WP/17/115

IMF Working Paper

International Financial Integration in the Aftermath of the Global Financial Crisis

by Philip R. Lane and Gian Maria Milesi-Ferretti

INTERNATIONAL MONETARY FUND

WP/17/115

IMF Working Paper

International Financial Integration in the Aftermath of the Global Financial Crisis

by Philip R. Lane and Gian Maria Milesi-Ferretti

INTERNATIONAL MONETARY FUND

 WP/17/115

IMF Working Paper

Research Department

International Financial Integration in the Aftermath of the Global Financial Crisis

Prepared by Philip R. Lane and Gian Maria Milesi-Ferretti[1]

May 2017

Abstract

This paper documents the evolution of international financial integration since the global financial crisis using an updated dataset on external assets and liabilities, covering over 210 economies for the period 1970-2015. It finds that the growth in cross-border positions in relation to world GDP has come to a halt. This reflects much weaker capital flows to and from advanced economies, with diminished cross-border banking activity, and an increase in the weight of emerging economies in global GDP, as these economies have lower external assets and liabilities than advanced economies. Cross-border FDI positions have continued to expand, unlike positions in portfolio instruments and other investment. This expansion reflects primarily positions vis-à-vis financial centers, suggesting that the complexity of the corporate structure of large multinational corporations is playing an important role. The paper also explores the cross-country drivers of foreign ownership of domestic debt securities, highlighting in particular the role of the euro debt crisis in explaining its evolution.

JEL Classification Numbers: F31, F32

Keywords: International financial integration, financial globalization

Authors E-Mail Addresses: philip.lane@centralbank.ie; gmilesiferretti@imf.org

[1] Central Bank of Ireland, Trinity College Dublin; Research Department, International Monetary Fund. We are very grateful to our discussants Linda Tesar, Anne-Laure Delatte, and Jana Riedel, and to Serkan Arslanalp, Thomas Elkjaer, Thornton Matheson, Victoria Perry, Neeltje Van Horen, participants to the IMF's 2016 Annual Research Conference, the Jean Monnet Workshop on Financial Globalization and Its Spillovers, and seminars at the Bank of England, the Banque de France, the Bank of Italy, and France Strategie for useful comments. Menglu Cai provided excellent research assistance. The views expressed in this paper do not necessarily reflect those of the Central Bank of Ireland or the Eurosystem. Lane's initial work on this project was supported by a grant from the Irish Research Council. The dataset used in this paper is available at: http://www.imf.org/~/media/Files/Publications/WP/2017/datasets/wp17115.ashx

Contents Page

I. Introduction 5

II. The Dataset 8

III. Dynamics of International Financial Integration 10

IV. External Balance Sheet and Global Macro-financial Trends 13
A. Banks 13
B. The Euro Area Crisis 14
C. FDI Measurement Issues 14
D. Emerging and Developing Economies and the Role of China 16

V. Foreign Holdings of Portfolio Debt Securities 16

VI. Conclusions 21

References 21

Tables
1. The Size of Global Debt Securities' Markets: 2007 vs 2014 28
2. Share of Debt Securities held by Nonresidents: 2007 and 2015 29
3. Drivers of Foreign Share of Government Debt Securities, 2007 vs 2015 Cross-sectional Regressions 30
4. Drivers of Change in Foreign Share of Government Debt Securities, 2007-2015 31
5. Drivers of Foreign Share of Government Debt Securities, 2006-2015 Panel Regressions 32

.
Figures
1. Global External Assets and Liabilities 33
2. The Composition of World GDP 34
3. Changes in External Assets, Liabilities and World GDP, 2007-2015 35
4. Changes in External Assets and Liabilities, 2007-2015 36
5. Gross and Net External Positions, Advanced Economies Excluding Financial Centers 37
6. Net External Position: United States and Other Advanced Economies Excluding Financial Centers and United States 38
7. Gross and Net External Positions, Financial Centers 39
8. Gross and Net External Positions, Emerging and Developing Economies 40
9. Net External Position: China and Other Emerging and Developing Economies 41
10. External Assets of BIS-reporting Banks 42
11. Claims of BIS-reporting Banks by Destination 43
12. Intra-euro Area Assets 44
13. Emerging and Developing Economies: Changes in Share of External Assets, Liabilities, and GDP to Global GDP 45
14. Emerging Markets: Change in Share of Portfolio Liabilities to GDP 46

15. Coefficients on Time Series Dummies…… 47

Appendices

1. Data and Country Classification…… 48
2. FDI in Financial Centers: the cases of Ireland and the Netherlands.....50

Appendix Tables

A1. FDI Positions in Ireland.....50
A2. The Netherlands: External Assets and Liabilities, Special Financial Institutions 52
A3. The Netherlands: External Assets and Liabilities, Excluding Special Financial Institutions.....53

I. INTRODUCTION

In this paper we document the evolution of cross-border holdings of financial assets and liabilities, which we refer to as international financial integration, since the onset of the global financial crisis, and relate it to the main macroeconomic and financial developments affecting the world economy over the past decade. These include: (i) the global financial crisis and associated hit on large international banks, resulting in a protracted period of bank deleveraging; (ii) the euro area crisis of 2010–2012, resulting in a scaling down of cross-border integration within the euro area; (iii) the post-crisis boom in emerging markets and associated large capital inflows, and subsequent fading thereof; and (iv) the rapid increase in China's size and role in the global economy.

To preview our main results, we show that the growth in cross-border positions in relation to world GDP has come to a halt, reflecting primarily two factors. The first is much weaker capital flows to and from advanced economies, especially financial centers, and in particular diminished cross-border activity by banks in advanced economies, including within the euro area. The second is an increase in the relative weight of emerging economies in global GDP, since these economies have lower external assets and liabilities relative to advanced economies.

We also document how cross-border FDI positions have continued to expand, unlike positions in portfolio instruments and other investment. This increase is primarily explained by FDI positions vis-à-vis financial centers, which include an important role for so-called special purpose vehicles. This suggests that the increased complexity of the corporate structure of large multinational corporations is playing an important role in this respect. More generally, the disproportionate role of international assets and liabilities intermediated by financial centers—large and small—makes it extremely difficult to separate "genuine" financial integration/cross-border portfolio diversification from positions reflecting multinational corporate structures or the domicile of investment fund vehicles.

Finally, we look more closely at cross-border holdings of portfolio debt instruments, which have received much attention in recent years, in light of the increased demand for "safe" assets following the global financial crisis, the impact of the euro area crisis on nonresident holdings of domestic debt instruments in the most affected economies in the region, as well as the rise in foreign ownership of debt securities issued by emerging markets. Our results show that the share of domestic debt securities held by nonresidents is negatively related to the size of the domestic debt market and positively related to the level of GDP per capita. The analysis also shows how the debt crisis has changed substantially the impact of a common currency on foreign holdings of domestic debt securities, but that it has done so only for the countries more severely affected by the crisis. Finally, we document a global trend towards a higher share of nonresident ownership of debt securities issued by a country's residents.

In this paper we briefly describe broad trends in net external positions and their composition for large country groups as well as China and the United States (Section III) but we abstract from a detailed cross-country analysis (see for instance Chapter 4 in IMF, 2014 for a discussion of the evolution of global flow and stock imbalances after the crisis).

In Lane and Milesi-Ferretti (2007), we profiled the evolution of financial globalization over 1970-2004 for a set of about 145 countries. We highlighted the rapid growth in cross-border financial positions since the mid-1990s and also the asymmetric nature of financial globalization during the so-called Great Moderation period, with advanced economies "long equity, short debt" and emerging/developing economies "long debt, short equity." This asymmetric pattern proved to be important factor in terms of the global risk distribution during the global financial crisis.

In particular, under this configuration major advanced economies attracted large-scale debt inflows during the run up to the crisis, which were partly recycled to fund foreign equity assets (both FDI and portfolio equity) and partly used to fund current account deficits in the United States and some European economies. At the same time, there was a dramatic increase in cross-border debt flows among advanced economies, especially within the euro area. These developments meant that the advanced economies were especially exposed to the global financial crisis, which initially took the form of a freeze in credit markets. These pre-crisis debt flows were primarily intermediated through banks, with cross-border bank assets and liabilities playing a central role in the unfolding of the various banking crises since 2007.

While the general profile of pre-crisis cross-border financial positions (and the implications for the international propagation of the crisis) is well understood, it is timely to review and examine the reconfiguration of financial globalization since the onset of the crisis. By now, there have been several phases in terms of post-crisis adjustment. First, there was an initial acute period in which capital flows and asset values dramatically declined during 2008-2009, with significant repatriation of capital, particularly by advanced economies (Milesi-Ferretti and Tille 2011). Second, there was an asymmetric recovery phase during 2010-2013, during which capital flows to emerging markets strongly recovered but flows vis-à-vis advanced economies remained weak. In addition, this period was characterized by increasing financial fragmentation among euro area economies. Since mid-2013, there has been considerable uncertainty about the future evolution of international capital flows, with greater volatility in relation to emerging market flows (with capital outflow episodes during the "taper tantrum" in the summer of 2013 Taper Tantrum and in late 2015/early 2016) and only tentative signs of a more robust recovery in capital flows to and from advanced economies.

Throughout the post-crisis period, the level and composition of capital flows have been substantially different relative to pre-crisis patterns and it is important to analyze these differences. Most obviously, the shrinking of bank balance sheets has disproportionately involved a pulling back from cross-border banking. This has been partly replaced by an increase in international bond issuance (Shin 2013, IMF 2014). In relation to sectoral composition, there has been a sharp increase in official flows along several dimensions. As a funder, the official sector has played a key role in Europe, with large-scale cross-border net Eurosystem liquidity flows during the euro area crisis and some countries relying on large-scale EU/IMF bailout loans. As a borrower, the surge in public debt in many countries means that cross-border debt liabilities are increasingly concentrated in the form of sovereign debt. In characterizing and analyzing global trends in cross-border holdings for advanced economies and emerging markets and developing economies, the paper focuses in particular on financial centers. This group—comprising both advanced economies such as Ireland,

Luxembourg, the Netherlands, Switzerland, and the United Kingdom and small offshore centers such as the Bermuda and the Cayman Islands—accounts for a disproportionately large share of external asset and liability holdings, far in excess of its share in world GDP. In previous work we had documented the very large size of external balance sheets in small, offshore financial centers (Lane and Milesi-Ferretti, 2011a), but in order to understand the evolution of cross-border positions since the crisis it is important to focus on a broader set of financial centers.

This paper connects to a variety of strands in the literature. The collapse in capital flows during the global financial crisis was analyzed by Milesi-Ferretti and Tille (2011) and Lane (2013a). Bussière and others (2016) provide an update to the former study that includes the post-crisis period, while Chapter 2 in IMF, 2016 analyzes post-crisis capital flows to emerging economies.[2] Other relevant recent contributions include the analysis of the cross-border valuation effects associated with the decline in the U.S. asset-backed securities market in 2008 provided by Gourinchas and others (2012). The macro-financial implications of high levels of financial globalization in relation to crisis dynamics are also studied in Obstfeld (2012, 2013a, 2013b). Shin has provided an array of papers on the role of cross-border banking in international capital flows, with his recent work also highlighting the role of bonds in the "second wave" of global liquidity (Shin, 2013). At the theoretical level, the interdependence between financial globalization and domestic factors (the level of development, productivity, domestic savings, and the quality of institutions) has been recently studied by Broner and Ventura (2016). Cross-country and cross-time variation in these factors can help to account for the shifting nature of financial globalization.

The analysis in this paper is framed by the research agenda that takes due account of the implications of the size and composition of international balance sheets for macroeconomic outcomes and macroeconomic policy (see, amongst others, Gourinchas and Rey, 2014; Obstfeld, 2015). It is also framed by the literature on the measurement and interpretation of international financial data (Lane, 2014; Borio and Disyatat, 2015; Avdjiev and others, 2016).

The empirical work on the covariates of foreign ownership of portfolio securities builds on the analysis of international financial integration in Lane and Milesi-Ferretti (2008a). It also relates to studies that examine the cross-country allocation of international portfolios from the perspectives of an individual home country, an individual host country and at the bilateral level (see, amongst others, Lane and Milesi-Ferretti, 2008b; Forbes 2010; Burger and others, 2015; Horioka and others, 2015; Benetrix and Lane, 2016; Galstyan and others, 2016). Finally, the analysis of the growing importance of FDI positions in financial centers connects to the vast public finance literature on international taxation and the structure of multinational corporations (see for instance Dharmapala (2014) and Dowd and others, 2016).

The structure of the rest of the paper is as follows. Focusing on group-level data, Section II briefly describes the new dataset. Section III presents evidence on the main shifts in

[2] We do not address the evolution of net external positions. See, amongst others, Lane and Milesi-Ferretti (2012, 2015).

international balance sheets in the aftermath of the global financial crisis, and Section IV relates these shifts to the main macroeconomic and financial trends since the crisis. Section V provides a more in-depth treatment of the role of foreign investors as holders of portfolio debt securities, which has seen considerable movement in recent years. Finally, Section VI discusses the future evolution of cross-border positions and offers some conclusions.

II. The Dataset

The dataset presented in this paper contains estimates of external assets and liabilities (the international investment position) for over 210 economies, for the period 1970–2015. The main novelties relative to its previous version (Lane and Milesi-Ferretti, 2007) are: its virtually universal coverage, now including small offshore financial centers such as the Cayman Islands and the British Virgin Islands (following Lane and Milesi-Ferretti, 2011b); a longer time period; and increased emphasis on the breakdown of portfolio debt instruments from other investment instruments (previously aggregated as debt assets and liabilities).

The database has been helped substantially by the large increase in the number of economies now reporting international investment position statistics to the International Monetary Fund (currently close to 150 economies, up from 113 economies in 2007), as well as increased availability of bilateral data on portfolio, FDI, and bank holdings which help improve the estimates of external portfolios for countries not reporting those statistics. The data presentation follows the standard decomposition of assets and liabilities according to the Balance of Payments Statistics Manual 6. Specifically, assets and liabilities are divided in the following categories: foreign direct investment; portfolio equity; portfolio debt; other investment; and financial derivatives; plus foreign exchange reserves on the asset side. We exclude gold holdings from foreign exchange reserves, which are included in official IIP statistics, as these are not financial claims on another economy.

When international investment position data are not available, estimates are constructed from a variety of sources, as discussed in detail in Lane and Milesi-Ferretti (2007) and as documented on a country-by-country basis in the dataset. For the special case of small financial centers not reporting international investment position or balance of payments data, such as the Cayman Islands or the Channel Islands (Guernsey, Jersey, and Isle of Man), the estimates of external assets and liabilities are constructed from reported data on specific external assets and liabilities (such as portfolio assets reported to the IMF's Coordinated Portfolio Investment Survey) as well as mirror data from financial trading partners (see Lane and Milesi-Ferretti, 2011a). These small financial centers are primarily financial intermediaries, and hence have very large gross positions but net positions that are negligible from a global perspective. Given sizable measurement error on gross positions (in light of incomplete data coverage), we only report estimates of identified total external assets and total external liabilities, but not estimates of their net position.

Relative to the previous release of the database, we have also extended the split of total debt claims and liabilities into portfolio debt and other investment (previously available only for countries and years with published international investment position data) to the most recent twenty-year period. This allows us to examine separately the dynamics of these two categories, which have moved differently since the global financial crisis.

In order to construct estimates of portfolio debt liabilities when these are not reported by the economy being considered, we use four sources of data: the stock of debt securities held by nonresidents as reported in the country's external debt statistics; the stock of international debt securities issued by that country's residents, reported by the BIS; holdings of a country's debt securities derived from the IMF's Coordinated Portfolio Investment Survey (CPIS); and the sum of foreign-held long-term bonds issued by the private and public sector, reported by the World Bank. Among the economies that do not report IIP statistics, the country with the largest estimated debt liabilities is the Cayman Islands, while others include other small financial centers such as Guernsey and Jersey as well as economies in the Middle East such as Qatar and the United Arab Emirates.

The construction of data for portfolio debt assets is more difficult. The most reliable source of data is the CPIS, but reporters only include a subset of the economies for which international investment position data on portfolio debt claims is missing.[3] The only sources of partner-country data are a few annual surveys of portfolio debt liabilities (in particular for the United States and Japan), but those data include positions held as foreign exchange reserves, which complicate the estimation of portfolio debt assets (excluding reserves). The economies with the largest estimated holdings of debt instruments but no IIP or full CPIS reporting include the Cayman Islands as well as Qatar and the United Arab Emirates. These are also economies for which the overall estimate of external assets—and not just the split between portfolio debt and other investment claims—is subject to vert substantial uncertainty.

In terms of presentation of the data, we aggregate economies into three groups:

1. Financial centers. These economies, selected on the basis of their ratios of external assets and liabilities to GDP, include both advanced economies with sizable financial center activity (Belgium; Hong Kong S.A.R.; Ireland; Luxembourg; Netherlands; Singapore; Switzerland; and the United Kingdom), emerging economies with similar characteristics (Mauritius and Panama) as well as small financial centers (such as Bermuda and the Cayman Islands);
2. Other advanced economies;[4]
3. Emerging and developing economies. We also present data for China separately in light of its size relative to the country group.

One rationale for the division is to highlight the role of pure international financial *intermediation*, which has increased substantially in recent years, in addition to financial

[3] Among CPIS reporters that do not provide comprehensive IIP statistics, those with the highest estimated stocks of debt assets are Bermuda, Guernsey, and Jersey (Bermuda reports IIP statistics, but they exclude the offshore sector). For the Cayman Islands, which has by far the largest estimated stock of debt assets among countries not reporting IIP statistics, only banks report their holdings of securities to the CPIS, which therefore misses the holdings of the very large hedge fund industry.

[4] We use the IMF's classification of advanced economies. See the Appendix for a complete list of countries.

market *integration*. An example of the former would be the purchase by, say, a German investor (say a pension fund) of a mutual fund domiciled in Luxembourg that invests in U.S. equities, while an example of the latter would be a direct purchase by the same German pension fund of U.S. shares. In the first case, the size of cross-border assets and liabilities increases by twice as much as in the second case. These phenomena apply to all categories in the balance of payments: portfolio investment (as in the previous example), other investment (when banking flows are channeled through financial centers—for instance, euro area banks conducting U.S. business through their London branches and affiliates), as well as foreign direct investment, as discussed more extensively in the next Section.

III. Dynamics of International Financial Integration

Has financial globalization been "in retreat" since the global financial crisis? Figure 1 shows the evolution of world external assets for the three country groups described above over the past 25 years. It shows clearly how, after a remarkable expansion in cross-border positions up to a peak in 2007, these have actually declined slightly in relation to world GDP. The data may actually understate the extent of this decline, given the increase in data coverage (for instance, more countries now report claims and liabilities in the form of financial derivatives). The figure also underscores the important role played by financial centers in the global expansion of cross-border positions, as well as in the post-crisis slowdown. Emerging markets and developing economies account for a small, albeit growing share of cross-border holdings.

Figure 2 depicts the evolution in the corresponding shares of world GDP: it vividly underscores the increasing weight of emerging and developing economies since the crisis. Together, Figures 1 and 2 highlight the disproportionate role of financial centers in cross-border holdings: as of 2007, these accounted for close to 10 percent of world GDP but over 43 percent of global financial assets. By 2015, their share in world GDP had declined to 8 percent, but their global share of external assets remained around 43 percent. Conversely, emerging and developing economies accounted for some 30 percent of world GDP in 2007, but only 10 percent of cross-border financial assets. As of 2015, the world GDP share of emerging and developing economies had increased to around 40 percent at market exchange rates, but their share of external assets had expanded only to 13 percent.

Figure 3 and 4 illustrate changes in external positions between 2007 and 2015 by type of instrument and group of countries, with Figure 3 reporting changes in nominal dollar terms, and Figure 4 reporting changes of the corresponding ratios to world GDP.[5] Focusing first on the ratios to GDP shows that the slowdown in cross-border holdings reflects primarily a contraction in the size of debt instruments relative to world GDP, offset in part by a large increase in FDI and a smaller increase in financial derivatives. We discuss those developments further below. But looking at the evolution of GDP in the different country groups (Figure 2 and last bar of Figure 3), together with evidence from Figure 1 on the

[5] While valuation changes play an important role in explaining year-to-year fluctuations in external positions, especially when equity prices and exchange rates move substantially, cumulative financial flows generally match the changes in positions reported in Figure 3.

smaller size of cross-border holdings of emerging and developing economies in relation to their GDP when compared with advanced economies, suggests a second factor explaining lower cross-border holdings in relation to world GDP. This is the increase in the global share of GDP of emerging and developing economies, which have smaller ratios of external assets and liabilities to GDP relative to advanced economies.

In terms of external balance sheet dynamics by group of countries, a few stylized facts stand out:

- For financial centers, the first is the sharp contraction in cross-border claims and liabilities in terms of "other investment" (where loans and deposits figure prominently). As discussed below, this is closely related to the scaling down in cross-border activities of large international banks. The second is the large increase in their FDI claims and liabilities. As we discuss below, this development is associated to an important extent with the increased complexity in the cross-border corporate structures of large multinational companies, as well as with their choices of domiciliation for headquarters.

- With regard to advanced economies excluding financial centers, we also see a shrinking in cross-border positions in the other investment category. The moderation in liabilities in terms of portfolio debt (Figure 3, second panel) was instead attenuated by the build-up of foreign exchange reserves by emerging and developing economies (see Figure 3, first panel).

- As for emerging economies, the increase in reserves was the largest change on the asset side, while it was the increase in FDI on the liabilities side. It is also interesting to note that emerging and developing economies experienced an increase in claims and liabilities in the form of debt instruments—both portfolio debt and other investment—unlike advanced economies and financial centers.

We turn next to a time-series decomposition for external assets, external liabilities, and the net external position for the three groups of countries in relation to their GDP, and also provide a split for the net positions for the United States and China from their respective country groups. The discussion of net positions—a topic well covered in a variety of papers—is limited to the broad trends for the different country groups.

With regard to advanced economies that are not financial centers (Figures 5 and 6), the already-mentioned decline in claims and liabilities in the form of other investment since the crisis implies that the largest asset category is now FDI, with portfolio equity claims roughly the same size as other investment claims. On the liabilities front, portfolio debt has expanded further, reflecting to an important extent increased holdings of foreign exchange reserves, especially emerging and developing economies. The net position shows a gradual deterioration, with rising net claims in equity instruments (portfolio equity and FDI) more than offset by rising net portfolio debt liabilities.

As shown in Figure 6, the deterioration in the net external position of this country group reflects entirely developments in the United States (top panel)—the net external position has

actually been improving for the group of other advanced economies, which includes economies such as Japan and Germany. With current account deficits much lower than their pre-crisis levels, valuation effects have played an important role in explaining the worsening of the U.S. external position, as an appreciating dollar, rising U.S. equity prices relative to those elsewhere, and the decline in U.S. interest rates have all contributed to a worsening U.S. international investment position. A common pattern in the external position of these economies is the persistent "long equity, short debt" pattern (already discussed in Lane and Milesi-Ferretti, 2007) with net FDI and portfolio equity claims but net liabilities in terms of portfolio debt and (to a lesser extent) other investment.

For financial centers (Figure 7), the largest share of the external portfolio pre-crisis was accounted for by other investment claims and liabilities, reflecting the role of these economies as banking centers. Since the crisis, those claims and liabilities have shrunk dramatically, but at the same time there has been a surge in FDI claims and liabilities, which represent now the largest component of their external portfolio (some 350 percent of these economies' GDP). These economies in the aggregate are net creditors, reflecting a positive net FDI position as well as sizable foreign exchange reserves. These countries have a net creditor position in portfolio debt instruments and a net debtor position in portfolio equity instruments, reflecting the substantial presence of investment funds in some of these economies (especially Luxembourg and Ireland, but also the Cayman Islands). Shares of these funds held by nonresidents are portfolio equity liabilities for the domestic economy, but these funds invest in a variety of instruments, including debt securities, thus explaining the apparent asymmetry in these countries' external balance sheet.[6]

Finally, Figures 8 and 9 for emerging and developing economies show a much lower stock of external assets and liabilities when compared to the size of these economies (around 60 percent of GDP). Foreign exchange reserves are an important component of their external assets, and on the liabilities front the relative importance of debt instruments relative to equity instruments has been declining. The net position shows a trend improvement over time, notwithstanding a spike in the net position in 2008–09 driven by valuation effects, as these countries' currencies depreciated and stock market valuations declined sharply.

Figure 9 separates out the net position of China from the one of other emerging and developing economies. The composition of the net position is quite similar (both China and other emerging and developing economies are "long" reserves and "short" FDI) but China has been a net creditor throughout the period, while in the aggregate other emerging and developing economies have been net debtors. The trend improvement in the net position of other emerging and developing economies reflects importantly the large surpluses of oil exporters throughout most of the pre- and post-crisis period.

[6] For a few small offshore centers such as the British Virgin Islands and the Cayman Islands we use rough estimates of gross external assets and liabilities in calculating total claims and liabilities of financial centers, but we don't use their difference to calculate a net position. The reason is the sizable measurement error in assets and liabilities, together with their large size. In practice, the net external position of these centers is close to zero, given that they are virtually pure intermediaries and that the absolute size of their economies is minimal.

IV. External Balance Sheet and Global Macro-financial Trends

The evolution of external balance sheets since the crisis depicted in Figures 1, 3, 4 and subsequent ones has been shaped by a number of global and regional macro-financial trends. With regard to advanced economies and financial centers, the first trend is the large reduction in cross-border banking activity following the global financial crisis and associated hit on large international banks; and the second is the euro area crisis of 2010–2012, resulting in a scaling down of cross-border integration within the euro area. With regard to emerging and developing economies, the main factors at play in explaining the evolution of cross-border balance sheets were the post-crisis boom in emerging markets and associated large capital inflows, and subsequent fading thereof, and the rapid increase in China's size and role in the global economy. We examine these developments in turn.

A. Banks

Large international banks played a key role in pre-crisis capital flows. In part, this reflected the capacity of these banks to use internal channels to arbitrage differences in funding conditions around the world (Cetorelli and Goldberg, 2012). A prominent example is provided by the active participation of large European banks in the dollar funding market during the mid-2000s, in order to fund both US-located assets and European-located assets (Acharya and Schnabl, 2010; Bruno and Shin, 2015; Ivashina and others, 2015). It is also plausible that the incentive structures facing banks encouraged a scaling up in the size of balance sheets, fueling cross-border expansion (Committee on Global Financial Stability, 2010; Allen and others, 2011). With the freezing of interbank and wholesale funding markets during 2008–2009 and large-scale credit losses, banking and regulatory models have been overhauled in response to the global financial crisis. One byproduct is that most large global banks, especially those from the euro area, the United Kingdom, and Switzerland, have undertaken a substantial retreat from cross-border banking activities.

This retreat is illustrated in Figures 10 and 11. Figure 10 shows that in 2007 the external claims of BIS-reporting banks on a locational basis accounted for some 56 percent of world GDP (and 28 percent of global external assets). By 2015, these claims accounted for 36 percent of world GDP, and less than 20 percent of all global external claims. Figure 11 shows the decline in claims between 2007 and 2015 by country group of destination: the decline is concentrated in advanced economies, and especially financial centers. In contrast, claims on emerging and developing economies have risen in dollar terms and also as a share of world GDP. However, these have declined as a share of GDP in emerging and developing economies, a further sign of the diminished role of international banks.

Two points need to be underscored. First, these aggregate trends in cross-border banking mask some regional differences (see also Bouvatier and Delatte, 2015). Among advanced economies, Japanese, Canadian and Australian banks have increased their cross-border claims as a share of their GDP, and so have banks from Scandinavian countries. Among emerging and developing economies, Chinese banks have for instance undertaken a sizable overseas expansion. On a smaller scale, banks from other emerging markets have expanded regionally—for instance, Colombian banks in Central America.

Second, as noted by Claessens and Van Horen (2015), foreign bank presence in domestic markets, which importantly include locally-funded subsidiaries, has declined by much less than cross-border banking activity. Here again there are differences across banks from different regions, with banks from OECD countries reducing their presence in foreign markets since the crisis while banks from non-OECD countries expanded theirs.

B. The Euro Area Crisis

The decline in cross-border banking is also an important element of the euro area crisis that took hold during 2010–2012. While the 2008–2009 global financial crisis had already had a significant impact in those countries most affected by the sudden stop in financial markets (that is, those running large current account deficits and/or managing the fallout from property boom-bust cycles), the euro area had also initially been buffeted by the operation of automatic Eurosystem liquidity flows and the absence of volatility in national-level currency markets. Rising sovereign debt levels, disappointing growth performance and the systemic implications of the emerging Greek crisis led to a more widespread questioning of the sustainability of the common currency during 2010–2012, with a rise in national sovereign spreads and active management of redenomination risk.

While existential uncertainty about the future of the euro was ultimately addressed by the ECB's OMT program in September 2012, the crisis exposed the fragile design of the euro area and the non-equivalent status of resident versus non-resident financial entities, even inside a monetary union. The deviation from full financial union was further underlined by the imposition of capital controls in Cyprus and Greece. Since the euro area had experienced by far the strongest growth in cross-border financial integration during the pre-crisis period, the impact of the retreat from full integration has been substantial (Lane, 2013b).

Figure 12 provides a snapshot of the evolution of intra-euro area holdings over the past decade, calculated as the difference between the sum of external assets across all euro area countries and total external assets for the euro area as a whole. It shows how such holdings have continued to rise primarily on account of FDI and non-bank other investment, while both portfolio debt holdings as well as bank loans have shrunk as a share of euro area GDP. The increase in FDI is importantly related to the expansion in special purpose vehicles, discussed in more detail in the next sub-section. More generally, the increased complexity in the financial structure of large multinational corporations is also contributing to the rising trend in nonbank other investment, together with official lending programs. The decline in cross-border loans reflects the general downsizing in international banking activity, and so does to some extent the decline in intra-euro area-border portfolio debt holdings, a topic we discuss more extensively in Section V.

C. FDI Measurement Issues

As of end-2007, residents of financial centers held some 43 percent of the world's FDI claims abroad, and FDI in financial centers accounted for around 40 percent of the global total. By end-2014, FDI claims by financial centers had risen to half of the world total, and

liabilities to 44 percent.[7] And—as shown in Figures 3 and 4, global FDI was the only asset category that expanded substantially as a share of global GDP since the global financial crisis. Its increase as a share of financial centers' GDP was dramatic, as illustrated in the top two panels of Figure 7.

While most of the larger financial centers have important multinational corporations with extensive cross-border activities, other factors play an important role in explaining both the size and composition of FDI claims and liabilities as well as their dynamics.

The first is the growing importance of Special Purpose Entities. These are legal entities with "little or no employment; or operations, or physical presence in the jurisdiction in which they are created by their parent enterprises which are typically located in other jurisdictions (economies)" (OECD, 2008). Such vehicles are used to raise capital or hold assets/liabilities and generally perform no production activities. Statistics on the relative importance of SPEs in total FDI are only available for a limited set of countries. Helpfully, those include the Netherlands and Luxembourg, which are the countries with the largest stocks of FDI claims and liabilities after the United States.[8] The vast majority of their FDI claims and liabilities (over ¾ for the Netherlands and over 90 percent for Luxembourg) are indeed SPEs. Total FDI claims by SPEs for just these two countries have grown by over $3.5 trillion between 2007 and 2014—over ¼ of the increase in the stock of global FDI claims during the same period.

The second factor is the increased tendency of multinational companies to move their domicile to a financial center. To the extent that the company is moving from a country where it has larger production facilities than in the financial center this will generally increase the stock of global FDI (think for instance of a U.S. pharmaceutical company with important local production facilities moving its headquarters to Ireland).[9] In that case, global FDI would increase by the value of the U.S. production facilities minus the value of any facility previously located in Ireland. Indeed, the stock of FDI claims overseas by Ireland has increased by $600 billion between 2007 and 2014, and by that date it is over 5 times Irish GDP. The counterpart to an increase in FDI assets in the countries hosting re-domiciled firms is a matching increase in foreign portfolio equity liabilities, given that the underlying shareholders of the entities remain the same.

---

[7] In relation to the size of financial centers, these claims and liabilities are each three times GDP. Blanchard and Acalin (2016) document a very strong correlation between FDI inflows and FDI outflows across a range of emerging economies, which they interpret as suggesting that an important proportion of measured FDI inflows are "pass through" flows going in and out of the country on their way to their final destination, with the stop due in part to favorable corporate tax conditions.

[8] Other countries reporting sizable FDI claims and liabilities by SPEs include Austria, Belgium, Hungary, and Ireland. SPEs likely play an important role in FDI claims and liabilities of Bermuda, the British Virgin Islands, and the Cayman Islands (which together account for over 5 percent of global FDI claims, according to our estimates).

[9] We are abstracting here from changes in the mix of financing which weaken the link between the value of production facilities and FDI. See for instance Jayaswal and others (2006) for an example related to FDI in Denmark.

D. Emerging and Developing Economies and the Role of China

Since the global financial crisis, the group of emerging and developing economies has become increasingly prominent in the global financial system. At a basic level, this reflects their growing importance in global GDP, in view of the substantial growth differential over the last decade between emerging and advanced economies. Since these economies have much lower ratios of external assets and liabilities to GDP compared to advanced economies, their growing share of global GDP has mechanically acted to reduce the share of cross-border assets in world GDP through a composition effect.

Across emerging markets, there have also been significant changes in the structure of international balance sheets. These include the much-discussed increase in portfolio liabilities as emerging market sovereigns and corporates have increased issuance and gained favor among global investors. It also reflects the rise of emerging economies as outward investors, as is evident in the increased scale of capital outflows. These include not only increased holdings by the official sector (foreign exchange reserves; sovereign wealth funds) but also an increased presence of corporations and institutional investors from emerging economies in international capital markets.

Within the emerging market group, China plays an especially important role. While the ratio of external assets and liabilities to GDP in China has not changed dramatically since the pre-crisis period, the very large increase in its share of the aggregate GDP of emerging economies implies that it now plays a large role in shaping global aggregate trends in their financial integration, particularly for foreign exchange reserves, foreign direct investment, and other investment.

These developments are illustrated in Figure 13, which has the same structure as Figure 4 but focuses on data for emerging and developing economies only, separating out China from other countries. As of 2015, China accounted for close to 40 percent of the GDP for this country group, calculated at market exchange rates, up from 22 percent in 2007. The figure shows how developments in China played a big role in explaining the increase in foreign exchange reserves, but also the increase in inward and outward FDI and other investment. For portfolio instruments, changes were larger in absolute terms for other emerging and developing economies, given the relatively closed nature of Chinese markets to foreign portfolio investment. With regard to those categories, the decline in portfolio equity is related to the weakening in equity valuations, while the increase in portfolio debt liabilities will be discussed extensively in the next section.

V. Foreign Holdings of Portfolio Debt Securities

Much discussion and commentary on capital flows in recent years has focused on portfolio investment, and especially on portfolio debt securities. This reflects several important developments in portfolio debt markets in recent years. These include a relative shift from international bank-intermediated debt liabilities to international portfolio debt liabilities, resulting inter alia in an increase in issuance of portfolio debt instruments by emerging economies and higher foreign participation in their securities markets; a reduction of foreign holdings of domestic debt securities for euro area countries more severely affected by the

euro area crisis of 2010–2012; an increase in demand for safe assets (such as U.S. Treasury bonds and German bunds) by international investors, including importantly foreign central banks; as well increased holdings of government debt securities by central banks in several advanced economies, associated with quantitative easing.

In order to analyze the dynamics of cross-border investment in portfolio debt securities, it is important to take into account variations in the size of securities' markets in individual countries. To gain insight into the role of foreign investors as holders of portfolio debt securities, we investigate the covariates of the ratio of foreign debt portfolio holdings to total portfolio debt for 2007 and 2015. Our primary focus is on the holdings of sovereign debt but we also explore the aggregate portfolio debt category. This empirical investigation is helpful in adding insight into the determinants of variation in the international investor base across countries by identifying the factors associated with some countries exhibiting much higher degrees of penetration by foreign investors than other countries and with shifts in the degree of foreign investor participation over time.

In aggregate terms, the stock of cross-border holdings of portfolio debt instruments increased by over $6 trillion for the period 2007–15, as shown in the bottom panel of Figure 3. The importance of increased holdings of safe assets in explaining this increase is immediately obvious if one compares this figure with the much-lower increase in portfolio debt claims (around $2 trillion), which exclude holdings of securities as foreign exchange reserves. Figures 3-4 as well as Figure 8 highlight the increase by of foreign holdings of portfolio debt instruments issued by emerging and developing economies. In the aggregate, the ratio of portfolio debt liabilities to GDP for emerging and developing economies has risen by 2 percentage points between 2007 and 2015. As shown in Figure 14, this aggregate figure masks considerable cross-country heterogeneity.

Table 1 provides some stylized facts on the size and evolution of global debt securities markets between 2007 and 2014. Over that period the size of markets relative to world GDP actually shrank, but this reflects entirely composition effects. Specifically, the size of the markets for debt securities relative to each country group's GDP went up, but the global total shrank because of the rising weight of emerging markets in general, and China in particular, which have smaller debt securities markets in relation to GDP when compared to advanced economies. Within total debt securities, the share of government debt securities has been increasing, both within country groups and at the global level.

Table 2 presents summary statistics on the share of debt securities held by nonresidents in advanced economies and emerging economies. The share is higher in the former and for government securities when compared to total debt securities, but it has risen for emerging economies over the post-crisis period.

We turn next to an empirical cross-country examination of factors explaining the share of foreign ownership of debt securities issued by domestic residents. We focus on foreign holdings of government debt securities. Results for foreign holdings of total debt securities are analogous, and presented in a separate appendix. Among the covariates, we consider macroeconomic variables, structural factors (for example, disaggregated measures of capital

controls), domestic financial development, as well as euro membership. To capture pre-crisis and post-crisis patterns, we examine the covariates of foreign holdings in 2007 and 2015; in addition, we examine the covariates of the change in holdings between 2007 and 2015.

Related papers include Burger and Warnock (2006), Lane and Milesi-Ferretti (2008b), Horioka and others (2015), and especially Arslanalp and Tsuda (2014a, 2014b), who put together a comprehensive cross-country dataset on holders of general government debt for both advanced economies and emerging markets.

We examine both the factors determining the cross-country heterogeneity in foreign holdings of government debt (for the pre-crisis year 2007, the most recent observation of 2015, and the change between the two) as well as the factors explaining the variation of the foreign share over time within countries. The regression specifications are

$$FORSHARE_i^{2007} = \alpha^{2007} + \beta^{2007} Z_i^{2007} + \varepsilon_i^{2007}$$
$$FORSHARE_i^{2015} = \alpha^{2015} + \beta^{2015} Z_i^{2015} + \varepsilon_i^{2015}$$
$$\Delta^{0715} FORSHARE_i = \alpha^{\Delta} + \beta^{\Delta} \Delta^{0715} Z_i + \varepsilon_i^{\Delta}$$
$$FORSHARE_{it} = \alpha_i + \gamma_t + \beta^{panel} Z_{it} + \varepsilon_{it}$$

where *FORSHARE* is the share of foreign investors in total holdings of domestic government debt securities, which is calculated as the ratio of portfolio debt liabilities (from our database) to total debt securities outstanding (calculated using data from the Bank of International Settlements complemented with national sources and data from Arslanalp and Tsuda (2014a, b).

The set of regressors *Z* includes the following variables:[10]

- Market size (log of bond market capitalization measured in U.S. dollars). Other things equal, we would expect the share of foreign holdings to be inversely correlated with the size of the market. For instance, with full global diversification nonresidents would hold a share of 50 percent in a country accounting for the issuance of half of global debt securities, but a share of close to 100 percent for small countries.

- Level of development (GDP per capita in U.S. dollars). We would expect more developed countries to have a higher share of foreign ownership.

- Common currency. We would expect a higher foreign share if foreign investors do not have to bear exchange rate risk. In practice for our sample these considerations are particularly relevant for euro area countries. Within those, we distinguish three groups: economies more severely affected by the euro area crisis (Greece, Ireland, Italy, Portugal, and Spain), smaller economies that joined the euro area in 2007 or thereafter (Cyprus,

[10] See the Appendix for variable definitions and sources.

Estonia, Latvia, Lithuania, Slovak Republic, and Slovenia), and the remainder (Austria, Belgium, Finland, France, Germany, Luxembourg, and Netherlands).

- Net external position. We expect countries that are net borrowers to have higher recourse to external finance and hence a higher share of foreign ownership in domestic debt markets.

- Capital controls. We expect the foreign share to be lower in countries with more restrictions on capital inflows, and especially in countries with more restrictions on bond inflows. The variables we use (one for total restrictions on capital inflows, the other for restrictions on bond inflows) come from Fernandez and others (2015). To measure the intensity of restrictions we use the average level of the variable for the preceding 3 years.[11]

- Securities' holdings by central banks. We expect the foreign share to be lower, the higher the share of debt securities held by the central bank.

The results of cross-sectional regressions for the foreign share of government securities are presented in Table 3 for the entire sample as well as advanced economies and emerging economies separately. The results show that the share of domestic government debt securities owned by nonresidents is negatively correlated with market size, positively correlated with the level of development, and negatively correlated with the NIIP position, both for 2007 and for 2015. The results for the euro area dummies are consistent with our priors. Nonresidents tend to hold higher shares of outstanding government debt securities in "core euro" countries, after controlling for other fundamentals, and the coefficient remains stable between 2007 and 2015. For the countries more severely affected by the euro crisis the coefficient for 2007 is positive and significant, albeit lower (indicating a share about 10 percentage points lower than for core countries). But the coefficient drops drastically for the 2015 regression, and loses statistical significance.

Finally, for smaller countries that joined the euro area later the coefficient is, as expected, much higher for 2015 than for 2007 (it switches from negative in the first period to positive in the second period) reflecting the increased integration of their securities markets with those in the rest of the euro area. Both measures of capital controls are generally statistically insignificant and occasionally with the "wrong" sign. Our interpretation of this finding is that these measures are poor proxies of the intensity of capital controls: for instance, for 2015 the bond restrictions variable takes the same value for China and India (where foreign access to the domestic government debt securities market is severely restricted and the foreign share is hence tiny) and Indonesia, where nonresidents hold 65 percent of outstanding government debt securities.

In Table 4, we focus directly the change in the foreign share between 2007 and 2015, and, consistent with the results of Table 3, we find a strong role for euro-related variables. Specifically, the dummy for euro area countries most affected by the crisis is negative and

[11] The dataset goes only until 2013, so for the year 2015 we use that observation.

economically and statistically very significant, while the dummy for the new euro area members is positive and very significant. Interestingly, within-country variations in the more general measure of capital controls are significantly and negatively correlated with the foreign share for all three samples. Instead, changes in the share of central bank holdings of government securities are not systematically correlated with changes in the foreign share. One possible reason for this surprising result is the relatively limited number of countries for which variations in the central bank share were sizable. The largest changes were for Japan and the United Kingdom, both countries in which the foreign share was roughly unchanged between 2007 and 2015.

Finally, Table 5 presents a similar set of regressions in a panel setting, for the period 2006-2015. Regressions include both country dummies, so as to focus on factors affecting the within-country variation in the foreign share, as well as time dummies, to capture global trends towards more or less financial integration. As for the euro area-specific variables, we include a dummy that takes the value of one for Greece, Ireland, Italy, Portugal, and Spain for the years 2011–2015, to capture the impact of the euro area debt crisis, as well as the dummy variable for euro area membership for the smaller countries that joined the single currency after 2007 (since it exhibits some time series variability). We instead exclude the dummy for the remainder of euro area countries, which is collinear with the fixed country effects. We also add GDP growth to capture in a rough fashion the impact of a country's economic performance on its attractiveness for foreign investors.

The time-series results confirm some of the key findings of the cross-sectional analysis—most notably the impact of market size and of the euro area debt crisis on the evolution of foreign holdings of domestic government debt. Results also suggest that the foreign share rises when a country's growth rate rises and when capital account restrictions are reduced, even though the latter result is not as robust and holds only for overall capital account restrictions. Finally, for the sample of advanced economies we find evidence that the foreign share declines in countries where the share of central bank holdings is rising.

Figure 15 plots the year-by-year estimates for time dummies, which capture the impact of global trends common across countries. These are generally statistically significant and show in all three samples a trend increase—about 12 percentage points for advanced economies between 2006 and 2014, and almost 20 percentage points for emerging and developing economies, consistent with an increased internationalization of domestic securities' markets.

In sum, the level and evolution of foreign holdings of government debt securities are remarkably well explained by a parsimonious set of variables. For advanced economies, euro area membership and the euro area debt crisis play an important role, in addition to market size. For emerging and developing economies, the level of development and the net external position play an important role in explaining the size of foreign holdings across countries, while within countries the share tends to rise with an economy's growth rate as well as with capital account liberalization.

VI. Conclusions

In this paper we have characterized the evolution of cross-border holdings of financial instruments since the financial crisis. In particular, we have shown how the very fast growth in cross-border positions in relation to global GDP has come to a halt since the financial crisis, reflecting both a retrenchment of cross-border banking activity and the increased weight of less-financially-integrated emerging and developing economies in global GDP. Across country groups, we have documented the disproportionate role played by financial centers—both small offshore centers and a few larger advanced economies—in total holdings, as well as the growing but still relatively modest role played by emerging and developing economies. Across financial instruments we have shown how the retrenchment in cross-border banking activity and the much more modest increase in portfolio positions relative to pre-crisis trends has been offset by rapidly increasing FDI positions. These have reflected to an important extent claims on and from financial centers, where pass-through financial vehicles as well as the shifting domiciles of multinationals have played a crucial role.

One concern highlighted by the data analysis in the paper is the increasing difficulty in properly assessing external exposures (total and especially bilateral), particularly but not exclusively in light of the size of cross-border asset trade intermediated by financial centers (see also Avdjiev and others, 2016). This difficulty affects virtually all categories of cross-border holdings: other investment positions by banks (often reflecting positions taken by affiliates of foreign banks); portfolio equity positions (which include investment fund shares, where the underlying funds may be investing in bond instruments or other financial assets); portfolio debt positions (for countries where offshore issuance is sizable); and increasingly FDI positions (given the role of pass-through financial vehicles and re-domiciliation of multinational companies, as discussed above). And while for bank positions the availability of consolidated data provides useful additional information to better identify exposures, the same is not true for portfolio equity positions in investment fund vehicles or for FDI positions. There is clearly scope for progress on improving data on this front.

More generally, a key question is how the measures of the size of external assets and liabilities presented in this paper relate to "international financial integration" as economists typically define it and model it, well as how this concept relates to welfare more generally. An important component of international financial integration is standard portfolio diversification—for instance pension funds in the Netherlands investing in other countries on behalf of Dutch savers. This component has clearly continued to increase. Another much-examined aspect of integration is provided by greenfield foreign direct investment, or by the acquisition of a foreign firm by a domestic one. A third direct link relates to government investment—for instance holdings of foreign exchange reserves or sovereign wealth funds. This has also shown an upward trend, reflecting primarily increased holdings by emerging market governments.

But other factors have also contributed to the growth in cross-border holdings to an extent that overstates both the level and composition of underlying cross-border financial linkages. In relation to the level of cross-border positions, tax management practices and regulatory arbitrage give rise to round tripping arrangements by which foreign assets and foreign liabilities essentially offset each other, with no true cross-border financial linkage. In relation

to geographical composition, as the location of financial intermediaries for portfolio investment has tended to concentrate in specific jurisdictions—such as Ireland and Luxembourg for mutual funds, or the Cayman Islands for hedge funds—cross-border holdings have grown reflecting the "passage" of investments through these financial centers en route to their final destination. In related manner, the composition of cross-border positions across categories (debt, equity, FDI) is affected by the rise of mutual fund vehicles (the liabilities of even bond-only mutual funds are portfolio equity liabilities) and balance sheet optimization by multinational firms which can generate practices such as corporate inversions and re-domiciliations, such that the host country sees a matched expansion in FDI assets and portfolio equity liabilities.

Turning to the boom-bust cycle in international bank-related flows, it is important to appreciate that the volume of cross-border bank assets and liabilities is not a helpful indicator of the extent of international risk sharing or intertemporal smoothing. Rather, to the extent that part of the mid-2000s expansion in cross-border banking was driven by distorted incentives to expand bank balance sheets (on the part of both net lenders and net borrowers in the inter-bank market), the post-crisis reversal can be interpreted as a welcome correction.

The analysis in the preceding sections provides some guidance about the likely future evolution of international financial integration. In particular, the paper has highlighted international banking, the institutional framework for the euro area, the global economic and financial shift towards emerging economies, but also balance sheet management by large financial and nonfinancial corporations as primary factors influencing the dynamics of cross-border financial trade.

In relation to international banking, there are several forces at work. While the global tightening of financial regulations generally penalizes international balance sheet expansion and limits risk appetites, there are some countervailing factors. In particular, the exit of marginal banks from some high-risk market segments provides scope for the remaining active firms to gain market share on a global basis. Second, some banks from emerging economies may seek to expand geographical diversification through cross-border activity and overseas acquisitions in both regional and advanced markets—a phenomenon already underway, especially across emerging and developing economies. Third, the fixed costs of investing in new technologies and meeting regulatory requirements may further induce cross-border consolidation in banking systems. An ancillary issue is whether non-financial entities can take on a larger long-term role as an intermediary for cross-border asset trade. While asset managers and other non-bank intermediaries have grown in prominence since the crisis, this has also flagged the importance of developing appropriate financial stability policies vis-à-vis non-bank credit providers.

In relation to the future of cross-border financial integration within the euro area (and the broader EU), the establishment of banking union and plans for capital markets union should support a higher degree of sustainable debt and equity flows. At the same time, the legacy of the crisis in terms of high levels of private and public sector debts means that the scope for net increases in debt levels is limited in many member countries, with deleveraging mechanisms still at work. In addition, tighter regulation of banks and greater deployment of

national macroprudential measures mean that the pre-crisis levels of cross-border debt flows are not likely to recur. The full potential of banking union also requires further progress in relation to the establishment of an area-wider common deposit insurance system.

Will we see a convergence in the patterns of international financial integration across advanced and emerging economies? A plausible baseline is that the share of emerging economies in the global financial system will ultimately match their rising share in global output, especially as these economies gradually remove remaining restrictions on the financial account. Lane and Milesi-Ferretti (2008a) find that the overall scale of cross-border holdings grows in line with rising levels of income per capita and the rate of domestic financial development. Moreover, the progressive relaxation of restrictions on international financial outflows should be associated with greater outward investment activity by domestic private-sector entities across the full range of investment categories.

In general, convergence in the scale and characteristics of international financial integration between the advanced and emerging country groups should be expected over the long term. Domestic financial development (including expansion of institutional investors) will expand domestic capacity to issue safe types of foreign liabilities and acquire a broad array of foreign assets. Through such developments, the shares of reserves and sovereign wealth funds in aggregate foreign assets will decline and the asymmetries between the international investment profiles of advanced and developing countries will diminish.

It is plausible that much of this outward expansion will be regionally focused, in view of the influence of gravity factors on international investment patterns (Lane and Schmukler, 2007; Lane and Milesi-Ferretti, 2008b; Park 2013; Park and Mercado, 2014). For instance, Committee on the Global Financial System (2014) highlight the scope for increased regional cross-border integration across the banking systems of emerging market economies. Regionalization would also increase if more emerging economies adopted independent monetary policies and/or regionally-orientated managed exchange rate regimes, which could be associated with a reduced need to hold large volumes of advanced-economy reserve currency liquid assets. In related fashion, the gradual internationalization of the RMB could foster a higher degree of regional financial integration over time (see also Taylor, 2013; Eichengreen and Kawai, 2015; He and others, 2015).

While the financial convergence process may play out as described above over the medium term, international financial integration carries risks for emerging economies. First, the elastic nature of international financial flows tends to magnify the impact of domestic policy errors. Second, emerging economies are more vulnerable to self-fulfilling pessimism among international investors (Calvo and Mendoza, 2000; Martin and Rey, 2006). Third, less liquid financial systems also find it harder to tolerate shifts in global portfolio weights. The impact on capital flows of recent shocks affecting emerging economies (from the summer 2013 “taper tantrum” to the decline in commodity prices in recent years) speaks to the relevance of these issues. At the same time, the change in portfolio structure of emerging economies, with increased reliance on domestic-currency liabilities and a move towards more flexible exchange rate regimes, together with stronger policy frameworks have arguably increased the resilience of emerging economies to external shocks.

References

Acharya, Viral and Philipp Schnabl, 2010, "Do Global Banks Spread Global Imbalances? Asset-Backed Commercial Paper During the Financial Crisis of 2007-2009," IMF Economic Review No. 58, No. 1, pp. 37–73.

Allen, Franklin, Thorsten Beck, Elena Carletti, Philip R. Lane, Dirk Schoenmaker, and Wolf Wagner (2011), "Cross-Border Banking in Europe: Implications for Financial Stability and Macroeconomic Policies," Centre for Economic Policy Research, London.

Arslanalp, Serkan and Takahiro Tsuda, 2014a, "Tracking Global Demand for Advanced Economy Sovereign Debt," IMF Economic Review No. 62, No. 3.

———, 2014b, "Tracking Global Demand for Emerging Market Sovereign Debt," IMF Working Paper 14/39 (Washington: International Monetary Fund).

Avdjiev, Stefan, Robert McCauley and Hyun Song Shin, 2016, "Breaking Free of the Triple Coincidence in International Finance," *Economic Policy,* Vol. 31 (June), pp. 409–45.

Benetrix, Agustin and Philip R. Lane, 2016, "Cross-Country Exposures to the Swiss Franc," Trinity Economic Paper No. 01-16.

Blanchard, Olivier and Julien Acalin, 2016, What Does Measured FDI Actually Measure?" Policy Brief 16-17, Peterson Institute for International Economics (October).

Borio, Claudio and Piti Disyatat, 2015, "Capital Flows and the Current Account: Taking Finance (More) Seriously," BIS Working Paper No. 525 (October).

Bouvatier, Vincent and Anne-Laure Delatte, 2015, "Waves of International Banking Integration: A Tale of Regional Differences," *European Economic Review,* Vol. 80 (November), pp. 354–73.

Broner, Fernando and Jaume Ventura, 2016, "Rethinking the Effects of Financial Globalization," *Quarterly Journal of Economics,* Vol. 131, No. 3 (March), pp. 1497–1542.

Bruno, Valentina and Hyun Song Shin, 2015, "Cross-Border Banking and Global Liquidity," *Review of Economic Studies*, Vol. 82, No. 2 (April), pp. 535–64.

Burger, John, Rajeswari Sengupta, Francis E. Warnock and Veronica C. Warnock, 2015, "US Investment in Global Bonds: As the Fed Pushes, Some EMEs Pull," Economic Policy, Vol 30, No. 84, pp. 729–766.

Burger, John D., and Francis E. Warnock, 2006, "Local Currency Bond Markets," *Staff Papers,* International Monetary Fund, Vol. 53 (Special Issue): pp. 133–46.

Calvo, Guillermo A. and Mendoza, Enrique G., 2000, "Rational contagion and the globalization of securities markets," Journal of International Economics, Vol. 51, No. 1 (June) pp, 79–113.

Lane, 2013Cetorelli, Nicola and Linda S. Goldberg, 2012, "Banking Globalization and Monetary Transmission," *Journal of Finance,* Vol. 67, No. 5, pp. 1811–43.

Claessens, Stijn and Neeltje Van Horen, 2015, "The Impact of the Global Financial Crisis on Banking Globalization," *IMF Economic Review,* Vol. 63, No. 4.

Committee on the Global Financial System, 2014, "EME Banking Systems and Regional Financial Integration," CGFS Papers No 51 (March).

Dharmapala, Dhammika, 2014, What Do We Know About Base Erosion and Profit Shifting? A Review of the Empirical Literature," CES IFO Working Paper 4612.

Dowd, Tim, Paul Landefeld and Anne Moore, 2016, "Profit Shifting of U.S. Multinationals," Joint Committee on Taxation (January), unpublished.

Economic Co-operation and Development, 2008, "OECD Benchmark Definition of Foreign Direct Investment: Fourth Edition" (Paris: OECD).

Eichengreen, Barry and Masahiro Kawai, 2015, "Renminbi Internationalization: Achievements, Prospects, and Challenges," Brookings Institution Press.

Fernandez, Andrés, Michael Klein, Alessandro Rebucci, Martin Schindler, and Martin Uribe, 2015, "Capital Controls: A New Dataset," NBER Working Paper 20970 (February).

Forbes, Kristin, 2010, "Why Do Foreigners Invest in the United States?" *Journal of International Economics,* Vol. 80, No. 1, pp. 3–21.

Galstyan, Vahagn, Philip R. Lane, Caroline Mehigan and Rogelio Mercado, 2016, "The Holders and Issuers of International Portfolio Securities," *Journal of the Japanese and International Economies*, Vol. 42 (December), pp. 100–08.

Gourinchas, Pierre-Olivier, Helene Rey and Kai Truempler, 2012, "The Financial Crisis and The Geography of Wealth Transfers," Journal of International Economics, Vol. 88, No. 2 (November), pp. 266–83.

Gourinchas, Pierre-Olivier and Helene Rey, 2014, "External Adjustment, Global Imbalances and Valuation Effects," in Gita Gopinath, Elhanan Helpman and Kenneth Rogoff (eds) *Handbook of International Economics*, Vol. 4, pp. 585–645.

He, Dong, Luk, Paul and Zhang, Wenlang, 2015, "The Internationalisation of the Renminbi as an Investing and a Funding Currency: Analytics and Prospects," HKIMR Working Paper No. 01/2015 (January).

Horioka, Charles, Akiko Terada-Hagiwara and Takaaki Nomoto, 2015, "Explaining Foreign Holdings of Asia's Debt Securities: The Feldstein-Horioka Paradox Revisited," NBER Working Paper No. 21734 (November).

International Monetary Fund, 2014, *World Economic Outlook,* October.

International Monetary Fund, 2016, *World Economic Outlook,* October.

Ivashina, Victoria, David S. Scharfstein and Jeremy C. Stein, 2015, "Dollar Funding and the Lending Behavior of Global Banks," *Quarterly Journal of Economics,* Vol. 130, No. 3, pp. 1241–81.

Jayswal, Peter, Mette Kornvig, and Katrine Skjærbæk, 2006, "Private Equity Funds, Capital Flows and the Foreign-Exchange Market," Monetary Review, 3rd Quarter, Central Bank of Denmark (October), pp. 81–94.

Lane, Philip R., 2013a, "Financial Globalisation and the Crisis," *Open Economies Review* Vol. 24, No. 3, pp. 555–80.

———, 2013b, "Capital Flows in Europe," *European Economy*, Economic Paper No. 497 (April).

———, 2014, "Cross-Border Financial Linkages: Identifying and Measuring Vulnerabilities," CEPR Policy Insight No. 77.

Lane, Philip R. and Gian Maria Milesi-Ferretti, 2007, "The External Wealth of Nations Mark II," *Journal of International Economics*, Vol. 73, pp. 223–50.

———, 2008a, "The Drivers of Financial Globalization," *American Economic Review* (Papers and Proceedings), Vol. 98, No. 2, pp. 327–32.

———, 2008b, "International Investment Patterns," *Review of Economics and Statistics,* Vol. 90, No. 3, pp. 538–49.

———, 2011a, "Cross-Border Investment in Small International Financial Centers," International Finance, Vol. 14, No. 2, pp. 301–30.

———, 2011b, "The Cross-Country Incidence of the Global Crisis*," IMF Economic Review*, Vol. 59. No. 1, pp. 77–110.

———, 2012, "External Adjustment and the Global Crisis," *Journal of International Economics*, Vol. 88, No. 2, pp. 252–65.

———, 2015, “Global Imbalances and External Adjustment after the Crisis,” in *Global Liquidity: Spillovers to Emerging Markets and Policy Responses*, edited by Claudio Raddatz, Diego Saravia, and Jaume Ventura, Central Bank of Chile.

Lane, Philip and Sergio Schmukler, 2007, “The Evolving Role of China and India in the Global Financial System,” *Open Economies Review*, Vol. 18, No. 4. pp. 499–520.

Martin, Philippe and Helene Rey, 2006, “Globalization and Emerging Markets: With or Without Crash?” *American Economic Review*, Vol. 96, No. 5 (December), pp. 1631–651.

Milesi-Ferretti, Gian Maria and Cedric Tille, 2011, “The Great Retrenchment: International Capital Flows During the Global Financial Crisis,” Economic Policy, Vol. 26, No. 66, pp. 285–342.

Obstfeld, Maurice, 2012a, “Does the Current Account Still Matter?” *American Economic Review*, Vol. 102, No. 3 (May), pp. 1–23.

———, 2012b, “Financial Flows, Financial Crises, and Global Imbalances,” *Journal of International Money and Finance*, Vol. 31, pp. 469–80.

———, 2013, “Finance at Center Stage: Some Lessons of the Euro Crisis,” European Economy, Economic Paper No. 493.

———, 2015, “Trilemmas and Tradeoffs: Living with Financial Globalization,” in Claudio Raddatz, Diego Saravia, and Jaume Ventura (eds.) Global Liquidity, Spillovers to Emerging Markets and Policy Responses, Central Bank of Chile.

Park, Cyn Young, 2013, "Asian Capital Market Integration: Theory and Evidence," ADB Economics Working Paper Series 351, Asian Development Bank.

Park, Cyn-Young and Rogelio Mercado, 2014, “Determinants of Financial Stress in Emerging Market Economies,” *Journal of Banking & Finance*, Vol. 45(C), pp. 199-224.

Shin, Hyun Song, 2013, “The Second Wave of Global Liquidity and Its Implications for Emerging Economies,” (unpublished; Princeton University).

Taylor, Alan, 2013, “The Future of International Liquidity and The Role of China,” NBER Working Paper 18771 (February).

Table 1. The Size of Global Debt Securities' Markets: 2007 vs 2014

	2007		2015	
	pct. of group GDP	pct. of world GDP	pct. of group GDP	pct. of world GDP
Total debt securities				
Financial centers	193.7	18.8	225.6	17.8
non-FC advanced economies	165.0	103.3	180.3	96.4
Emerging and development economies	36.2	10.0	50.3	19.4
China	48.1	3.0	70.5	10.7
Others	32.7	7.0	37.2	8.7
Total	132.1	132.1	133.6	133.6
General government debt securities				
Financial centers	35.1	3.4	60.4	4.8
non-FC advanced economies	63.0	39.5	91.9	49.1
Emerging and development economies	23.5	6.5	21.3	8.2
China	20.3	1.3	14.2	2.2
Others	24.5	5.2	25.8	6.1
Total	49.4	49.4	62.1	62.1

Source: Bank for International Settlements, national sources, and Arslanalp and others (2014).

Table 2. Share of Debt Securities held by Nonresidents: 2007 and 2015

	Advanced Economies		Emerging Markets	
	Mean	Median	Mean	Median
	2007			
General government securities	0.48	0.50	0.31	0.27
Total debt securities	0.44	0.50	0.26	0.25
Observations		32		25
	2015			
General government securities	0.51	0.54	0.36	0.35
Total debt securities	0.45	0.44	0.35	0.40
Observations		33		32

Source: Bank for International Settlements, national sources, and Arslanalp and other (2014).

Table 3. Drivers of Foreign Share of Government Debt Securities, 2007 vs 2015
Cross-sectional Regressions

	2007			2015		
	(1)	(2)	(3)	(4)	(5)	(6)
	All	AE	EM	All	AE	EM
Log GDP per capita	0.11***	0.23***	0.10***	0.09***	0.11	0.10*
	(5.66)	(4.53)	(3.50)	(2.70)	(1.09)	(1.84)
Log market size	--- 0.071***	--- 0.055***	-0.095***	-0.042***	-0.050***	-0.025
	(-5.75)	(-5.05)	(-3.43)	(-3.28)	(-3.07)	(-0.80)
Euro_core dummy	0.42***	0.40***		0.37***	0.38***	
	(10.28)	(12.25)		(8.07)	(7.07)	
New euro members	-0.23***	-0.19***		0.10	0.13	
	(-3.07)	(-3.72)		(0.83)	(0.77)	
Euro crisis dummy	0.28***	0.26***		0.015	0.033	
	(5.48)	(4.45)		(0.20)	(0.28)	
Ratio NFA/GDP	-0.14***	-0.15***	-0.034	-0.12***	-0.12**	-0.20
	(-5.33)	(-6.60)	(-0.28)	(-3.78)	(-2.73)	(-1.51)
Bond restrictions	0.17	0.44**	0.12	0.12	0.13	0.13
	(1.25)	(2.85)	(0.93)	(0.90)	(0.67)	(0.82)
Overall restrictions	-0.14	0.32	-0.13	-0.19	-0.29	-0.23
	(-0.90)	(1.03)	(-0.84)	(-1.02)	(-0.55)	(-0.92)
Constant	0.073	-1.48***	0.46	0.013	-0.10	-0.28
	(0.28)	(-2.94)	(1.15)	(0.05)	(-0.10)	(-0.64)
Observations	51	28	23	59	28	31
Adjusted R^2	0.75	0.89	0.50	0.54	0.6	0.22

Note: Dependent variable if the ratio of foreign holdings of general government debt securities to GDP in 2007 (columns 1-3) and 2015 (columns 4-6). Robust standard errors, t- statistics in parentheses. * p<0.10; ** p<0.05; *** p<0.01.

Table 4. Drivers of Change in Foreign Share of Government Debt Securities, 2007-2015

	(1) All	(2) AE	(3) EM
Log diff. market size	-0.10***	-0.04	-0.19***
	(-4.37)	(-0.88)	(-4.18)
average growth rate 2007-15	2.33	0.75	1.58
	(1.64)	(0.28)	(0.92)
Euro_core dummy	-0.03	-0.02	
	(-0.57)	(-0.35)	
New euro members dummy	0.39***		
	(5.21)		
Euro crisis dummy	-0.17**	-0.16**	
	(-2.18)	(-2.21)	
Change in NFA/GDP ratio	-0.013	-0.016	-0.048
	(-0.39)	(-0.33)	(-0.26)
Change in bond restrictions	0.065	-0.14	0.30
	(0.46)	(-1.28)	(1.15)
Change in overall restrictions	-0.43***	-0.49***	-0.34*
	(-3.33)	(-3.51)	(-1.90)
Change in central bank share		-0.14	
		(-0.61)	
Constant	0.052	0.064	0.13
	(1.28)	(1.13)	(1.52)
Observations	52	25	23
Adjusted R^2	0.49	0.54	0.37

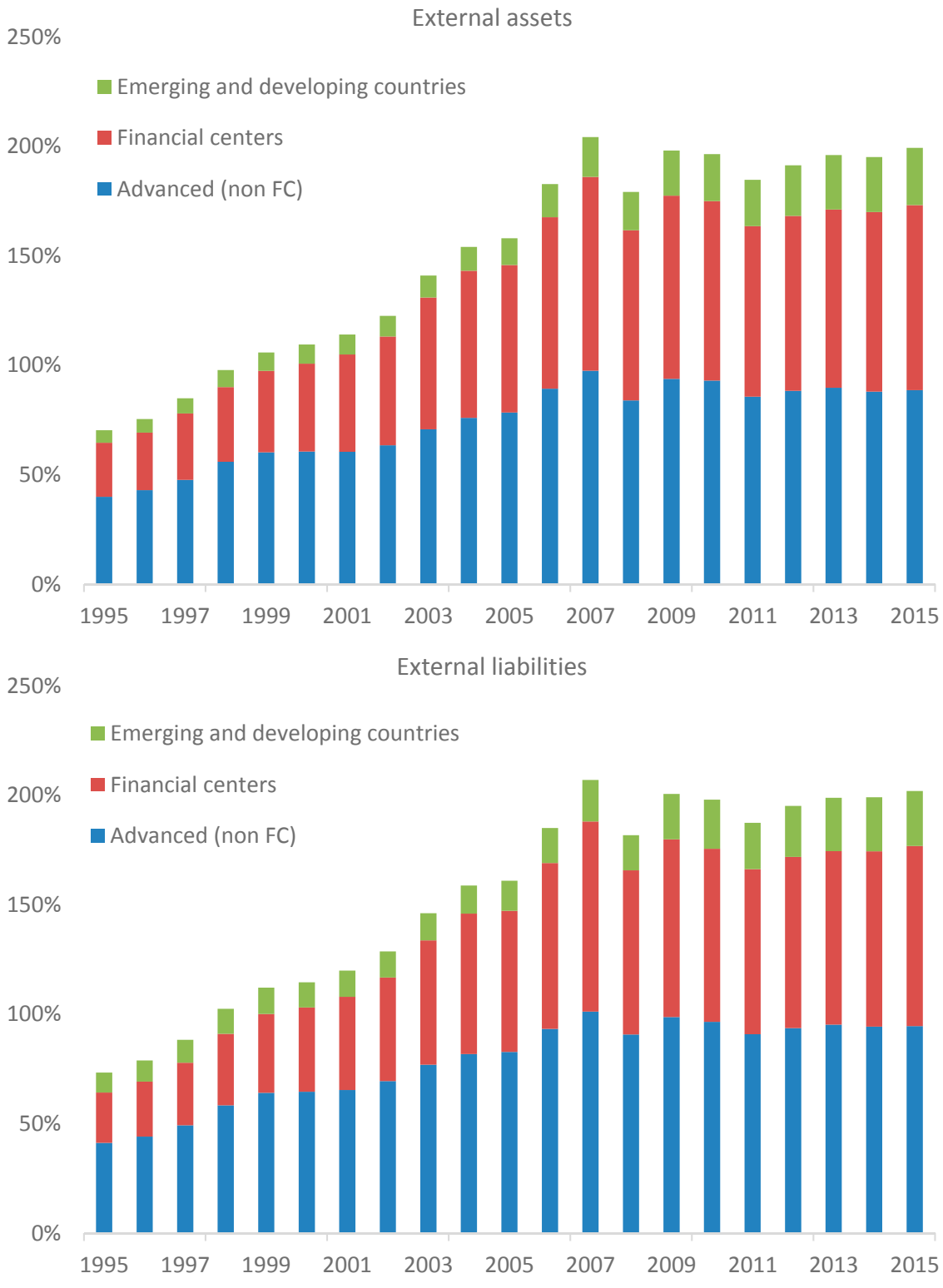
Note: Dependent variable if the change in the ratio of foreign holdings of general government debt securities to GDP between 2007 and 2015. Robust standard errors, t- statistics in parentheses. * p<0.10; ** p<0.05; *** p<0.01.

Table 5. Drivers of Foreign Share of Government Debt Securities, 2006-2015 Panel Regressions

	(1)	(2)	(3)
	All	AE	EM
Log market size	-0.071***	-0.032**	-0.16***
	(-5.51)	(-2.31)	(-8.09)
Ratio NFA/GDP	-0.0036	-0.013	-0.038
	(-0.17)	(-0.62)	(-0.62)
Bond restrictions	0.079*	-0.017	0.13**
	(1.71)	(-0.25)	(2.19)
Overall restrictions	-0.094	-0.29*	-0.17**
	(-1.40)	(-1.74)	(-2.26)
Real GDP growth	0.64***	0.51**	0.92***
	(4.28)	(2.02)	(4.59)
New euro members	0.21***	-0.019	
	(4.79)	(-0.24)	
Euro crisis dummy	-0.23***	-0.19***	
	(-9.51)	(-9.21)	
Central bank share		-0.40***	
		(-3.94)	
Observations	559.00	242.00	279.00
R^2 (within)	0.29	0.44	0.39

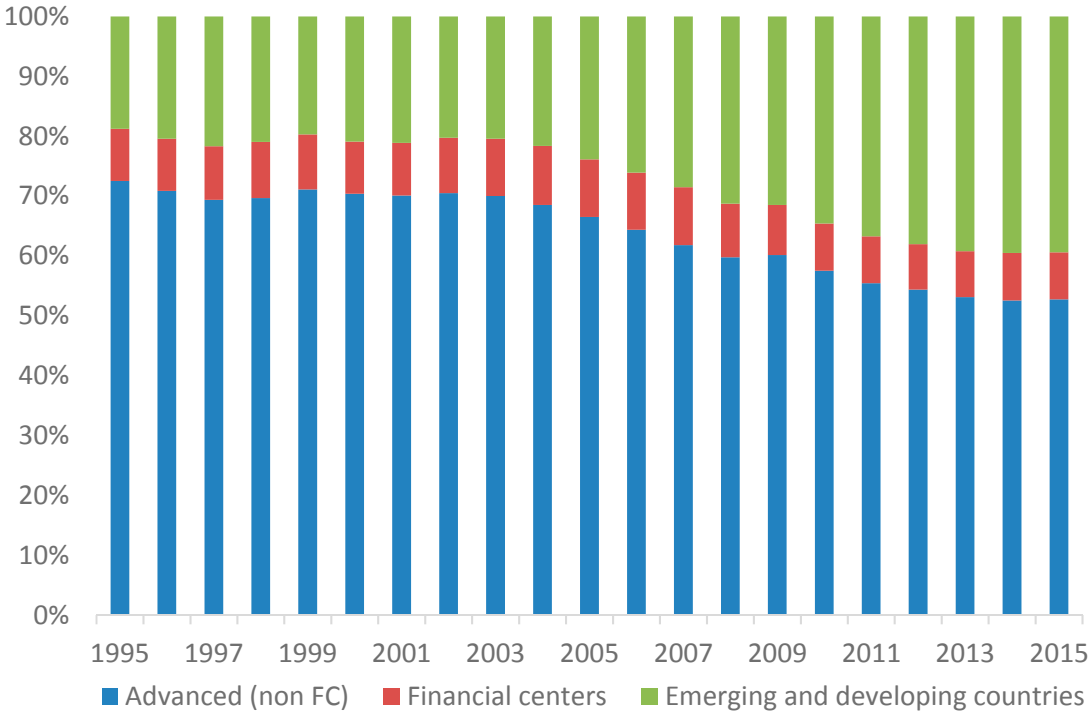
Note: Dependent variable if the ratio of foreign holdings of general government debt securities to GDP. Panel regressions with fixed country and time effects. t- statistics in parentheses. * p<0.1; ** p<0.05; *** p<0.01. The coefficients and standard errors for time dummies are plotted in Figure 15.

Figure 1. Global External Assets and Liabilities
(ratio of world GDP)



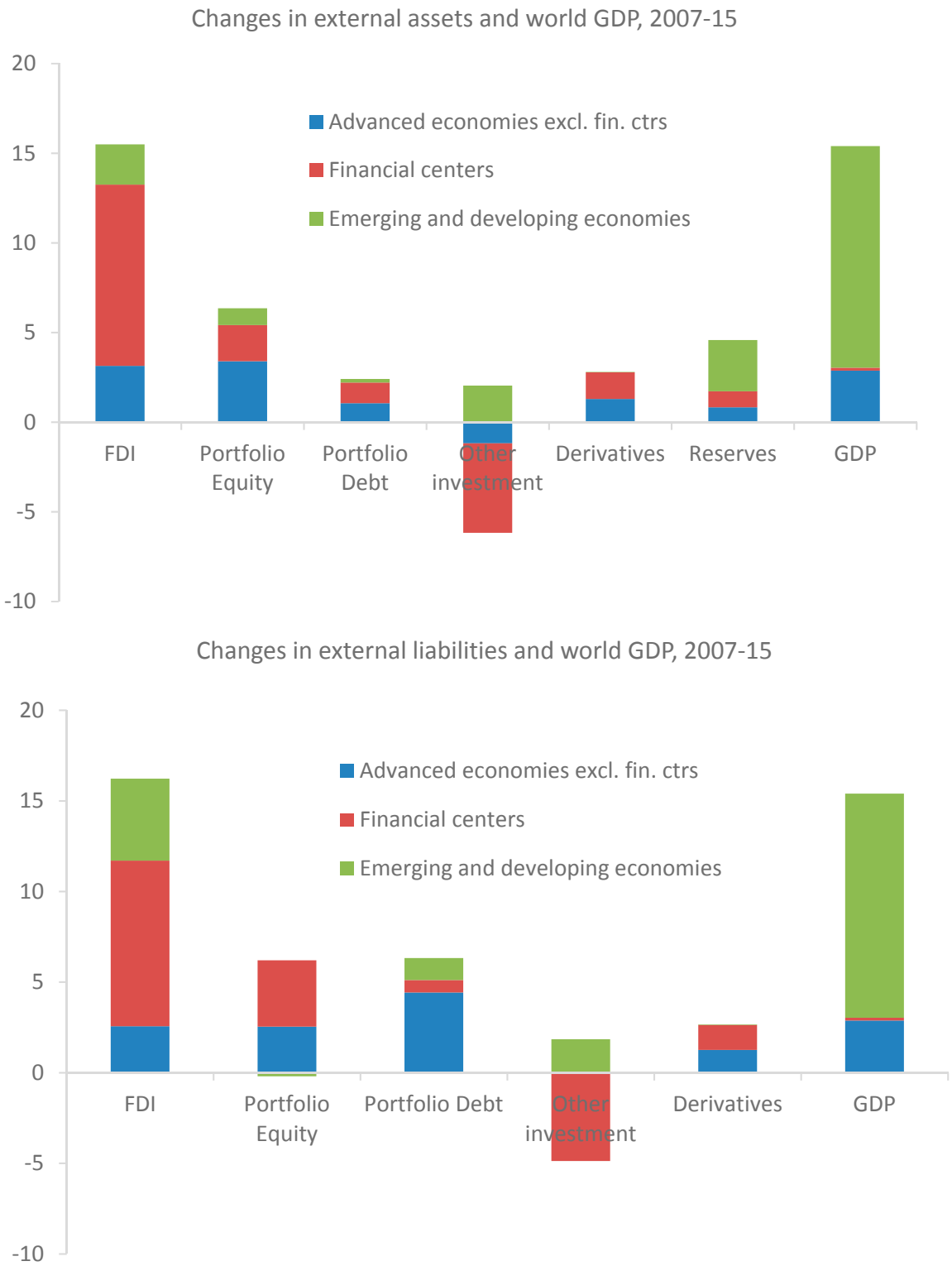
Source: authors' calculations based on revised and extended EWN database.

Figure 2. The Composition of World GDP
(shares of world GDP)



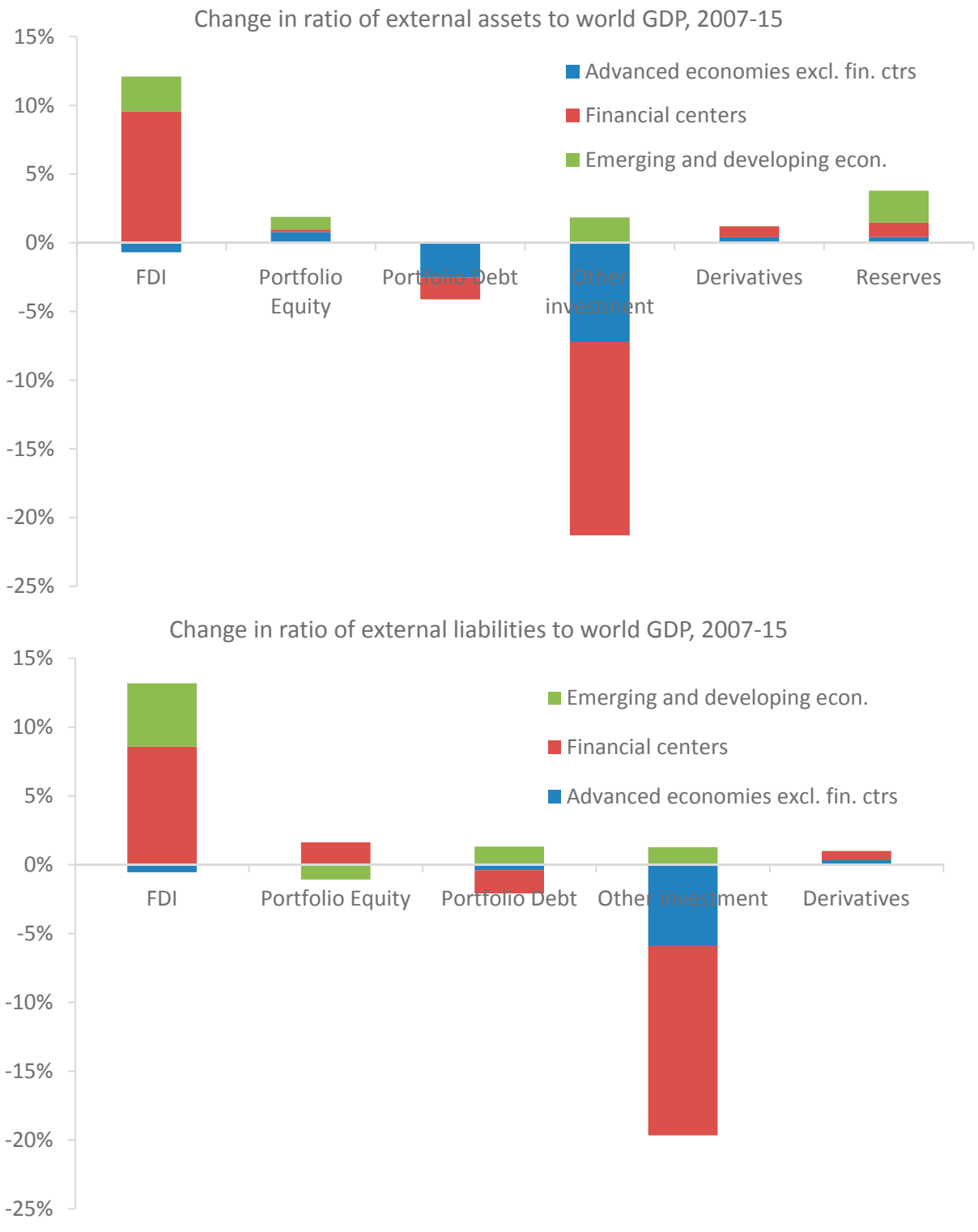
Source: authors' calculations based on World Economic Outlook database.

Figure 3. Changes in External Assets, Liabilities and World GDP, 2007-2015
(trillions US $)



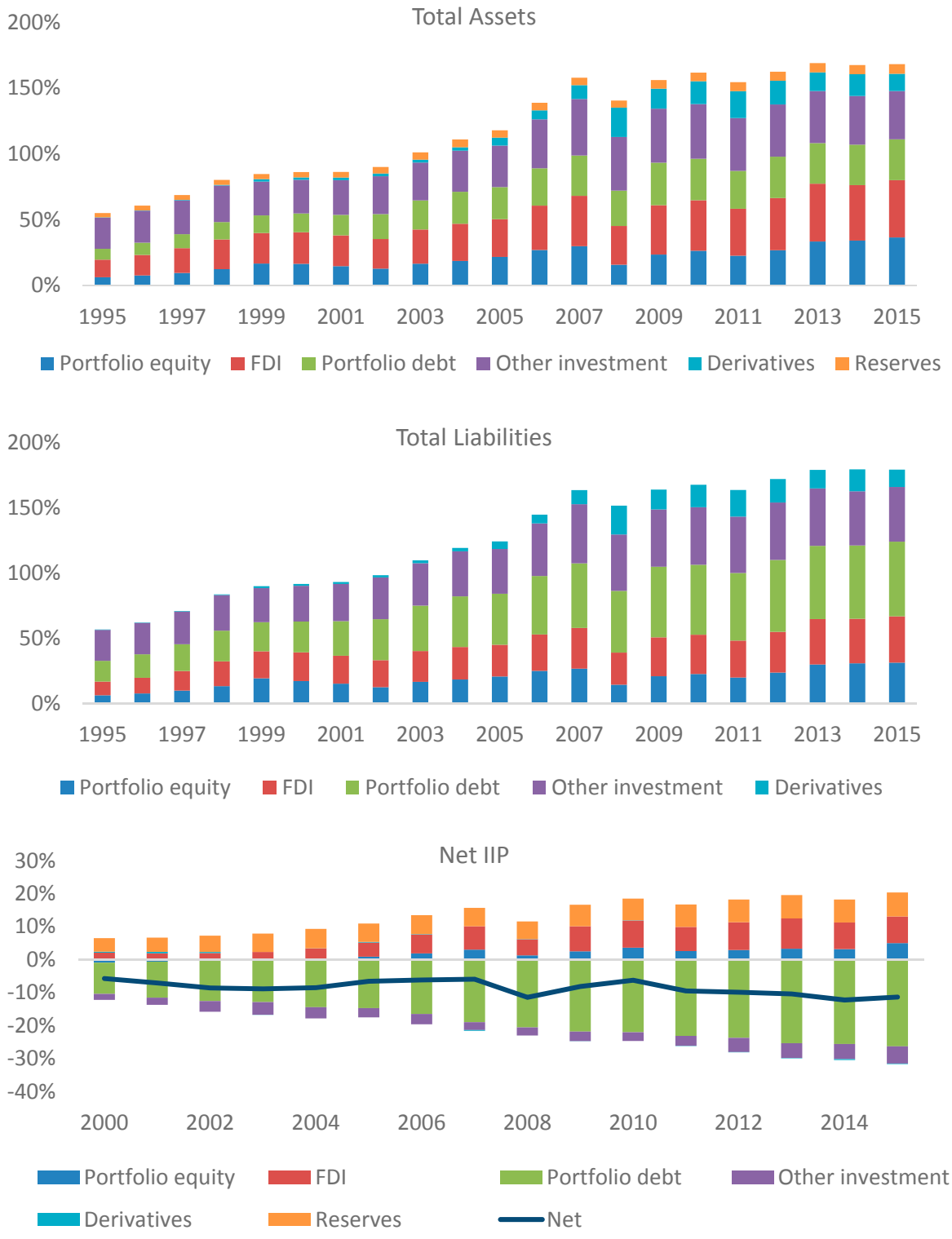
Source: authors' calculations based on revised and extended EWN database.

Figure 4. Changes in External Assets and Liabilities, 2007-2015
(percent of world GDP)



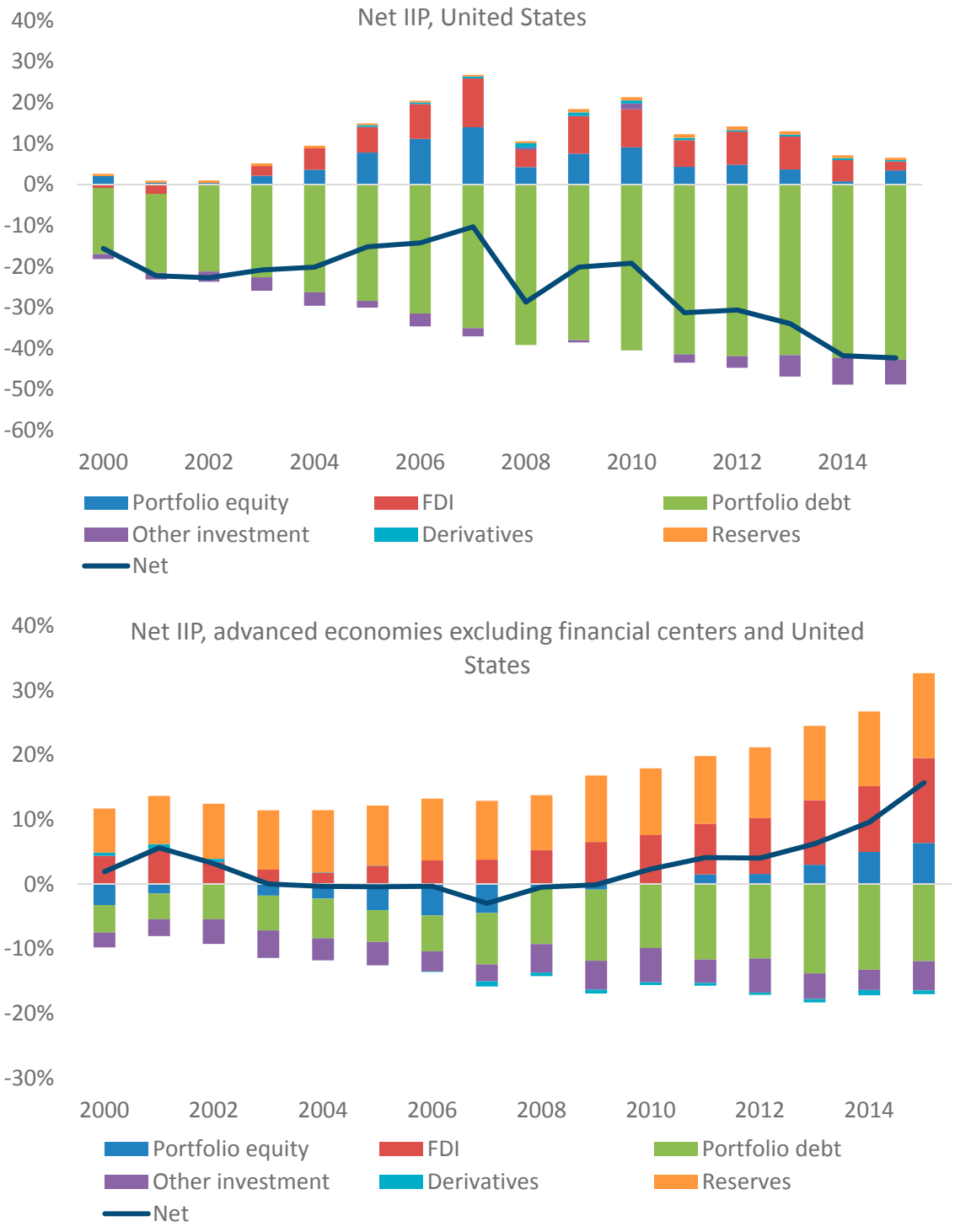
Source: authors' calculations based on revised and extended EWN database.

Figure 5. Gross and Net External Positions, Advanced Economies Excluding Financial Centers
(ratio of group GDP)



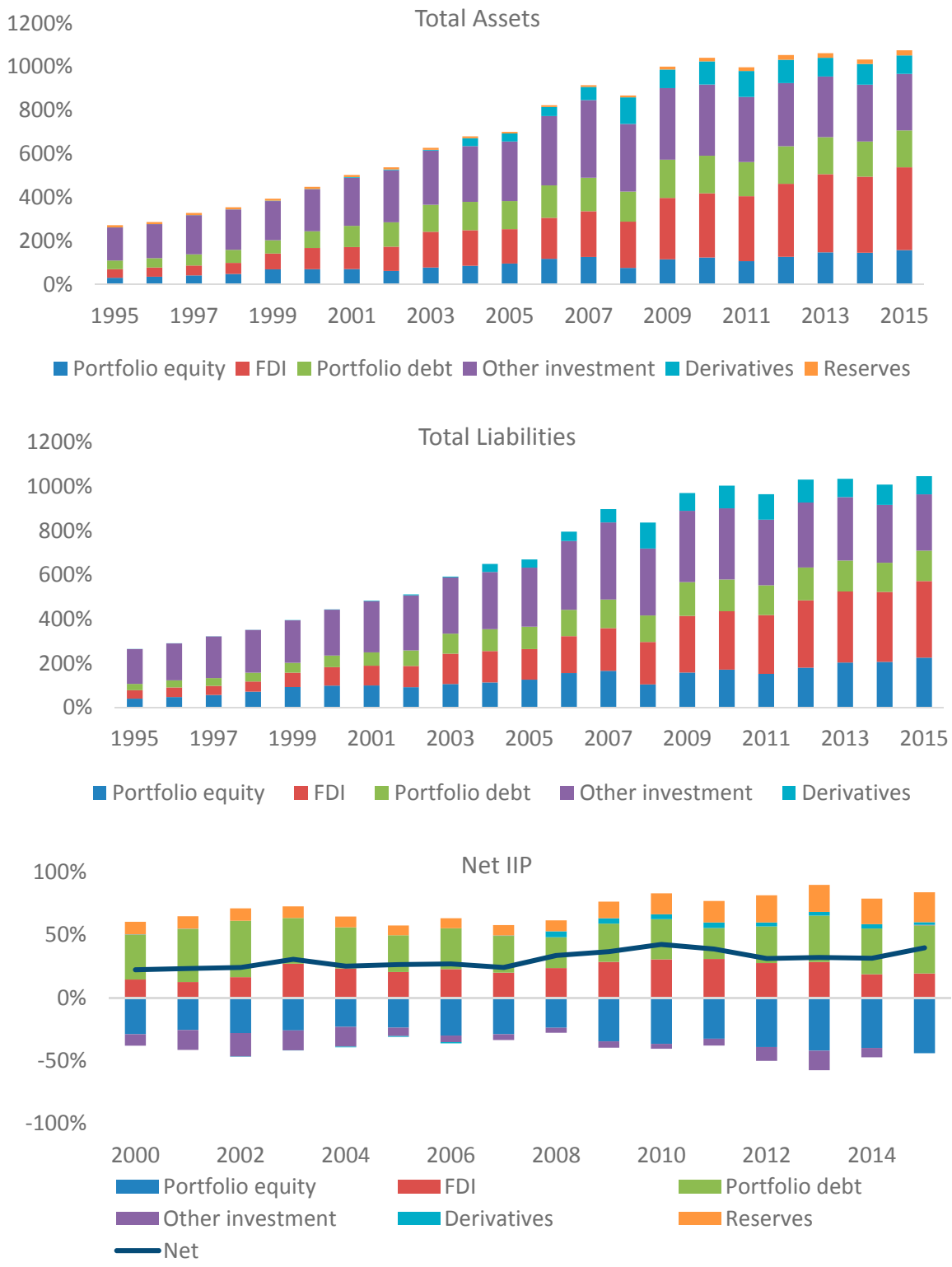
Source: authors' calculations based on revised and extended EWN database.

Figure 6. Net External Position: United States and Other Advanced Economies Excluding Financial Centers and United States
(ratio of group GDP)



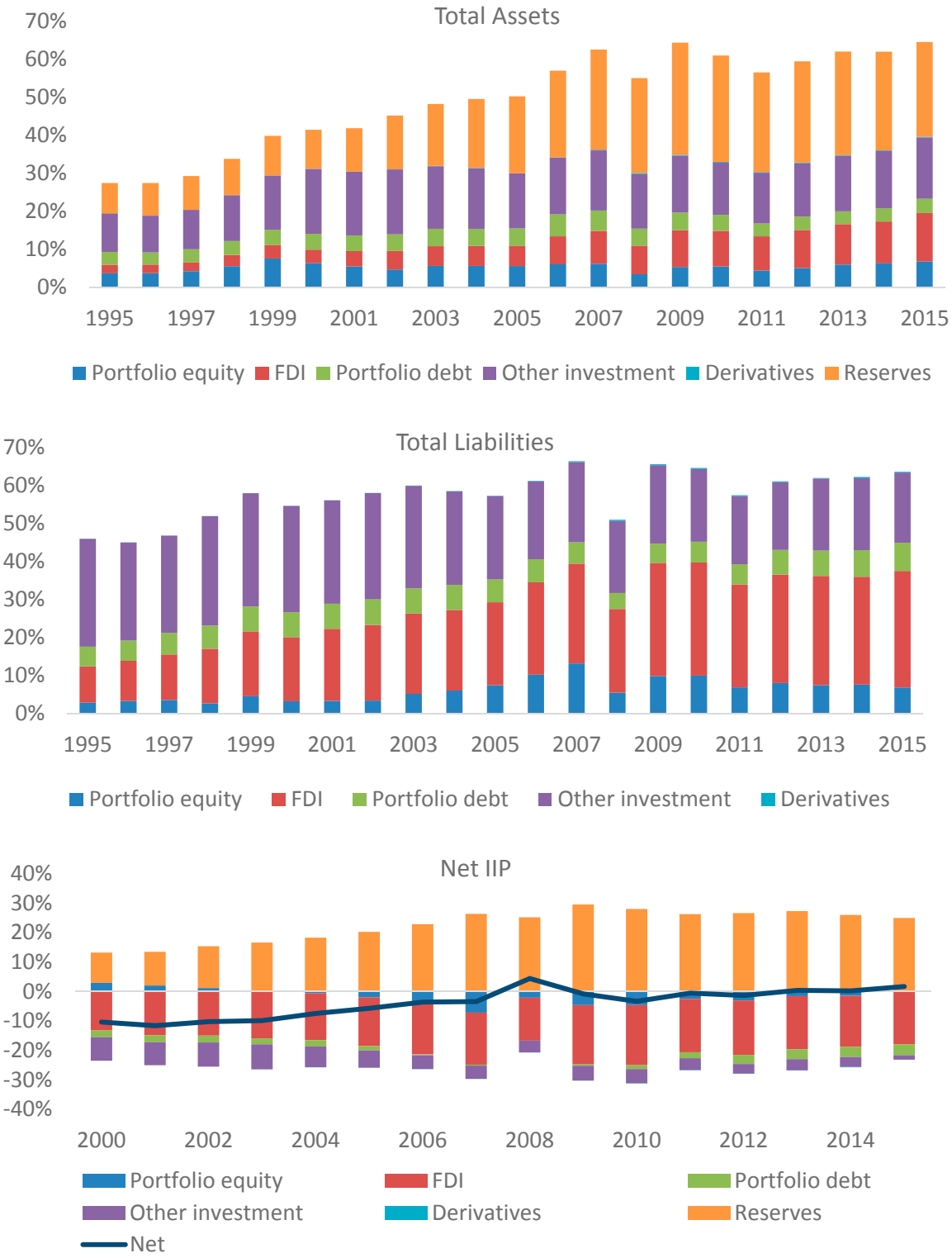
Source: authors' calculations based on revised and extended EWN database.

Figure 7. Gross and Net External Positions, Financial Centers
(ratio of group GDP)



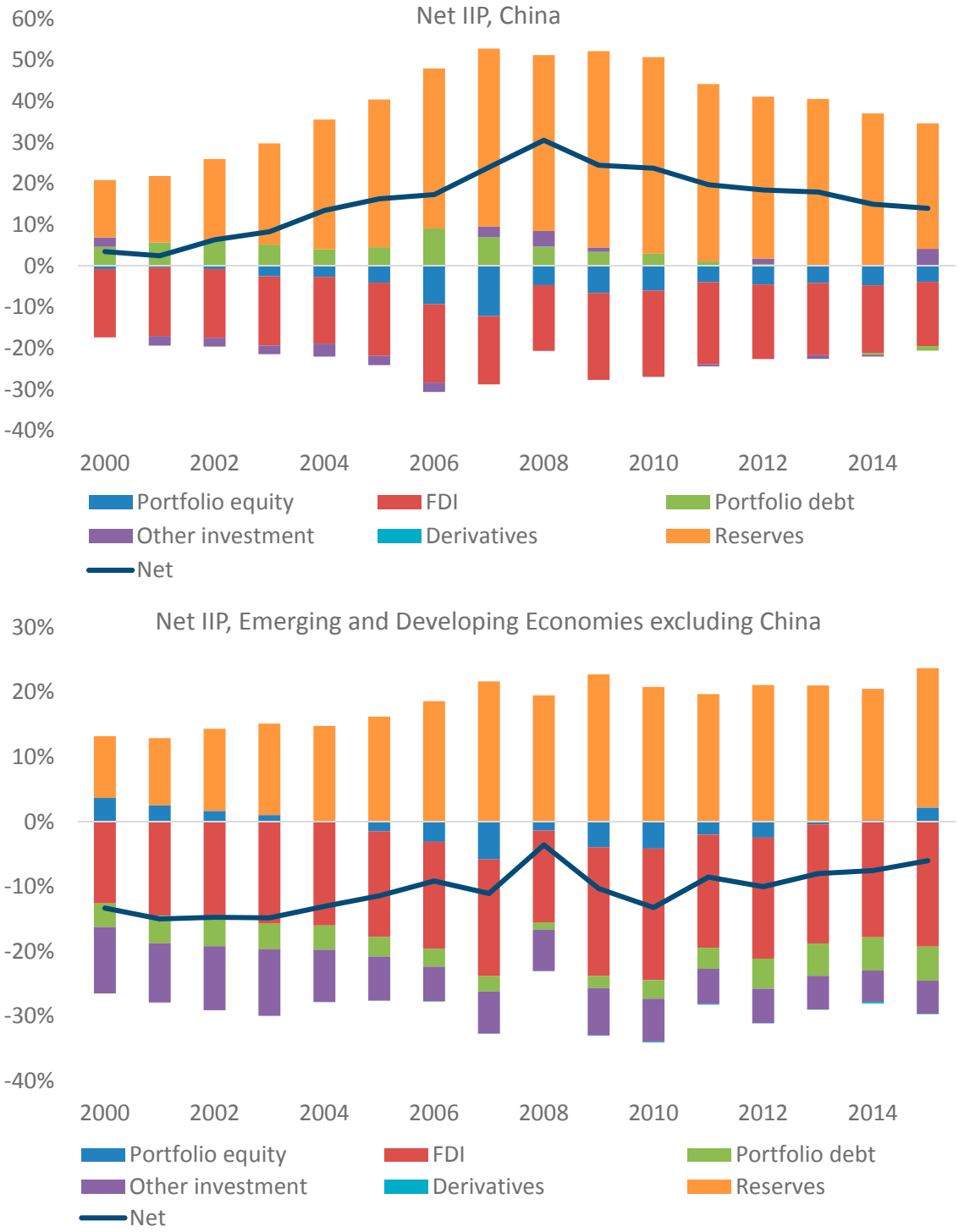
Source: authors' calculations based on revised and extended EWN database.

Figure 8. Gross and Net External Positions, Emerging and Developing Economies
(ratio of group GDP)



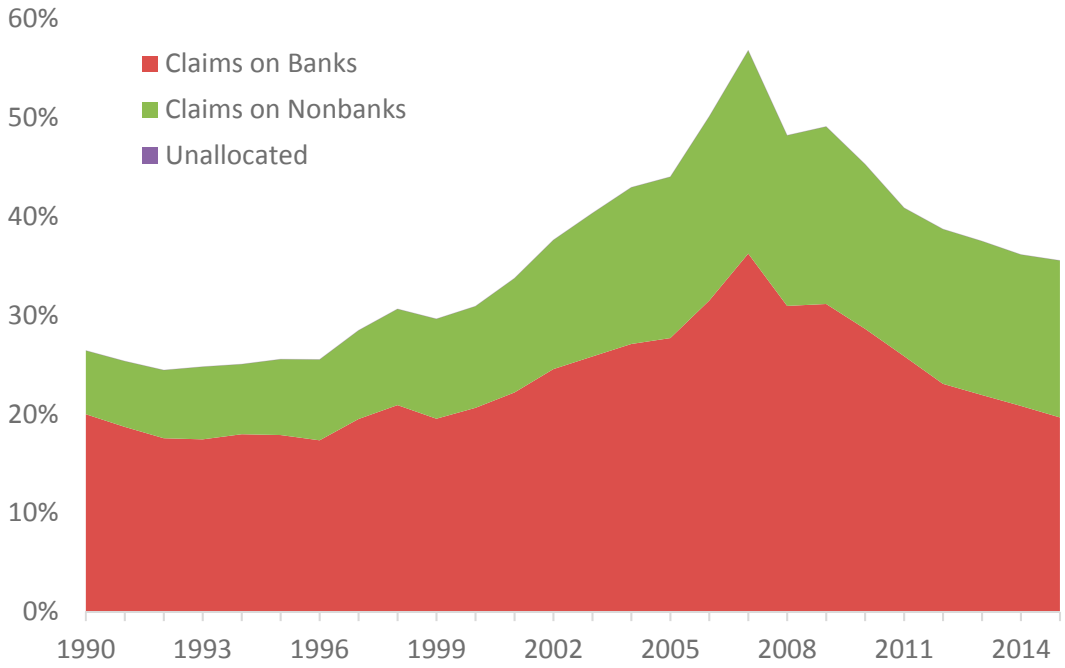
Source: authors' calculations based on revised and extended EWN database.

Figure 9. Net External Position: China and Other Emerging and Developing Economies
(ratio of group GDP)



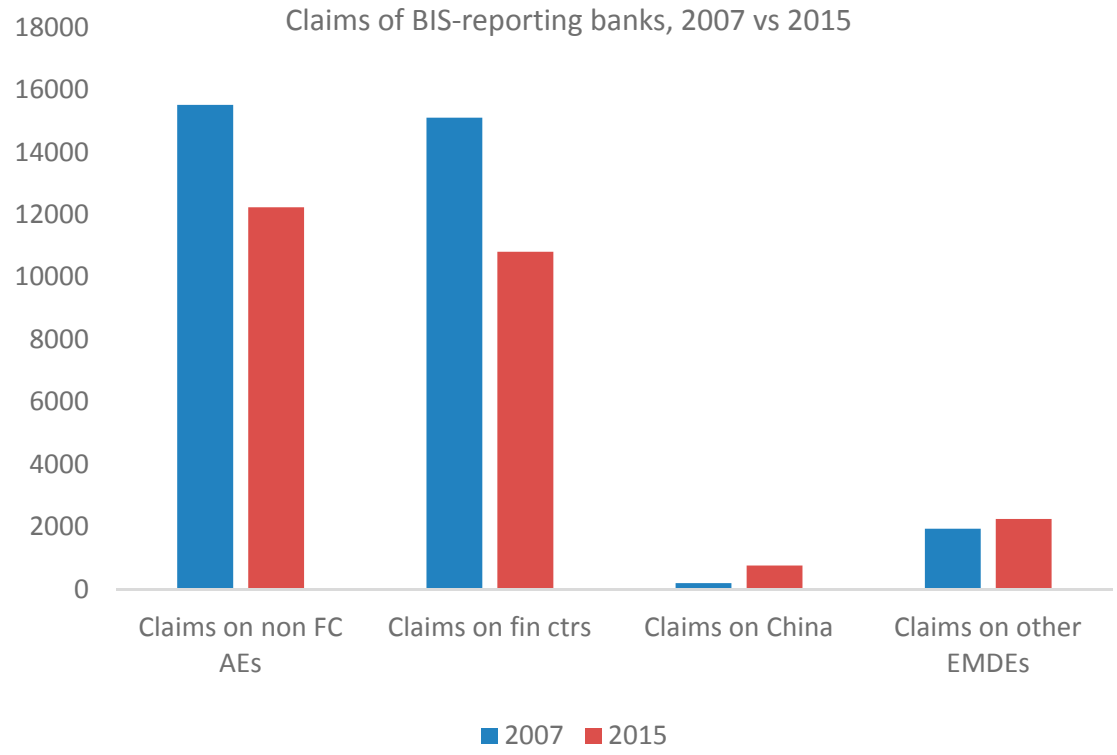
Source: authors' calculations based on revised and extended EWN database

Figure 10. External Assets of BIS-reporting Banks
(ratio of global GDP)



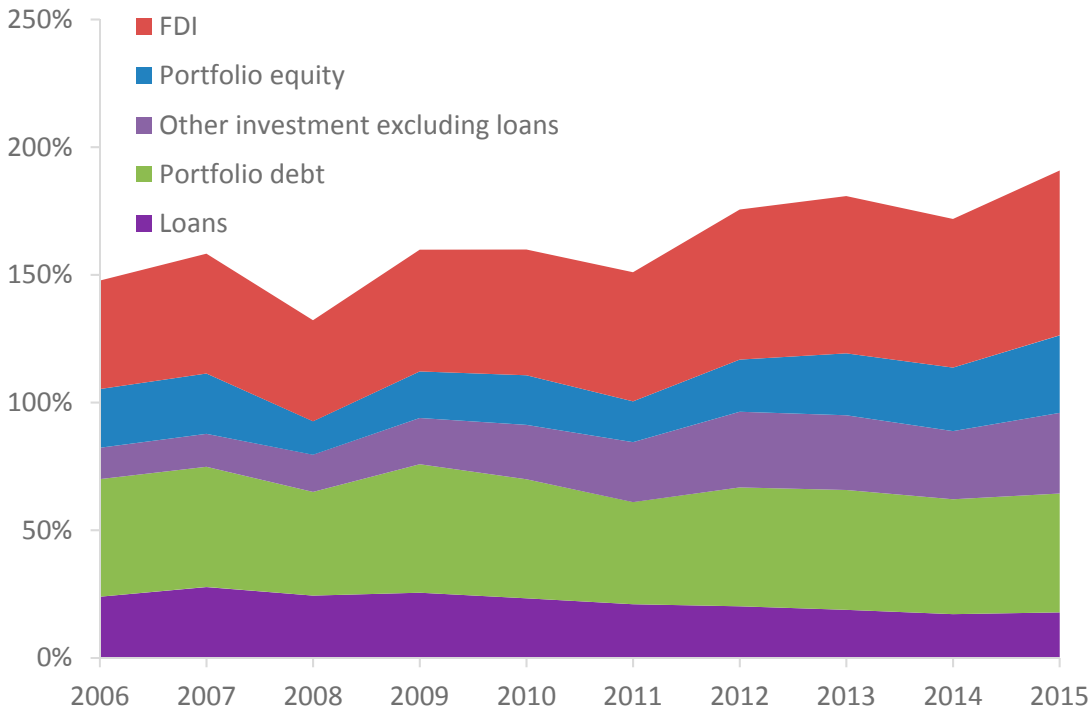
Source: Bank for International Settlements.

Figure 11. Claims of BIS-reporting Banks by Destination
(billions US dollars)



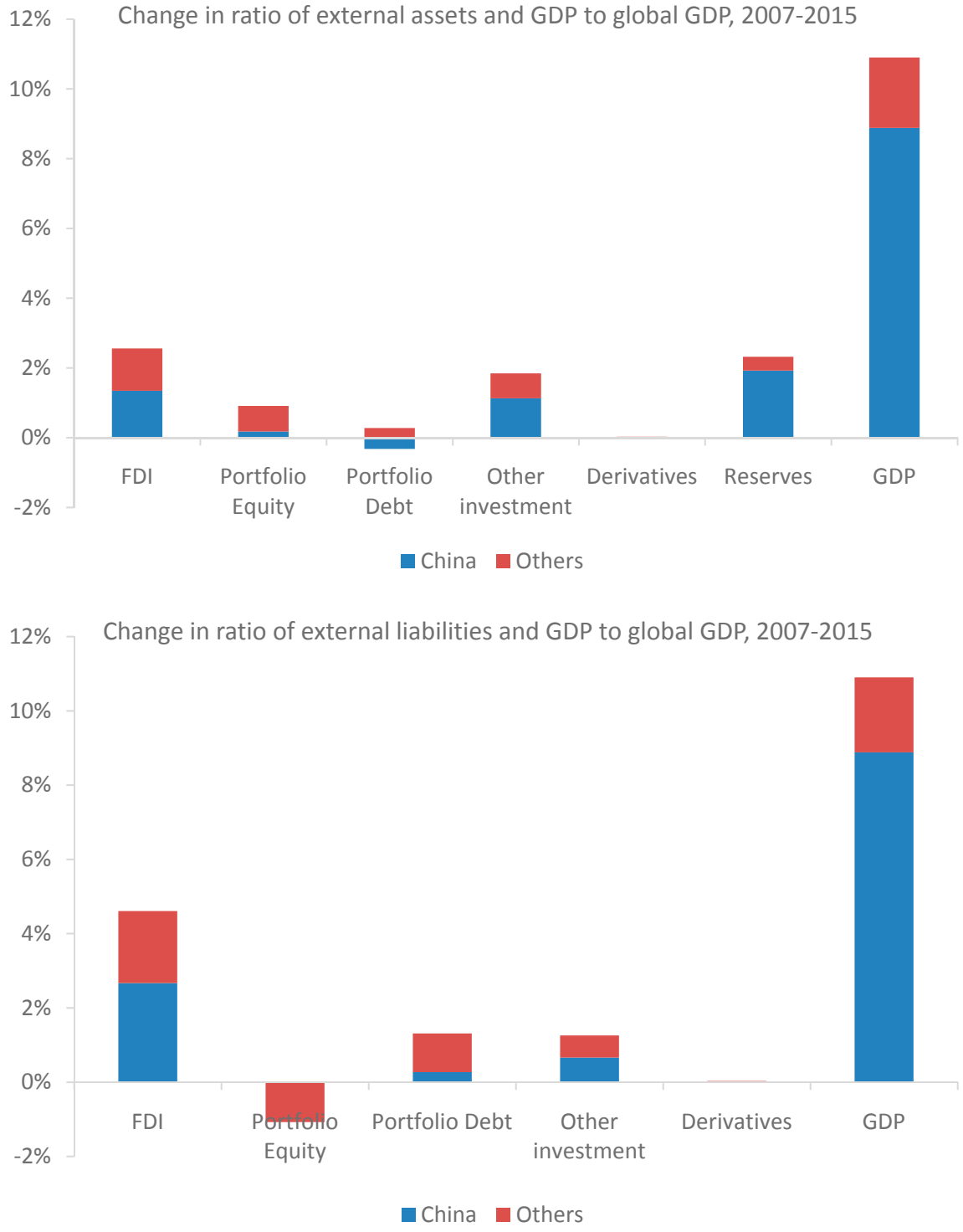
Source: Bank for International Settlements.

Figure 12. Intra-euro Area Assets
(percentage of euro area GDP)



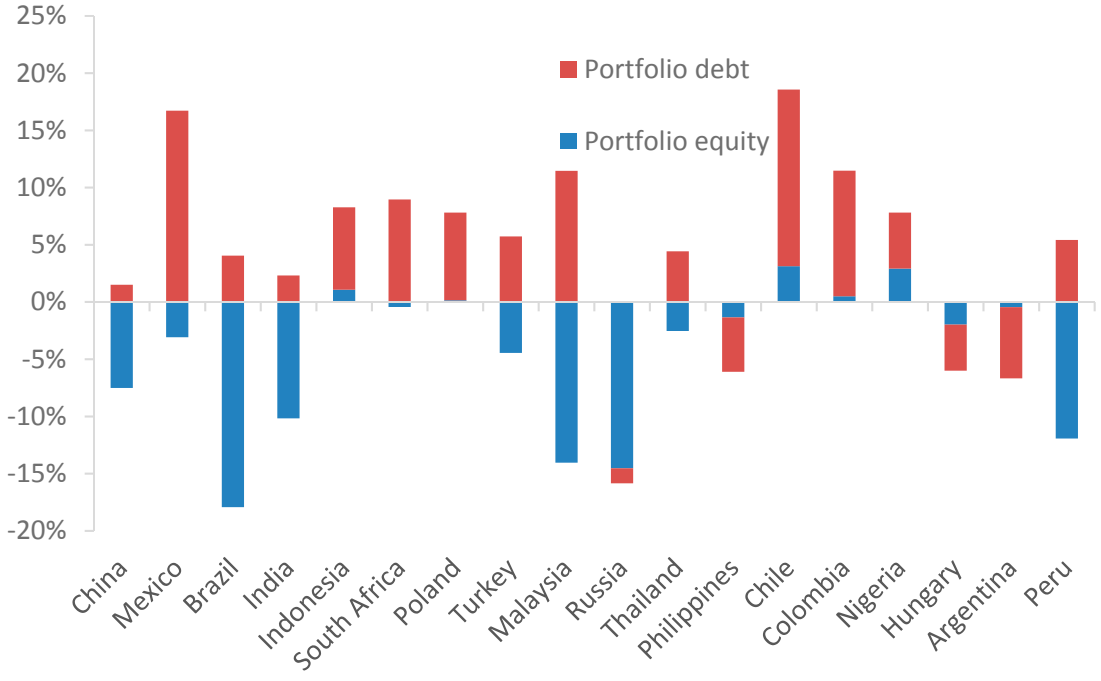
Source: authors' calculations based on revised and extended EWN database.
Note: Intra-euro area assets are calculated as the sum of external assets of individual euro area countries minus the external assets of the euro area as a whole.

Figure 13. Emerging and Developing Economies: Changes in Share of External Assets, Liabilities, and GDP to Global GDP
2007-2015



Source: authors' calculations based on revised and extended EWN database.

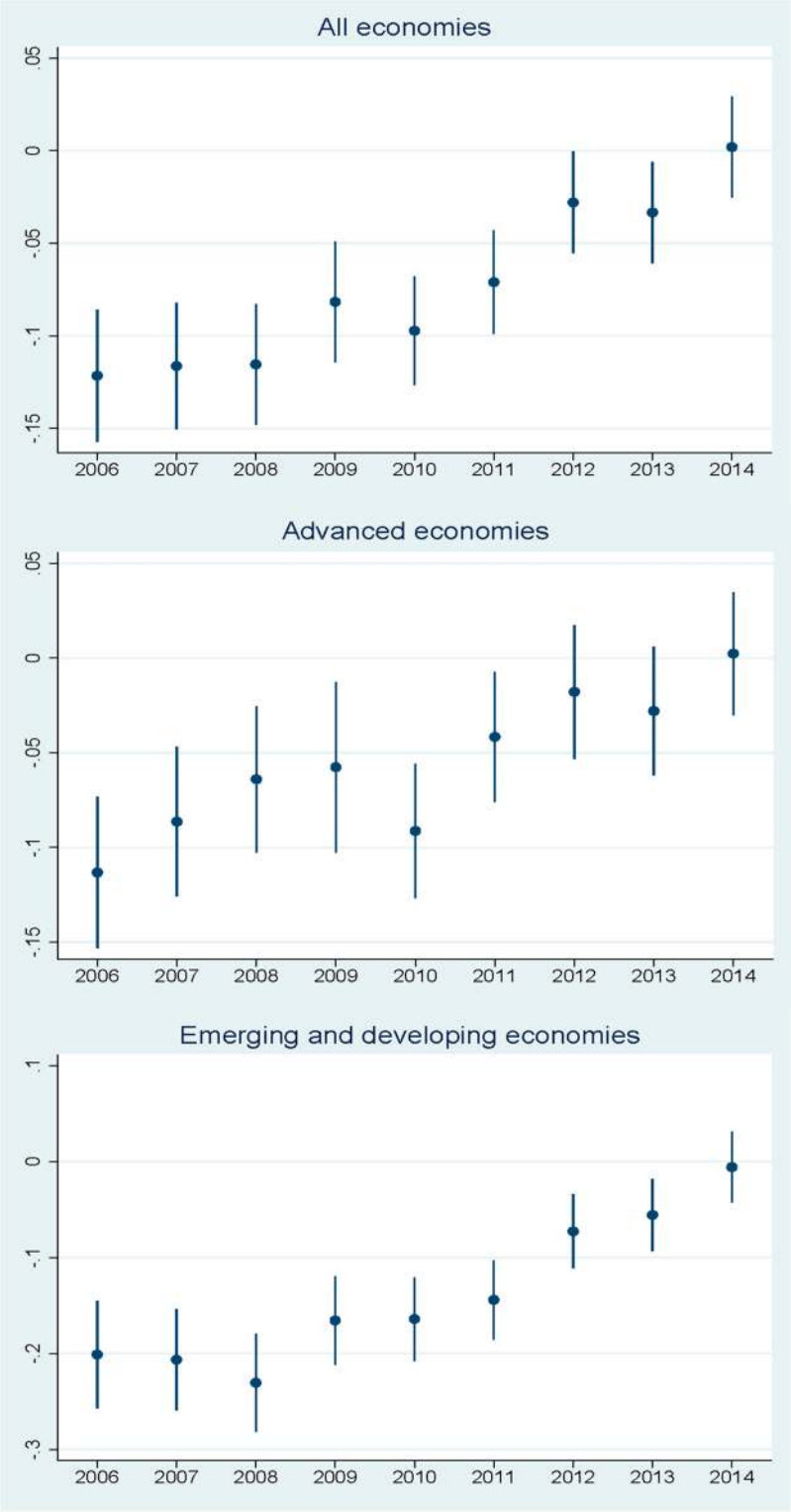
Figure 14. Emerging Markets:
Change in Share of Portfolio Liabilities to GDP
2007-2015



Source: authors' calculations based on revised and extended EWN database.
Note: countries are ordered by the size of their total portfolio liabilities in U.S. dollars in 2015.

Figure 15. Coefficients on Time Series Dummies

(panel regressions, Table 5)



Note: Figures depict point estimates and 2-standard-error bands for time dummies in the panel regressions reported in Table 5.

Appendix 1. Data and Country Classification

A. Classification of Economies

1. Financial centers: Bahrain, Belgium, Cyprus, Hong Kong S.A.R. of China, Ireland, Luxembourg, Macao S.A.R. of China, Malta, Netherlands, Singapore, Switzerland, United Kingdom, Andorra, Bahamas, Barbados, Bermuda, British Virgin Islands, Cayman Islands, Curaçao, Gibraltar, Guernsey, Isle of Man, Jersey, Mauritius, Netherlands Antilles, Panama, San Marino, Turks and Caicos.

2. Other advanced economies: Australia, Austria, Canada, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Iceland, Israel, Italy, Japan, Korea, Latvia, Lithuania, New Zealand, Norway, Portugal, Slovak republic, Slovenia, Spain, Sweden, Taiwan province of China, United States.

Emerging and developing economies: Afghanistan, I.R. of; Albania; Algeria; Angola; Anguilla; Antigua and Barbuda; Argentina; Armenia; Aruba; Azerbaijan; Bangladesh; Belarus; Belize; Benin; Bhutan; Bolivia; Bosnia and Herzegovina; Botswana; Brazil; Brunei Darussalam; Bulgaria; Burkina Faso; Burundi; Cambodia; Cameroon; Cape Verde; Central African Rep.; Chad; Chile; China; Colombia; Comoros; Congo, Dem. Rep. of; Congo, Republic of; Costa Rica; Croatia; Côte d'Ivoire; Djibouti; Dominica; Dominican Republic; Ecuador; Egypt; El Salvador; Equatorial Guinea; Eritrea; Ethiopia; Fiji; French Polynesia; Gabon; Gambia; Georgia; Ghana; Grenada; Guatemala; Guinea; Guinea-Bissau; Guyana; Haiti; Honduras; Hungary; India; Indonesia; Iran, Islamic Republic of; Iraq; Jamaica; Jordan; Kazakhstan; Kenya; Kiribati; Kosovo; Kuwait; Kyrgyz Republic; Lao People's Dem.Rep; Lebanon; Lesotho; Liberia; Libya; Lithuania; Macedonia; Madagascar; Malawi; Malaysia; Maldives; Mali; Marshall Islands; Mauritania; Mauritius; Mexico; Micronesia; Moldova; Mongolia; Montenegro; Montserrat; Morocco; Mozambique; Myanmar; Namibia; Nauru; Nepal; New Caledonia; Nicaragua; Niger; Nigeria; Oman; Pakistan; Palau; Panama; Papua New Guinea; Paraguay; Peru; Philippines; Poland; Qatar; Romania; Russia; Rwanda; Samoa; Saudi Arabia; Senegal; Serbia; Seychelles; Sierra Leone; Sint Maarten; Solomon Islands; Somalia; South Africa; South Sudan; Sri Lanka; St. Kitts and Nevis; St. Lucia; St. Vincent & Grenadines.; Suriname; Swaziland; Syrian Arab Republic; São Tomé & Príncipe; Tajikistan; Tanzania; Thailand; Timor-Leste; Togo; Tonga; Trinidad and Tobago; Tunisia; Turkey; Turkmenistan; Tuvalu; Uganda; Ukraine; United Arab Emirates; Uruguay; Uzbekistan; Vanuatu; Venezuela, Rep. Bol.; Vietnam; West Bank and Gaza; Yemen; Republic of; Zambia; Zimbabwe.

B. Variable Definitions (Regressions in Section V)

Market size: log of government bond market capitalization measured in U.S. dollars. Source: Bank for International Settlements; Arslanalp and Tsuda (2014a, 2014b); and national sources.

Level of development: Log GDP per capita in U.S. dollars. Source: IMF, World Economic Outlook database.
Euro core: dummy taking the value of 1 for Austria, Belgium, Finland, France, Germany, Luxembourg, and the Netherlands.
Euro crisis: dummy taking the value of 1 for Greece, Ireland, Italy, Portugal, and Spain.
New euro members: dummy taking the value of 1 for Cyprus, Estonia, Latvia, Lithuania, Malta, Slovak Republic, and Slovenia for all years they were part of the euro as well as for the year before joining.
Ratio of NFA to GDP: net external position divided by domestic GDP. Source: Lane and Milesi-Ferretti, External Wealth of Nations database.
Bond restrictions: index of restrictions on foreign purchases of debt securities issued by the country. To measure the intensity of restrictions we use the average level of the variable for the preceding 3 years. Since the dataset goes only until 2013, we use data for that year for the 2014 and 2015 observations. Source: Fernandez and others (2015).
Overall restrictions: index of restrictions on foreign purchases of domestic assets. To measure the intensity of restrictions we use the average level of the variable for the preceding 3 years. Since the dataset goes only until 2013, we use data for that year for the 2014 and 2015 observations. Source: Fernandez, and others (2015).
Central bank share: Central bank holdings of domestic government debt securities as a share of total government debt securities outstanding. Sources: Arslanalp and Tsuda (2014a, 2014b), International Financial Statistics, and national sources.

C. Regression Sample (Section V)

Advanced economies: Australia, Austria, Belgium, Canada, Cyprus, Czech Republic, Denmark, Finland, France, Germany, Greece, Hong Kong S.A.R., Ireland, Israel, Italy, Japan, Korea, Latvia, Netherlands, New Zealand, Norway, Portugal, Slovenia, Spain, Sweden, Switzerland, United Kingdom, United States.

Emerging economies: Argentina, Bangladesh, Brazil, Bulgaria, Chile, China, Colombia, Costa Rica, Dominican Republic, Egypt, El Salvador, Georgia, Guatemala, Hungary, India, Indonesia, Malaysia, Mexico, Nigeria, Pakistan, Paraguay, Peru, Philippines, Poland, Romania, Russia, South Africa, Thailand, Turkey, Ukraine, Uruguay.

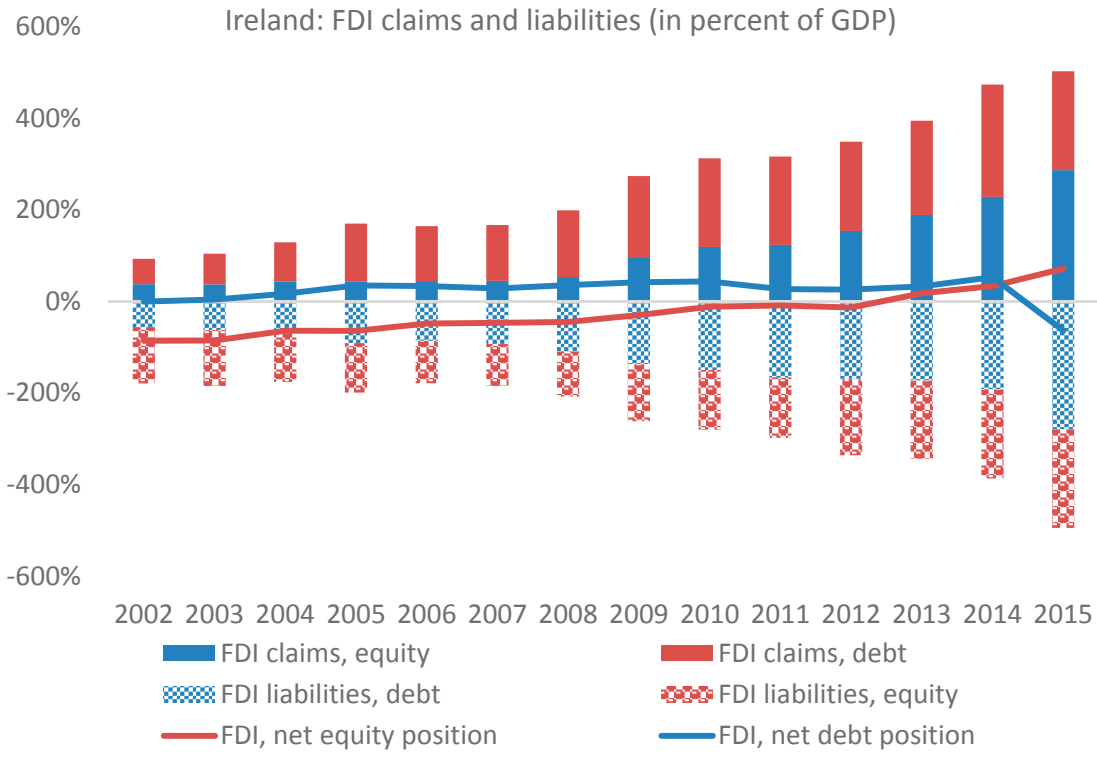
Appendix 2. FDI in Financial Centers: the cases of Ireland and the Netherlands

In this Appendix we briefly discuss the expansion in FDI claims and liabilities in Ireland and the Netherlands—two countries which contribute to an important extent to the aggregate trend for these balance sheet items in financial centers.

Ireland

For decades, Ireland has been well known as an export-platform location for multinational firms. In 2000, the net FDI position in Ireland amounted to minus 98 percent of GDP, primarily in the form of net equity liabilities. While the underlying role of multinational firms in the Irish export sector has continued to expand in recent years, Figure A1 shows that the net FDI position has been transformed, with net FDI equity assets turning positive from 2012 onwards and the net FDI debt position in positive territory between 2003 and 2014. A further shift took place in 2015, with a discrete jump in net FDI debt liabilities associated with the financial restructuring of some global firms. Behind these net figures, the scale of gross FDI positions has expanded: FDI assets increased from 28 percent of GDP in 2000 to 319 percent of GDP in 2015, while FDI liabilities shifted from 126 percent of GDP in 2000 to 311 percent of GDP in 2015.

Figure A1. FDI Positions in Ireland



A substantial proportion of the increase in gross positions reflects stock-flow adjustments due to internal balance sheet reclassifications inside global firms and inversions. In relation to the former, the transfer of intangible capital assets (such as intellectual property) between affiliates

of a global firms is funded by parallel FDI recalculations; in relation to the latter, the inversion of a global firm into a domestically-resident firm enlarges FDI assets with a matching increase in foreign portfolio equity liabilities (since the investors owning shares in the new entity are mainly non-resident). The rise in net FDI debt assets during 2003–2014 also reflects the strategies of various firms to retain accumulated funds in Ireland-resident affiliates that are recycled through intra-firm loans to other units in the global firm or held in the form of bank deposits and marketable debt instruments.

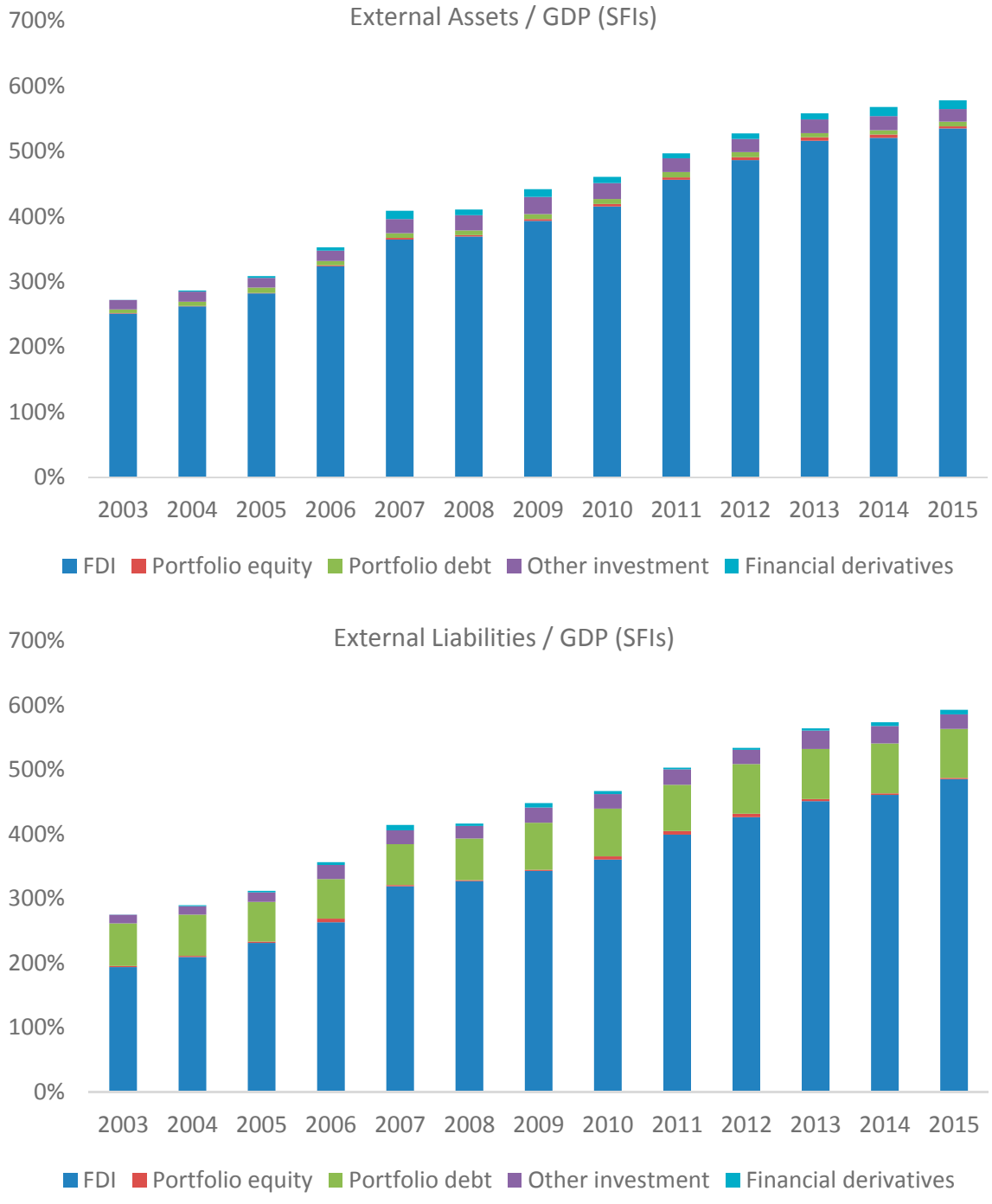
The Netherlands

The Netherlands provides a useful decomposition of its International Investment Position which allows the separate identification of claims and liabilities associated with "special financial institutions" (SFIs).[12] In turn, the decomposition shows how the increase in external claims and liabilities reflects both "financial engineering" by multinational firms and genuine international financial integration in the form of rising portfolio diversification.

Figures A2 and A3 show the external position of Dutch Special Financial Institutions (SFIs), as well as the external position of the Netherlands excluding these institutions. Of note in Figure A2 is the rapid run-up in the size of SFI claims and liabilities: as of end-2015, they were around $4 trillion dollars, with the lion's share in FDI claims and liabilities. Figure A.3 also shows an increase in Dutch liabilities and (especially) claims since the crisis, albeit to a smaller extent than for SFI balance sheets. The increase in claims reflects the rising net external position of the Netherlands, following several years of large current account surpluses, and the size of the external balance sheet also reflects the size of pension funds.

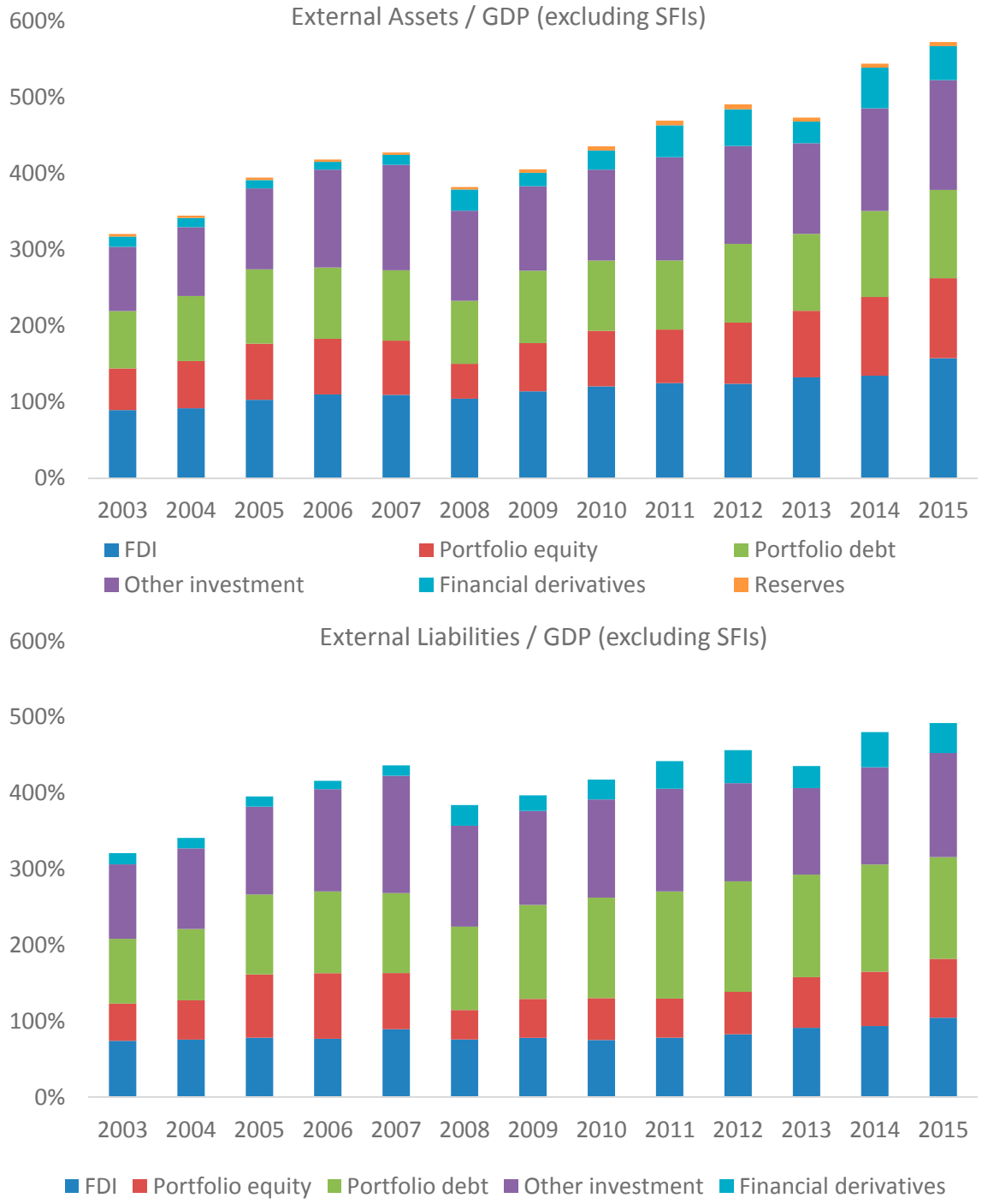
[12] As noted in the Netherlands' IIP statistics, "Special Financial Institutions (SFIs) are resident Dutch enterprises or institutions, fully owned by foreign direct investors, that act as financial intermediary between other parts of the group to which they belong. The financial assets and liabilities of these institutions usually are related to direct investment via the Netherlands in third countries or are connected to the channeling of funds collected in the direction of the foreign investor."

Figure A2. The Netherlands: External Assets and Liabilities, Special Financial Institutions
(ratio of GDP)



Source: De Nederlansche Bank.
Notes: Special Financial Institutions (SFIs) are resident Dutch enterprises or institutions, fully owned by foreign direct investors, that act as financial intermediary between other parts of the group to which they belong.

Figure A3. The Netherlands: External Assets and Liabilities, Excluding Special Financial Institutions
(ratio of GDP)



Source: De Nederlansche Bank.
Note: Special Financial Institutions (SFIs) are resident Dutch enterprises or institutions, fully owned by foreign direct investors, that act as financial intermediary between other parts of the group to which they belong.