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THE EXORBITANT PRIVILEGE FROM A GLOBAL PERSPECTIVE

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Abstract

This paper studies net foreign assets and the differential returns between gross foreign assets and liabilities for a sample of 49 countries between 1981 and 2007. It shows that investment income is more important than capital gains in imparting a drift to net foreign assets over the long-run, whereas the latter dominate short-term dynamics. 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, real exchange rate depreciations increase excess returns through capital gains, proportionally to the relative foreign currency exposure. Excess yields on investment income are positively associated with the country risk rating.

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

JEL classification: F30, F31, F36

Non-technical summary

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. In turn, large gross foreign positions magnify the impact of small differences in returns on the net external position. The second development is the accumulation and sustainability of large external deficits by the United States. Economists noted that U.S. residents pay relatively low returns on their liabilities to foreigners, while earning relatively high returns on their foreign assets. This positive "excess return" on net foreign assets, known in the literature as the "exorbitant privilege" of issuing an international currency, facilitates the sustainability of large negative external positions. This is usually viewed as a consequence of the central position of the United States in the international monetary system and, in particular, its role as the main financial centre of the world, issuing safe low-yield liabilities to finance risky investment abroad, transforming savings from the rest of the world in risky capital.

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 49 countries over the period between 1981 and 2007. In particular, the paper systematically documents the contribution of investment income and capital gains to the evolution of net foreign positions from two different perspectives: the cumulated impact over time and the differential returns between assets and liabilities. In addition, it studies the role of potential determinants of excess total returns and its components, yields and rates of capital gain. In particular, the effect of exchange rate changes on excess returns is carefully investigated, using the new estimates of foreign currency exposure of Lane and Shambaugh (2007) and creating a finance-weighted exchange rate index to properly gauge valuation effects.

There are a number of potentially interesting findings emerging from this analysis. First, the paper shows that the investment income is more important than capital gains in imparting a drift to net foreign assets over the long term, whereas capital gains transmit their short-term volatility to total returns.

Second, 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.

Third, 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.

Finally, 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. Notably, countries experiencing large real exchange rate depreciations may hope to boost their excess returns on net foreign assets, with an impact that is proportional to the relative foreign currency exposure. This effect is channelled through capital gains, not through investment income. Excess yields on investment income are instead positively affected by improvements in the country risk profile.

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 49 countries over the period between 1981 and 2007. The main contribution to the existing literature is twofold. First, the paper systematically documents the contribution of investment income and capital gains to the evolution of net foreign positions from two different perspectives: the

[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.

cumulated impact over time and the differential returns between assets and liabilities. Second, it studies the role of potential determinants of excess total returns and its components, yields and rates of capital gain. In particular, the effect of exchange rate changes on excess returns is carefully investigated, using the new estimates of foreign currency exposure of Lane and Shambaugh (2007) and creating a finance-weighted exchange rate index to properly gauge valuation effects. In addition, the empirical analysis controls for the impact of other explanatory variables, such as leverage, testing the hypothesis of Gourinchas and Rey (2005) across several countries, and country risk.

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, I clarify and quantify the contribution of investment income vis-à-vis capital gains to the dynamic of net foreign assets over the long-run (section 4). Next, a thorough analysis of excess returns across the countries in our sample is presented (section 5). 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. 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 6). Finally, the possible determinants of excess total returns, yields and rates of capital gain on net foreign assets – such as real exchange rates, leverage and country risk – are tested in an econometric panel analysis (section 7). 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. Finally, only Meissner and Taylor (2006) devote 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.

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 49 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 29 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.

[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.

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 BoP), 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:

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

Another way to look at equation (2) is to solve it backward for past values of B_t.

$$B_t \equiv \sum_{i=0}^{t} BGS_i + \sum_{i=0}^{t} UT_i + \sum_{i=0}^{t} IIB_i + \sum_{i=0}^{t} KG_i + \sum_{i=0}^{t} (KA_i + EO_i) \tag{3}$$

The net international investment position in each period is equal to the cumulated sum of the current account balance – or its subcomponents – cumulated capital gains and cumulated errors and omissions.

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

$$b_t - b_{t-1} \equiv bgs_t + ut_t + iib_t + kg_t - \frac{\gamma_t}{1+\gamma_t} b_{t-1} + z_t \tag{4}$$

[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.

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 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 (4), 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:

$$\bar{i}_t^A = \frac{II_t^A}{A_{t-1}} \text{ and } \bar{i}_t^L = \frac{II_t^L}{L_{t-1}} \quad \text{(yield)} \quad (5a)$$

$$\bar{k}_t^A = \frac{KG_t^A}{A_{t-1}} \text{ and } \bar{k}_t^L = \frac{KG_t^L}{L_{t-1}} \quad \text{(rate of capital gain)} \quad (5b)$$

$$\bar{r}_t^A = \frac{II_t^A + KG_t^A}{A_{t-1}} \text{ and } \bar{r}_t^L = \frac{II_t^L + KG_t^L}{L_{t-1}} \quad \text{(total return)} \quad (5c)$$

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:

$$i_t^J = \frac{1+\bar{i}_t^J}{1+\pi_t} - 1 \quad \text{(real yield)} \quad (6a)$$

$$k_t^J = \frac{1+\bar{k}_t^J}{1+\pi_t} - 1 \quad \text{(real rate of capital gain)} \quad (6b)$$

$$r_t^J = \frac{1+\bar{i}_t^J + \bar{k}_t^J}{1+\pi_t} - 1 = i_t^J + k_t^J + \frac{\pi_t}{1+\pi_t} \quad \text{(real total return)} \quad (6c)$$

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:

$$\frac{\overline{r}_t^A - \overline{r}_t^L}{1+\pi} \quad = \quad r_t^A - r_t^L \quad = \quad (i_t^A - i_t^L) \quad + \quad (k_t^A - k_t^L) \tag{7}$$

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 (4) 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:

$$iib_t + kg_t \quad = \quad \frac{r_t^d b_{t-1}}{1+\gamma_t} \quad = \frac{r_t^{A,d} a_{t-1} - r_t^{L,d} l_{t-1}}{1+\gamma_t} \tag{8}$$

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 (8) in equation (4), it is possible to obtain the following:

$$b_t - b_{t-1} \equiv bgst_t + \frac{r_t^{A,d} - r_t^{L,d}}{1+\gamma_t} a_{t-1} + \frac{r_t^{L,d} - \gamma_t}{1+\gamma_t} b_{t-1} + z_t \tag{9a}$$

or, alternatively, using (6c) to deflate nominal returns:

$$b_t - b_{t-1} \equiv bgst_t + \frac{r_t^{A} - r_t^{L}}{1+g_t} a_{t-1} + \frac{r_t^{L} - g_t}{1+g_t} b_{t-1} + z_t \tag{9b}$$

where g_t denotes the real GDP growth rate. Equations (9a) and (9b) highlights 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

[5] In the current presentation, equations (9a) and (9b) 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.

Statistics (IFS). Nominal rates are deflated with the Consumer Price Index inflation to calculate real returns.

4. Net foreign assets, investment income and valuation effects

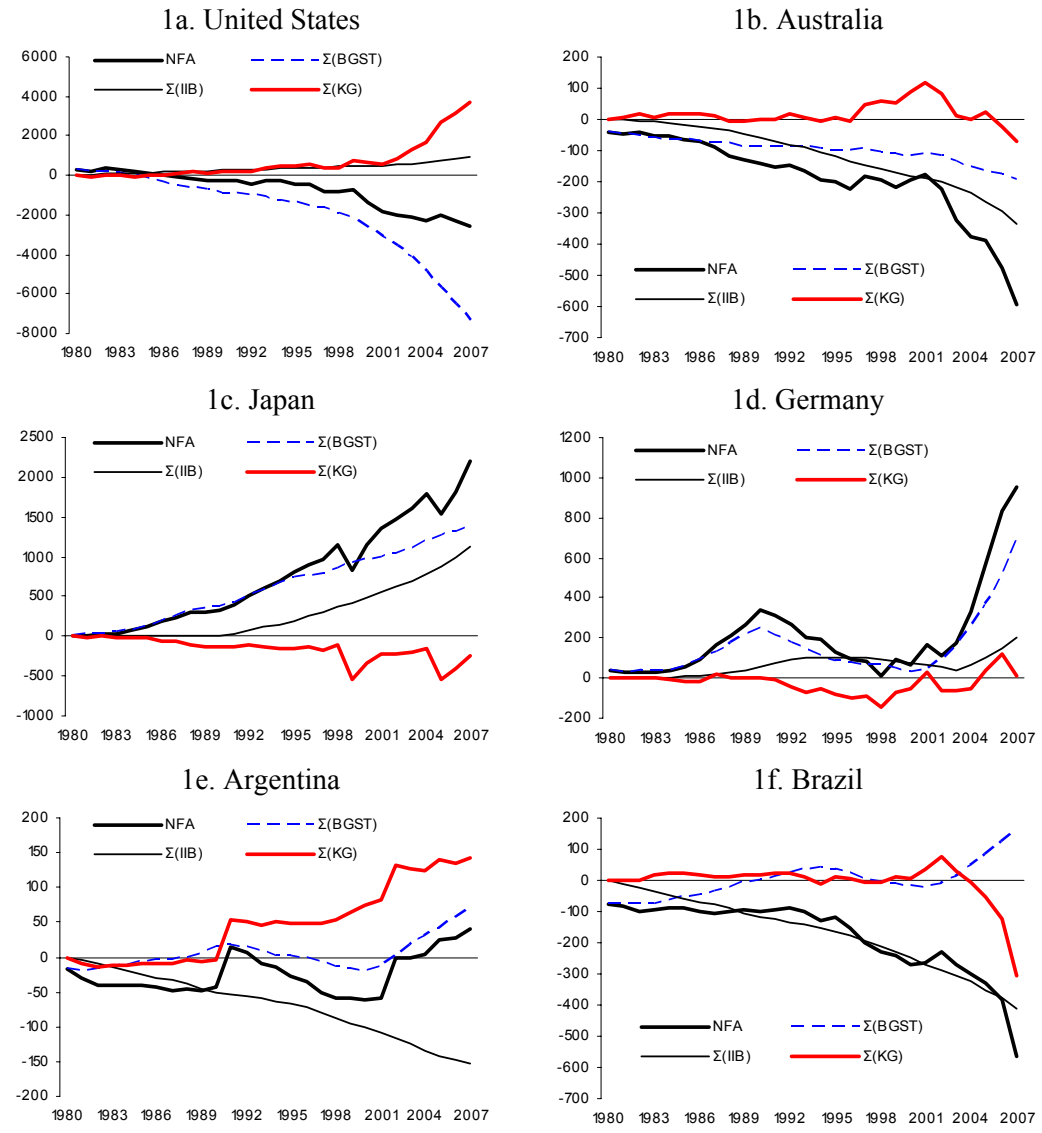
The recent literature on the dynamics of net foreign assets emphasises the impact of valuation effects for the sustainability of external positions. These valuation effects are generated by swings in the market value of domestic and foreign investment (asset price channel) and changes in the exchange rate at which the foreign currency component of foreign assets and liabilities are valued (exchange rate channel). As regards the asset-price channel, the over performance of the domestic equity or bond market vis-à-vis the foreign markets in which residents have allocated their foreign portfolio produces a deterioration of the net foreign position. The impact of the exchange rate channel depends instead on the "net" foreign currency external position. For countries that have a long external position in foreign currency – i.e. more foreign currency assets than foreign currency liabilities – a depreciation of the exchange rate produces a positive valuation effect. This is usually the case for more advanced economies. On the contrary, developing and emerging markets are often short in foreign currency and experience a deterioration in the net foreign position following a depreciation that raises the domestic currency value of liabilities (Lane and Shambaugh, 2007).

These valuation effects are relatively large in the case of the United States, but also for some emerging markets which experienced large depreciation or appreciation of their exchange rate (Lane and Milesi-Ferretti 2005a and 2005b). However, it is important to note that both the relative performance of asset prices and the level of exchange rates tend to fluctuate, so that gains in one period are often followed by losses in the next period. It is therefore difficult to understand how "permanent" these wealth effects are and gauge their relative importance compared to the different items of the current account.

In order to understand the relative importance of these factors, in this section, we look at the cumulative impact of the different components of the current account vis-à-vis capital gains. First, we show the evidence of selected economies with the aim of highlighting possible patterns in the evolution of net foreign assets. Subsequently, a complete and systematic assessment of the whole sample of countries is presented. Charts 1a to 1f illustrate the evolution of the net international investment position compared to the *cumulated* current account (excluding investment income) for selected countries between 1980 and 2007. The charts show also the *cumulated* capital gains and investment income, separately, in order to highlight their contribution to the change in net foreign

assets. Cumulated capital gains and investment income are assumed to be zero in 1980, whereas the cumulated current account (excluding income) starts at the same level of the international investment position.[6]

Chart 1. Decomposition of net foreign assets. 1980-2007 (USD billion)



Notes. The charts display the net foreign asset position (NFA) of each country and its decomposition according to a slightly modified version of equation (3) in the main text:

$$NFA \equiv \sum(BGST) + \sum(IIB) + \sum(KG) + \sum(EO + KA)$$

where Σ(BGST) is the cumulated balance on goods and services including unilateral transfers and compensation of employees; Σ(IIB) is the cumulated investment income balance; Σ(KG) are cumulated capital gains. The term Σ(EO + KA), cumulated errors and omissions plus the capital account, is not shown.

[6] Charts are based on equation (2), adding the balance of goods and services together with unilateral transfers. To make the charts easier to interpret, errors and omissions and the capital account are not shown.

The six countries have been chosen to highlight different patterns in the evolution of net foreign assets and their components. Charts 1a and 1b show the paradigm of the Anglo-Saxon economies which have been able to run almost without interruption substantial trade deficits for several decades, resulting in large negative foreign asset positions. Among the different explanations of these external deficits and, in particular, the absence of tensions for their sustainability, two of the most popular justifications include positive productivity shocks within the framework of the present value theory of the current account (Glick and Rogoff, 1995) and, more recently, the greater ability of the Anglo-Saxon countries to generate financial assets in order to absorb capital inflows and a global savings glut (Bernanke, 2005, and Caballero et al. 2008). It is useful to contrast the United States and Australia to highlight similarities and differences. In the case of the United States, the still positive income balance and large valuation gains, equivalent to a cumulated amount of USD 3.7 trillion between 1980 and 2007, moderated the worsening of the net foreign position compared to cumulated trade deficits. It is interesting to note that the bulk of valuation gains accrued since 2000 and, as noted in section 2, they are not fully explained by asset price and exchange rate movements, but also by statistical adjustments. In the case of Australia, trade balance dynamics are roughly similar to those of the United States; however, in the absence of any exorbitant privilege or other "puzzles", the net debtor position generates debt servicing obligations that worsen its sustainability. The cumulated negative investment income balance of Australia between 1980 and 2007 (USD -334 billion) explains more than half of the worsening of its net foreign asset position (USD 550 billion) over the same period.

Charts 1c and 1d show instead the two largest surplus countries, Germany and Japan, among the advanced economies. In both cases, a series of large trade surpluses imparts a clear positive trend to the net foreign assets, whereas cumulated capital gains are relatively small. In the case of Japan the accumulation of positive investment income plays a grater role compared to Germany.

The comparison between two Latin American emerging economies, Argentina and Brazil, is instructive of the possible different impact of emerging market crises on valuation gains and net foreign assets over the long-run (Charts 1e and 1f). Both countries underwent several currency and financial crises in the period under observation. In the case of Argentina, the 1991 and 2001 crises brought about large valuation gains as the exchange rate dropped and domestic asset prices (i.e. the market value of the claims of foreigners on domestic residents) collapsed. More importantly, these valuation shocks are not reversed and, therefore, seem to have a permanent impact on net foreign assets. On the contrary, in Brazil, the weakness of the Brazilian currency and financial markets

following the 1999 currency crisis, generated large valuation gains for only a few years. Starting from 2004, these gains were quickly reversed and transformed in large losses, as the successful recovery and macroeconomic stabilisation boosted Brazilian asset prices and its currency. Finally, it is worth noting that the investment income balance appears to be a main driver of net foreign asset positions in these two Latin American countries.

In general, cumulated capital gains appear to be more volatile than investment income – or the trade and service balance – and hover around or cross the zero line over time, indicating that their long-term impact could be close to zero. On the contrary, the cumulated investment income balance often imparts a strong drift to net foreign assets that can be reverted only when the balance of goods and services manages to turn around the net foreign asset position. Both components, valuation gains and investment income, may drive the net foreign asset position far apart from the cumulated balance of trade in goods and services.

In a more formal and complete exposition, Table 1 summarises the decomposition of the change in net foreign assets between 1980 and 2007 according to equation (4) in section 3. The contributions of each sub-component to the dynamics of net foreign assets are averaged across 40 countries in our sample, 20 advanced economies and 20 emerging markets.[7] This decomposition is based on the ratio of net foreign assets to GDP, the relevant concept for external sustainability, and includes the effect of positive GDP growth in stabilising external positions.

A number of interesting observations emerge from the analysis of these figures. First, across the whole sample, the absolute value of cumulated investment income – a negative change by 57 percentage points as ratio to GDP between 1980 and 2007 – is much larger – ten times larger – than that of valuation effects – an increase by 5 percentage points over the same period. Not surprisingly, FDI, equity and debt servicing obligations are particularly large for emerging economies, accounting for a deterioration by 75 percentage points in the average ratio of net foreign assets to GDP between 1980 and 2007. On average, the negative investment income contributed also to the worsening by almost 40 percentage points in the net foreign position for advanced economies.[8] Both, the

[7] In order to compare cumulated gains over the same time period, seven transition countries (Bulgaria, Croatia, Czech Republic, Romania, Russia, Slovak Republic and Slovenia) have been excluded from the sample. Other two Asian emerging economies (Singapore and Philippines) have been excluded since the link between two different datasets, IMF BPS and Mark-II, generates artificial abnormal valuation gains.

[8] As noted by Lane and Milesi-Ferretti (2007), there is a discrepancy in the world balance on income, where payments to foreign investors tend on average to exceed earnings on foreign assets.

balance on goods and services and the GDP growth, on average, have rather large and positive contributions to the change in net foreign assets.

Table 1. Change in net foreign assets. 1980 - 2007 (percentage of GDP)

All countries	1980-2007	1980-1985	1985-1990	1990-1995	1995-2000	2000-2007
Net foreign assets	**3.5**	**-10.8**	**9.4**	**-3.9**	**-0.7**	**9.5**
Balance on goods and services	31.6	-1.8	4.8	1.0	7.1	20.4
Unilateral Transfers	13.0	3.5	3.9	3.1	1.4	1.0
Net investment income	-57.0	-12.3	-12.3	-9.9	-9.3	-13.2
Capital gain/loss	-5.2	2.6	2.4	-4.7	1.1	-6.6
Growth effect	25.4	-1.9	10.0	5.6	0.1	11.5
Other adjustments	-4.3	-1.0	0.5	1.0	-1.1	-3.6
Advanced economies	1980-2007	1980-1985	1985-1990	1990-1995	1995-2000	2000-2007
Net foreign assets	**-5.5**	**-7.1**	**3.2**	**-2.6**	**-2.8**	**3.7**
Balance on goods and services	32.8	-1.9	0.8	7.0	10.1	16.8
Unilateral Transfers	0.4	2.2	2.1	1.3	-1.0	-4.3
Net investment income	-38.6	-7.5	-8.0	-8.6	-7.1	-7.4
Capital gain/loss	-16.0	-1.4	-0.8	-5.1	-3.5	-5.2
Growth effect	22.7	0.2	8.5	2.0	0.2	11.9
Other adjustments	-6.8	1.3	0.7	0.9	-1.5	-8.1
Emerging markets	1980-2007	1980-1985	1985-1990	1990-1995	1995-2000	2000-2007
Net foreign assets	**12.6**	**-14.5**	**15.5**	**-5.3**	**1.5**	**15.4**
Balance on goods and services	30.4	-1.7	8.9	-4.9	4.0	24.1
Unilateral Transfers	25.6	4.9	5.6	5.0	3.8	6.4
Net investment income	-75.5	-17.0	-16.6	-11.2	-11.5	-19.1
Capital gain/loss	5.6	6.6	5.7	-4.4	5.8	-8.1
Growth effect	28.1	-3.9	11.6	9.2	0.0	11.2
Other adjustments	-1.7	-3.3	0.3	1.1	-0.7	0.9

Notes. Table 1 shows the decomposition of the change in net foreign assets as a share of GDP between 1980 and 2007 according to equation (4) in the main text:

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

Reported figures are unweighted averages for 40 countries out of the 49 countries in the sample. In this table, seven transition (Bulgaria, Croatia, Czech Republic, Romania, Russia, Slovak Republic and Slovenia) and two Asian economies (Singapore and Philippines) have been excluded in order to keep the sample balanced over time. See Section 3 and Appendix A.1 for list of countries and definition of groups.

Second, the analysis of the temporal evolution of the various components of the net foreign assets shows that the contribution of investment income is rather stable, whereas, as expected, valuation effects alternate positive and negative signs. It is also worth noting that for emerging market economies, which are recipients of remittances and official assistance, unilateral transfers are an

See also next section, where we show that the yield from the investment income balance on foreign liabilities is systematically larger than the yield on foreign assets.

important and stable external source of funding, contributing by 25 percentage points to the improvement in their net foreign assets between 1980 and 2007.

Finally, focussing on the most recent period between 2000 and 2007, it is possible to identify a large contribution of trade surpluses to the average change in net foreign assets. Bearing in mind that these figures are unweighted averages, this may be reconciled with the presence of global imbalances, where many surplus countries are needed to make up for one single large deficit country – the United States. Cumulated capital gains are also slightly larger between 2000 and 2007 compared to previous sub-periods, reflecting large swings in asset prices and rising gross foreign positions.

Overall, the analysis in this section shows that the investment income balance – as well as naturally the balance on goods and services – is more important than valuation effects in imparting a drift to net foreign assets over the long-run. Valuation effects are indeed becoming large, but their long-run contribution to changes in net foreign assets is of second order importance compared to other categories. Occasionally, however, valuation gains or losses may produce a structural shift in the dynamic of net foreign assets, as a result of country-specific financial crises with permanent effects or prolonged asset price booms.

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

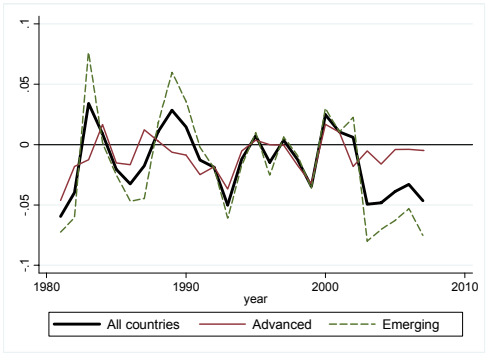
The previous section clarified the relative importance of investment income and capital gains for the evolution of net foreign assets over the long-run. As shown in section 3, these two items are the result of the interaction between rates of returns and gross asset or liability positions. Let us now take another perspective, focussing only on the returns, in particular differential returns between foreign assets and liabilities, in order to understand the size of the exorbitant privilege of the United States compared to other countries.

The set of Charts 2a-2g 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 2a, 2c, and 2e, on the left hand-side, show the average excess return for the whole sample and, separately, the group of advanced and emerging countries. Charts 2b, 2d, and 2f 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

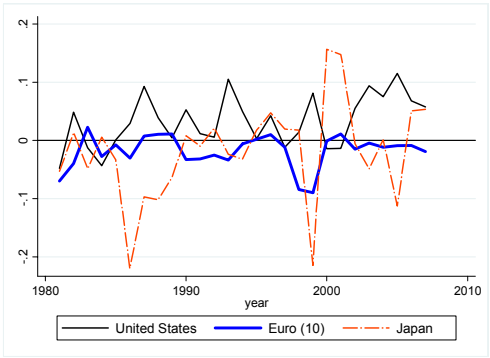
calculated as the unweighted average of national data of 10 euro area member states.[9]

Chart 2. Excess real returns, yields and rates of capital gain. 1981-2007

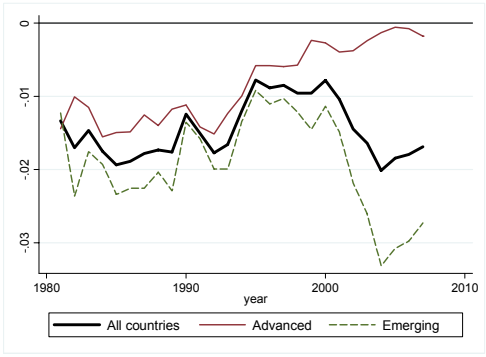
2a – Excess total return



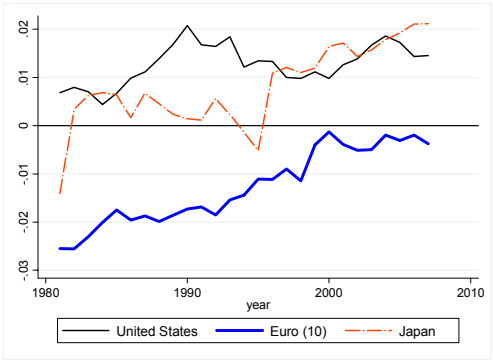
2b – Excess total return



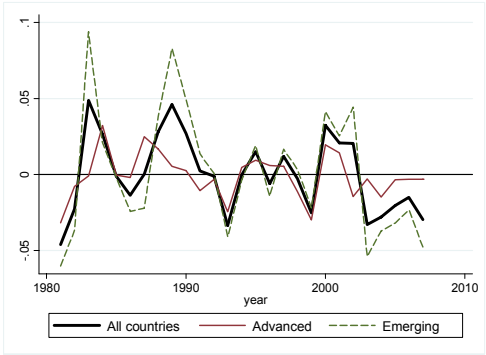
2c – Excess yield



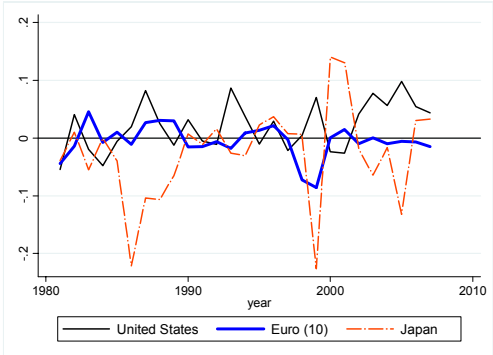
2d – Excess yield



2e – Excess rate of capital gain



2f – 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 (5) to (7) 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.

[9] 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.

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 (2a and 2b) are very similar to those of capital gains (2e and 2f). 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 2e), resulting in larger spikes in excess total returns (plot 2a). 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 2c). 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 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.[10] 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.

The exorbitant privilege of the United States is evident in the Charts 2b, 2d and 2f. 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 2b). Again, all these large annual excess returns are due to capital gains (plot 2f). Yields on foreign assets of the United States have consistently exceeded yields on foreign liabilities by one or two percentage points (plot 2d). 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

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

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.[11] 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 2 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.[12]

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.[13] 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

[11] See Codogno et al. (2003), for instance, for an analysis of the compression of yield spreads on EMU government bonds.
[12] 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.
[13] This is virtually in line with the result of Gourinchas and Rey (2005), which is calculated over the period 1973-2004.

negative excess total return is of a similar size (186 basis points), but not statistically different from zero and entirely due to valuation losses.

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 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.

Table 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.
All countries	$r^A - r^L$	1231	-1.54 ***	0.29	-5.6	-1.4	2.5	-88.0	85.4	-0.3	18.9
	$i^A - i^L$	1231	-1.52 ***	0.07	-2.9	-1.2	0.0	-14.0	20.0	0.5	10.3
	$k^A - k^L$	1231	-0.02	0.28	-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	$r^A - r^L$	691	-2.03 ***	0.45	-7.6	-1.9	3.1	-88.0	85.4	0.0	15.6
	$i^A - i^L$	691	-2.05 ***	0.11	-3.5	-2.0	-0.6	-14.0	20.0	1.0	11.1
	$k^A - k^L$	691	0.03	0.43	-4.8	0.0	4.2	-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.

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. It has already been discussed in section 2 whether the 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. Here, we do not offer further evidence on this debate. In the next section, instead, we investigate the contribution of specific asset classes – FDI, equity, debt and other – to excess returns on net foreign assets in selected economies.

6. 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.[14] 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.

[14] 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.

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

$$r^A - r^L = \underbrace{\frac{\sum_j (\alpha_j + \lambda_j)}{2}\left(r_j^A - r_j^L\right)}_{\text{return effect}} + \underbrace{\sum_j (\alpha_j - \lambda_j)\frac{\left(r_j^A + r_j^L\right)}{2}}_{\text{composition effect}} \qquad (10)$$

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.[15] 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 (10) 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 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 (10) in the two components of excess total returns: yields from investment income and capital gains from asset price and exchange rate movements (see equation 7). 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 3 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

[15] 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.

returns in the United States.[16] 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.[17]

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).

Excess total returns in the two other major economies in Table 3, 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.[18]

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[16] In this paper, both data and time-dimension are different from Gourinchas and Rey (2005). It is also evident from Table 3 that in some cases results may change significantly across different time-periods.

[17] 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.

[18] 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.

Table 3. 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.

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.

7. Excess returns: exchange rate, leverage and country risk

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. Following the literature (see section 2), it is possible to identify three variables that may affect excess returns: the exchange rate, leverage and country risk.

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.[19] 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.[20] 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.[21] 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.

[19] 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.

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

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

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:

$$r_t^J = \frac{II_t^{J,risk} + KG_t^{J,risk}}{J_{t-1}^{risk}} \frac{J_{t-1}^{risk}}{J_{t-1}} + \frac{II_t^{J,safe} + KG_t^{J,safe}}{J_{t-1}^{safe}} \frac{J_{t-1}^{safe}}{J_{t-1}} \qquad (11)$$

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:

$$r_t^A - r_t^L = \left(r_t^{A,risk}\alpha_{t-1} + r_t^{A,safe}(1-\alpha_{t-1})\right) - \left(r_t^{L,risk}\lambda_{t-1} + r_t^{L,safe}(1-\lambda_{t-1})\right) \quad (12)$$

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:

$$r_t^A - r_t^L = \left(\hat{r}_t^{risk} - \hat{r}_t^{safe}\right)\left(\alpha_{t-1} - \lambda_{t-1}\right) \quad (13)$$

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.

Risk and excess returns

Finally, 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.

The empirical model

Two alternative models are eventually tested, which differ in the specification of the exchange rate impact on excess returns, keeping instead a similar treatment of leverage and country risk. In the first model, the relationship to be tested is the following:

$$y_{i,t} = \alpha + \beta_1 DRER_{i,t} + \beta_2 DRER_{i,t} * FC_{i,t} + \gamma LEV_{i,t-1} + \delta RiskR_{i,t} + \varepsilon_{i,t}$$
$$\beta_1 \approx 0; \quad \beta_2 < 0; \quad \gamma > 0; \quad \delta > 0 \quad (14)$$

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; $DRER_t$ 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.[22] 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, $\beta_2<0$, while the change in the real exchange rate alone should have an impact close to zero $\beta_1 \sim 0$. In general, we would expect the marginal effect of $DRER_t$ to be negative: $\left(\beta_1 + \beta_2 * FC_t\right) < 0$. 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.

$LEV_{t\text{-}1}$ 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 coefficient associated with this variable is expected to be positive, $\gamma>0$, if leveraged investors are to be compensated for higher risk taking, in particular for excess rates of capital gain.[23] Finally, *RiskR* 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.[24] 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 coefficient associated with this variable is therefore expected to be positive, $\delta>0$, 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.

[22] 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.

[23] 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.

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

A second model has also been tested to measure the valuation effect of exchange rate movements more precisely, including an *effective* exchange rate that takes into account currency exposure. In the previous 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).[25] 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:

$$DFWI_t \equiv DFWI_t^A - DFWI_t^L$$

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. The model in equation (14) is re-specified in the following form:

$$\begin{aligned} y_{i,t} = \ & \alpha + \beta DFWI_{i,t} + \gamma LEV_{i,t-1} + \delta RiskR_{i,t} + \varepsilon_{i,t} \\ & \beta < 0; \quad \gamma > 0; \quad \delta > 0 \end{aligned} \tag{15}$$

Empirical results

Equation (14) and (15) are estimated for our panel of 48 countries over the period 1981-2007.[26] The panel is strongly balanced with only six transition economies

[25] 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.

[26] One country had to be dropped, Bulgaria, since there is no information on the currency composition of foreign assets and liabilities.

having observations for less than half of the period under examination. As a first step, traditional static panel linear methods are applied to estimate excess returns, yields and rates of capital gain. In a second phase, we apply instead a dynamic panel estimator to check the robustness of the preliminary step.

Table 4. Excess real returns, yields and rates of capital gain. Panel estimations

Panel A

Dependent variable	$r^A - r^L$			$i^A - i^L$			$k^A - k^L$		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Est. Method	BE	FE	RE	BE	FE	RE	BE	FE	RE
DRER	-0.1717	-0.0024	-0.0060	-0.1465	0.0180	0.0172	-0.0252	-0.0204	-0.0206
	(0.3178)	(0.0172)	(0.0167)	(0.1693)	(0.0126)	(0.0123)	(0.3028)	(0.0169)	(0.0167)
*DRER*FC*	-0.4015	-0.4938 **	-0.4880 **	-0.0573	-0.0444	-0.0471	-0.3443	-0.4494 **	-0.4329 **
	(0.9620)	(0.2124)	(0.2029)	(0.5125)	(0.0396)	(0.0392)	(0.9167)	(0.2172)	(0.2052)
LEV (-1)	0.0650 **	-0.0070	0.0374 **	0.0196	-0.0039	0.0034	0.0454	-0.0031	0.0231
	(0.0302)	(0.0318)	(0.0179)	(0.0161)	(0.0118)	(0.0096)	(0.0288)	(0.0315)	(0.0151)
RiskR	0.0019	-0.0851	-0.0213	0.0709 ***	0.0023	0.0177	-0.0689	-0.0874	-0.0672 **
	(0.0436)	(0.0651)	(0.0287)	(0.0232)	(0.0251)	(0.0204)	(0.0416)	(0.0596)	(0.0277)
Const.	-0.0132	0.0470	0.0028	-0.0664 ***	-0.0171	-0.0285 *	0.0533	0.0641	0.0508 **
	(0.0338)	(0.0468)	(0.0225)	(0.0180)	(0.0184)	(0.0161)	(0.0322)	(0.0427)	(0.0218)
R^2 Within	0.014	0.021	0.019	0.004	0.007	0.005	0.021	0.024	0.023
R^2 Between	0.164	0.002	0.146	0.284	0.009	0.235	0.108	0.044	0.095
R^2 Total	0.019	0.011	0.024	0.013	0.002	0.075	0.027	0.024	0.027

Panel B

Dependent variable	$r^A - r^L$			$i^A - i^L$			$k^A - k^L$		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Est. Method	BE	FE	RE	BE	FE	RE	BE	FE	RE
DFWI	-0.6702	-0.3314 ***	-0.3415 ***	-0.2096	0.0259	0.0222	-0.4606	-0.3572 ***	-0.3543 ***
	(0.4900)	(0.1071)	(0.1017)	(0.2730)	(0.0324)	(0.0318)	(0.4655)	(0.0929)	(0.0878)
LEV (-1)	0.0629 **	0.0001	0.0416 **	0.0204	-0.0031	0.0040	0.0424	0.0032	0.0266
	(0.0282)	(0.0334)	(0.0191)	(0.0157)	(0.0119)	(0.0097)	(0.0268)	(0.0333)	(0.0164)
RiskR	-0.0026	-0.0838	-0.0209	0.0653 ***	0.0036	0.0186	-0.0679 *	-0.0874	-0.0683 **
	(0.0399)	(0.0624)	(0.0276)	(0.0222)	(0.0244)	(0.0198)	(0.0379)	(0.0578)	(0.0277)
Const.	-0.0094	0.0465	0.0029	-0.0620 ***	-0.0180	-0.0291 *	0.0526 *	0.0645	0.0520 **
	(0.0307)	(0.0447)	(0.0218)	(0.0171)	(0.0179)	(0.0156)	(0.0292)	(0.0415)	(0.0219)
R^2 Within	0.016	0.018	0.016	0.002	0.003	0.002	0.021	0.022	0.022
R^2 Between	0.159	0.001	0.146	0.260	0.000	0.236	0.117	0.061	0.108
R^2 Total	0.021	0.010	0.021	0.047	0.003	0.081	0.026	0.024	0.027
Countries	48	48	48	48	48	48	48	48	48
N. obs.	1215	1215	1215	1215	1215	1215	1215	1215	1215

Notes. The table shows the results of the estimation of equations (14) and (15) in the main text, according to three different methods: OLS between regression on country means (BE); OLS fixed-effects regression (FE) and GLS random-effects (RE). Standard errors are reported in parentheses. Standard errors for fixed-effects and random-effects estimations allow for clustering of residuals by country. ***, ** and * indicate significance at the 1%, 5% and 10% level, respectively.

Table 4 reports the results of the panel estimation according to three different methods: OLS between regression on country means; OLS regression allowing for country fixed-effects and GLS random-effects assuming that individual effects and regressors are uncorrelated. The F-test rejects the null hypothesis that

individual effects are all equal to zero in the fixed-effects estimations. At the same time, in most of the cases, the Hausman test cannot reject the null hypothesis that fixed-effects and random-effects estimates are statistically different and, hence, it is also feasible to study random-effects estimates.[27] The upper panel A shows the estimation of the first model including the interaction of the real trade-weighted exchange rate with the relative share of foreign currency assets and liabilities. The lower panel B displays instead the result of the regressions including the real financial exchange rate, i.e. the index weighted with the currency composition of foreign assets and liabilities.

The signs of the estimated coefficients are in general consistent through the various estimations and in line with theoretical predictions, in particular as regards the impact of the exchange rate and with the exception of the country risk variable. In particular, one may note that, in the first model, the coefficient of the real trade-weighted exchange rate is statistically significant at the 5 percent level, according to fixed or random effects estimates, only when interacted with the relative foreign currency share. 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 150 basis points (columns 2 and 3 in Panel A of Table 4).[28] As expected, the exchange rate channel works through capital gains (columns 8 and 9), whereas the impact on excess yields turned out to be not significantly different from zero (columns 5 and 6). Using the net real Finance Weighted Index, instead of the trade-weighted exchange rate, it is possible to obtain similar qualitative results (see Panel B). The main difference is that *DFWI* is three times less volatile than *DRER* and the associated coefficient comparatively higher. An appreciation of the net index by 3.5 percent (close to one standard deviation) would decrease excess returns by around 120 basis points. Coefficients are now significant at the 1 percent level.

The impact of leverage is positive and statistically significant for excess total real returns only in between regressions and random-effects, but not in the fixed-effects estimates. An increase by ten percentage points in the share of FDI and equity in total assets relative to the same share in total liabilities would be

[27] In the case of excess yields, however, the Hausman test suggests that estimated random effect coefficients in column 6 of Table 4 may be biased.

[28] Table A.4 in the appendix shows the result of the regression of the first model without the interaction term *DRER*FC*, including simply the change in the real exchange rate. As expected, the coefficient associated with *DRER* is still negative, even though relatively smaller in absolute value (around -0.075) and only significantly different from zero at the 10 percent level.

associated with higher excess total returns in the order of 40 to 60 basis points. This variable is not statistically significant when regressing excess yields or excess rates of capital gain. Finally, country risk has an ambiguous and not statistically significant impact on excess total returns. This is 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.[29]

The panel regressions explain only a minimal fraction of the variability of excess total returns and rates of capital gain (R^2 is equal to maximum 2%) and do marginally better in the case of the excess yields without fixed-effects. Indeed, as noted in the previous sections, total returns and capital gains are more volatile than yields. Our control variables cannot explain the variability "within" each country series. In the case of less volatile excess yields, instead, panel regressions perform better, explaining 20 to 30 percent of the "between" variability across countries.

Robustness checks

A number of checks have been performed to test the robustness of the basic static regressions. These include the control for potential dynamic misspecifications in the panel, the use of nominal variables in domestic currency terms in order to see whether the relation between real exchange rate and real excess returns is driven only by inflation and, finally, the robustness of results splitting the sample between advanced economies and emerging markets.

Table 4 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. As regards the first type of bias, indeed, the Wooldridge (2002) test for panel models cannot reject the presence of serial correlation in the residuals of our first regressions. The relatively large time-dimension of our sample 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

[29] This is also consistent with the evidence from Table 2 in section 5, which shows that average excess yields for (low-rating, high-risk) emerging markets are much lower than for the group of (high-rating, low risk) advanced economies. Excess rates of capital gain are instead on average slightly higher for emerging markets than for advanced economies.

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.[30]

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)
DRER	-0.0706 ***	-0.0427		0.0442 ***	-0.0031		-0.0770 ***	-0.0519 **	
	(0.0261)	(0.0322)		(0.0118)	(0.0126)		(0.0216)	(0.0251)	
*DRER*FC*		-0.1346			0.1611 ***			-0.1528	
		(0.1249)			(0.0478)			(0.1044)	
DFWI			-0.2242 ***			0.1260 ***			-0.2570 ***
			(0.0769)			(0.0300)			(0.0716)
LEV(-1)	-0.0391 **	-0.0403 **	-0.0318 *	-0.0008	-0.0009	-0.0002	-0.0190	-0.0222	-0.0090
	(0.0183)	(0.0179)	(0.0185)	(0.0070)	(0.0070)	(0.0073)	(0.0162)	(0.0161)	(0.0170)
RiskR	-0.2329 ***	-0.2341 ***	-0.2638 ***	0.0350 **	0.0431 ***	0.0519 ***	-0.2182 ***	-0.2127 ***	-0.2486 ***
	(0.0393)	(0.0386)	(0.0399)	(0.0153)	(0.0154)	(0.0149)	(0.0349)	(0.0343)	(0.0366)
Const.	0.1441 ***	0.1453 ***	0.1726 ***	-0.0165 ***	-0.0178 ***	-0.0179 ***	0.1555 ***	0.1514 ***	0.1852 ***
	(0.0101)	(0.0101)	(0.0104)	(0.0029)	(0.0032)	(0.0021)	(0.0097)	(0.0094)	(0.0096)
Error corr. (φ)	-0.9453 ***	-0.9438 ***	-0.9709 ***	-0.3594 ***	-0.3406 ***	-0.3183 ***	-0.9866 ***	-0.9820 ***	-1.0115 ***
	(0.0376)	(0.0398)	(0.0350)	(0.0476)	(0.0474)	(0.0329)	(0.0419)	(0.0436)	(0.0376)
LogL	1530.3	1573.7	1544.5	3969.5	4002.7	3989.2	1586.2	1628.7	1594.9
Countries	48	48	48	48	48	48	48	48	48
N. obs.	1164	1161	1167	1164	1161	1167	1164	1161	1167

Notes. The table shows the results of the estimation of equation (14) and (15) 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.

Table 5 shows the results of this second set of estimations, reporting the long-run coefficients associated with the explanatory variables. For comparison,

[30] In our case, equation (14) and (15) are 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.

regressions including simply the real effective exchange rates are included (see columns 1, 4 and 7). It is possible to appreciate a similar pattern in the sign of the coefficient associated with the various measures of real exchange rate changes. This coefficient is negative when the dependent variable is the excess total return or the excess rate of capital gain, positive instead for excess yields. The absolute size of the impact on excess returns and excess rates of capital gain, although, is estimated to be lower compared to static panel regressions. In particular, focussing on the finance-weighted exchange rate (column 3), a real depreciation of the domestic currency by 3.5 percent, one standard deviation, produces a positive excess return of almost 80 basis points, which is approximately two thirds of the impact that was estimated through static panels. The impact of country risk is also consistent across static and dynamic regressions. This effect is positive for excess yields and negative for excess total returns and rates of capital gain. In the dynamic setting the absolute size and statistical significance of estimated parameters for country risk are magnified compared to static regressions. The major difference of dynamic panel estimations compared to static ones lies in the effect of leverage on excess returns, which is now negative and statistically significant in the case of excess returns (see columns 1 to 3). Therefore, it is possible to conclude that this relationship is not robust across different estimation methods.

Equation (7) in section 3 shows that the excess return will be dampened down by domestic inflation. One could wonder whether the negative coefficient for the real exchange rate, where domestic prices are at the numerator, is driven simply by inflation. Table A.5 in the appendix reports the result of the previous robust dynamic panel regressions using "nominal" domestic currency excess returns (yields and rates of capital gain) as dependent variables and "nominal" effective exchange rates and indices as regressors. These nominal variables are much more volatile weakening the statistical relationship, which is less clear cut when using the trade-weighted exchange rate. However, when using the nominal Finance Weighted Index (*DNFWI*), which properly measures currency exposure, the coefficient is again negative and statistically significant at the 1 percent level, confirming the presence of a valuation channel due to exchange rate movements.

As a further robustness check, the sample has been split in advanced and emerging economies, running similar static and dynamic panel regressions, separately, for the two groups of countries. These results do not show any dramatic difference with the outcome of regressions across the full sample, in particular as regards the signs of the coefficients, even though the statistical significance of estimated coefficients may vary (see Tables A.6 - A.9 in the Appendix). The results of static panel regressions show that there is no major

difference in the estimated effect of changes in the real exchange rate on excess returns and rates of capital gain between advanced and emerging market economies. Interestingly, the effect of the risk rating explanatory variable is large and significant across advanced economies, but not across emerging markets. The sign and statistical significance of the coefficients measuring the role of leverage is different across different estimation methods, further weakening the case for a positive association between this variable and excess returns (Table A.6 and A.7). As regards dynamic panels, it is interesting to note again the negative effect of higher risk rating on excess total return, mainly driven by capital gains. The negative effect of changes in real exchange rates on the excess rates of capital gain is particular evident in the case of emerging markets and when using the financial exchange rate as regressor (Table A.8 and A.9).

Overall, the thorough analysis of the potential determinants of excess returns between foreign assets and liabilities delivers a number of rather clear and consistent messages. First, there is a negative effect of changes in the exchange rate on excess returns, which is transmitted through capital gains and is particularly evident when using financial exchange rates that properly account for currency exposure. Second, there is only tentative evidence that higher leverage is positively associated with higher excess returns. A number of specifications, actually, deliver the opposite result. Finally, countries with better risk rating benefit from higher excess yields, i.e. they have a better income balance compared to countries with a similar net foreign position; nevertheless, they 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.

8. Concluding remarks

This paper analysed excess returns on net foreign assets from a global perspective, studying a sample of 49 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. The investment income is more important than capital gains in imparting a drift to net foreign assets over the long term, whereas capital gains transmit their short-term volatility to total returns.

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. Notably, countries experiencing large real exchange rate depreciations may hope to boost their excess returns on net foreign assets, with an impact that is proportional to the relative foreign currency exposure. This effect is channelled through capital gains, not through investment income. Excess yields on investment income are instead positively affected by improvements in the country risk profile.

A. Appendix

A.1 Data sources and definitions

The sample includes annual data between 1980 and 2007 (unless otherwise indicated) for 49 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, Bulgaria (from 1991), 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

Variable	Source
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
Consumer price index	IMF International Financial Statistics and World Economic Outlook database
Composite risk rating	PRS Group, International Country Risk Guide*

* 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		**Economic risk components**	
Government Stability	12	GDP per head	5
Socioeconomic Conditions	12	Real GDP growth	10
Investment Profile	12	Annual inflation rate	10
Internal Conflict	12	Budget balance (% of GDP)	10
External Conflict	12	Current account (% of GDP)	15
Corruption	6	Total	**50**
Military in Politics	6	**Financial risk components**	
Religious Tensions	6	Foreign debt (% of GDP)	10
Law and Order	6	Foreign debt service (% of XGS)	10
Ethnic Tensions	6	Current account (% of XGS)	15
Democratic Accountability	6	Reserves incl. gold (months of imports)	5
Bureaucracy Quality	4	Exchange rate stability (% change vs. USD)	10
Total	**100**	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
Bulgaria	$r^A - r^L$	**16**	**-0.16**		**2.14**	**-4.28**	**-0.85**	**3.30**	**-15.3**	**21.1**	**0.5**	**3.9**
	$i^A - i^L$	16	-2.25	***	0.50	-3.74	-1.47	-0.69	-6.0	0.3	-0.7	2.3
	$k^A - k^L$	16	2.08		1.99	-1.05	1.55	5.71	-12.5	21.6	0.5	3.8
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. (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.

Table A.4 Excess real returns, yields and rates of capital gain. 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)
Est. Method	BE	FE	RE	BE	FE	RE	BE	FE	RE
DRER	-0.2464	-0.0750 *	-0.0785 *	-0.1588	0.0115	0.0103	-0.0876	-0.0866 *	-0.0848 *
	(0.2124)	(0.0429)	(0.0418)	(0.1126)	(0.0076)	(0.0072)	(0.2009)	(0.0465)	(0.0439)
LEV (-1)	0.0661 **	-0.0020	0.0413 **	0.0199	-0.0032	0.0041	0.0463	0.0012	0.0264
	(0.0292)	(0.0329)	(0.0192)	(0.0155)	(0.0118)	(0.0096)	(0.0276)	(0.0328)	(0.0165)
RiskR	0.0050	-0.0877	-0.0213	0.0716 ***	0.0020	0.0176	-0.0666	-0.0898	-0.0673 **
	(0.0425)	(0.0651)	(0.0287)	(0.0225)	(0.0251)	(0.0203)	(0.0402)	(0.0598)	(0.0279)
Const.	-0.0156	0.0490	0.0028	-0.0670 ***	-0.0169	-0.0284 *	0.0514	0.0659	0.0510 **
	(0.0327)	(0.0468)	(0.0226)	(0.0173)	(0.0184)	(0.0160)	(0.0310)	(0.0430)	(0.0220)
R^2 Within	0.009	0.012	0.009	0.004	0.005	0.003	0.014	0.016	0.015
R^2 Between	0.149	0.006	0.127	0.283	0.025	0.229	0.100	0.041	0.088
R^2 Total	0.013	0.004	0.015	0.012	0.001	0.076	0.020	0.017	0.020
Countries	48	48	48	48	48	48	48	48	48
N. obs.	1212	1212	1212	1212	1212	1212	1212	1212	1212

Notes. The table shows the results of the estimation of equations (14) and (15) in the main text, according to three different methods: OLS between regression on country means (BE); OLS fixed-effects regression (FE) and GLS random-effects (RE). Standard errors are reported in parentheses. Standard errors for fixed-effects and random-effects estimations allow for clustering of residuals by country. ***, ** and * indicate significance at the 1%, 5% and 10% level, respectively.

Table A.5 Excess 'nominal' 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)
DNER	0.0001	0.1356 ***		-0.0125 **	-0.0443 ***		-0.0031	0.1352 ***	
	(0.0250)	(0.0360)		(0.0052)	(0.0113)		(0.0247)	(0.0345)	
*DNER*FC*		-0.5614			0.1089 ***			-0.6204 ***	
		(0.1292)			(0.0370)			(0.1211)	
DNFWI			-0.1563 **			0.2109 ***			-0.2133 ***
			(0.0720)			(0.0149)			(0.0665)
LEV(-1)	-0.0502 **	-0.0510 **	-0.0423 **	-0.0492 ***	-0.0431 ***	-0.0162 *	-0.0126	-0.0202	-0.0115
	(0.0202)	(0.0197)	(0.0202)	(0.0059)	(0.0060)	(0.0087)	(0.0179)	(0.0177)	(0.0185)
RiskR	-0.3224 ***	-0.2827 ***	-0.2809 ***	-0.0014	-0.0102	0.0271	-0.3579 ***	-0.3131 ***	-0.2819 ***
	(0.0490)	(0.0476)	(0.0484)	(0.0180)	(0.0183)	(0.0220)	(0.0448)	(0.0431)	(0.0433)
Const.	0.1974 ***	0.1733 ***	0.1961 ***	-0.0081 ***	-0.0050 ***	-0.0166 ***	0.2553 ***	0.2235 ***	0.2287 ***
	(0.0142)	(0.0134)	(0.0147)	(0.0019)	(0.0017)	(0.0036)	(0.0155)	(0.0147)	(0.0163)
Error corr. (φ)	-0.9046 ***	-0.9049 ***	-0.9891 ***	-0.3544 ***	-0.3166 ***	-0.3568 ***	-0.9636 ***	-0.9577 ***	-1.0318 ***
	(0.0448)	(0.0468)	(0.0382)	(0.0432)	(0.0458)	(0.0423)	(0.0457)	(0.0487)	(0.0407)
LogL	1373.9	1425.7	1260.1	3544.8	3582.4	3656.1	1417.2	1472.6	1316.0
Countries	48	48	48	48	48	48	48	48	48
N. obs.	1038	1035	1167	1038	1035	1167	1038	1035	1167

Notes. The table shows the results of the estimation of equation (14) and (15) in the main text with the Pooled Mean Group 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.

Table A.6 Advanced economies. Excess real returns, yields and rates of capital gain. Panel estimations

Panel A

Dependent variable	$r^A - r^L$			$i^A - i^L$			$k^A - k^L$		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Est. Method	BE	FE	RE	BE	FE	RE	BE	FE	RE
DRER	1.7996	-0.0558	-0.0662	-0.0757	0.0099	0.0095	1.8752	-0.0656	-0.0775
	(1.5265)	(0.1700)	(0.1794)	(0.8859)	(0.0273)	(0.0270)	(1.2760)	(0.1510)	(0.1652)
*DRER*FC*	-1.3698	-0.3934	-0.3782	-2.2619	-0.0378	-0.0388	0.8921	-0.3556	-0.3161
	(3.2786)	(0.4330)	(0.4355)	(1.9028)	(0.0662)	(0.0661)	(2.7405)	(0.3898)	(0.3966)
LEV (-1)	0.0952	-0.0854 **	-0.0230	0.0099	-0.0323 *	-0.0289 *	0.0853 *	-0.0531 *	-0.0030
	(0.0575)	(0.0341)	(0.0238)	(0.0334)	(0.0171)	(0.0157)	(0.0480)	(0.0275)	(0.0185)
RiskR	-0.1357	-0.2118 **	-0.1526 ***	0.0562	0.1215 ***	0.1234 ***	-0.1919 *	-0.3333 ***	-0.2718 ***
	(0.1110)	(0.0780)	(0.0497)	(0.0644)	(0.0259)	(0.0225)	(0.0928)	(0.0739)	(0.0452)
Const.	0.0976	0.1690 **	0.1187 ***	-0.0533	-0.1088 ***	-0.1104 ***	0.1509 *	0.2778 ***	0.2257 ***
	(0.0929)	(0.0651)	(0.0430)	(0.0539)	(0.0216)	(0.0194)	(0.0776)	(0.0617)	(0.0382)
R^2 Within	0.017	0.034	0.030	0.000	0.133	0.132	0.020	0.045	0.042
R^2 Between	0.243	0.006	0.037	0.322	0.092	0.103	0.505	0.193	0.256
R^2 Total	0.011	0.020	0.029	0.002	0.109	0.114	0.012	0.052	0.058

Panel B

Dependent variable	$r^A - r^L$			$i^A - i^L$			$k^A - k^L$		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Est. Method	BE	FE	RE	BE	FE	RE	BE	FE	RE
DFWI	1.0103	-0.3240 *	-0.3358 **	-3.0655 *	-0.0066	-0.0077	4.0758	-0.3174 *	-0.3211 **
	(2.8790)	(0.1681)	(0.1702)	(1.5627)	(0.0208)	(0.0208)	(2.4805)	(0.1569)	(0.1571)
LEV (-1)	0.0573	-0.0862 **	-0.0227	0.0146	-0.0322 *	-0.0285 *	0.0427	-0.0540 *	-0.0035
	(0.0494)	(0.0351)	(0.0245)	(0.0268)	(0.0170)	(0.0156)	(0.0425)	(0.0283)	(0.0187)
RiskR	-0.1283	-0.2300 **	-0.1609 ***	0.0373	0.1216 ***	0.1235 ***	-0.1656	-0.3516 ***	-0.2795 ***
	(0.1190)	(0.0801)	(0.0499)	(0.0646)	(0.0254)	(0.0219)	(0.1025)	(0.0739)	(0.0451)
Const.	0.0961	0.1838 **	0.1251 ***	-0.0385	-0.1088 ***	-0.1105 ***	0.1346	0.2926 ***	0.2318 ***
	(0.0995)	(0.0668)	(0.0433)	(0.0540)	(0.0211)	(0.0190)	(0.0857)	(0.0617)	(0.0383)
R^2 Within	0.014	0.030	0.026	0.000	0.132	0.132	0.015	0.041	0.038
R^2 Between	0.165	0.009	0.044	0.345	0.091	0.103	0.419	0.204	0.268
R^2 Total	0.006	0.017	0.025	0.001	0.108	0.114	0.009	0.049	0.055
Countries	20	20	20	20	20	20	20	20	20
N. obs.	540	540	540	540	540	540	540	540	540

Notes. The table shows the results of the estimation of equations (14) and (15) in the main text, according to three different methods: OLS between regression on country means (BE); OLS fixed-effects regression (FE) and GLS random-effects (RE). Standard errors are reported in parentheses. Standard errors for fixed-effects and random-effects estimations allow for clustering of residuals by country. ***, ** and * indicate significance at the 1%, 5% and 10% level, respectively.

Table A.7 Emerging market economies. Excess real returns, yields and rates of capital gain. Panel estimations

Panel A

Dependent variable	$r^A - r^L$			$i^A - i^L$			$k^A - k^L$		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Est. Method	BE	FE	RE	BE	FE	RE	BE	FE	RE
DRER	-0.2520	-0.0015	-0.0043	-0.1735	0.0196	0.0190	-0.0785	-0.0211	-0.0203
	(0.3803)	(0.0171)	(0.0163)	(0.2012)	(0.0135)	(0.0132)	(0.3582)	(0.0161)	(0.0155)
*DRER*FC*	-0.3914	-0.4651	-0.4627 *	0.1331	-0.0384	-0.0401	-0.5246	-0.4267	-0.4167
	(1.1683)	(0.2737)	(0.2571)	(0.6181)	(0.0466)	(0.0463)	(1.1004)	(0.2814)	(0.2617)
LEV (-1)	0.0597	0.0252	0.0391	0.0357	0.0065	0.0082	0.0241	0.0187	0.0239
	(0.0585)	(0.0418)	(0.0290)	(0.0309)	(0.0131)	(0.0119)	(0.0551)	(0.0417)	(0.0242)
RiskR	0.0117	-0.0535	-0.0347	0.0872 *	-0.0110	-0.0050	-0.0755	-0.0425	-0.0572
	(0.0899)	(0.0763)	(0.0466)	(0.0476)	(0.0292)	(0.0254)	(0.0847)	(0.0665)	(0.0399)
Const.	-0.0224	0.0188	0.0078	-0.0747 **	-0.0121	-0.0163	0.0523	0.0309	0.0411
	(0.0576)	(0.0468)	(0.0302)	(0.0305)	(0.0189)	(0.0186)	(0.0542)	(0.0408)	(0.0263)
R^2 Within	0.013	0.021	0.020	0.007	0.012	0.012	0.021	0.022	0.022
R^2 Between	0.147	0.100	0.114	0.155	0.015	0.001	0.129	0.127	0.127
R^2 Total	0.015	0.024	0.024	0.000	0.001	0.004	0.026	0.026	0.027

Panel B

Dependent variable	$r^A - r^L$			$i^A - i^L$			$k^A - k^L$		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Est. Method	BE	FE	RE	BE	FE	RE	BE	FE	RE
DFWI	-0.7742	-0.3253 **	-0.3343 ***	-0.1463	0.0406	0.0384	-0.6279	-0.3658 ***	-0.3628 ***
	(0.5704)	(0.1306)	(0.1220)	(0.3176)	(0.0420)	(0.0416)	(0.5320)	(0.1108)	(0.1038)
LEV (-1)	0.0632	0.0338	0.0470	0.0350	0.0074	0.0091	0.0282	0.0264	0.0301
	(0.0535)	(0.0450)	(0.0321)	(0.0298)	(0.0132)	(0.0120)	(0.0499)	(0.0451)	(0.0270)
RiskR	0.0167	-0.0480	-0.0253	0.0816 *	-0.0096	-0.0036	-0.0649	-0.0384	-0.0520
	(0.0835)	(0.0726)	(0.0421)	(0.0465)	(0.0284)	(0.0246)	(0.0779)	(0.0643)	(0.0365)
Const.	-0.0233	0.0167	0.0032	-0.0700 **	-0.0129	-0.0171	0.0466	0.0296	0.0390
	(0.0530)	(0.0442)	(0.0273)	(0.0295)	(0.0184)	(0.0179)	(0.0495)	(0.0393)	(0.0247)
R^2 Within	0.017	0.019	0.018	0.003	0.008	0.007	0.022	0.022	0.022
R^2 Between	0.137	0.096	0.113	0.123	0.009	0.000	0.137	0.135	0.132
R^2 Total	0.020	0.021	0.022	0.009	0.000	0.003	0.026	0.027	0.027
Countries	28	28	28	28	28	28	28	28	28
N. obs.	675	675	675	675	675	675	675	675	675

Notes. The table shows the results of the estimation of equations (14) and (15) in the main text, according to three different methods: OLS between regression on country means (BE); OLS fixed-effects regression (FE) and GLS random-effects (RE). Standard errors are reported in parentheses. Standard errors for fixed-effects and random-effects estimations allow for clustering of residuals by country. ***, ** and * indicate significance at the 1%, 5% and 10% level, respectively.

Table A.8 Advanced economies. 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)
DRER	-0.0785 *	-0.0175		-0.0344 ***	-0.1508 ***		-0.0911 **	0.0177	
	(0.0459)	(0.1189)		(0.0125)	(0.0351)		(0.0425)	(0.1038)	
*DRER*FC*		-0.1731			0.3997 ***			-0.3209	
		(0.3152)			(0.1010)			(0.2807)	
DFWI			-0.1331			-0.0376			-0.1620 *
			(0.0891)			(0.0302)			(0.0857)
LEV(-1)	-0.0281	-0.0286	-0.0245	-0.0348 ***	-0.0161 *	-0.0307 ***	-0.0074	-0.0070	-0.0034
	(0.0234)	(0.0234)	(0.0230)	(0.0088)	(0.0098)	(0.0095)	(0.0230)	(0.0235)	(0.0233)
RiskR	-0.2266 ***	-0.2246 ***	-0.2828 ***	0.0181	0.1212 ***	0.0209	-0.3080 ***	-0.2917 ***	-0.3516 ***
	(0.0605)	(0.0592)	(0.0597)	(0.0235)	(0.0234)	(0.0246)	(0.0617)	(0.0612)	(0.0614)
Const.	0.1879 ***	0.1873 ***	0.2379 ***	-0.0070 ***	-0.0366 ***	-0.0081 ***	0.2697 ***	0.2569 ***	0.3085 ***
	(0.0122)	(0.0121)	(0.0156)	(0.0015)	(0.0062)	(0.0016)	(0.0153)	(0.0145)	(0.0180)
Error corr. (φ)	-1.0362 ***	-1.0451 ***	-1.0406 ***	-0.3555 ***	-0.3352 ***	-0.3593 ***	-1.0516 ***	-1.0597 ***	-1.0528 ***
	(0.0532)	(0.0562)	(0.0569)	(0.0544)	(0.0532)	(0.0538)	(0.0533)	(0.0547)	(0.0559)
LogL	847.9	861.0	856.6	1951.8	1969.6	1943.9	861.5		868.9
Countries	20	20	20	20	20	20	20	20	20
N. obs.	520	520	520	520	520	520	520	520	520

Table A.9 Emerging market economies. 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)
DRER	-0.0693 **	-0.0420		0.0693 ***	0.0908 ***		-0.0727 ***	-0.0592 **	
	(0.0321)	(0.0343)		(0.0137)	(0.0207)		(0.0239)	(0.0251)	
*DRER*FC*		-0.2268			-0.0359			-0.1327	
		(0.1833)			(0.0700)			(0.1451)	
DFWI			-0.5272 ***			0.1986 ***			-0.5026 ***
			(0.1477)			(0.0363)			(0.1303)
LEV(-1)	-0.0666 **	-0.0767 ***	-0.0555 *	0.0076	0.0109	0.0038	-0.0311	-0.0430 *	-0.0288
	(0.0283)	(0.0274)	(0.0308)	(0.0084)	(0.0080)	(0.0092)	(0.0222)	(0.0219)	(0.0254)
RiskR	-0.2613 ***	-0.2751 ***	-0.2404 ***	0.0231	0.0167	0.0384 **	-0.1848 ***	-0.1935 ***	-0.1980 ***
	(0.0510)	(0.0494)	(0.0522)	(0.0170)	(0.0160)	(0.0156)	(0.0414)	(0.0401)	(0.0443)
Const.	0.1213 ***	0.1277 ***	0.1204 ***	-0.0166 ***	-0.0153 ***	-0.0160 ***	0.1076 ***	0.1105 ***	0.1262 ***
	(0.0118)	(0.0120)	(0.0099)	(0.0043)	(0.0045)	(0.0027)	(0.0109)	(0.0111)	(0.0099)
Error corr. (φ)	-0.8761 ***	-0.8661 ***	-0.9277 ***	-0.3988 ***	-0.4062 ***	-0.3266 ***	-0.9458 ***	-0.9276 ***	-0.9943 ***
	(0.0502)	(0.0542)	(0.0448)	(0.0788)	(0.0894)	(0.0478)	(0.0593)	(0.0626)	(0.0513)
LogL	682.7	713.4	690.2	2026.6	2047.2	2051.0	726.6	757.3	729.6
Countries	28	28	28	28	28	28	28	28	28
N. obs.	644	641	647	644	641	647	644	641	647

Notes. Tables A.8 and A.9 show the results of the estimation of equation (14) and (15) in the main text with the Pooled Mean Group 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.

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