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**ON THE DETERMINANTS  
OF EXTERNAL  
IMBALANCES AND  
NET INTERNATIONAL  
PORTFOLIO FLOWS  
A GLOBAL PERSPECTIVE**

by Roberto A. De Santis  
and Melanie Lührmann





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# ON THE DETERMINANTS OF EXTERNAL IMBALANCES AND NET INTERNATIONAL PORTFOLIO FLOWS

## A GLOBAL PERSPECTIVE <sup>1</sup>

by Roberto A. De Santis <sup>2</sup>  
and Melanie Lührmann <sup>3</sup>



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**Abstract:** In a panel covering a large number of countries from 1970 to 2003, we show that net portfolio flows play an important role in correcting external imbalances, since they are driven by common determinants represented by countries' demographic profiles, the quality of institutions, monetary aggregates and initial net financial asset positions. Population ageing causes current account deficits, net equity inflows and net outflows in debt instruments. A higher money to GDP ratio – associated with lower interest rates – favours international investments in domestic stocks to the detriment of the less attractive domestic bonds. Additionally, current account balances are driven negatively by real GDP growth, losses in competitiveness and increases in the quality of the institutions; net equity flows are driven positively by the quality of the institutions and negatively by per capita income; while net flows in debt instruments are driven by long-term interest rate differentials and deviations from the UIP.

*Keywords:* Current accounts; net portfolio flows, panel regressions.

*JEL classification:* F21, F32; F41, O16.

## Executive summary

The main aim of this paper is to identify the determinants of current account balances (CABs) and net flows in equity securities and debt instruments (bonds plus money market instruments). In particular, we examine whether CABs and net portfolio flows are determined by the same economic fundamentals. If CABs and net portfolio flows were driven in a similar way by the same determinants, then countries' current account deficits would be easily financed by net inflows in portfolio investment. Therefore, external imbalances would be more sustainable, although undesired abrupt adjustments in portfolio flows (i.e. sudden stops) would be more costly.

Though current accounts and net portfolio flows are potentially linked, there are additional components which can adjust to equilibrate the balance of payments. Net foreign direct investment, net other investment (mainly net cross-border bank loans), net financial derivatives, and changes in official reserve assets together with net portfolio investment finance current account deficits. However, growing international portfolio diversification has been playing a key role, particularly in the last decade. The sum of asset and liabilities of portfolio investment stocks of the euro area, the United States and Japan, which are the biggest international players in the financial markets, represent 38%, 39% and 55% of total assets and liabilities outstanding respectively in these economies. Therefore, we provide a quantitative assessment of the importance of macroeconomic and financial variables in explaining CABs and net portfolio flows in a broad sample of developing and industrial countries for the period 1970-2003 in one unified empirical framework (i.e. the same data sources and sets of explanatory variables are employed).

We present evidence that countries' demographic profiles, the quality of the institutions, monetary aggregates and initial net foreign asset positions systematically influence CABs and net portfolio flows. This implies that external imbalances can adjust smoothly together with developments in net portfolio flows. However, some conflicting signs emerge for money to GDP ratio and relative old-age dependency ratio.

We find that the impact of countries' relative demographic profile is not constant across the alternative model specifications. Countries with relatively large young and old population groupings are characterised by lower CABs and net equity inflows. At the same time countries with relative high old-age dependency ratios - specifically OECD countries - are associated with net outflows in debt instruments. If net outflows in debt instruments are due to lower purchases of domestic bonds by non-residents, then an "asset meltdown" (i.e. a rapid fall in securities prices due to a withdrawal of assets by the retiring baby-boomers) in

fixed income can be expected, as a fall in domestic bond demand would not be sufficiently compensated by foreign demand. However, domestic investors may prefer to invest in riskier asset when they are younger and to hold and purchase safer assets when they get older re-allocating part of their investments towards fixed income portfolios. If this were the case, there would be no risk of a sharp fall in bond prices. The asymmetric effect of demographic change on the CABs and portfolio flows is a first indication that this mechanism might be at work. If one could find empirical evidence in favour of portfolio reallocation towards safer assets, it could also in part motivate the so called Greenspan's conundrum; namely the puzzle, that bond yields are low across developed countries despite rising short term interest rates, positive economic growth and low inflation rates. As the workforce ages and individuals become more risk adverse, portfolio shift towards fixed income instruments push up bond prices with a negative effect on yields.

We find that a rise in money stock to GDP ratio improves the CABs and brings about net equity inflows and net outflows in debt instruments. Literature has interpreted the result on CABs, as the effect of financial deepening on savings. We instead argue that money to GDP ratio measures a portfolio shift effect. A higher M3 to GDP ratio can be associated – through the money demand channel – with lower interest rates. This can favour international investment in domestic stocks (i.e. net equity inflows) to the detriment of less attractive investments in domestic bonds (i.e. net outflows in debt instruments).

We show that CABs worsen with lagged real GDP growth and losses in competitiveness, as suggested by economic theory. We cannot find any empirical support for an impact of financial factors specific to the equity market, such as market performance, market valuation and market size. However, we find that net equity flows are driven negatively by per capita income, which implies that richer countries allocate part of their savings in global equity portfolios.

We find that net flows in debt instruments are driven by long-term interest rate differentials. The effect is, however, positive in the medium term (momentum motive) but negative in the shorter run (portfolio re-balancing motive). We also find that a rise in the short-term domestic interest rate above its trend brings about an equilibrating portfolio shift out from domestic debt instruments.

The results obtained for the sub-sample period of enhanced global financial integration are broadly similar. There is some evidence of a structural break between the pre and post 1990 period, but it does not strongly alter the way in which CABs and net portfolio flows are determined.

## 1. Introduction

Current account improvements have often occurred through adjustments in exchange rates and interest rates (Croke et al., 2005; Edwards, 2005; Freund and Warnock, 2005) and can cause global contagion effects if the country adjusting its sizeable external imbalance is a large economy (Edwards, 2005; Obstfeld and Rogoff, 2005). However, growing international portfolio diversification can facilitate adjustments in external imbalances, but it poses risks to global financial stability if capital inflows needed to finance current account deficits face an abrupt and major reduction (Edwards, 2005; Obstfeld and Rogoff, 2005).<sup>1</sup>

In this paper, we do not study the consequences of sudden stops of capital flows. On the contrary, we treat capital flows - specifically net international portfolio flows - endogenously, as we are interested in identifying the determinants of net flows in equity securities and debt instruments (bonds plus money market instruments). In particular, we examine whether current account balances (CABs) and net portfolio flows are determined by the same economic fundamentals. If CABs and net portfolio flows were driven by the same determinants in a similar way, then countries' current account deficits would be easily financed by net inflows in portfolio investment. Therefore, external imbalances would be more sustainable, although undesired abrupt adjustments in portfolio flows (i.e. sudden stops) would be more costly.

It is important to clarify that the balance on the financial account is given by the sum of net foreign direct investment, net portfolio flows, net flows in other investment (mainly net cross-border bank loans), net financial derivatives, plus changes in official reserve assets. Therefore, a country's current account deficit is not necessarily associated with net portfolio inflows, if one of the other categories adjusts to equilibrate the balance of payments. However, international portfolio investment plays a key role. For example, the sum of asset and liabilities of portfolio investment stocks of the euro area, the United States and Japan, which are the biggest international players in the financial markets, represent 38%, 39% and 55% of total asset and liability outstanding respectively in these economies.

We study the determinants of CABs and net international flows in both equity securities and debt instruments in one unified empirical framework (i.e. the same data sources and sets of explanatory variables are employed). Additionally, we investigate potential changes that might have taken place in the 1990s due to enhanced global financial integration. To our

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<sup>1</sup> Another branch of literature focuses on the sustainability of current account imbalances computing country-specific thresholds for current account adjustment (Clarida, et al, 2006) and studies the link between exchange rates, trade and net foreign asset positions (Gourinchas and Rey, 2005).



knowledge, the determinants of these three important components of the balance of payments have not yet been investigated in one systematic common framework. This analysis appears particularly useful in the light of the recent remarkable external imbalances across the world.

The theoretical and empirical literature on CABs is extensive being at the core of international macroeconomics, as countries trade goods over time by borrowing and lending to each other in order to smooth final consumption.<sup>2</sup> Conversely, the empirical determinants that systematically influence net international flows in equity securities and debt instruments are barely investigated.

Using the savings-investment balance approach, we provide a quantitative assessment of the importance of macroeconomic and financial variables in explaining CABs and net portfolio flows in a broad sample of developing and industrial countries for the period 1970-2003.

The section of the paper dedicated at studying the determinants of CABs is related to the work of Chinn and Prasad (2003). They provide an empirical investigation for a large sample of countries over the period 1971-1995 and investigate the medium-term fluctuations that are not purely driven by cyclical influences and temporary shocks.<sup>3</sup> They find that the government budget balance, the initial net foreign asset (NFA) position and money to GDP ratio affect systematically CABs.

We use the empirical model of Chinn and Prasad (2003) as a baseline, although there are three important differences. First, we do not explicitly include in the regressions the government budget balance. We abstain from doing so because current account and government budget balances belong to the same savings-investment identity and could be driven by the same shocks and the same deterministic variables.<sup>4</sup> The social security system, for example, comprises a large fraction of the government budget in industrial countries. Therefore, the demographic profile of a country can affect contemporaneously current account and government budget balances. Similarly, GDP growth, the stages of a country's economic development and the level of foreign indebtedness affect both private sector savings-investment balance as well as public savings-investment balance. Second, we add important economic variables, which are expected to affect CABs and net portfolio flows, such as real labour productivity growth, past real GDP growth, the civil liberties enjoyed by countries and, as suggested

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<sup>2</sup> Empirical studies on the intertemporal approach to the current account have been carried out amongst others by Sheffrin and Woo (1990a, 1990b), Otto (1992), Milbourne and Otto (1992), Glick and Rogoff (1995), Otto and Voss (1995), Bergin and Sheffrin (2000), Bergin (2004).

<sup>3</sup> A similar approach applied to developing countries has been adopted by Calderon et al. (2002).

<sup>4</sup> Furthermore, deficit spending shocks have qualitatively and quantitatively different effects than deficit tax shocks (Favero, 2002; Mountford and Uhlig, 2004; Perotti 2004).

by Bergin (2004), deviations from the uncovered interest parity (UIP) condition. Third, our analysis offers a longer and more recent sample from 1970 to 2003.

We then use this framework to explore whether the same variables and some additional financial variables, which are specific to the type of portfolio flows under investigation, affect the net flows in equity securities and debt instruments.

Net equity flows, for example, are often shown to be influenced by past stocks' performance (Froot et al., 2001). Similar results pointing to the argument that capital flows are more likely driven by 'return chasing' than portfolio rebalancing are obtained by Brennan and Cao (1997), Bohn and Tesar (1996) and Bekaert et al. (1999), although the latter study finds that returns shocks lead to net equity inflows only in the first two months. A related literature on portfolio flows is that on portfolio weights. Brandt et al. (2004) provide evidence that the equity portfolio weight assigned to each stock is a function of the firm's size, its value and past performance. None of these papers, however, provides a quantitative assessment of the importance of macroeconomic and financial variables and their effects on net equity flows.

The literature on cross-border debt instruments flows is also in its infancy and is mostly related to international investment in emerging markets (Calvo et al., 1993; Fernandez-Arias, 1996; Chohan et al., 1998; Bekaert et al., 1999). Therefore, we find appropriate and useful to investigate whether the variables affecting CABs together with long-term interest rate differentials systematically influence net flows in debt instruments.

The remainder of the paper is organised as follows: Section 2 presents the potential determinants of CABs and net portfolio flows and discusses some theoretical issues germane to the empirical modelling. Section 3 describes the data and the methodology. Section 4 presents the empirical results on CABs, net equity flows and net flows in debt instruments. Section 5 shows several robustness checks. Section 6 presents the empirical results disentangling the effects on OECD and non-OECD countries. Finally, Section 7 provides a summary and concludes.

## **2. The intertemporal approach of the current account: An empirical perspective**

There is an abundant theoretical literature on the determinants of CABs and capital flows. However, as pointed out by Calderon et al. (2002) and Chinn and Prasad (2003), no single theoretical model captures the entire range of empirical relationships affecting the savings-investment balance of a country and, thereby, its current and financial account balances. Hence, in this section, we discuss the theoretical links between all variables used in this paper and respectively the CABs and net portfolio flows.

## 2.1 Demographic structure

A structural determinant of national savings and investment is the demographic profile of a country.<sup>5</sup> High youth and old-age dependency ratios would bring about a current account deficit and net capital inflows, as a relatively large population of dependent young and old has a relatively lower savings rate (Ando and Modigliani, 1963). Furthermore, countries with a large fraction of young dependents tend to have a high investment demand, as shown by Higgins (1998).

If cross-border capital flows were limited due to home bias, trade restrictions or large transaction costs, capital-intensive countries with a shrinking workforce could face an “asset meltdown” (i.e. a rapid fall in securities prices due to a withdrawal of assets by the retiring baby-boomers), as a fall in domestic asset demand would not be sufficiently compensated by foreign demand (Abel, 2001 and 2003; Brooks, 2000 and 2004).<sup>6</sup> On the contrary, in a financially integrated world, demographic cross-country differences create incentives to invest in younger economies characterised by higher capital demand and higher expected asset returns and in older economies if they offer a higher premium. We instrument the idea that relative differences in countries’ demographic profiles drive international capital flows by using countries’ youth and old-age dependency ratios that are measured relatively to their world averages.

The expected positive relationship between dependency ratios and net capital inflows might not hold for all types of portfolio flows. If pensioners’ savings were reallocated from equity securities to less risky assets, such as global government bonds, then the link with the dependency ratios would differ between types of portfolio flows. In general, households might take less financial risk, as they reach their retirement years (Constantinides et al., 2002). For a more risk-averse domestic investor, the rational response is to demand higher returns on stock and/or a move to fixed income investment, thereby generating net equity inflows and net outflows in debt instruments. Findings by Riley and Chow (1992), for example, indicate a U-shaped relationship between relative risk aversion and age. Similarly, Ameriks

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<sup>5</sup> The dependency hypothesis has also been tested by economic historians. Taylor and Williamson (1994), for example, found that high dependency rates did significantly depress domestic savings rates in the new world economies (Argentina, Australia and Canada) triggering foreign investment from Britain at the end of the 19th century.

<sup>6</sup> The “asset meltdown” hypothesis is based on a simple accounting exercise: when the oldest of the baby boomers begin to turn 65 (expected in the year 2010 in several developed countries), the baby boomers will be selling off their stocks to a much smaller generation of buyers, causing stock prices to decline. If, on the contrary, capital were mobile, the fall in asset prices would be cushioned by capital inflows in search of higher expected returns.

and Zeldes (2000) estimated a hump-shaped age effect on the fraction of household financial assets held in equity securities. Heaton and Lucas (2000) found that the share of equity relative to marketable financial assets declines above age 65, but this effect disappears when the wealth measure includes private business.

A parallel literature has looked at the relation between demographic changes and risk premia in asset prices. Poterba (2004) finds only modest effects of population age structure on real returns on Treasury bills, long-term government bonds, and corporate stocks. Bakshi and Chen (1994) present empirical evidence in favour of the link between the population age distribution and equity premia in the United States, and endorse the hypothesis that an investor's risk aversion increases with age. Ang and Maddaloni (2005) instead find that this relationship is weak when extended to other countries. The evidence, however, has to be interpreted with caution, as the dynamics of asset prices is too volatile relative to developments in the countries' demographic profile.<sup>7</sup>

To our knowledge, the link between demography and international capital flows has only been analysed using the CABs, which is in absolute value the sum of capital and financial accounts. In this study, we address explicitly the role of demography on international portfolio flows in equity securities and debt instruments.

## 2.2 *Real GDP growth*

The interaction of the CABs and of capital flows with real GDP growth is theoretically well established. Modigliani (1970) argued that income growth has an important positive effect on private savings, as workers' savings increase relative to retirees' dissaving. Such a pro-cyclical response of CABs and a counter-cyclical response of capital flows would moderate the costs of business cycles. However, when the economy is growing, workers might anticipate future income increases and, as a result, tend to increase present consumption (Tobin, 1967; Farrell, 1970; Summers, 1981). If this effect dominates, then capital flows are pro-cyclical and CABs counter-cyclical.<sup>8</sup> We employ one-period lagged real GDP growth given the potential collinearity with the labour productivity growth measure.

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<sup>7</sup> See IMF (2004) for a detailed discussion.

<sup>8</sup> For alternative explanations for the relationship between capital flows and economic growth relevant for emerging markets see Kaminsky et al. (2004).



### 2.3 *International competitiveness*

Another fundamental theoretical variable affecting CABs is countries' international competitiveness proxied by the ratio of price inflation across countries, which is often measured by the change in the real exchange rate. We measure competitiveness by the real effective exchange rate (REER), because it contains specific information on how the exchange rate changes within the group of a country's major trade partners. An appreciation of the real effective exchange rate is associated with loss in competitiveness and, as a result, in a deterioration of the CABs.<sup>9</sup>

### 2.4 *"Stages of development"*

The 'stages of development' hypothesis for the balance of payments originates from the development economics literature. It suggests that countries in the early stages of development tend to experience current account deficits, arising from building the infrastructure and expanding domestic markets. In a subsequent phase, as new ideas are transformed into products and services and the country develops some comparative advantage in specific industries, its per capita income rises and the current account deficit declines. Hence, the 'stages of development hypothesis' postulates an inverse U-shaped relationship between current account deficits and relative per capita income. A similar relationship can be also hypothesised for portfolio flows, as investors in global portfolios attracted by expectations of higher asset returns allocate capital to economies with higher potential output growth. As in Chinn and Prasad (2003), we use the ratio of per capita income relative to the corresponding US level and the ratio squared in order to test this hypothesis.

### 2.5 *Financial deepening, borrowing constraint or portfolio shift?*

Money stock to GDP ratio is often used in the literature as a proxy for the depth and sophistication of the financial system. The theoretical argument behind this link is that a well-developed financial system allows households to increase the savings rate (Edwards, 1996). However, this measure could also be a proxy for borrowing constraints, as a more stringent borrowing constraint (lower money to GDP ratio) decreases present consumption and aggregate investment, thereby generating current account surpluses (Edwards, 1996). Empirical studies have shown that savings rates and CABs are positively influenced by money to GDP

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<sup>9</sup> The real exchange rate could be also considered as a proxy of terms of trade (defined as price of exports in terms of imports), given the positive relationship between an appreciation of a country's real exchange rate and an increase in its terms-of-trade (Obstfeld and Rogoff, 1995).

ratio, thus endorsing the financial deepening hypothesis (Edwards, 1996; Chinn and Prasad, 2003).

We offer a third interpretation for such a relationship related to the theory of money demand. A high money stock to GDP ratio might imply lower interest rates. Such an environment is particularly attractive to international investors in domestic stocks, but it discourages investments in fixed income. We can verify empirically whether money to GDP ratio is associated with improvements in CABs, net inflows in equity securities and net outflows in debt instruments. If this were the case, money to GDP ratio would rather proxy a portfolio shift.

### *2.6 Labour productivity growth*

The relationship between current accounts and productivity is well understood and generally depends upon whether productivity growth is permanent or temporary. Permanent productivity growth increases both savings and investment. However, since profitable investment raises the economy's intertemporal consumption possibilities and since capital stock takes time to adjust, the consequent rise in consumption deteriorates the CABs (Glick and Rogoff, 1995). Instead, temporary productivity shocks can lead to a higher increase in savings, due to the household's interest in reducing consumption volatility over time, thereby improving CABs.

The impact of productivity growth on net portfolio flows could also take both signs. Domestic permanent productivity growth could act as a pull factor of international portfolio flows as returns on domestic assets would be expected to rise. However, if productivity growth is temporary, the consequent increase in domestic savings could be partly allocated into global stock and bond markets, which translate into net outflows in portfolio investment.

Glick and Rogoff (1995) define the productivity measure for the G-7 countries as a residual from a Cobb-Douglas production function of the manufacturing sector. Given the role of services particularly in the last two decades and the sizeable country coverage of our study, which include several developed and developing countries for which data to estimate a Cobb-Douglas production function are missing, we employ as a measure of productivity the growth rate in GDP per worker.

### *2.7 "Original sin"*

Countries with an initial net foreign asset (NFA) debtor position might have had a better access to international capital markets and be favoured by international investors. Higher rates of expected returns in these countries or a higher future net export growth might have encour-

aged foreign financing. However, their borrowing has to be repaid by future generations. Since in our sample, the initial NFA positions are largely debtor positions (i.e. the median and mean NFA position in the 1970s amounted to -12.4% and -11.9%, respectively), we could expect current account surpluses and net capital outflows associated with the initial stock of NFA positions.

## 2.8 Civil liberties

Sound institutions and a high degree of governance play an important role in the competitiveness of an economy as well as a country's credibility vis-à-vis international investors. Reliable institutions enhance transparency, and a sound legal and political system offers a better protection against fraud. Therefore, countries' institutions, such as the rule of law, property rights, freedom, and democratic values can affect savings and investment decisions.

We expect that an improvement in countries' civil liberties (i.e. freedom of expression and belief, association and organization rights, rule of law and human rights, personal autonomy and economic rights) reduce the cost of capital and encourage investment in these economies. We capture the development of a country's institutional framework by the civil liberties index compiled by Freedom House, which takes a value between 1 and 7, where 1 indicates a high degree of civil liberties including well-functioning rule of law and enforcement of civil rights. Therefore, net portfolio outflows and current account surpluses are expected to be positively correlated with this index.<sup>10</sup>

## 2.9 Restrictions on the current and capital account

The degree of countries' openness of international trade in goods, services and financial assets can affect CABs and net portfolio flows. Capital controls or restrictions on the current account can be of administrative nature (i.e. direct prohibition, quantity limits or approval procedure) or market-based (i.e. high taxation on foreign transactions). Generally, capital controls are imposed to prevent capital flight, therefore, one might expect smaller current account deficits and smaller net portfolio outflows.

We measure restrictions on the capital and on the current account separately. The two measures are dummy variables that take the value of 1 if restrictions are in place according to the IMF's annual report *Exchange Arrangements and Exchange Restrictions*. Key shortcomings of these indices are that restrictions imposed on domestic or foreign residents cannot be

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<sup>10</sup> Lührmann (2003) provides empirical evidence of a link between the civil liberties index and the CABs.

distinguished and their intensity and effectiveness cannot be measured (Dreher and Siemers, 2004).

### 2.10 Deviations from the UIP

From a theoretical perspective, the optimal international portfolio choice implies the UIP condition which is defined as:  $E_t(s_{t+h} - s_t) = i_{t+h} - i_{t+h}^*$ , where  $s_t$  denotes the nominal domestic exchange rate in terms of foreign currency,  $E_t s_{t+h}$  is the expected spot rate in period  $t+h$ ,  $i_{t+h}$  and  $i_{t+h}^*$  denote respectively domestic and foreign interest rates over the horizon  $h$ . However, one of the puzzles in exchange rate economics is the UIP puzzle, which highlights that the forward exchange rate is a biased predictor of the future spot rate, or, put it differently, that short-term interest rate differentials fail to explain changes in spot exchange rates. Deviations from the UIP could be due to time-varying risk premia, which might have an influence on the allocation of global portfolios.

By estimating an intertemporal current account model for the US and an aggregate of the remaining G-7 countries, Bergin (2004) found that deviations from the UIP can explain two-thirds of movements in the current accounts. He argues that if the de-trended domestic interest rate exceeds the de-trended foreign rate adjusted for the change in the forward exchange rate, the demand for domestic bonds declines because an excess return is required to make household willing to hold domestic bonds in equilibrium. Specifically, a positive deviation from the UIP due to a rise in foreign exchange risk premia can bring about net outflows in debt instruments. This shock affecting the financial account would generate a surplus in the current account. This idea is investigated empirically in this study by constructing the following variable:  $\tilde{i}_{t+h} - \tilde{i}_{t+h}^* - E_t(\tilde{s}_{t+h} - \tilde{s}_t)$ , where tildes indicate deviations from the steady state.

A portfolio shift due to deviations from the UIP can also occur across the different asset classes, as the foreign demand for domestic bonds can be partly shifted to domestic equity securities, thereby generating net equity inflows.

### 2.11 Momentum or portfolio rebalancing?

It has been shown by several authors that net equity flows are positively influenced by past returns (Brennan and Cao, 1997; Bohn and Tesar, 1996; Froot et al., 2001). The relationship is associated with the country's positive momentum (Asness et al., 1997; Rouwenhorst, 1998). This evidence is supported by a parallel literature suggesting that equity portfolio weights assigned to firms' stocks is determined also by the firms' lagged returns (Brandt et



al., 2004). However, international investors might sell the “winning” financial assets to rebalance their portfolio such that the portfolio weights remain constant (Bohn and Tesar, 1996). Therefore, we control for differentials in lagged equity returns and long term bond yields in local currencies to determine net flows in equity securities and debt instruments, respectively.

### *2.12 Market valuation*

The price-earnings ratio of a composite index measures how expensive the stock market is relative to the ability of firms to earn profits. It is a good predictor of equity returns (Campbell and Shiller, 1988) and can be used to value stocks (Campbell and Shiller, 2001). The higher the positive deviation of the price-earnings ratio from its fundamental value, the more overvalued the market is. This might result in a re-allocation of the global equity portfolio. Therefore, we investigate whether the deviation of a market’s price-earnings ratio from its fundamental value affects the country’s net equity flows.

### *2.13 Size effect*

The size effect was first documented by Banz (1981), but subsequently found by other authors including Fama and French (1992) and Brandt et al. (2004) at the firm level. The underlying hypothesis is that companies with a lower market capitalisation are expected to perform better. Fama and French argue that the cross-sectional dispersion in mean returns is due to differences in size risk. In other words, given the ex-ante competitive hedge of large companies, which can better exploit economies of scale, smaller firms ought to offer higher returns on their stocks. This relationship has been studied on a country basis by Asness et al. (1997) in a sample of developed countries and by Bekaert et al. (1997) for the emerging markets. Put into a country context, we expect net equity inflows to be negatively related to a country’s stock market capitalisation.

## **3. Data and methodology**

The empirical analysis is carried out using annual data from 1970 to 2003 as well as over the sub-sample period 1990-2003. The choice of the sub-sample period is motivated by the large increase in cross-border equity and bond flows in the 1990s due to technical change and deregulation of financial markets across the world. Technical change has reduced transaction costs and the costs linked to calculus and computations. Deregulation has mainly increased competition among financial products and markets. Ultimately, countries’ international portfolio flows on both the asset and liability sides skyrocketed over the 1990s. To account for a

potential structural break in the sample, we investigate whether the determinants of CABs and net portfolio flows are significantly different from 1990 onwards.

Depending upon data availability on the individual variables, we conduct the econometric analysis on a sample, which ranges between 44 and 130 countries for the CABs, 27 and 72 countries for net equity flows, and 27 and 74 countries for net flows in debt instruments. The country data on CABs, asset and liabilities of portfolio flows and other macroeconomic key variables originate from the International Financial Statistics of the IMF and the World Development Indicators of the World Bank.<sup>11</sup> Additional data were added from other sources after extensive consistency checks. The financial variables are taken from Thomson Financial DataStream, while the demographic variables are taken from the UN World Population Prospects. A detailed description of the sample, the data sources and summary statistics of the variables can be found in Appendices A, B and C.

To facilitate the comparison of the results among the different model specifications, CABs and net portfolio flows are defined such that a positive coefficient on the explanatory variables implies an increase in the current account deficit and net portfolio inflows.<sup>12</sup> The three dependent variables are defined as a percentage of GDP in order to control for country size.

The variance decomposition analysis of the data shows that approximately half of the variation is of cross-sectional nature (see Tables 1). Specifically, the cross-sectional variation amounts to 49% for CABs, 69% for net equity flows and 41% for net flows in debt instruments. Therefore, we employ a pooled estimation method to explain the time-series as well as the cross-sectional variation of CABs and net portfolio flows. This method permits to exploit all information contained in the sample.

If unobserved heterogeneity is present in the pooled OLS estimations, the composite errors would be potentially heteroskedastic. Therefore, in order not to bias the inference of the pooled OLS, we use the heteroskedasticity-robust Huber-White-Sandwich variance estimator.

First, we present results based on non-overlapping five-year averages, which allow investigating medium-term determinants, as also suggested by Chinn and Prasad (2003). Addi-

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<sup>11</sup> We eliminated those countries with no observations after the year 2001, adding up to a total of 144, 65, and 34 deleted observations respectively on the CABs, net flows in debt instruments and equity securities. Additionally, we deleted six observations on equity flows and thirteen observations on net flows in debt instruments for Ireland, because they are extreme outliers amounting respectively to 16-54% and above 33% of GDP. The samples without the observations of Ireland on net flows in equity securities and debt instruments range respectively from -14% to 18% of GDP and from -18% to 14% of GDP, while the sample mean amounts respectively to -0.02% and 0.11% of GDP.

<sup>12</sup> We calculate the net portfolio inflows subtracting the net flows of assets from the net flows of liabilities.

tionally, the sample is analyzed at annual frequency, in which the business cycle has a greater influence.

In order to test the robustness of the findings, we present in Section 5 fixed-effects regression results, thereby filtering all time-constant cross-sectional variation and relying largely on the time variation. We also examine the results of cross-sectional regressions, where we take averages of all variables over the whole sample period, such that each country represents one observation in the sample. This approach assumes all variation to be purely cross-sectional.

Table 1  
Decomposition of variance into cross section and time series variation

	Total variance	in % of total variance	
		Across countries	Over time
Current account / GDP	6.13	46.56	53.44
Net equity flows / GDP	2.16	68.60	31.40
Net flows in debt instruments / GDP	3.87	46.73	53.27
Relative old-age dependency ratio	67.15	49.92	50.08
Relative youth dependency ratio	31.87	46.13	53.87
Real GDP growth	3.67	63.30	36.70
Civil Liberties	1.46	49.29	50.71
M3 / GDP	41.20	47.71	52.29
Relative income	27.41	51.35	48.65
REER growth	8.99	71.43	28.57
Labour productivity growth	36.86	76.87	23.13
Deviation from the UIP	1944.32	75.30	24.70
NFA / GDP (initial)	19.77	48.51	51.49
Capital controls (current account)	0.50	54.23	45.77
Capital controls (capital account)	0.45	52.22	47.78
Long-term yields differential	4435.33	82.11	17.89
Deviation of Price/Earnings ratio	5.27	88.85	11.15
Market Capitalization / GDP	41.68	50.96	49.04
Equity return Differential	48.91	67.77	32.23

Notes: This table shows the proportion of total variance of each variable that is attributable to variation across countries and over time based on annual observations.

We proceed in several steps in specifying the empirical model for the three different endogenous variables. We start with specification (1) including dependency ratios and a set of macroeconomic variables that might particularly affect CABs represented by an index of Civil Liberties, lagged real GDP growth, lagged M3 to GDP ratio, relative income and relative income squared. In the second specification, we add the lagged growth rate of the real effective exchange rate and the growth rate of labour productivity. Then, we add the deviations from

the UIP. Finally, the full model includes initial NFA to GDP ratio and capital controls on current and capital accounts.

An additional model specification is estimated for the portfolio flows, to take into account the role of security-specific financial variables. In the case of net equity flows, we examine the role of equity return differentials, market capitalisation to GDP ratio and deviation of the price-earnings ratio from its fundamental value; whereas we focus on long-term yield differentials when examining net flows in debt instruments.

## 4. Results

### 4.1 The current account deficit

In this subsection, we aim at identifying the medium- and short-term determinants of CABs. Thus, we use the panel data set at two frequencies: first we use non-overlapping 5-year averages of the data and then we employ annual observations.

The results of the medium-term determinants are reported in Table 2. The first specification is based on a sample of 130 countries. The country coverage in the subsequent specifications with additional explanatory variables declines due to the lack of data. Despite the reduction of the sample, the empirical findings are generally quite robust across all specifications.

The results suggest that both dependency ratios consistently affect countries' current account deficits, since the coefficients are positive and statistically significant. This is consistent with the view that a high future workforce potential triggers a higher investment demand, while generating low savings domestically. Equally, the repatriation of foreign savings by ageing investors generates current account deficits. It is worth pointing out that the coefficient on the youth dependency ratio exceeds that of the old-age dependency ratio by two to three times. However, to illustrate and compare the magnitude of the demographic effects, we compute the effect of a change in the relative dependency ratios by one standard deviation. The standard deviation of a country's youth (old-age) dependency ratios from the world average is in the range of 34% (53%) and the median deviation is 6.7% (21.5%).<sup>13</sup> Hence, if relative youth (old-age) dependency ratios rise by one standard deviation, i.e. by 34% (53%), the increase in the current account deficit will be in the range of 1.4%-1.5% (1%-1.1%) of GDP. In the future, these relative demographic differences will become even larger: one standard deviation in youth (old-age) dependency ratio, averaged over the period 2005-2050, is expected

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<sup>13</sup> These statistics are average deviations over the sample period.

to have a value of 42.6% (65.7%). Therefore, the CAB is expected to decline by an average of 59-64 basis points as a percentage of GDP as a result of future population dynamics. These results are similar to the IMF's findings that are based on a 115-country panel data set covering the period 1960–2000, where the data for each country are averaged over each decade. The IMF (2004) finds that CABs increase with the relative size of the working-age population, and decrease when the elderly dependency ratio rises. Moreover, the magnitude of the coefficients is very similar to those reported in Table 2.<sup>14</sup>

Table 2  
Results for the current account deficit to GDP ratio  
(Pooled OLS estimation with time effects, non-overlapping 5-yr averages, 1970-2003)

	(1)	(2)	(3)	(4)
Relative old-age dependency ratio	0.0215*** (3.04)	0.0187** (2.24)	0.0180** (2.03)	0.0210** (2.42)
Relative youth dependency ratio	0.0520*** (4.39)	0.0731*** (3.33)	0.0488* (1.95)	0.0451* (1.78)
Real GDP growth (t-1)	0.0013 (0.02)	0.1448 (1.22)	0.3121** (2.13)	0.2462* (1.70)
Civil Liberties	-0.6209*** (3.03)	-0.8819*** (3.11)	-1.2235*** (3.02)	-0.9055*** (2.21)
M3 / GDP (t-1)	-0.0183*** (2.66)	-0.0269*** (3.74)	-0.0215*** (2.65)	-0.0208** (2.60)
Relative income	-0.0517 (1.25)	0.0358 (0.74)	-0.0217 (0.34)	0.0186 (0.26)
Relative income <sup>2</sup>	-0.0004 (0.95)	-0.0012** (2.33)	-0.0008 (1.28)	-0.001 (1.33)
REER growth (t-1)		0.1157*** (4.86)	0.0782 (1.33)	-0.0483 (0.88)
Labour productivity growth		-0.0084 (1.38)	0.0015 (0.30)	-0.0048 (1.18)
Deviation from the UIP			-0.0001 (0.46)	-0.0001 (0.36)
NFA / GDP (0)				-0.0447** (2.40)
Capital controls (current account)				-0.0242 (0.03)
Capital controls (capital account)				-0.3483 (0.38)
Constant	0.4095 (0.20)	-1.659 (0.57)	1.2123 (0.34)	-1.8102 (0.50)
Number of observations	645	330	235	190
Number of countries	130	78	63	44
Adjusted R <sup>2</sup>	0.16	0.31	0.27	0.25

Notes: Robust *t* statistics are reported in parentheses. The symbols \*, \*\* and \*\*\* indicate statistical significance at the 10 percent, 5 percent, and 1 percent levels, respectively.

<sup>14</sup> These results have been also confirmed by Higgins (1998), and Lührmann (2003).

The impact of the past development in real GDP growth on the current account deficit is positive, but not robust across all specifications. In the last two specifications, we find potentially a countercyclical relation, as a rise in GDP growth is accompanied by a decline in CABs.

We find a robust negative coefficient of the Civil Liberty index across all specifications. Countries with better institutions (i.e. lower index in civil liberties) are characterised by current account deficits, because they are relatively better able to attract foreign capital.

Another important determinant of CABs is the monetary aggregate. All four specifications indicate that a rise in M3 relative to GDP is associated with a current account surplus. This result is generally found in the literature (Chinn and Prasad, 2003) and is associated with financial deepening, as a country's financial development stimulates its domestic savings rate. However, if a higher M3 to GDP ratio is associated through the money demand channel with lower interest rates, then a portfolio shift could explain the improvement in the CABs. This hypothesis is corroborated when looking at the effects of money on international portfolio flows.

As to the 'original sin' hypothesis, the empirical evidence suggests a negative relationship between the initial NFA position and the current account deficit. The 'original sin' hypothesis is therefore validated by the empirical results, as the initial foreign debt triggered current account surpluses in the subsequent decades. A similar coefficient was also found by Chinn and Prasad (2003).

The data frequency adopted in Table 2 emphasises the medium term perspectives of CABs. The same specifications based on annual data are presented in Table 3. In particular, the first four specifications are obtained using the full annual sample period from 1970 to 2003, while the following four specifications are based on the sub-sample 1990-2003. The results obtained using the shorter sample are shown to verify whether global financial integration - enhanced over the 1990s - has altered the determinants of CABs and net portfolio flows, or changed the impact of these determinants.

The results are broadly similar to those reported in Table 2. The additional findings refer to lagged real GDP growth, which shows a statistically significant countercyclical relation in almost all specifications; countries' international competitiveness – measured by the change in the real effective exchange rate – and capital controls, which become statistically significant with the expected sign.

Table 3  
Results for the current account deficit to GDP ratio  
(Pooled OLS estimation with time effects, annual data)

	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
	1970 2003				1990 2003			
Relative old-age dependency ratio	0.0201*** (5.12)	0.0218*** (4.38)	0.0162*** (3.23)	0.0172*** (3.45)	0.0224*** (4.06)	0.0303*** (4.43)	0.0249*** (3.61)	0.0259*** (3.28)
Relative youth dependency ratio	0.0501*** (7.56)	0.0840*** (5.92)	0.0469*** (3.53)	0.0494*** (3.50)	0.0567*** (6.67)	0.0972*** (5.52)	0.0603*** (3.64)	0.0603*** (3.39)
Real GDP growth (t-1)	0.0218 (0.70)	0.1358*** (2.59)	0.2804*** (5.30)	0.2082*** (3.68)	0.0999*** (2.73)	0.2017*** (3.91)	0.2739*** (4.34)	0.1886** (2.44)
Civil Liberties	-0.5835*** (5.39)	-0.7268*** (4.81)	-1.1735*** (5.42)	-0.9089*** (4.09)	-0.9532*** (6.72)	-0.9871*** (5.11)	-1.4963*** (5.05)	-1.1190*** (3.40)
M3 / GDP (t-1)	-0.0189*** (4.90)	-0.0240*** (6.36)	-0.0196*** (4.60)	-0.0204*** (4.81)	-0.0210*** (4.64)	-0.0232*** (5.04)	-0.0178*** (3.34)	-0.0186*** (3.33)
Relative income	-0.0397* (1.73)	0.0460* (1.66)	-0.0426 (1.10)	-0.0378 (0.79)	-0.0514* (1.77)	0.0295 (0.90)	-0.0455 (1.00)	-0.0349 (0.59)
Relative income <sup>2</sup>	-0.0005** (2.22)	-0.0012*** (4.30)	-0.0005 (1.40)	-0.0002 (0.50)	-0.0005 (1.59)	-0.0012*** (3.63)	-0.0007 (1.58)	-0.0004 (0.71)
REER growth (t-1)		0.0314*** (4.62)	0.0541*** (2.63)	0.0303 (1.64)		0.0677*** (2.72)	0.0577** (2.06)	0.0368 (1.19)
Labour productivity growth		-0.0066** (2.51)	-0.0005 (0.28)	-0.0017 (1.08)		-0.0044 (1.40)	-0.0005 (0.23)	-0.0021 (1.11)
Deviation from the UIP			-0.0001 (0.54)	-0.0001 (0.59)			-0.0001 (0.56)	-0.0001 (0.63)
NFA / GDP (0)				-0.0563*** (5.59)				-0.0512*** (3.58)
Capital controls (current account)				-0.8535** (2.27)				0.0091 (0.02)
Capital controls (capital account)				-0.2989 (0.64)				-0.1274 (0.21)
Constant	-1.1282 (0.69)	-4.1438** (2.07)	0.0034 (0.00)	0.7611 (0.31)	0.8434 (0.50)	-5.3432** (2.10)	0.3513 (0.14)	-4.3152 (1.51)
Number of observations	2901	1410	980	810	1673	918	670	517
Number of countries	130	78	63	44	130	78	63	44
Adjusted R <sup>2</sup>	0.13	0.22	0.24	0.26	0.16	0.26	0.28	0.26
Chow Test					4.40 (0.0001)	4.49 (0.0000)	3.63 (0.0001)	3.18 (0.0001)

Notes: Robust *t* statistics are reported in parentheses. The symbols \*, \*\* and \*\*\* indicate statistical significance at the 10 percent, 5 percent, and 1 percent levels, respectively.

The Chow tests reported in the last column of Table 3 reject the hypothesis of equal coefficients in the samples before and after 1990. However, when testing for equal coefficients of the regressors separately, it turns out that only the civil liberties variable is systematically different between the two time periods across all specifications. In fact, testing for equal coefficients in all regressors except civil liberties reveals no systematic differences between the two samples. We can safely argue that the sample is not characterised by substantial structural changes.

#### **4.2. Net equity flows**

This sub-section is devoted to studying the determinants of net equity inflows as a percentage of GDP, using the same estimation approach adopted to study the short- and medium-term determinants of CABs (see Tables 4, 5a and 5b).

In a nutshell, we find that the demographic profile of a country and the quality of its institutions systematically affect both CABs and net international equity flows in the short- as well as medium-term with very similar coefficients, while the initial NFA position affects the evolution of net equity flows only in the short term.

In the medium term, i.e. when using non-overlapping 5-year averages, increases in old-age and youth dependency ratios relative to the world average induce net equity inflows - at least in the first three specifications characterised by a larger number of observations and countries (see Table 4). If relative youth (old-age) dependency ratios rise by one standard deviation, i.e. by 34% (53%), the increase in net equity inflows will be in the range of 0.33%-0.64% (0.36%-0.42%) of GDP.

The second important variable influencing net equity flows systematically is the quality of institutions. As expected, an improvement in a country's civil liberties encourages international investments in the purchase of this economy's stocks.

We also find a strong relationship between net equity flows and M3 to GDP ratio. However, while the current account deficit was negatively affected by developments in money stock, the coefficient on net equity inflows is positive and statistically significant in all five specifications. This can be associated to the portfolio shift argument. A rise in M3 to GDP ratio might be associated with lower interest rates, which might encourage domestic and foreign investors in the purchase of domestic stocks.



Table 4  
Results for net equity inflows to GDP ratio  
(Pooled OLS estimation with time effects, non-overlapping 5-yr averages, 1970-2003)

	(1)	(2)	(3)	(4)	(5)
Relative old-age dependency ratio	0.0074** (2.09)	0.0080** (2.04)	0.0068* (1.73)	0.0087 (1.48)	0.0092 (1.28)
Relative youth-dependency ratio	0.0098* (1.82)	0.0186** (2.05)	0.0190** (2.05)	0.0184 (1.25)	0.0064 (0.31)
Real GDP growth (t-1)	0.0090 (0.51)	0.0011 (0.03)	0.0066 (0.19)	0.0151 (0.30)	0.0064 (0.09)
Civil Liberties	-0.3254** (1.98)	-0.4802** (2.13)	-0.5888** (2.35)	-0.5317* (1.81)	-0.5916* (1.76)
M3 / GDP (t-1)	0.0053* (1.78)	0.0069** (2.16)	0.0060* (1.71)	0.0088** (2.13)	0.0079* (1.74)
Relative income	-0.0143 (0.71)	-0.0141 (0.63)	-0.0251 (0.93)	-0.0425 (1.04)	-0.0605 (1.05)
Relative income <sup>2</sup>	-0.0003 (1.46)	-0.0003 (1.56)	-0.0002 (0.87)	0.0000 (0.01)	0.0001 (0.18)
REER growth (t-1)		0.0098 (0.57)	0.0134 (0.73)	0.0183 (0.43)	0.0319 (0.67)
Labour productivity growth		-0.0013 (0.92)	-0.0013 (0.83)	-0.0003 (0.10)	0.0004 (0.11)
Deviation from the UIP			0.0002*** (6.55)	0.0003 (0.80)	0.0003 (0.57)
Equity return differential (t-1)				0.0018 (0.35)	0.0029 (0.44)
Market capitalization (t-1)				-0.0107 (1.51)	-0.0068 (0.93)
Deviation of price-earnings ratio (t-1)				-0.0479 (0.72)	-0.0675 (0.85)
NFA / GDP (0)					-0.0096 (1.02)
Capital controls (current account)					0.2006 (0.50)
Capital controls (capital account)					0.1504 (0.24)
Constant	-0.4001 (0.45)	-0.6273 (0.56)	0.0844 (0.06)	0.1260 (0.05)	1.2910 (0.40)
Number of observations	222	178	158	118	108
Number of countries	72	55	50	34	29
Adjusted R <sup>2</sup>	0.19	0.22	0.24	0.20	0.19

Notes: Robust *t* statistics are reported in parentheses. The symbols \*, \*\* and \*\*\* indicate statistical significance at the 10 percent, 5 percent, and 1 percent levels, respectively.

Re-estimating the specifications using annual data yields very similar results (see Table 5a). The main differences are the negative coefficients on the initial NFA position and relative per capita income. The latter result implies that when countries become richer part of their savings is allocated in international equity portfolio, thereby generating net equity outflows. Over the sub-sample period 1990-2003, net equity flows are also affected by deviations

from the UIP. The sign of the coefficient is positive endorsing the global portfolio shift hypothesis suggested by Bergin (2004).

Table 5a:  
Results for net inflows in equity securities to GDP ratio  
(Pooled OLS regression with time effects, annual data, 1970-2003)

	(1)	(2)	(3)	(4)	(5)
Relative old-age dependency ratio	0.0075*** (3.31)	0.0079*** (2.86)	0.0057** (1.98)	0.0078* (1.86)	0.0101** (2.00)
Relative youth-dependency ratio	0.0074** (2.14)	0.0130* (1.95)	0.0113 (1.53)	0.011 (1.04)	0.0011 (0.08)
Real GDP growth (t-1)	-0.002 (0.12)	-0.0084 (0.35)	-0.008 (0.27)	-0.0422 (0.93)	-0.0453 (0.86)
Civil Liberties	-0.3388*** (3.33)	-0.5038*** (3.71)	-0.6553*** (4.33)	-0.5942*** (3.70)	-0.6498*** (3.72)
M3 / GDP (t-1)	0.0042** (2.34)	0.0049** (2.56)	0.0047** (2.23)	0.0069*** (2.81)	0.0069*** (2.67)
Relative income	-0.0365** (2.42)	-0.0410** (2.45)	-0.0613*** (2.97)	-0.0805*** (3.24)	-0.0995*** (3.17)
Relative income <sup>2</sup>	-0.00003 (0.19)	-0.00003 (0.21)	0.0001 (0.77)	0.0003 (1.46)	0.0004 (1.62)
REER growth (t-1)		-0.009 (1.48)	-0.009 (1.38)	-0.0095 (0.91)	-0.0055 (0.48)
Labour productivity growth		-0.0004 (0.64)	-0.0003 (0.46)	-0.0012 (1.24)	-0.0013 (1.30)
Deviation from the UIP			0.0002*** (5.93)	0.0002 (1.28)	0.0002 (1.17)
Equity return differential (t-1)				0.0021 (0.99)	0.0038 (1.28)
Market capitalization (t-1)				-0.0068 (1.38)	-0.003 (0.60)
Deviation of price-Earnings ratio (t-1)				0.0034 (0.16)	0.0074 (0.31)
NFA / GDP (0)					-0.0141** (2.24)
Capital controls (current account)					0.0586 (0.22)
Capital controls (capital account)					0.5612 (1.41)
Constant	0.4802 (0.65)	-0.0894 (0.09)	1.4489 (1.12)	1.4521 (0.84)	1.7244 (0.90)
Number of observations	894	732	645	488	447
Number of countries	72	55	50	34	29
Adjusted R <sup>2</sup>	0.12	0.14	0.17	0.14	0.14

Notes: Robust *t* statistics are reported in parentheses. The symbols \*, \*\* and \*\*\* indicate statistical significance at the 10 percent, 5 percent, and 1 percent levels, respectively.

**Table 5b**  
**Results for net inflows in equity securities to GDP ratio**  
(Pooled OLS regression with time effects, annual data, 1990-2003)

	(1)	(2)	(3)	(4)	(5)
Relative old-age dependency ratio	0.0124*** (3.68)	0.0143*** (3.32)	0.0112** (2.48)	0.0201*** (2.93)	0.0223*** (2.97)
Relative youth dependency ratio	0.0160*** (3.19)	0.0299*** (3.05)	0.0254** (2.37)	0.0375** (2.36)	0.0181 (0.93)
Real GDP growth (t-1)	-0.0038 (0.19)	-0.0095 (0.35)	-0.0122 (0.37)	-0.0562 (1.06)	-0.0734 (1.16)
Civil Liberties	-0.4304*** (3.41)	-0.6121*** (3.71)	-0.7885*** (4.31)	-0.7262*** (3.66)	-0.8700*** (3.93)
M3 / GDP (t-1)	0.0044** (2.02)	0.0052** (2.23)	0.0046* (1.78)	0.0069** (2.39)	0.0092*** (2.99)
Relative income	-0.0315** (1.98)	-0.0356** (2.07)	-0.0562*** (2.63)	-0.0803*** (3.14)	-0.1057*** (3.35)
Relative income2	-0.0002 (1.11)	-0.0002 (1.06)	.00002 (0.10)	0.0002 (0.92)	0.0004 (1.47)
REER growth (t-1)		-0.0076 (0.96)	-0.0061 (0.73)	0.0076 (0.49)	0.0248 (1.42)
Labour productivity growth		-0.0007 (1.01)	-0.0006 (0.71)	-0.0009 (0.85)	-0.0008 (0.71)
Deviation from the UIP			0.0002*** (4.61)	0.0009* (1.71)	0.0010* (1.85)
Equity return differential (t-1)				0.0024 (0.88)	0.0064 (1.49)
Market capitalization (t-1)				-0.0046 (0.90)	-0.0016 (0.29)
Deviation of Price-Earnings ratio (t-1)				0.0025 (0.11)	0.0084 (0.30)
NFA / GDP (0)					-0.0146* (1.77)
Capital controls (current account)					0.7219* (1.92)
Capital controls (capital account)					0.72 (1.60)
Constant	-0.4735 (0.52)	-0.9953 (0.74)	0.6963 (0.42)	-1.0814 (0.47)	-0.1934 (0.07)
Number of observations	654	539	466	347	313
Number of countries	72	55	50	34	29
Adjusted R2	0.17	0.19	0.22	0.22	0.24
Chow test	8.80 (0.000)	6.47 (0.000)	8.48 (0.000)	4.12 (0.000)	4.52 (0.000)

Notes: Robust *t* statistics are reported in parentheses. The symbols \*, \*\* and \*\*\* indicate statistical significance at the 10 percent, 5 percent, and 1 percent levels, respectively.

Some differences can be identified when re-estimating the models over the sub-sample period 1990-2003 (see Table 5b). The Chow test reveals that the null hypothesis of equal coefficients is strongly rejected. However, testing for equal coefficients for each regressor separately reveals that systematic differences in the coefficients are mainly due to differences in the relative youth dependency variable.

### 4.3 Net flows in debt instruments

The global investment in fixed income, both short- and long-term debt instruments is another important component of international capital flows. Similarly to the analysis carried out for the net equity flows, we aim at studying short- and medium-term determinants of net inflows in debt instruments as a ratio to GDP and at identifying common determinants with the CABs (see Tables 6, 7a and 7b).

We find that the monetary aggregate and the initial NFA position systematically affects both CABs and international flows in debt instruments in the medium-term with comparable coefficients. Moreover, net flows in debt instruments are affected by interest rate differentials, deviations for the UIP, capital controls, labour productivity growth and relative per capita income.

If a country's financial system deepens, the domestic savings rate is stimulated, which leads to current account surplus and net outflows in debt instruments (Table 6). The alternative preferred explanation is linked to the portfolio shift argument. If a higher monetary aggregate to GDP ratio is due to lower interest rates, then investment in fixed income is less attractive and net outflows in debt securities would be observed.

Fixed income operations imply debt contracts, which explicitly state the maturity, the coupon and the amount to be repaid. This might explain why the initial NFA position does affect developments in cross-border debt instruments.

The results on deviations from the UIP validate the hypothesis suggested by Bergin (2004). Positive shocks to the UIP yield net debt instruments outflows, as the demand for domestic bonds declines to achieve a new equilibrium.

The results on the "stages of development" hypothesis have to be interpreted with some caution, because the coefficients on the relative income variables are significant only in the last two specifications with the expected sign. Poorer countries finance their development by issuing or selling debt instruments and reversing this process as they become richer.

The effect of real labour productivity growth is not robust across the different specifications. Its coefficient is statistically significant and negative in specifications (2) and (3), but positive in specification (4). In the last column of Table 6, no significant impact is found.

Table 6  
Results for net inflows in debt instrument to GDP ratio  
(Pooled OLS estimation with time effects, non-overlapping 5-yr averages, 1970-2003)

	(1)	(2)	(3)	(4)	(5)
Relative old-age	0.0011	0.0019	0.0004	-0.0076	-0.0110*
Dependency ratio	(0.22)	(0.35)	(0.07)	(1.39)	(1.73)
Relative youth	-0.0025	-0.0005	0.0030	0.0127	0.0038
Dependency ratio	(0.47)	(0.06)	(0.38)	(0.80)	(0.15)
Real GDP growth (t-1)	0.0487	0.0706	0.0361	-0.0849	-0.1685
	(0.93)	(0.97)	(0.51)	(0.76)	(1.52)
Civil Liberties	-0.4480*	-0.4818	-0.6509	0.2921	0.5961
	(1.86)	(1.52)	(1.59)	(0.61)	(1.20)
M3 / GDP (t-1)	-0.0202***	-0.0185***	-0.0176***	-0.0177***	-0.0136***
	(3.85)	(3.64)	(3.32)	(3.80)	(3.08)
Relative income	-0.0021	-0.0031	0.0066	0.1329***	0.1679**
	(0.05)	(0.06)	(0.11)	(2.95)	(2.30)
Relative income <sup>2</sup>	-0.0001	-0.0001	-0.0003	-0.0011***	-0.0013**
	(0.14)	(0.22)	(0.57)	(2.68)	(2.12)
REER growth (t-1)		-0.0246	-0.0467	-0.0211	-0.0226
		(0.97)	(1.37)	(0.46)	(0.51)
Labour productivity growth		-0.0088***	-0.0113***	0.2714**	0.1501
		(3.37)	(5.21)	(2.14)	(0.82)
Deviation from the UIP			-0.0005***	-0.0005***	-0.0004***
			(6.08)	(9.32)	(9.46)
Long-term yield differentials (t-1)				0.0001***	0.0001***
				(2.77)	(2.99)
NFA / GDP (0)					-0.0245*
					(1.67)
Capital controls (current account)					0.8058
					(1.42)
Capital controls (capital account)					-1.6712***
					(2.92)
Constant	2.3618**	2.2833	2.7647	-1.8099	-2.5009
	(2.11)	(1.57)	(1.37)	(0.66)	(0.66)
Number of observations	266	214	183	127	114
Number of countries	74	60	54	34	27
Adjusted R <sup>2</sup>	0.12	0.12	0.23	0.28	0.33

Notes: Robust *t* statistics are reported in parentheses. The symbols \*, \*\* and \*\*\* indicate statistical significance at the 10 percent, 5 percent, and 1 percent levels, respectively.

Additional potential driving forces of global investment in fixed income in the medium term are long-term yield differentials. The results presented in specifications (4) and (5) suggest that net debt instrument inflows are positively influenced by past performance.

Restrictions on the capital account systematically affect net flows in debt instruments. The coefficient is negative and statistically significant at the 1% level. Countries frequently introduce capital controls on portfolio flows to limit the consequences of capital flights. These capital controls make the domestic financial market less attractive for foreigners and domestic

residents can react to the restrictive policies by allocating their savings abroad, if capital flows are not blocked completely.

In order to investigate the short-term determinants of global investment in fixed income, the same specifications are investigated using annual observations, respectively for the entire sample period (see Table 7a) and the sub-sample period 1990-2003 (see Tables 7b).

Table 7a  
Results for net inflows in debt instruments to GDP ratio  
(Pooled OLS estimation, annual data, 1970-2003)

	(1)	(2)	(3)	(4)	(5)
Relative old-age dependency ratio	-0.00323 (1.20)	-0.00421 (1.38)	-0.0052 (1.56)	-0.00986** (2.56)	-0.01240*** (2.79)
Relative youth dependency ratio	-0.00689* (1.77)	-0.00558 (0.84)	-0.00027 (0.03)	0.01934 (1.45)	0.01665 (0.91)
Real GDP growth (t-1)	0.05201* (1.95)	0.04596 (1.52)	0.04867 (1.25)	0.03243 (0.56)	-0.04071 (0.71)
Civil Liberties	-0.32148*** (2.81)	-0.32278** (2.26)	-0.47831*** (2.68)	0.18358 (0.67)	0.57601* (1.90)
M3 / GDP (t-1)	-0.01849*** (5.67)	-0.01918*** (5.80)	-0.01794*** (4.72)	-0.01811*** (4.91)	-0.01347*** (3.99)
Relative income	0.01376 (0.58)	0.01188 (0.44)	0.00981 (0.32)	0.10185*** (2.71)	0.14174** (2.45)
Relative income <sup>2</sup>	-0.00017 (0.70)	-0.00017 (0.63)	-0.00019 (0.64)	-0.00077** (2.16)	-0.00090* (1.78)
REER growth (t-1)		-0.00308 (0.34)	-0.00873 (0.82)	-0.00855 (0.63)	-0.01216 (0.90)
Labour productivity growth		-0.00494*** (3.53)	-0.00573*** (5.59)	0.04093 (0.85)	-0.08265 (1.51)
Deviation from the UIP			-0.00023*** (3.12)	-0.00025*** (4.35)	-0.00024*** (5.04)
Long-term yield differentials (t-1)				-0.00011*** (5.09)	-0.00009*** (3.88)
NFA / GDP (0)					-0.03260*** (3.22)
Capital controls (current account)					0.65339* (1.84)
Capital controls (capital account)					-0.94399** (2.41)
Constant	3.35808*** (3.34)	4.03678*** (3.03)	4.94335*** (2.90)	1.49057 (0.67)	-0.37762 (0.14)
Number of observations	1035	830	718	502	473
Number of countries	74	60	54	34	27
Adjusted R <sup>2</sup>	0.06	0.08	0.1	0.12	0.16

Notes: Robust *t* statistics are reported in parentheses. \*, \*\* and \*\*\* indicate significance at the 10, 5, 1 percent level.

**Table 7b**  
**Results for net inflows in debt instruments to GDP ratio**  
(Pooled OLS estimation, annual data, 1990-2003)

	(1)	(2)	(3)	(4)	(5)
Relative old-age dependency ratio	-0.00505 (1.30)	-0.00666 (1.45)	-0.00785 (1.60)	-0.02027*** (3.26)	-0.02603*** (3.33)
Relative youth dependency ratio	-0.00818 (1.62)	-0.01257 (1.40)	-0.00813 (0.77)	-0.01549 (0.91)	-0.00693 (0.32)
Real GDP growth (t-1)	0.0247 (0.87)	0.03311 (0.97)	0.03083 (0.68)	-0.01604 (0.21)	-0.08155 (1.02)
Civil Liberties	-0.27566* (1.95)	-0.33923* (1.93)	-0.52357** (2.30)	0.42552 (1.24)	0.93315** (2.43)
M3 / GDP (t-1)	-0.01834*** (4.70)	-0.01837*** (4.61)	-0.01637*** (3.56)	-0.01730*** (3.71)	-0.01488*** (3.45)
Relative income	0.00459 (0.17)	-0.00066 (0.02)	-0.0089 (0.26)	0.09069** (2.23)	0.19192*** (2.61)
Relative income <sup>2</sup>	-0.00005 (0.20)	-0.00003 (0.12)	-0.00002 (0.05)	-0.00059 (1.53)	-0.00121** (1.99)
REER growth (t-1)		-0.00287 (0.22)	-0.01025 (0.71)	-0.00444 (0.18)	-0.00742 (0.29)
Labour productivity growth		-0.00493*** (3.53)	-0.00579*** (5.39)	0.04089 (0.73)	-0.09664 (1.45)
Deviation from the UIP			-0.00025*** (3.84)	-0.00028*** (6.26)	-0.00025*** (5.56)
Long-term yield differentials (t-1)				-0.00012*** (5.48)	-0.00009*** (3.30)
NFA / GDP (0)					-0.02815* (1.95)
Capital controls (current account)					0.69251 (1.33)
Capital controls (capital account)					-1.71792** (2.40)
Constant	3.00221** (2.46)	4.38565*** (2.81)	4.94435*** (2.60)	2.92082 (1.08)	-0.56003 (0.17)
Number of observations	736	603	513	329	307
Number of countries	74	60	54	34	27
Adjusted R <sup>2</sup>	0.05	0.07	0.09	0.12	0.16
Chow test	2.17 (0.0347)	1.64 (0.1005)	3.14 (0.0010)	4.49 (0.0000)	2.54 (0.0022)

Notes: Robust *t* statistics are reported in parentheses. \*, \*\* and \*\*\* indicate significance at the 10, 5, 1 percent level.

In addition to the results obtained when using non-overlapping 5-year averages, we find that net flows in debt instruments are negatively affected by the old-age dependency ratio. Countries with a relatively older population face net outflows in debt instruments. As pointed out in Section 2, we do not expect a symmetric link between dependency ratios and net capital inflows for all types of portfolio flows. If retired persons behaved as if they were more risk-averse and rebalanced their portfolios in favour of less risky assets, we would expect that a relatively large old-age dependency ratio triggered net outflows of debt instru-

ments, as also the demand for foreign debt securities would increase. We find support for this hypothesis only in specifications (4) and (5). However, if net outflows in debt instruments are due to lower purchases of domestic bonds by non-residents, then an “asset meltdown” in fixed income can be expected, as a fall in domestic bond demand would not be sufficiently compensated by foreign demand.

The effect of real labour productivity growth is not robust across the different specifications, but its coefficient is statistically significant and negative in specifications (2) and (3). The main difference - compared to the results obtained when using non-overlapping 5-year averages - is that long-term interest rate differentials negatively affect international investments in fixed income. This means that on annual basis international investors tend to move into fixed income markets to rebalance their portfolio in order to keep their portfolio weights constant.

Finally, the results reported in Tables 7a and 7b are consistent in that they identify the same major determinants of net debt security flows. However, the Chow test indicates a structural break between the pre 1990 period and the time afterwards. This structural break could be partly explained by the liberalisation of capital accounts, and technological advances in payment, settlement and trading systems during the 1990s, which facilitated the cross-border investment in fixed income global portfolios.

## 5. Robustness checks

The pooled OLS estimation with time effects used in the previous section exploits the cross-sectional as well as the time-series variation of the data and does not take into account unobserved country heterogeneity. This method has been employed because cross-country variations in CABs and net portfolio flows are economically meaningful, as also suggested by the variance decomposition analysis reported in Table 1.

As a first robustness check, we employ the fixed-effects model that excludes all time-invariant cross-sectional variation from the sample. The results are expected to be strongly affected given the considerable cross-sectional dimension of the employed panel. Furthermore, the many cross-sectional units require that we include many country dummy variables, which reduce the degrees of freedom needed for powerful statistical tests. Another disadvantage is that the specifications might be plagued by multicollinearity, which increases the standard errors; hence weakening the precision of the estimated coefficients. Nonetheless, estimating the fixed effects model represents a good sensitivity check because it shows how



much of the previously identified effects on our dependent variables remain if we concentrate on the time-series variation.<sup>15</sup>

As an alternative method, we report the results of cross-sectional OLS regressions based on the full-sample averages of the dependent and independent variables for each country. This rules out all time-series variation in the sample and exclusively relies on the cross-sectional variation.

All in all, several results are corroborated using these two alternative methods.

**Table 8**  
**Results for current account deficit to GDP ratio**  
(Panel regression, fixed effects specification without time effects, annual data, 1970-2003)

	(1)	(2)	(3)	(4)
Relative old-age dependency ratio	0.0074 (0.57)	0.0344*** (2.85)	0.0336*** (2.81)	0.0347*** (2.90)
Relative youth dependency ratio	0.0059 (0.37)	0.0503* (1.85)	-0.0337 (0.96)	-0.0256 (0.73)
Real GDP growth (t-1)	0.0682*** (3.04)	0.1420*** (4.52)	0.2515*** (6.46)	0.2476*** (6.38)
Civil Liberties	-0.1862 (1.28)	-0.0059 (0.03)	0.1209 (0.54)	0.1457 (0.66)
M3 / GDP (t-1)	-0.0133 (1.60)	-0.0189** (2.53)	-0.0187** (2.33)	-0.0082 (0.99)
Relative income	-0.1913*** (2.95)	-0.1416** (2.18)	-0.3961*** (5.21)	-0.4321*** (5.61)
Relative income <sup>2</sup>	0.0003 (0.58)	0.0002 (0.37)	0.0019*** (3.28)	0.0020*** (3.49)
REER growth (t-1)		0.0026 (0.57)	0.0435*** (3.20)	0.0456*** (3.36)
Labour productivity growth		-0.0067* (1.75)	-0.0021 (0.57)	-0.0012 (0.33)
Deviation from the UIP			-0.0001 (1.18)	-0.0001 (1.23)
Capital controls (current account)				-1.0232** (2.34)
Capital controls (capital account)				-1.1939*** (2.61)
Constant	6.6839*** (2.68)	-1.4114 (0.42)	9.5484** (2.34)	10.2141** (2.50)
Number of observations	2901	1410	980	965
Number of countries	130	78	63	44
R <sup>2</sup>	0.03	0.08	0.18	0.19

Notes: *t* statistics are reported in parentheses. The symbols \*, \*\* and \*\*\* indicate significance at the 10, 5, 1 percent level.

<sup>15</sup> The fixed effects models are run removing the time-invariant initial NFA/GDP variable as well as the year dummies.

Table 9  
Results for net inflows in equity securities to GDP ratio  
(Panel regression, fixed effects specification without time effects, annual data, 1970-2003)

	(1)	(2)	(3)	(4)	(5)
Relative old-age dependency ratio	0.0097* (1.68)	0.0071 (0.97)	0.0081 (1.02)	0.0002 (0.02)	0.0000 (0.00)
Relative youth dependency ratio	-0.0614*** (3.69)	-0.0908*** (3.71)	-0.0889*** (3.20)	-0.0942** (2.33)	-0.0984** (2.43)
Real GDP growth (t-1)	0.0198 (1.10)	0.013 (0.54)	0.0132 (0.48)	0.0477 (1.19)	0.0307 (0.76)
Civil Liberties	-0.0193 (0.16)	0.0465 (0.31)	-0.0369 (0.22)	0.1496 (0.68)	0.1891 (0.87)
M3 / GDP (t-1)	0.0091** (2.12)	0.0099** (2.06)	0.0111** (2.16)	0.0139** (2.36)	0.0146** (2.44)
Relative income	-0.2295*** (5.60)	-0.2470*** (5.00)	-0.2710*** (5.10)	-0.3211*** (4.74)	-0.3629*** (5.31)
Relative income <sup>2</sup>	0.0011*** (3.64)	0.0013*** (3.37)	0.0014*** (3.58)	0.0019*** (3.86)	0.0021*** (4.31)
REER growth (t-1)		-0.0004 (0.05)	-0.0024 (0.27)	-0.0082 (0.64)	-0.0083 (0.65)
Labour productivity growth		0.0004 (0.20)	0.0003 (0.14)	0.001 (0.46)	0.001 (0.48)
Deviation from the UIP			0.0001*** (3.36)	0.0002* (1.81)	0.0002* (1.70)
Equity return differential (t-1)				0.0024 (0.90)	0.0029 (1.10)
Market capitalization (t-1)				-0.0085** (2.05)	-0.0009 (0.20)
Deviation of price-earnings ratio (t-1)				-0.0112 (0.54)	-0.0159 (0.77)
Capital controls (current account)					0.1392 (0.41)
Capital controls (capital account)					-0.2421 (0.46)
Constant	8.3642*** (4.11)	10.8538*** (3.95)	11.3302*** (3.75)	14.4214*** (3.50)	15.7418*** (3.80)
Number of observations	894	732	645	488	479
Number of countries	72	55	50	34	29
R <sup>2</sup>	0.13	0.13	0.15	0.17	0.16

Notes: *t* statistics are reported in parentheses. The symbols \*, \*\* and \*\*\* indicate statistical significance at the 10 percent, 5 percent, and 1 percent levels, respectively.

## 5.1 Fixed effects

Comparing the current account results of the fixed effects model with those of the pooled model yields consistent, albeit weaker results. The fixed effects specifications for the CABs indicate that real GDP growth and changes in international competitiveness are key variables driving CABs given the time-variant dimension of these series (see Table 8). Their coefficients have the consistent positive sign. In some specifications, we find statistically and consistent significant effects for old-age dependency and lagged M3 to GDP ratio. Interestingly,

the “stage of development” hypothesis is endorsed by the fixed effects estimation, but only in the last two specifications.

The specifications for net equity flows confirm the findings of the previous section that money to GDP ratio influence consistently global investment decisions in equity markets (see Table 9). Deviations from the UIP and the “stage of development” hypothesis are endorsed very strongly by the fixed effects estimation, but the coefficient on youth dependency ratio is negative in contrast with previous results.

The specifications for net flows in debt instruments confirm the previous findings that deviations from the UIP influence global investment decisions in fixed income (see Table 10).

Overall some of the results are robust, but key explanatory variables, such as the relative demographic profile and civil liberties are not longer found significant as their cross-country dimension is central (see Table 1).

## 5.2 Cross-section results

To eliminate the time-series variation in the sample and rely on the cross-sectional variation only, we re-estimated the specifications in the cross-section constructing one long-term averaged observation per series for each country.

These findings are illustrative, as taking averages over-fits the results, reduces the degrees of freedom and shrinks the sample size to less than 100 observations in most specifications. Moreover, the averages of dependent and independent variables for each country are taken over different time spans, because the panel data set is unbalanced. This might also bear negatively on the results.

Despite these caveats, we still find that youth dependency ratio, civil liberties, monetary aggregates, change in international competitiveness and the initial NFA position systematically affect developments in CABs consistently with theory and with the findings of the pooled OLS regressions (see Table 11). Conversely, the only variable that affects both components of net portfolio flows is the deviation from the UIP endorsing once again the Bergin’s (2004) suggestion (see Table 12). Developments in monetary aggregates to GDP ratio do not have a significant impact on net equity flows, but have a negative effect on the net inflows in debt instruments supporting the financial deepening as well as the portfolio shift arguments.

**Table 10**  
**Results for net inflows in debt instruments to GDP ratio**  
(Panel regression, fixed effects specification without time effects, annual data)

	(1)	(2)	(3)	(4)	(5)
Relative old-age dependency ratio	-0.0002 (0.03)	0.005 (0.54)	0.0056 (0.57)	0.0063 (0.58)	0.0026 (0.23)
Relative youth dependency ratio	-0.0438** (2.02)	-0.0324 (0.91)	-0.0384 (0.97)	-0.0468 (0.92)	-0.0485 (0.92)
Real GDP growth (t-1)	0.0428* (1.76)	0.0424 (1.38)	0.046 (1.27)	0.0046 (0.08)	-0.0182 (0.32)
Civil Liberties	-0.2247 (1.24)	0.0065 (0.03)	0.0348 (0.14)	0.128 (0.36)	0.1552 (0.43)
M3 / GDP (t-1)	0.0039 (0.73)	0.0009 (0.16)	0.0042 (0.66)	0.0005 (0.07)	-0.0029 (0.41)
Relative income	-0.1131** (2.08)	-0.1110* (1.71)	-0.0938 (1.32)	-0.1376 (1.45)	-0.0912 (0.93)
Relative income <sup>2</sup>	0.0006 (1.35)	0.0005 (1.11)	0.0003 (0.52)	0.0006 (0.85)	0.0004 (0.52)
REER growth (t-1)		-0.0029 (0.26)	-0.0051 (0.4)	-0.0062 (0.37)	-0.0072 (0.42)
Labour productivity growth		-0.0059** (2.32)	-0.0065** (2.46)	-0.0155 (0.26)	-0.0206 (0.34)
Deviation from the UIP			-0.0002*** (3.44)	-0.0002*** (3.81)	-0.0002*** (3.81)
Long-term yield differentials (t-1)				-0.0001 (1.53)	-0.0001 (1.42)
NFA / GDP (0) (current account)					0.8335* (1.96)
Capital controls (capital account)					-0.2086 (0.31)
Constant	6.4431** (2.46)	4.6447 (1.20)	4.6225 (1.09)	7.0763 (1.20)	6.0365 (1.00)
Number of observations	1035	830	718	502	493
Number of countries	74	60	54	34	27
Adjusted R <sup>2</sup>	0.02	0.03	0.06	0.06	0.07

Notes: *t* statistics are reported in parentheses. \*, \*\* and \*\*\* indicate significance at the 10, 5, 1 percent level.

Table 11  
Results for the current account deficit to GDP ratio  
(Cross-section regressions)

	(1)	(2)	(3)	(4)
Relative old-age dependency ratio	0.01 (0.84)	0.0047 (0.36)	0.0031 (0.16)	0.0062 (0.47)
Relative youth dependency ratio	0.0419* (1.94)	0.0521** (2.04)	0.0646 (1.41)	0.0504* (1.77)
Real GDP growth (t-1)	-0.243 (1.12)	0.0186 (0.08)	0.1018 (0.32)	0.0475 (0.15)
Civil Liberties	-0.6704** (2.29)	-0.6951* (1.92)	-0.7086 (0.99)	-0.7596 (1.57)
M3 / GDP	-0.0097 (0.76)	-0.0169* (1.72)	-0.0189* (1.88)	-0.0203* (1.85)
Relative income	-0.0691 (1.07)	0.0394 (0.58)	0.09 (0.90)	0.1174 (1.53)
Relative income <sup>2</sup>	-0.0002 (0.28)	-0.0012 (1.51)	-0.0016 (1.51)	-0.0016* (1.92)
REER growth (t-1)		0.2829*** (8.61)	0.3734** (2.02)	0.0975 (0.44)
Labour productivity growth		-0.0009 (0.03)	-0.005 (0.20)	-0.0183 (1.46)
Deviation from the UIP			0.0007 (1.05)	0.0008* (1.82)
NFA / GDP (0)				-0.0601** (2.32)
Capital controls (current account)				1.7335 (1.04)
Capital controls (capital account)				-1.5386 (0.94)
Constant	3.6112 (0.94)	1.0948 (0.22)	-0.6721 (0.08)	-1.6723 (0.28)
Number of observations	130	78	63	44
Adjusted R <sup>2</sup>	0.18	0.50	0.27	0.49

Notes: *t* statistics are reported in parentheses. The symbols \*, \*\* and \*\*\* indicate significance at the 10, 5, 1 percent level.

Table 12  
Results for net portfolio flows to GDP ratio  
(Cross-section regression)

	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
					<b>Net debt inflows to GDP ratio</b>			
Relative old-age dependency ratio	0.0057 (1.58)	0.0061 (1.33)	0.0041 (0.85)	-0.0143 (1.40)	0.0045 (0.51)	0.009 (0.89)	0.0051 (0.46)	0.0101 (0.66)
Relative youth dependency ratio	0.0056 (0.96)	0.0126 (1.19)	0.0115 (0.97)	-0.0858** (2.43)	0.0027 (0.28)	0.0047 (0.39)	-0.0039 (0.28)	-0.0156 (0.50)
Real GDP growth (t-1)	-0.0138 (0.23)	-0.0272 (0.36)	-0.0365 (0.43)	-0.5476** (2.72)	0.1105 (0.81)	0.1949 (1.34)	0.1387 (0.77)	0.566 (1.69)
Civil Liberties	-0.1517 (1.21)	-0.274 (1.26)	-0.3398 (1.45)	-0.4829* (2.10)	-0.5151 (1.29)	-0.5025 (1.09)	-0.6807 (1.34)	-0.8908 (1.68)
M3 / GDP	0.0026 (0.73)	0.0043 (1.07)	0.0018 (0.50)	0.0021 (0.32)	-0.0282** (2.46)	-0.0301** (2.49)	-0.0310** (2.30)	-0.0239 (1.71)
Relative income	-0.0048 (0.32)	-0.0077 (0.44)	-0.0181 (0.82)	-0.1419** (2.37)	-0.0132 (0.18)	-0.0475 (0.56)	-0.054 (0.64)	-0.1598 (1.71)
Relative income <sup>2</sup>	-0.0002 (1.28)	-0.0003 (1.28)	-0.0001 (0.47)	0.0008 (1.33)	0.0001 (0.16)	0.0004 (0.48)	0.0003 (0.41)	0.0013 (1.54)
REER growth (t-1)		-0.0244 (0.96)	-0.025 (0.90)	-0.2618** (2.17)		-0.1244 (1.48)	-0.1601 (1.53)	-0.3681* (1.72)
Labour productivity growth		-0.0008 (0.26)	0.0002 (0.06)	0.0082 (1.45)		0.0033 (0.22)	0.0007 (0.04)	0.0231 (1.61)
Deviation from the UIP			0.0004*** (3.99)	0.0004*** (3.58)			-0.0008*** (3.11)	-0.0009*** (2.73)
NFA / GDP (0)				-0.0078 (0.69)				-0.0128 (0.68)
Capital controls (current account)				-1.5802* (1.98)				0.7201 (0.37)
Capital controls (capital account)				0.8049 (1.08)				-1.1103 (0.65)
Constant	-0.5522 (0.48)	-0.5227 (0.33)	0.2832 (0.14)	14.3018** (2.60)	1.8911 (0.78)	1.7621 (0.59)	3.9268 (1.11)	5.0964 (0.90)
Number of observations	72	55	50	27	74	60	54	27
Adjusted R <sup>2</sup>	0.26	0.33	0.43	0.65	0.29	0.37	0.45	0.60

Notes: Robust *t* statistics are reported in parentheses. \*, \*\* and \*\*\* indicate significance at the 10, 5, 1 percent level.

## 6. OECD versus non-OECD member countries

Are the main results discussed in section 4 asymmetric across groups of countries? This is the question addressed in this section, which splits the sample between OECD and non-OECD countries and re-estimates the models using the pooled OLS method with time effects.

When re-estimating the regressions on the lower frequency data averaged over 5 years, splitting the sample leads to a reduction in sample size which prohibits the estimation of the richer specifications for both types of portfolio flows. Hence, we report results only using the annual frequency (see Tables 13-15).<sup>16</sup> We also re-estimated the specifications excluding African countries, as the measurement error of their data might be high. Also in this case, the results do not change markedly from those reported in Tables 13-15.<sup>17</sup>

Population ageing, civil liberties, monetary aggregates, initial net financial asset positions all affect CABs in both sub-groups of countries. The other additional result is that the “stage of development” hypothesis is endorsed by both sub-groups specifications.

Conversely, the results on net flows in equity securities and debt instruments do not show many common determinants among OECD and non-OECD countries.

Net portfolio flows in OECD countries are driven by the portfolio shifts effect. A higher M3 to GDP ratio – associated with lower interest rates – favours global investment in domestic stocks and make investments in fixed income less attractive, thereby generating net equity inflows and net outflows in debt instruments (see Tables 14a and 15). The portfolio shift argument could explain the net equity flows also in non-OECD countries (see Table 14b).

The deviation from the UIP influences net portfolio flows in OECD countries. A rise in the domestic interest rate above its trend brings about a global portfolio shift out of domestic fixed income.

The “stage of development” hypothesis and the demographic effects are validated for the developing countries for both components of portfolio flows. The coefficients on the relative income measures and on the dependency ratios are correctly sign and statistically significant when the number of observations and countries is relatively large.

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<sup>16</sup> The empirical results of those specifications that we could estimate on the basis of the 5-year averaged data are available from the authors upon request.

<sup>17</sup> The results are not reported in the paper, but are available upon request.

Table 13  
Results for the current account deficit to GDP ratio  
(Pooled OLS estimation with time effects, annual data, 1970-2003)

	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
	OECD Countries				Non-OECD Countries			
Relative old-age dependency ratio	0.0012 (0.26)	0.0020 (0.40)	0.0012 (0.23)	0.0061 (1.15)	0.0243*** (4.78)	0.0372*** (4.78)	0.0272** (2.52)	-0.0099 (0.79)
Relative youth dependency ratio	0.0284* (1.85)	0.0482*** (2.68)	0.0543*** (2.89)	0.1164*** (4.98)	0.0535*** (7.18)	0.1009*** (5.45)	0.0460** (2.25)	-0.0100 (0.49)
Real GDP growth (t-1)	0.1130** (2.07)	0.0535 (0.90)	0.0673 (1.03)	-0.0075 (0.11)	0.0165 (0.50)	0.1584** (2.42)	0.3544*** (4.67)	0.2780*** (3.55)
Civil Liberties	-0.6342*** (3.15)	-0.6690*** (2.96)	-0.5784** (2.40)	0.2030 (0.75)	-0.4311*** (3.82)	-0.3749** (2.03)	-0.8864*** (2.75)	-0.1881 (0.65)
M3 / GDP (t-1)	-0.0136*** (3.75)	-0.0122*** (3.23)	-0.0111*** (2.71)	-0.0113*** (2.87)	-0.0252*** (4.01)	-0.0440*** (5.31)	-0.0298** (2.40)	-0.0615*** (4.72)
Relative income	0.0812* (1.88)	0.0918** (1.99)	0.1187** (2.46)	0.2502*** (3.81)	0.0761 (1.62)	0.2510*** (4.09)	0.2146*** (3.11)	0.3497*** (4.40)
Relative income <sup>2</sup>	-0.0016*** (3.77)	-0.0017*** (3.85)	-0.0019*** (4.01)	-0.0025*** (4.26)	-0.0032*** (3.29)	-0.0049*** (4.14)	-0.0060*** (5.12)	-0.0089*** (7.00)
REER growth (t-1)		0.0245 (1.52)	0.0242 (1.45)	0.0110 (0.63)		0.0300*** (4.37)	0.0480 (1.29)	0.0146 (0.41)
Labour productivity growth		-0.0155 (0.22)	-0.0316 (0.41)	-0.1619** (1.97)		-0.0062** (2.17)	0.0013 (0.51)	0.0021 (1.06)
Deviation from the UIP			-0.0001 (1.54)	-0.0001 (1.37)			0.0000 (0.98)	0.0000 (0.51)
NFA / GDP (0)				-0.0458*** (4.08)				-0.1184*** (3.84)
Capital controls (current account)				-0.3060 (0.78)				-2.6939*** (3.03)
Capital controls (capital account)				-0.4405 (0.66)				-0.6602 (0.83)
Constant	2.1828 (0.94)	0.3628 (0.14)	-0.8090 (0.29)	-10.7246*** (2.97)	-4.1881** (2.36)	-9.8833** (2.14)	-1.6340 (0.35)	6.5815 (1.22)
Number of observations	717	664	602	548	2184	746	378	262
Adjusted R <sup>2</sup>	0.23	0.24	0.23	0.26	0.11	0.23	0.37	0.60

Notes: Robust *t* statistics are reported in parentheses. The symbols \*, \*\* and \*\*\* indicate significance at the 10, 5, 1 percent level.



Table 14a  
Results for net equity inflows to GDP ratio  
(Pooled OLS estimation with time effects, annual data, 1970-2003)

	(1)	(2)	(3)	(4)	(5)
	OECD Countries				
Relative old-age dependency ratio	-0.0006 (0.16)	-0.0005 (0.14)	-0.0015 (0.40)	-0.0019 (0.43)	-0.0012 (0.23)
Relative youth-dependency ratio	-0.0098 (0.52)	-0.0108 (0.56)	-0.0093 (0.48)	-0.0013 (0.06)	0.0161 (0.54)
Real GDP growth (t-1)	-0.0047 (0.14)	0.0029 (0.08)	0.0025 (0.07)	0.0112 (0.27)	-0.0100 (0.23)
Civil Liberties	0.2997* (1.91)	0.3413* (1.95)	0.2270 (1.28)	0.2421 (1.05)	0.5225* (1.86)
M3 / GDP (t-1)	0.0061** (2.54)	0.0060** (2.48)	0.0060** (2.40)	0.0062** (2.47)	0.0038 (1.47)
Relative income	0.0386 (1.39)	0.0394 (1.36)	0.0345 (1.12)	0.0478 (1.39)	0.1040** (2.07)
Relative income <sup>2</sup>	-0.0006** (2.25)	-0.0006** (2.19)	-0.0005* (1.94)	-0.0006** (2.06)	-0.0011*** (2.60)
REER growth (t-1)		-0.0095 (0.94)	-0.0081 (0.79)	-0.0106 (0.90)	-0.0063 (0.53)
Labour productivity growth		0.0122 (0.38)	0.0163 (0.51)	0.0290 (0.68)	0.0337 (0.71)
Deviation from the UIP			0.0002*** (5.33)	0.0003 (1.39)	0.0002 (1.20)
Equity return differential (t-1)				0.0030 (1.00)	0.0026 (0.86)
Market capitalization (t-1)				-0.0018 (0.36)	0.0046 (0.84)
Price/Earnings differential (t-1)				0.0108 (0.48)	0.0143 (0.60)
NFA / GDP (0)					-0.0152** (2.22)
Capital controls (current account)					0.3575 (1.56)
Capital controls (capital account)					-0.3389 (0.54)
Constant	-0.4771 (0.21)	-0.5917 (0.25)	0.0940 (0.04)	-1.2110 (0.46)	-4.7673 (1.28)
Number of observations	498	483	460	391	357
Adjusted R <sup>2</sup>	0.10	0.09	0.11	0.04	0.06

Notes: Robust *t* statistics are reported in parentheses. \*, \*\* and \*\*\* indicate significance at the 10, 5, 1 percent level.

It is also interesting to note that ageing is associated with net outflows in debt instruments in OECD countries in all specifications (see Table 15). This might confirm the empirical evidence that people prefer to hold safe assets when they get older re-allocating part of their investment towards global fixed income portfolios. Alternatively, it can be argued that international investors are less keen in purchasing fixed income securities of ageing economies.

Table 14b  
Results for net equity inflows to GDP ratio  
(Pooled OLS estimation with time effects, annual data, 1970-2003)

	(1)	(2)	(3)	(4)	(5)
	<b>Non-OECD</b>		<b>Countries</b>		
Relative old-age dependency ratio	0.0112*** (4.28)	0.0130*** (3.41)	0.0059 (1.41)	0.0129 (1.21)	-0.0005 (0.02)
Relative youth-dependency ratio	0.0137*** (3.87)	0.0223*** (3.04)	0.0089 (1.20)	0.0095 (0.59)	-0.0131 (0.54)
Real GDP growth (t-1)	-0.0030 (0.19)	0.0013 (0.06)	-0.0003 (0.01)	-0.0703 (0.81)	-0.1032 (0.94)
Civil Liberties	-0.0803 (1.19)	-0.0471 (0.40)	-0.2714 (1.32)	-0.4434 (1.09)	-0.5584 (1.21)
M3 / GDP (t-1)	0.0123*** (3.53)	0.0153*** (4.37)	0.0120** (2.49)	0.0269* (1.88)	0.0099 (0.52)
Relative income	0.0981*** (5.09)	0.1105*** (4.60)	0.0812*** (2.63)	-0.0091 (0.14)	0.0227 (0.13)
Relative income <sup>2</sup>	-0.0032*** (7.54)	-0.0035*** (6.95)	-0.0033*** (5.35)	-0.0018* (1.81)	-0.0018 (0.88)
REER growth (t-1)		-0.0031 (0.49)	-0.0030 (0.42)	-0.0111 (0.70)	-0.0174 (0.64)
Labour productivity growth		0.0009 (1.17)	0.0012 (1.02)	-0.0001 (0.04)	-0.0002 (0.05)
Deviation from UIP			0.0000 (0.01)	0.0005* (1.86)	0.0007** (2.19)
Equity return Differentials (t-1)				0.0024 (0.65)	0.0113 (0.89)
Market capitalization (t-1)				-0.0282* (1.81)	-0.0179 (0.69)
Deviation from the UIP Price-earnings ratio (t-1)				-0.0448 (0.79)	-0.0639 (0.83)
NFA / GDP (0)					0.0569 (1.03)
Capital controls (current account)					2.0182 (1.50)
Capital controls (capital account)					-0.3017 (0.30)
Constant	-2.5996*** (2.97)	-4.1430*** (3.24)	-0.8571 (0.44)	3.3327 (0.79)	4.3535 (1.13)
Number of observations	396	249	185	97	90
Adjusted R <sup>2</sup>	0.46	0.52	0.59	0.56	0.55

Notes: Robust *t* statistics are reported in parentheses. \*, \*\* and \*\*\* indicate significance at the 10, 5, 1 percent level.

Table 15: Results for net inflows in debt instruments to GDP ratio

(Pooled OLS estimation with time effects, annual data, 1970-2003)

	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)
		OECD	Countries			Non-OECD	Countries	
Relative old-age dependency ratio	-0.0102*** (2.76)	-0.0104** (2.58)	-0.0109*** (2.77)	-0.0129*** (3.14)	-0.0140*** (3.10)	0.0009 (0.23)	0.0042 (1.02)	0.0046 (0.68)
Relative youth dependency ratio	-0.0034 (0.25)	0.0077 (0.44)	0.0149 (0.88)	0.0517** (2.39)	0.0335 (1.35)	0.0002 (0.03)	0.0058 (0.80)	0.0090 (0.67)
Real GDP growth (t-1)	0.0403 (0.86)	0.0170 (0.30)	0.0265 (0.49)	-0.0163 (0.25)	-0.0798 (1.24)	0.0393 (1.18)	0.0397 (1.12)	0.0500 (0.84)
Civil Liberties	-0.1277 (0.52)	0.0071 (0.03)	0.0652 (0.27)	0.5720* (1.72)	0.8057** (2.30)	-0.1040 (0.79)	-0.0016 (0.01)	-0.1011 (0.25)
M3 / GDP (t-1)	-0.0184*** (5.24)	-0.0191*** (5.29)	-0.0174*** (4.79)	-0.0197*** (5.13)	-0.0150*** (4.18)	-0.0089 (1.33)	-0.0118* (1.68)	-0.0143 (1.33)
Relative income	0.0734 (1.62)	0.0897* (1.91)	0.1060** (2.42)	0.2045*** (3.16)	0.2130*** (3.00)	0.0623* (1.95)	0.0805** (2.01)	0.0911 (1.26)
Relative income <sup>2</sup>	-0.0007* (1.65)	-0.0008* (1.81)	-0.0009** (2.20)	-0.0015*** (2.82)	-0.0014** (2.36)	-0.0016*** (3.78)	-0.0018*** (3.90)	-0.0019** (2.03)
REER growth (t-1)		-0.0023 (0.15)	-0.0067 (0.47)	-0.0069 (0.46)	-0.0138 (1.00)		-0.0062 (0.45)	-0.0199 (0.84)
Labour productivity growth		0.1139* (1.78)	0.0756 (1.23)	0.0516 (0.65)	-0.0964 (1.12)		-0.0047*** (3.49)	-0.0062*** (5.13)
Deviation from the UIP			-0.0002*** (4.45)	-0.0002*** (4.36)	-0.0002*** (5.13)			0.0003 (1.44)
Long-term yield differentials (t-1)				-0.0001*** (3.92)	-0.0001*** (3.04)			
NFA / GDP (0)					-0.0331*** (3.25)			
Capital controls (current account)					0.7296** (1.97)			
Capital controls (capital account)					-0.6535* (1.66)			
Constant	2.9066 (1.32)	1.7133 (0.67)	1.0732 (0.43)	-2.7222 (0.85)	-4.1171 (1.18)	0.3768 (0.32)	0.1464 (0.10)	-0.9747 (0.23)
Number of observations	565	535	511	455	437	470	295	207
Adjusted R <sup>2</sup>	0.07	0.07	0.11	0.13	0.25	0.05	0.09	0.08

Notes: Robust *t* statistics are reported in parentheses. \*, \*\* and \*\*\* indicate significance at the 10, 5, 1 percent level.

## 7. Conclusions

Current account imbalances are primarily financed by net flows in foreign direct investment, net flows in portfolio investment, net flows in bank loans and changes in foreign official reserves. In this study, we focus on the common determinants of CABs and net portfolio flows. We do so because of their importance in the countries' international investment position, and the key role they played particularly during the 1990s, when countries were facing growing current account imbalances. We construct a unified empirical framework which uses the same data sources and sets of deterministic variables to explain current account deficits and net inflows in equity securities and debt instruments over the period 1970 to 2003 for a large number of developed and developing countries.

The summary table reports the key results (see Table 16).

Table 16  
Summary Table of the Empirical Results

	5-year non-overlapping averages			Annual Frequency		
	Current account deficit	Net in-flows in equities	Net in-flows in debt inst.	Current account deficit	Net in-flows in equities	Net in-flows in debt inst.
Relative old-age dependency	+	+		+	+	-
Relative youth dependency	+	+		+	+	
Lagged Real GDP growth	+			+		
Civil Liberties	-	-		-	-	
Lagged M3 / GDP	-	+	-	-	+	-
Relative income			+		-	+
Relative income <sup>2</sup>			-			-
Lagged REER appreciation				+		
Labour productivity growth						-
Deviation from the UIP			-			-
Initial NFA / GDP	-		-	-	-	-
Capital controls - Cur. Acc.				-		+
Capital controls - Cap. Acc.			-			-
Long-term interest rate differentials			+			-

Notes: The symbol + (-) indicates a deterioration (improvement) of the CABs and net inflows (outflows) in portfolio investment. The choice is based on the hypotheses that variables are statistically significant at minimum 10% level and at least for two different specifications.

We show that net portfolio flows play an important role in correcting external imbalances, since they are driven by common determinants. Specifically, countries' demographic profiles, civil liberties and the initial NFA systematically influence CABs and net equity

flows; while monetary aggregates and the initial NFA affect CABs and net flows in debt instruments. These results show that external imbalances can adjust smoothly together with developments in net portfolio flows. However, some conflicting signs emerge for money to GDP ratio and relative old-age dependency ratio.

Regarding the monetary aggregates, the literature suggests that a higher money stock to GDP ratio is associated with an improvement in CABs, as a result of financial deepening. Our preferred interpretation for this result is related to the theory of money demand. A high money stock to GDP ratio implies lower interest rates. Such an environment is particularly attractive to international investors in domestic stocks, but it discourages investments in fixed income. Consistently, we find that M3 to GDP ratio is associated with improvements in CABs, net inflows in equity securities and net outflows in debt instruments. Therefore, money to GDP ratio is a proxy for a portfolio shift effect.

The impact of countries' relative demographic profiles is not symmetric across the alternative types of flows. Consistently with economic theory, countries with relatively high youth and old-age population ratios are characterised by lower CABs and net equity inflows. However, countries with high relative old-age dependency ratios - particularly OECD countries - are associated with net outflows in debt instruments. These results have alternative implications. Either they corroborate the hypothesis that investors prefer to hold and purchase safer assets when they get older re-allocating part of their investments towards fixed income portfolios, or they endorse the hypothesis that foreign investors may reduce their investment in bonds issued by ageing countries with potential negative consequences on future domestic bond prices. If the former explanation could be corroborated, it could also in part motivate the so called Greenspan's conundrum; namely, why bond yields are so low across developed countries despite rising short term interest rates, positive economic growth and well anchored inflation rates. As the workforce ages and individuals become more risk adverse, portfolio shift towards fixed income instruments push up bond prices with a negative effect on yields. Hence, further research is needed to analyse whether a shift from stocks to bonds can be observed in older populations or whether international investors are less keen in purchasing fixed income assets of ageing economies.

Furthermore, we show that CABs worsen with lagged real GDP growth and losses in competitiveness, as suggested by economic theory. We cannot find any empirical support for an impact of financial factors specific to the equity market, such as market performance, market valuation and market size. However, we find that net equity flows are driven negatively

by per capita income, which implies that richer countries allocate part of their savings in global equity portfolios.

We find that net flows in debt instruments are driven by long-term interest rate differentials. The effect is, however, positive in the medium term (momentum motive) but negative in the shorter run (portfolio re-balancing motive). We also find that a rise in the short-term domestic interest rate above its trend brings about an equilibrating portfolio shift out from domestic debt instruments.

The results obtained for the sub-sample period of enhanced global financial integration are broadly similar. There is some evidence of a structural break between the pre and post 1990 period, but it does not strongly alter the way in which CABs and net portfolio flows are determined.

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## Appendix A: Sample Description of the countries

The countries comprising the sample are as follows:

### *Regressions for the current account balances (130 countries)*

Albania, Angola, Argentina, Armenia, Australia, Austria, Azerbaijan, Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belize, Benin, Bolivia, Botswana, Brazil, Bulgaria, Burkina Faso, Burundi, Cambodia, Canada, Cape Verde, Chile, China, Colombia, Republic of Congo, Costa Rica, Cote d' Ivoire, Croatia, Cyprus, Czech Republic, Denmark, Dominican Republic, Ecuador, Egypt, El Salvador, Estonia, Ethiopia, Finland, France, Georgia, Germany, Ghana, Greece, Guatemala, Guinea-Bissau, Guyana, Haiti, Honduras, Hungary, Iceland, India, Indonesia, Iran, Ireland, Israel, Italy, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Republic of Korea, Kyrgyz Republic, Lao, Latvia, Lesotho, Lithuania, Macedonia, Madagascar, Malawi, Malaysia, Mali, Malta, Mauritius, Mexico, Moldova, Mongolia, Morocco, Mozambique, Nepal, Netherlands, New Zealand, Nicaragua, Norway, Oman, Pakistan, Panama, Papua New Guinea, Paraguay, Peru, Philippines, Poland, Portugal, Romania, Russian Federation, Rwanda, Saudi Arabia, Senegal, Sierra Leone, Singapore, Slovak Republic, Slovenia, South Africa, Spain, Sri Lanka, St. Lucia, St. Vincent and the Grenadines, Sudan, Swaziland, Sweden, Switzerland, Syrian Arab Republic, Tanzania, Thailand, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Uganda, Ukraine, United Kingdom, United States, Uruguay, Vanuatu, Venezuela, Vietnam, Republic of Yemen.

### *Regressions for the net flows in equity securities (72 countries)*

Argentina, Armenia, Australia, Austria, Bahrain, Bangladesh, Barbados, Belarus, Benin, Botswana, Brazil, Bulgaria, Canada, Chile, China, Cote d' Ivoire, Croatia, Cyprus, Czech Republic, Denmark, Egypt, Estonia, Finland, France, Germany, Greece, Guinea-Bissau, Hungary, Iceland, India, Israel, Italy, Japan, Jordan, Kazakhstan, Kenya, Republic of Korea, Latvia, Lithuania, Macedonia, Malaysia, Mali, Malta, Mauritius, Netherlands, New Zealand, Norway, Pakistan, Peru, Philippines, Poland, Portugal, Romania, Russian Federation, Senegal, Singapore, Slovak Republic, Slovenia, South Africa, Spain, Sri Lanka, Swaziland, Sweden, Switzerland, Thailand, Togo, Turkey, Ukraine, United Kingdom, United States, Uruguay, Venezuela.

### *Regressions for the net flows in debt instruments (74 countries)*

Argentina, Armenia, Australia, Austria, Bahrain, Barbados, Belarus, Benin, Brazil, Bulgaria, Canada, Chile, China, Colombia, Costa Rica, Cote d' Ivoire, Croatia, Cyprus, Czech Republic, Denmark, Dominican Republic, El Salvador, Estonia, Finland, France, Germany, Greece, Guatemala, Guyana, Hungary, Iceland, Ireland, Israel, Italy, Jamaica, Japan, Kazakhstan, Kenya, Republic of Korea, Kyrgyz Republic, Latvia, Lithuania, Macedonia, Mali, Malta, Mexico, Moldova, Netherlands, New Zealand, Norway, Panama, Paraguay, Peru, Philippines, Poland, Portugal, Romania, Russian Federation, Senegal, Singapore, Slovak Republic, Slovenia, South Africa, Spain, Sweden, Switzerland, Thailand, Togo, Turkey, Ukraine, United Kingdom, United States, Uruguay, Venezuela.

## Appendix B: List of Variables and Data Sources

Variable	Description	Source
Current account balances	Current account deficit to GDP ratio (%)	WDI, IFS
Net equity flows	Net inflows in equity securities to GDP ratio (%)	IFS, ECB, DRIASIA
Net flows in debt instruments	Net inflows in debt instruments to GDP ratio (%)	IFS, ECB, DRIASIA
Relative old-age dependency ratio	Old-age dependency ratio relative to the world average (65+/15-65) (%)	UN World Population Prospects
Relative youth dependency ratio	Youth dependency ratio relative to the world average (0-15/15-65) (%)	UN World Population Prospects
REER growth	Growth rate of the real effective exchange rate (REER appreciates if it moves upwards) (%)	IFS, WDI, MEI, ECB, WMMD, AMECO
Civil Liberties	Civil Liberties Index	FreedomHouse
Real GDP growth	Real GDP growth (%)	WDI
M3 / GDP	M3 to GDP ratio (%)	WDI, IFS, ECB
Labour productivity growth	Growth in real output per worker (%)	WDI, IFS, ILO, AMECO
Relative income	Ratio of country <i>i</i> 's per capita GDP to US per capita GDP (both in PPP terms)	WDI
Equity return differentials	Growth of domestic equity price index including dividends minus growth of world price index (in US dollar) (%)	DataStream
Deviation of price-earnings ratio	Actual minus de-trended (using Hodrick-Prescott filter method) equity price-earnings ratio	DataStream and own calculations
Market capitalisation	Stock market capitalisation to GDP ratio (%)	DataStream and own calculations
Deviation from the UIP	Domestic short-term interest rate gap, minus US short-term interest rate gap, minus one-year lead depreciation gap of the domestic currency (gaps are calculated as difference between the nominal rates and the Hodrick-Prescott detrended rates) (%)	IFS and own calculations
Long-term yields differentials	Domestic long-term interest rate, minus US long-term interest rate, minus depreciation of the domestic currency (%)	IFS and own calculations
Initial NFA / GDP	Net foreign assets to GDP ratio (% , average value 1970-1980)	Milesi-Ferretti and Lane (2001)
Capital controls (current account)	Capital restrictions on the current account (dummy = 1 if capital controls exist)	Milesi-Ferretti (1998), Dreher and Siemers (2004)
Capital controls (capital control)	Capital restrictions on the capital account (dummy = 1 if capital controls exist)	Milesi-Ferretti (1998), Dreher and Siemers (2004)

## Appendix C: Summary Statistics

Variables	Observations	Mean	Std. Dev.
Current account / GDP (%)	3872	-3.833	8.754
Net equity flows / GDP (%)	1016	0.006	3.500
Net flows in debt instruments / GDP (%)	1193	-0.149	5.632
Relative old-age dependency ratio (%)	6888	100	55.723
Relative youth dependency ratio (%)	6888	100	36.086
Real GDP growth (%)	5304	3.618	6.451
Civil Liberties	4776	3.973	1.885
M3 / GDP (%)	5095	41.799	39.524
Relative income	3488	19.402	22.787
REER growth (%)	2366	0.223	21.910
Labour productivity growth (%)	2214	2.278	25.029
Deviation from the UIP (%)	1667	9.782	2320.61
NFA / GDP (initial) (%)	2747	-13.507	30.823
Capital controls (current account)	5134	0.548	0.498
Capital controls (capital account)	5145	0.747	0.435
Long-term yields differential (%)	1047	76.075	3287.40
Deviation of Price/Earnings ratio	926	0.000	5.183
Market Capitalization / GDP (%)	904	33.565	40.027
Equity return differential (%)	853	6.604	45.431

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