimation are almost identical to those in the baseline model, indicating that there is no additional explanatory power stemming from a more refined measurement of currency exposures. In conclusion, the trade-weighted exchange rate interacted with the relative currency exposure (*DRER*FC*) performs as well as a Finance Weighted Index (*DFWI*).

Summary assessment of empirical results

Overall, the analysis of the potential determinants of excess returns between foreign assets and liabilities delivers a number of rather clear and consistent messages. First, valuation effects are indeed an important determinant of excess returns. There is a negative effect of changes in the exchange rate on excess returns, which is transmitted through capital gains and is proportional to the relative currency exposure. Similarly, there is a negative effect of change in real share prices, again transmitted through capital gains, which is proportional to the relative risk exposure in foreign liabilities. Second, there is no evidence that higher leverage produces higher excess returns. Actually, a number of specifications deliver the opposite result. Third, countries with better risk ratings seem to benefit from higher excess yields, i.e. they have a better income balance compared to countries with a similar net foreign position; nevertheless, they clearly tend to suffer from an inferior relative performance in terms of capital gains, which dominates the yield effect and, eventually, results in lower excess total returns. Fourth, tax incentives are an important determinant of excess total returns. Countries with higher (lower) tax rates have higher (lower) excess

returns. Finally, the results confirm that countries having an international reserve currency enjoy a benefit in terms of higher excess yields and total returns. All these results are robust to different econometric specifications and different country groupings.

8. Concluding remarks

This paper analysed excess returns on net foreign assets from a global perspective, studying a sample of 48 advanced and emerging market economies over the period 1981–2007. In particular, the excess total return is decomposed and studied in its two main components: yields from the investment income balance and capital gains from changes in asset prices and exchange rates.

This study confirms that the excess return on net foreign assets of the United States, more than 330 basis points per year between 1981 and 2007, is indeed exorbitant from a global perspective, larger than in other countries, consistently through time, and statistically significant. One third of this excess return is accounted for by a positive yield differential from investment income and two thirds by capital gains. At least as regards yields from the investment income, other major issuers of international currencies, such as Japan and Switzerland, enjoy positive differential returns almost similar to those of the United States. The euro area instead does not enjoy a yield privilege similar to other issuers of international currencies. On a positive note, though, a negative yield differential on the net foreign assets of euro area member states has been virtually eliminated in the run-up to EMU accession. The excess returns stemming from the capital gains of the United States are instead not matched by any other major issuer of international currencies and only by a handful of countries.

The decomposition of excess returns shows that the exorbitant privilege of the United States is the result of an extraordinary return effect, i.e. the better performance of U.S. investment abroad compared to foreign investment in each of the main categories of the international investment position. Contrary to the finding of previous studies, the composition effect – i.e. the impact of a higher share of riskier investment in the foreign assets relative to liabilities – is negative. In different terms, the position of the United States as "levered investor" did not contribute to its exorbitant privilege, at least over the past two decades. The econometric analysis of excess returns also fails to find a robust positive relationship between leverage and excess returns in our panel of countries. There seem to be other more important determinants of excess returns, such as valuation effects, country risk, tax incentives and the currency share in foreign official exchange reserves. Countries experiencing large real exchange rate depreciations

may boost their excess returns on net foreign assets, with an impact that is proportional to the relative foreign currency exposure. Similarly, a decline in the stock market raises excess returns, with an impact that is proportional to the relative risk exposure on foreign liabilities. Rather surprisingly, countries with better risk ratings tend to have lower excess rates of capital gains and excess total returns, even though the impact of this variable on excess yield is positive. Higher statutory corporate tax rates may induce companies to shift income abroad and bring about higher excess returns on foreign assets and liabilities. Finally, countries having an international currency do indeed enjoy higher excess yield from the income balance and higher excess total returns.

A. Appendix

A.1 Data sources and definitions

The sample includes annual data between 1980 and 2007 (unless otherwise indicated) for 48 countries divided in two groups. Advanced economies (20 countries): Australia, Austria, Canada, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Japan, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom, United States. Emerging economies (29 countries): Argentina, Brazil, Chile, China (from 1981), Colombia, Croatia (from 1997), Czech Republic (from 1993), Hong Kong, Hungary (from 1982), India, Indonesia, Israel, Korea, Malaysia, Mexico, Peru, Philippines, Poland, Romania (from1990), Russia (from1993), Singapore, Slovak Republic (from 1993), Slovenia (from 1992), South Africa, Thailand, Turkey, Uruguay, Venezuela.

Table A.1 Data sources

Balance of payments	IMF Balance of Payments Statistics
International investment position (IIP)	IMF Balance of Payments Statistics and Lane and Milesi-Ferretti (2007) Mark II database
US dollar bilateral exchange rate	IMF Balance of Payments Statistics
Real effective exchange rate	IMF International Financial Statistics and Bloomberg
Finance weighted index	Own calculations based on Lane and Shambaugh (2007) database
Currency composition of IIP	Lane and Shambaugh (2007) database
Share prices	Datastream benchmarks and Global Financial Data stock market indices
Consumer price index	IMF International Financial Statistics and World Economic Outlook database
Composite risk rating	PRS Group, International Country Risk Guide*
Statutory corporate tax rates	Mintz, J. M. and A. J. Weichenrieder (2010)
Currency composition of FX reserves	IMF COFER database and IMF annual reports

* See below for details

The International Country Risk Guide (ICRG) rating of the PRS Group is an assessment of the country risk based on a set of 22 components grouped into three major categories (weight in parenthesis): political (50%), financial (25%), and economic (25%) risk. A separate index is created for each of the subcategories. Political risk is assessed on the basis of subjective ratings by analysts, whereas financial and economic risks are assessed on the basis of data. The index has been normalised between 0 (highest risk) and 1 (lowest risk) and is available on annual frequency between 1984 and 2007.

International Country Risk Guide Rating System

Political risk components	
Government Stability	12
Socioeconomic Conditions	12
Investment Profile	12
Internal Conflict	12
External Conflict	12
Corruption	6
Military in Politics	6
Religious Tensions	6
Law and Order	6
Ethnic Tensions	6
Democratic Accountability	6
Bureaucracy Quality	4
Total	**100**

Economic risk components	
GDP per head	5
Real GDP growth	10
Annual inflation rate	10
Budget balance (% of GDP)	10
Current account (% of GDP)	15
Total	**50**
Financial risk components	
Foreign debt (% of GDP)	10
Foreign debt service (% of XGS)	10
Current account (% of XGS)	15
Reserves incl. gold (months of imports)	5
Exchange rate stability (% change vs. USD)	10
Total	**50**

Table A.2 Excess real returns, yields and rates of capital gain on net foreign assets. 1981-2007 (percentage)

	Variable	N. obs.	Mean	St. Err.	Lower Q	Median	Upper Q	min	Max	Skewn.	Kurt.
Advanced economies											
United States	$r^A - r^L$	**27**	**3.35 *****	**0.86**	**0.12**	**3.89**	**6.85**	**-4.8**	**11.5**	**0.0**	**2.1**
	$i^A - i^L$	27	1.28 ***	0.08	0.98	1.33	1.67	0.4	2.1	-0.1	2.2
	$k^A - k^L$	27	2.07 **	0.82	-1.23	2.49	5.41	-5.5	9.8	0.1	2.0
United Kingdom	$r^A - r^L$	**27**	**0.16**	**0.45**	**-1.43**	**0.14**	**1.82**	**-5.1**	**4.9**	**-0.3**	**2.9**
	$i^A - i^L$	27	0.03	0.11	-0.48	0.06	0.54	-0.9	0.8	-0.1	1.7
	$k^A - k^L$	27	0.14	0.43	-1.87	0.49	1.97	-4.3	4.4	-0.1	2.3
Austria	$r^A - r^L$	**27**	**-0.21**	**1.02**	**-3.09**	**-0.93**	**2.74**	**-15.7**	**13.8**	**0.0**	**5.5**
	$i^A - i^L$	27	-0.37 ***	0.10	-0.84	-0.45	0.02	-1.2	0.8	0.4	2.4
	$k^A - k^L$	27	0.16	0.97	-2.53	-0.28	2.44	-14.4	13.9	0.1	5.6
Denmark	$r^A - r^L$	**27**	**0.62**	**0.77**	**-1.67**	**0.07**	**2.71**	**-6.3**	**9.8**	**0.5**	**3.2**
	$i^A - i^L$	27	-0.03	0.39	-1.49	-0.76	0.77	-2.2	6.0	1.4	4.4
	$k^A - k^L$	27	0.65	0.70	-2.37	-0.53	3.47	-5.6	9.8	0.5	2.8
France	$r^A - r^L$	**27**	**-0.77**	**0.78**	**-3.77**	**-1.48**	**2.84**	**-9.4**	**6.9**	**0.0**	**2.4**
	$i^A - i^L$	27	-0.02	0.08	-0.29	-0.14	0.32	-0.9	0.6	0.0	2.2
	$k^A - k^L$	27	-0.75	0.77	-3.73	-0.80	2.43	-10.1	6.4	-0.1	2.6
Germany	$r^A - r^L$	**27**	**-1.07 ****	**0.53**	**-3.17**	**-0.54**	**0.65**	**-7.9**	**3.7**	**-0.3**	**2.7**
	$i^A - i^L$	27	-0.26 **	0.10	-0.76	-0.38	0.07	-1.0	0.8	0.5	2.1
	$k^A - k^L$	27	-0.82	0.54	-3.24	-0.55	1.11	-8.5	3.8	-0.5	3.4
Italy	$r^A - r^L$	**27**	**-1.94 ****	**0.78**	**-4.09**	**-1.79**	**0.78**	**-11.0**	**5.9**	**-0.2**	**2.8**
	$i^A - i^L$	27	-2.23 ***	0.23	-3.17	-1.89	-1.15	-5.0	-0.7	-0.5	2.3
	$k^A - k^L$	27	0.28	0.68	-2.15	0.19	2.56	-6.8	7.6	0.0	2.7
Netherlands	$r^A - r^L$	**27**	**-2.39 ****	**1.15**	**-4.78**	**-3.09**	**-0.70**	**-18.3**	**17.6**	**0.8**	**7.2**
	$i^A - i^L$	27	-0.45 **	0.20	-1.17	-0.47	0.24	-2.5	1.8	0.0	2.4
	$k^A - k^L$	27	-1.94 *	1.08	-4.20	-3.02	-0.05	-18.3	15.8	0.4	7.2
Norway	$r^A - r^L$	**27**	**-0.86**	**1.04**	**-4.53**	**-1.43**	**1.88**	**-12.3**	**12.5**	**0.4**	**3.2**
	$i^A - i^L$	27	-1.40 ***	0.20	-1.98	-1.10	-0.67	-3.8	0.0	-0.8	2.7
	$k^A - k^L$	27	0.55	1.03	-3.99	1.56	3.22	-9.7	13.6	0.4	2.9
Sweden	$r^A - r^L$	**27**	**-1.49 ***	**0.84**	**-5.06**	**-0.92**	**2.00**	**-13.4**	**4.6**	**-0.6**	**3.2**
	$i^A - i^L$	27	-0.14	0.27	-0.68	0.13	0.83	-4.0	1.6	-1.3	4.2
	$k^A - k^L$	27	-1.35 *	0.74	-4.05	-1.07	2.32	-10.3	4.5	-0.3	2.4
Switzerland	$r^A - r^L$	**27**	**-1.32**	**1.23**	**-4.35**	**-1.43**	**2.04**	**-16.1**	**14.3**	**-0.1**	**4.2**
	$i^A - i^L$	27	1.17 ***	0.09	0.98	1.21	1.37	-0.2	2.0	-0.6	4.2
	$k^A - k^L$	27	-2.49 **	1.22	-5.63	-2.65	0.91	-17.2	12.4	-0.2	4.0
Canada	$r^A - r^L$	**27**	**-1.86 *****	**0.59**	**-4.23**	**-2.32**	**0.11**	**-6.9**	**5.3**	**0.6**	**2.9**
	$i^A - i^L$	27	-1.48 ***	0.16	-2.05	-1.45	-1.05	-3.1	0.9	0.6	4.1
	$k^A - k^L$	27	-0.38	0.52	-2.22	-0.81	1.15	-6.2	5.6	0.4	3.2
Japan	$r^A - r^L$	**27**	**-1.86**	**1.64**	**-5.30**	**-0.54**	**1.98**	**-22.0**	**15.7**	**-0.4**	**3.9**
	$i^A - i^L$	27	0.80 ***	0.16	0.23	0.67	1.57	-1.4	2.1	-0.4	3.0
	$k^A - k^L$	27	-2.66 *	1.60	-6.43	-1.65	1.59	-22.7	14.0	-0.6	4.0
Finland	$r^A - r^L$	**27**	**-6.91 ****	**3.44**	**-8.95**	**-4.77**	**0.82**	**-75.4**	**18.2**	**-2.4**	**9.9**
	$i^A - i^L$	27	-1.26 ***	0.45	-2.64	-1.17	0.47	-5.1	3.8	0.2	2.4
	$k^A - k^L$	27	-5.65	3.46	-7.18	-2.62	1.96	-77.6	15.5	-2.8	11.5
Greece	$r^A - r^L$	**27**	**1.20**	**2.20**	**-5.84**	**-1.80**	**6.95**	**-14.9**	**36.0**	**1.4**	**4.8**
	$i^A - i^L$	27	-2.15 ***	0.26	-3.27	-2.08	-0.88	-4.2	0.4	0.2	1.8
	$k^A - k^L$	27	3.35	2.26	-3.21	-0.04	9.00	-12.8	39.3	1.4	4.7
Ireland	$r^A - r^L$	**27**	**-3.85 *****	**1.48**	**-8.17**	**-2.57**	**0.62**	**-25.0**	**12.8**	**-0.5**	**4.2**
	$i^A - i^L$	27	-3.98 ***	0.38	-5.88	-3.36	-2.21	-7.5	-1.2	-0.3	1.6
	$k^A - k^L$	27	0.12	1.44	-3.56	-0.33	4.81	-21.8	18.1	-0.4	4.9
Portugal	$r^A - r^L$	**27**	**0.12**	**1.09**	**-2.59**	**-0.70**	**2.13**	**-15.2**	**12.4**	**0.2**	**4.3**
	$i^A - i^L$	27	-0.98 ***	0.37	-1.98	-0.58	0.01	-5.9	2.2	-0.9	3.8
	$k^A - k^L$	27	1.11	1.14	-1.84	-0.01	2.08	-9.3	16.1	1.3	4.4
Spain	$r^A - r^L$	**27**	**-1.81 *****	**0.63**	**-4.02**	**-2.12**	**0.34**	**-7.0**	**6.0**	**0.4**	**2.6**
	$i^A - i^L$	27	-1.06 ***	0.24	-2.04	-0.70	-0.22	-3.3	1.2	-0.4	2.1
	$k^A - k^L$	27	-0.75	0.69	-3.41	-0.92	0.88	-6.0	8.7	0.8	3.1
Australia	$r^A - r^L$	**27**	**1.34**	**1.28**	**-2.45**	**2.05**	**5.12**	**-19.6**	**14.1**	**-0.8**	**5.2**
	$i^A - i^L$	27	-1.26 ***	0.21	-1.87	-1.28	-0.72	-3.8	1.7	0.4	4.3
	$k^A - k^L$	27	2.60 **	1.21	-0.08	3.44	5.58	-19.2	14.9	-1.3	6.9
New Zealand	$r^A - r^L$	**27**	**1.32**	**3.09**	**-9.84**	**0.66**	**7.58**	**-31.9**	**46.6**	**0.7**	**4.1**
	$i^A - i^L$	27	-2.90 ***	0.73	-5.67	-3.06	-1.19	-9.6	5.9	0.6	3.3
	$k^A - k^L$	27	4.22	3.11	-5.71	3.14	10.23	-25.1	56.2	1.2	5.3
Emerging economies											
Turkey	$r^A - r^L$	**27**	**-3.15 ****	**1.44**	**-6.91**	**-2.83**	**1.84**	**-16.4**	**12.6**	**-0.2**	**2.5**
	$i^A - i^L$	27	-1.20 ***	0.36	-1.84	-0.25	0.03	-5.6	0.5	-1.3	3.3
	$k^A - k^L$	27	-1.95	1.48	-6.42	-0.90	2.99	-16.4	12.5	-0.2	2.3
South Africa	$r^A - r^L$	**27**	**-4.03 ****	**1.76**	**-10.94**	**-5.80**	**1.67**	**-16.3**	**15.9**	**0.6**	**2.6**
	$i^A - i^L$	27	-3.36 ***	0.28	-4.18	-3.20	-2.62	-7.4	-0.9	-0.8	4.0
	$k^A - k^L$	27	-0.67	1.66	-6.51	-2.14	3.66	-13.4	19.5	0.7	2.9
Israel	$r^A - r^L$	**27**	**-0.46**	**1.54**	**-5.17**	**0.02**	**4.56**	**-20.7**	**14.5**	**-0.2**	**3.1**
	$i^A - i^L$	27	-0.28	0.24	-1.09	-0.50	0.55	-2.5	2.4	0.3	2.5
	$k^A - k^L$	27	-0.18	1.49	-4.76	-0.10	4.98	-20.2	13.5	-0.4	3.2

Notes. Excess real total returns (r^A-r^L), yields (i^A-i^L) and rates of capital gain (k^A-k^L) are calculated according to equations (5) to (7) in the main text. ***, ** and * denote significance at 1% , 5% and 10% level, respectively.

Table A.2 (follows)

	Variable	N. obs.	Mean	St. Err.	Lower Q	Median	Upper Q	min	Max	Skewn.	Kurt.
Argentina	$r^A - r^L$	**27**	**-2.06**	**5.66**	**-7.91**	**-0.01**	**4.09**	**-88.0**	**59.1**	**-1.0**	**6.2**
	$i^A - i^L$	27	-4.27 ***	0.44	-4.56	-3.73	-2.91	-9.8	0.0	-0.9	3.6
	$k^A - k^L$	27	2.22	5.57	-3.81	1.80	9.00	-79.6	66.9	-0.6	5.9
Brazil	$r^A - r^L$	**27**	**2.01**	**3.83**	**-10.88**	**-2.67**	**9.94**	**-23.6**	**85.4**	**2.8**	**12.5**
	$i^A - i^L$	27	-3.08 ***	0.23	-3.83	-3.31	-1.91	-5.3	-0.8	0.0	2.4
	$k^A - k^L$	27	5.09	3.89	-6.95	1.13	13.32	-21.9	90.5	2.8	12.9
Chile	$r^A - r^L$	**27**	**1.00**	**1.96**	**-7.32**	**-0.31**	**5.96**	**-19.1**	**26.7**	**0.7**	**3.4**
	$i^A - i^L$	27	-4.74 ***	0.58	-5.37	-4.18	-2.82	-14.0	-0.9	-1.5	5.0
	$k^A - k^L$	27	5.74 ***	2.02	-0.45	4.35	8.81	-14.6	30.0	0.7	3.3
Colombia	$r^A - r^L$	**27**	**-5.31 *****	**1.53**	**-9.62**	**-7.56**	**-0.67**	**-20.0**	**11.5**	**0.6**	**3.0**
	$i^A - i^L$	27	-5.52 ***	0.50	-7.69	-6.04	-3.40	-9.7	0.2	0.4	2.6
	$k^A - k^L$	27	0.22	1.36	-3.12	-1.85	5.69	-17.3	13.5	0.2	3.2
Mexico	$r^A - r^L$	**27**	**-0.32**	**1.45**	**-4.48**	**-1.02**	**4.85**	**-14.3**	**19.1**	**0.5**	**3.3**
	$i^A - i^L$	27	-2.13 ***	0.36	-2.62	-1.77	-1.29	-10.2	-0.3	-3.1	13.8
	$k^A - k^L$	27	1.82	1.34	-3.25	0.58	6.45	-11.5	19.3	0.5	3.1
Peru	$r^A - r^L$	**27**	**-1.26**	**2.16**	**-4.35**	**-0.51**	**3.67**	**-30.3**	**24.1**	**-0.3**	**3.9**
	$i^A - i^L$	27	-3.36 ***	0.63	-4.35	-2.55	-0.91	-12.2	0.4	-1.4	4.6
	$k^A - k^L$	27	2.10	2.03	-0.64	1.79	4.61	-26.5	29.0	-0.1	4.8
Uruguay	$r^A - r^L$	**27**	**1.96**	**2.08**	**-2.54**	**-0.85**	**2.85**	**-8.7**	**49.3**	**3.2**	**14.9**
	$i^A - i^L$	27	-1.37 ***	0.33	-3.04	-1.21	0.20	-4.5	2.1	0.0	2.2
	$k^A - k^L$	27	3.33	2.03	-1.13	0.63	3.85	-7.5	50.3	3.5	16.0
Venezuela	$r^A - r^L$	**27**	**-3.58 ****	**1.52**	**-5.64**	**-2.78**	**-0.43**	**-35.1**	**9.6**	**-2.2**	**10.9**
	$i^A - i^L$	27	-2.46 ***	0.44	-3.50	-2.65	-1.57	-5.8	6.7	2.3	10.9
	$k^A - k^L$	27	-1.13	1.40	-1.75	0.14	1.78	-32.8	9.3	-3.0	14.5
Hong Kong	$r^A - r^L$	**27**	**-1.43**	**1.70**	**-5.02**	**-2.38**	**3.86**	**-20.5**	**15.4**	**-0.2**	**3.1**
	$i^A - i^L$	27	-0.53 ***	0.15	-1.21	0.00	0.00	-2.1	0.0	-1.0	2.3
	$k^A - k^L$	27	-0.90	1.67	-4.37	-1.51	3.89	-20.5	15.4	-0.2	3.1
India	$r^A - r^L$	**27**	**2.76**	**1.98**	**-1.46**	**3.34**	**5.63**	**-32.0**	**31.7**	**-0.7**	**8.1**
	$i^A - i^L$	27	0.91 *	0.50	-0.72	0.23	1.63	-2.1	9.1	1.7	5.9
	$k^A - k^L$	27	1.85	2.05	-2.03	2.65	5.60	-30.3	32.3	-0.3	6.4
Indonesia	$r^A - r^L$	**27**	**-3.67**	**2.37**	**-12.03**	**-5.01**	**7.25**	**-28.7**	**14.3**	**-0.5**	**2.2**
	$i^A - i^L$	27	-3.07 ***	0.39	-4.59	-3.63	-1.18	-7.3	0.4	0.0	2.1
	$k^A - k^L$	27	-0.59	2.37	-8.86	-1.23	8.43	-25.1	20.6	-0.4	2.3
Korea	$r^A - r^L$	**27**	**0.20**	**2.05**	**-6.01**	**0.23**	**6.17**	**-23.8**	**23.6**	**0.0**	**3.2**
	$i^A - i^L$	27	2.57 **	1.10	-0.63	0.67	2.19	-2.4	20.0	1.9	5.3
	$k^A - k^L$	27	-2.37	1.64	-9.12	-0.80	3.92	-23.9	13.8	-0.5	3.1
Malaysia	$r^A - r^L$	**27**	**-6.06 *****	**2.25**	**-15.93**	**-5.17**	**-1.53**	**-26.6**	**19.2**	**0.3**	**2.4**
	$i^A - i^L$	27	-3.51 ***	0.27	-4.65	-3.37	-2.32	-6.3	-1.4	-0.5	2.2
	$k^A - k^L$	27	-2.55	2.16	-12.90	-2.46	3.86	-21.9	21.5	0.3	2.3
Philippines	$r^A - r^L$	**27**	**0.44**	**1.74**	**-5.05**	**0.10**	**5.21**	**-18.6**	**19.8**	**0.4**	**3.1**
	$i^A - i^L$	27	-0.96 **	0.42	-2.45	-1.77	-0.29	-3.6	4.4	1.1	3.3
	$k^A - k^L$	27	1.40	1.67	-3.16	1.02	3.25	-18.1	21.6	0.4	3.5
Singapore	$r^A - r^L$	**27**	**-0.79**	**1.01**	**-5.04**	**-1.10**	**2.51**	**-9.5**	**13.2**	**0.0**	**3.2**
	$i^A - i^L$	27	-1.16 ***	0.35	-2.24	-1.16	-0.27	-5.5	3.0	-0.5	2.6
	$k^A - k^L$	27	0.37	0.76	-2.75	-0.08	2.41	-7.1	10.2	0.4	3.0
Thailand	$r^A - r^L$	**27**	**-3.85 ****	**1.57**	**-9.78**	**-3.35**	**1.38**	**-21.9**	**13.3**	**0.0**	**2.9**
	$i^A - i^L$	27	-1.61 ***	0.33	-2.50	-1.23	-0.60	-5.2	1.2	-0.7	2.8
	$k^A - k^L$	27	-2.24	1.47	-6.04	-0.61	2.52	-20.7	12.4	-0.4	2.9
Russia	$r^A - r^L$	**14**	**-12.15 *****	**3.77**	**-20.75**	**-13.79**	**1.85**	**-42.2**	**7.8**	**-0.4**	**2.5**
	$i^A - i^L$	14	-3.32 ***	0.56	-3.78	-3.06	-2.41	-9.0	-0.1	-1.2	5.1
	$k^A - k^L$	14	-8.83 ***	3.40	-17.40	-10.87	1.99	-33.2	12.7	0.0	2.2
China	$r^A - r^L$	**26**	**-5.62 ****	**2.73**	**-11.88**	**-2.91**	**0.66**	**-40.2**	**34.8**	**0.1**	**5.2**
	$i^A - i^L$	26	-0.73 *	0.43	-2.58	-0.61	0.50	-3.9	3.5	0.3	2.2
	$k^A - k^L$	26	-4.89 *	2.63	-13.16	-2.39	1.59	-39.6	31.3	-0.2	4.7
Czech Republic	$r^A - r^L$	**14**	**-2.90 ***	**1.52**	**-7.53**	**-0.70**	**0.02**	**-13.7**	**5.0**	**-0.7**	**2.3**
	$i^A - i^L$	14	-3.11 ***	0.39	-4.44	-2.84	-1.63	-5.6	-1.3	-0.2	1.6
	$k^A - k^L$	14	0.20	1.19	-2.57	1.15	2.92	-8.1	6.3	-0.7	2.5
Slovak Republic	$r^A - r^L$	**14**	**-5.69 *****	**2.13**	**-11.61**	**-4.77**	**0.20**	**-19.7**	**6.7**	**-0.3**	**2.2**
	$i^A - i^L$	14	-2.71 ***	0.52	-4.40	-1.70	-1.43	-6.8	-1.0	-1.1	2.6
	$k^A - k^L$	14	-2.98	2.01	-6.39	-2.92	4.16	-18.4	8.3	-0.4	2.6
Hungary	$r^A - r^L$	**25**	**-1.38**	**2.16**	**-8.14**	**-2.50**	**0.97**	**-15.3**	**39.0**	**2.1**	**8.9**
	$i^A - i^L$	25	-1.07 ***	0.32	-2.43	-1.05	-0.04	-3.5	2.6	0.6	2.6
	$k^A - k^L$	25	-0.32	1.94	-6.16	-1.09	1.49	-14.2	36.4	2.2	9.3
Croatia	$r^A - r^L$	**10**	**-3.36**	**4.51**	**-13.26**	**-9.32**	**5.36**	**-20.4**	**21.8**	**0.6**	**2.1**
	$i^A - i^L$	10	-2.86 ***	0.47	-3.74	-2.63	-2.18	-5.9	-0.8	-0.5	2.9
	$k^A - k^L$	10	-0.51	4.57	-11.08	-6.52	8.17	-17.9	25.4	0.7	2.2
Slovenia	$r^A - r^L$	**15**	**-2.31**	**2.14**	**-6.98**	**-1.70**	**-0.01**	**-16.9**	**21.0**	**1.1**	**5.7**
	$i^A - i^L$	15	-1.32 ***	0.17	-1.94	-1.23	-0.77	-2.3	-0.2	-0.1	1.9
	$k^A - k^L$	15	-0.99	2.09	-5.72	-0.47	1.93	-15.9	21.5	1.0	5.5
Poland	$r^A - r^L$	**27**	**-1.50**	**1.74**	**-6.42**	**-1.36**	**4.65**	**-19.1**	**20.8**	**0.1**	**3.1**
	$i^A - i^L$	27	-2.04 ***	0.43	-3.89	-2.84	0.08	-5.4	1.6	0.3	1.7
	$k^A - k^L$	27	0.54	1.57	-4.66	0.04	6.28	-14.5	23.7	0.6	3.8
Romania	$r^A - r^L$	**17**	**-4.33 ****	**1.80**	**-7.84**	**-3.42**	**0.29**	**-22.2**	**9.2**	**-0.5**	**3.5**
	$i^A - i^L$	17	-2.92 ***	0.55	-3.45	-2.13	-1.43	-8.1	-0.4	-1.0	2.8
	$k^A - k^L$	17	-1.41	1.58	-3.10	-0.27	1.54	-18.8	10.7	-0.8	4.5

Table A.3 Decomposition of excess returns on net foreign assets: return versus composition effect. Annual averages (percentage)

United Kingdom	1986-2007			1996-2007			2000-2007		
	$r^A - r^L$	$i^A - i^L$	$k^A - k^L$	$r^A - r^L$	$i^A - i^L$	$k^A - k^L$	$r^A - r^L$	$i^A - i^L$	$k^A - k^L$
Excess return	**0.2**	**0.2**	**0.0**	**0.3**	**0.6**	**-0.2**	**1.2**	**0.7**	**0.5**
Return effect	**-0.3**	**0.0**	**-0.2**	**-0.1**	**0.1**	**-0.3**	**0.6**	**0.2**	**0.4**
- FDI	0.3	0.4	-0.1	0.4	0.3	0.1	0.4	0.3	0.1
- Equity	-0.5	-0.1	-0.3	-0.5	-0.1	-0.4	0.2	0.0	0.2
- Debt	0.2	-0.1	0.2	0.0	0.0	0.0	0.1	0.0	0.1
- Other	-0.2	-0.1	-0.1	0.0	-0.1	0.1	0.0	-0.1	0.1
Composition effect	**0.4**	**0.2**	**0.2**	**0.4**	**0.4**	**0.0**	**0.6**	**0.5**	**0.1**
- FDI	0.2	0.3	-0.2	0.2	0.4	-0.4	0.3	0.5	-0.4
- Equity	0.3	0.0	0.2	0.1	0.0	0.1	0.2	0.0	0.3
- Debt	0.1	0.0	0.1	0.1	0.1	0.0	0.1	0.0	0.0
- Other	-0.1	-0.1	0.2	0.0	-0.1	0.3	0.0	0.0	0.2

Switzerland	1986-2007			1996-2007			2000-2007		
	$r^A - r^L$	$i^A - i^L$	$k^A - k^L$	$r^A - r^L$	$i^A - i^L$	$k^A - k^L$	$r^A - r^L$	$i^A - i^L$	$k^A - k^L$
Excess return	**-0.5**	**1.2**	**-1.6**	**-1.2**	**1.0**	**-2.2**	**-1.5**	**0.9**	**-2.4**
Return effect	**0.0**	**0.6**	**-0.6**	**-0.8**	**0.3**	**-1.1**	**-2.2**	**0.1**	**-2.3**
- FDI	0.0	0.2	-0.3	-0.2	0.2	-0.3	-0.4	0.1	-0.5
- Equity	-0.3	0.0	-0.3	-0.7	0.1	-0.7	-1.4	0.1	-1.5
- Debt	-0.1	0.1	-0.2	-0.4	0.0	-0.4	-0.7	-0.1	-0.6
- Other	0.4	0.3	0.1	0.4	0.0	0.4	0.3	-0.1	0.4
Composition effect	**-0.6**	**0.4**	**-1.0**	**-0.3**	**0.8**	**-1.1**	**0.7**	**0.8**	**-0.1**
- FDI	0.4	0.3	0.1	0.8	0.6	0.1	0.9	0.7	0.1
- Equity	-1.2	0.0	-1.0	-1.8	-0.2	-1.5	-0.7	-0.2	-0.4
- Debt	0.3	0.2	-0.3	0.9	0.5	0.2	0.6	0.5	0.0
- Other	-0.2	-0.2	0.1	-0.2	-0.2	0.0	-0.1	-0.1	0.1

Canada	1986-2007			1996-2007			2000-2007		
	$r^A - r^L$	$i^A - i^L$	$k^A - k^L$	$r^A - r^L$	$i^A - i^L$	$k^A - k^L$	$r^A - r^L$	$i^A - i^L$	$k^A - k^L$
Excess return	**-1.7**	**-1.6**	**-0.2**	**-2.1**	**-1.5**	**-0.5**	**-3.3**	**-1.6**	**-1.7**
Return effect	**-0.8**	**-1.3**	**0.5**	**-1.4**	**-1.4**	**0.0**	**-1.9**	**-1.4**	**-0.4**
- FDI	-0.2	-0.7	0.5	-0.5	-1.0	0.5	-0.7	-1.1	0.4
- Equity	0.1	0.0	0.1	0.2	-0.1	0.2	-0.3	-0.1	-0.2
- Debt	-0.5	-0.5	0.0	-0.6	-0.2	-0.4	0.0	-0.1	0.1
- Other	-0.3	-0.1	-0.2	-0.4	-0.2	-0.3	-0.8	-0.1	-0.7
Composition effect	**-0.9**	**-0.3**	**-0.6**	**-0.7**	**-0.1**	**-0.6**	**-1.4**	**-0.1**	**-1.3**
- FDI	0.3	0.5	-0.5	0.2	0.6	-0.7	-0.1	0.5	-0.9
- Equity	-0.3	0.2	-0.7	-0.5	0.3	-1.0	-0.9	0.3	-1.5
- Debt	-1.4	-1.5	1.0	-0.6	-1.3	1.4	-0.4	-1.0	1.4
- Other	0.5	0.5	-0.4	0.3	0.3	-0.2	0.0	0.1	-0.2

Australia	1989-2007			1996-2007			2000-2007		
	$r^A - r^L$	$i^A - i^L$	$k^A - k^L$	$r^A - r^L$	$i^A - i^L$	$k^A - k^L$	$r^A - r^L$	$i^A - i^L$	$k^A - k^L$
Excess return	**1.0**	**-1.6**	**2.7**	**2.1**	**-1.2**	**3.3**	**0.4**	**-1.2**	**1.6**
Return effect	**3.6**	**1.1**	**2.5**	**1.9**	**-0.7**	**2.6**	**-0.5**	**-0.8**	**0.3**
- FDI	0.9	-0.8	1.7	1.3	-0.9	2.2	0.5	-1.0	1.5
- Equity	-0.6	-0.3	-0.4	-0.8	-0.3	-0.6	-1.8	-0.3	-1.5
- Debt	3.4	2.7	0.7	1.2	0.7	0.5	0.6	0.6	0.0
- Other	0.0	-0.5	0.5	0.3	-0.2	0.5	0.2	-0.2	0.3
Composition effect	**-2.6**	**-2.7**	**0.1**	**0.1**	**-0.6**	**0.7**	**0.9**	**-0.4**	**1.3**
- FDI	0.8	0.4	0.1	1.2	0.6	0.2	0.9	0.5	0.0
- Equity	0.5	0.0	0.3	0.4	0.0	0.3	0.3	0.0	0.2
- Debt	-3.9	-3.1	0.1	-1.4	-1.2	0.5	-0.3	-0.8	1.4
- Other	0.0	0.0	-0.4	0.0	0.0	-0.2	-0.1	-0.1	-0.3

Notes. Excess total returns (r^A-r^L), yields (i^A-i^L) and rates of capital gain (k^A-k^L) are decomposed according to eq. (9):

$$r^A - r^L = \frac{\sum_j (\alpha_j + \lambda_j)}{2}\left(r_j^A - r_j^L\right) + \sum_j (\alpha_j - \lambda_j)\frac{\left(r_j^A + r_j^L\right)}{2}$$

where α_j and λ_j are the weights of each asset class, j, in total assets and liabilities. The first term on the right-hand-side of (9) is the *return effect*, i.e. the weighted impact of excess returns within each asset class, and the second term is the *composition effect*, i.e. the excess return deriving from being long or short in each asset class in relative terms.

Table A.4 Advanced economies versus emerging market economies. Excess real returns, yields and rates of capital gain. Fixed-effects panel estimations

	Advanced economies					Emerging market economies			
Panel A. Dependent variable: excess real total return (r^A - r^L)									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
lambda	0.107*	0.097	0.100	0.099	0.105*	0.120**	0.121**	0.123***	0.126***
	(0.059)	(0.059)	(0.059)	(0.059)	(0.058)	(0.044)	(0.046)	(0.044)	(0.045)
*DRER*FC*	-0.627**	-0.603**	-0.630**	-0.637***	-0.568**	-0.415	-0.371	-0.393	-0.385
	(0.221)	(0.218)	(0.221)	(0.220)	(0.214)	(0.259)	(0.261)	(0.263)	(0.259)
*RSP*FE*	-0.251**	-0.239*	-0.242**	-0.246**	-0.236*	-0.163***	-0.155***	-0.141***	-0.140***
	(0.117)	(0.117)	(0.114)	(0.112)	(0.119)	(0.047)	(0.047)	(0.047)	(0.047)
LEV (-1)	-0.085				-0.110*	0.012			-0.041
	(0.054)				(0.056)	(0.032)			(0.036)
RiskR		-0.132			-0.221***		-0.100***		-0.064
		(0.096)			(0.066)		(0.036)		(0.051)
TAX			0.033		0.016			0.183**	0.184**
			(0.030)		(0.039)			(0.070)	(0.078)
FXR				-0.010	0.046				
				(0.051)	(0.047)				
R^2 Total	0.103	0.125	0.117	0.111	0.111	0.093	0.095	0.091	0.089
Panel B. Dependent variable: excess real yield (i^A - i^L)									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
lambda	0.637***	0.627***	0.641***	0.625***	0.572***	0.695***	0.694***	0.689***	0.689***
	(0.056)	(0.056)	(0.065)	(0.058)	(0.036)	(0.064)	(0.063)	(0.064)	(0.065)
*DRER*FC*	0.036*	0.021	0.030	0.030	0.024	0.035	0.037	0.040	0.035
	(0.020)	(0.023)	(0.024)	(0.024)	(0.020)	(0.036)	(0.035)	(0.035)	(0.037)
*RSP*FE*	0.008	0.007	0.008	0.011	0.006	-0.013*	-0.013*	-0.012	-0.013*
	(0.010)	(0.012)	(0.011)	(0.011)	(0.009)	(0.007)	(0.007)	(0.007)	(0.007)
LEV (-1)	-0.022**				-0.028***	-0.004			-0.006
	(0.008)				(0.006)	(0.007)			(0.007)
RiskR		0.045***			0.016		0.001		0.004
		(0.012)			(0.014)		(0.007)		(0.009)
TAX			-0.016**		-0.015*			0.010	0.016
			(0.008)		(0.008)			(0.011)	(0.013)
FXR				0.021***	0.020***				
				(0.007)	(0.006)				
R^2 Total	0.669	0.691	0.676	0.683	0.628	0.708	0.709	0.707	0.707
Panel C. Dependent variable: excess real rate of capital gain (kg^A - kg^L)									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
lambda	0.110*	0.090	0.101	0.097	0.095	0.100**	0.101**	0.106**	0.109**
	(0.063)	(0.061)	(0.061)	(0.058)	(0.060)	(0.043)	(0.044)	(0.041)	(0.043)
*DRER*FC*	-0.656***	-0.601**	-0.648***	-0.657***	-0.577**	-0.442	-0.401	-0.430	-0.415
	(0.219)	(0.219)	(0.225)	(0.219)	(0.218)	(0.275)	(0.274)	(0.278)	(0.274)
*RSP*FE*	-0.259*	-0.245*	-0.250*	-0.262**	-0.243*	-0.137***	-0.129***	-0.119***	-0.117***
	(0.126)	(0.129)	(0.123)	(0.121)	(0.127)	(0.042)	(0.042)	(0.043)	(0.042)
LEV (-1)	-0.045				-0.064	0.012			-0.033
	(0.050)				(0.054)	(0.032)			(0.040)
RiskR		-0.254***			-0.276***		-0.093**		-0.069
		(0.089)			(0.071)		(0.041)		(0.055)
TAX			0.072**		0.043			0.140**	0.132
			(0.034)		(0.041)			(0.067)	(0.078)
FXR				-0.064	0.004				
				(0.045)	(0.042)				
R^2 Total	0.120	0.152	0.115	0.103	0.145	0.077	0.085	0.072	0.076
N. obs.	520	520	520	520	520	596	596	570	570
Countries	20	20	20	20	20	28	28	27	27

Notes. The table shows the results of the estimation of equations (13) in the main text, with OLS fixed-effects regression. Robust standard errors, allowing for clustering of residuals by country, are reported in parentheses. ***, ** and * indicate significance at the 1%, 5% and 10% level, respectively. See Table 3 in the main text for definition of variables. The variable *TAX* is not available for one country, Israel. The variable *FXR* has been excluded from the regressions for emerging market economies, since there is only one non-zero observation of this variable in this group (Slovenia which adopted the euro in 2007).

Table A.5. Excess real returns, yields and rates of capital gain. Fixed effects panel estimations using the Finance Weighted Index of currency exposure

Dependent variable	$r^A - r^L$					$i^A - i^L$					$k^A - k^L$				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
lambda	0.125***	0.123***	0.127***	0.124***	0.131***	0.686***	0.686***	0.686***	0.680***	0.678***	0.114***	0.112***	0.117***	0.113***	0.119***
	(0.041)	(0.042)	(0.040)	(0.041)	(0.042)	(0.051)	(0.051)	(0.051)	(0.052)	(0.052)	(0.041)	(0.041)	(0.040)	(0.040)	(0.041)
DFWI	-0.368***	-0.337***	-0.356***	-0.367***	-0.336***	0.047	0.047*	0.049*	0.047*	0.047	-0.402***	-0.369***	-0.392***	-0.398***	-0.367***
	(0.094)	(0.095)	(0.098)	(0.095)	(0.096)	(0.028)	(0.028)	(0.028)	(0.028)	(0.029)	(0.097)	(0.097)	(0.099)	(0.098)	(0.097)
*RSP*FE*	-0.179***	-0.168***	-0.164***	-0.177***	-0.159***	-0.009	-0.008	-0.008	-0.008	-0.009	-0.160***	-0.150***	-0.146***	-0.161***	-0.143***
	(0.048)	(0.047)	(0.047)	(0.047)	(0.047)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.049)	(0.050)	(0.048)	(0.049)	(0.049)
LEV(-1)	-0.013				-0.044	-0.009*				-0.010*	-0.002				-0.030
	(0.030)				(0.032)	(0.005)				(0.005)	(0.029)				(0.031)
RiskR		-0.100**			-0.107**		0.004			-0.002		-0.111**			-0.107**
		(0.038)			(0.043)		(0.007)			(0.008)		(0.043)			(0.047)
TAX			0.095**		0.092**			-0.004		0.002			0.098**		0.079**
			(0.037)		(0.039)			(0.006)		(0.007)			(0.037)		(0.039)
FXR				0.004	0.060				0.015**	0.018***				-0.046	0.004
				(0.049)	(0.050)				(0.007)	(0.006)				(0.045)	(0.048)
R^2 Within	0.078	0.082	0.084	0.078	0.088	0.533	0.531	0.532	0.532	0.536	0.073	0.078	0.079	0.074	0.082
R^2 Between	0.667	0.220	0.423	0.688	0.164	0.961	0.988	0.985	0.979	0.951	0.579	0.326	0.222	0.410	0.227
R^2 Total	0.096	0.088	0.102	0.099	0.088	0.709	0.723	0.719	0.722	0.711	0.090	0.096	0.085	0.087	0.092
N. obs.	1,120	1,120	1,094	1,120	1,094	1,120	1,120	1,094	1,120	1,094	1,120	1,120	1,094	1,120	1,094
Countries	48	48	47	48	47	48	48	47	48	47	48	48	47	48	47

Notes. The table shows the results of the estimation of equation (13) in the main text with OLS fixed-effects regression. Robust standard errors, allowing for clustering of residuals by country, are reported in parentheses. ***, ** and * indicate significance at the 1%, 5% and 10% level, respectively. *DFWI* is the net change in the (log) real Finance Weighted Index (see equation (14) in the main text). See Table 3 in the main text for definition of other variables. The variable *TAX* is not available for one country, Israel.

References

Bernanke, B. (2005), "The Global Saving Glut and the U.S. Current Account Deficit", Remarks at the Sandridge Lecture, Virginia Association of Economics, Richmond, Virginia, March 10.

Bracke, T. and M. Schmitz (2008), "Channels of International Risk-Sharing: Capital Gains versus Income Flows", ECB Working Paper 938, European Central Bank, September.

Bosworth B., S. M. Collins and G. Chodorow-Reich (2007), "Returns on FDI: Does the U.S. Really Do Better?", NBER Working Paper 13313, National Bureau of Economic Research, August.

Caballero, R. J., E. Farhi and P. Gourinchas (2008), "An Equilibrium Model of 'Global Imbalances' and Low Interest Rates", *American Economic Review* 98 (1), 358–393.

Caballero, R. J. and A. Krishnamurthy (2009), "Global Imbalances and Financial Fragility", *American Economic Review Papers & Proceedings* 99 (2), 584–588.

Codogno, L., C. Favero and A. Missale (2003), "Yield spreads on EMU government bonds", *Economic Policy* 18 (37), 503-532, October.

Curcuru, S., T. Dvorak and F.E. Warnock (2008), "Cross-Border Returns Differentials", *Quarterly Journal of Economics* 123, 1495-1530, November.

ECB (2006), "Financial Stability Review", European Central Bank, June.

Glick, R. and K. Rogoff (1995), "Global versus Country-specific Productivity Shocks and the Current Account", Journal of Monetary Economics, 35 (1), 159-192, February.

Gros, D. (2006b), "Foreign Investment in the U.S. (II): Being taken to the cleaners?", CEPS Working Document 243, Centre for European Policy Studies, April.

Gourinchas, P. and H. Rey (2005), "From World Banker to World Venture Capitalist: U.S. External Adjustment and the Exorbitant Privilege", NBER Working Paper 11563, National Bureau of Economic Research, August.

Hausmann, R. and F. Sturzenegger (2006), "Global Imbalances or Bad Accounting? The Missing Dark Matter in the Wealth of Nations", Center for International Development Working Paper 124, Harvard University, September.

Higgins, M. T. Klitgaard and C. Tille (2005), "The Income Implications of Rising U.S. International Liabilities", *Current Issues in Economics and Finance* 11 (12), Federal Reserve Bank of New York, December.

Hung, J. H. and A. Mascaro (2004), "Return on Cross-Border Investment: Why Does U.S. Investment Abroad Do Better?", CBO Technical Paper Series 17, U.S. Congressional Budget Office, December.

Lane, P.R. and G. Milesi-Ferretti (2002), "External Wealth, the Trade Balance and the Real Exchange Rate", *European Economic Review* 46, 1049-1071.

Lane, P.R. and G. Milesi-Ferretti (2003), "International Financial Integration", *IMF Staff Papers* 50, Special Issue, 82-113, International Monetary Fund.

Lane, P.R. and G. Milesi-Ferretti (2005a), "Financial Globalization and Exchange Rates", IMF Working Paper 05/03, International Monetary Fund, January.

Lane, P.R. and G. Milesi-Ferretti (2005b), "A Global Perspective on External Positions", IMF Working Paper 05/161, International Monetary Fund, August.

Lane, P.R. and G. Milesi-Ferretti (2007), "The External Wealth of Nations Mark II: Revised and Extended Estimates of Foreign Assets and Liabilities, 1970-2004", *Journal of International Economics* 73, 223-250.

Lane, P.R. and G. Milesi-Ferretti (2008), "Where Did All the Borrowing Go? A Forensic Analysis of the U.S. External Position", IMF Working Paper 08/28, International Monetary Fund, February.

Lane, P.R. and J.C. Shambaugh (2007), "Financial Exchange Rates and International Currency Exposures", NBER Working Paper 13433, National Bureau of Economic Research, September.

Mataloni, R. J. (2000), "An examination of the Low Rates of Return of Foreign-Owned U.S. Companies", *Survey of Current Business*, U.S. Bureau of Economic Analysis, March.

Meissner, C. M. and A. Taylor (2006), "Losing our Marbles in the New Century? The Great Rebalancing in Historical Perspective", NBER Working Paper 12580, National Bureau of Economic Research, October.

Mintz, J. M. and A. J. Weichenrieder (2010), "The Indirect Side of Direct Investment. Multinational Company Finance and Taxation", MIT press.

Nickell, S. (1981), "Biases in Dynamic Models with Fixed Effects", *Econometrica* 49, 1417-1426.

Pesaran, M.H., Y. Shin and R.P. Smith (1999), "Pooled Mean Group Estimation of Dynamic Heterogeneous Panels", *Journal of the American Statistical Association*, 94 (446), 621-634, June.

Pesaran, M.H. and R.P. Smith (1995), "Estimating Long-run Relationships from Dynamic Heterogeneous Panels", *Journal of Econometrics*, 68, 79-113.

Portes R. and E. Papaioannou (2008), "Costs and Benefits of Running an International Currency", European Economy, Economic Papers 348, European Commission, November.

Triffin, R. (1960), "Gold and the Dollar Crisis: the Future of Convertibility", New Haven, Connecticut, Yale University Press.