

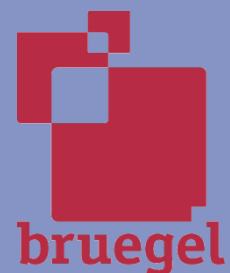


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Analysis of developments in EU capital flows in the global context

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3 November 2015



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Abstract

This report analyses capital movements in Europe in a global context. Capital outflows from the EU as a whole declined in recent quarters and there was even a net inflow in 2015Q1, driven by both euro-area and non-euro area countries. Some emerging countries experienced capital outflows, which are likely related to expectations about tightening monetary policies in the United States. Our econometric results confirm the importance of global factors in driving capital flows to emerging countries, but also show that FDI flows are rather insensitive in contrast to portfolio and other investment flows. Following a period of more than two decades of large-scale foreign exchange reserve accumulation by primarily emerging-country central banks, reserves started to decline, which is a rather marked trend-change and can lead to interest rate increases in advanced countries and offset the impacts of quantitative easing policies. At the EU's border, Ukraine managed to attract some capital in recent months, but Russia continues to display persistent net capital outflows. We report a remarkable similarity between capital flows in central and eastern European member states and euro area periphery countries during the past twelve years. We analyse the bilateral patterns of capital flows to Greece and Cyprus in the context of their respective crises. Intra-euro area financial integration continues to be lower than it was in the pre-crisis period. Our econometric analysis shows the dis-anchoring of EU countries' domestic savings and investments in the pre-crisis period, which has reversed in the past six years. While the euro-area aggregate financial cycle fluctuated rather moderately, a major divergence of domestic financial cycles can be observed within the euro area, which was very much linked to capital flows. The credit cycles for the UK, Denmark and Sweden are found to have been close to the euro-area cycle. We analyse the challenges faced by macro-prudential policy in the euro area and suggest improvements.

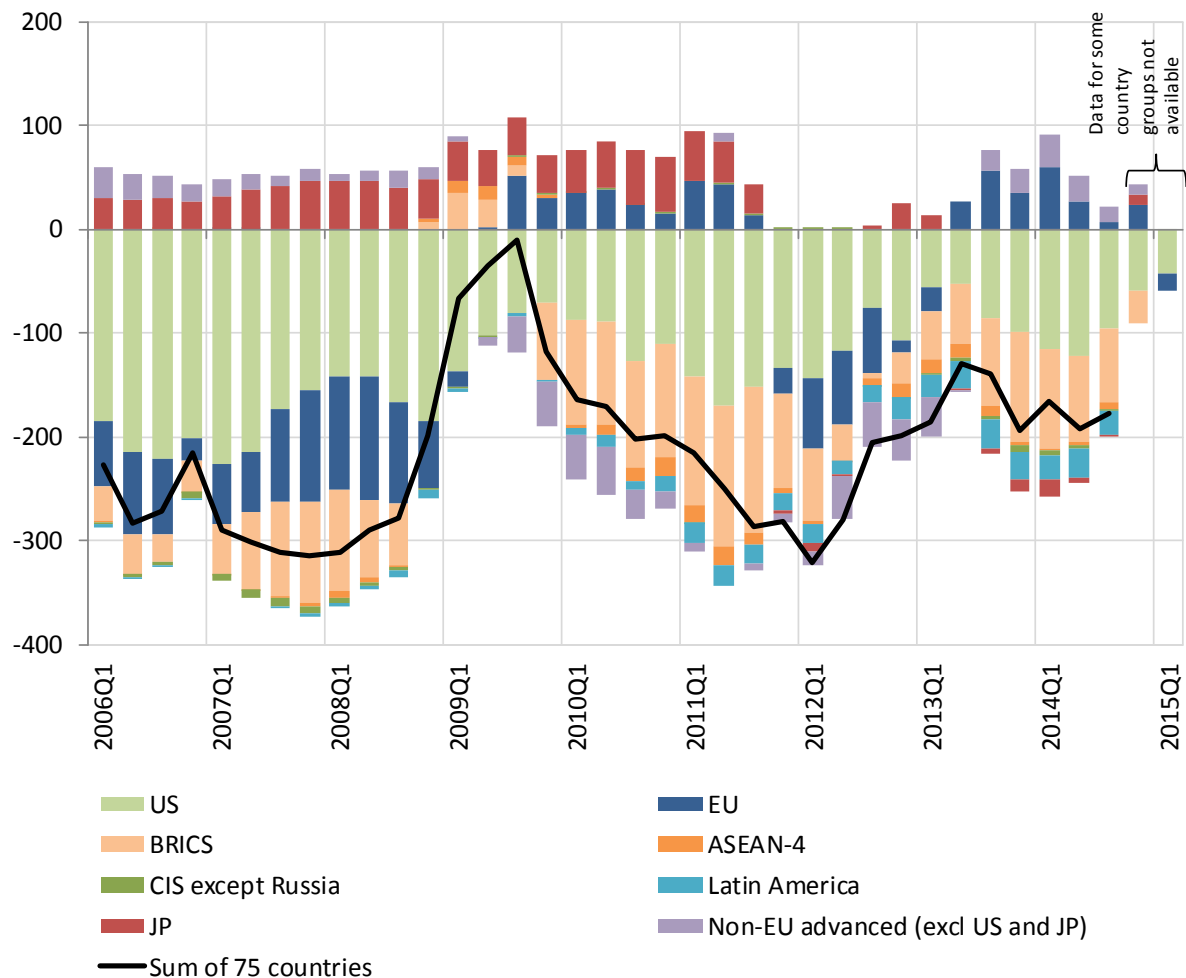
Executive summary*

The purpose of our report is to provide a comprehensive overview of capital movements in Europe in a global context. Free movement of capital, which is one of the four fundamental economic freedoms of the European Union, can enhance welfare if it leads to better allocation of financial and productive resources. However, it can also be a source of vulnerability, with far-reaching spillovers. Monitoring and assessing capital flows is therefore crucial for policymakers, market participants and analysts.

Chapter one introduces the topic and presents the outline of our report.

Chapter two analyses global capital flows. Figure 4 gives an overview of the development in net financial accounts across the world.

Figure 1 Net financial account for different country aggregates (in USD billions, four-quarter moving average)



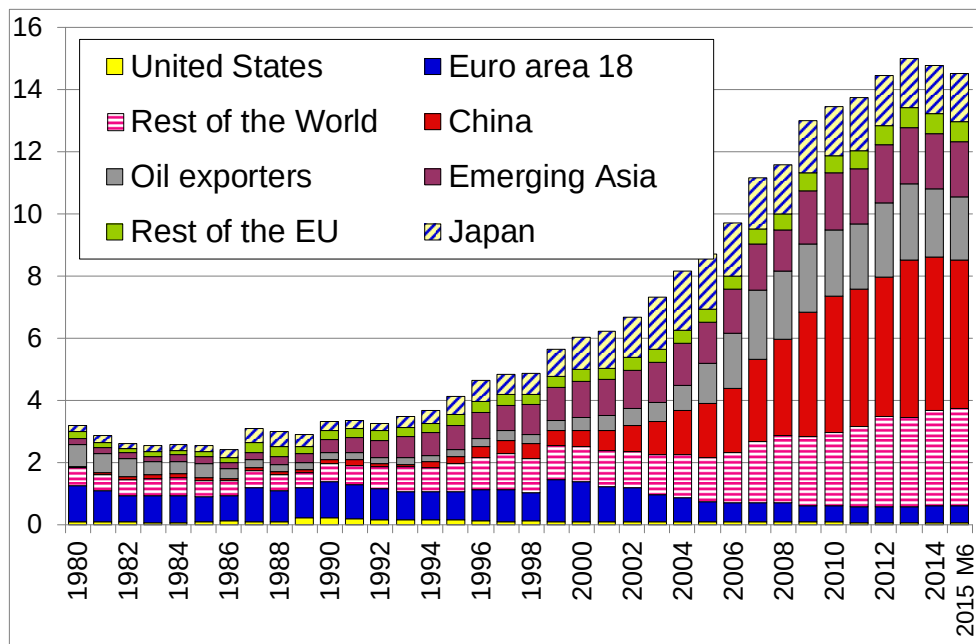
Source: Bruegel calculations using IMF Balance of Payments Statistics and Eurostat for the EU28 (EU-28 vis-à-vis extra-EU-28, excluding intra-EU flows). Note: The sum of 75 countries is the

* The authors are thankful to several colleagues from the European Commission and Bruegel for valuable comments and suggestions. Jaume Martí Romero provided excellent research assistance.

balance of net assets minus net liabilities, where a positive sign is interpreted as net lending to the rest of the world and a negative sign as net borrowing. We report four-quarter moving averages. The 75 countries included in our country groups account for around 90 percent of GDP of the countries included in the IMF World Economic Outlook. Data is complete for all country groups up to 2014Q3, while data is available only for 5 groups for 2014Q4 and only for the EU and US for 2015Q1.

- Considering **the EU** as a whole, capital outflows, which characterised the EU in 2009-2011 and again from early 2013, have gradually been reduced since early 2014, and in the first quarter of 2015 there was even an inflow of 155 bn USD (note that Figure 1 reports 4-quarter moving averages and thereby the figure indicates 17 bn USD for 2015Q1).
- The **euro area** stands out as being an increasing net capital exporter since the end of 2010, on the back of net outflows of banking related investment (mainly deposits and loans), but this trend has declined over 2014. Euro area banks slowed the pace of their expansion of holdings and FDI abroad increased again, contributing to a reduction in net capital outflows in Q1 2015. At the same time, portfolio investment in the euro area became less attractive for foreign investors, possibly due to the European Central Bank's large-scale asset purchases, which compressed government and corporate bond yields in the euro area.
- **The UK, Sweden and Denmark** experienced increasing net capital inflows in 2014, on the back of strong portfolio and FDI inflows, while net capital inflows decreased somewhat during 2014 in **non EU-advanced countries**.
- The **Central Eastern European Countries'** net financial account did not return to pre-crisis levels, and net capital inflows started receding in 2011Q4 amid an outright reduction of cross-border lending on the part of foreign banks operating in the region. This trend seems to have lessened by the end of 2013/beginning of 2014. Moreover, outflows seem to be more than offset by domestic deposit growth in most countries, pointing towards a more balanced post-crisis economic model in the region.
- Globally, both the **ASEAN-5** and the **BRICS** have been subject to increased capital inflows since the global financial crisis due to accommodative monetary policy in advanced economies and the resulting global search for yields. For **Latin America**, a similar portfolio-based recovery can be observed. However, since May 2013, when the Federal Reserve discussed for the first time its plans for **tapering unconventional monetary policies**, these emerging markets have experienced receding or even reversing capital inflows at the same time that their domestic economic activity was slowing down.
- Analysing the **underlying drivers of capital flows to emerging economies** with vector-autoregressive models (VARs), we find that global factors are important. Capital inflows to emerging countries increase when advanced country GDP is higher and when the VIX index (a widely-used measure of risk aversion of financial investors) is lower. We also find that monetary policy of the Federal Reserve and the ECB influence economic developments in the US and euro area, respectively, and thereby monetary policies of advanced countries also influence capital flows to emerging economies. Further, we find that capital inflows to emerging economies are also higher when the GDP of emerging countries is higher and capital inflows increase the GDP of emerging countries. By assessing the three main types of capital flows, we find that FDI flows to emerging economies are not influenced by the VIX index (and consequently all factors that influence the VIX index), while portfolio and other investment flows to emerging economies do respond to changes in the VIX index.

- **Sub-Saharan Africa** has benefited from massive direct investment inflows since 2010, highlighting the attractiveness of this region in recent years. Between 2013Q1 and 2014Q1, FDI inflows continued while other investment inflows reversed, leading to a stronger financial account position. **The Middle East and North Africa** have experienced receding FDI inflows and other large investment outflows over the last three years.
- **CIS 9 (EXCL. RUSSIA)** experienced cross-border deleveraging of banks operating in the area between 2008 and 2013, a trend which seems to have stopped in the last two quarters of 2013. At the same time, portfolio funding has been coming back to the region, contributing to increasing net financial inflows. In 2014Q1, capital flows reversed as the geopolitical tensions between Russia and Ukraine intensified.
- Available data on banks also suggest that the observable deleveraging process of **Euro area banks** since the financial crisis in 2008/09 seems to have reached a plateau at a lower level in mid-2012, a trend which continued throughout 2013 and into the second half of 2014. Three non-Euro area countries, **Denmark, Sweden and the United Kingdom**, report most claims on other non-EU advanced. Since 2012, a steady deleveraging process of banks in those three countries can be observed. By contrast, the banks located in the **six non-EU advanced economies** of Australia, Canada, Japan, South Korea, Switzerland, and the US continue to increase their exposure to foreign banks up to the end of 2013.
- The **net international investment positions (NIIP) of the Euro area and non-EU advanced economies** have been negative and stable for the past years, mainly on the back of negative portfolio investment and positive FDI stocks. However, academic research found that 8 percent of the global financial wealth of households is held in tax havens, three-quarters of which goes unrecorded. Accounting for unrecorded assets, the euro area becomes a net creditor instead of a net debtor to the rest of the world as indicated by official statistics.
- **In the CEE**, FDI liabilities are dominant and account for about the same as the sum of net portfolio and other investment liabilities while there was practically no change in NIIP/GDP position of this group of countries in 2010-14. **CIS 8 (excl. Russia)** and **Latin America** also have negative overall NIIP, but they have positive net portfolio and/or other investment positions.
- **Japan and Switzerland** exhibit strong positive NIIPs. Switzerland accumulated sizable positive reserve assets, stemming from interventions in the foreign exchange rate market by the Swiss National Bank during and after the peg of the Swiss Franc to the Euro (September 2011-January 2015). Other investment by foreign investors in Switzerland exceeds other investment abroad, suggesting an increasing importance of Switzerland as a safe haven, a trend which has been reverting over 2014.
- A rather marked trend-change can be observed for **foreign exchange reserves** held by central banks: following a period of more than two decades of large-scale foreign exchange reserve accumulation, reserves started to decline measured both in US dollars and as a share of world GDP in 2013 (Figure 6). Capital outflow from emerging markets is likely linked to the rumours about monetary tightening in some advanced economies. The sell-off of reserves by emerging-country central banks aimed to dampen the impact of capital outflows on currency depreciation. It needs to be seen if the depletion of foreign exchange reserves is a temporary phenomenon or not. Yet in the short-run, reserve depletion can lead to interest rate increases in advanced countries and offset the impacts of quantitative easing policies.

Figure 2 Foreign exchange reserves (as share of world GDP)

Source: IMF IFS (foreign exchange reserves) and IMF WEO April 2015 (GDP).

- A **special focus on Ukraine and Russia** shows that both Ukraine and Russia have experienced capital outflows in the recent past due to geopolitical unrest, but to a smaller extent than during the turmoil of the financial crisis. While Russia continues to display persistent net capital outflows in 2015, Ukraine has managed to attract some capital in recent months. Despite this positive development, the country still faces major economic challenges.
- It is difficult to disentangle **the impact of sanctions and oil prices on the Russian economy**: the large drop in oil prices was immediately reflected in the deterioration of Russian economic outlook, yet the outlook also deteriorated when sanctions were imposed, suggesting that sanctions may have played an important role too.

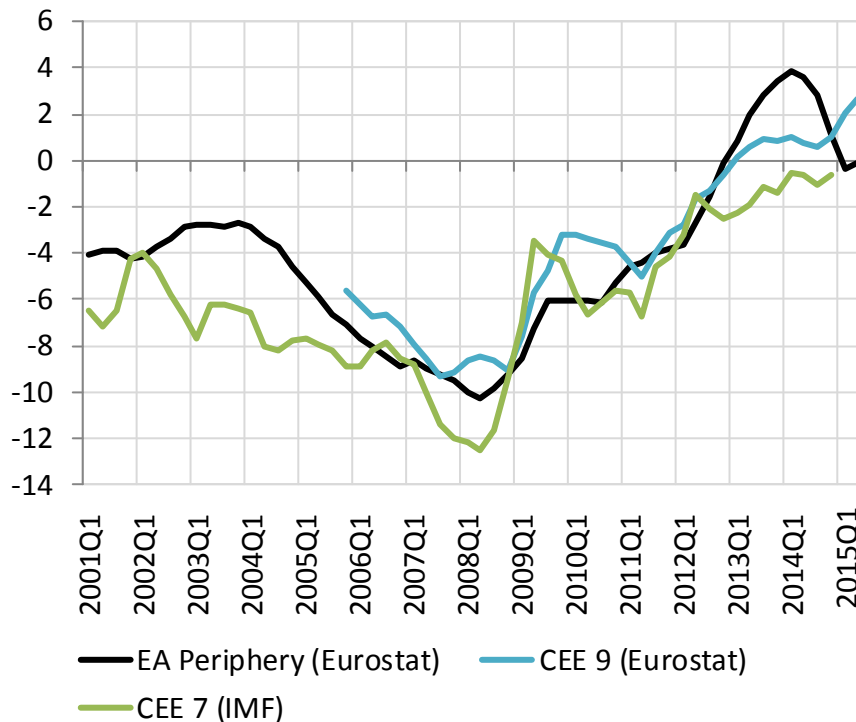
The third chapter focuses on capital flows in the European Union, with a special focus on Greece and Cyprus.

- The effect of the rise and contraction in **gross flows** is most evident in the **euro area centre and periphery** – where gross flows contracted both during the financial crisis in 2008Q3 and, after a short recovery phase, again in 2013Q1. By that time, the periphery had turned into a net exporter of capital, on the back of gross other investment outflows. By the end of 2014, the net outflows peaked and were slowing down, a trend which reverted in 2015Q1. In the euro area core, gross flows after the financial crisis have remained more stable, albeit at a significantly lower level compared to pre-crisis times. Since 2012Q1, the euro area core increased its position as net exporter of capital, a trend which reverted somewhat over 2014 before intensifying again in 2015Q1.
- This is confirmed by looking at **cross-border banking exposure**: In the post-crisis period, the banks in the euro-area core deleveraged significantly, reflected by the drop in net foreign claims from nearly 30% of group GDP to less than 10% by end 2013. Over 2014 and 2015Q1, net foreign claims seem to have stabilized at that level. The euro-area centre banks' net foreign claims peaked at 10% of group GDP in 2012Q2 and have decreased steadily since

then, only, beginning to increase their exposure abroad again in 2015Q1. Euro-area periphery banks were characterised by substantial inflows, which translated into a negative net foreign claim position. These inflows contracted massively during the financial crisis in 2007/2008 and again with the rise of the redenomination risk during the European debt crisis in 2011. Negative net foreign claims turned positive by mid-2012, reflecting massive deleveraging from the rest of the world. Since 2013, the euro-area periphery net foreign claims stayed in a balanced position, a trend which has continued in the latest quarters.

- The magnitude of gross flows in **Denmark and Sweden** as well as in the **CEE** tends to be smaller than in the euro area. As a share of GDP, **the UK**, which plays a special role as financial centre, experienced gross flows of up to 80% of GDP during the financial crisis. In terms of compositions, the three non-euro groups differ significantly from the euro area. For the UK, the banking-related component (loans and deposits) massively dominates capital flows, and portfolio investments (especially debt) play a certain role too. Flows to Northern Europe are characterized by portfolio equity and debt, as well as other investment. In the CEE, FDI constitutes the bulk of inflows before the crisis together with other investments (which includes bank loans). In the post-crisis period, the magnitudes held up well in Northern Europe, were volatile in the UK and declined dramatically in the CEE (and continue to stay at much lower levels compared to the pre-crisis period).
- In terms of **net flows**, the latest developments show a stabilization of net outflows over 2014, as rising net portfolio outflows are substituting receding other investment outflows. The **euro area centre** has been experiencing rising net outflows over 2014, which intensified by the end of the year on the back of increasing net portfolio investment outflows.
- **Denmark and Sweden** have been net exporters of capital up until the end of 2007 (reflecting current account surpluses). With the start of the financial crisis, capital in search of safety started pouring into these countries. This was particularly pressing for **Denmark**, which eventually adopted monetary policy measures such as the negative rate on central bank deposits to curb the inflows it was undergoing. Over the latest period, banking-related investment outflows are decreasing in importance while net portfolio investment turned from in- to outflows.
- A remarkable similarity can be observed when **comparing CEE countries with the euro area periphery countries** in terms of net flows (Figure 3). Both regions experienced large capital inflows before the crisis, which declined from late 2008. Over 2009-10, the initial adjustment was more gradual in the euro-area periphery most likely due to the provision of financial assistance and especially by ECB liquidity, which allowed a smoother adjustment on the external position than that which occurred in CEE countries, especially in the Baltics. Yet the trend remained broadly similar in both country groups, though in the past two years capital outflows from euro-area periphery countries were much larger than from CEE countries.

Figure 3 Net financial account of the euro-periphery and Central and Eastern Europe (percent of GDP)



Source: Eurostat, IMF and Bruegel calculations. Note: the EA periphery includes GR, PT, ES; the CEE 9 (Eurostat) includes CZ, HR, EE, HU, LV, LT, PL, RO, SI while the CEE7 (IMF) includes BL, CZ, LV, LT, HU, PL, RO; Data is available from 1999Q1 to 2015Q2.

- We included a special focus on **Greece and Cyprus**, two EU countries that introduced capital controls. Both countries experienced large capital inflows up to the financial crisis in 2008/09. With the start of the sovereign debt crisis in **Greece** in 2010, capital started leaving the country and Greece turned into a net exporter of capital by the end of 2012. In terms of net portfolio positions, France, Germany, and the rest of the euro area were the largest holders of portfolio before the crisis, a trend which reversed by December 2012. Beginning in 2010, Greece was also subject to substantial cross-border deleveraging, a trend which stabilized in 2013 at significantly lower levels. Bank exposure to Greece continued to decrease in 2015 amid renewed political and economic uncertainty. Capital controls were introduced in Greece in June 2015, but data is not yet available to assess its impact on capital flows.
- By contrast, **Cyprus** saw much slower and more gradual capital withdrawal even during the outbreak of the European debt crisis, which accelerated with the outbreak of the Cypriot crisis in winter 2012/spring 2013. On a bilateral basis, countries receiving the most portfolio outflows were Greece and the United Kingdom up to December 2012. In the midst of a 10 percent of quarterly GDP net capital outflow in 2013Q1, in March the Cypriot government established restrictive measures on capital movements. While capital outflow slowed down due to the controls, it did not stop but continued throughout 2013. In 2014, stabilization in portfolio, debt and other investment flows can be observed, reflecting the removal of uncertainty and the improved prospects of the country. Interestingly, exposure of Greek banks to Cyprus increased steadily, from 24% of Cypriot GDP in 2005 to 48% of Cypriot GDP in 2015, and

banking exposure from the rest of the euro area picked up in the first half of 2015.

Chapter four presents the results of our in-depth study on financial cycles and macro-prudential policy.

- While price-based measures of financial integration signal a recovery of financial integration, various **quantity-based indicators suggest little change in intra-euro area financial integration**, which continues to be well below the pre-crisis level.
- **In the 1999-2007 period**, massive financial flows spurred by currency unification resulted into the **dis-anchoring of countries' domestic savings and investment**, as reflected also in the growing current account imbalances. Evidence of dis-anchoring is significantly weaker when all 27 EU countries are considered, although by 2007 non-euro area EU countries achieved the same level of dis-anchoring that persisted in the euro area for a decade.
- While the euro-area aggregate financial cycle fluctuated rather moderately, a **major divergence of domestic financial cycles** can be observed within the euro area, which was very much linked to capital flows, and especially to intra-euro area debt flows. The credit cycle for UK, Denmark and Sweden are found to have been close to the euro-area cycle.
- **The rationale for an effective macro-prudential policy is particularly strong** in the euro area going forward, especially in the current low rates environment. Since the financial cycles of individual euro-area countries will likely remain heterogeneous, macro-prudential policy in the euro area will face significant challenges. Financial integration and potential cross-country financial spillovers would favour strong macro-prudential power for the ECB, yet the euro area's macro-prudential system has become a two-tier system in which national authorities and the ECB each have certain tools to govern in a complex relationship. This system for macro-prudential policy in the euro area seems unfit to deal effectively with the special challenges. We suggest giving the ECB more power, which would require changes in the SSM legal framework.
- To the extent that capital flows are linked to underlying domestic macroeconomic imbalances, **there is synergy between the EU's Macroeconomic Imbalance Procedure (MIP) and macro-prudential policy**. Consistent and effective implementation of the MIP would facilitate the ECB's task to prevent the build-up of excessive financial risk at the country level.

1. Introduction

Free capital movements can enhance welfare if they lead to better allocation of financial and productive resources, yet they can also be a source of vulnerability with far-reaching spillovers. Monitoring and assessing capital flows is therefore crucial for policymakers, market participants and analysts.

This is our second annual report on analysing capital movements in Europe in a global context. Given that in last year's report (Darvas *et al*, 2014) we reviewed the key theoretical aspects of capital flows, we do not repeat these considerations but instead begin with an analysis of global capital flows in Chapter 2. In order to be able offer the big picture, we aggregate countries into ten groups and highlight different patterns of capital flows throughout the world. We focus on more recent developments, while interested readers can find our analysis of pre-crisis developments in our previous report. We pay special attention to emerging market economies, given the recent turbulences there. We report our new econometric results assessing the determinants of capital flows to emerging countries and briefly discuss the consequences of foreign exchange reserve depletion, which is a new phenomenon after more than two decades of massive foreign exchange reserve hoarding. In this chapter we also update our analysis of capital flows and stocks in Ukraine and Russia, two countries heavily impacted by geopolitical conflicts near the EU borders. Our results suggest some normalisation in Ukraine but not in Russia.

Chapter 3 focuses on Europe. While we continue to focus on the euro area due to its unique characteristics, we pay more attention to non-euro area EU countries too. We analyse the different capital flow patterns and developments in international investment positions, including the analysis of their composition. An interesting picture emerges when we compare euro-area periphery countries with central and eastern European (CEE) member states of the EU. The imposition of capital controls, which is in principle prohibited in the European Union, makes Cyprus and Greece highly interesting cases for a bilateral analysis of their capital flows.

Finally, Chapter 4 presents the results of our in-depth analysis, which this year focused on financial integration, capital flows, financial cycles and macro-prudential policy. We look at the state of financial integration in the euro area by considering cross-border financial asset holdings and analyse the correlation of savings and investments, both inside and outside the euro area. We next provide an analysis of financial cycles that considers both the euro area as a whole and its individual member states, as well as those non-euro EU member states for which sufficiently long time series are available. We scrutinise whether capital flows contributed to differences in financial cycles and conclude the chapter with observations on the macro-prudential framework of the euro area.

2. Global trends

2.1 Major country groups of the world

We start our monitoring analysis by examining capital flows and stocks at the global level, before analysing some country-specific developments. We group countries into 10 major aggregates: euro area 17, 8 Central and Eastern European countries of the European Union (CEE8), the 3 other EU countries (UK, Denmark and Sweden), 11 non-EU advanced economies, 5 Association of Southeast Asian Nations (ASEAN-5), Latin America 13, 5 Sub-Sahara African countries (SSA5), Commonwealth of Independent States not including Russia (CIS 9 (excl. Russia)), Middle East and North Africa 5 (MENA5), and the aggregate of Brazil, Russia, India, China and South Africa (BRICS). The time period we consider is from 2000Q1 to the latest data available (end of 2014 or first quarter 2015) — the period for which we have data for all country groups¹.

The evolution of gross and net capital flows for our country groupings is presented in Figure 4. In the run-up to the crisis, data indicates there were net capital inflows into most country groups² (especially in CEE8, Non-EU advanced, CIS9 and the BRICS), while the Euro area was characterized by capital outflows.

The eruption of the financial crisis in 2007 resulted in a collapse of gross financial flows in all country aggregates. In the CEE8, the Other EU 3 and the non-EU advanced countries, net flows fell to zero for a few quarters before rebounding by the end of 2009. Sizeable net capital outflows were registered in the CIS 9 (EXCL. RUSSIA), the BRICS and Latin America, as well as in the ASEAN-5.

The recovery of capital flows in the post-crisis period was uneven across regions. By the first quarter of 2010, gross capital flows reached nearly pre-crisis levels in Latin America, the ASEAN-5 and Sub-Saharan Africa. Latin America and Sub-Saharan Africa especially are experiencing increasing capital inflows in the most recent period, while ASEAN-5 is characterized by more overall volatility. A similar return to pre-crisis levels, albeit to a somewhat lesser extent, can be observed for the BRICS.

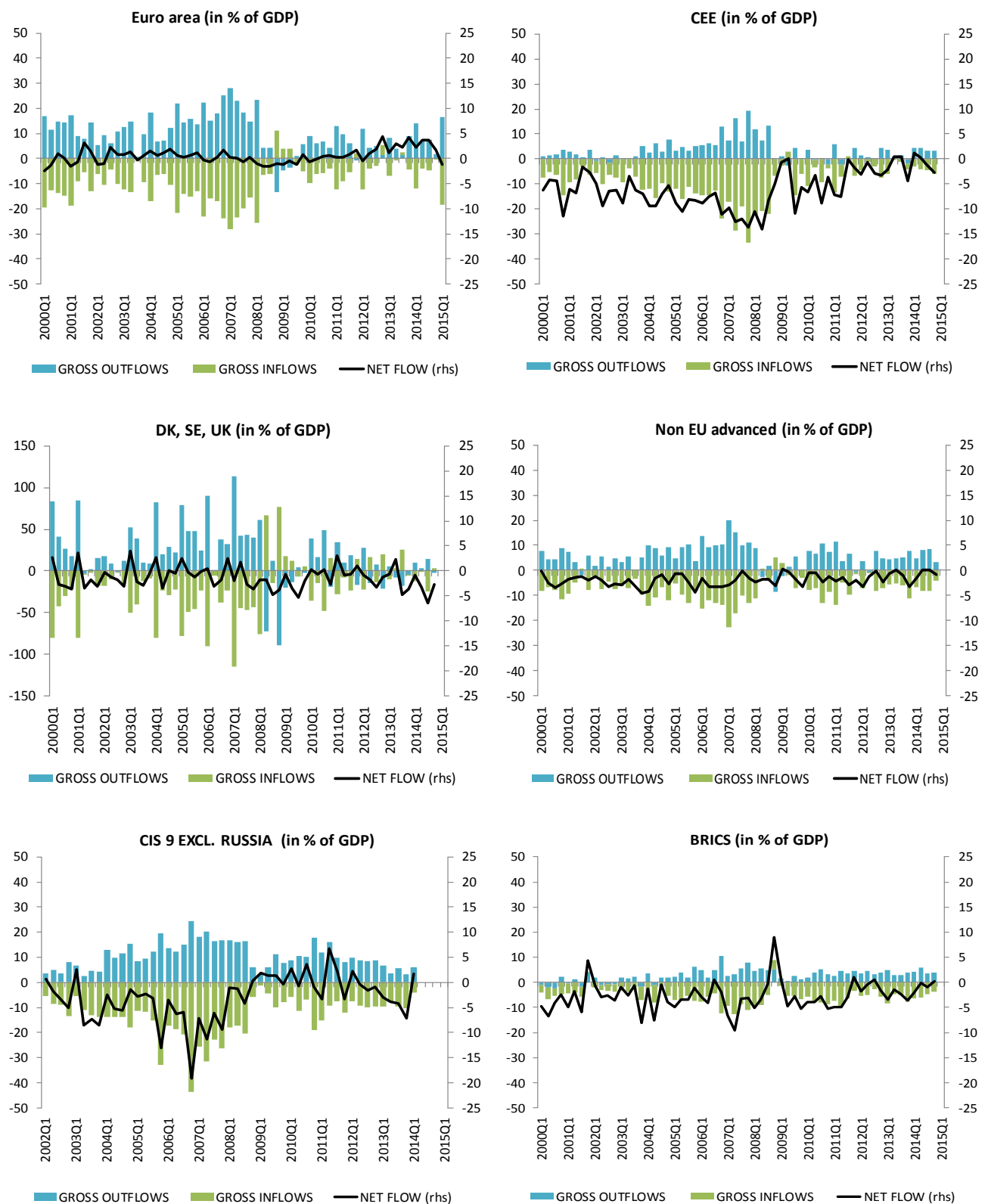
However, over the last year gross flows into emerging markets decreased as expectations of an impending interest rate rise by the US Fed mounted, and reports suggest major outflows in 2015³. Unfortunately, we cannot assess these reports in our dataset because available data for emerging country groups ends in 2014. In advanced countries with more recent data available, we do not observe a recent drop in gross flows, although they continue to stay below pre-crisis levels.

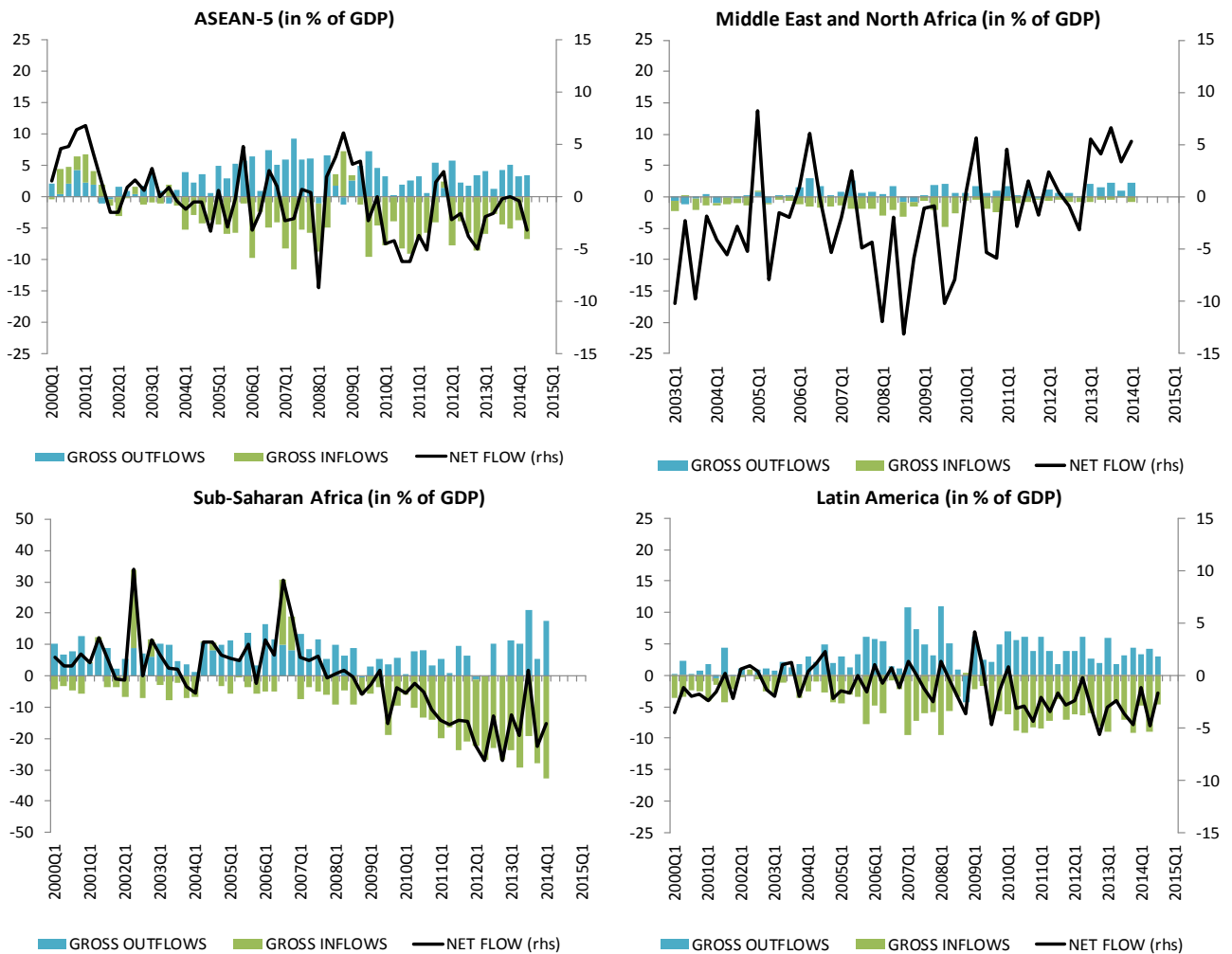
¹ This report follows the sign conventions set out in the 6th edition of the IMF's Balance of Payments Manual (for more detail, please refer to Box 1).

² We highlight the findings by Zucman (2013), which show that official statistics substantially underestimate the net foreign assets position (and consequent flows) of rich countries, since they fail to capture most of the assets held in offshore tax havens.

³ The Institute of International Finance expects capital flows to emerging markets to fall to post-crisis low in 2015 (<https://www.iif.com/press/em-capital-flows-projected-fall-post-crisis-low-2015>).

Figure 4 The evolution of gross and net capital flows in the world (percent of GDP)





Source: IMF IFS (quarterly capital flows); WEO (annual GDP). Note: The country groups are as follows: Euro area = EA 17; other EU 3 = United Kingdom, Sweden, Denmark; CEE8 = Bulgaria, Czech Republic, Croatia, Latvia, Lithuania, Hungary, Poland and Romania; non-EU advanced = Canada, Japan, United States, Australia, Hong Kong, Iceland, Israel, Korea, New Zealand, Norway, Switzerland; BRICS = Brazil, Russia, India, China, South Africa; CIS 9 (excl. Russia) = Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyz Republic, Moldova, Tajikistan, Ukraine; Latin America = Argentina, Bolivia, Chile, Costa Rica, Colombia, El Salvador, Guatemala, Panama, Venezuela, Mexico, Uruguay, Middle East and North Africa = Jordan, Lebanon, Morocco, Saudi Arabia, Yemen; Sub-Saharan Africa = Cabo Verde, Lesotho, Mozambique, Namibia; ASEAN-5 = Indonesia, Philippines, Thailand, Vietnam, Malaysia (until 2010); Gross inflows/outflows are calculated as the sum of the liabilities/assets of the following instruments: direct investment, portfolio investment and other investment, where gross inflows are reported with a negative sign. Net flow is the net financial account.

Box 1 – What’s new? A short overview of major changes introduced with the changeover from IMF 5th BMP manual to IMF 6th BMP manual⁴

This report follows the **IMF 6th edition of the Balance of Payments and International Investment Position Manual**. This box gives a short overview of what this means in theory and practice.

In 2009, the IMF released the sixth edition of its Balance of Payments and International Investment Position Manual (BPM6), replacing the fifth edition (BPM5) which was in place since 1993. Since then, major changes occurred in the global economy, making a revision necessary. The BPM6 now takes three major factors into consideration: (i) globalization (increased use of cross-border production processes, complex international company structures and international labour mobility), (ii) increasing focus on balance sheets and (iii) financial innovation.

The most important change is with respect to the **sign convention**: all components are now recorded according to the asset–liability principle, which supports the full implementation of the balance sheet approach in the financial account. In this regard, net values are recorded and have to be interpreted by keeping the underlying gross transactions in mind — net acquisition of assets is based on the acquisition of new assets minus the reduction of assets during the observed period while net incurrence of liabilities consists of the issue of new liabilities minus redemptions of outstanding liabilities. **The resulting balance of net assets minus net liabilities is interpreted as net lending to the rest of the world when positive and net borrowing when negative.** The sign convention for the international investment position remains unchanged: assets and liabilities are presented with a positive sign. Balancing items such as “current account balance” or “net lending/net borrowing” are always derived as credits minus debits or (net acquisition of) assets minus (net incurrence of) liabilities.

Furthermore, foreign direct investment (FDI) experienced a major **presentational change**. Standard presentation is now on a “gross” basis (assets and liabilities), instead of the former “directional principle”, which would net out reverse. This also has methodological consequences: while this has an impact on total (acquisition of) assets and (incurrence of) liabilities and the respective debit and credit income transactions, it does not have an impact on net FDI (transactions and positions).

In terms of **net position and components**⁵ (Figure 8), the **euro area** stands out as an increasing net capital exporter since the end of 2012. These outflows were predominantly driven by bank-related outflows (loans and deposits) in an order of magnitude of around 5% of Euro area GDP, a trend which was reversed in 2014 Q3. Over 2013, foreign investors showed a renewed interest in euro area equity and debt markets, reflected by positive inflows of portfolio investment, which turned into outflows by 2014 Q4. In the latest quarter available (2015 Q1), financial outflows from the Euro area slowed somewhat on the back of strong FDI outflows while other investment, financial derivatives and portfolio investment outflows stabilized at low levels. The European Central Bank’s large-scale asset purchases, which were announced in January 2015 and began in March 2015, may have contributed to

⁴ This report draws mainly from the FAQs on the introduction of BPM6 published by the ECB and available under <http://www.ecb.europa.eu/stats/external/bpm6/html/BPM6-faq-ECB.pdf?dad2e270978bb6eb8393bbefd94c7dc7>

⁵ See Box 2 for more detail.

portfolio investment outflows from the euro area in recent months because they compressed euro-area government and corporate bond yields. **The Central Eastern European Countries'** net financial inflows receded substantially since the height of the financial crisis, on the back of outright reductions of cross-border lending on the part of foreign banks operating in the region since 2011. The deleveraging peaked at 2% of CEE GDP over 2011 and 2013, before declining to 1% over 2013 and 2014. Portfolio investment inflows decreased significantly over the same period and turned into outflows by 2014Q2. Nevertheless, these outflows seem to be more than offset by domestic deposit growth in most countries as well as by a significant return of FDI inflows over the last two quarters of 2014, pointing towards **a more balanced post-crisis economic model in the region. Sweden, Denmark and the United Kingdom** experienced **increasing net capital inflows over 2014**, on the back of strong portfolio and FDI inflows, while bank-related outflows over the same period offset somewhat the observed inflows. Net capital inflows continued to decrease slightly in **non EU advanced countries**, on the back of somewhat receding portfolio investment inflows, a trend which can be observed since 2013.

Box 2 – Components of capital flows

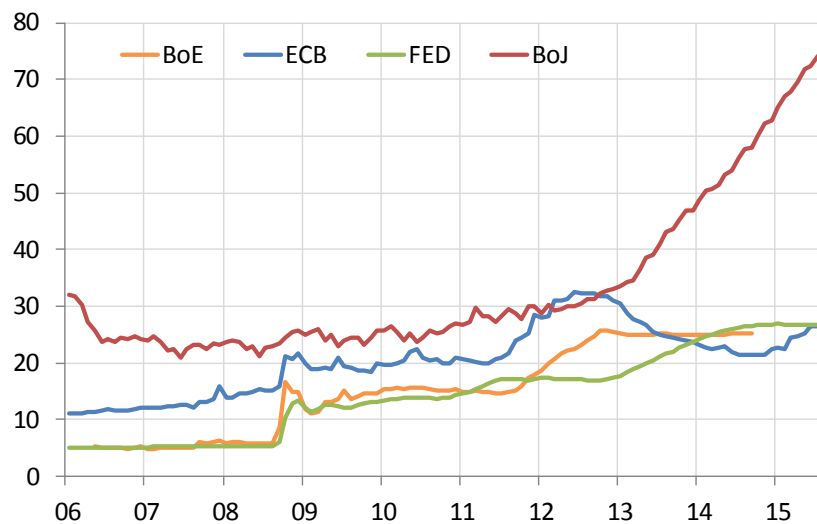
Capital flows are defined as cross-border financial transactions recorded in a country's external financial accounts, which produce a change in the assets and liabilities of residents vis-à-vis non-residents and can be broken down into the following components:

- Foreign direct investment: records financial flows between resident and non-resident firms that are under a direct investment relationship. A direct investment relationship is established when a resident firm holds at least 10% in the share capital of a non-resident firm, or vice versa.
- Portfolio investment: records financial flows related to transactions between residents and non-residents that affect their assets and liabilities vis-à-vis each other related to securities and derivatives. Securities are distinguished between equities and debt securities, namely bonds and money market instruments. Residents' net investment in securities issued by non-residents is recorded under 'Assets', whereas non-residents' net investment in securities issued by residents is recorded under 'Liabilities'.
- Other investment: records financial flows stemming from transactions between residents and non-residents primarily related to cross-border loans and deposits. Financial flows related to loans granted by residents to non-residents, as well as residents' deposits with non-resident monetary financial institutions, are recorded under "Assets". Financial flows related to loans granted by non-residents to residents, as well as non-residents' deposits with resident monetary financial institutions, are recorded under "Liabilities".
- Financial derivatives: records financial flows stemming from financial derivative contracts, which are financial instruments linked to another specific financial instrument/indicator or commodity and are traded in their own right in financial markets. These transactions are treated as separate transactions rather than as integral parts of the values of the underlying transactions to which they are linked.

Both the **ASEAN-5** and **the BRICS** have been subject to increased capital inflows since the global financial crisis due to accommodative monetary policy in advanced economies (as reflected in the increase in major central banks' balance sheets shown in Figure 5) and the resulting global search for yields. This is reflected in increased portfolio funding since 2010 in both regions. For **Latin America**, a similar portfolio-based recovery can be observed; a trend which continues throughout 2014. Since May 2013, when the Federal Reserve discussed for the first time its plans for **tapering unconventional monetary policies**, these emerging markets have experienced receding or even reversing capital inflows at the same time that their domestic economic activity has slowed. Only inflows to Latin America seem to have held up. In this context, IMF research showed that emerging markets were hit by outflows indiscriminately across countries at first, but over time there was greater differentiation and especially good macroeconomic fundamentals helped dampen the market reaction (IMF, 2014a). Our research indicates that capital inflows to emerging countries increase when advanced country GDP is higher, emerging country GDP is higher and the VIX index is lower. In turn, capital inflows increase the GDP of emerging countries. By assessing the three main types of capital flows, we also find that FDI flows to emerging economies are not influenced by the VIX index (and consequently all factors that influence the VIX index), while the responses of portfolio and other investments to changes in the VIX index are broadly similar. See Box 3 for further details.

During 2014, the net financial account was further strengthened in the BRICS as other investment switched to net outflows in 2014Q2 – suggesting foreign investors' withdrawals of deposits and loans from banks located in the BRICS. The ASEAN-5 have been characterized by a similar picture over 2013-2014, experiencing outright portfolio outflows in 2013Q4. Since the beginning of 2014Q1, FDI and portfolio flows seem to have recovered again.

An interesting picture emerges for **Sub-Saharan Africa**, which has been benefiting from massive direct investment inflows since 2010, highlighting the attractiveness of this region in recent years. Between 2013Q1 and 2014Q1, FDI inflows continued while other investment inflows reversed, leading to a stronger financial account position. **CIS 9 (EXCL. RUSSIA)** experienced cross-border deleveraging of banks operating in the area between 2008 and 2013, a trend which seems to have stopped in the last two quarters of 2013. At the same time, portfolio funding has been coming back to the region, contributing to increasing net financial inflows. In 2014Q1, capital flows reversed as the geopolitical tensions between Russia and Ukraine intensified (for a more detailed discussion, please refer to chapter 3.2 in this report). **The Middle East and North Africa** have been experiencing receding FDI inflows and large other investment outflows over the last three years.

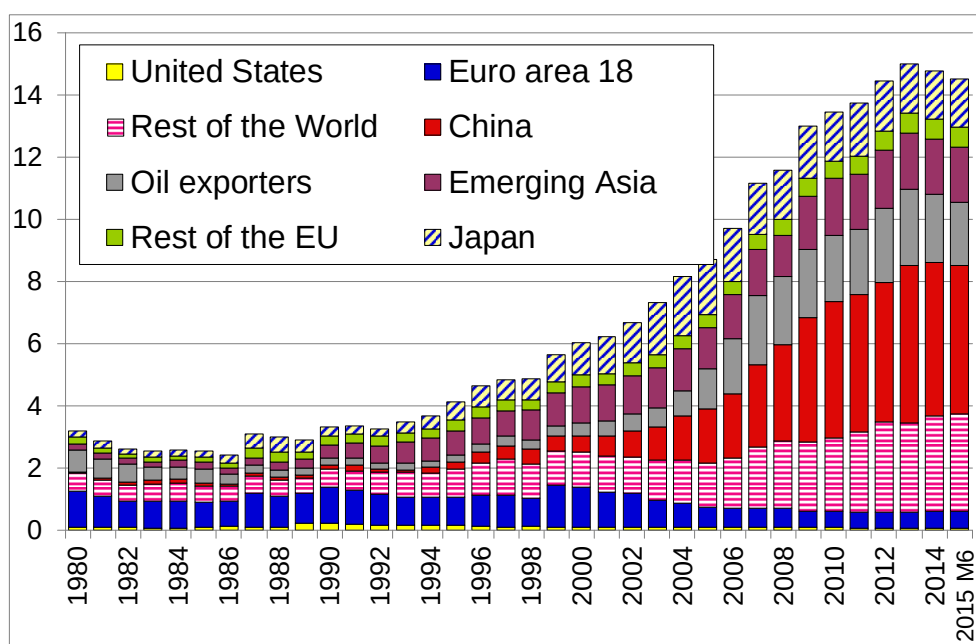
Figure 5 Expansion of Central Banks' balance sheets (in % of GDP)

Source: FRED and WEO; BoE data discontinued as of September 2014.

A rather marked trend-change can be observed for foreign exchange reserves held by central banks. Reserve accumulation and depletion result from the discrepancy between the current account and capital flows (sum of financial and capital account). Up to 2013, there was a very rapid process of reserve accumulation of central banks (Figure 6): the share of foreign currency reserves in world GDP has increased from about 3 percent in the early 1990s to 15 percent by 2013, during which world GDP also increased rapidly. A large literature analyses the reasons behind such reserve accumulation (like precautionary reserve accumulation as a kind of self-insurance against future capital outflows, the desire to keep the currency exchange rate weaker to support export growth, or saving large revenues from commodity sales like oil exports) and the consequences of it (like welfare losses for reserve holding countries); see for example Angeloni *et al* (2011).

The trend has clearly changed after 2013, when reserves started to decline both nominally (measured in US dollars) and as a share of GDP. This reversal indicates that net capital inflows to reserve-holding countries are smaller than their current account deficits (in absolute terms). Related to monetary policy tightening in some advanced countries, like the US 'tapering' in 2013 and the more recent expectations about an interest rate increase, capital outflows from emerging economies accelerated. Central banks of reserve-holding emerging countries decided to dampen the depreciating impact of capital outflows on the exchange rate by selling their foreign exchange reserves.

It remains to be seen if the depletion of foreign exchange reserves is a temporary phenomenon that will end once capital outflows stabilise or if a new trend has started in which central banks that hold large reserves reassess their strategies. Yet even in the short-run reserve depletion can have an impact on advanced economies: a large share of reserves are held in liquid financial assets like government bonds of advanced countries, and to decrease reserves those government bonds should be sold first. This in turn can lead to interest rate increases in advanced countries and offset the impacts of quantitative easing policies (see Cohen-Setton, 2015, for a recent survey of the debate in the blog-sphere on this issue).

Figure 6 Foreign exchange reserves (as share of world GDP)

Source: IMF IFS (foreign exchange reserves) and IMF WEO April 2015 (GDP).

Box 3 – Capital flows to emerging economies: results from a VAR model

In order to study the spillover effects from advanced countries' developments on emerging economies, including on capital inflows, we estimate various vector autoregressions (VAR).

Short-term interest rates and the term premium (the difference between long-term and short-term interest rates), which were frequently used in the literature, are inadequate for identifying monetary shocks when the sample includes both normal and zero lower bound periods. We use instead three alternative indicators of monetary policy: the long-term interest rate, an estimated shadow rate and Divisia-money indicators.

The expectation hypothesis of the term structure of interest rates defines the relationship between current and expected short-term interest rates and the long-term interest rate. Thereby the long-term rate can be informative about monetary policy actions, including when various unconventional measures such as large-scale asset purchases are implemented. An alternative measure is the estimated "shadow interest rates": when monetary policy is constrained by the zero lower bound, the estimation of a so-called shadow rate term structure model allows an approximation of what the short-term nominal interest rate would be in the absence of the zero lower bound. We use the estimates of Wu and Xia (2015). A third possible indicator of monetary policy is a Divisia-money aggregate, which is a theory-based measure of the money stock (see Darvas, 2015).

Our first set of VAR estimates show that all three indicators contain useful information about monetary policy shocks in the euro area and the United States.

Next, we estimate a 5-variable model which includes constant price GDP of either the

United States or the euro area, the weighted average of emerging countries' constant price GDP, the aggregate financial account of emerging countries (as percent of their GDP), the VIX index (the implied volatility of the S&P 500 index from the Chicago Board Options Exchange) and any of the three monetary policy indicators we discussed above: the long-term interest rate, the shadow rate or the Divisia-monetary aggregate. We used quarterly data from 2000-2014 for the aggregate of the 30 emerging countries: Argentina, Brazil, Chile, Colombia, Costa Rica, Czech Republic, El Salvador, Estonia, Guatemala, Hong Kong (Special Administrative Region of P.R. China), Hungary, India, Indonesia, Israel, Korea, Latvia, Lithuania, Mexico, Pakistan, Philippines, Poland, Russia, Singapore, Slovenia, South Africa, Sri Lanka, Thailand, Turkey, Ukraine and Uruguay.

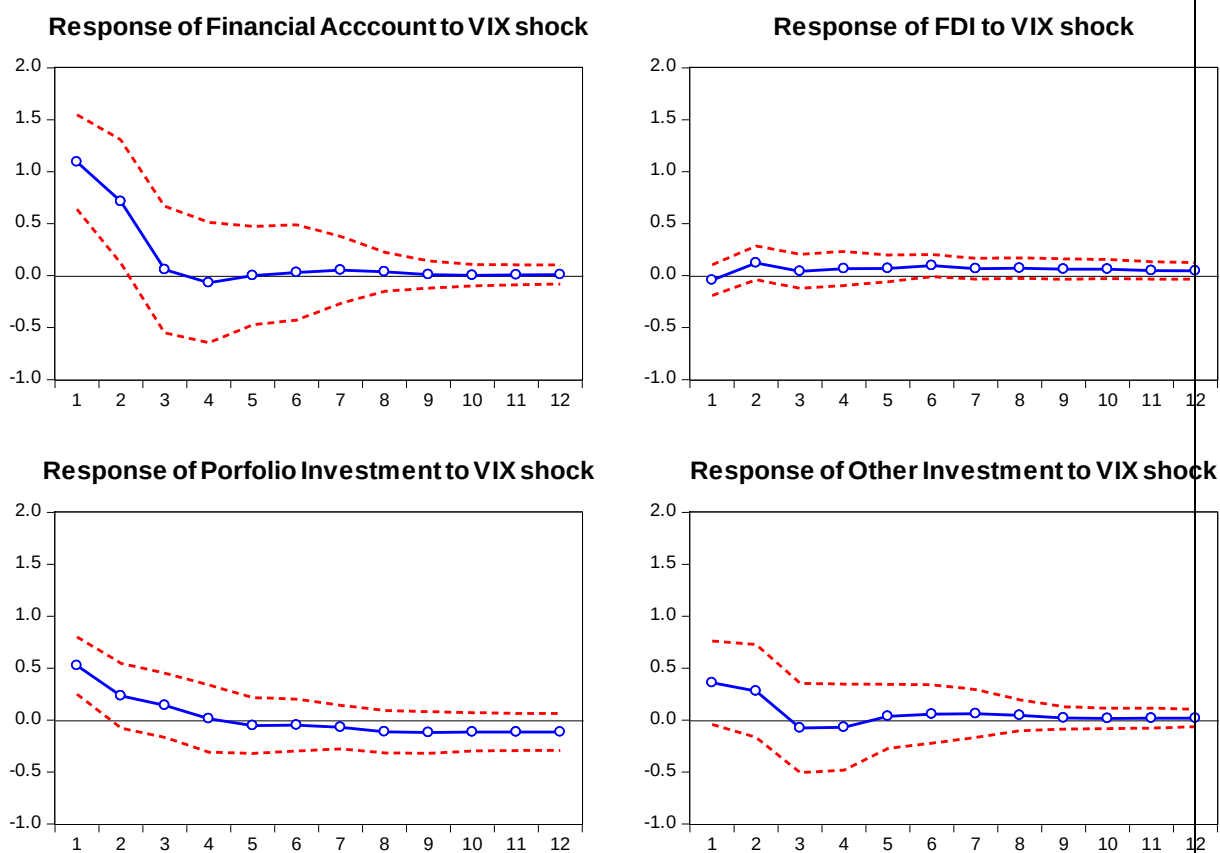
Our results show that capital inflows to emerging countries increase when advanced country GDP is higher and when the GDP growth in emerging countries is higher. These findings are intuitive: higher US/euro-area growth may signal higher risk appetite of investors, who could then be ready to invest more in emerging countries. Higher emerging country growth should indicate better investment opportunities, thereby making these countries more attractive for investment. Since we found that monetary policy of the Federal Reserve and the ECB support economic growth in the US and euro area, respectively, advanced country monetary policies also impact capital flows to emerging economies.

We also find that an increase in the VIX index is followed by capital outflows from emerging countries. It is useful to remember that the VIX index is an indicator of volatility of a US stock market, and as such one should not draw causal conclusions, e.g. saying that a higher VIX index "causes" capital outflows from emerging countries. Rather, it is better to assess it as an indicator: any underlying development that leads to an increase in the VIX index may have a causal implication for capital outflows from emerging countries. For example, weak economic outlook in advanced countries (which reduces company profits and increases uncertainty) can be one such factor, and thereby measures which support economic growth in advanced countries also support capital inflows to emerging countries. Indeed, the estimated response of the VIX index to a shock in advanced country GDP is negative, suggesting that higher advanced country growth is associated with a smaller VIX index. Various crisis episodes (both in advanced and emerging countries) also likely increase the VIX index and thereby measures to prevent crises, or to address them forcefully when they occur, have important roles in supporting capital flows to emerging economies.

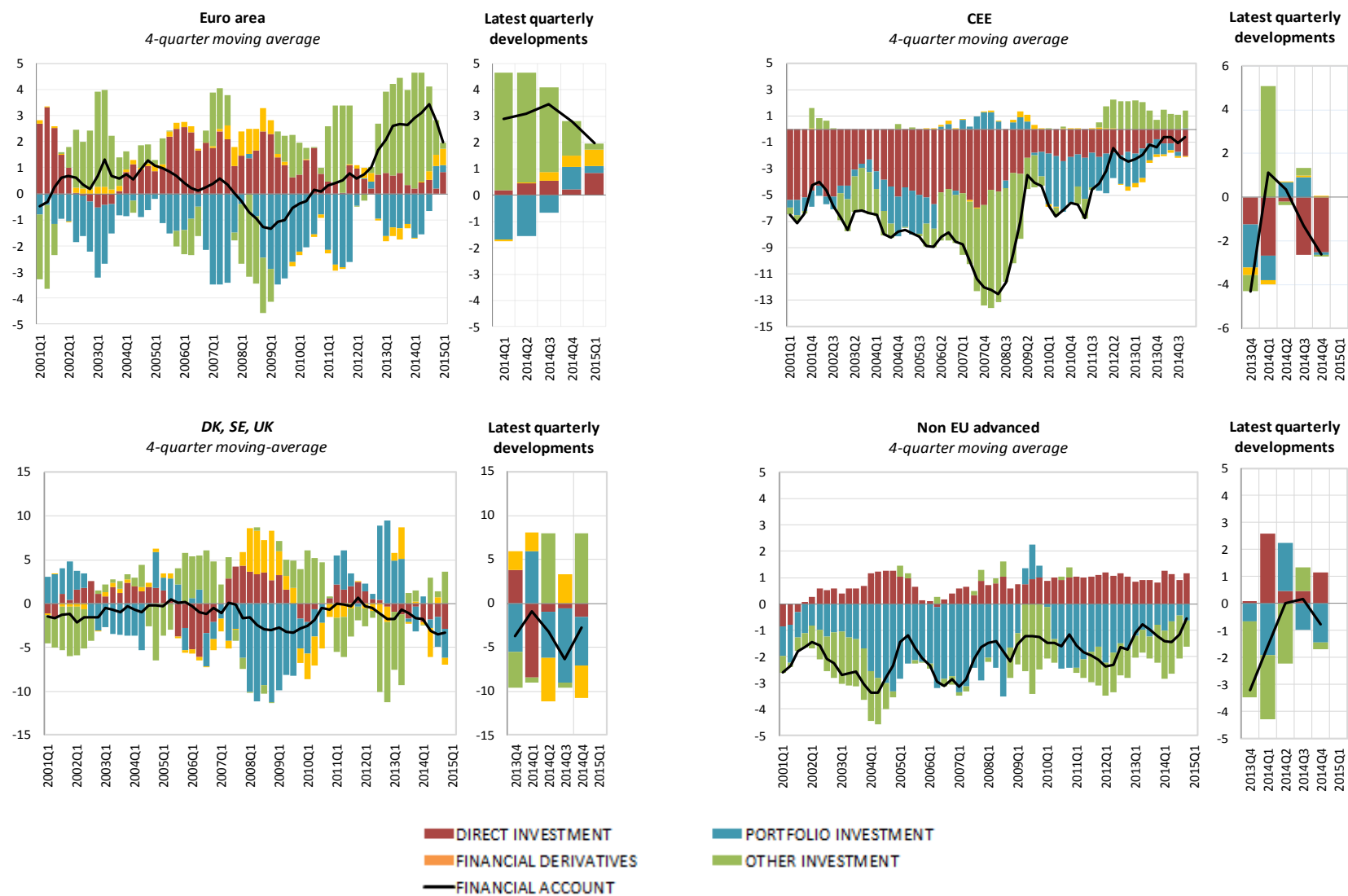
We also find that reduced capital inflows to emerging countries leads to lower GDP growth there, which supports the fear of possible capital outflows from emerging countries when advanced country central banks tighten monetary policy.

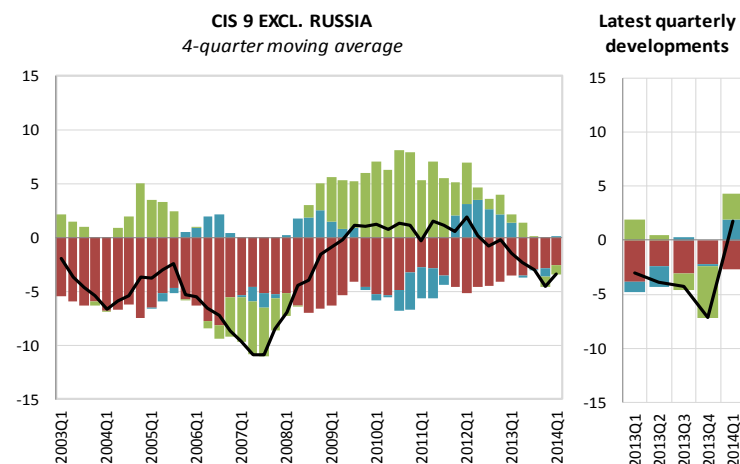
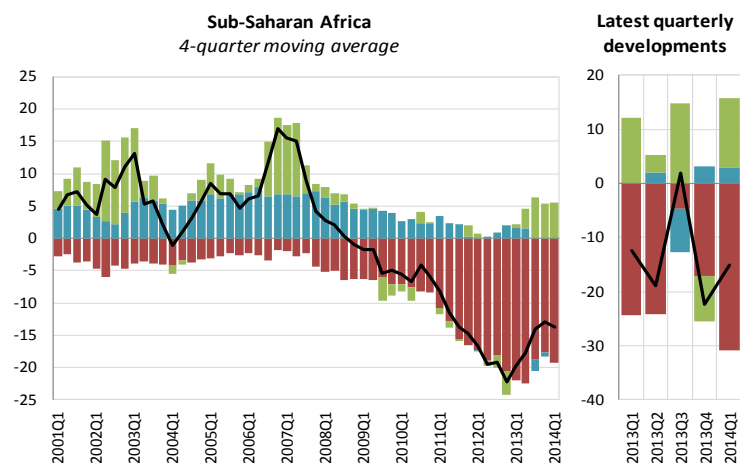
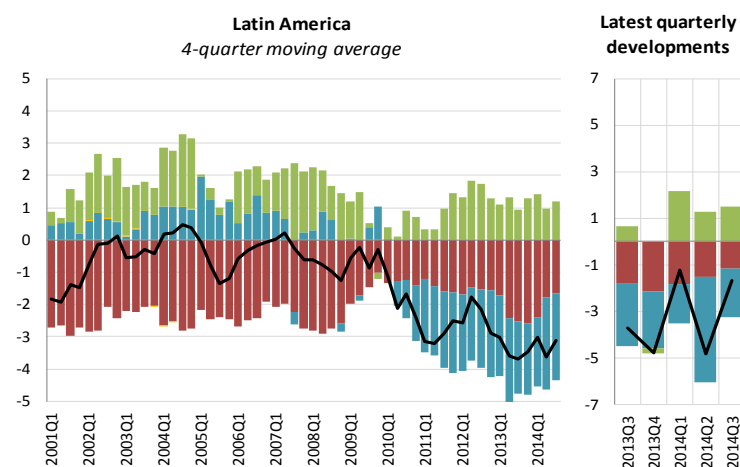
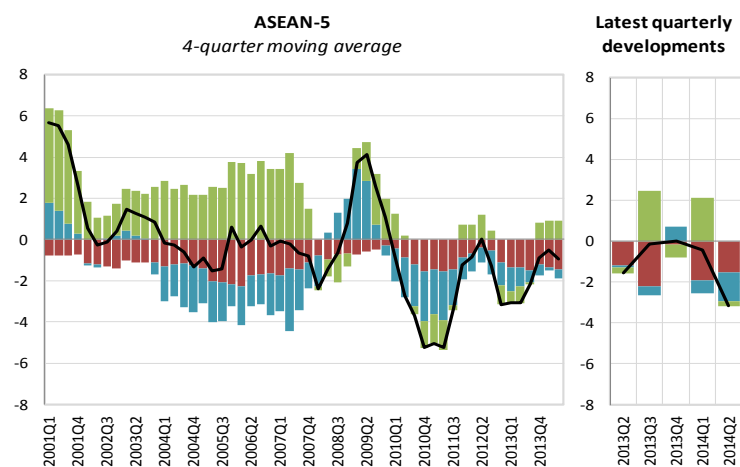
Finally, we also explore the responses of the different components of the financial account to a shock in the VIX index (and thereby to all developments influencing the VIX index). Figure 7 shows that FDI does not seem to respond at all to a shock to the VIX index, while the responses of portfolio and other investments are broadly the same, and thereby each of these latter two components accounts for about half of the full response of the total financial account. These findings are again intuitive and suggest that emerging countries would benefit from more stable capital inflows if they foster more FDI inflow.

Figure 7 Response of emerging-country financial account and its three main components to a shock in VIX index

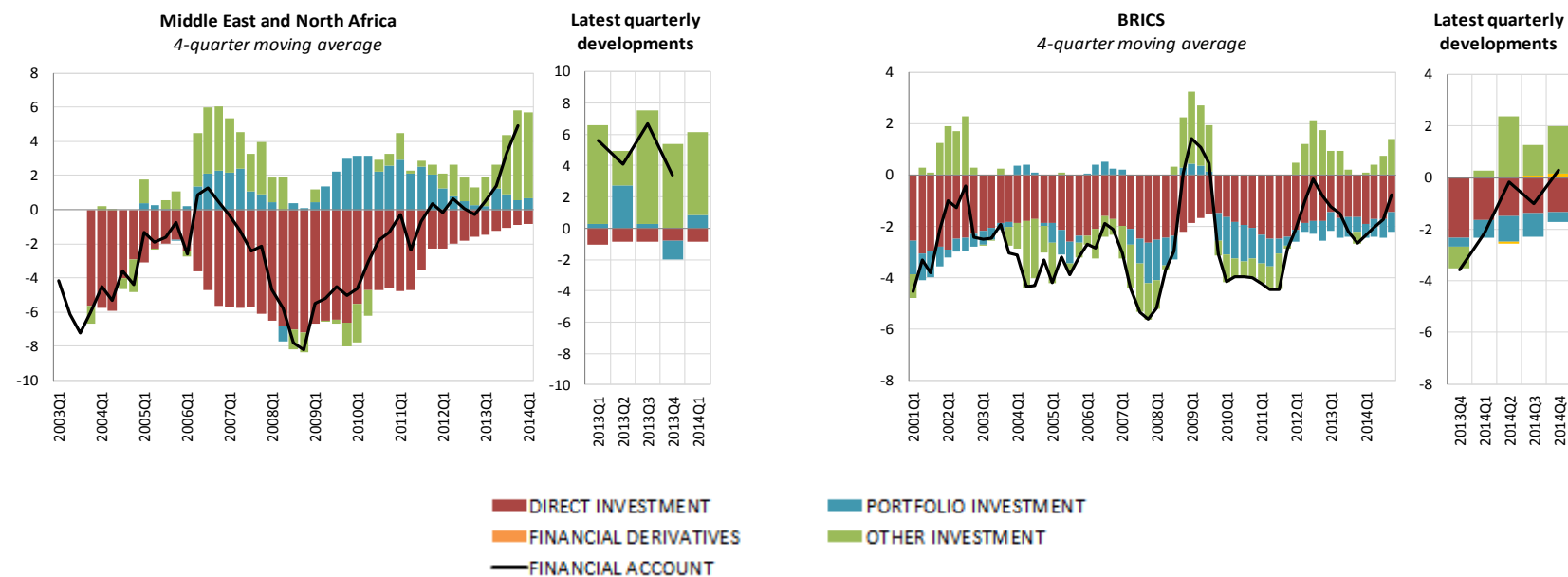


Note: The vertical axis is measured as a share of GDP, while the size of the VIX shock is approximately 6 points, e.g. an increase from 15 to 21. Thereby, a 6-point increase in VIX reduces total capital flows to emerging countries by about 1.1 percent of their GDP in the same quarter and about 0.7 percent of GDP in the next quarter (top-left panel).

Figure 8 Composition of net capital flows in the world (in percent of GDP)



DIRECT INVESTMENT
 FINANCIAL DERIVATIVES
 FINANCIAL ACCOUNT
 PORTFOLIO INVESTMENT
 OTHER INVESTMENT



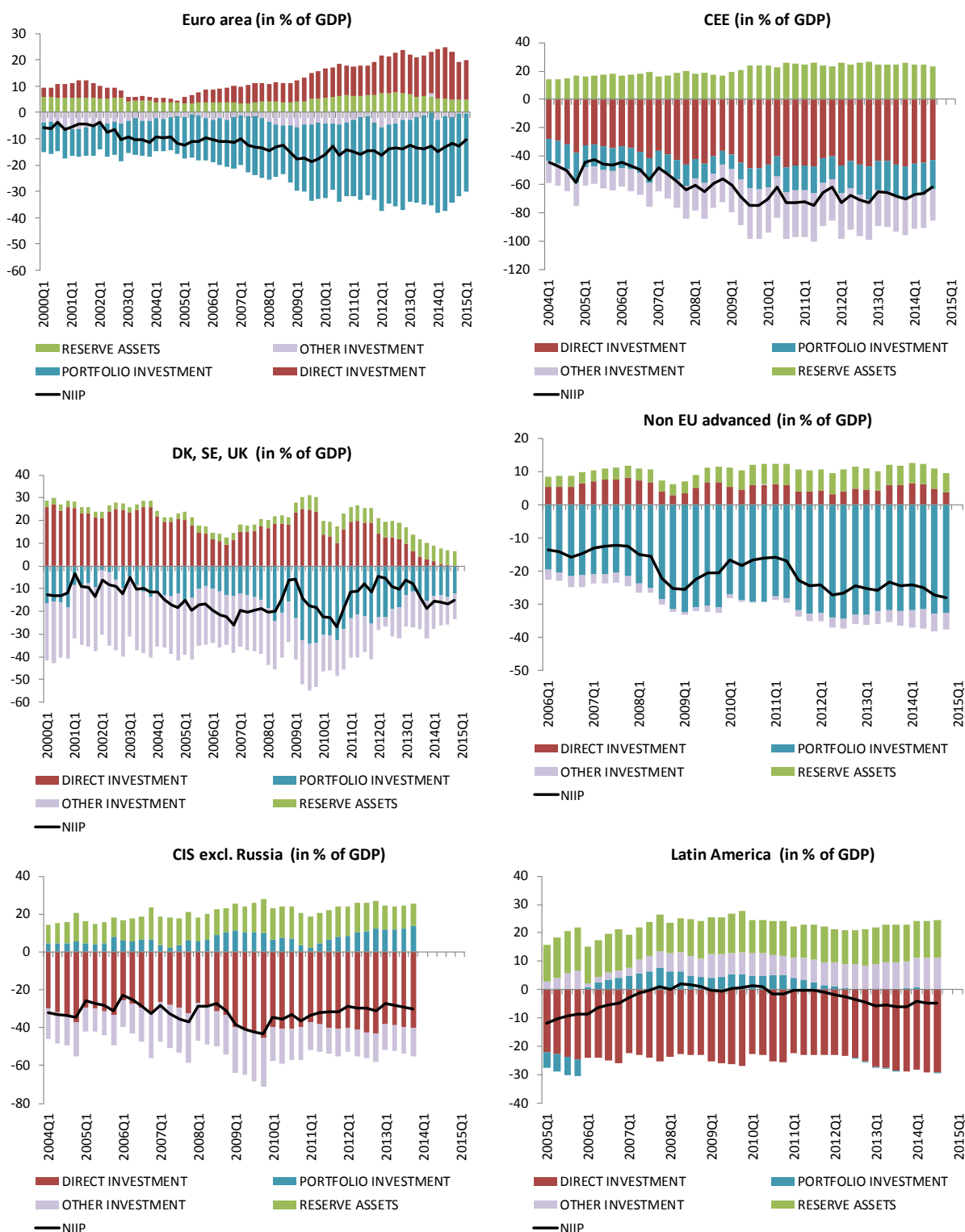
Source: IMF IFS (quarterly capital flows) and WEO (annual GDP); Note: see the definition of the country groups in the note to Figure 4.

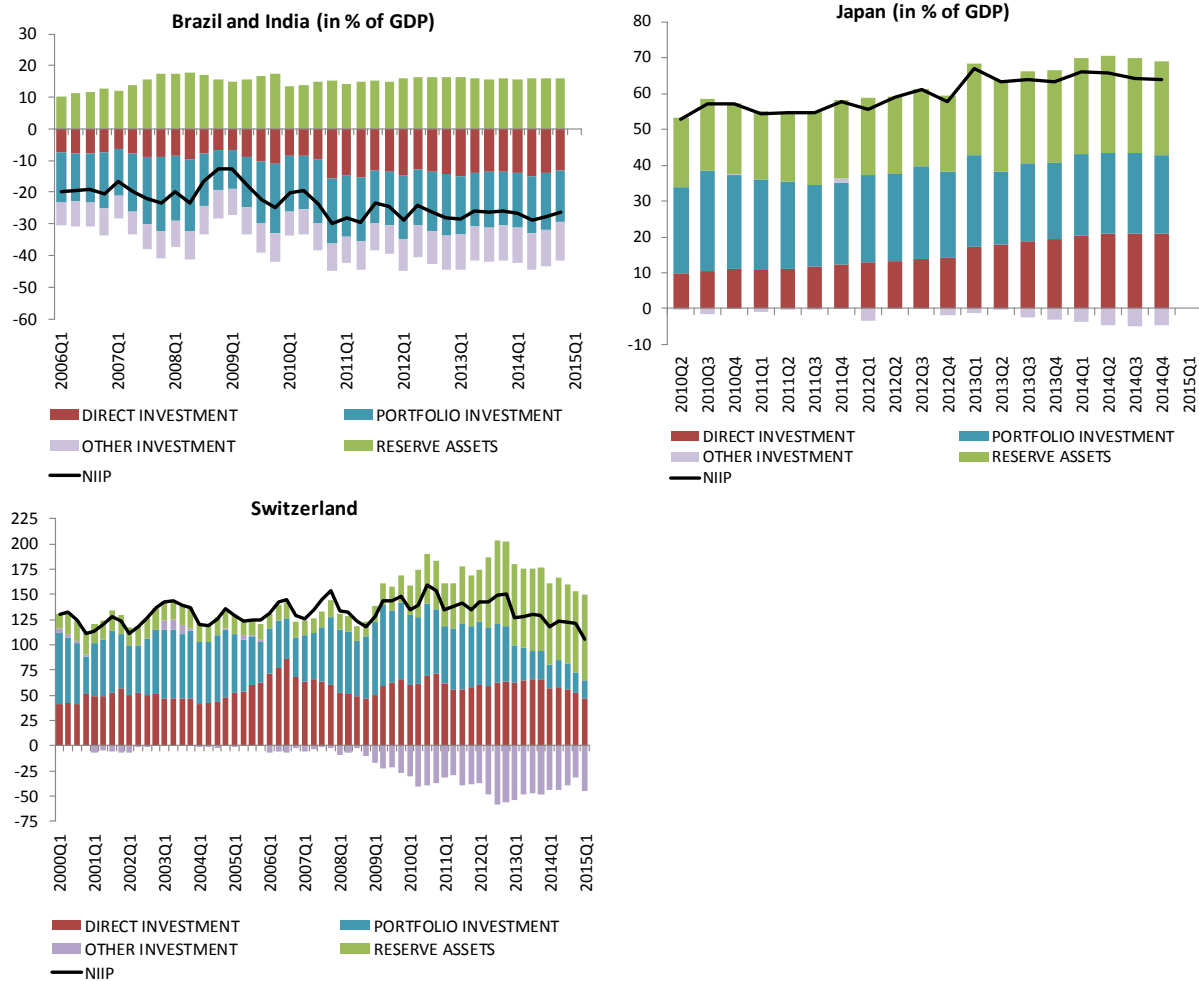
The **net international investment position** (NIIP)⁶ reflects the accumulated stock of capital flows and valuation changes of the earlier stock whenever the price of different assets and liabilities change and is relevant for monitoring the external wealth of an economy. It is important to note that large gross stocks are prone to major valuation changes, which can lead to significant shifts in the net stock position even if net flows are small. As an example, net valuation losses for Germany amounted to 20% of German GDP in 2011. A large part of these losses were already being realised in 2007-8 as a result of the implosion of the US subprime mortgage debt market, reflecting a high past exposure of German banks in US securities (European Commission, 2012).

As shown in Figure 9, the net position of the euro area has been negative and stable over the past years (around -12 percent of GDP in the last quarter of 2014). Similarly, in the second quarter of 2014, CEE8 (-66 percent of GDP), the non-EU advanced economies (-28 percent of GDP) and the Other EU 3 (-15 percent of GDP) also exhibit negative net positions. By contrast, both Japan and Switzerland exhibit strong positive net positions of 65 percent of GDP and 120 percent of GDP as of Q4 2014, respectively, and can be seen as outliers (therefore, we separate Japan and Switzerland out of the non-EU advanced country group). The CIS 9 (excl. Russia) as well as Brazil and India (data not available for Russia, China and South Africa) and Latin America also exhibit negative NIIP positions.

The components of the NIIP suggest major differences across the country groups. In the **euro area**, the negative net position is largely due to accumulated negative portfolio investment stocks. However, according to the estimates of Zucman (2013), around 8 percent of the global financial wealth of households is held in tax havens, three-quarters of which goes unrecorded. Accounting for unrecorded assets, the euro area turns into a net creditor and not a net debtor to the rest of the world as indicated by official statistics. Foreign direct investment (FDI) abroad exceeds FDI by foreign investors in the euro area, resulting in a positive net claim on the rest of the world. This is an increasing trend since the mid-2000s, as euro area firms use FDI to penetrate new markets or to achieve efficiency gains through splitting the value chain of the production (European Commission, 2012). **Non-EU advanced** economies show a similar pattern in terms of components. **In the CEE and the CIS (excl. Russia)**, other investment liabilities play a significantly greater role than in euro area countries and non-EU advanced economies, suggesting that this region relied significantly on borrowing from abroad. The NIIP of **Latin America** is negative at present, having accumulated a significant negative direct investment stock somewhat counterbalanced by accumulated reserve assets and other investment. Interestingly, in **Brazil and India**, accumulated negative portfolio investment stocks are slightly more important than direct investment stocks, reflecting deep capital markets. Turning to **Japan and Switzerland**, their positive NIIPs are mainly due to accumulated positive direct and portfolio investment as well as reserve assets. Most notably, **Switzerland** accumulated sizeable positive reserve asset stocks, stemming from intensified interventions in the foreign exchange rate market by the Swiss National Bank before, during and after the peg of the Swiss Franc to the Euro (September 2011-January 2015), while net portfolio investment assets are shrinking. Moreover, since the beginning of 2009 other investment by foreign investors in Switzerland exceeds other investment abroad, suggesting an increasing importance of Switzerland as a safe haven, a trend which has been reverting over 2014Q1-2014Q4.

⁶ The international investment position is a measure of the assets that a country owns abroad and the assets that foreigners own in the country in question. In the graphs, the negative bars indicate an increase in the claim of non-residents on a country in question, while the positive bars indicate an increase in the claims of the country in question on non-residents.

Figure 9 Net international investment positions (in percent of GDP)



Source: IMF IFS (quarterly IIP) and WEO (annual GDP). Note: country groups are defined in the note to Figure 4, but due to data limitations, the following changes occur: non-EU advanced: Hong Kong is included only since 2010; CEE8: Bulgaria is included only since 2007; Latin America: without Argentina, Ecuador, Mexico, Uruguay; CIS 8 (EXCL. RUSSIA): without Azerbaijan, Kyrgyz Republic, Tajikistan and Ukraine; No data availability for ASEAN-5, Middle East and North Africa and Sub-Saharan Africa.

2.2 Global trends in the banking sector

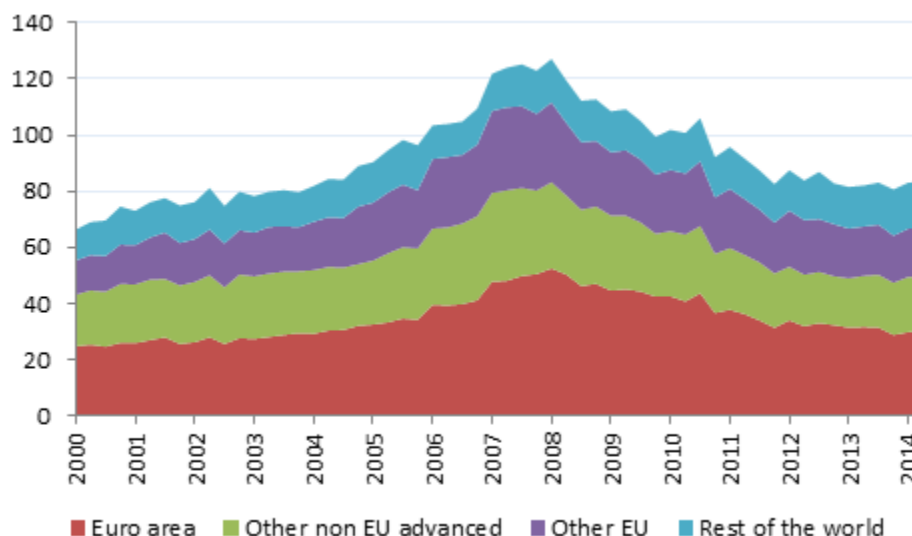
The banking system is of crucial importance in Europe, and so we look at capital flows from the perspective of the banking sector via international banking claims, as reported by the BIS banking statistics. This allows us to analyse cross-border bank integration (or disintegration)⁷.

Figure 10 shows the consolidated foreign claims on the rest of the world by country grouping, at quarterly frequency up to the end of 2014.

⁷ One should note however, that not all countries are BIS reporting countries, even in Europe.

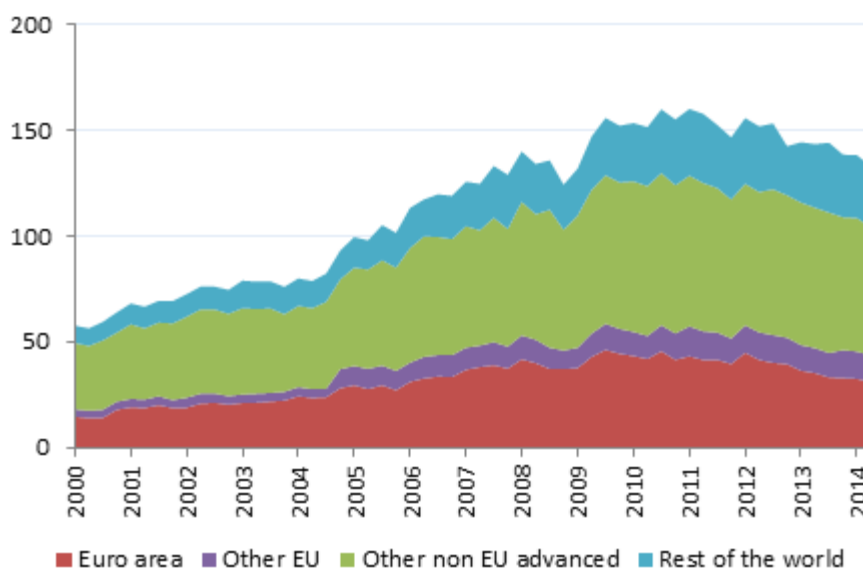
Figure 10 Gross foreign claims of domestically owned banks on the rest of the world (percent of group GDP)

A: Euro area 10



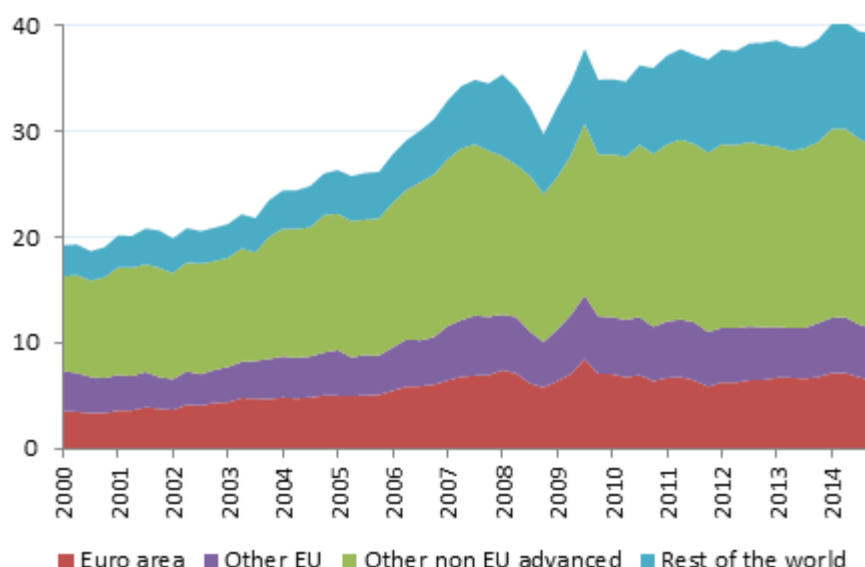
Source: BIS consolidated banking statistics (series: immediate borrowing basis, domestically owned banks, Foreign claims) Federal Reserve Economic Data and Bruegel calculations. Note: On the reporting country side, Euro area is made up of AT, BE, DE, ES, FR, IT, IE, NL, PT, FI. On the counterparty side, The Euro area is all 19 member states of the single currency.

B: non-Euro EU 3: Denmark, Sweden, and United Kingdom



Source: as above. Note: among the non-euro area EU countries, only Denmark, the United Kingdom and Sweden are BIS reporting countries.

C: Non-EU Advanced 6: Australia, Canada, Japan, South Korea, Switzerland, US



Source: as above.

Recent developments through late 2013 and early 2014 in the banking sector continue into the second half of 2014 (most recent reported data) more or less unchanged. **Euro area banks** (Panel A in Figure 10) exhibit the largest claims on other Euro area banks (amounting to 30% of group GDP in 2014Q4), followed by claims on other non EU advanced (20% of group GDP). The deleveraging of Euro area banks with respect to all other country groupings which could be observed since the financial crisis in 2008/09 seems to have reached a plateau at a lower level in mid-2012, a trend which continued throughout 2013 and into the second half of 2014.

The non-Euro area countries **Denmark, Sweden and the United Kingdom** (Panel B in Figure 10) report the most claims on other non EU advanced countries. A deleveraging process is ongoing, and claims on the Euro area have fallen from highs of over 46% of group GDP in 2012 to 26.25% of GDP currently.

Finally, in contrast to the European regions, the banks located in the **six non-EU advanced economies** of Australia, Canada, Japan, South Korea, Switzerland, and the US (Panel C in Figure 10) continued to increase their exposure to banks within the same country grouping until the end of 2013. However, claims on both European groups have fallen since the end of 2013 (-0.35 and 0.22 percentage points inside and outside the Euro area, respectively). Claims on all EU banks amount to about 11.3 percent of group GDP, or 29 percent of total cross-border claims, compared to 44 percent of claims within-group.

2.3 Ukraine and Russia

This section presents an update of our analysis presented in our last year's report (Darvas et al, 2014)⁸.

Panel A of Figure 11 reports the **financial account and its components for Ukraine**, capturing the latest developments of capital flows up to August 2015. The left chart presents the somewhat volatile data as a 12-month moving average to highlight the medium-term trends developing, while the second panel reports the actual monthly data unprocessed in order to highlight the most current developments.

After facing major difficulties financing the balance of payments on the back of the global financial crisis and applying for financial assistance from the IMF in late 2008, Ukraine experienced a reversal in capital outflows 2011: FDI and portfolio investment inflows were returning to Ukraine. However, throughout 2011 and 2012 foreign banks active in Ukraine reduced their exposure, as reflected by substantial other investment outflows. This negative trend stopped in 2013, when cross-border lending resumed somewhat again and portfolio investment inflows started to substitute for declining FDI inflows.

However, the financial account of Ukraine deteriorated sharply through 2014 when the geopolitical tensions between Russia and Ukraine escalated. Large capital flight took hold, especially in the second half of 2014, reflecting reductions of cross-border bank exposure and net outflows of portfolio investment. At the height of the most recent deterioration, capital outflows peaked at 25 percent of monthly GDP in October 2014.

The magnitude of these capital outflows and the erosion of reserves on the back of substantial exchange rate devaluations, together with large debt repayment needs, put the financial account seriously under pressure. However, throughout 2015, the financial situation in Ukraine began to ease and banking and portfolio related outflows turned to inflows, with Ukraine becoming a net importer of capital by April 2015. This benign situation remained till the last observation available at the time of writing this report, August 2015. The most important component of capital inflows is FDI, which is a notable development. In the coming years, official assistance, estimated at about USD 25 bn over the next four years (World Bank, 2015), will support capital inflows into Ukraine.

Turning to the **Russian balance of payments**, Panel B of Figure 11 shows Russia experienced large capital outflows of about 10 percent of quarterly GDP during the financial crisis in 2009, on the back of receding portfolio and other investment flows. After a short recovery phase in the last quarters of 2010, capital outflows began again as foreign banks decreased their exposure to Russia. By the end of 2013, other investment outflows decreased somewhat before intensifying again at the beginning of 2014 with the start of the Ukrainian crisis. In the first two quarters of 2014, Russia experienced significant capital outflows of around 8 and 5 percent of quarterly GDP respectively, predominantly on the back of banking-related and portfolio debt outflows. Contrary to what is observed in Ukraine, in Russia no reduction of capital flight can be seen over the first and second quarter of 2015. On an annualised scale, capital flight from Russia is less than during the height of the crisis around 2009 (peaking around 10 percent of GDP); nevertheless, the most recent outflows from

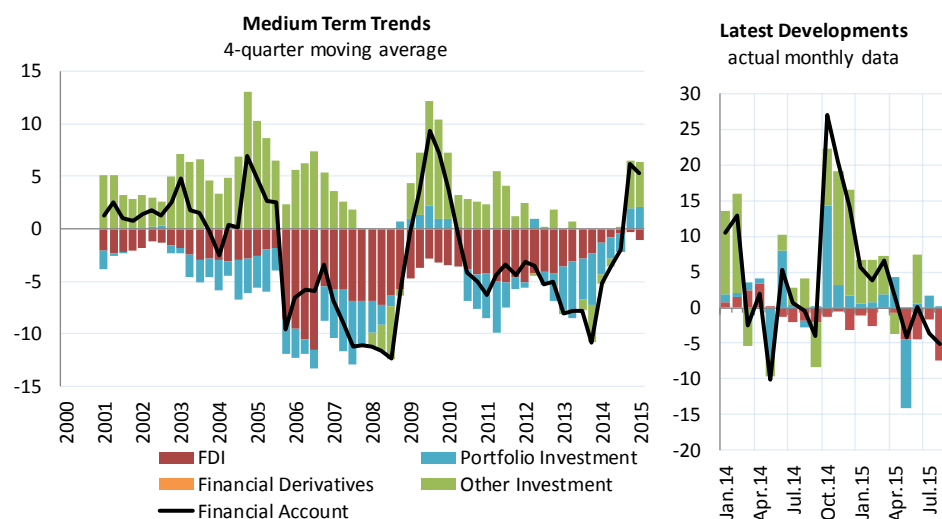
⁸ The data has been collected from the Central Bank of the Russian Federation and the National Bank of Ukraine, from the IMF CPIS (Coordinated Portfolio Investment Survey, <http://cpis.imf.org/>) and from BIS consolidated banking statistics.

Russia in the first half of 2015, stemming mostly from bank deleveraging, remain substantial.

Figure 11 Components of the Ukrainian and Russian financial account

Panel A: Ukraine

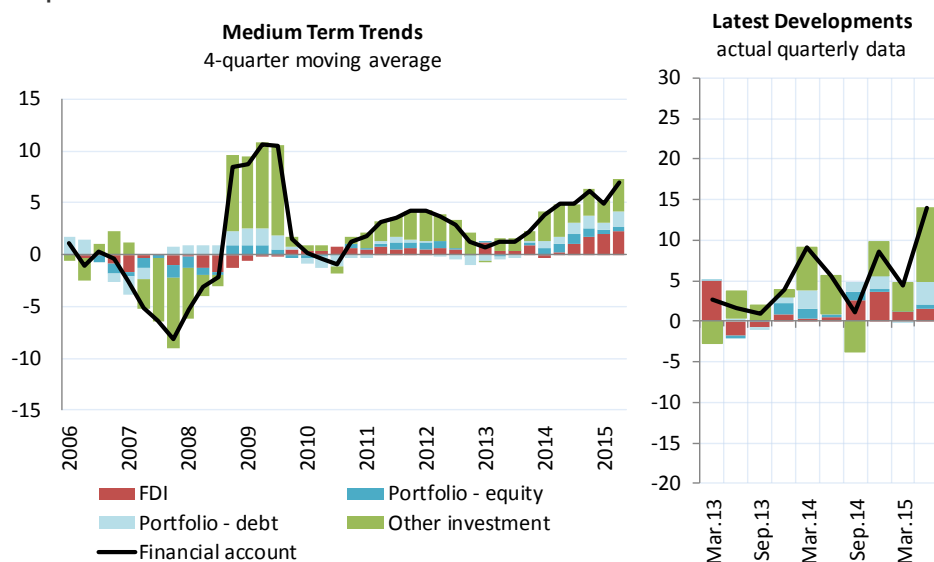
as percent of GDP



Source: National Bank of Ukraine (latest monthly developments) and IMF BOP (medium Term Trends) and WEO October 2015 (for GDP data).

Panel B: Russia

as percent of GDP

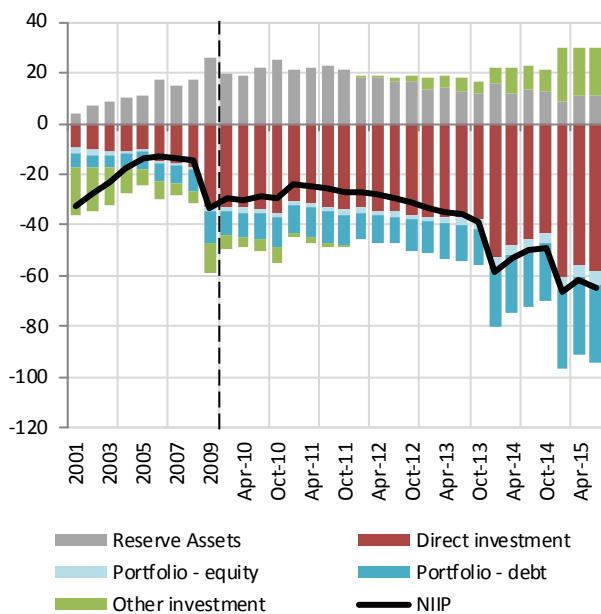


Source: Central Bank of the Russian Federation (for BoP data) and IMF WEO (for GDP data); Note: The Russian balance of payments statistics include the accumulation of reserve assets in the financial account, while IMF and EU sources treat reserves separately. In order to report consistent concepts throughout our paper, we do not include the changes in reserves in the financial account; quarterly data: 2005Q1-2015Q2.

With regards to the accumulated capital flows and valuation changes, Panel A of Figure 12 shows the **net international investment position for Ukraine**, which has been negative from 2001-2015 and saw a major deterioration at the beginning of 2014. Both foreign direct investment and portfolio debt dominate net external liabilities. Moreover, it is interesting to note the depletion of foreign exchange reserves, which fell from about 20 percent of GDP in late 2011 to about 10 percent of GDP in July 2015 while banking-related assets were accumulated, implying a substantial cut-back in cross-border banking exposure to Ukraine.

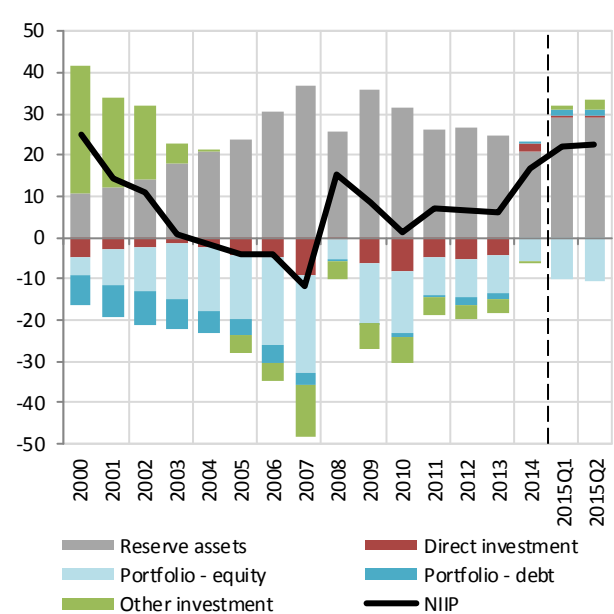
Figure 12 Net international investment position and its components in Ukraine and Russia

Panel A: Ukraine
(in percent of GDP)



Source: National Bank of Ukraine (for IIP data) and IMF WEO (for GDP data). annual data: 2001-2009, quarterly data: Jan 2010 – Jul 2015.

Panel B: Russia
(in percent of GDP)



Source: Central Bank of the Russian Federation (for IIP data) and IMF WEO (for GDP data). Annual data: 2000–2014, quarterly estimate Q2 2015.

In contrast, the **Russian net international investment position** turned positive in 2008 when the global financial crisis intensified, mostly due to the sudden collapse of net portfolio equity liabilities (see Panel B of Figure 12). This was the main source of funding for Russia before the crisis. In 2009/10, net portfolio investment liabilities in equity increased again while portfolio investment liabilities in debt never returned to pre-crisis-levels. Regarding the intervention of the Central Bank in the foreign exchange market through reserve assets, the stock of reserve assets was gradually depleted over the later years (2009-2014). However, by the end of 2014, reserve assets still significantly outweighed the total stock of liabilities, contributing to a positive NIIP of 16 percent of GDP. In 2015, Russia reportedly increased its gold reserves to hedge against legal and political risks, which was reflected in increased reserve assets as of 2015Q1. Moreover, Russia stopped being a net importer of direct investment, instead turning into a net exporter of direct investment in 2014 and Q1 2015.

BIS consolidated banking data, as well as FDI and Portfolio investment data, allows an analysis of the bilateral relationships of Russia and the Ukraine with their respective partners.

The **exposure of the European banking sector to Ukraine** dropped from 7 bn USD in 2008Q4 to 1.0 bn USD in 2015Q1 (see 'fixed reporting EU' in Table 1). Adding countries with limited data availability (most importantly Austria and Italy), the European banking sector exposure peaked at an impressive 35.9 bn USD in 2008Q4. Within the EU, Table 1 shows that Austrian banks played a major role before the crisis, with claims reaching USD 11.4 bn in 2007. In the post-crisis period, Austrian banks deleveraged extensively and reduced their claims to 3 bn in 2015Q1. Over the latest quarter, a slight increase of claims to USD 3.2 bn can be observed. French banks were also heavily exposed to Ukraine in the run-up to the crisis, and they reduced their exposure significantly afterwards from 9.5 bn in 2008 Q3 to 3.8 bn in 2011 Q4 (latest data available for France). By contrast, Italian banks' exposure to Ukraine grew constantly until 2010, peaking at 6.6 bn in 2010 4Q, before declining to 4.9 bn in 2014 2Q. **Overall, we can see a substantial pivot away from risk in Ukraine since the financial crisis in 2008/09, a trend which accelerated further since the outbreak of the conflict with Russia.** Outside the EU, the US holds claims vis-a-vis Ukraine amounting to USD 0.7 bn in 2015 Q2, a slight reduction from peak value of 1.3 bn in 2012 Q4. By contrast, Switzerland reports major reductions of claims, from 7.3 bn in 2007 to 0.7 bn in 2015 Q2. **Nevertheless, in the first half of 2015, the process of deleveraging seems to have come to a stop as claims have remained stable overall.**

The **exposure of the European banking sector to Russia** declined significantly, falling from 142 bn USD at its peak in 2009 Q4 to 77 bn USD in 2015 Q2 (see 'fixed reporting EU' in Table 2). **However, compared to Ukraine, individual European country claims are less concentrated.** Table 2 reveals that French and German, and to some extent Austrian, Italian and Dutch, banks have been the most prominent since at least 2007Q4. In 2015 Q2, France, with claims amounting to 27.2 bn USD, is certainly the most exposed, followed by Italy at 19.1 bn USD and Austria at 13.7 bn USD. The United Kingdom, the Netherlands and Germany exhibit exposure of around 9 to 11 bn USD in 2015 Q2. The US reduced its claims of over 34 bn USD in 2012Q4 to USD 15.2 bn in 2015 Q2, while Japan's claims declined from 20 bn in 2013 Q4 to 12 bn in 2015 Q1. **In the first half of 2015, the deleveraging process seems to have slowed down, with Austrian banks even increasing exposure slightly.**

Table 1 Exposure to Ukraine of individual EU countries, in USD billions

	2005	2006	2007	2008	2009	2010	2011	2012 -Q3	2012 -Q4	2013 -Q4	2014 -Q2	2014 -Q4	2015 -Q1	2015 -Q2
Austria	5.03	5.88	11.43	10.70	9.03	8.84	8.94	7.48	7.53	-	-	-	3.02	3.24
Belgium	0.03	0.16	0.48	0.40	0.06	0.03	0.07	0.06	0.08	0.11	0.11	0.09	0.05	0.05
Germany	1.38	2.52	3.82	4.73	1.94	1.69	1.24	1.51	1.53	1.04	0.94	0.63	-	-
France	0.34	4.62	7.91	8.24	7.04	-	3.76	-	-	-	-	-	-	-
Italy	0.11	0.15	2.55	4.85	2.37	6.46	6.40	6.11	6.06	6.28	4.92	-	-	-
Portugal	0.04	0.10	0.17	0.16	0.14	0.08	0.06	0.04	0.04	0.04	0.04	0.02	0.02	0.01
Greece	0.11	0.19	0.68	0.77	2.03	1.77	1.93	1.77	1.79	1.40	1.20	0.96	0.82	0.82
Sweden	0.08	0.25	3.96	5.48	3.12	2.77	1.84	1.17	0.87	0.13	0.07	0.10	0.07	0.04
United Kingdom	0.18	0.19	0.58	0.59	0.40	0.56	0.35	0.41	0.41	0.33	0.90	0.15	0.10	0.04
Switzerland	0.75	3.27	7.31	5.07	2.73	2.30	1.39	1.49	0.99	-	-	-	-	-
United States	0.48	0.56	1.21	0.75	0.79	1.34	1.18	1.22	1.30	0.98	1.13	0.93	-	0.71
Japan	0.18	0.37	0.83	0.67	0.43	0.59	0.57	0.36	0.42	0.14	0.11	0.06	0.03	0.02
Reporting EU	7.30	14.06	31.59	35.92	26.13		24.58							
Fixed reporting EU*	0.44	0.88	5.88	7.40	5.76	5.21	4.25	3.45	3.19	2.00	2.31	1.31	1.06	0.96

Source: BIS consolidated banking statistics, ultimate risk basis. Note: years refer to fourth quarter data of the same year; interpolation has been used to account for missing data points for France; data for Switzerland is available only up to 2013Q3, for France up to 2012Q1 and for Italy up to 2014Q2. *fixed reporting EU groups countries for which data is available over the whole reporting period, namely BE, PT, GR, SE and UK.

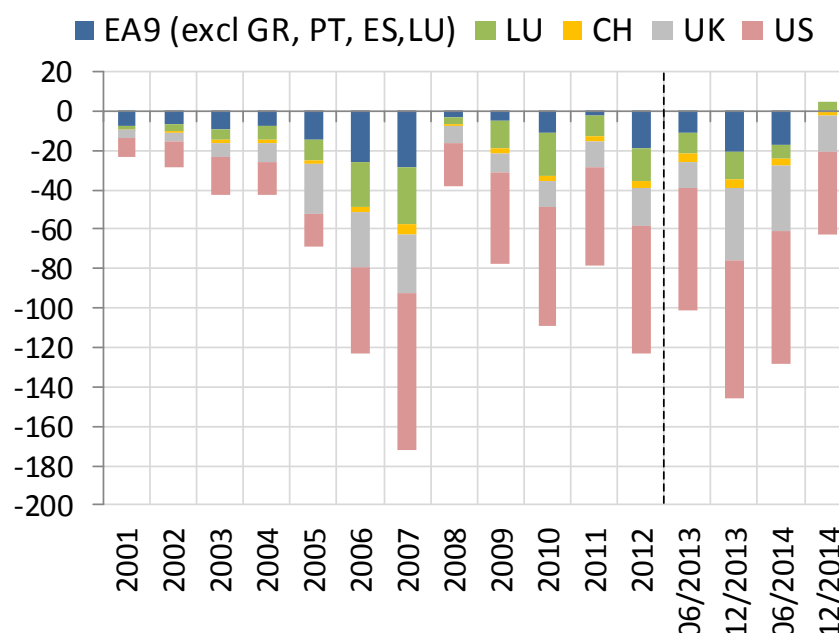
Table 2 Exposure to Russia of individual EU countries, in USD billions

	2005	2006	2007	2008	2009	2010	2011	2012 -Q3	2012 -Q4	2013 -Q4	2014 -Q2	2014 -Q4	2015 -Q1	2015 Q2
Austria	6.44	12.72	19.59	21.66	13.56	-	-	16.95	-	-	-	-	13.18	13.71
Belgium	1.12	1.09	8.31	8.18	5.04	4.15	4.04	4.07	3.79	0.75	0.70	0.67	0.46	0.45
Germany	11.16	16.53	33.25	40.78	27.49	25.30	22.88	26.28	24.88	19.34	17.68	13.52	11.04	10.90
France	6.12	6.63	27.29	40.05	33.24	37.94	39.43	39.87	41.13	49.20	47.28	31.78	27.21	27.24
Italy	2.00	2.57	19.70	22.27	18.56	25.21	22.96	22.87	25.71	29.20	27.67	21.60	19.24	19.11
Netherlands	7.15	11.83	18.83	20.19	13.82	11.64	13.97	13.38	15.01	17.47	15.70	11.45	10.91	10.69
Portugal	0.22	0.32	0.72	0.73	0.46	0.11	0.10	0.10	0.14	0.19	0.29	0.22	0.19	0.20
Greece	0.70	1.04	1.18	1.36	1.09	0.57	0.39	0.46	0.38	0.38	0.36	0.31	0.29	0.26
Sweden	0.82	1.51	6.30	10.49	9.11	8.54	9.19	15.03	14.57	8.52	9.08	7.18	-	-
United Kingdom	2.55	6.62	11.01	7.79	7.68	12.29	13.68	20.24	17.76	17.10	14.26	10.35	9.10	8.23
Switzerland	9.49	15.13	19.55	10.40	6.15	7.50	6.75	10.50	10.41	-	-	-	-	-
United States	8.09	10.32	16.55	8.03	18.48	21.17	19.25	25.80	33.88	32.36	26.08	20.15	16.56	15.18
Japan	5.89	6.95	12.09	13.92	11.68	9.88	12.20	13.74	14.01	20.47	18.40	13.89	12.75	12.03
Reporting EU	38.27	60.86	146.18	173.50	130.04			159.26	143.36					
Fixed reporting EU*	31.01	46.63	120.29	141.34	107.38	117.21	117.44	127.28	128.79	133.62	123.93	89.91	78.45	77.08

Source: BIS consolidated banking statistics, ultimate risk basis. Note: years refer to fourth quarter data of the same year; data for Switzerland is available only up to 2013Q3. *fixed reporting EU groups countries for which data is available over the whole reporting period, namely BE, DE, FR, IT, NL, PT, GR and UK.

Turning to **bilateral portfolio investments with respect to Russia vis-à-vis other countries**, Figure 13 confirms the overall picture of the negative net portfolio investment position of Russia. The most important negative net positions are held with the US, the UK, the Euro area 9 and Luxembourg—interestingly, the net positions with Luxembourg are as big as the ones with the rest of the euro area 9, suggesting an important role of Luxembourg as a money hub for Russia. From June 2013 to June 2014, the negative net positions vis-à-vis the UK increased from 14 bn to 33 bn and from 11 to 23 bn for the euro area, while net positions with Luxembourg decreased from 13 to 8 bn USD. On one hand, this suggests that foreign investors purchased significant amounts of Russian securities. On the other hand, the Russian stock exchange increased somewhat over the same period, so valuation effects might play a significant role too (see Figure 15). The latest data for December 2014 shows a significant reduction in net portfolio investment, especially from the EA9 and Luxembourg, which might be driven by the impact of the sanctions imposed on Russia on 17 March 2014⁹, as well as the deteriorating macro-economic environment we discuss below.

Figure 13 Net position of portfolio investment of Russia vis-à-vis its main partners (in bn USD)



Source: IMF CPIS; Note: reported portfolio net position for Russia vis-à-vis other countries is calculated by subtracting Table 8 Derived Portfolio Investment Liabilities from Table 1 Reported Portfolio Investment Assets; the data is collected on a semi-annual basis from 2013 onwards.

A similar analysis is not possible for Ukraine, since it is not a reporting country. However, a simple method of mirror positions¹⁰ allows reconstructing the claims of the most important countries on Ukraine as shown in Panel A of Figure 14, while Panel B reports Russian liabilities.

Due to crumbling stock prices during the financial crisis in 2007/08 (see Figure 15), the value of euro area portfolio investment decreased significantly in

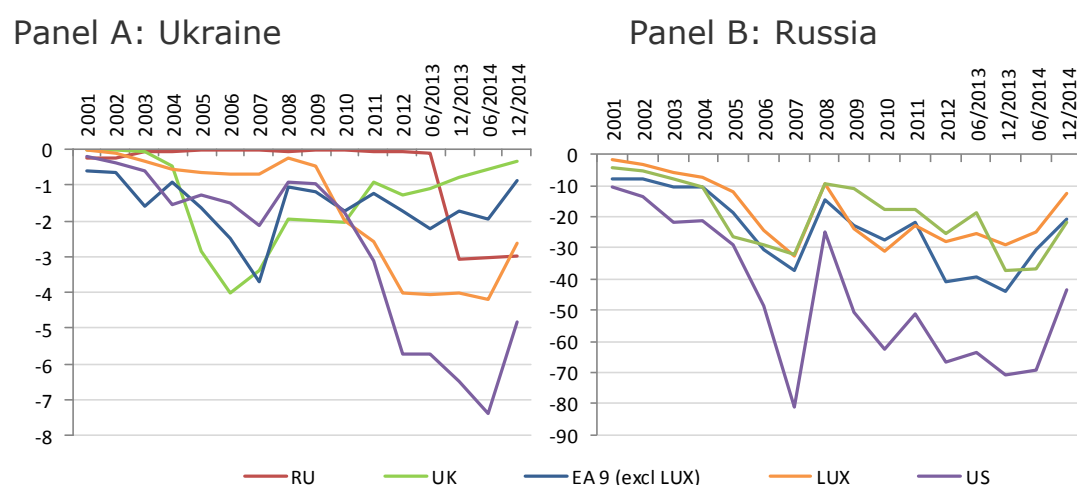
⁹ For further information, see http://europa.eu/newsroom/highlights/special-coverage/eu_sanctions/index_en.htm

¹⁰ Portfolio investment **assets** of a reporting country on Ukraine are portfolio investment **liabilities** for Ukraine.

Ukraine, remaining at around 1.5 bn in the subsequent periods. A similar pattern can be observed for the UK, while Luxembourg increased its portfolio investments towards Ukraine from 0.5 bn in 2008 to -4 bn in June 2014, more than double the position of the whole Euro area over the same period. The spike of 3 bn USD in Russian liabilities in Ukraine at the end of 2013 reflects the first instalment of the 15bn USD financial assistance package agreed between Russia and Ukraine in December 2013¹¹ before geopolitical relations started to escalate.

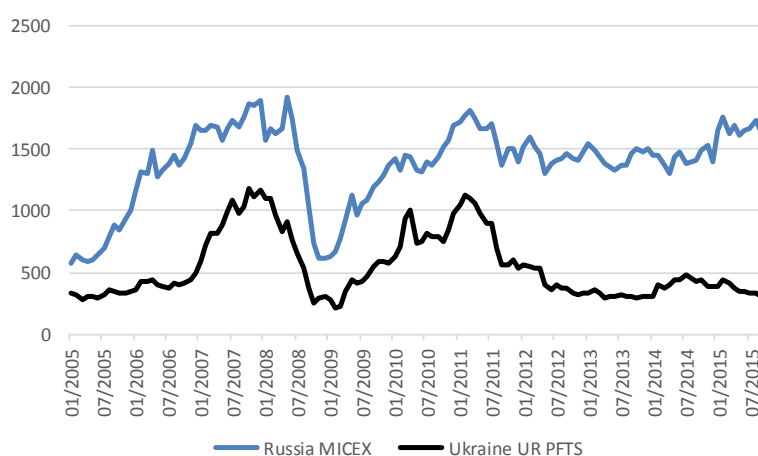
In Russia, the value of portfolio investment of all countries taken into consideration suffered from falling stock prices during the financial crisis (see Figure 15), a trend which was reversed slightly afterwards. By December 2013, the US had almost recovered to its pre-crisis levels, standing at 70 bn USD. Both sanctions and the macro-economic outlook for the Russian economy seem to have contributed to declining portfolio investment from all major countries.

Figure 14 Portfolio investment liabilities, Ukraine and Russia (in bn USD)



Source: IMF CPIS and Bruegel calculations; Note: the data is semi-annual from 2013 onwards. euro area (excluding Luxembourg) is defined as AT, BE, FI, FR, DE, IT, IR, ND, EE (data is missing for FI in Ukraine, so it is euro area 8).

Figure 15 Stock exchange indexes, Russia and Ukraine



Source: Datastream, Thomson Reuters.

¹¹ See <http://www.ft.com/intl/cms/s/0/75db4726-6727-11e3-8d3e-00144feabdc0.html#axzz3INVLO2UU>

Unfortunately, no bilateral FDI data breakdown is available for either Ukraine or Russia (last years' report shows data up to 2014 but cannot be updated due to a discontinuation of the data series).

A crucial question for Russian macroeconomic developments is the importance of lower oil prices and the sanctions imposed on Russia by several advanced countries, which in turn had an impact on capital flows. The first sanctions were enacted in March 2014, still before the drop in oil prices (which happened only in the second half of 2014, as can be seen in Panel A of Figure 16). The IMF forecast of Russian GDP deteriorated only significantly from October 2013 to April 2014 (Panel B of Figure 16), which might not yet include the impact of the sanctions because IMF forecasts are finalised several weeks before the publication of the World Economic Outlook. The IMF's October 2014 forecast further downgraded the economic outlook, which can be explained by the negative impact from sanctions because oil prices had hardly fallen in August, the latest data considered by the IMF at that time. By late 2014/early 2015 oil prices collapsed, which likely explains the even more significant downgrade of the outlook. This suggests that the large drop in oil prices had a strong immediate impact on Russian economic outlook. The October 2015 IMF projection did not foresee any major change to the outlook, perhaps because oil prices hardly changed during the year while the impact of the sanctions have probably already been taken into consideration.

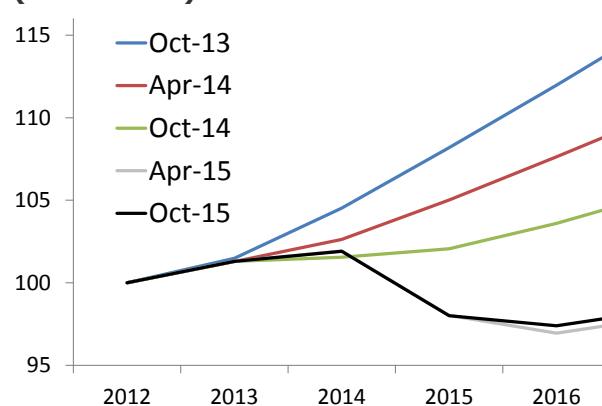
To sum up, it is difficult to disentangle the impact of sanctions and oil prices on the Russian economy: the large drop in oil prices was immediately reflected in the deterioration of Russian economic outlook, yet the outlook also deteriorated when sanctions were imposed, suggesting that sanctions may have played an important role too.

Figure 16 Oil price and vintages of IMF forecasts for Russian GDP

**Panel A: Oil price
(2005 = 100)**



**Panel B: IMF forecast vintages
(2012=100)**



Source: for Panel A: IMF, Primary Commodity Price System; for Panel B: IMF WEO. Note: the average petroleum spot price shown is the simple average of Brent, WTI and Dubai oil prices.

3. A closer look at Europe

The previous section assessed capital flows and stock from a global perspective, presenting data on the euro area and non-euro area EU countries. In this section, we take a closer look at the European Union by considering the following six country groups:

- **Euro area (EA) Core:** Austria, Belgium, Germany, Luxemburg and the Netherlands.
- **Euro area (EA) Periphery¹²:** Greece, Portugal and Spain.
- **Euro area (EA) Centre:** France.
- **North:** Denmark and Sweden.
- **Central and Eastern Europe:** Czech Republic, Croatia, Estonia, Hungary, Latvia, Lithuania, Poland, Romania and Slovenia.
- The **UK** is considered individually in light of its special role for financial intermediation and capital flows.

While countries included in a particular group have major similarities, there is certainly a large degree of heterogeneity within most of the groups. However, increasing the number of groups further would greatly complicate the analysis. We present data for each country in the Annex of this report, enabling the analysis of country-specific data¹³.

The data source for all the charts presented in this section is Eurostat balance of payments and international investment statistics, unless stated otherwise. All aggregate group figures are obtained by dividing the group's totals for each of the instrument presented by the group's GDP (as an annualised amount, that is, the sum of the present and previous three quarters).

3.1 Gross financial flows

As highlighted in last year's report, the euro area is a special case for the study of capital flows and deserves major attention. For this reason, Figure 17 reports gross capital flows (both assets and liabilities) for the **three euro-area groups**, broken down by instruments, i.e. foreign direct investment, portfolio investments and other investments. The black line represents the net financial account as a percent of the group GDP. There is a problem with the analysis of gross flows, however, because in the absence of bilateral statistics the intra-group positions cannot be netted out, thus inflating the numbers when countries are grouped. To allow comparison, we report all countries' charts in the appendix.

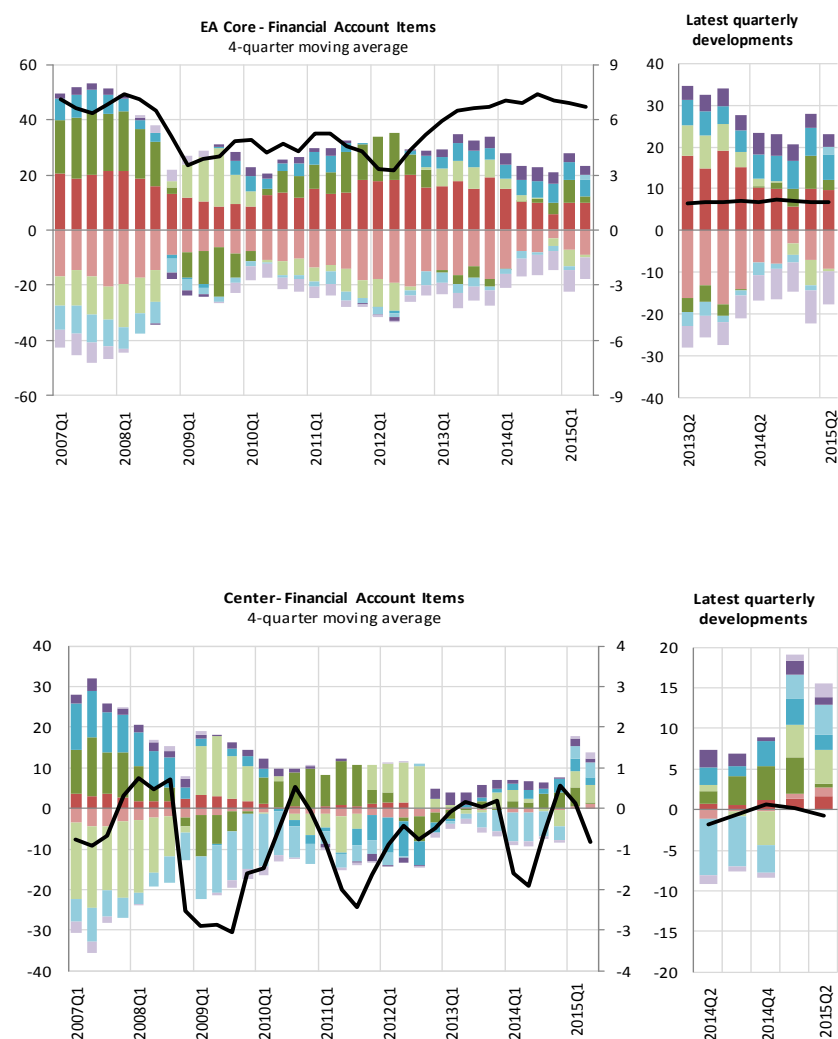
The effect of the rise and contraction in gross flows is most evident in the **euro area centre and periphery** – where gross flows contracted both during the financial crisis in 2008Q3 and after a short recovery phase, again in 2013Q1. By that time, the periphery had turned into a net exporter of capital, on the back of gross other investment outflows. By the end of 2014, the net outflows peaked and were slowing down, a trend which reverted in 2015Q1. In the **euro area core**, gross flows after the financial crisis have remained more stable, albeit at a significantly lower level compared to pre-crisis times. Since 2012Q1, the euro area core increased its position as a net exporter of capital, a trend which reverted somewhat over 2014 before intensifying again in 2015Q1.

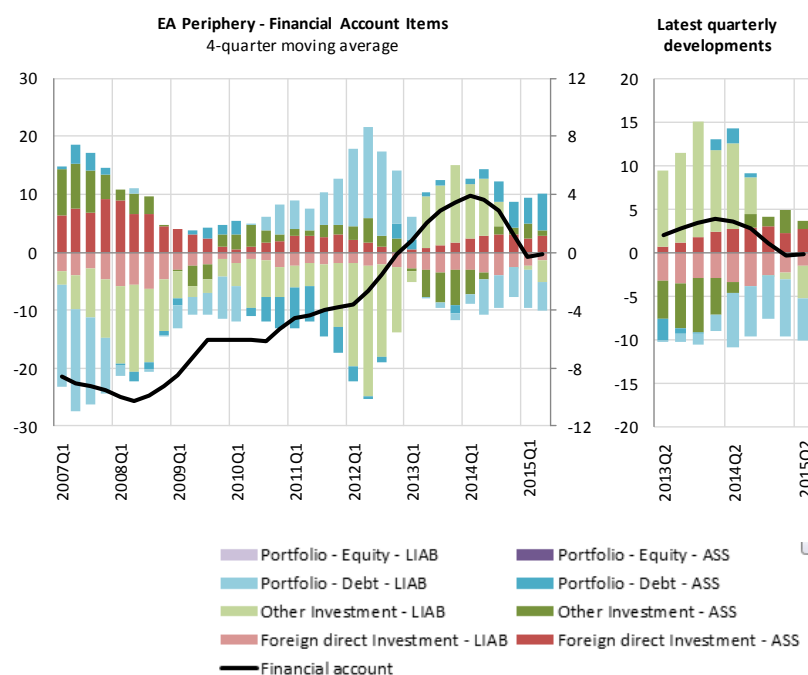
¹² Ireland is excluded from the EA periphery given its outstanding role as an offshore financial sector.

¹³ No data available for Finland, Italy, Cyprus, Bulgaria, Slovak Republic.

The gross quarterly flows are also sizable for the **centre** – which is composed of **France** (Italy is excluded due to data limitations) – where they often reached 20 percent of quarterly GDP in the years immediately before the crisis. France is a case that deserves particular attention. Hobza and Zeugner (2014) show that France's financial system received inflows from the euro-area northern countries as well as from the rest of the world and channelled them towards the euro-area south.

Figure 17 Gross financial flows in euro-area groups (percent of GDP)

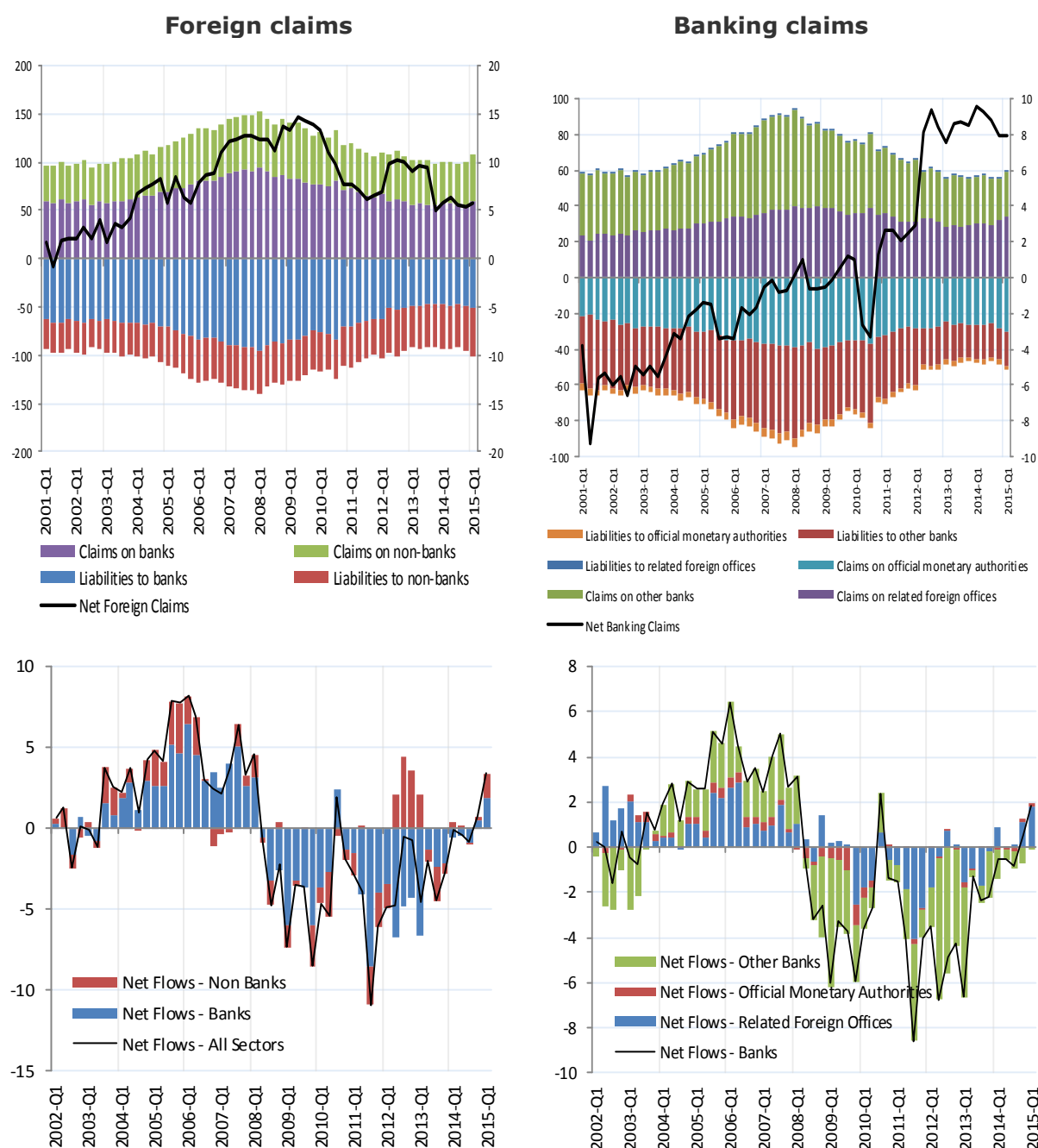




Source: Eurostat and Bruegel calculations.

Similar patterns can be observed when looking at the stocks and flows of foreign claims (including both gross and net) as reported by the **BIS locational banking statistics** by nationality after exchange rate adjustments¹⁴. Figure 18 shows the gross and net aggregate asset position of euro area banks over the rest of the world, as well as the quarter to quarter changes in stocks (quarterly flows) as a share of GDP as provided by the BIS locational banking data. The reasons to choose the locational rather than the consolidated banking data are twofold: first, it allows us to see both gross and net claims (and flows); second, it allows us to disaggregate bank flows between a banking group and its related foreign offices from flows between a banking group and other non-related banks.

¹⁴ The locational statistics provide information about the currency and geographical composition of banks' balance sheets. They capture outstanding claims and liabilities of banking offices located in the BIS reporting countries, including positions between related offices. The locational statistics are compiled using principles that are consistent with balance of payments. The availability of a currency breakdown facilitates the calculation of exchange-rate adjusted changes in amounts outstanding, as an approximation for flows. For additional information, see http://www.bis.org/statistics/about_banking_stats.htm

Figure 18 Euro area banks foreign claims (percent of GDP)

Sources: BIS locational banking statistics by nationality, FRED and Bruegel calculations.
 Note: On the reporting country side, Euro area is made up of AT, BE, DE, ES, FR, IT, IE, NL, PT, FI due to data limitations. Flows are presented as four-quarter moving-averages to give a clearer picture of the trends, as at the quarterly frequency the series are very volatile.

The **net foreign claims of euro-area banks** show a moderate accumulation, developing positively from 2000 until levelling off in late 2008 and into 2009, reaching a peak of just over 15 percent of GDP, before falling to approximately 5 percent in 2011 and experiencing a rebound in late 2012. Over 2014, net foreign claims fell again and have not recovered since. In the post-crisis period, **gross foreign claims of euro-area banks** declined steadily, reflecting deleveraging by the euro-area core banks, from a peak of over 150 percent of euro area GDP in

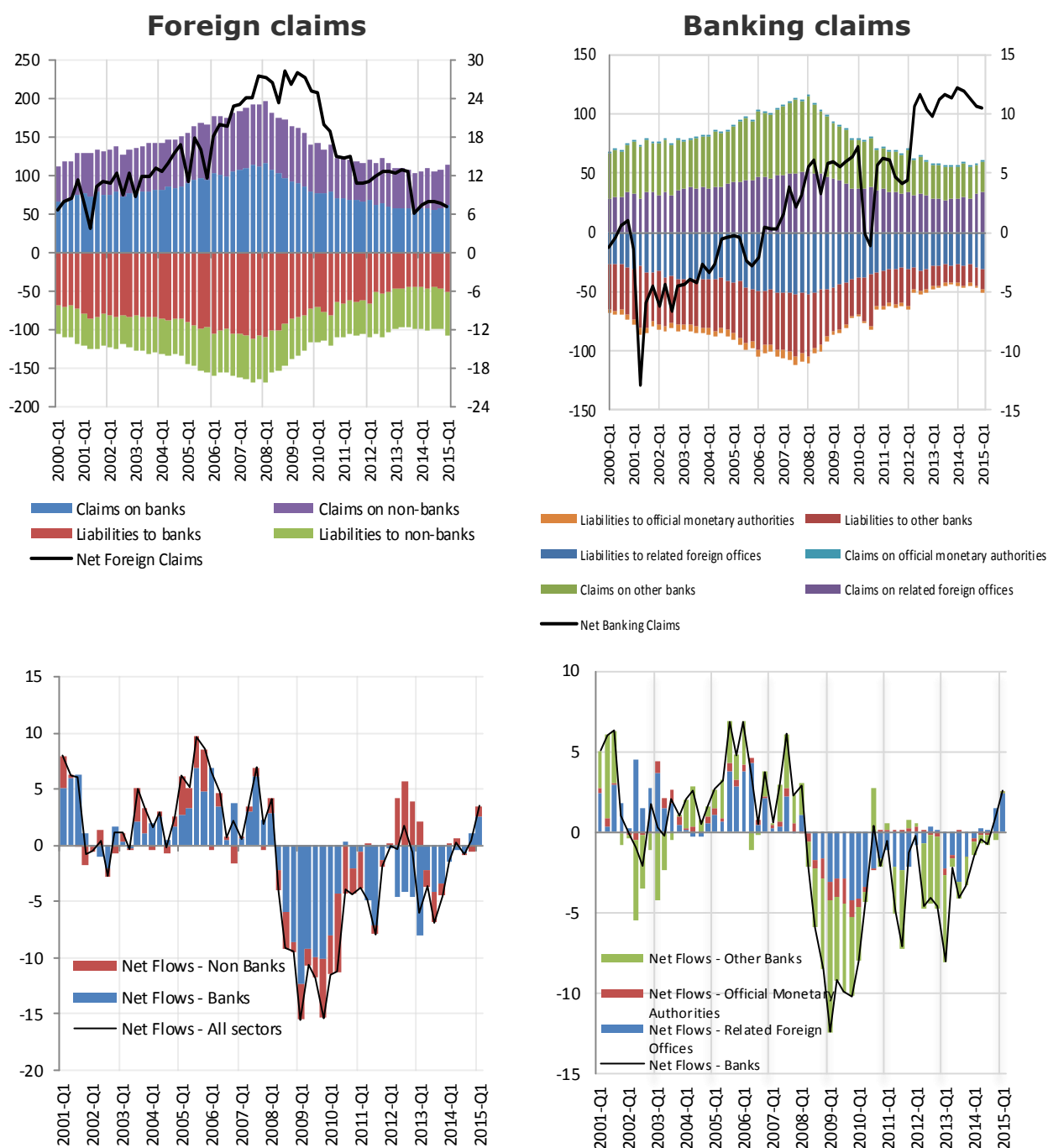
2008 to 100 percent in 2013. Gross flows appear to have stabilised at this magnitude in 2014 before increasing somewhat in 2015Q1.

Figure 19 separates these developments for the euro area core, centre and periphery, though we highlight that a major flaw of such groups (similar to groupings based on Eurostat statistics) is that the intragroup positions cannot be netted out, given the absence of bilateral data. Hence gross flows are overestimated when grouping countries together.

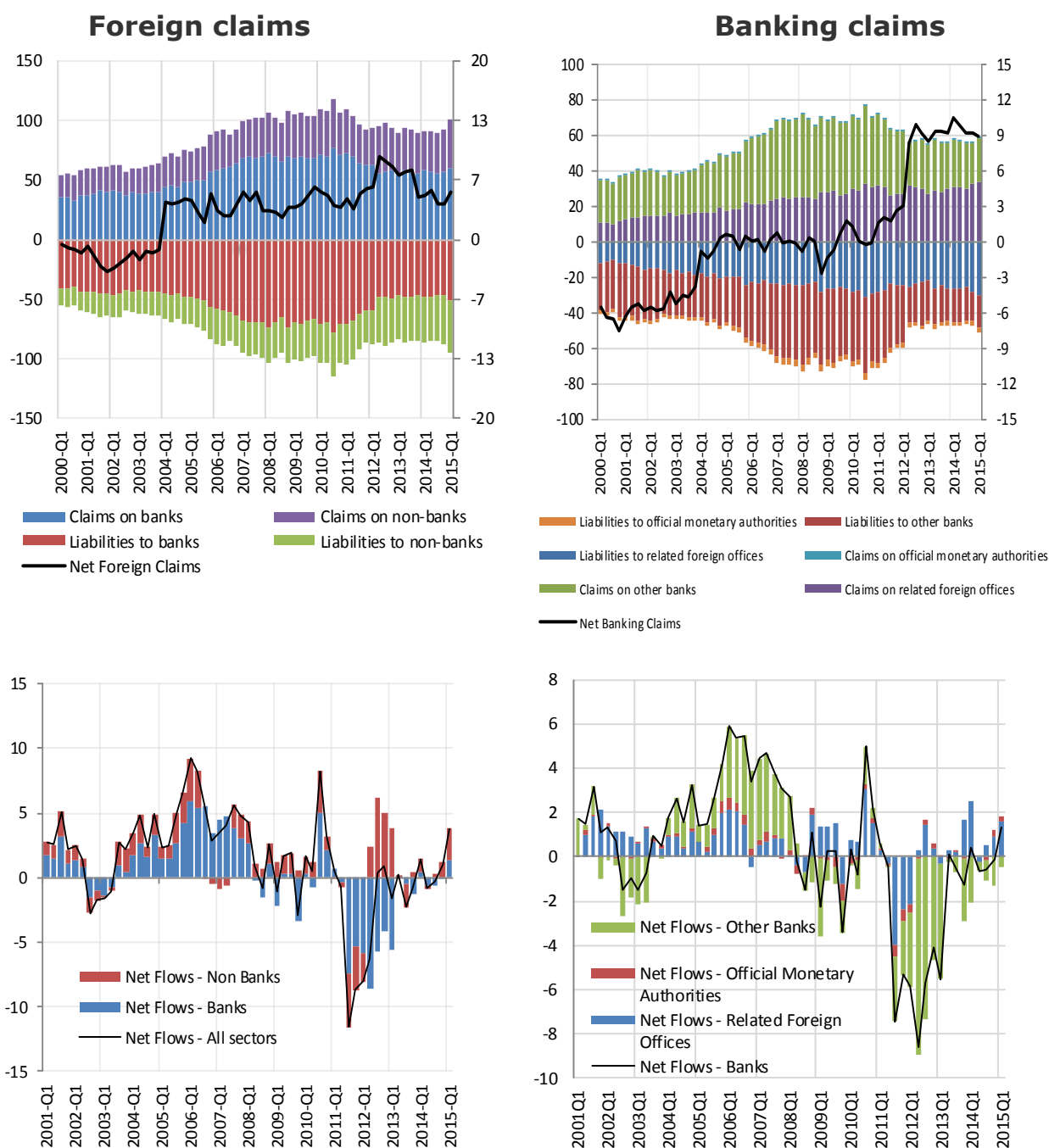
In the post-crisis period, banks in the **euro-area core** deleveraged significantly, reflected by the drop in net foreign claims from nearly 30 percent of group GDP to less than 10 percent by the end of 2013, and net foreign claims seem to have stabilized at that level throughout 2014 and 2015Q1. The **euro-area centre** banks saw their net foreign claims peak in 2012Q2 at 10 percent of group GDP before decreasing steadily since then. Only in 2015Q1 did net foreign claims start to increase again. In the **euro-area periphery**, banks had negative net foreign claims, stemming from substantial inflows. These inflows contracted massively during the financial crisis in 2007/2008 and again with the rise of the redenomination risk during the European debt crisis in 2011. Negative net foreign claims turned positive by mid-2012, reflecting massive deleveraging from the rest of the world. Since 2013, the euro-area periphery net foreign claims stayed in a balanced position, a trend which has continued in recent quarters.

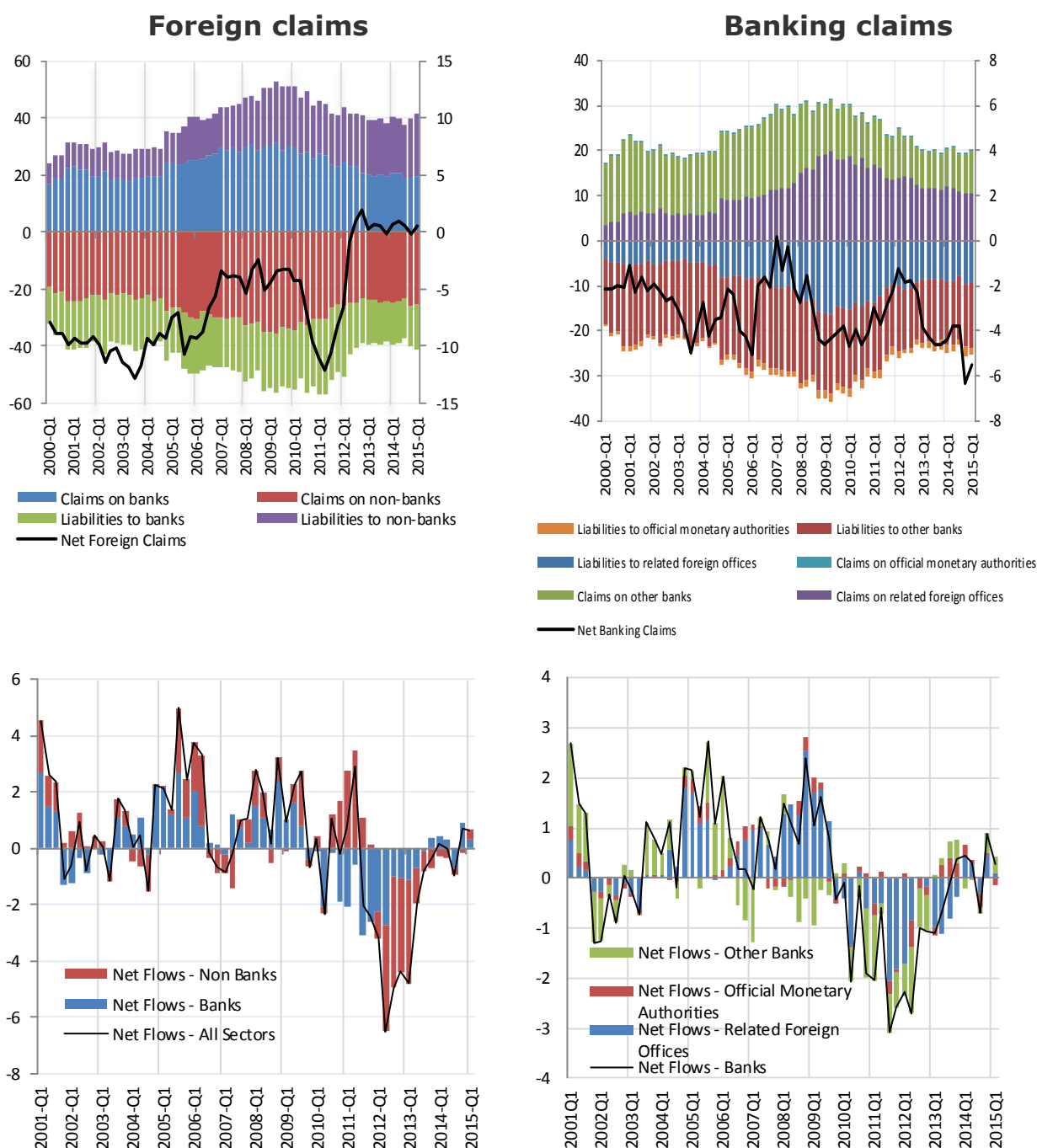
Figure 19 Foreign claims of euro-area banks for Euro-area Core, Centre and Periphery (percent of respective country aggregate GDP)

A: Euro-area Core banks' foreign claims and banking claims



B: Euro-area Centre banks' foreign claims and banking claims



C: Euro-area Periphery banks' foreign claims (L) and banking claims (R)


Source: BIS locational banking statistics.

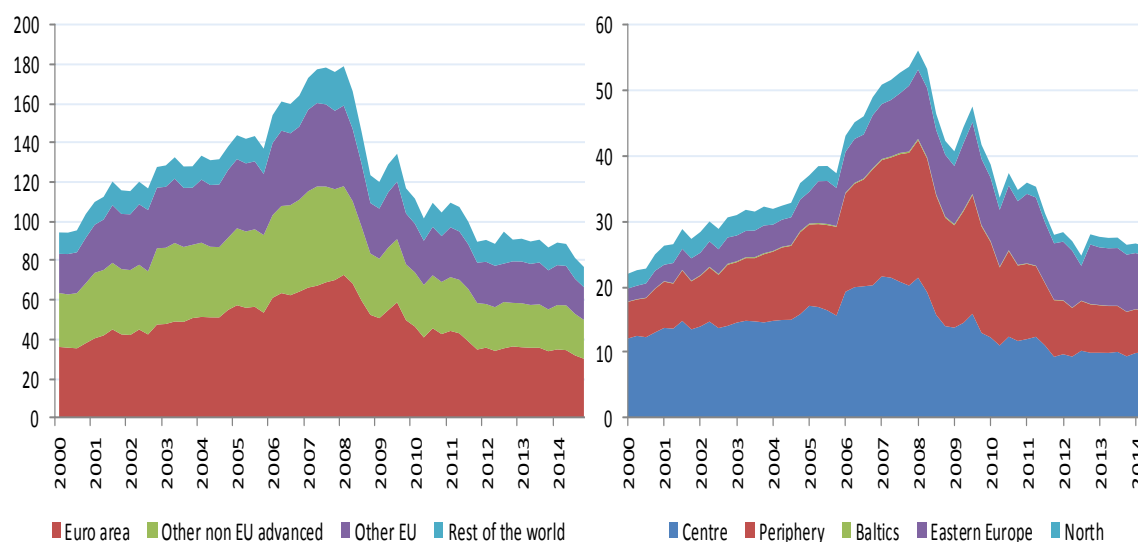
Note: Gross and net stocks (top); net flows (bottom); Net position (black line) on RHS scale. Core is defined as: AT, BE, DE, NL; Centre: FR, IT; Periphery: ES, PT; data available from 2000Q1 to 2014Q2, however frequently country level data is missing, so actual series may not extend this far.

To overcome the problem of intra-group double-counting, we present in Figure 20 the consolidated foreign claims for each euro area subgroup as these statistics are disaggregated by individual counterparty and thus allow us to net out each country group.

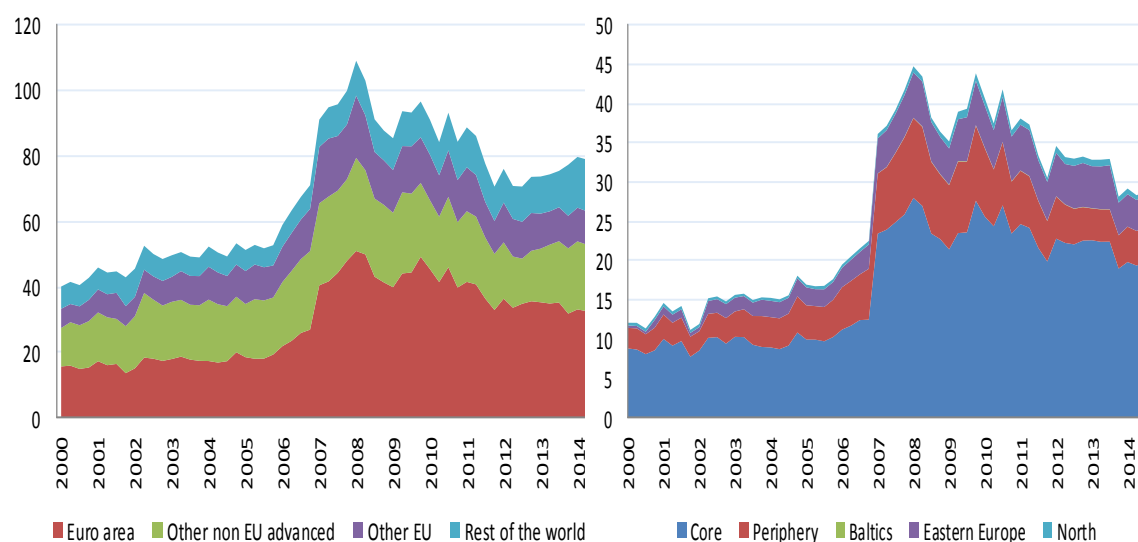
The right hand panel of Figure 20 with respect to the **Core** allows us to observe the capital flow reversal experienced by the periphery from core euro-area banks: at its peak in the first quarter of 2008, the core euro-area bank exposure to the periphery reached 19.8 percent of the core GDP. At the end of 2013, this share stood at just 6.5 percent and declined further in the last two quarters of 2014.

Figure 20 Foreign claims for each euro area subgroup (percent of GDP)

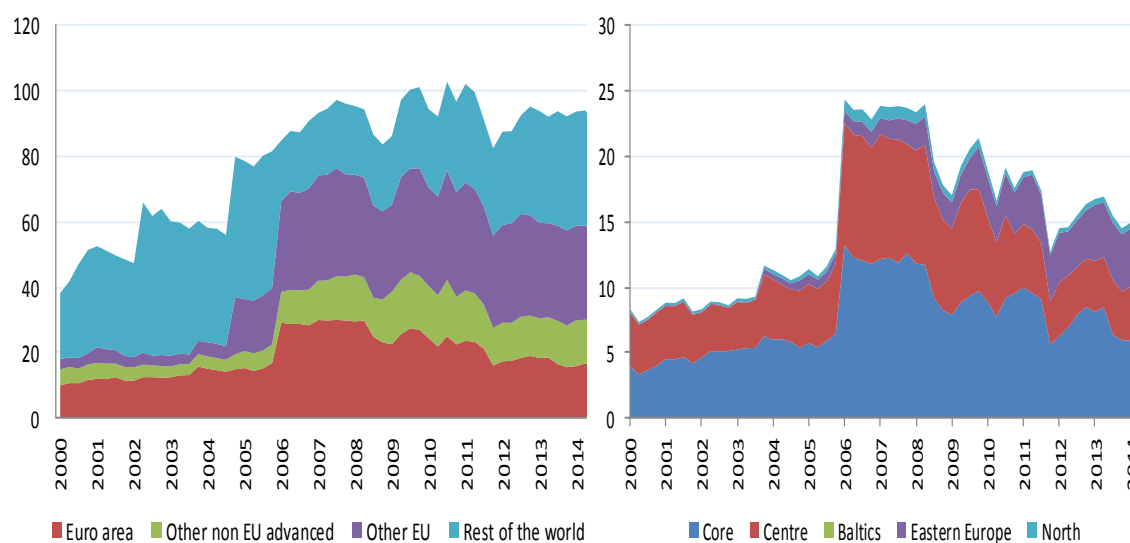
Core



Centre



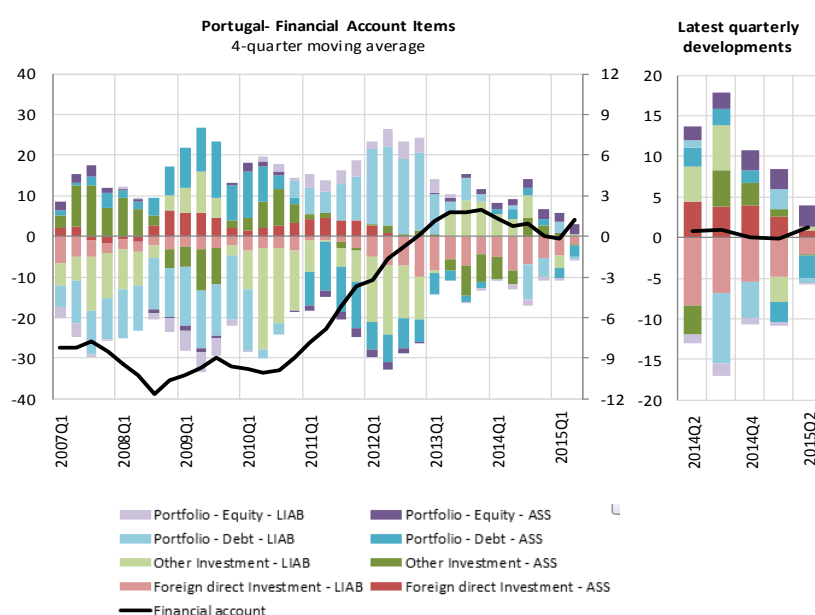
Periphery

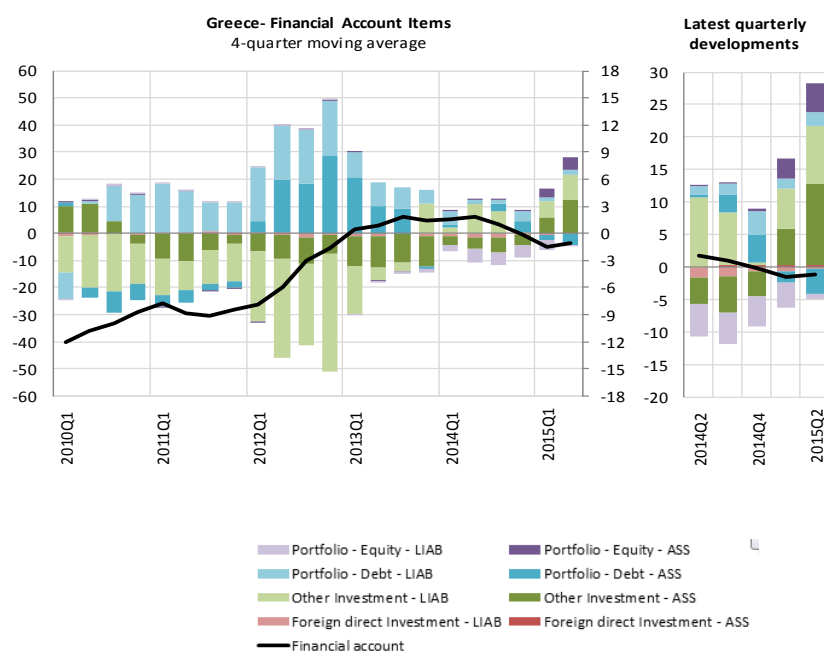


Sources: BIS consolidated banking statistics, OECD and Bruegel calculations. Note: Due to data availability the subgroups are formed as follows: Core: Austria, Belgium, Finland, Germany and the Netherlands; Centre: France and Italy; Periphery: Ireland, Portugal and Spain. Data is available from 1999Q1 to 2014Q4/2015Q1.

As discussed before, the periphery has been subject to increased capital outflows since the beginning of the European debt crisis in 2010. A look at gross flows in single countries in the post-crisis period shows that both Portugal and Greece turned into net capital exporters by the beginning of 2013 (see Figure 21). In Portugal, gross flows have remained stable since then while Greece has experienced a steady decline in gross flows. By 2015 Q2, Greece turned again into a net importer of capital, on the back of movements in other investment (loans).

Figure 21 Gross financial flows in single euro-periphery countries (% GDP)





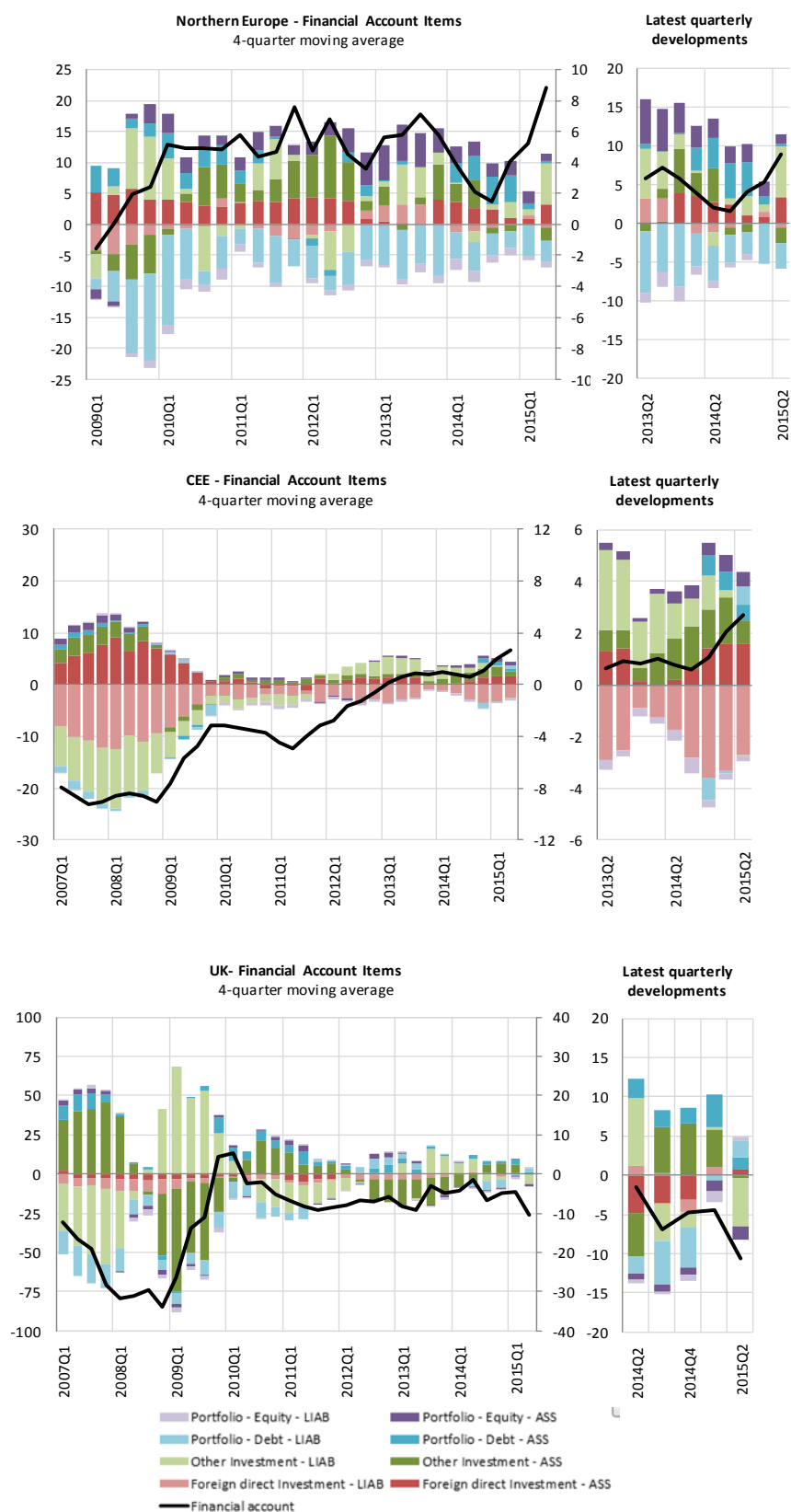
Source: Eurostat and Bruegel calculations. No data available for Spain and Ireland.

In terms of composition, Figure 21 shows that the flows in the three euro area groupings were overwhelmingly dominated by portfolio and other investments, two sources of financing that tend to be relatively more volatile than FDI. Foreign direct investment played a very marginal role, even in the euro area periphery. From an economic standpoint it is important to distinguish within the portfolio category between fixed income instruments such as bonds and equity, whose remuneration is far more sensitive to the economic developments, through valuation effects. This is what we do in the appendix at the level of individual countries. Since the split between debt and equity is not always available but the aggregate portfolio figure is, we prefer to represent only the aggregate at the group level to avoid introducing any bias in the results. Within portfolio investment, debt instruments normally played the more major role.

Figure 22, which reports the other three groups, allows a comparison with non-euro European countries. The magnitude of **gross flows in Northern Europe as well as in CEE** tends to be smaller than in the euro area. As a share of GDP, **the UK**, which plays a special role as a financial centre, experienced gross flows of up to 80% of GDP during the financial crisis. **In terms of compositions**, the three non-euro groups differ significantly from the euro area. **For the UK**, the other investment component massively dominates capital flows, and portfolio investments (especially debt) play a certain role too. Flows to Northern Europe are characterized by portfolio equity and debt, as well as other investment. In the CEE, FDI constitutes the bulk of inflows before the crisis together with other investments (which includes bank loans). In the post-crisis period, the magnitudes held up well in Northern Europe, were volatile in the UK and declined dramatically in the CEE (and continue to stay at much lower levels compared to the pre-crisis period).

In the case of **banks' foreign claims for Denmark, Sweden and the United Kingdom**, stock accumulation during the build-up to the crisis was much steeper than in euro-area banks, but the deleveraging process has been less dramatic than for euro-area banks.

Figure 22 Gross financial flows in northern Europe, the UK and central and Eastern Europe (percent of GDP)

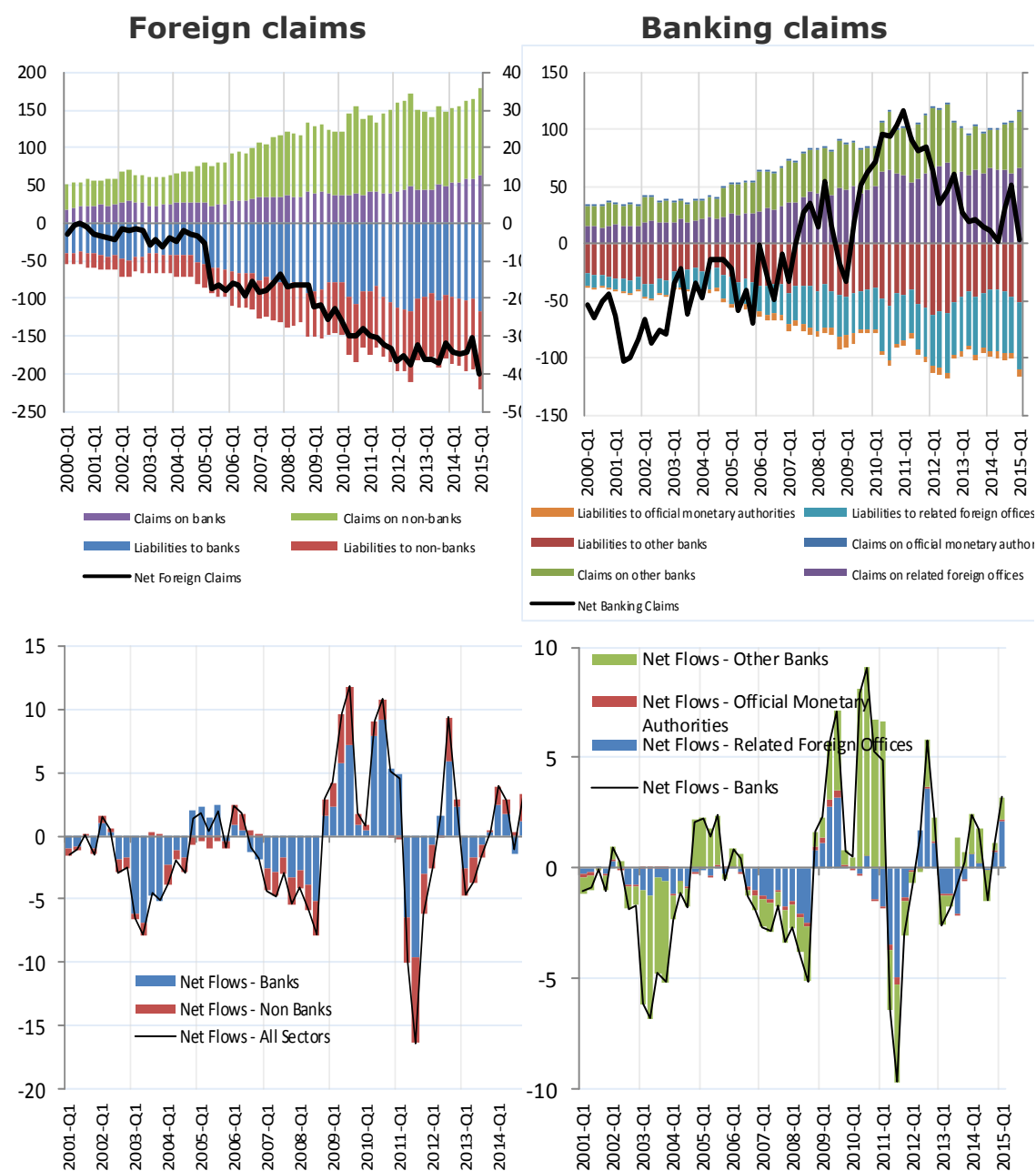


Source: Eurostat and Bruegel calculations.

Figure 23 shows the respective claims of banks for the three countries in question.

Figure 23 Northern and UK bank foreign claims (percent of GDP)

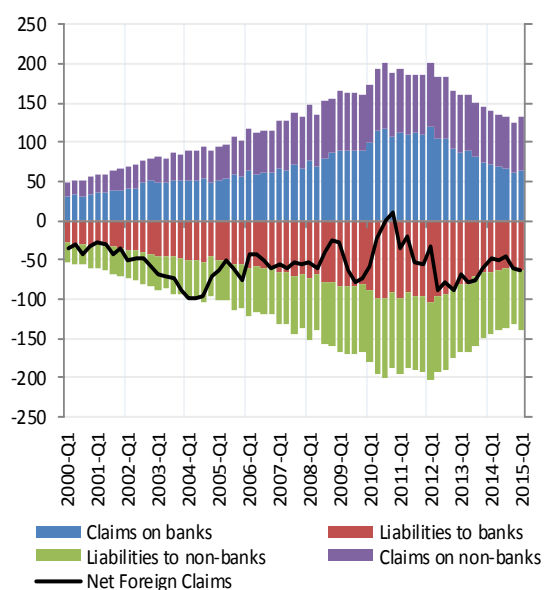
A: Danish and Swedish (North) foreign and banking claims



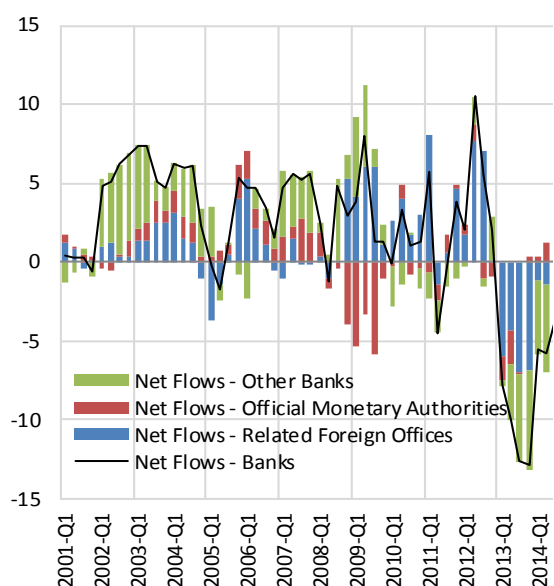
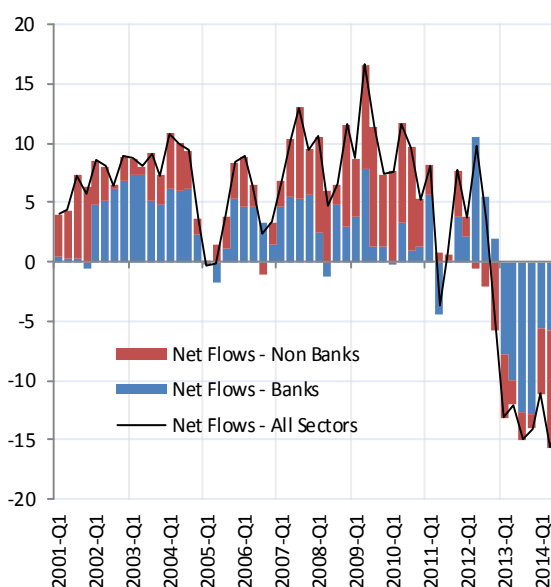
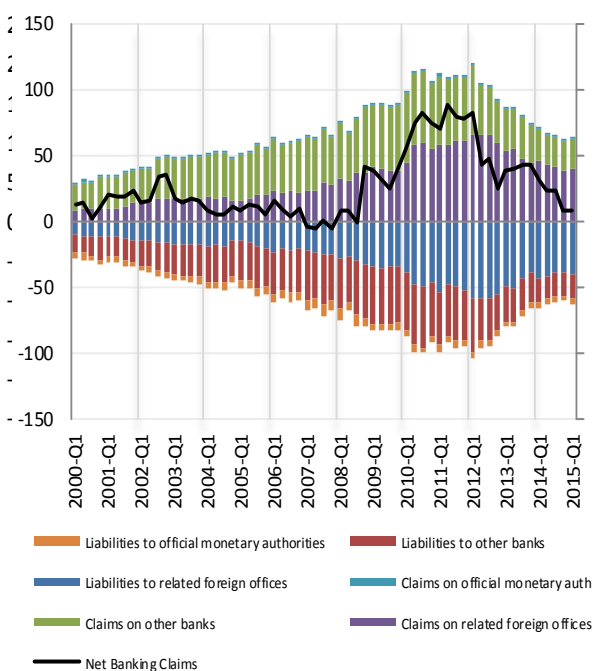
Sources: BIS consolidated banking statistics;

B: British banks' foreign and banking claims

Foreign claims



Banking claims



Sources: BIS consolidated banking statistics.

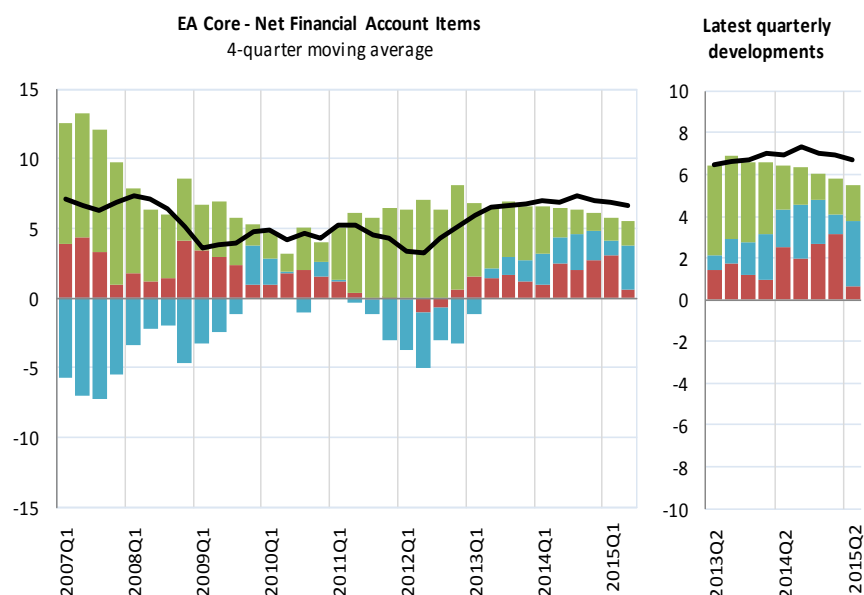
3.2 Net financial flows

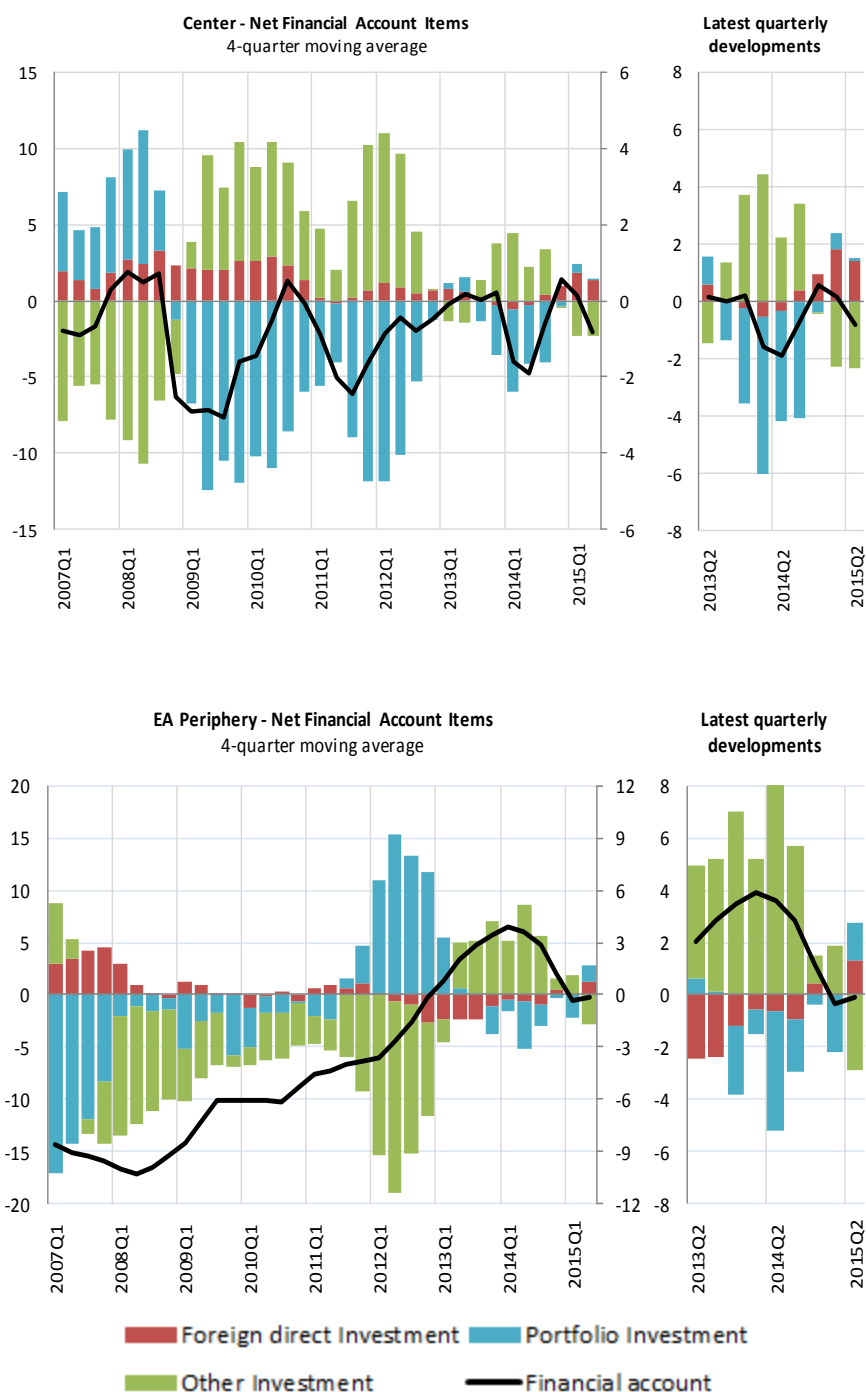
Figure 24 and Figure 25 show the **net position of the groups' financial account** according to the underlying components, offering a simpler picture of the composition of countries' and groups' net balances vis-à-vis the rest of the world. As recalled previously, the net financial account is an important variable to look at in order to understand countries' external borrowing requirements. The

net flows for each of the financial account components can give an indication of where potential financing problems could arise.

Figure 24 shows that the persistent net financial inflows experienced by the **euro area periphery** before the crisis were largely accounted for by portfolio and other investment. From 2003 to 2008, portfolio net financial inflows were the most important component of the financial surplus, but they massively contracted in 2008 and became largely negative between summer 2011 and summer 2012. This captures the intensifying of the euro crisis, when foreign investors increasingly off-loaded debt issued by countries in the euro area periphery. Interestingly, the effect of the disappearing (or negative) portfolio flows on the total net financial account appears to be neutralised by other investment flows of an opposite sign. This captures the flows related to financial assistance and the ECB's liquidity provision, which provided a cushion against the withdrawal of private external funds. Over 2014 net outflows stabilized, but no composition is available as data for Spain is missing. The **euro area core** reports persistent net financial outflows, mostly driven by other investment and to a lesser extent by FDI outflows. Portfolio investment instead shows net inflows for the euro area core, most likely driven by the presence of Germany and international appeal of the Bund during crisis times. The latest developments show a stabilization of net outflows over 2014 as rising net portfolio outflows are substituting receding other investment outflows. The **euro area centre** has been experiencing rising net outflows over 2014, which intensified by the end of the year on the back of increasing net portfolio investment outflows.

Figure 24 Net financial flows in the three euro-area groups (percent of GDP)



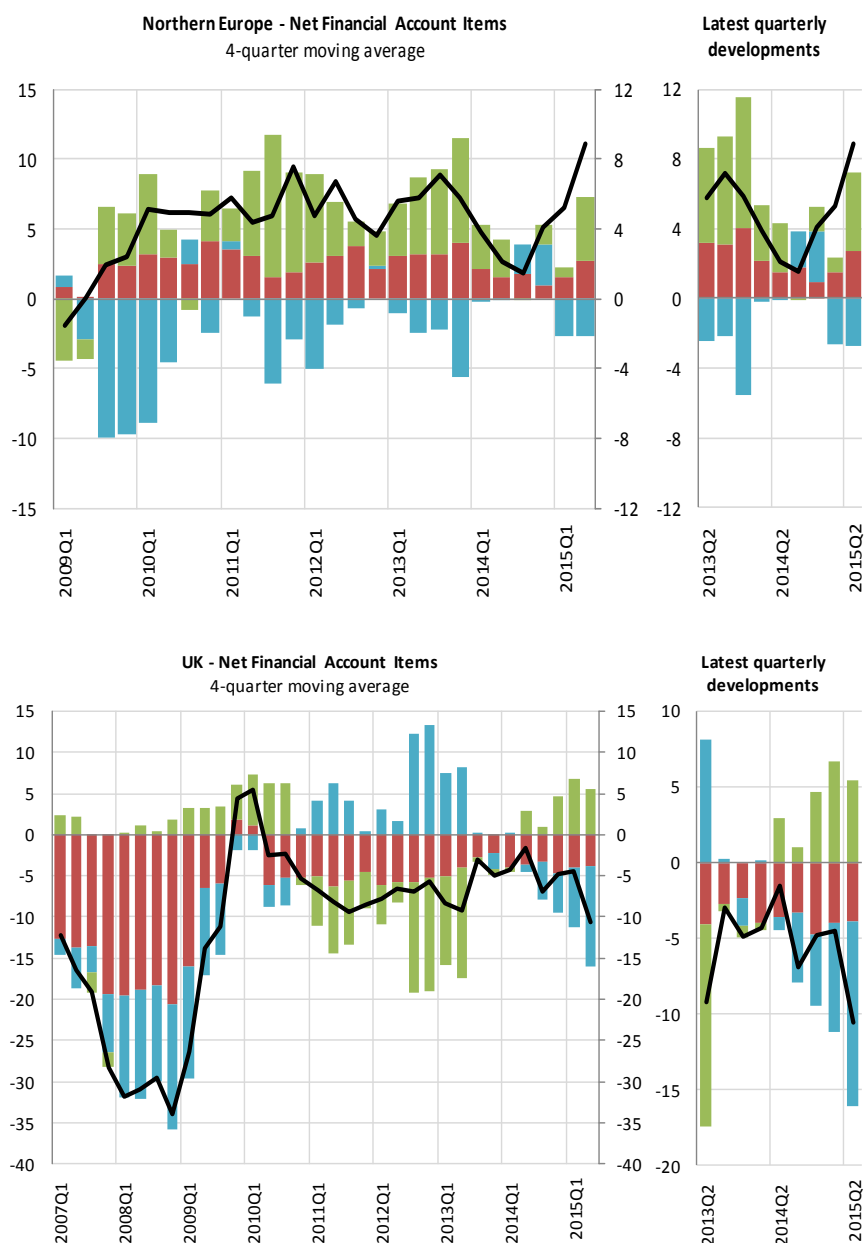


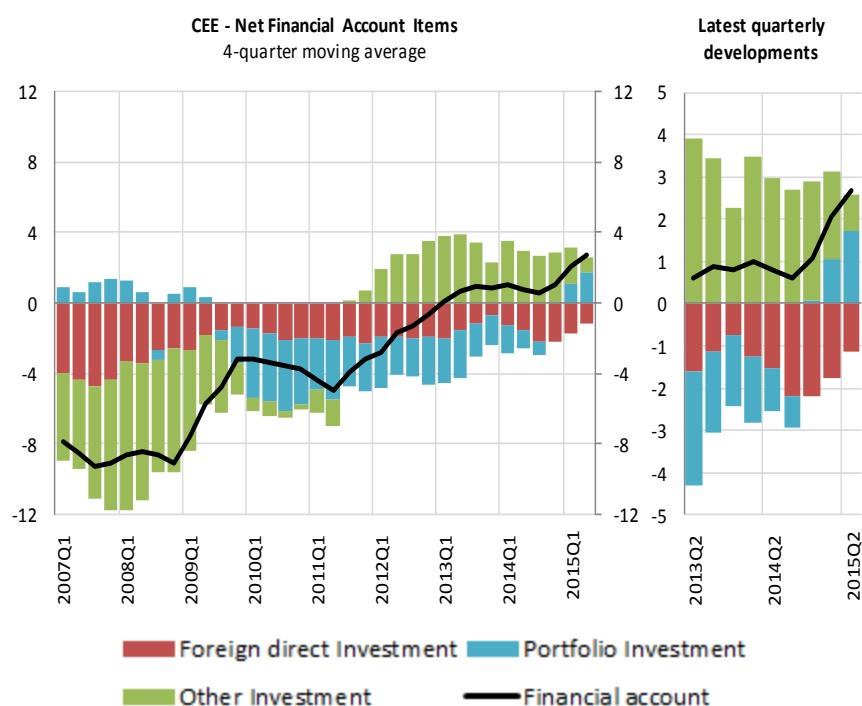
Source: Eurostat and Bruegel calculations.

The **north of Europe** was a net exporter of capital up until the end of 2007 (reflecting current account surpluses), a trend which reverted in 2008-2009 amid increasing inflows of capital leaving the euro area in search of safety. This was particularly pressing for **Denmark**, which eventually adopted monetary policy measures such as the negative rate on central banks' deposits to curb the inflows it was undergoing (Hüttl, 2014). Over the latest period, net other investment outflows are decreasing in importance while net portfolio investment turned from inflows to outflows. The **UK** (Figure 25) experienced spiking inflows in 2007-2008, mostly in terms of portfolios, which were then abruptly reversed in 2009. Portfolio (and other) flows then disappeared for more than a year, finally coming

back with the opposite sign. In 2014 portfolio investment inflows intensified, but this trend was reversed by 2015Q1.

Figure 25 Net financial flows in the three euro-area groups (percent of GDP)



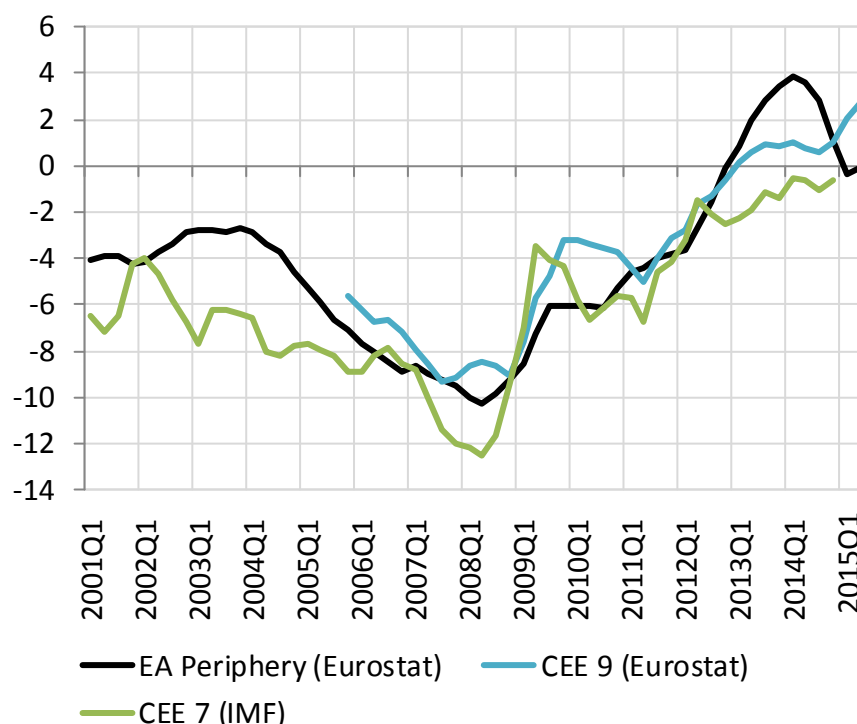


Source: Eurostat and Bruegel calculations.

Central Eastern Europe countries stand out as a different world. They experienced prolonged inflows of mainly direct investment with capital moving 'downhill', mostly from rich EU15 countries to poorer CEE countries as highlighted by Becker et al. (2010). Parallel to this development, credit to the private sector increased rapidly before the crisis in the region, fuelling a credit boom in the three Baltic States, Bulgaria and Romania (Darvas and Szapáry, 2008). By the end of 2011, other investment started outflowing, reflecting a massive withdrawal of banking funds from the region, and by 2013Q1 CEE turned into a net exporter, a trend which continued throughout the latest period.

The comparison with what happened in the euro area periphery (Figure 26) is striking. The euro area periphery accumulated a significantly larger financial account surplus before the crisis (almost 15 percent of total group GDP), which then dropped during the crisis, although it remained positive until late 2012. This was made possible by the provision of financial assistance and especially by ECB liquidity, which allowed a smoother adjustment on the external position than that which occurred in CEE countries, especially in the Baltics (Darvas, 2012a). Since 2013, the net financial account in the CEE stabilized somewhat as other investment outflows stabilized, while the periphery continued to experience massive capital outflows. By the end of 2014, both regions saw falling net capital outflows, a trend which reversed by 2015Q2.

Figure 26 Net financial account of the euro-periphery and Central and Eastern Europe (percent of GDP)



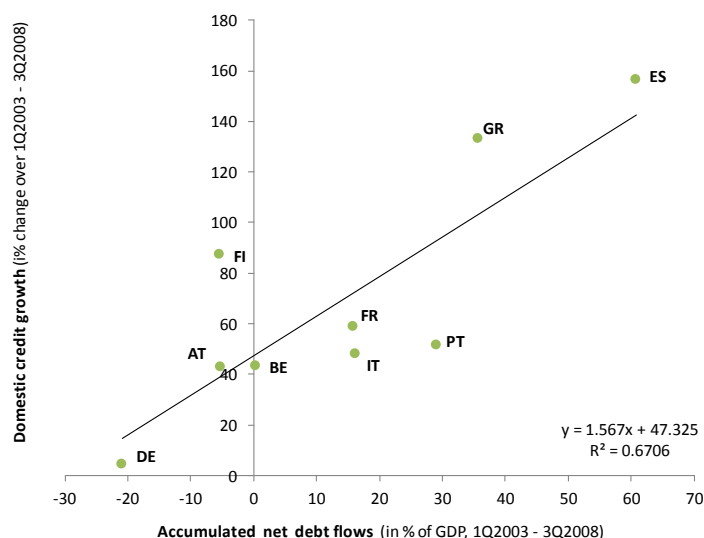
Source: Eurostat and Bruegel calculations.

Note: the EA periphery includes GR, PT, ES; the CEE 9 (Eurostat) includes CZ, HR, EE, HU, LV, LT, PL, RO, SI, while the CEE7 (IMF) includes BU, CZ, LV, LT, HU, PL, RO; Data is available from 1999Q1 to 2015Q1.

A major issue that arises is the composition of economic sectors in which debt-type capital inflows were actually unutilised in the euro-area periphery and in the new member states of the EU. Unfortunately, this issue is not a well-researched topic. The relationship between capital inflows and credit booms is already well established (see Figure 27 and, among others, Mendoza Terrones (2012), Bruno and Shin (2012), Lane and Milesi-Ferretti (2008), Lane and McQuade (2012)), suggesting that credit-intensive sectors, like the housing sector, were a major destination of capital inflows. But the nature of the economic sectors into which capital actually flows is an area little explored in the literature, even though it is of crucial importance. For example, capital flows that support investment in the tradable sector may promote sustainable long-term growth and improve capacity of the country to repay external loans.

Mitra (2011) argues that it is the destination, not the form of capital inflows, that most influences GDP growth. Reis (2013) highlights that credit frictions in the financial system suggest a misallocation of capital inflows, with non-productive firms surviving through an increase in their debt levels, limiting the expansion of more productive firms. This contributes to the expansion of the non-traded sector vis-à-vis the traded sector. Lane (2013) discusses the growth differentials between the traded and non-traded sector and finds striking differences across countries, with the non-traded sector expanding strongly in Greece, Ireland and Spain during 2003-2007. Finally, another body of research examines the connections between house prices and international capital flows, with an emphasis on the current account (see among others Adams et al (2011), Aizenman and Jinjark (2009), Favilukis et al (2012)).

Figure 27 Euro area domestic credit growth vs accumulated net debt flows



Source: Eurostat, ECB and Bruegel calculations.

Note: accumulated net debt flows consist of the sum of net flows in portfolio debt and other investment; data for Italy starts only in 2004Q1.

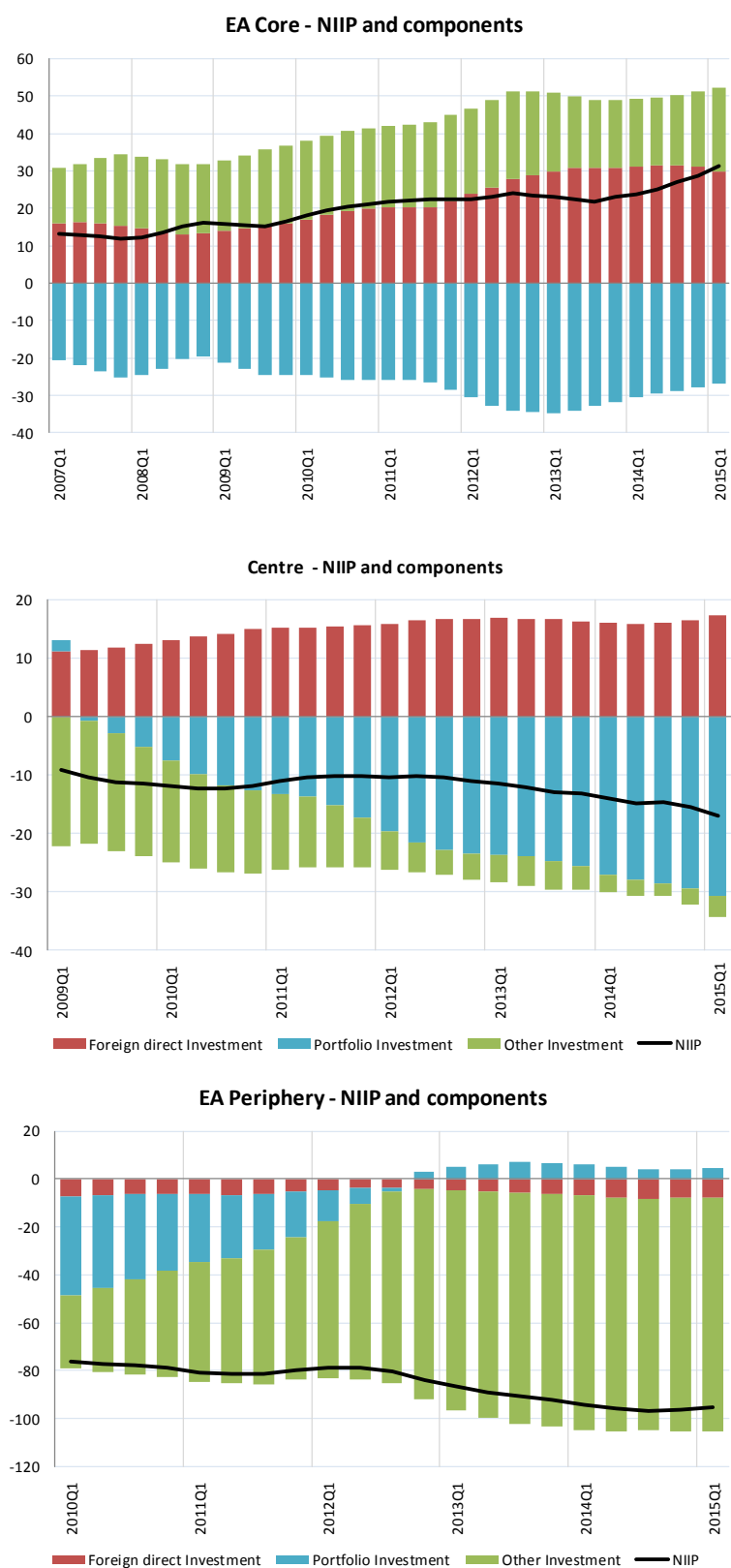
3.3 Net international investment positions (NIIPs)

Turning to an analysis of the stock and valuation effects in the euro area and beyond, the following emerges:

The prolonged period of current (and financial) account imbalances in the pre-crisis period resulted in the accumulation of a large stock of external assets and liabilities for all the **euro area** groups as well as the **CEE** countries. **The UK** had a negative NIIP position of around 36 percent of GDP until 2010, but this has been considerably reduced over the last three years. **Northern Europe** moved closer to a balanced position by 2013. **Central Eastern European countries** stand out for their large negative NIIP, which surpassed 80 percent of GDP in 2009 and has remained constant at that level since then.

In terms of composition, the **euro area core** surplus is mostly accounted for by other investment (the most important part of it is cross-border bank loans) and direct investment. Portfolio equity and debt instead contributed negatively, reflecting the attractiveness of the euro area capital markets for foreign investors, although they have been declining since 2013. In the euro area periphery, accumulated portfolio investment liabilities have been declining since the start of the European debt crisis and turned into assets by the end of 2012, while other investment liabilities grew in importance and make up nearly all of the euro area periphery's negative NIIP today. The **euro area centre** also has a negative position, but here the most important component is portfolio debt liabilities outstanding followed by other investment liabilities, which have decreased their importance over the last 4 years reflecting a deleveraging process.

Figure 28 Net international investment position the three euro-area groups (percent of GDP)

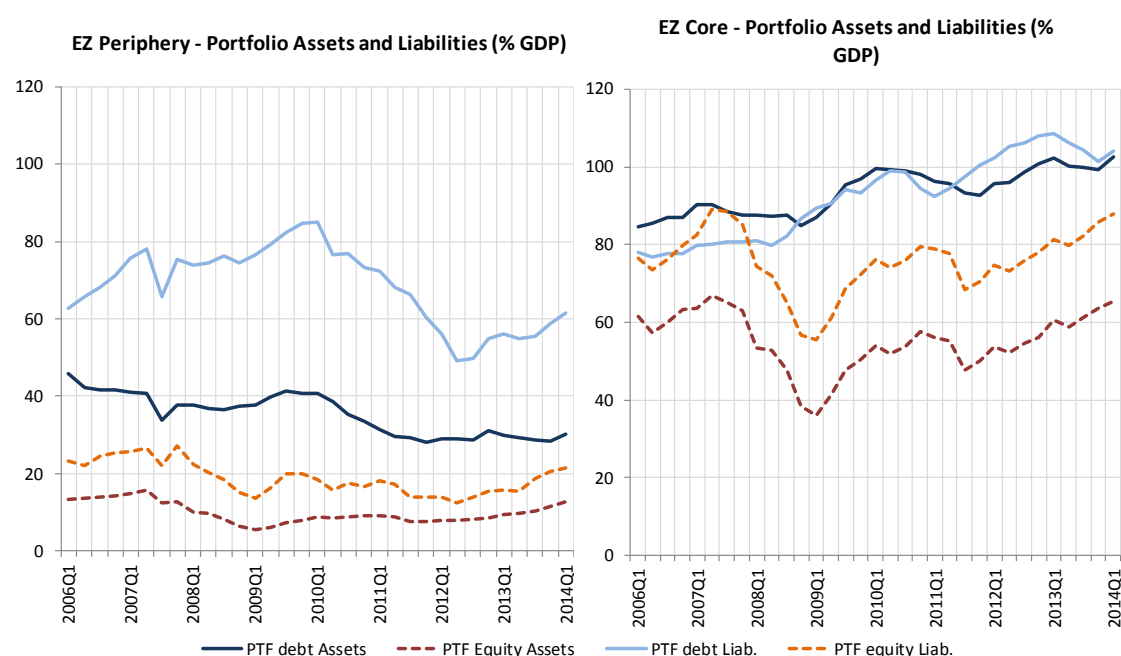


Source: Eurostat and Bruegel calculations.

The comparison of the three euro area groups raises an interesting question. The country level charts collected in the annex show that in terms of *flows*, the largest share of portfolio investments is accounted for by *debt instruments* whereas equity plays a relatively minor role. In light of this evidence, one would expect that a large share of the outstanding NIIP be accounted for by stock of portfolio debt. However, the NIIP figures tell a different story. The outstanding net portfolio debt is in fact very small compared to the outstanding equity in both the euro area core and the euro area periphery. For the euro-area centre, instead, the stock of portfolio debt is significantly more important than portfolio equity in explaining the NIIP position.

To reconcile these two apparently contradictory facts, one needs to factor **valuation effect into the picture**. Figure 29 is an illustration of how important such effects can be¹⁵. It plots the stock of assets and liabilities separately, for both portfolio debt and equity in the euro area periphery and core.

Figure 29 Portfolio international investment position the euro-area periphery (percent of GDP)



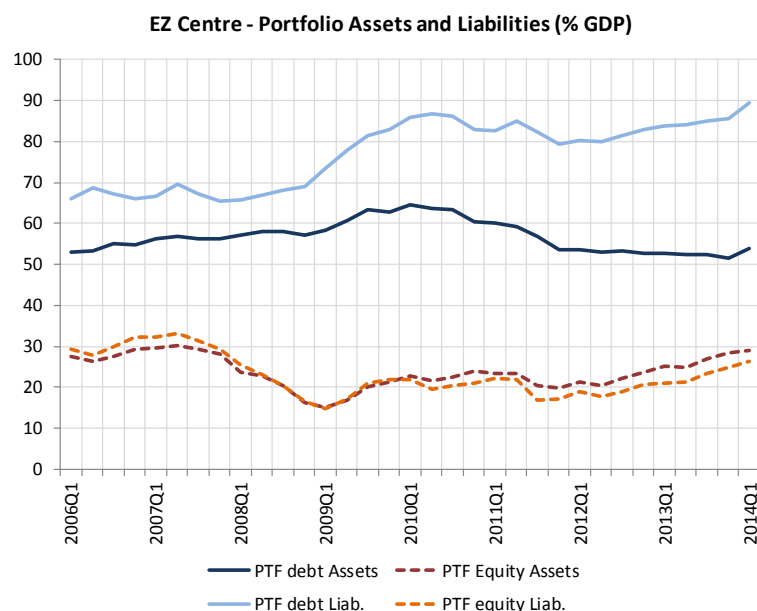
Source: Eurostat and Bruegel calculations.

The left panel shows that the market price valuation of debt liabilities dropped in the euro area periphery during the crisis through the end of 2012. This is not surprising since during the crisis the government bonds issued by these countries came under significant stress, bond yields surged and prices fell sharply. The fall pictured in the chart stopped in 2012, consistent with the introduction of the ECB's outright monetary transactions (OMT), which eased tensions on the sovereign bond markets. Portfolio debt assets also dropped in market value, but the drop was not as pronounced as the one on the liability side. At the same time, the value of equity liabilities increased significantly more than the value of equity assets, and the combination of these two dynamics explains the relatively larger role of equity in explaining the dynamics observed in the aggregate NIIP. A similar development is visible for the euro area core, where portfolio assets and

¹⁵ For more detail, see the section 5 on revaluation and external yields across various instruments and countries.

liabilities net out almost entirely while equity liabilities are larger in value than equity assets, although the gap is not widening as in the Periphery. The opposite situation happened in the Centre (Figure 30), where the valuation gap was significantly larger on the debt side and almost non-existent on the equity side.

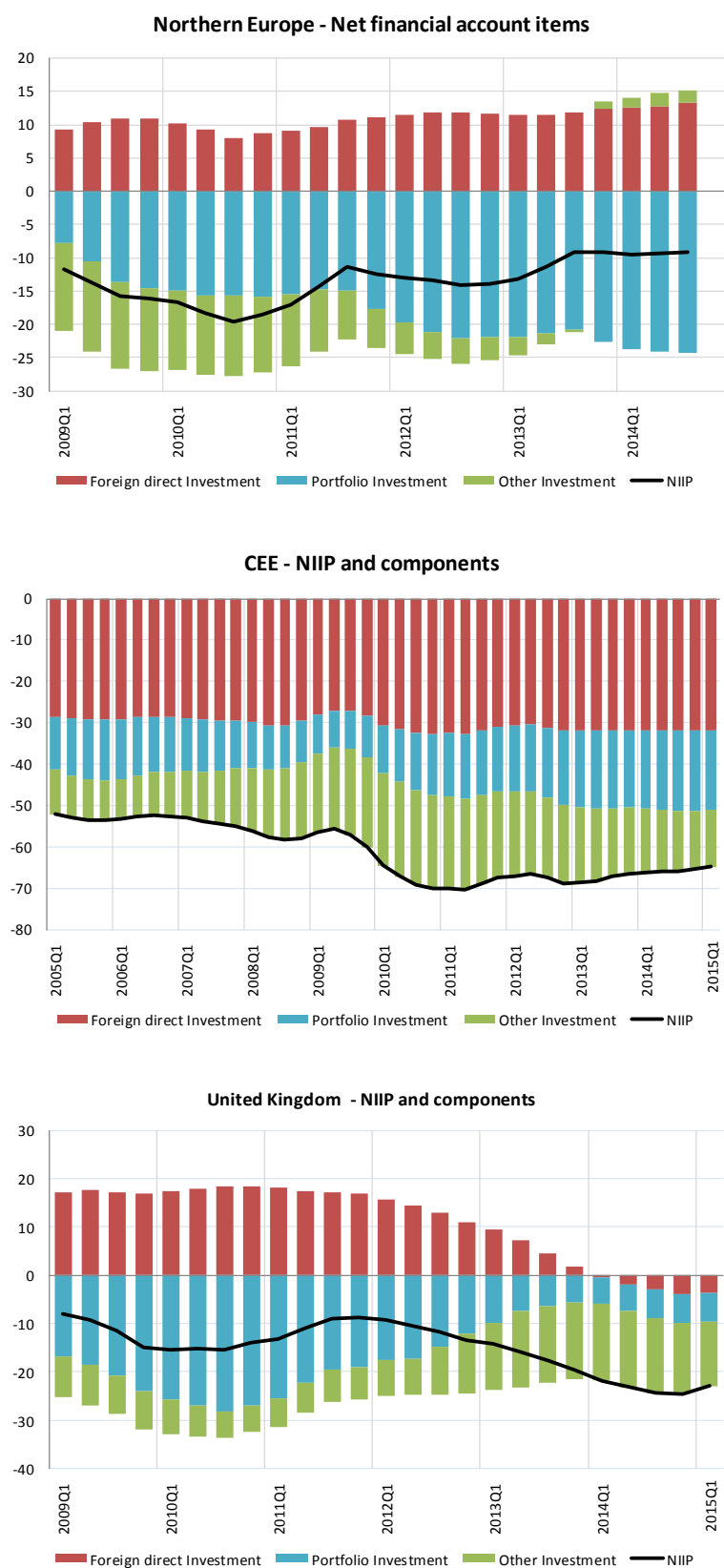
Figure 30 Portfolio international investment position the euro-area centre (percent of GDP)



Source: Eurostat and Bruegel calculations.

Concerning the other groups of countries (Figure 31), the **North of Europe's** external negative NIIP is driven by portfolio debt, whereas the contribution of other investment stocks has been shrinking over time and direct investments and portfolio equity investments are positive. The **UK** was in deficit in terms of all NIIP components apart from direct investment, which has recently almost rebalanced through a reduction of both assets and liabilities, suggesting a sizeable cross-border deleveraging. **CEE** exhibits net liabilities in all instruments and more than one-half of their NIIP liabilities are direct investment while portfolio debt and other investment (including bank loans) share the remaining part. It is noteworthy that their net other investment liabilities decreased from about 23 percent of GDP in 2009Q4 to about 14 percent of GDP by 2015Q1, suggesting that foreign banks decreased significantly their exposure to the region.

Figure 31 Net international investment position of EU north, the UK and central and Eastern Europe (percent of GDP)



Source: Eurostat and Bruegel calculations.

3.4 Cyprus and Greece – a tale of two crises

The imposition of capital controls, which is in principle prohibited in the European Union, makes Cyprus and Greece highly interesting cases for a bilateral analysis of their capital flows. The two countries have a number of similarities such as their large current account deficits and fast-growing private credit in the pre-crisis period, and there are deep linkages between the two countries. Yet there are major differences as well: Cyprus had a particularly large banking system, its institutional quality indicators were not particularly weak and its public debt was close to the 60 percent of GDP limit set by the Stability and Growth Pack before the crisis while Greece had a very large budget deficit, high public debt and its institutional quality indicators were very weak.

Figure 32 shows the net financial account for the two countries. Focusing first on **Greece**, we can see that Greece was a net importer of capital over the period 2000 until mid-2012, driven largely by net inflows in portfolio investment. However, as the Greek sovereign debt crisis broke out with Greece applying for a financial assistance programme in May 2010, the net financial position of Greece began to deteriorate. A year later, a worsened recession along with a delayed implementation by the Greek government of the agreed conditions in the bailout programme revealed the need for Greece to receive a second bailout worth 130 bn EUR (including a bank recapitalization package worth 48 bn EUR), while at the same time all private creditors holding Greek government bonds were required to sign a deal accepting extended maturities, lower interest rates and a 53.5 percent face value loss. As the European debt crisis intensified with contagion-risk spreading to other periphery countries with weak fiscal positions, capital continued to flee the country, turning Greece into a net exporter of capital by the end of 2012. In December 2012, the Troika agreed to provide Greece with a round of significant debt relief measures. Over 2013, portfolio investment outflows started contracting as the outlook for the Greek economy improved. This trend continued throughout 2014, and Greece experienced capital inflows in the form of increasing other investment. Portfolio outflows seem to have stabilized over the last two quarters of 2014.

Monthly balance of payment data from the Bank of Greece allows analysing the impact on capital flows of the renewed uncertainty linked to the snap parliamentary election in January 2015 and the following formation of a Syriza-led government refusing to respect the terms of its existing financial assistance agreement. The rift between the government and the international creditors caused a renewed and increasingly growing liquidity crisis and a deposit flight, as reflected in large banking-related outflows in February 2015 of up to 15 percent of monthly GDP (see right hand side of Panel A in Figure 32). As a referendum on the creditor terms was called in end-May 2015, capital controls were imposed (for more detail, see Box 4). On July 5, Greek citizens voted to reject the bailout terms; in the same month, large portfolio investment outflows can be observed. A third financial assistance programme was agreed in August 2015. The impact thereof cannot be analysed yet as data availability stops in the same month.

Turning to **Cyprus**, it is striking that in periods of financial stress, gross flows increase to around or even more than 100% of quarterly GDP (2008-09 and 2013). Following the financial crisis in 2009, large inflows of other investment into Cyprus took place but were almost equally matched by outflows of portfolio investment of the same scale, reflecting the role of Cyprus as a financial centre.

In 2012/2013, Cyprus was hit by further financial turmoil on the back of the Greek government-debt crisis. As financial soundness indicators kept

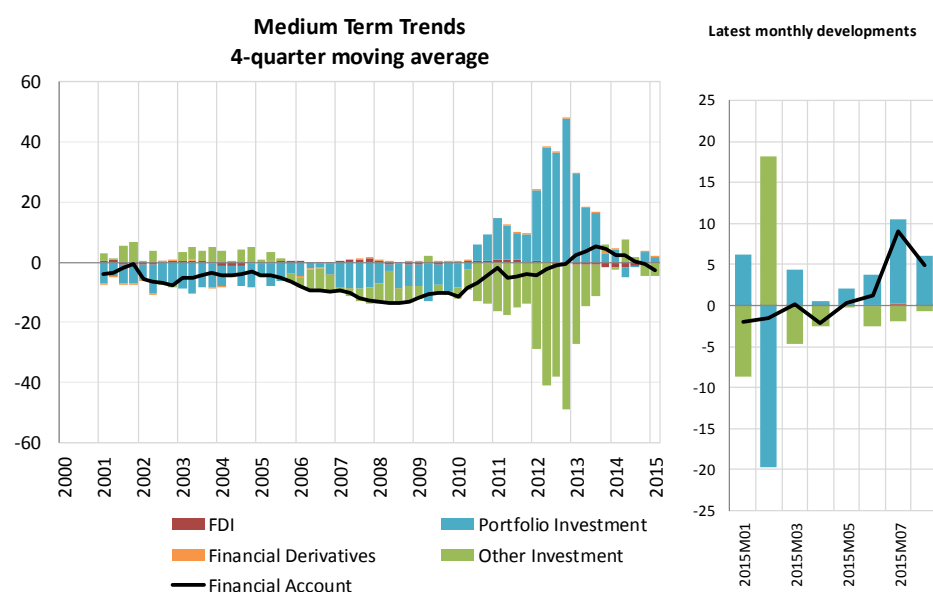
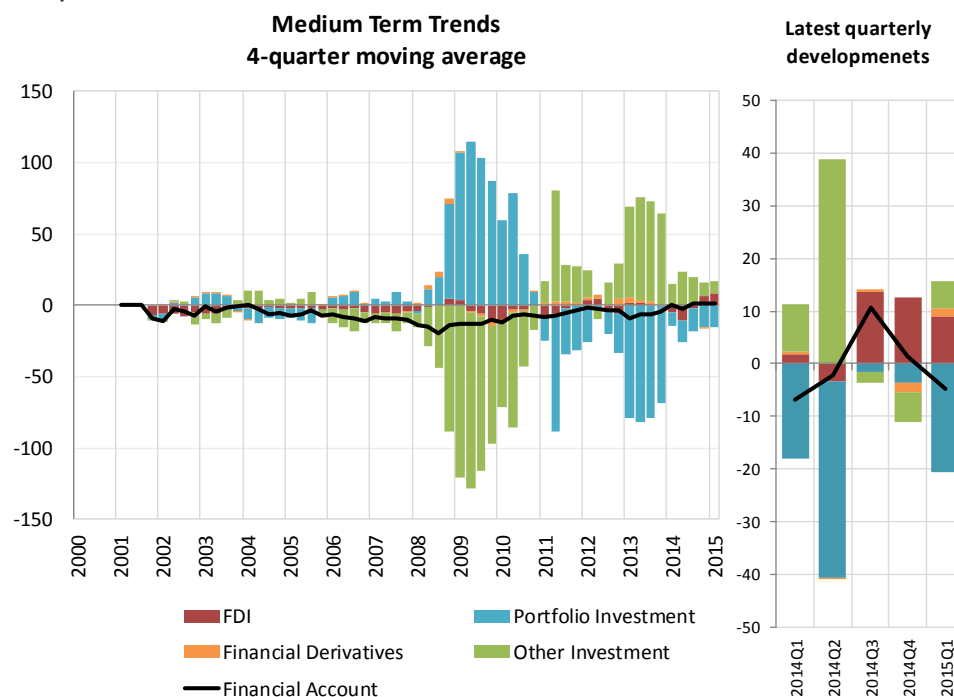
deteriorating, a deposit flight began in January 2013: almost 4 percent (2.7 billion euro) of total deposits were lost during the first two months of the year, and as the rumours of an upcoming bail-in on depositors spread in March the deposit flight intensified. On 16 March 2013, the Eurogroup reached an agreement with the Cypriot authorities to apply a one-off “stability levy” on deposits of residents and non-residents in order to limit the size of the financial assistance programme to €10 billion. This agreement was supported by most European leaders, including the Cypriot president Nicos Anastasiades. However, the agreement was rejected by the Cypriot House of Representatives on 19 March 2015. The ECB’s Governing Council announced on 21 March 2013 its decision to stop the Emergency Liquidity Assistance (ELA) provision as of 25 March¹⁶ unless an EU/IMF programme was in place.

To avoid an outright bank run, Cyprus declared a bank holiday until 28 March. On 22 March, the Cypriot government established restrictive measures on capital movements¹⁷. These measures were supported by the ECB and European institutions in the hope that they would help avoid capital outflows that could threaten financial stability in Cyprus. Despite statements by the Troika implying that the restrictions should be removed as soon as possible, there was no clear plan for their removal in the Cypriot programme when it was approved and the last measure was only abolished in April 2015.

As the time line suggests, the “hottest” period for Cyprus was from January (start of capital flight) to March (capital flow restrictions) 2013. In this context, Panel B in Figure 32 shows that by the end of 2013, Cyprus experienced major net capital outflows amounting to 10 percent of GDP. Both portfolio investment and banking related investment show major movements in 2013 1Q, reflecting the financial stress of that period. In 2014, some relaxation can be observed with stabilizing portfolio outflows and increasing other investment inflows.

¹⁶ See ECB Press Release, <https://www.ecb.europa.eu/press/pr/date/2013/html/pr130321.en.html>.

¹⁷ See Box 4 for more information on the measures actually imposed.

Figure 32 Net financial account and components for Greece and Cyprus**Panel A: Greece**
as percent of GDP**Panel B: Cyprus**
as percent of GDP

Source: IMF and national central banks.

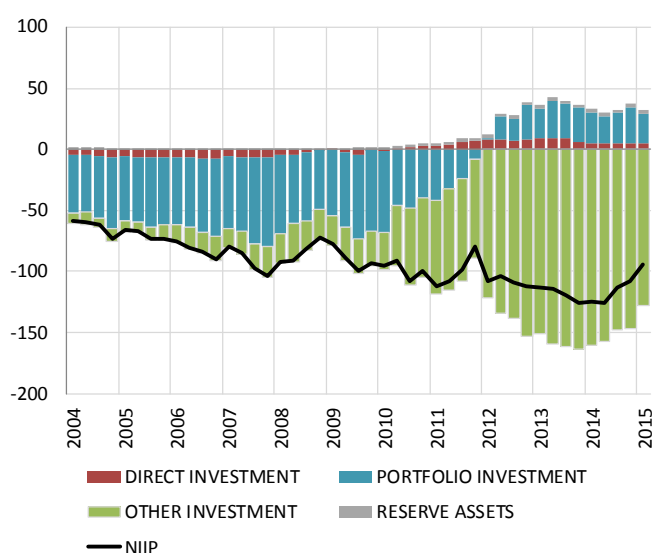
In stock terms, Figure 33 reports the **net international investment position (NIIP)** for both Cyprus and Greece. **Greece** exhibits a negative NIIP, reflecting the accumulation of portfolio investment and other investment liabilities. In 2010, the accumulated portfolio stock was steadily replaced by the accumulation of

other investment liabilities, and by 2012 portfolio investment assets outweighed liabilities, contributing to a less negative NIIP, a trend which has continued over 2014. In 2015 Q1, banking related liabilities were reduced through deposit outflows.

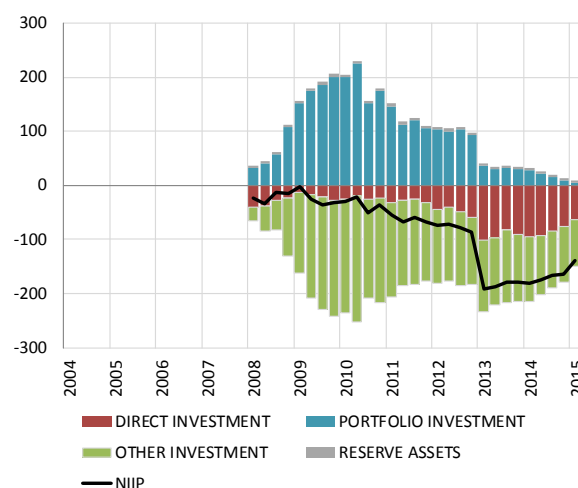
The Cypriot NIIP was deteriorating from -32 percent of GDP in 2010Q4 to -140 percent of GDP in 2015 Q1, on the back of receding portfolio investment assets, which registered a significant fall in 2013 Q1 (when capital flights started). Interestingly, the share of FDI in Cyprus external liabilities was increasing massively up to the first half 2013 (and receding only marginally thereafter).

Figure 33 Net international investment position and its components

Panel A: Greece
(in percent of GDP)



Panel B: Cyprus
(in percent of GDP)



Source: IMF, data only available after 2004Q1

To grasp which countries have reduced their exposure to both countries the most, we turn to a bilateral analysis of portfolio investment (banking) flows.

The net bilateral composition of portfolio investment of the two countries (Figure 34) reveals that the euro area (and especially France and Germany) increased their **portfolio holdings vis-à-vis Greece** during the run-up to the crisis in 2010. Greek holdings in the United Kingdom started to increase from 2007 to 2009 before decreasing to a somewhat lower level which has been maintained over the last four semesters (Dec 2012 to Jun 2014). Germany and France reduced their exposure significantly in Dec 2011 as a consequence of the Greek government debt crisis, and their exposures were negligible thereafter. Net portfolio investment turned from liabilities in Dec 2011 to assets by the end of 2012 as non-residents moved out of Greek portfolio holdings. In December 2014 (latest data-point available), the Euro area (excluding Germany and France) and to a lesser extent the United Kingdom were by far the two most important destinations of portfolio flows from Greece.

Other investment banking flows captured by the **BIS consolidated banking statistics** exhibit a significant exposure of Euro area banks to **Greece** before the start of the crisis (

Figure 35 Panel A). With the start of the financial crisis and the subsequent Greek crisis in 2010, Greece was subject to substantial cross-border deleveraging from the Euro area as well as from other reporting countries. In 2013, the decline reached a trough and stabilized at significantly lower levels. In the first two quarters of 2015, a new deleveraging in cross-border terms can be observed as both the Euro area and other reporting countries decreased their exposure on the back of renewed tensions in the Greek negotiations process.

Bilateral net portfolio investment holdings of Cyprus report an increasing accumulation of portfolio assets vis-à-vis Russia, the United Kingdom and others in the run-up to the crisis. At the same time, the Euro area increased its exposure to Cyprus: from 2008 on, resident investors purchased significant amounts of British and Greek securities. Flows to Greece started to diminish when the Greek crisis hit in 2010, and in June 2012, a haircut of 53.5 percent was applied to the nominal value of Greek government bond holdings. The total bank losses in Cyprus as a consequence of the Greek PSI are estimated at 4 billion euro (around 22 percent of GDP) according to the European Commission (EC, 2013). This is reflected in the contraction of stocks in 2013, especially regarding the assets held in Greek securities. Between June and December 2014, Luxembourg (and to a lesser extent Russia) seemed to increase their portfolio exposure to Cyprus again significantly.

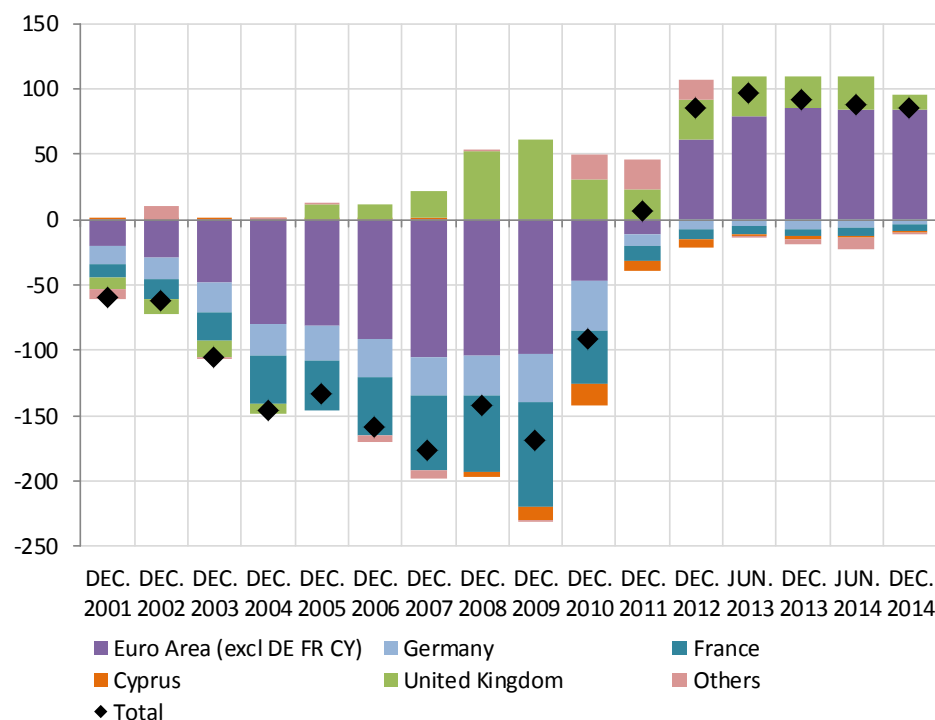
In terms of **banking exposure to Cyprus**, Panel B in

Figure 35 reports that Greece, the rest of the euro area and other reporting countries increased their exposure until the start of the financial crisis in 2008. Greek banks also continued to increase their exposure slowly during the crisis while the rest of the euro area steadily decreased it. The events unfolding during winter/spring 2013 accelerated this trend and led to a major drop in banking claims on Cyprus. Only recent data from June 2014 onward shows a stabilization of cross-border deleveraging and a slight pickup in the first two quarters of 2015.

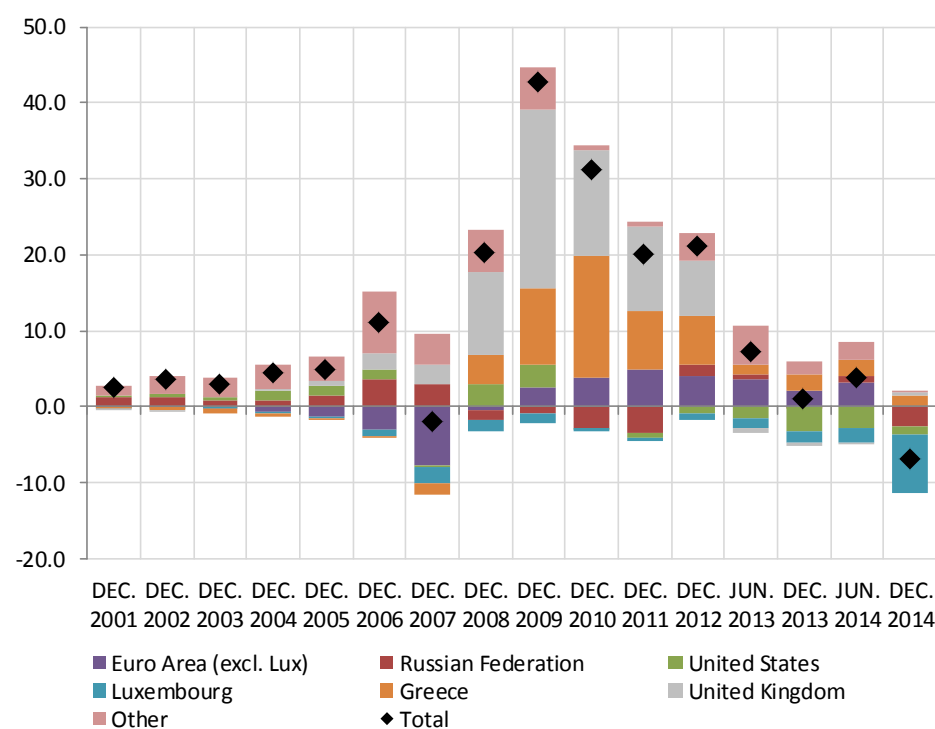
Overall, both Greece and Cyprus experienced large capital inflows up to the financial crisis in 2008/09. With the start of the sovereign debt crisis in Greece in 2010, capital started leaving the country and Greece turned into a net exporter of capital by the end of 2012. Over 2013, portfolio investment outflows were smaller as the outlook for the Greek economy improved, a trend which continued in 2014. Since 2010, Greece was also subject to substantial cross-border deleveraging, a trend which stabilized in 2013 at significantly lower levels. Amid the economic and political unrest in 2015, renewed outflows of banking-related investment can be observed, reflecting deposit flight and a liquidity crisis before the agreement to a third financial assistance programme was reached. Cyprus saw a much slower and more gradual withdrawal, even during the outbreak of the European debt crisis, which accelerated with the outbreak of the Cypriot crisis in winter 2012/spring 2013. A deposit flight began in January 2013, and almost 4 percent of total deposits were lost during the first two months of the year. On 22 March 2013, the Cypriot government established restrictive measures on capital movements. This is reflected in large net capital outflows mostly concerning portfolio and other investment amounting to 10 percent of GDP in 2013Q1 (which continued to some extent throughout 2013). In 2014, portfolio, debt and other investment flows stabilized, and in 2015 bilateral banking data show a slight pick-up in portfolio and banking investment in Cyprus.

Figure 34 Net portfolio investment positions of Greece and Cyprus

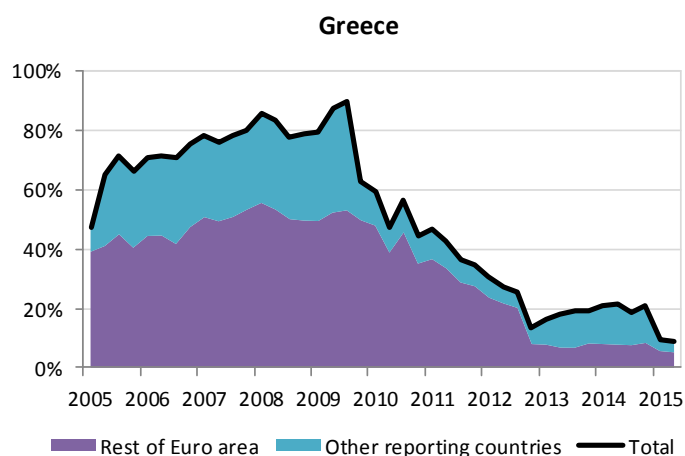
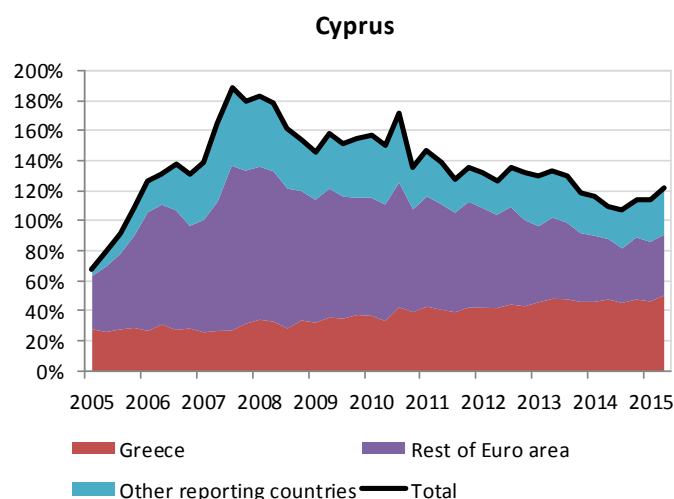
Panel A: Greece (Billion USD)



Panel B: Cyprus (Billion USD)



Source: IMF Coordinated Portfolio Investment Survey (CPIS); Note: Data availability is June 2014.

Figure 35 Net Foreign Banking exposures to Greece and Cyprus**Panel A: claims on Greece**
(in percent of GDP)**Panel B: claims on Cyprus**
(in percent of GDP)

Source: BIS, Consolidated Banking Statistics, Ultimate Risk Basis. GDP: Thomson Reuters Datastream.

Box 4 – Capital controls in Cyprus and Greece**Cyprus:**

Cyprus authorities implemented a set of capital controls on 27 March 2013 in order to avoid a massive bank run. The following measures were imposed:

- 47.5% levy of all deposits above 100.000€ in Laiki Bank. This money was used to recapitalize the bank resulting from the merge between Laiki Bank and Bank of Cyprus. The rest of the money could be withdrawn little by little (6, 9, 12 and 24 months).
- Restrictions on cash withdrawals (300€ per person/day until 31 March 2014. Legal entities 300€ per account/day until 2 August 2013 and 500€ from there until 31 March).
- Non-cash payment: Individuals, legal entities and regular business had to face restrictions on payments until 31 March 2014. These restrictions were revised and softened over the year. In addition, tighter conditions were applied to individuals and institutions abroad from Cyprus.
- Opening restrictions: Opening new accounts was not possible unless they were funds from abroad intended to stay in Cyprus for more than 3 months. This measure was abolished on 31 May 2014.
- Cyprus authorities banned the addition of new beneficiaries to an existing account. Moreover, cash checks were prohibited. This measure passed away on the 31 May.
- Transactions by international customers of foreign banks faced restrictions from 27 March 2013 to 2 August 2013.
- An extension in time deposits maturing in one month was implemented. It started with 90% of the deposit value until 2 August and turned to 80%

from 2 August until 24 February.

- There will no longer be a monthly cap of €20,000 on transfers by individuals to foreign banks or of €10,000 for travellers moving money out of the country.
- Transfers of more than €5,000 required permission from the central bank.

All the remaining capital controls were lifted on 6 April 2015, two years after their implementation. The monthly cap of €20,000 on transfers by individuals to foreign banks and the €10,000 limit for travellers moving money out of the country was abolished on that date.

Greece:

Following the decision to hold a referendum on the creditor terms of the Greek financial assistance programme, the Greek government introduced capital controls on Monday, 29 June 2015 and closed banks until after the referendum (set for 5 July 2015). The measures were¹⁸:

- From 29 June until 7 July, banks and the stock market in Greece remained closed.
- Restrictions on cash withdrawals: From 29 June, each person was only able to withdraw 60€ per card from ATMs. There were no restrictions for tourists as their cards were issued abroad.
- Electronic transactions within the country were not affected. The Committee to Approve Bank Transactions was created to deal with exceptional cases in which 60€ withdrawal per day is not enough.
- Greek authorities banned transfers and payments abroad.
- Greek authorities decided to "open" banks with strict on-the-door policies and allowed pensioners without a bank card to withdraw €120 a week.

As of 18 August:

- Greeks can wire up to €500 a month abroad.
- Cash withdrawals rose to €420 a week as Athens brokered a deal with the country's creditors.
- Greek citizens can also send up to €5,000 out of the country every three months to their children if they are studying abroad and up to €8,000 with documents proving those expenses.

¹⁸ See also: <http://www.bloomberg.com/news/articles/2015-06-29/what-are-greece-s-capital-controls->

4. Financial cycles, financial integration & macro-prudential policy in the Euro area

4.1 Introduction

The financial crisis prompted a renewed interest in macro-prudential policy as a framework to address the stability of the financial system as a whole rather than only its individual components. One lesson from the crisis is that while being an objective of global relevance, preserving financial stability appears to be even more important in contexts where financial linkages are strong and deep, such as in the Euro area. The set-up of an effective macro-prudential framework appears to be especially important for the Euro area going forward in light of the low interest rate environment spurred by ECB expansionary policy, which may encourage excessive risk taking by the financial sector.

However, the macro-prudential debate is mainly held in a global context, somewhat neglecting the specific features of Europe. Defining the optimal macro-prudential policy setting for a heterogeneous monetary union like the Euro area poses additional challenges compared to the case of a standalone country. Members of the currency union are in fact subject to a common monetary policy and in principle cannot impose direct limits/controls on the flow of capital, an instrument sometimes used in the cases of emerging markets¹⁹. The purpose of this paper is to contribute to the European macro-prudential discussion by empirically assessing the special challenges for the set-up of macro-prudential policy in the Euro area due to strong financial integration and the free flow of capital.

By computing the cycles in real credit growth and real house prices growth for both the Euro area as a whole and the individual member states, section 4.2 establishes two facts that have important policy implication as far as it concerns the set-up of macro-prudential policy for the euro area. First, the Euro area has a financial cycle, like any other standalone country. Over the last decade, this cycle has been “well-behaved”, fluctuating very moderately. Second, behind this smooth cycle, individual countries’ positions diverged substantially across the Euro area.

Section 4.3 investigates the reasons behind the divergence in domestic financial cycles of Euro area member states, and it will show that divergence was very much linked to what could be considered the most important achievement of currency unification, i.e. financial integration²⁰. Quantity and price measures of intra-euro area financial integration will be shown, as well as the geographical

¹⁹ There are two qualifications to this point. First, while being unimaginable earlier, the severe crises in Cyprus and Greece have led to the introduction of payments and capital controls, which were approved by European institutions. Second, despite the establishment of the European Banking Authority, which aims to coordinate between home and host supervisors in the EU, several unilateral actions were adopted by national supervisors to ring-fence banking activities. In February 2013, the European Commission even had to issue a statement trying to limit such activities (see e.g. Bloomberg ‘EU Warns of ‘Disproportionate’ Crackdown on Cross-Border Banking’, 4 February 2013).

²⁰ Section 2 updates and expands section 4.6 from our report of last year and from Merler (2014) <http://bruegel.org/2014/01/home-sweet-home-bias-and-other-stories/>

diversification of Euro area banks' loans and debt portfolios. This analysis suggests that while the Euro area was becoming more financially integrated with the world during the first decade of the 21st century, most of the surge in financial activity associated with the introduction of the single currency is explained by intra-area activity.

Section 4.4 will show how the introduction of the euro drew interest rates to historically low levels, boosting credit demand. It will also look at how the credit boom in the South was financed from the side of the banking sector, showing that the growth of credit was closely associated with a strong increase in banks' non-core liabilities. This finding suggests that banks relying heavily on non-core liability are exposed to the volatility of these funding sources.

Section 4.5 will look at how the credit boom in the South was financed from the side of the banking sector, showing that the growth of credit was closely associated with a strong increase in banks non-core liabilities. Banks relying heavily on non-core liability are exposed to the volatility of these funding sources, so this finding suggests that the pre-crisis credit expansion was accompanied by the build-up of significant financial stability risk.

Section 4.6 will draw the link between financial cycles and their macroeconomic counterpart by showing that financial cycles' divergence was accompanied by growing external imbalances and the dis-anchoring of domestic savings and investment across countries in the Euro area. The historically low rates associated with the introduction of the Euro spurred a credit boom in the South, but the bulk of credit went to the housing sector (from which the importance of house prices for describing the credit cycle developed).

The conclusion from the empirical analysis is that the divergence in financial cycles within the euro area is very much linked to capital flows and especially to intra-euro area flows. This finding has important policy implications because it raises the question of whether macro-prudential policy can be compatible with a monetary union characterised by the free flow of capital. Section 4.5 and 4.6 will look at the special challenges that macro-prudential policy making faces in a heterogeneous monetary union such as the euro area and will discuss the current set up in light of these findings.

4.2 Financial Cycles in the Euro area

Understanding the development of the financial cycle is especially important for the purposes of macro-prudential policy monitoring. The literature suggests that financial cycles' peaks are closely associated with financial crisis and that the cycle helps detect financial distress risks with a good lead. Nevertheless, there is not a unanimously agreed definition of the financial cycle. Borio (2012) uses the term to denote "self-reinforcing interactions between perceptions of value and risk, which translate into a series of booms followed by busts and that can amplify economic fluctuations". This definition is closely linked with the increasingly popular idea of pro-cyclicality of the financial system²¹.

As far as it concerns the empirical representation, the literature has established two important stylised features of the financial cycle. First, the financial cycle has a much lower frequency than the traditional business cycle. Drehmann et al (2012) show that the average length of the financial cycle in a sample of seven industrialised countries since the 1960s has been around 16 years and that financial cycles normally have greater amplitude than business cycles. The length and amplitude of the financial cycle are not exogenous as they depend on the policy adopted (Borio 2012), but the existing literature identifies a tendency for financial variables to evolve at a relatively slow pace (see also Aikman et al 2010). Second, the financial cycle appears to be most parsimoniously and effectively described with fluctuations in credit and property prices (Drehmann et al. 2012). These two variables tend to co-vary rather closely with each other, and the variability in the two series is dominated by low-frequency components (whereas equity prices are normally found to be "noisier")²². Concerning the methodology, the literature typically analytically investigates the financial cycle by making use of techniques traditionally used for the study of business cycles.

An analysis of the developments of financial cycles for both the Euro area and its Member States seems to be a natural starting point for discussing the macro-prudential set up for the Euro area, especially since the literature on this is still relatively new and limited²³. In this paper, credit cycles are estimated for both the Euro area as a whole and eleven Member States. We follow the methodology in Drehmann et al (2012) and Aikman et al (2011) and apply a band-pass filter²⁴ to isolate specifically medium-term credit cycles, defined as cycles in real credit growth with duration between 8 and 30 years. The same analysis is replicated for real house prices, and a summary indicator of the financial cycle is constructed by combining these two variables by means of principal component analysis.

²¹ See e.g. Borio et al. (2001); Danielsson et al. (2004); Kashyap and Stein (2004); Brunnermeier et al. (2009); Adrian and Shin (2010).

²² There is however a number of studies that focused exclusively on credit growth, such as Aikman et al. (2010), Schularick and Taylor (2009), Jordá et al. (2011),

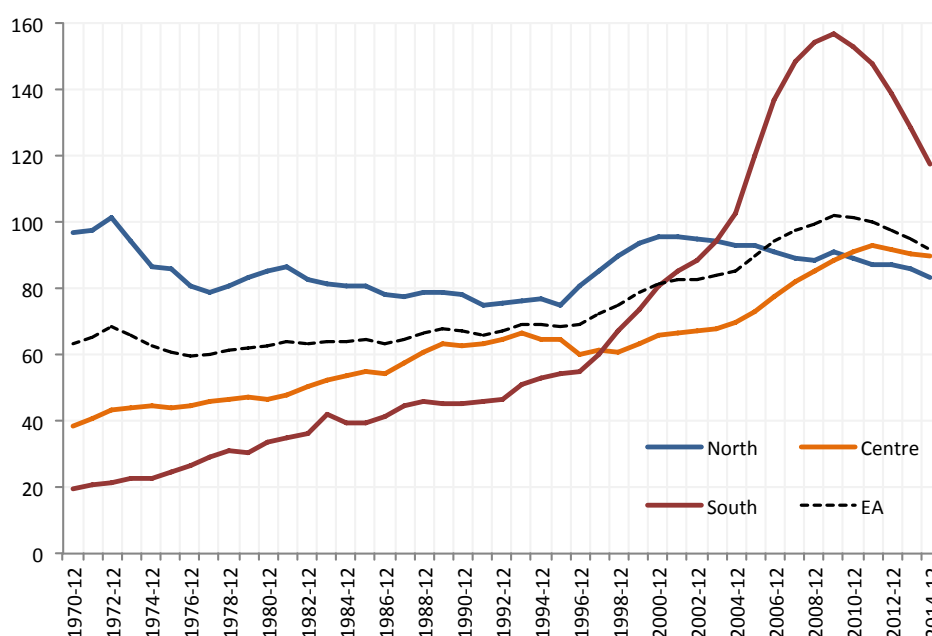
²³ To our knowledge a financial cycle analysis in the European context has been conducted only recently in Hibert et al. (2014)

²⁴ More specifically, following Drehmann et al. (2012) and Aikman et al. (2011) I apply the band-pass filter developed by Christiano and Fitzgerald (2003), which is implementable in statistical packages like STATA and is a common choice in the existing literature on financial cycles. Christiano and Fitzgerald provided evidence that their filter is preferable to Baxter and King's when extracting lower frequencies (and recent works agree on the fact that the financial cycle displays a lower frequency than the traditional business cycle). Aikman et al. (2011) also experiment with a Hodrik-Prescott filter and find comparable results, but they conclude that the choice of appropriate parameters is less straightforward.

Domestic Credit Cycles in the Euro area and individual Member States

During the first decade since monetary unification, credit developments diverged significantly across countries in the EMU (Figure 36). In the South—defined here as Greece, Ireland, Portugal and Spain—bank credit to the private sector boomed, growing faster than for the EA as a whole and more than doubling in percentage of GDP between 1999 and 2009. In the North—Austria, Belgium, Germany, Finland and the Netherlands—credit to the private sector tended to grow slowly, stagnate or even decrease over the same period (Finland being an exception). In Germany, for example, bank credit to the private sector decreased by almost 20 points of GDP from 1999 to 2012. In between these two extremes, Italy and France experienced positive credit growth, faster than in the North but slower than in the South, and closely aligned to the aggregate credit growth of the euro area as a whole.

Figure 36 Bank credit to domestic private sector (% GDP)



Source: BIS; National Sources; IMF; AMECO.

Note: groups are defined as follows: North includes Austria, Belgium, Finland, Germany and the Netherlands; Centre includes France and Italy; South includes Greece, Ireland, Portugal and Spain.

These data suggest the existence of important differences in countries' credit cycles across the Euro area over the last decade, which is confirmed by a formal financial cycle analysis.

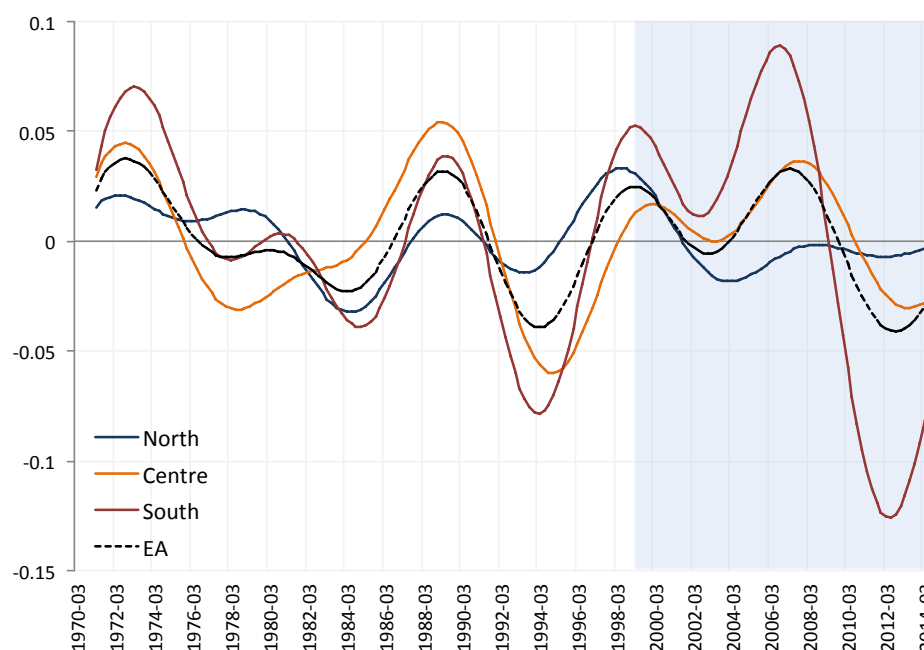
The sample consists of eleven Euro area countries over the period 1960:Q1 – 2014:Q4²⁵, and the underlying variable used to compute the cycles is the growth of domestic banks' credit to the private sector in real terms²⁶. A measure of

²⁵ The aggregate for the euro area as a whole is constructed as the sum of individual countries positions.

²⁶ Data comes from a recently constructed BIS cross-country dataset and series have been checked against those provided by national authorities. Whenever needed, series have been back-dated using growth rates from the historical statistics in IMF IFS. All series have

overall credit to the private sector would be preferable, but the quality and availability of data beyond bank credit is not always good. In light of the importance of bank intermediation in the Euro area financial system, however, bank credit is especially relevant from a policy perspective. Figure 37 shows estimated credit cycles for the Euro area as a whole and the three groups of countries previously defined.

Figure 37 Estimated cycles in the growth of real bank credit to the private sector



Source: Bruegel calculations based on data from BIS; National Sources; IMF; AMECO.

Note: shaded area indicates the period after currency unification

Two interesting facts emerge. First, the euro area has a credit cycle, just as any other standalone country, and this credit cycle has been very moderate and smooth over the last decade. Second, there appears to have been significant divergence within the Euro area, starting around the time of currency unification. In the early 2000s, Southern countries entered a rapid expansion phase of their credit cycle which lasted until 2008, when the financial crisis abruptly turned the boom into a deep bust. The opposite happened to the Northern countries, which entered a phase of sluggish real credit growth at about the same time. The credit cycles of France and Italy followed very closely the aggregate cycle of the Euro area, with a moderate expansion over 2000-2008 and a moderate contraction later.

Group aggregates offer an effective synthetic picture, but the divergence appears even more pronounced at the individual country level. This is especially evident from a comparison of credit cycles in Germany, the Netherlands, Spain, Ireland, Italy and France²⁷ (Figure 38, Figure 39 and Figure 40). From 2001-2009, credit cycles diverged markedly across these countries. In 2001, real credit growth

been deflated using CPI series from IFS and are converted in logarithms, so that the annual growth rate is defined as the 4-quarters log difference.

²⁷ See annexes A and B to see results for all the individual countries.

entered a downward phase both in Germany and the Netherlands. In Spain and Ireland the opposite happened. It is interesting to notice that in both Spain and Ireland, real credit growth appeared to have peaked in the late Nineties and was on a downward path, but it rapidly diverted back upwards in 2001 after the introduction of the euro. As previously anticipated, France and Italy have moved closely with the Euro area cycle since 2001 and even more closely now than before.

Figure 38 Credit Cycles – Individual countries

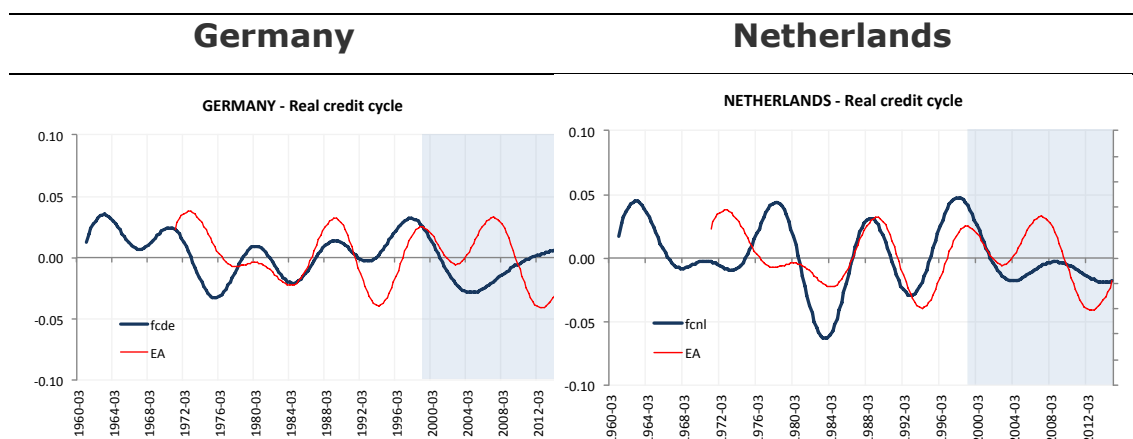


Figure 39 Credit Cycles – Individual countries

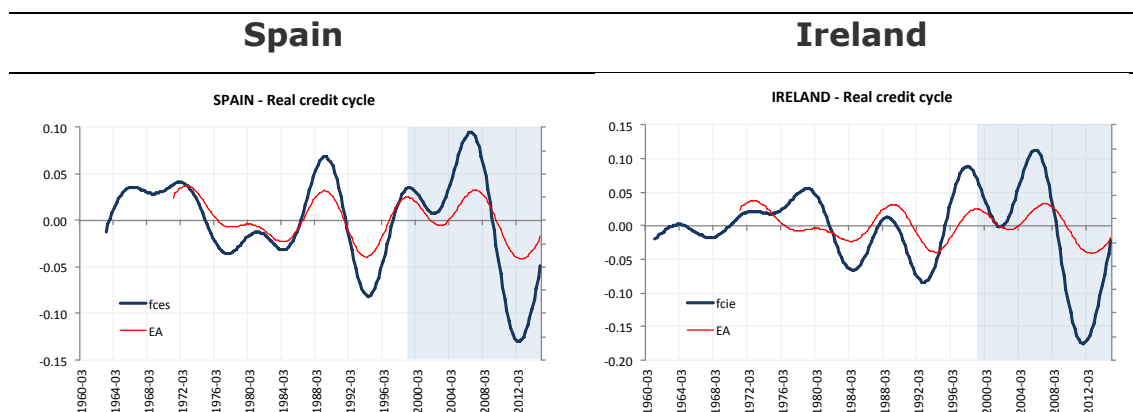
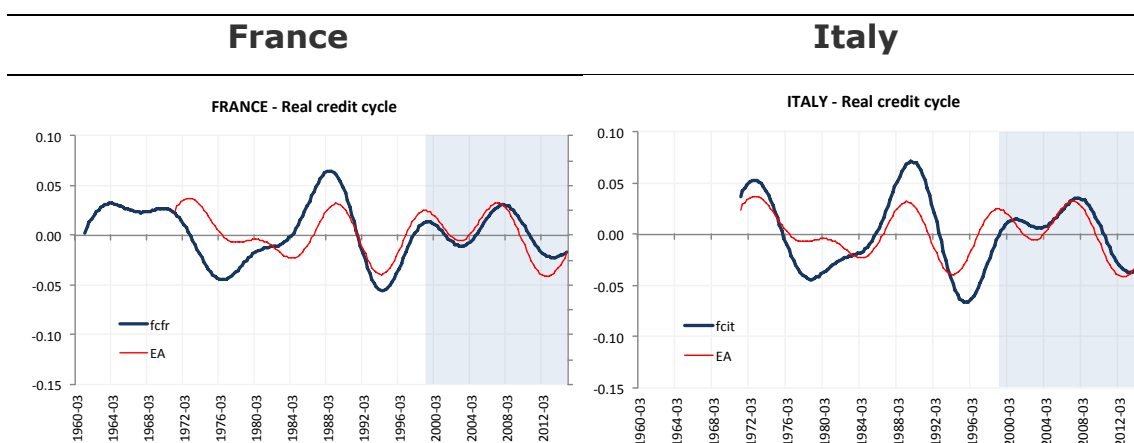


Figure 40 Credit Cycles – Individual countries

Note: real bank credit to domestic private sector, year-on-year growth (BIS, National Sources, IMF and own calculations). Shaded area indicates the period after currency unification.

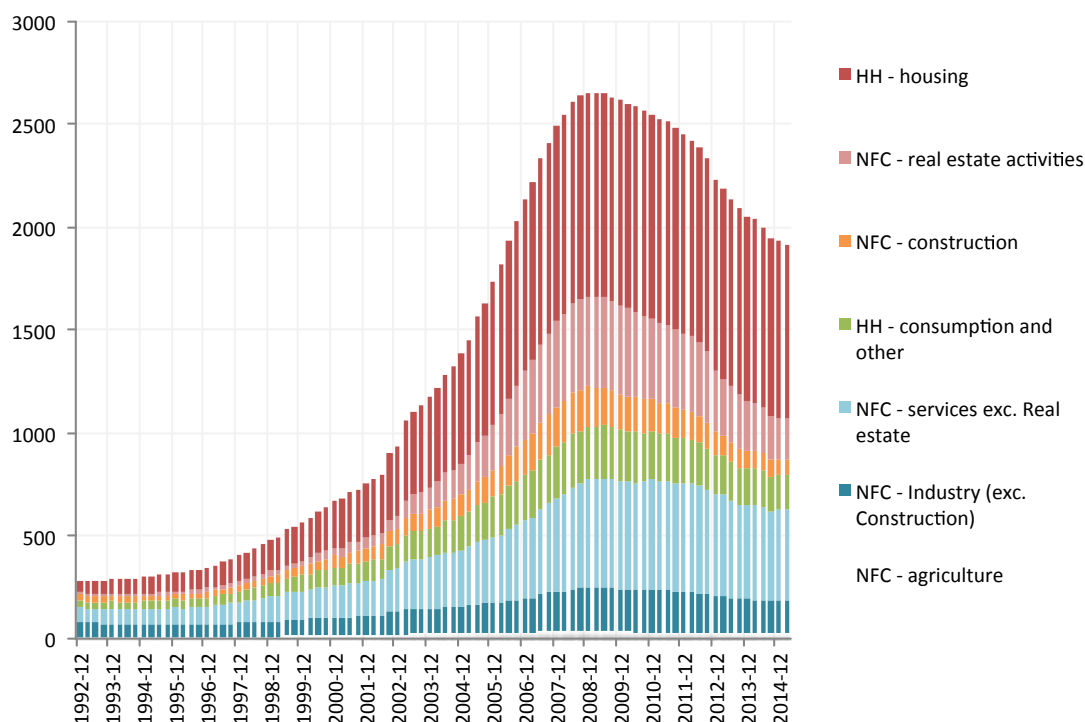
Another interesting fact emerging from this credit cycle analysis is that no significant divergence is detected over the period 1980-2001. Before 2001, the amplitude of fluctuations differed (even considerably) across countries and peaks were not always synchronised, but there does not seem to be a period during which the sign of individual countries' cycles was persistently different from the sign of the Euro area's cycle. In other words, before 2001, when the credit cycle of the Euro area as a whole was in an expansion (or contraction) phase, it tended to be the result of all countries being in an expansion (or contraction) phase. From 2001 on, this has no longer been the case²⁸.

House Prices cycles in the Euro Area and individual Member States

In several countries, the surge in bank credit was closely associated with a boom in the housing sector. Figure 41 shows banks' credit to the domestic private sector in the South, broken down by borrower (non-financial corporations vs. households) and by end-use of the credit. The total of credit directed to non-financial corporations operating in the construction sector and real estate activities or directed to households for housing purposes increased from 34% of total credit in 1992 to 63% in 2007.

²⁸ The same analysis has also been replicated using the growth in credit to GDP ratio as an underlying variable. Cycles in credit to GDP ratios appear less aligned before the crisis than cycles in real credit growth, but the main results are confirmed for the three groups and individual countries.

Figure 41 South: Bank credit to private sector by sector and purpose (euro bn)

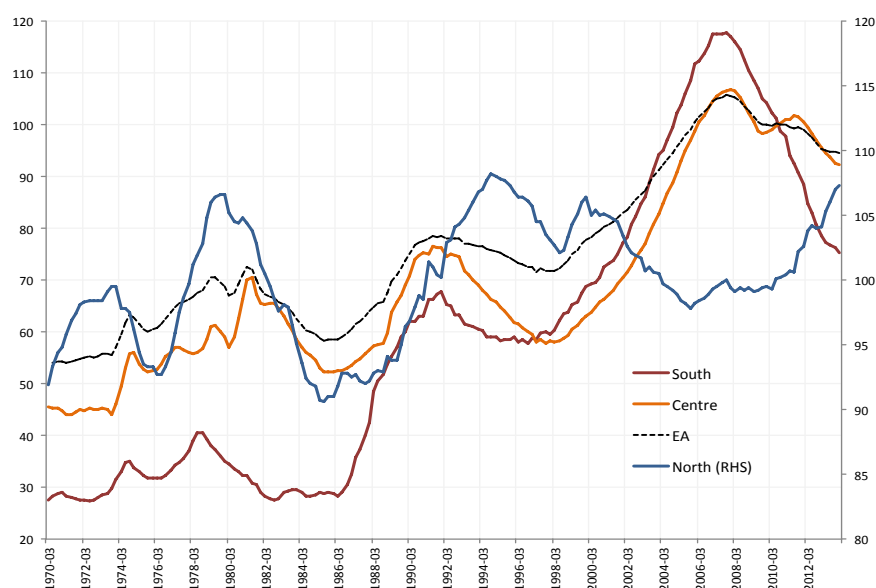


Source: Bruegel calculations based on data from National Central Banks

Note: South=ES; GR; IE; PT. Last available data is 2015 Q1.

The divergence in credit cycles is therefore reflected in different house price development across Euro area countries over the pre-crisis period (Figure 42).

In the North, real house prices picked up in 1994, started to decrease in the late Nineties until 2009, and have recently started to increase again. There are significant intra-group differences: prices decreased in real terms over the period 2000-2009 in Germany, whereas in the Netherlands they kept growing until the crisis but at a slower pace after 2000. In the Centre and the South, prices increased very rapidly from 1999 on and decreased during the crisis. The difference between South and Centre in this case is mostly in the drop during the recent crisis (which was more pronounced in the South). Spain and Ireland experienced both the strongest and fastest pre-crisis growth and the deepest contraction in real house prices during the crisis. Italy and France underwent slightly more moderate expansion and contraction phases.

Figure 42 Real house prices (2010=100)

Source: OECD.

Note: groups are GDP-weighted aggregate of individual countries indexes

We replicate the analysis carried out in the previous section and estimate here the cycles in real house prices growth. Data on real house prices comes from OECD statistics and is only available after 1970Q1 for most countries, meaning that the time series for house prices is 10 years shorter than for credit. Data is missing in many years for Austria, Greece and Portugal, making the series too short for the purpose of filtering medium term frequencies. These countries have therefore been excluded from the sample in this exercise.

The estimated cycles of real credit and real house prices yield consistent messages. Intra-Euro area divergence is evident also in the growth of real house prices, which over the period 2000-2008 stagnated in Germany and the Netherlands, boomed in Spain and Ireland and fluctuated more moderately in Italy and France (Figure 43, Figure 44 and Figure 45).

Figure 43 Real house prices – Individual countries vs. EA (red line)

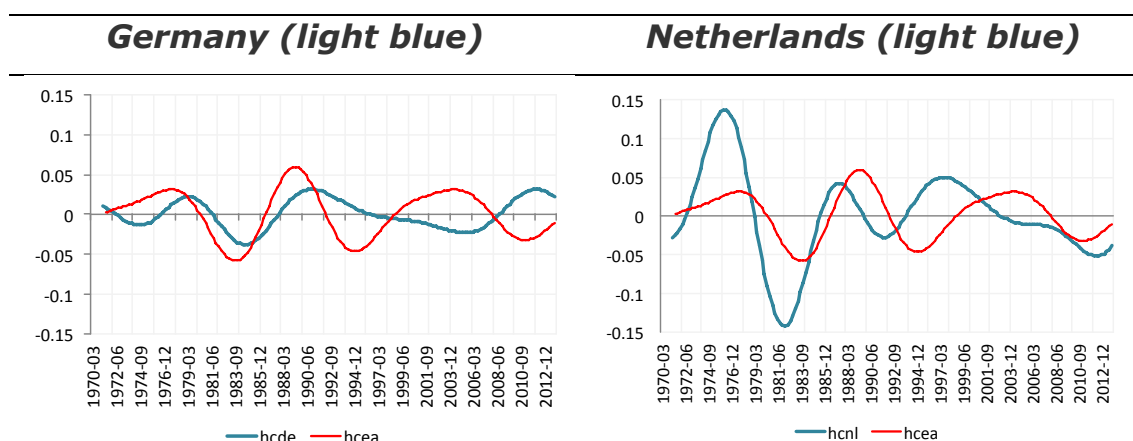


Figure 44 Real house prices – Individual countries vs. EA (red line)

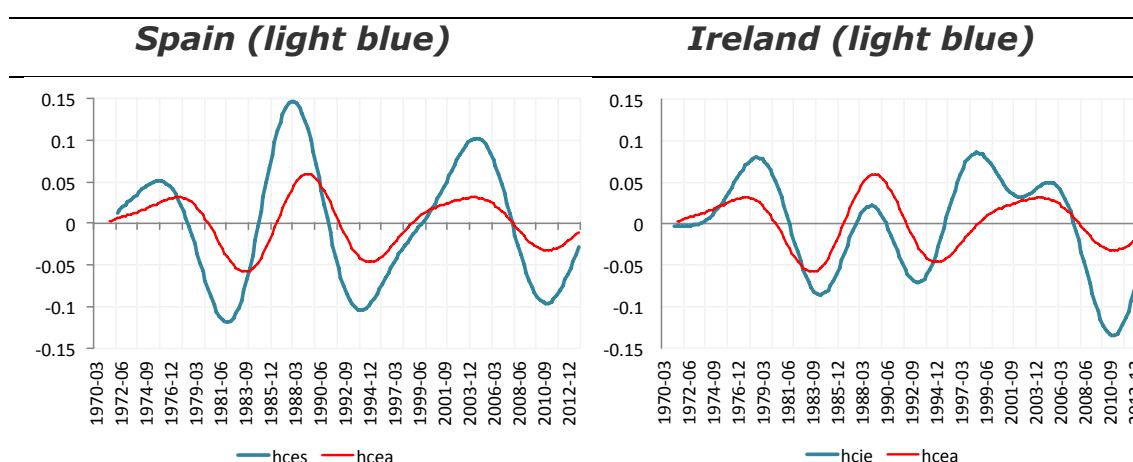
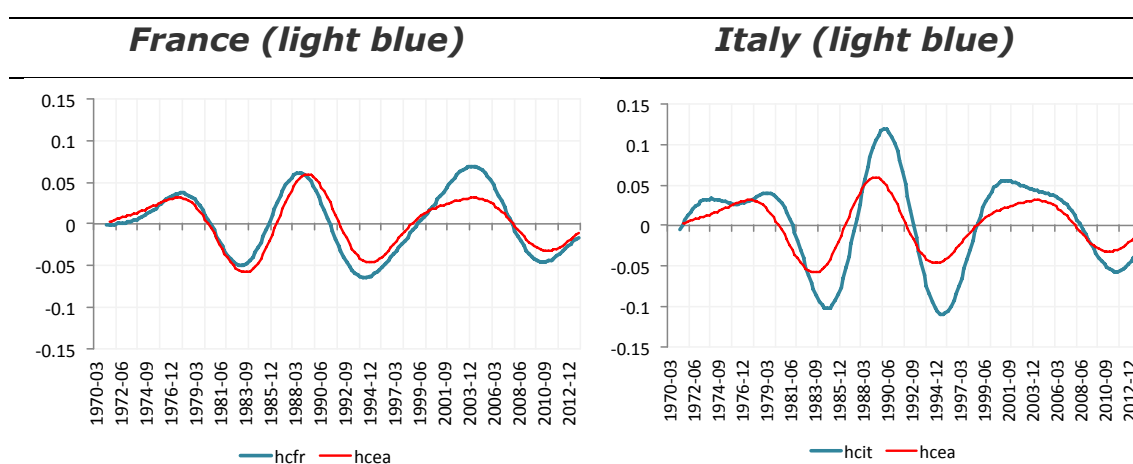


Figure 45 Real house prices – Individual countries vs. EA (red line)

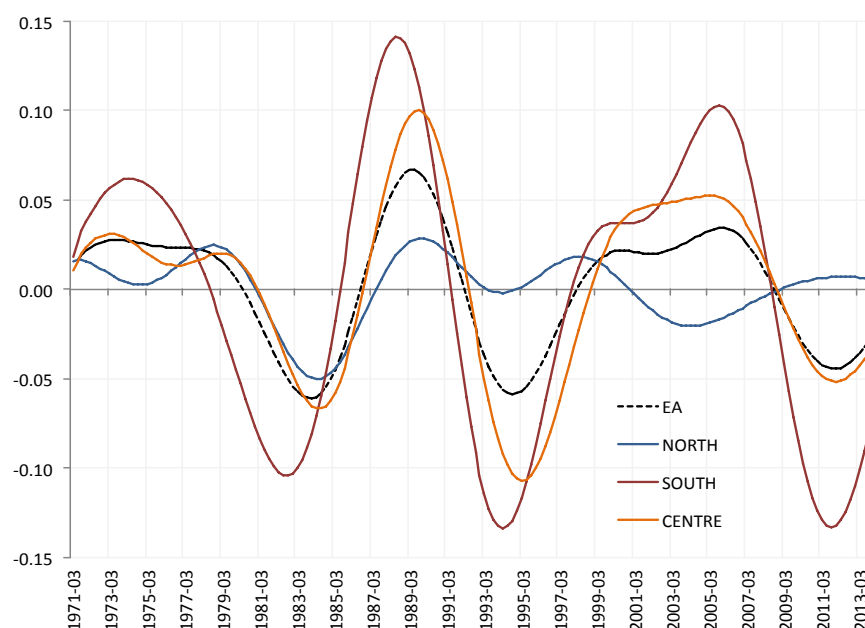


Note: real house prices growth, year-on-year growth (OECD and Bruegel calculations). Shaded area indicates the period after currency unification.

A rudimentary financial cycle measure

Cycles in credit growth and house prices can be combined into a unique synthetic indicator²⁹ by means of Principal Component Analysis (PCA). PCA is a statistical technique used to reduce multivariate data into a smaller set of components that capture the maximum amount of variance³⁰. Here, PCA is used to summarize into a single indicator the information contained in the variance of credit growth and the growth of real house prices (see also Hibert et al 2014). The principal component indicator is only estimated here for those countries that have a long enough time series on both credit and house prices, i.e. all countries in the sample with the exclusion of Austria, Greece and Portugal³¹.

Figure 46 Financial cycle: principal component of cycles in real house prices and credit



Source: Bruegel calculations based on data from BIS; national sources; IMF; AMECO; OECD.

This simple measure of the financial cycle (Figure 46) confirms the previous findings, most notably the existence of a moderate financial cycle for the Euro area as a whole and divergence across countries since the late Nineties. In Spain and Ireland, the introduction of the euro seems to be associated with the start of a big expansionary phase in the financial cycle (Figure 48). In the case of Ireland, there was a temporary downturn in correspondence when the dot-com bubble burst, but it quickly reverted into an expansion phase. In Germany and the

²⁹ Ideally, such an indicator would also include other components, such as asset and equity prices. Based on the existing literature, however, credit and house prices are found to be the most important drivers of the financial cycle also for Euro area countries (Hibert et al. 2014).

³⁰ PCA can be based on a covariance or correlation matrix, the different being that in the second case a re-normalization of the data would be involved. This is particularly important in case the data are expressed in different scales, which could otherwise influence the result. In this paper, since the previously estimated financial cycles were already expressed in the same scale the covariance-based PCA has been applied.

³¹ The definition of the three groups in Figure 10 has been changed accordingly, meaning that **Error! Reference source not found.** is not entirely comparable with **Error! Reference source not found.**.

Netherlands the opposite happened (Figure 47), and both countries entered a contraction phase in the late Nineties. Contraction lasted until 2010 in Germany and longer in the Netherlands. France and Italy again are found to move very closely to the Euro area financial cycle (Figure 49).

Figure 47 Summary indicators of financial cycles – Individual countries vs. EA (red line)

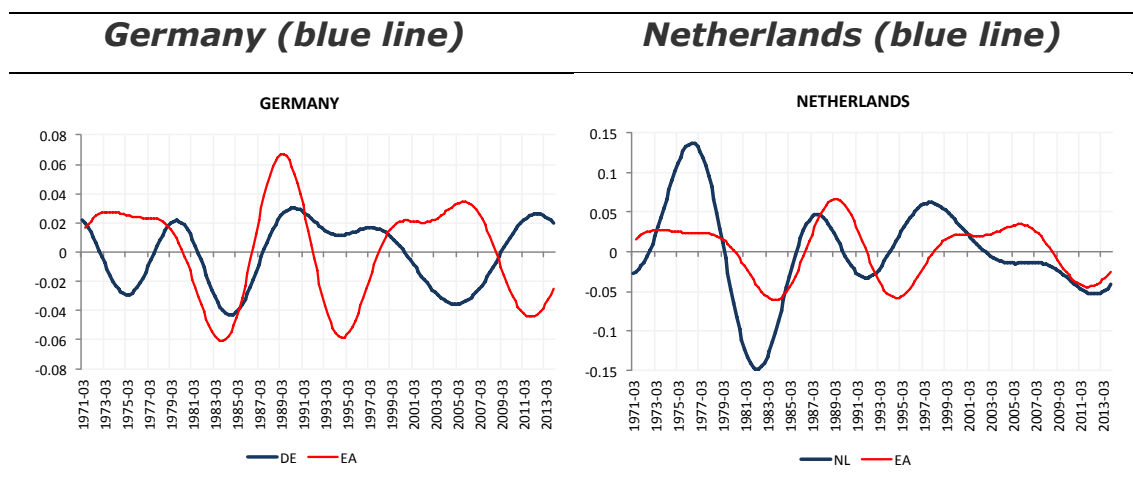


Figure 48 Summary indicators of financial cycles – Individual countries vs. EA (red line)

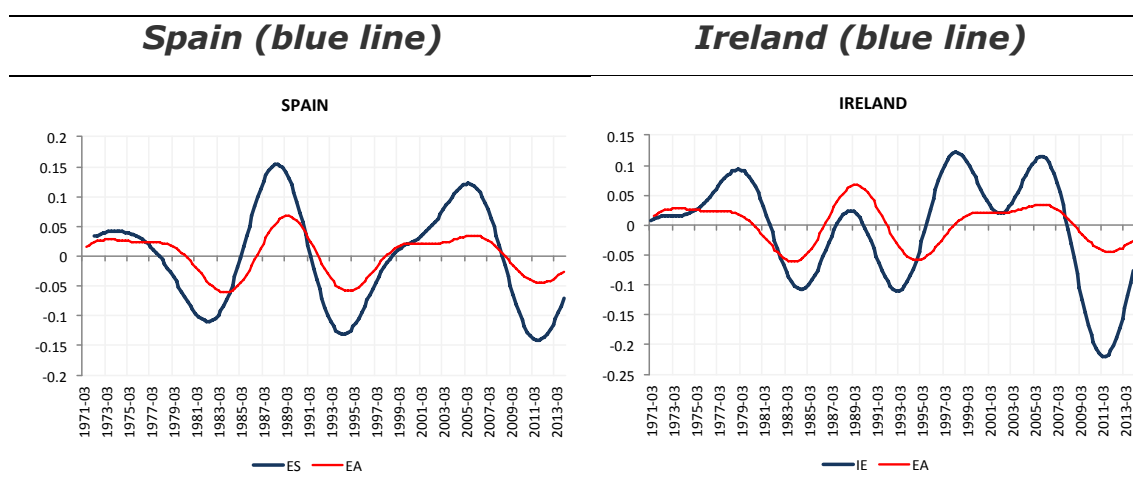
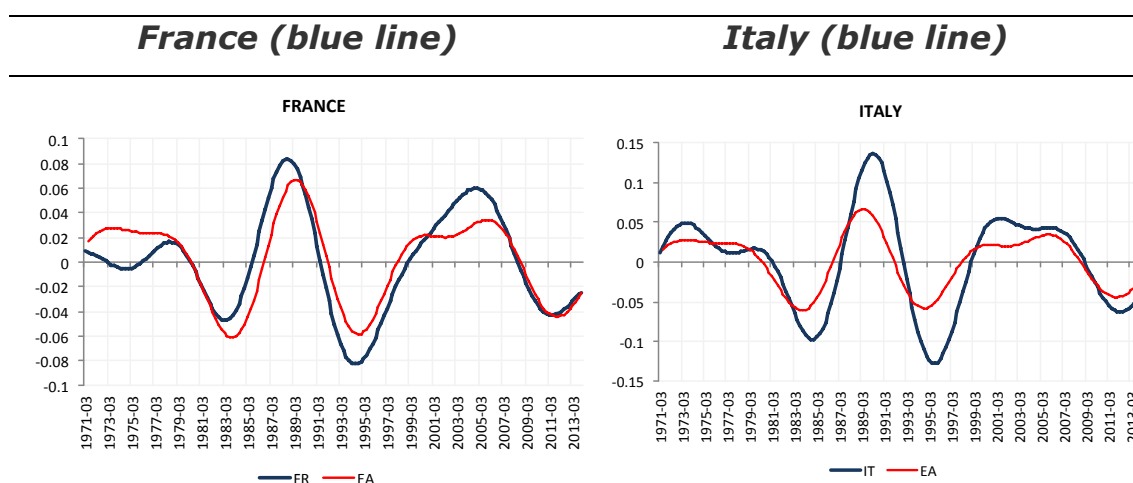


Figure 49 Summary indicators of financial cycles – Individual countries vs. EA (red line)

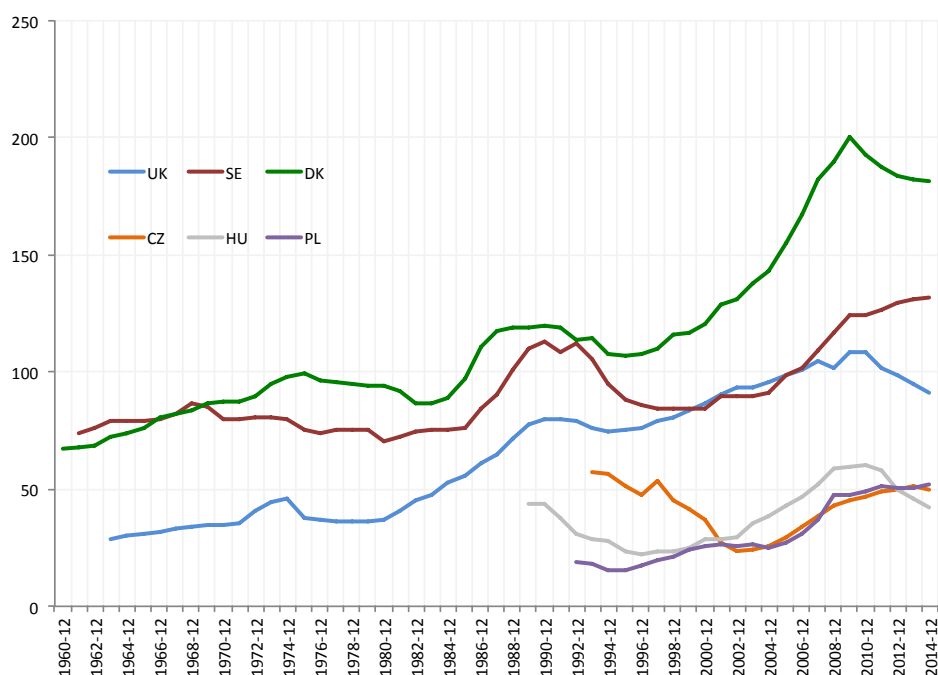


Note: real bank credit to domestic private sector, year-on-year growth (BIS, national sources, IMF and own calculations).

Developments outside the Euro area

Section 4.2 showed the existence of significant differences in countries' domestic financial cycles within the Euro area. To understand whether this phenomenon was particular to Euro area countries, we replicate the credit cycle analysis for selected EU non-Euro area countries.

Data are less readily available for non-euro area countries, especially when it comes to the New Member States. Financial cycles' computation requires very long time series, so it is only possible to replicate the analysis of the previous section for the UK, Denmark and Sweden. Credit to GDP grew especially fast in Denmark between the late Nineties and the crisis, as it also did in Sweden and the UK, although to a lesser extent (Figure 50).

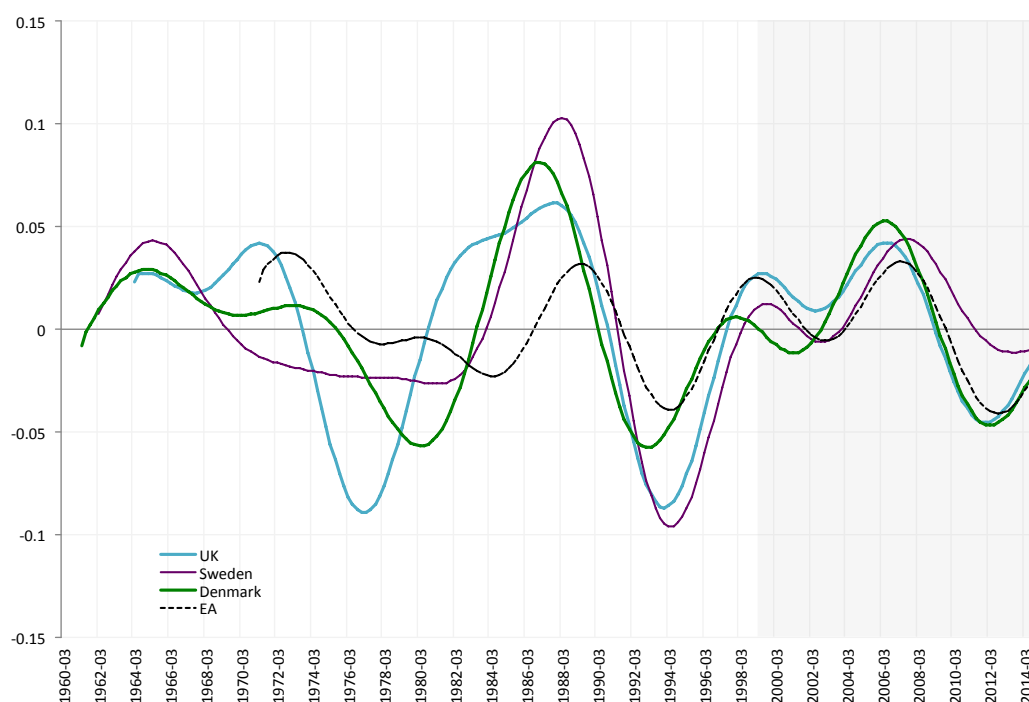
Figure 50 Credit to GDP – selected non-EA EU countries

Source: Bruegel based on data from BIS, IMF and AMECO.

Comparing real credit cycles for the UK, Denmark and Sweden with the previously estimated credit cycle for the Euro area yields an interesting result (Figure 51). Perhaps somewhat strikingly, these four credit cycles have been very similar since the early Nineties. Credit cycles in the UK, Denmark and Sweden have been closer than domestic credit cycles of Euro area member states to the Euro area cycle. This suggests that credit developments for the Euro area as a whole (i.e. considered as a single country) were very much in line with what was occurring throughout the rest of the EU. The significant internal divergence shown in the previous section would instead be more similar to developments observed in Central and Eastern European countries, for which we do not have long enough time series to run a comparable analysis.

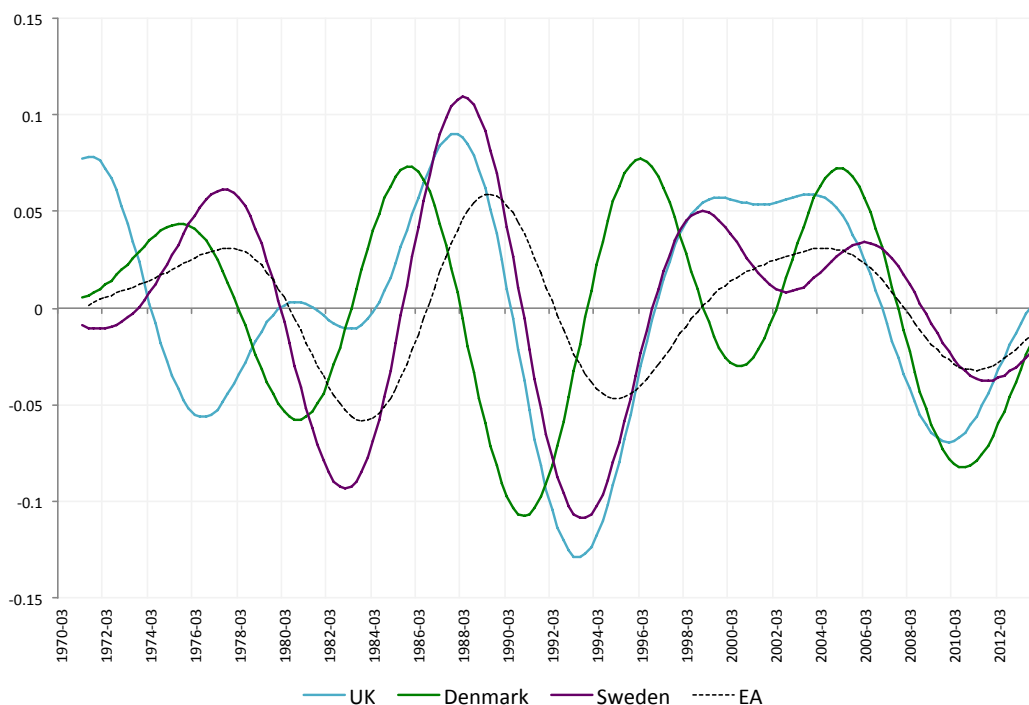
The picture is less clear in terms of house prices cycles (Figure 52), where developments appear more diverse, but because housing markets are very national markets, it should not be surprising that cycles in house prices appear more idiosyncratic than credit cycles.

Figure 51 Real credit cycles – UK, Denmark, Sweden, Euro area



Sources: Bruegel based on data from BIS, IMF and AMECO

Figure 52 Real house price cycles – UK, Denmark, Sweden, Euro area



Source: Bruegel based on data from BIS, IMF and AMECO.

Overall, this analysis of financial cycles has established three facts that are important from a policy perspective. First, the Euro area has a financial cycle, like any other standalone country. Over the last decade, this cycle has been “well-behaved”, fluctuating very moderately. Second, behind this smooth cycle, individual countries’ positions diverge substantially within the Euro area. For Germany and the Netherlands, 1999 marked the turn of the cycle into the contraction phase that lasted until very recently. For countries in the South, the opposite happened, and the currency unification is associated with the start of a big expansion in the cycle. France and Italy experienced more moderate fluctuations and remained very closely aligned with the Euro area cycle. These results are valid for cycles in credit as well as house prices. Third, the credit cycle of the Euro area as a whole (i.e. considered as if it were a single country) has been very much in line with credit cycles in other big non-Euro area EU countries such as the UK, Denmark and Sweden.

4.3 Explaining the divergence of financial cycles within the Euro area

Why did countries’ financial cycles diverge so markedly within the Euro area?

This section will show that this divergence is very much linked to cross border capital flows and in particular *intra*-euro area flows. This statement has important policy implications as it raises the question of whether macro-prudential policy can be compatible with a monetary union characterised by the free flow of capital, where intra-area capital flows are found to play an important role in shaping countries’ financial cycles. To understand the link between internal capital flows and the financial cycles of Euro area countries, it is useful to take a step back and review what would have been considered the biggest achievement of the euro introduction before the crisis: financial integration.

The euro, financial integration and dis-integration

One of the most sizable effects of establishing the Economic and Monetary Union (EMU) was the unprecedented degree of financial integration that it spurred across EMU member states. Financial integration happened at a global level over the past three decades as a result both of many countries liberalizing their financial account and the surge in financial innovation (Lane and Milesi-Ferretti, 2003), but the introduction of the single currency made the process even more rapid and sizable in the euro area.

There are generally two ways to measure financial integration: price indicators and quantity indicators. Price-based integration is usually measured by looking at dispersion of interest rates/spreads or asset return differentials (Baele et al. 2004). Quantity-based measures build on indicators of cross-border activities, such as measures of cross-border capital flows and stocks of external assets and liabilities, and are helpful to investigate the extent to which investors have internationalised their portfolios.

Both price and quantity indicators suggest that financial integration in the euro area rapidly built up in the run up to the currency unification. This was expected: economic theory would suggest that by removing a financial friction as sizable as exchange rate risk, the currency unification would allow capital to flow freely

“downhill”. What was not expected, however, was that financial integration could be quickly and abruptly reverted and that countries within the monetary union could under-go internal balance of payment crises. Yet it happened, starting in 2010, when the global financial crisis turned into a euro-specific sovereign-banking crisis. Foreign private investors withdrew massively from countries in the South of the euro area, and the capital flight grew to the point that – absent the ECB’s liquidity provision and the money disbursed under EU/IMF programmes – Southern Euro area countries would have been exposed to full-fledged sudden stops in external financing, a phenomenon normally more frequent in emerging markets (Merler and Pisani-Ferry 2012).

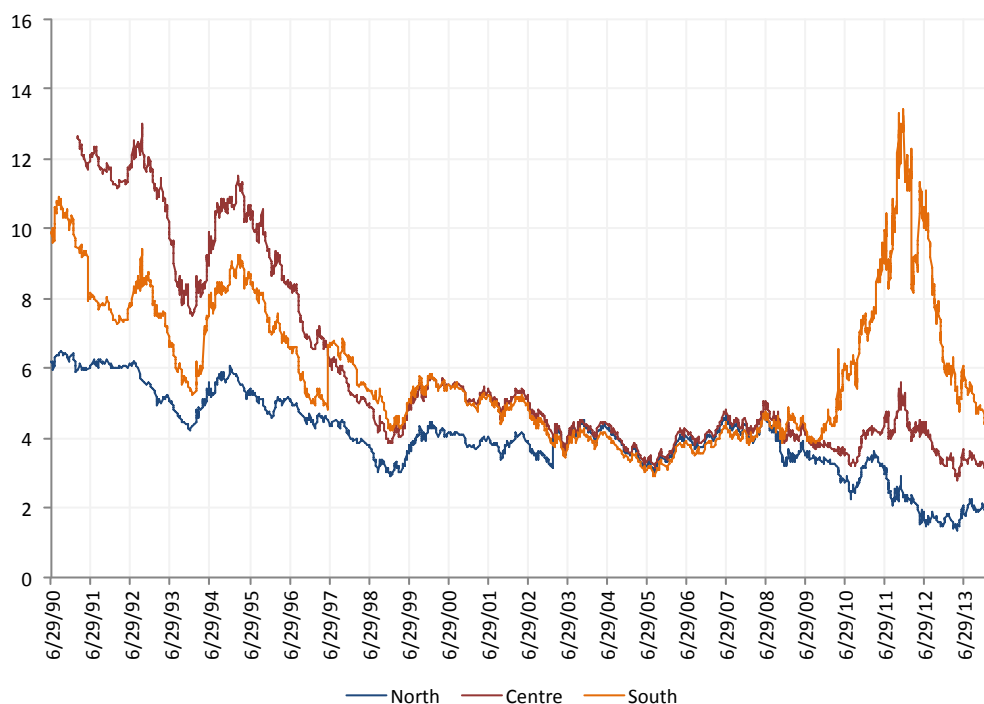
Since the outbreak of the crisis in 2008, but especially since the beginning of the euro crisis in 2010, financial integration in the Euro area has suffered a setback as impressive as the previous surge. While price-based measures offer ground for optimism about the recovery of financial integration in the Euro area, signals from quantity-based measures are less positive, especially when looking at the present degree of geographic home-bias in banks’ assets³².

Price-based financial integration

Price-based measures of financial integration rely on the idea of the “law of one price”, according to which assets that have similar characteristics should be priced similarly across countries. In a context of perfect financial integration, we should not observe discrepancies in assets’ prices or returns that can be traced back to the geographical origin of the assets.

Price-based indicators suggest a rapid increase in financial integration in the run up to the currency unification. The no-arbitrage condition suggests that interest rate differentials across countries reflect expected exchange rate fluctuations and differences in risk premia for financial instruments. Currency unification by definition removes the risk of exchange rate fluctuations. As a consequence, the interest rates on financial instruments with similar characteristics should be the same across members of the monetary union. Consistent with this view, benchmark and retail rates rapidly converged downwards in the run up to the euro introduction and remained aligned for a decade.

³² Part of the analysis reported in this section was updated from Darvas, de Sousa, Huettl, Merler and Walsh (2015), which provided a detailed analysis of developments in EU capital flows in a global context.

Figure 53 Sovereign benchmark rates (yields on 10-year government bonds, %)

Source: Bruegel calculations based on data from Datastream.

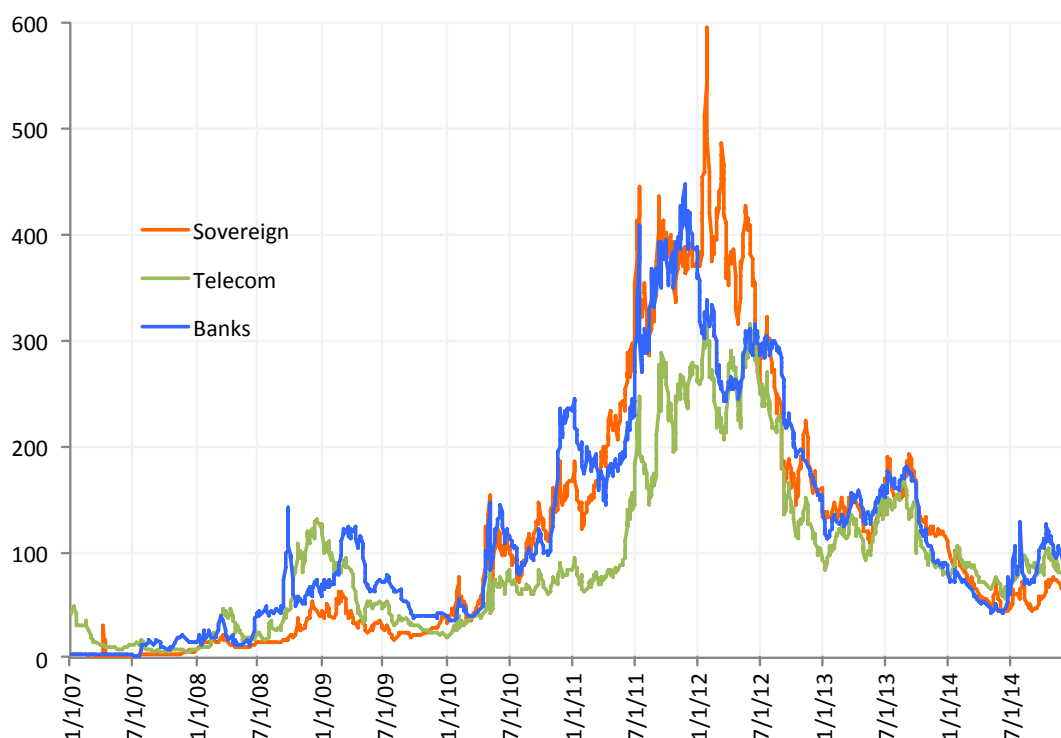
Before currency unification, differences in benchmark rates reflected different monetary policy rates and the exchange rate risk, as well as differences in countries' macroeconomic fundamentals (De Sola Perea and Van Nieuwenhuyze 2014). The anticipation of the euro introduction was associated with a rapid convergence of interest rates on the sovereign bond market (Figure 53), suggesting that – once the exchange rate risk was eliminated and monetary policy centralised – the financial market priced the country risk of different members of the monetary union equally, as if they had identical fundamentals. This assumption was strongly reconsidered by markets during the crisis, as is evident from the huge divergence in sovereign yields between 2010 and 2012.

A similar picture emerges from the dispersion of credit default swap (CDS) premia for different sectors across Euro area countries. CDS premia reflect the cost of insuring debt against default and therefore signal the probability that markets attach to the event that the issuer will default on its debt. Issuers that are perceived to be riskier will also face difficulty in funding, so CDS premia can also serve as a proxy for funding costs.

In a context of perfect financial integration, the cost of funding for different borrowers should depend on their individual risk and not on country risk. During the crisis, however, the cross-country dispersion of CDS premia increased substantially in the euro area for both public and private issuers. This suggests that risk was segmented along national borders and that within countries the increase in funding costs for governments had a strong impact on the private sector too. The correlation with sovereign risk is especially strong for the banking sector, reflecting the fact that during the crisis concerns for bank and sovereign

solvency mutually reinforced each other in a vicious circle (Merler & Pisani-Ferry 2012).

Figure 54 Dispersion in the five-year CDS premia across the euro area (excluding Ireland and Greece)



Source: Bruegel based on ECB, financial integration indicators.

Note: this is an aggregate indicator computed by ECB. Greece is excluded owing to very high sovereign CDS premia, and Ireland is excluded owing to the very high CDS premia of its telecom company. "Sovereign" includes Austria, France, Germany, Italy, the Netherlands, Portugal and Spain. "Banks" include ABN AMRO (NL), Alpha Bank (GR), Allied Irish Banks (IE), Banca Monte dei Paschi di Siena (IT), Banca Popolare di Milano (IT), Banco Comercial Português (PT), Banco Sabadell (ES), Banco Espírito Santo (PT), Banco Santander Central Hispano (ES), Erste Bank der österreichischen Sparkassen (AT), Bank of Ireland (IE), Bayerische HypoVereinbank (DE), BNP Paribas (FR), Commerzbank (DE), Crédit Agricole (FR), Deutsche Bank (DE), Dexia Group (BE), EFG Eurobank Ergasias (GR), Fortis NL (NL), Intesa Sanpaolo SPA (IT), Mediobanca (IT), Natixis (FR), National Bank of Greece (GR), Nordea Bank (FI), Piraeus Group Finance PLC (GR), Société Générale (FR), UniCredito Italiano (IT). "Telecom" includes Deutsche Telekom (DE), France Telecom (FR), Hellenic Telecommunications Organization (GR), KPN (NL), Portugal Telecom (PT), Telecom Italia (IT), Telefónica (ES), Telekom Austria (AT).

Price based indicators for the money market also point to rapid integration between 1997 and 1999, when the cross-country standard deviation of average unsecured interbank lending dropped very rapidly to zero. During the crisis, interest rate dispersion in the euro area money market resurfaced, although divergence was not comparable with the pre-euro period. Banks in countries under the strongest market pressure experienced difficulty accessing money market liquidity and increasingly resorted to the refinancing operations conducted

by the ECB. Since 2012, the dispersion in money market rates has narrowed, although it has not yet entirely reverted to pre-crisis levels (Figure 55).

Figure 55 Money market price based indicators: Cross-country standard deviation of average unsecured interbank lending rates across euro area countries

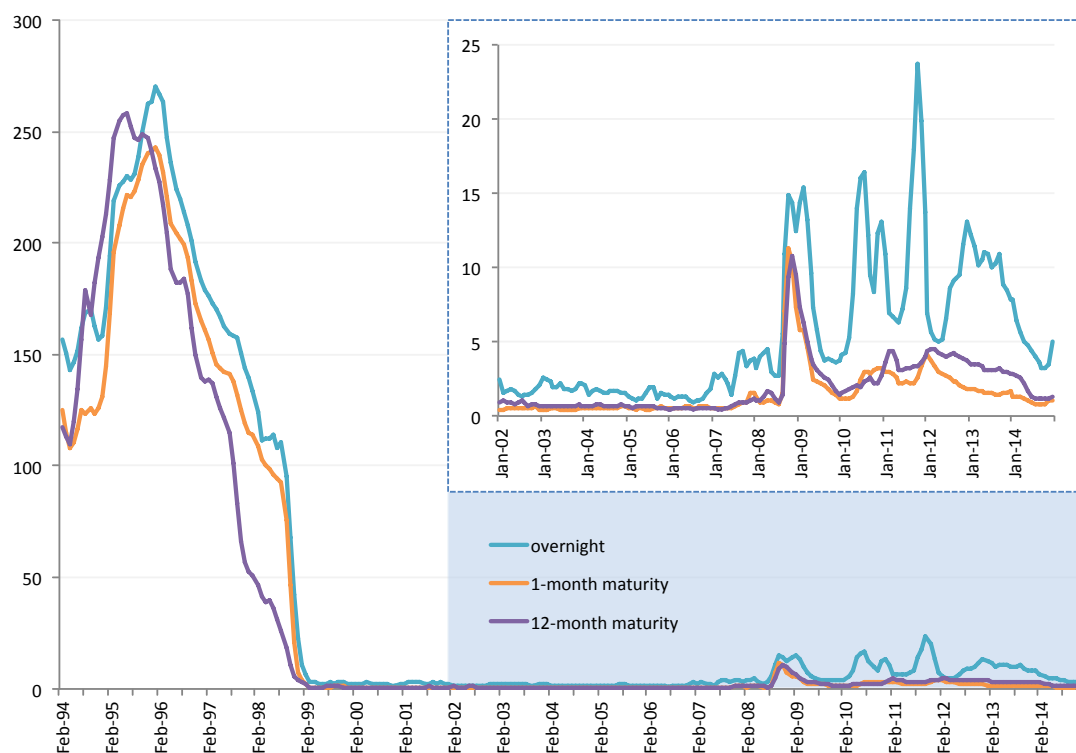
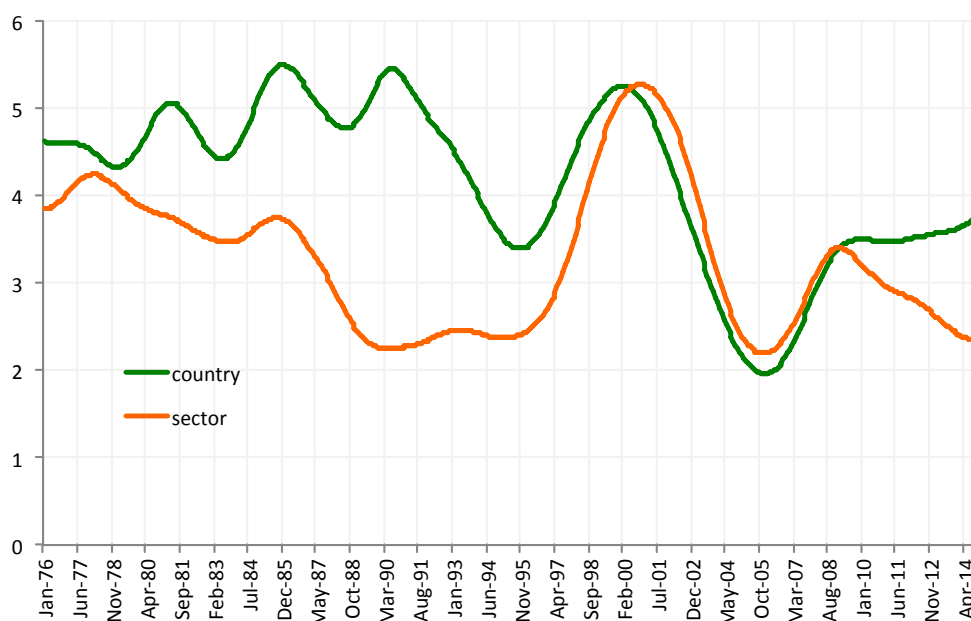


Figure 56 shows a measure of dispersion in equity returns in the euro area over 35 years. The idea behind this indicator is that in a context of full financial integration and especially in a monetary union, where there is no financial premium on geographical diversification in principle, we should observe a reduction in the gap between cross-country and cross-sectoral dispersions of equity return. The pre-EMU period appears indeed to have been characterised by a significantly higher cross-country than cross-sectoral dispersion in equity returns, pointing to the existence of geographical segmentation of return and the benefit of geographical diversification. Between 1999 – after the introduction of the euro – and 2007, cross-country and cross-sector dispersion grew closer and both declined substantially. From 2008 on, the dispersion in equity returns increased both at the sectoral and country level, but sectoral dispersion has been declining since 2010 while cross-country dispersion has remained higher, pointing to fragmentation.

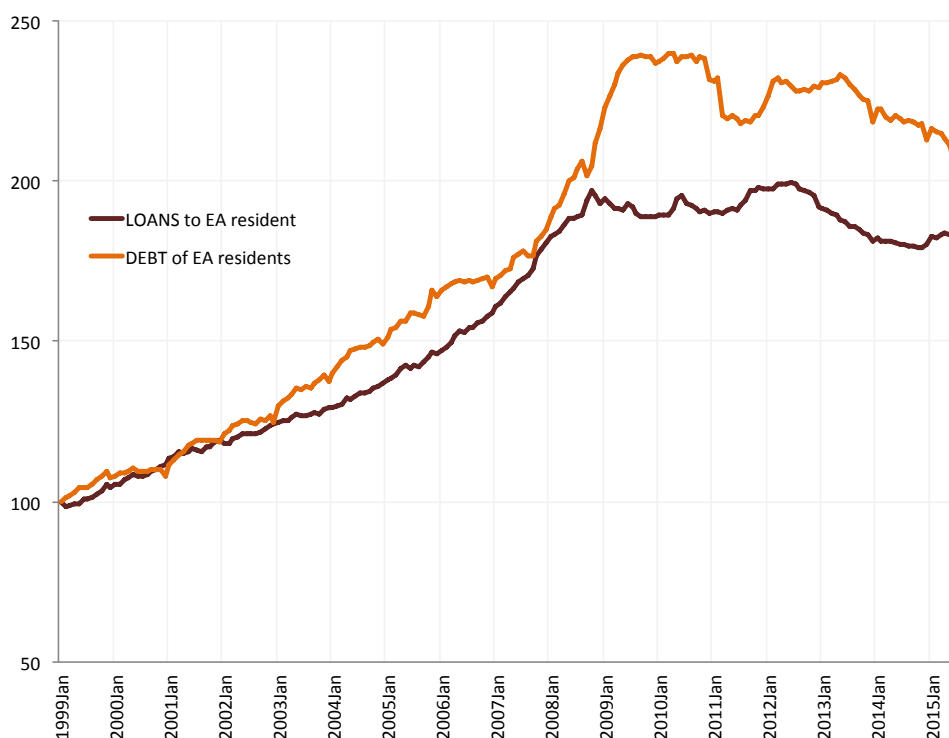
Figure 56 Country and sector dispersions in euro area equity returns

Source: ECB's financial integration indicators.

Quantity-based integration: the euro and cross-border lending

Quantity-based indicators of financial integration show a massive increase in bank lending activity in the Euro area after the introduction of the single currencies. The outstanding amount of loans to euro area borrowers from euro area banks doubled between 1999 and 2008, whereas holdings by euro area banks of debt securities issued by euro area issuers more than doubled over the same period (Figure 57). Looking at aggregate euro area loans and security holdings, the crisis does not appear to have brought about a dramatic reversal (Figure 36), but breaking down aggregate euro area bank lending into its "domestic" and "cross-country" components, the picture changes significantly (Figure 58).

Figure 57 Euro area: Bank loans to euro area borrowers and holdings of debt issued by euro-area borrowers (1999/01 = 100)



Source: Bruegel calculation based on ECB data.

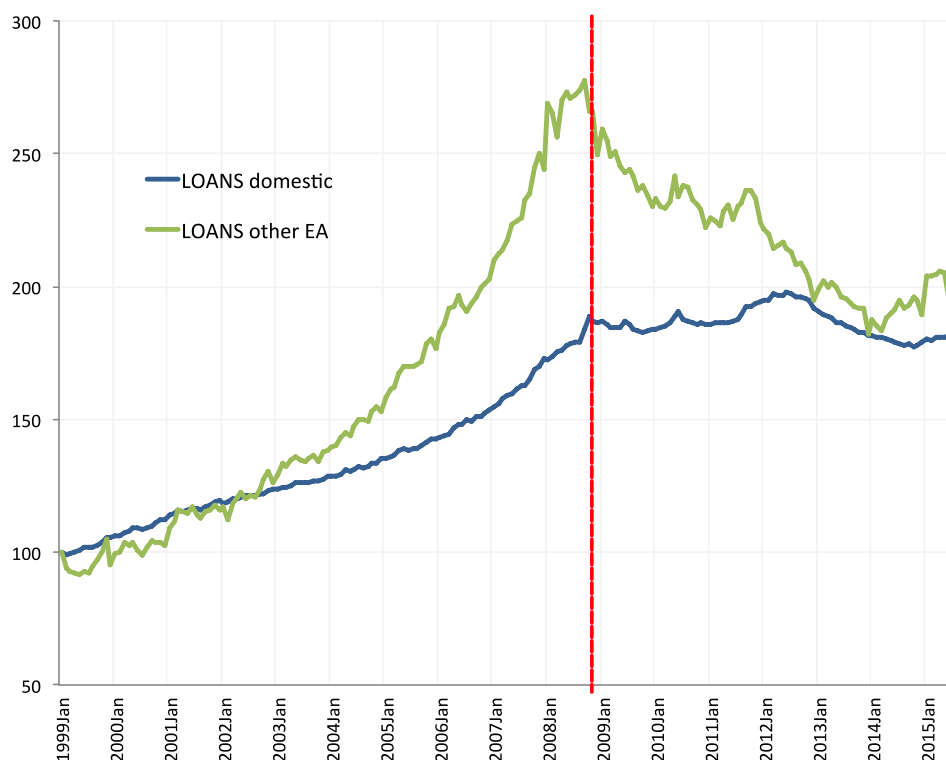
Note: the numbers are indexed in 1999.

The aggregate growth in bank lending recorded prior to the crisis and shown in Figure 1 was mostly due to an explosion in cross-border activity, in particular intra-area³³ lending. Loans granted by euro area banks to residents in other euro area countries almost tripled over 10 years, whereas loans granted to domestic borrowers “just” doubled³⁴ over the same period (Figure 23). Since the crisis, domestic lending has stabilised and started to decrease slowly in 2013, whereas intra-euro area lending has been falling since 2009 and only recently started to recover. A sector breakdown would show that bank cross-border lending was mostly wholesale activity (Sapir & Wolff 2013). About 80 percent of banks’ loans to other euro area borrowers were directed to other banks in other euro area countries while retail banking remained a predominantly domestic activity.

³³ The Eurosystem provides statistics on cross-border loans and securities holdings of euro area banks, but these only distinguish between “domestic” and “other Euro Area”. Loans and holdings vis-à-vis the rest of the world are aggregated in a single category called “external assets”. Some of the National Central Banks do provide a disaggregation by instrument of the assets vis-à-vis the rest of the world (which are used later in the analysis) but not all of them do, so for comparability purposes in this paragraph the analysis is restricted to ECB data, looking only at “domestic” versus “other euro area” positions.

³⁴ It is important to point out that these figures also include bank loans.

Figure 58 Euro area: Bank loans to domestic borrowers vs. borrowers in different euro-area countries (1999/01 = 100)



Source: Bruegel calculation based on ECB data.

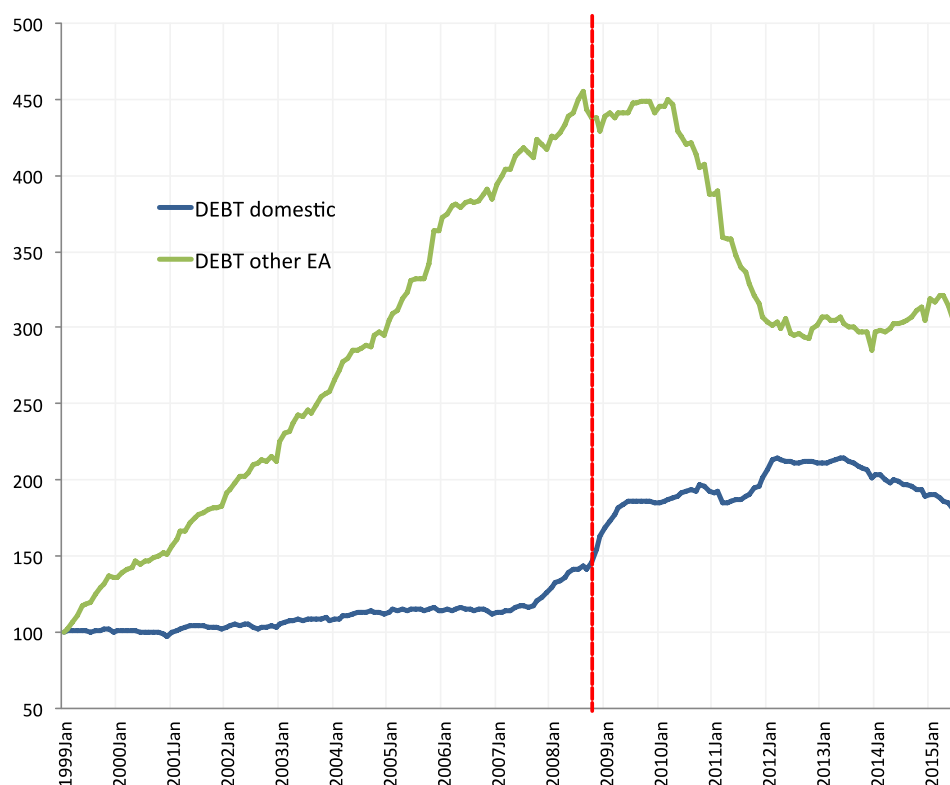
A similar evolution can be seen in the geographical composition of banks' debt portfolios (Figure 59). Banks' holdings of debt issued by issuers resident in other euro area countries increased by 4.5 times between 1999 and 2009 while holdings of debt issued by domestic residents remained constant until the crisis. Holdings of domestically issued debt started to increase in 2008, which may reflect a tendency by euro area banks to respond to the US-led financial turmoil by rebalancing their debt portfolios towards domestic debt (at that time perceived as safer). Attempts by domestic regulators to ring-fence and pressure to concentrate banks' activities in home countries may have also played an important role³⁵.

The great deleveraging in banks' intra-euro area debt holdings started later than the correspondent deleveraging in intra-euro area loans. Deleveraging of intra-area loans happened in two phases, starting in 2009 and then re-accelerating in 2011. Intra-area debt holdings proved resilient to the 2008/2009 financial

³⁵ For example, the European Commission even had to issue a statement in February 2013 trying to limit such activities, including intra-EU capital controls and other restrictions. According to Bloomberg (2013), "The Commission took this action because it had been made aware that, on several occasions, national bank supervisors acted independently to impose allegedly disproportionate prudential measures on national banking subsidiaries of cross-border EU banking groups. The alleged measures in question include capital controls, restrictions on intra-group transfers and lending, limiting activities of branches or prohibiting expatriation of profits. These would have the effect of 'ring-fencing' assets, which could, in practice, restrict cross-border transfers of banks' capital and potentially constrain the free flow of capital throughout the EU." See at: <http://www.bloomberg.com/news/2013-02-04/eu-warns-of-disproportionate-crackdown-on-cross-border-banking.html>

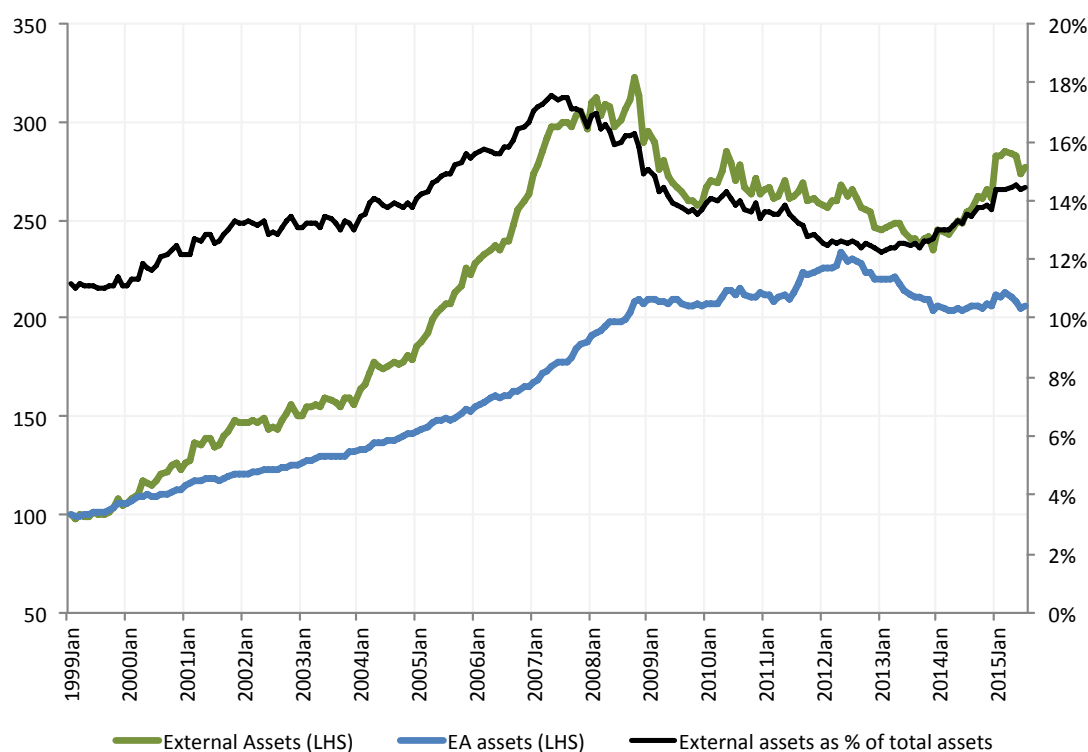
turmoil, but a much more rapid deleveraging started in 2010 when the Greek case ignited what would become the euro sovereign-banking crisis.

Figure 59 Euro area: Banks' holding of debt issued by domestic borrowers vs. borrowers in different euro-area countries (1999/01 = 100)



Source: Bruegel calculation based on ECB data.

While intra-euro area integration was booming, the euro area banking system was also becoming more globally integrated. Figure 60 shows the evolution of euro area banks' external (i.e. extra-euro area) assets and internal (i.e. euro area) assets, both indexed in January 1999. Assets held by euro area banks inside the euro area doubled between 1999 and 2008 whereas assets held outside the euro area grew by three times. As a consequence, external assets grew from 12% to 17% of total euro area banks' assets over the period. With the crisis, euro area banks rapidly decreased their extra-euro area assets, which fell back to 12% of total assets in 2013 and started to slowly increase again in 2014. On the contrary, internal assets remained largely stable until 2012, when they started to decline slowly. This is consistent with the fact that euro area internal integration was taking place at a time when financial integration was increasing substantially across countries at the global level. Lane and Milesi-Ferretti (2006) show that financial integration for industrial countries has increased by a factor of seven, from 45 percent in 1970 to over 300 percent in 2004. During the 1970s and 1980s, the increase in international financial integration was fairly gradual, but it accelerated significantly in the mid-1990s.

Figure 60 Euro area: Banks' external assets vs. EA assets (1999/01 = 100)

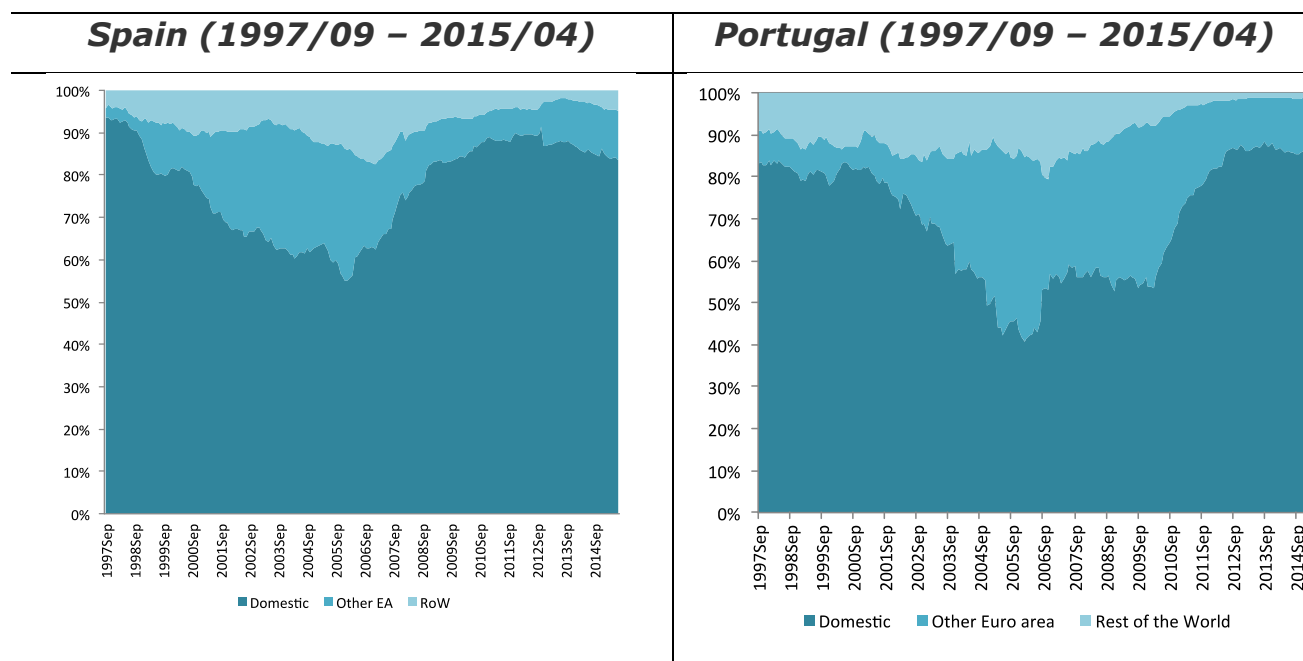
Source: Bruegel calculation based on ECB data

Home-bias and geographical diversification in banks' debt portfolio

The developments described in the previous section are reflected in the geographical diversification of assets held by banks in the euro area, in particular the geographical diversification of their debt asset portfolios. Despite country differences, there appears to have been a tendency for banks in the South of the euro area to diversify their debt asset portfolio geographically after the introduction of the euro and re-domesticize it during the crisis.

In Spain and Portugal (Figure 61), for example, banks' debt asset portfolio was dominated by domestic debt before the currency unification. It became significantly more diversified between 1999 and 2006, when holdings of domestic debt securities reached a minimum of 55 percent of total debt holdings in Spain and 41 percent in Portugal. Consistent with the developments shown in the previous section, diversification was mostly due to an increase in holdings of debt issued in other euro area countries, which grew from 8 percent to 44 percent of the total debt portfolio in Portugal and from 2 percent to 31 percent in Spain.

However, in late 2006 banks' debt portfolios started to re-domesticize, and with the outbreak of the global financial crisis and later the euro crisis, this process accelerated. By end of summer 2013, the share of banks' debt holdings that were accounted for by domestic instruments had increased to levels that had last been seen before the euro introduction.

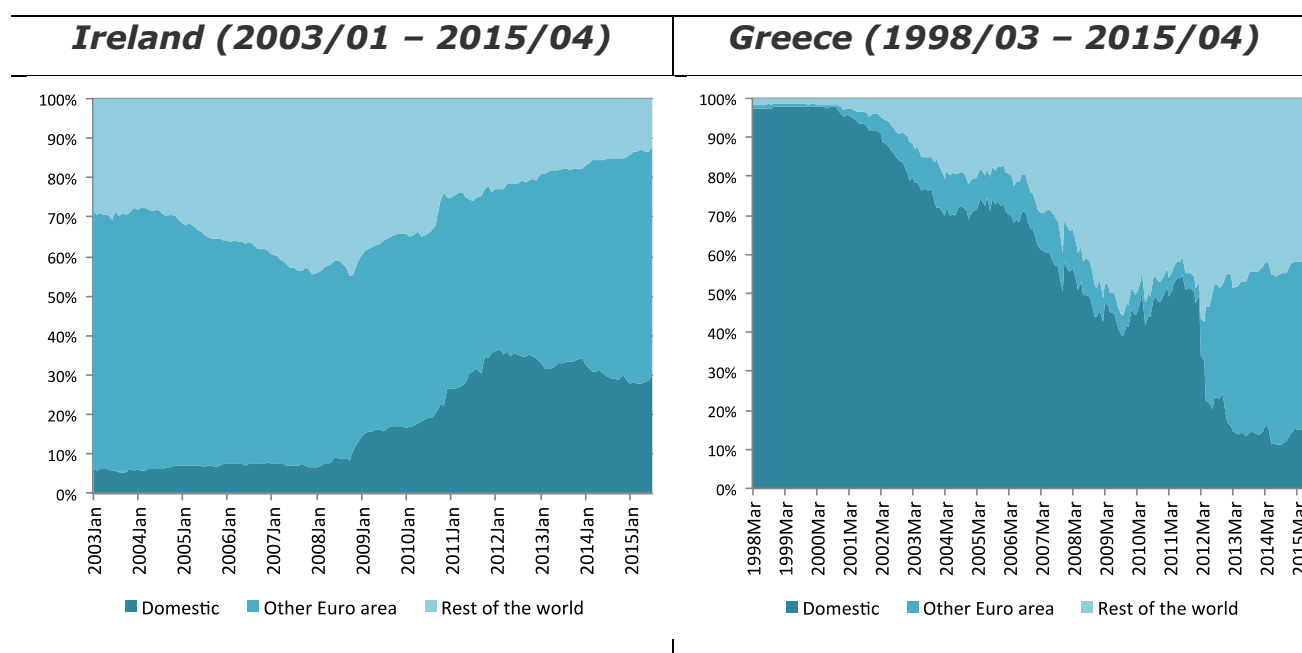
Figure 61 Banks' holdings of securities other than shares, geographical breakdown

Source: Bruegel calculation based on ECB data.

Ireland and Greece are two special cases. In Ireland, a financial hub, banks did not hold many domestic debt assets before the crisis (below 10 percent of total portfolio). The euro crisis led to renationalisation, even in Ireland, where the share of domestic holdings is now around 30 percent, an unprecedentedly high value for this country.

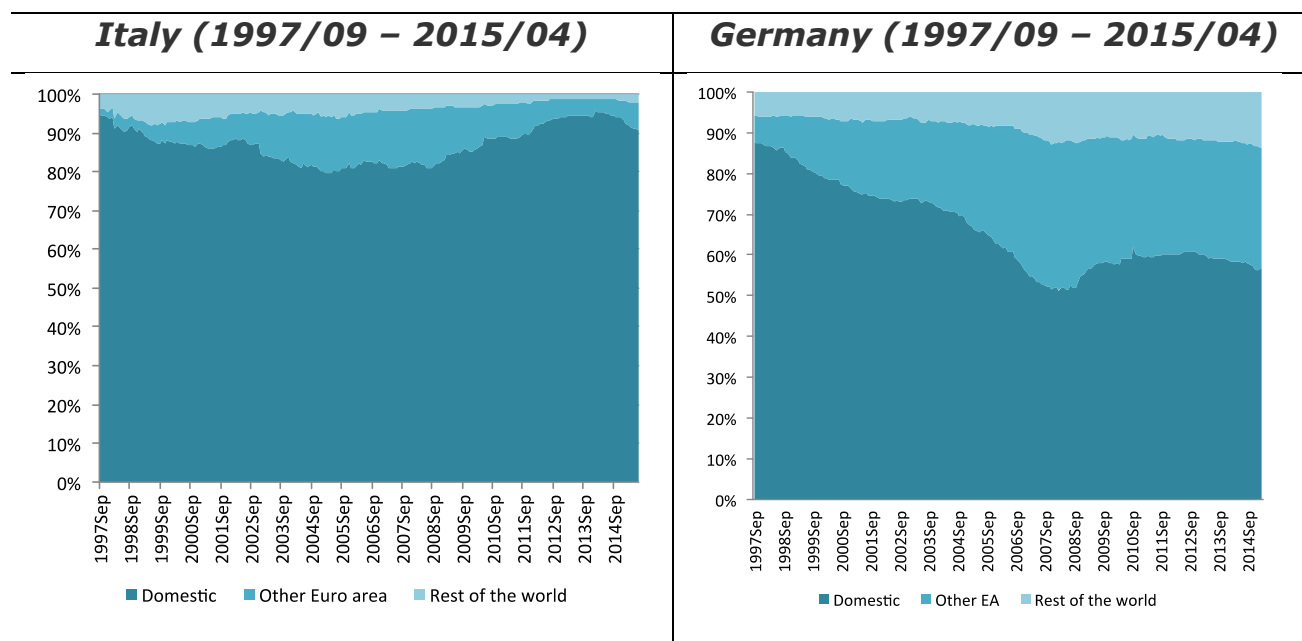
In Greece, banks' debt holdings were almost entirely (98 percent) domestic before the country joined the euro. Between 2000 and 2009, domestic holdings went down to 39 percent, but contrary to Spain and Portugal, diversification occurred through an increase in debt issued by non-euro area borrowers. This reached 56 percent of banks' total debt holdings in 2009 while other euro area debt countries never exceeded 12 percent of total holdings. In 2009 – in correspondence with the start of the Greek crisis – re-domestication of banks' debt portfolio began in Greece³⁶.

³⁶ Notice that the recent numbers are strongly influenced by the 2012 debt restructuring, which slashed the value of domestic debt compared to foreign debt, while there was very small debt issuance since. Therefore, lack of supply strongly constrains Greek banks in holding Greek securities.

Figure 62 Banks' holdings of securities other than shares, geographical breakdown

Source: Bruegel calculation based on ECB data

With a historically high public debt-to-GDP ratio, Italy appears to be a country where the banking system remained very much focused on domestic debt. Banks' debt portfolios never really internationalised, and the share accounted for by domestic securities never fell below 80 percent, even in the golden years of financial integration. Diversification was an eminently intra-euro area phenomenon, as holdings of debt issued in other euro area countries increased from 1 percent to 15 percent of total holdings, squeezing holdings of debt issued in the rest of the world. Debt portfolios of German banks instead internationalised significantly as the domestic share fell from 88 percent to 51 percent, almost entirely substituted for by other euro area holdings which grew from 7 percent to 37 percent of the total. Domestic holdings increased during the crisis at the expenses of other euro area debt, but only very limitedly.

Figure 63 Banks' holdings of securities other than shares, geographical breakdown

Source: Bruegel calculation based on ECB data.

Geographical diversification and cross-border financial integration in the euro area were not equally strong when looking at other quantitative measures. Sapir & Wolff (2013) show that bank mergers and acquisitions in the euro area happen predominantly within national borders. The percentage of cross-border mergers in Europe is low, and since mergers and acquisitions are mostly domestic, the percentage of subsidiaries and branches that are foreign-owned is correspondingly low when measured in terms of assets. The euro area also has underdeveloped cross-border equity: equity portfolios are significantly home-biased, and the ownership of listed companies remains predominantly national (Sapir & Wolff 2013).

This is because the development of financial integration in the euro area is mostly a tale of debt integration. In fact, the massive capital flows spurred by currency unification predominantly took the form of debt instruments (loans and debt securities). Hale and Obstfeld (2012) analyse the geography of international debt flows up to 2008 and provide evidence that after the currency unification, core EMU countries increased their borrowing from outside the EMU and their lending to the EMU periphery. Hobza and Zeugner (2012) constructed a new database of bilateral external assets and liabilities following the model in Waysand et al (2010), which allows a bilateral breakdown of external flows and stocks for FDI, portfolio equity, portfolio debt and other investment. Using the Hobza and Zeugner (2012) database, it is possible to see that debt instruments accounted on average for 64% of external assets and 67% of total external liabilities over the period 2002-2012³⁷ across the eleven EA countries considered in this paper³⁸.

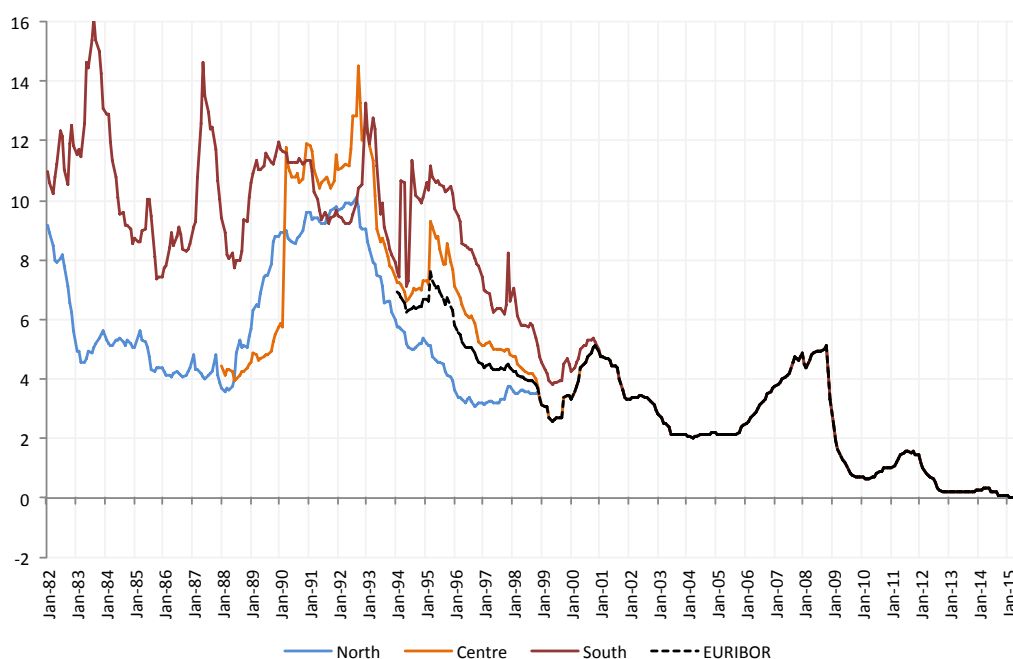
³⁷ Bruegel calculations based on Hobza and Zeugner (2012). Numbers refer to private capital flows only, i.e. after excluding the money from EU/IMF programmes (which enter the balance of payments and international investment position under "other investments"); the purchases of government debt by the ECB's Securities Market Programme (which are classified under "portfolio debt" instruments) and the ECB liquidity provision to banks (which also enters as "other investments"). This depuration is especially important in the

Funding the credit cycle: financial integration, interest rate convergence and credit development

This rapid and sizable process of financial integration was the key factor behind the divergence of countries' financial cycles within the euro area. The cross-country convergence of benchmark interest rates translated into very different credit developments at the country level within the euro area. Convergence was not only limited to the interest rates on government bonds but also happened on interbank rates, which differed significantly before 1996 (Figure 64). Sovereign and interbank rates represent the benchmark for interest rates charged by banks on their lending to the private sector. Therefore, interest rates charged by banks on loans to non-financial corporations (and households) also converged markedly in the second half of the Nineties towards a lower bound represented by rates in the Northern countries.

The rapid downward convergence of retail interest in the South fuelled credit demand, as borrowing from banks had literally never been so cheap in these countries. On the other hand, banks were now able to meet the higher credit demand because the currency unification meant their funding pool had significantly expanded beyond national borders. They were now part of an integrated Euro area-wide financial market, where the cost of funding had significantly dropped.

Figure 64 Euro area: pre and post euro inter-bank rates (3 months)



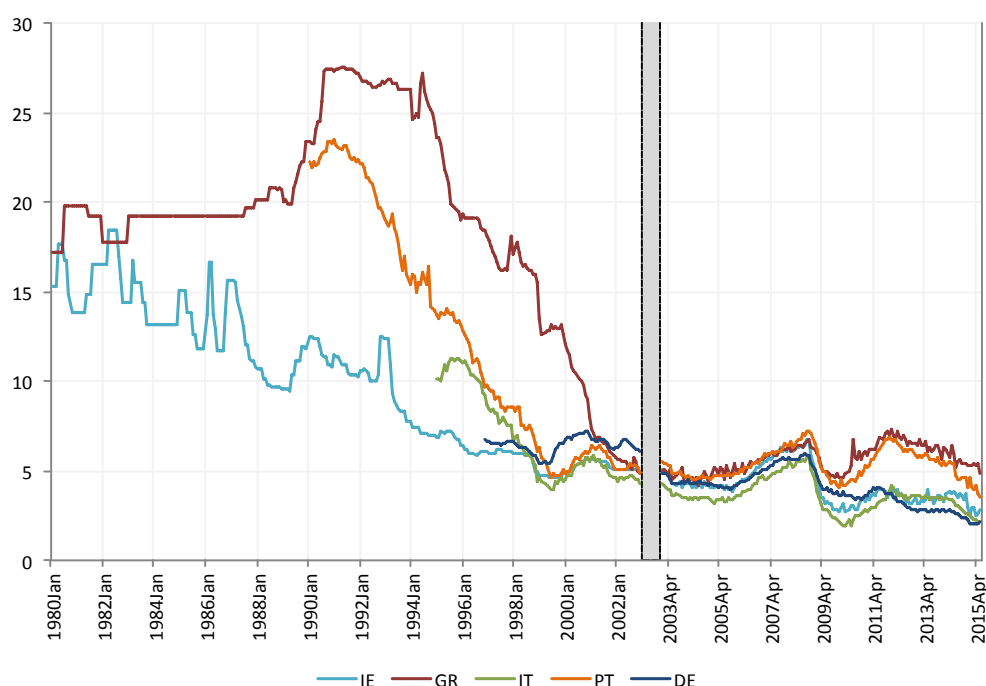
Source: Bruegel calculation based on data from Datastream and National central banks.
 Note: it is not immediate to find pre-euro interbank rates, as many central banks don't publish them any longer, or at least not at all maturities. Here, 3-months rates are used because this is the maturity for which pre-euro rates are still available for almost all

case of the euro area, where public capital inflows substituted for private capital outflows during the crisis.

³⁸ Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Netherlands, Portugal and Spain.

countries. North = Austria, Finland, Germany, the Netherlands; Centre = France, Italy; South = Greece, Spain Portugal. Data for Belgium and Ireland could not be found.

Figure 65 Euro area: pre and post euro rates on bank loans to NFCs



Source: Bruegel calculation based on data from National central banks.

Note: pre-euro data is only available for a limited number of countries. In 2003 a new series of interest rates was computed: the break in the figure has been included to indicate that the two series may not be entirely consistent.

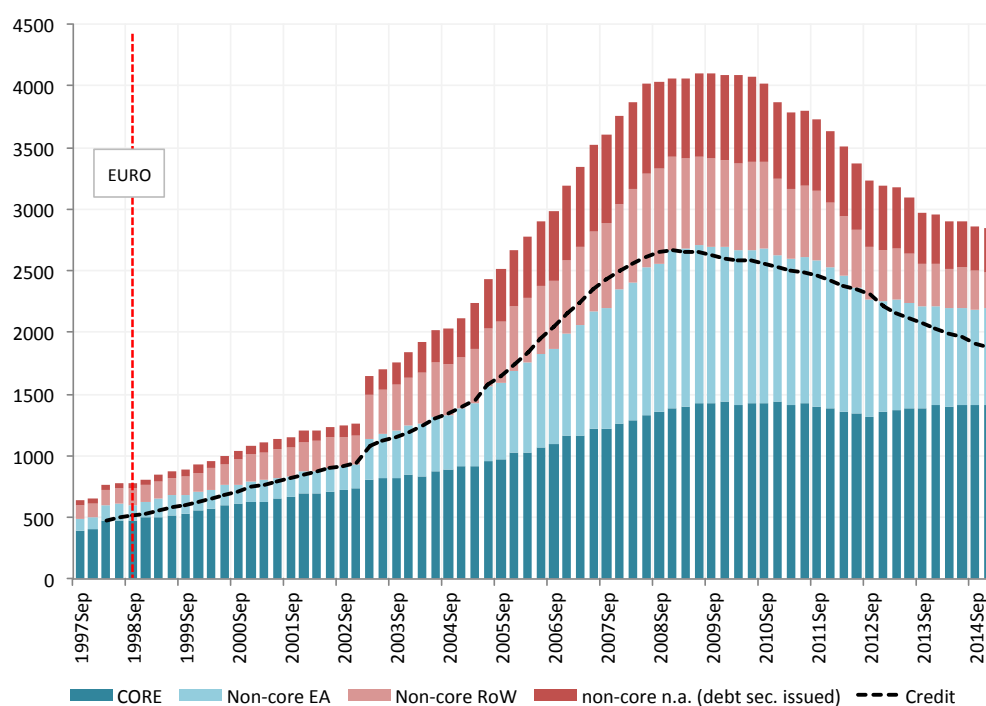
The counterpart of this was a significant change in the structure of banks' liabilities. In the performance of their intermediation role, banks must raise funding in order to lend to their borrowers. The most immediate source of funding available to banks is domestic retail deposits of the non-financial private sector (households and non-financial corporations). These are "core" liabilities, which tend to be relatively stable. But when credit is growing faster than the pool of available retail deposits – as happens during credit booms – banks need to resort to additional "non-core" sources of funding. Shin et al (2011) find evidence that lending booms are indeed accompanied by a shift in the liability structure of banks towards an increase in non-core liabilities and that various measures of non-core liabilities (and especially liabilities to the foreign sector) serve as good indicators of vulnerability to currency and credit crises.

The pre-crisis credit boom in the Southern euro area countries appears to be no exception to this rule. Between 1999 and 2008, banks in Southern euro area countries significantly expanded their non-core liabilities (Figure 65). Following Shin et al (2011), core funding is defined here as deposits of domestic households and non-financial corporations, whereas non-core funding includes all deposits from other domestic non-bank financial institutions as well as deposits from non-residents and debt securities issued. To the extent possible, non-core deposit liabilities are broken down here to distinguish those due to depositors within the euro area and outside.

For banks in the South, non-core funding grew from 34% of total funding in 1997 to 60% in 2008. The bulk of this increase is attributable to an expansion in intra-euro area non-core deposits, which increased by three times between the early 2000s and the crisis whereas non-core deposits from the rest of the world “just” doubled over the same period.

The access to the euro-area-wide deposit base was a key factor for banks in the South to be able to finance credit growth well beyond the growth of the domestic retail deposit base. Figure 66 shows that bank credit to the private sector expanded significantly beyond banks’ core liabilities after the introduction of the euro, and the funding gap was filled by non-core liabilities. In June 2008 – right before the outbreak of the financial crisis – core deposits accounted for only 48% of the outstanding stock of credit to the private sector; the remaining 52% was matched with intra-euro area non-core liabilities. At the pre-crisis peak, total outstanding bank credit to the private sector was roughly equivalent in size to the total of core deposits plus intra-euro area non-core deposits.

Figure 66 South: bank credit to private sector vs. banks’ core and non-core funding



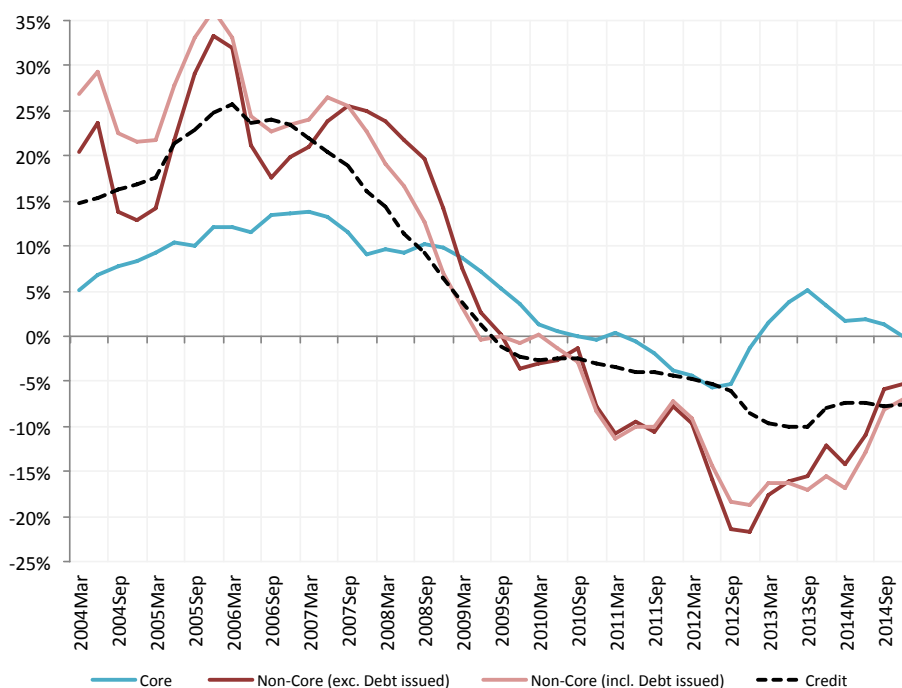
Source: Bruegel computations based on ECB data.

Note: data for Ireland on non-core funding from rest of the world (RoW) are only available since 2003, so Ireland is only included starting from that date. This is the reason why a jump appears on the chart around that date). Core deposits include domestic households and non-financial corporations’ deposits. Non-core includes all deposits from other domestic non-bank financial institutions as well as deposits from non-residents and debt securities issued. Non-core deposit are broken down into external funding coming from within the euro area and from outside, while this is not possible for debt securities issued.

Credit growth in the years immediately following currency unification was significantly above the growth of core deposits, and the pre-crisis growth pattern

of non-core liabilities resembled that of credit, although more volatile (Figure 67). When credit growth slowed down in 2007, the growth of non-core liabilities appeared to have also slowed down, with a lag, while core liabilities remained significantly more stable.

Figure 67 South: banks' credit, core and non-core funding – 4-quarters growth rate (%)

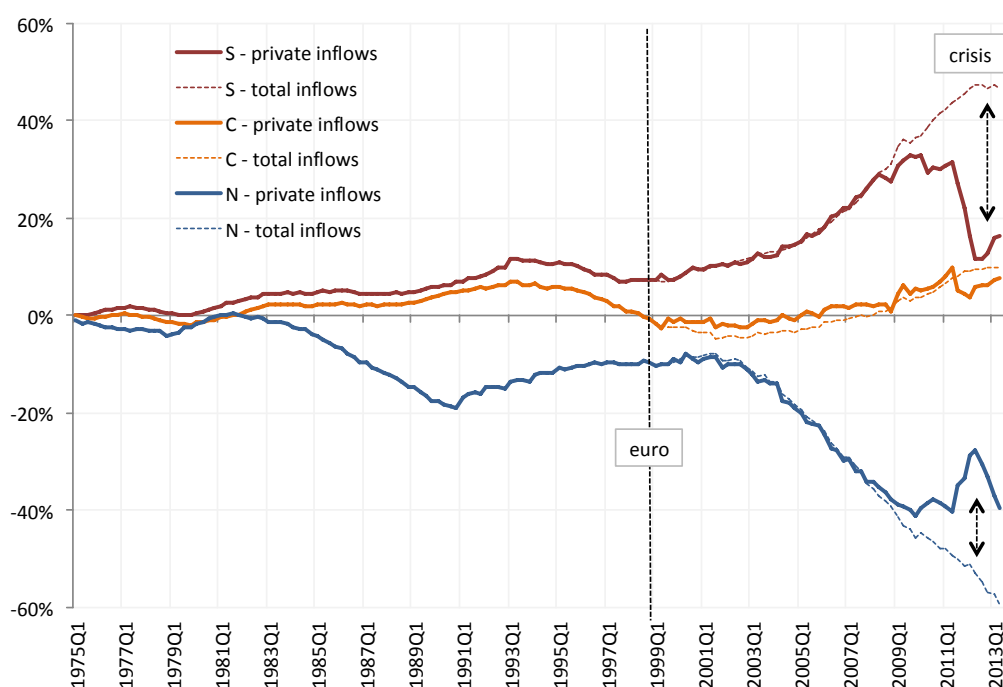


Source: *Bruegel* calculations based on ECB and BIS data.

Note: there are data limitations for Ireland, as highlighted in the previous figure 34. Since the growth rate would be significantly more sensible than the stock to the inclusion of a new country, only covers the period for which data for all countries are available (i.e. 2003 on).

These facts suggest a close link between credit growth and the expansion of banks' intra-euro area non-core liabilities. Before the crisis, credit growth in the South was faster than growth in the domestic core deposit base and was financed by recurring cross-border borrowing, mostly from within the euro area.

The heavy reliance on non-core liabilities significantly increased the financial stability risk associated with financing the pre-crisis credit growth. Bank non-core liabilities, especially non-resident deposits, are by nature more volatile than domestic core liabilities, but this is even more so in the context of a currency union where capital movements are completely free and cross-border investment can be reverted especially fast. This became clear during the crisis when countries in the South experienced strong outflows of private capital (Figure 68) – which were absorbed by the ECB liquidity provision and EU/IMF programme money – whereas countries in the North of the Euro area experienced strong capital inflows, partly due to a fly-to-safety effect (Merler and Pisani-Ferry 2012).

Figure 68 Private vs. total financial account – cumulated (% GDP)

Source: Bruegel calculations based on IMF BoP data.

Note: Total inflows are obtained as the cumulated financial account as a percentage of GDP; private inflows is obtained as the cumulated financial account net of ECB liquidity provisions to banks and SMP (TARGET2 numbers) as well as the disbursement under EU/IMF programmes. Groups are defined as follows: North includes Austria, Belgium, Finland, Germany and the Netherlands; Centre includes France and Italy; South includes Greece, Ireland, Portugal and Spain.

4.4 Macroeconomic counterpart of financial integration: savings-investment correlation

The macroeconomic counterpart of the massive financial flows spurred by currency unification was the dis-anchoring of countries' domestic savings and investment across the euro area. Back in 1980, Feldstein and Horioka (1980) highlighted the existence of an economic "puzzle" for financial integration. Running a cross-country regression of domestic investment rates on domestic savings rates, they found a large, positive coefficient, contradicting the theoretical prediction for a frictionless open economy. They interpreted this as a sign that sizable financial frictions existed in reality in international capital markets, hindering capital flows and indirectly limiting risk sharing across countries.

In 2002, three years after the introduction of the euro, Blanchard and Giavazzi (2002) documented persistent current account divergences and a significant drop in the correlation of national investment and national savings across Euro area countries. This finding was consistent with what theory would predict for countries undergoing a strong process of financial integration.

Table 3 updates and extends the analysis in Blanchard and Giavazzi (2002). The first column reports the coefficients of a regression of national investment on national savings in percentage of GDP, estimated on a panel of the eleven Euro area countries considered in the rest of this paper over three sub-periods between 1975 and 2012³⁹. As a comparison, the same analysis is also run for a panel comprising all 27 EU Member States and for the EU as a whole.

Table 3 Correlation of national savings and investments (Feldstein-Horioka coefficients)

Period	11 EA countries (panel)	EA as a whole (aggregate of 11 countries)	27 EU countries (panel)	EU as a whole (aggregate of 27 countries)
1975-1998	0.33*** [0.077]	0.46** [0.175]	0.11 [0.079]	0.26** [0.111]
1999-2007	-0.08* [0.040]	0.73*** [0.061]	0.09** [0.042]	1.06*** [0.48]
2008-2014	0.23*** [0.068]	0.45 [0.933]	0.28** [0.052]	0.82 [0.96]

Source: Bruegel calculations using data from AMECO ESA 2010.

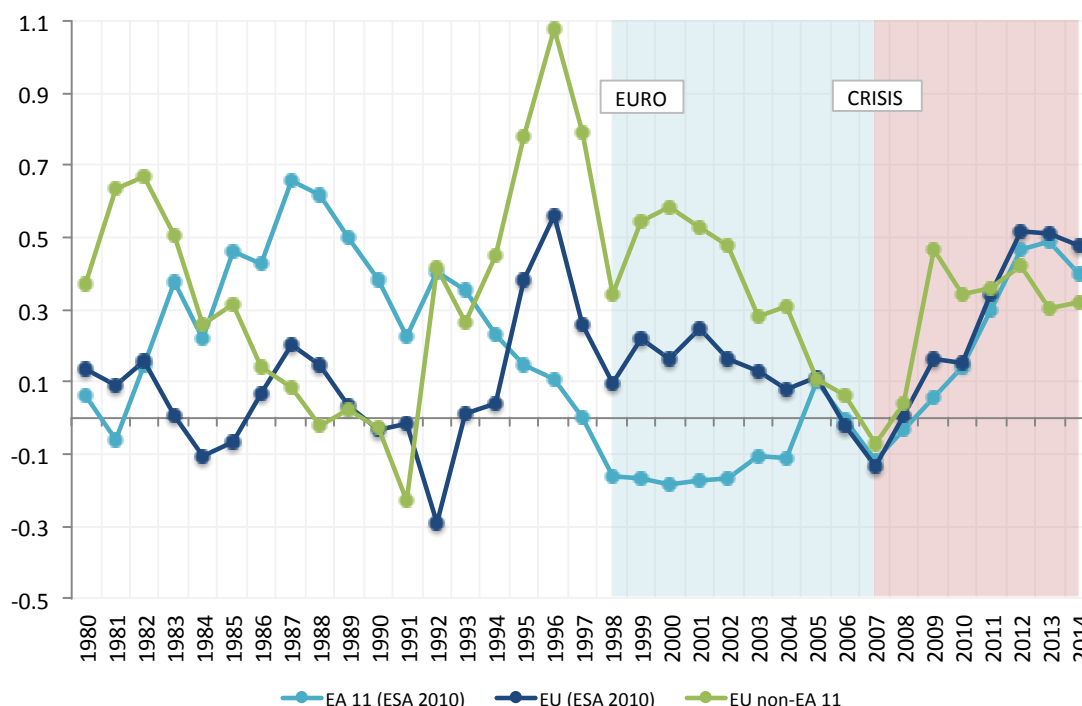
Note: the classification of several items affecting savings and investment accounting were changed last year with the release of the new ESA2010 that we use. Results for the Euro area using ESA 1995 are available in the Annex, which indicate broadly similar findings which are actually stronger in terms of significance. Parenthesis includes Huber-White robust standard errors. EA and EU composition changed over time, but here we consider it fixed because some of the countries entered the EU/EA within the time intervals that are considered in Table 1 rather than exactly at the beginning or end of them.

The regression shows that for Euro area members, cross-country savings-investment correlation was positive and significant until 1998, negative and significant between 1999 and 2007, and positive and significant again during the crisis (Table 3). The second column of Table 3 shows the correlation of aggregate savings and investment for the Euro area as a whole, i.e. considered as a single country. The picture looks very different from the one previously described: at the aggregate Euro area level, no decoupling of savings and investment is evident over the period 2000-2008. The correlation remained always positive, strong and significant until the crisis, while after 2008 the coefficient is no longer significant. This is consistent with the fact that the euro area as a whole ran a balanced financial (and current) account over the decade preceding the crisis while it has recently started to run a persistent financial account deficit (the counterpart of its growing current account surplus).

³⁹ The coefficients have been obtained following Blanchard & Giavazzi (2002), who used data up to 2001. A consistency check has been previously performed, replicating the exact analysis of the paper and is available in the appendix.

Table 3 also shows that the dis-anchoring of savings and investment in the period between 1999 and 2007 is stronger in the case of the Euro area. The only negative parameter is found for the panel of 11 euro-area countries (-0.08), while for the 27 EU countries the parameter estimate is positive, though rather small, 0.09. For the euro-area as a whole as well as the EU as a whole, the parameter estimates are positive and rather large, 0.73 for the euro area and 1.06 for the EU.

**Figure 69 Savings-investment correlation in the EA and EU, 1980-2014
(Estimated correlation coefficients)**



Source: Bruegel calculation based on data from AMECO.

Note: EA 11 includes the EA countries considered throughout all the paper, i.e. Austria, Belgium, Germany (West Germany before 1990), Ireland, Greece, Spain, France, Italy, Netherlands, Portugal, Finland. Data for all these countries are available in AMECO since 1960. EU includes all the 27 EU member States. Data for some EU countries are not available for the earlier years (some of these countries did not even exist before). In particular, data in AMECO are available since 1980 for Poland, Romania and Hungary; since 1990 for Bulgaria and Czech Republic; since 1991 for Slovenia; since 1992 for Latvia and Lithuania; since 1993 for Estonia and Slovakia. The country composition of both EA and EU varied over time; here the groups are fixed to ensure comparability with Table 1.

As in the original paper (Blanchard and Giavazzi 2002), Figure 69 plots the individual correlation coefficients obtained from yearly regressions for the EU as a whole as well as for the two subgroups composed by the 11 Euro area countries considered in this paper versus the other countries. The figure clearly shows that the pre-crisis negative savings-investment correlation has been a characteristic feature of euro-area countries and is a result of a gradual decline in correlation that started in the early Nineties. Similar dis-anchoring can be observed for non-euro area countries, for which an approximate 0.5 correlation coefficient around 2000 gradually declined below zero by 2007. Since the central and eastern

European countries joined the EU in 2004/2007⁴⁰, it is interesting to note that correlation also declined parallel to their EU accession.

The pattern for Euro area countries is consistent with the recent history of the Euro area. The introduction of the single currency in 1999 and the removal of the exchange rate risk resulted in national investments and savings dis-anchoring. This was possible because the removal of the exchange rate risk spurred massive intra-euro area capital flows, part of which has been documented in the previous section.

Member States that were relatively poorer in capital terms (and offered higher expected rates of returns on investment) received large inflows of foreign capital. In the South of the euro area, investment could expand significantly above the level of national savings before the crisis, partly thanks to the inflow of foreign capital. As a result, the current account balance (which represents the difference between national savings and investment) fell persistently deeper into negative territory. Northern countries instead were net savers over the same period. National savings remained above national investment, and these excess savings were channelled abroad. Incidentally, it is interesting to notice that the savings-investment correlation started to decline well before the single currency was effectively introduced. In particular, savings-investment correlation had been steadily declining since 1992, i.e. when the Treaty of Maastricht was signed, establishing the completion of the EMU as a formal objective. This suggests the existence of a significant anticipation effect connected to financial integration and the single currency.

Savings-investment correlation started to increase again in 2008 in both the euro area and non-euro area countries, became positive again in 2009, and returned to the 1993 level by 2012. This is consistent with the disruption of financial integration that has occurred in both the euro area and central-European EU member states since 2008 and the consequent financial account adjustment.

The belief that current account imbalances within a monetary union would be harmless was proven wrong by the crisis, when countries in the South of the Euro area effectively underwent a balance of payment crisis and capital flights that would have qualified as a fully-fledged sudden stop absent the ECB liquidity provision (Merler and Pisani-Ferry 2012). Interestingly, the pre-crisis capital flows and their reversal within the euro area are similar to developments observed in Central and Eastern Europe EU member states, although the impact was different due to the absorption function played by the ECB in the euro area (Alcidi and Gros 2013).

4.5 Macro-prudential policy in the Euro area: rationale and challenges

This paper has established several facts on the evolution of financial cycles in the euro area that are especially relevant from the perspective of macro-prudential policy, for which the financial cycle constitutes an important “target”⁴¹. The

⁴⁰ Croatia, which joined the EU in 2014, is excluded from our analysis due to data limitations.

⁴¹ According to Smets (2013), macro-prudential policy should have four intermediate targets: mitigate and prevent excessive credit growth and leverage, mitigate and prevent excessive maturity and liquidity mismatch, limit excessive exposure concentrations and limit bail-out expectations.

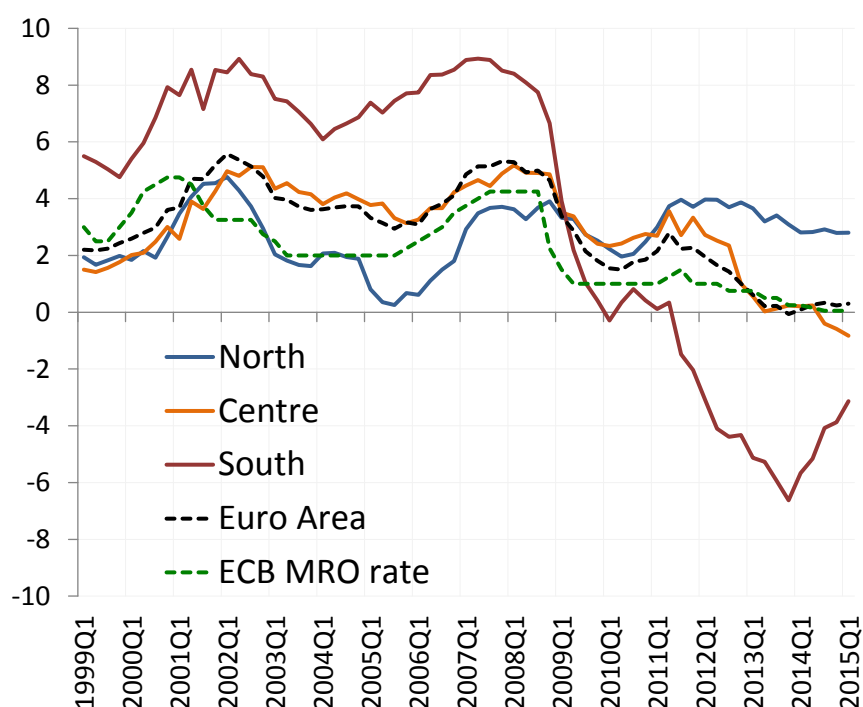
financial crisis prompted a renewed global interest in macro-prudential policy as a framework to address the stability of the financial system as a whole rather than only its individual components. This section reviews the rationale for macro-prudential policy in the euro area – which is in our view especially strong – and the special challenges for the set-up of macro-prudential policy in a heterogeneous monetary union, based on the results from previous sections.

Rationale for macro-prudential policy in the euro area

The objective of macro-prudential policy can be described as to limit the risk of widespread disruptions to the provision of financial services and thereby minimize the impact of such disruptions on the economy as a whole (Columba et al 2011). System-wide risk may arise due to existing interconnections in the financial system, which creates pre-requisites for contagion across institutions and potentially across countries. Micro-prudential policy, which looks at financial institutions individually, is necessary to limit individual risk but may not be sufficient to ensure stability of the system as a whole. Smets (2013) suggests that macro-prudential policy should have four intermediate targets: mitigate and prevent excessive credit growth and leverage, mitigate and prevent excessive maturity and liquidity mismatch, limit excessive exposure concentrations and limit bail-out expectations.

While it is an objective of global relevance, preserving financial stability appears to be even more important in contexts where financial linkages are strong and deep, such as in the Euro area. The original design of the Economic and Monetary Union (EMU) did not include tools to prevent or deal with non-fiscal imbalances, and financial instability was not perceived as a significant risk, *ex ante*. *Ex post*, this view proved short sighted. During the crisis, the cross-border capital flows spurred by the introduction of the single currency and documented in previous sections proved to be highly destabilizing, and the significant financial integration achieved since 1999 was severely harmed. In light of this lesson, the set-up of an effective macro-prudential framework appears to be especially important for the Euro area going forward.

Moreover, the low interest rate environment spurred by ECB expansionary policy, while needed to stimulate demand in an economic downturn, may encourage excessive risk taking by the financial sector. This makes the exercise of strong micro-prudential supervision and the set-up of effective macro-prudential tools even more important and topical in the euro area (Claeys & Darvas 2015). ECB Vice-President Constancio drew attention to this issue during a recent speech (Constancio 2015) when he stressed that in the case of the EMU, the fact that cyclical conditions are diverging across countries makes concern for financial stability risk stemming from low rates more acute. In this environment, “monetary policy needs a complement, and that complement is macro-prudential policy”.

Figure 70 Taylor rule interest rates vs. actual ECB policy rate

Source: Bruegel computation based on Darvas & Merler (2013).

Risk may be building up in the financial sector, and asset prices may deviate from fundamental levels even without significant movement in CPI inflation. In that case, the potential for the ECB's monetary policy to react would be limited because monetary policy targets consumer-price inflation and does not generally take asset prices into account. In a heterogeneous monetary union like the EMU where there are divergences in inflation dynamics at the country level, the counteractive role of monetary policy is even more limited because the central bank targets the average inflation rate.

As a matter of fact, the single monetary policy might have itself played an important role in the build-up of pre-crisis imbalances. Figure 70 shows Taylor rules computed for the three groups of countries previously considered compared with the actual ECB policy rate. As noted in Darvas and Merler (2013), the single ECB rate was significantly different from what an optimal Taylor rule would have predicted for several countries in the euro area. In particular, the actual ECB rate was consistently lower than would have been predicted for the South, driving real interest rates to low levels and therefore reinforcing the credit boom.

Special challenges for macro-prudential policy in the euro area

The rationale for an effective macro-prudential policy is therefore especially strong in a heterogeneous monetary union like the euro area, but research devoted to establishing the best design of a macro-prudential policy framework for the Euro area is relatively limited. The macro-prudential debate is mainly held in a global context, somewhat neglecting the specific features of Europe. Defining the optimal macro-prudential policy setting for a monetary union like the Euro

area poses additional challenges than in the case of a standalone country, some of which have been highlighted in the previous sections.

The empirical analysis suggests that financial cycles diverged significantly at the country level before the crisis, while fluctuations at the aggregate Euro area level were very moderate. For countries in the North – especially Germany and the Netherlands – the introduction of the euro in 1999 appears to coincide with the start of a contraction phase in the financial cycle, which lasted until very recently. For countries in the South – especially Spain, Ireland and Greece – the opposite happened. If these results will continue to characterize the euro area in the future, then from a policy perspective they support the idea that macro-prudential policy in the Euro area should be differentiated across member states, taking into account countries' specificities.

Members of the currency union, however, are subject to a common monetary policy and in principle cannot impose direct limits/controls on the flow of capital, an instrument sometimes used in the cases of emerging markets⁴². But the divergence in financial cycles shown in Section 4.4 is very much linked to capital flows. The existence of a link between domestic credit development and capital flows is a fairly established fact, especially in the case of the euro area (Lane and McQuade 2012). Capital inflows and outflows allow explaining the dis-anchoring of national investment from national savings observed across euro area members between 2000 and 2010 and documented in Section 4.4, as well as the reappearance of positive savings investment correlation after the outbreak of the crisis.

For macro-prudential policy consideration, however, it is more important to highlight that these capital flows were to a great extent internal to the monetary union and therefore could not be limited in a direct way. Hale and Obstfeld (2012) analyse the geography of international debt flows up to 2008 and provide evidence that after the currency unification, core EMU countries increased their borrowing from outside the EMU and their lending to the EMU periphery. Hobza and Zeugner (2012) constructed a new database of bilateral external assets and liabilities following the model in Waysand et al (2010), which allows a bilateral breakdown of external flows and stocks for FDI, portfolio equity, portfolio debt and other investment⁴³. They document the dominant role of 'core' countries in financing the euro area periphery before the financial crisis, with France and the UK acting as important intermediaries of financial flows from elsewhere, particularly outside the euro area. Based on the Hobza and Zeugner (2012) bilateral data, it is also possible to shed more light on the relationship between domestic credit growth and international capital flows, breaking the capital flows down between flows that were internal to the Euro area and flows that were not.

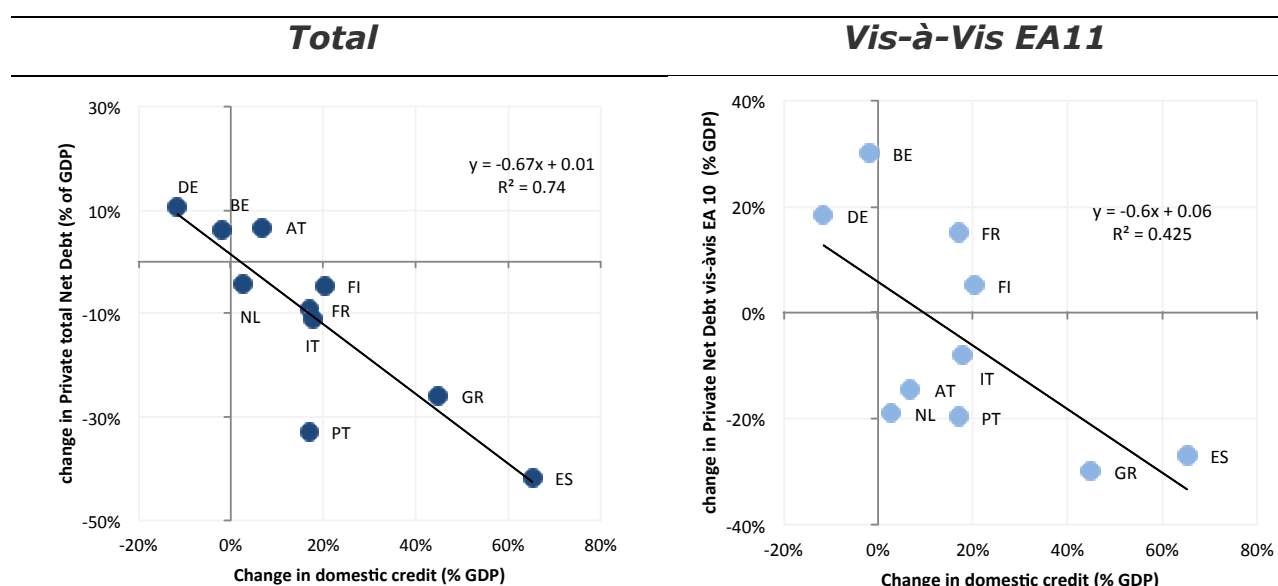
⁴² There are two qualifications to this point. First, while being unimaginable earlier, the severe crisis in Cyprus has led to the introduction of payments and capital controls, which were approved by European institutions. Second, despite the establishment of the European Banking Authority, which aims to coordinate between home and host supervisors in the EU, several unilateral actions were adopted by national supervisors to ring-fence banking activities. In February 2013, the European Commission even had to issue a statement trying to limit such activities (see e.g. Bloomberg 'EU Warns of 'Disproportionate' Crackdown on Cross-Border Banking', 4 February 2013).

⁴³ The authors are grateful to Hobza and Zeugner for sharing the restricted version of their dataset, which allows a more detailed breakdown than the published version.

The left panel of Figure 71 plots the change in domestic credit-to-GDP against the change in private net external debt-to-GDP. The horizon is 2003-2008 and the sample includes the eleven Euro area countries considered in this paper with the exception of Ireland, which is a strong outlier when it comes to capital flows. As found by Lane and Mc Quade (2012), the correlation is very strong over the period considered. This is not a new finding, and it suggests that countries where domestic credit-to-GDP was growing more were also experiencing the greatest deterioration in external net debt position (and accumulating the largest net-debt liabilities).

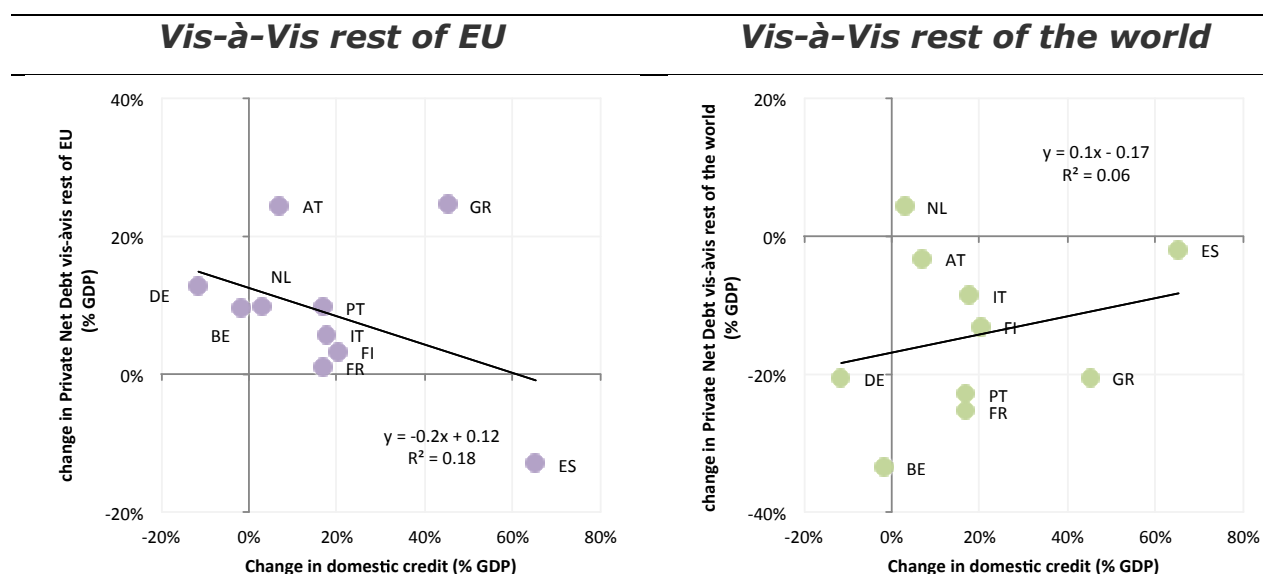
More interesting results emerge, however, when breaking down the total external net-debt positions bilaterally, i.e. vis-à-vis different partners. This exercise shows that the existing pre-crisis correlation between the growth of external net debt and domestic credit growth was in fact mostly accounted for by the external positions vis-à-vis other Euro area members (Figure 71, right panel). The correlation of domestic credit growth with the growth of net debt vis-à-vis the rest of EU or rest of the world was much weaker (Figure 72)⁴⁴.

Figure 71 Domestic credit vs. private net debt (stocks) vis-à-vis different partners 2003-2008



Source: Bruegel calculations based on Hobza and Zeugner (2012), BIS.

⁴⁴ The same findings hold when total NIIP is used, although all correlations tend to be weaker.

Figure 72 Total Net Debt Position (stocks) vis-à-vis different partners

Source: Bruegel calculations based on Hobza and Zeugner (2012), BIS.

The message from this is that in the euro area, financial cycles – which constitute the “target” for macro-prudential policy – were significantly divergent at the country level over the last decade, and this divergence was driven by capital flows that were internal to the monetary union. This evidently points to the existence of significant challenges for the set-up of macro-prudential policy in the Euro area in order to ensure that it is effective in preventing financial stability risk while remaining compatible with the free flow of capital.

4.6 Macro-prudential policy in the euro area: tools and institutional set up

From the evidence presented in the previous sections, the key challenge for macro-prudential policy in the euro area seems to be to square the circle between two (potentially conflicting) goals:

- Deal in an effective way with potentially divergent financial cycles across countries, preventing the build-up of risks to financial stability from underlying domestic imbalances;
- Cater to the cross-border implications of macro-prudential policy in a monetary union, where a high degree of financial integration may induce potential cross-country spillovers from national policies, which national authorities in turn would have little incentive to internalise.

These two goals appear complementary in the quest for financial stability in the euro area, but if addressed individually they could lead to potentially conflicting policy prescriptions. The challenge is therefore to find a combination of tools and institutional set-up that is compatible with both.

In the Euro area, the process to set up a macro-prudential policy framework started with the creation of the European Systemic Risk Board (ESRB) in 2010, gathering representatives from national central banks and supervisors from all EU countries. The ESRB was not given any direct authority over policy instruments, but it has the power to issue recommendations and warnings about systemic risks to national authorities. Recently, the Regulation establishing the Single Supervisory Mechanism (SSM) conferred to the ECB some active competences in macro-prudential policy, alongside national authorities.

This could potentially be an important step in the direction of addressing the two issues mentioned above. In practice, however, the effectiveness of the new structure risks being daunted by two substantial problems.

First, the relationship between the ECB and national authorities under the SSM regulation is complex. While the ECB can express objections to measures proposed by a national authority, the authority concerned only has to “duly consider the ECB’s reasons prior to proceeding with the decision” (Article 4a(1)). The ECB cannot block such measures. On the other hand, the ECB is given the power to apply higher requirements for capital buffers and more stringent measures than those set by the national authorities, with the aim of addressing systemic or macro-prudential risks. And again, the ECB is only obliged to “duly consider” the objections of the national supervisor, if any, but these objections do not have blocking power. In other words, the framework seems to be articulated under the principle of ‘the stronger wins’ (Darvas and Merler 2013), which may give rise to uncertainty (or delay) when it comes to macro-prudential policy implementation.

Second (and probably more important), the macro-prudential tools available to the ECB are more limited than the arsenal available to national supervisors, and in particular the ECB’s toolkit excludes those instruments that would be the most important for the conduct of its macro-prudential policy competences in the EMU.

Macro-prudential authorities rely on a series of tools that can be roughly divided into two main categories, as suggested by Blanchard et al (2013): tools seeking to influence lenders’ behaviour, such as time-varying capital requirements, leverage ratios or dynamic provisioning, and tools focusing on borrowers’ behaviour, such as ceilings on loan-to-value ratios (LTVs) or on debt-to-income ratios (DTIs).

On the lenders’ side, capital-based measures already exist at the European level based on CRR/CRDIV. These include: the Countercyclical Capital Buffer (Art. 130, 135-140 CRDIV), the Systemic Risk Buffer (Art. 133-134 CRD IV) and capital surcharge on systemically important institutions (Art. 131 CRD IV). Art. 458 of the Capital Requirement Regulation (CRR) also includes Large Exposure limits, the Capital Conservation Buffer, Sectoral Risk Weights (in the residential and commercial property sectors) and Intra-financial Sector Exposures whereby higher risk weights can be set vis-à-vis financial sector exposures. Some countries have already started implementing these measures. In the euro area, the Netherlands was among the first to introduce systemic risk buffers in July 2014. Similar measures have been adopted in Estonia, Denmark, Sweden and Austria (Constancio 2015). However, part of the literature assessing macro-prudential policy tools points to the existence of several problems connected to capital-based measures. Apart from the counter-cyclical capital buffer, capital-based measures tend to be applied statically and more generally are found to

have indirect and limited effects on cyclical adjustments and the costs of loans⁴⁵, which may make them less effective in restraining excessive credit demand in environments of house price appreciation.

Borrower-based instruments tend to be used more in advanced economies than in emerging ones, and there is evidence suggesting they are especially effective in reducing credit and house prices growth (Claessens et al 2013; Cerruti et al. 2015; IMF 2014). An increasing number of euro area countries are introducing such measures to address the impact of low interest rates on housing market developments. Estonia has introduced limits on LTV, DSTI and maturity restriction requirements for commercial banks issuing housing loans (Constancio 2015). Ireland has taken the decision to place ceilings on the proportion of mortgage lending with high LTV and LTI ratios while the Netherlands has introduced a gradual tightening of its LTV caps, decreasing by 1 percentage point each year until the LTV reaches 90% in 2028 (Constancio 2015). Slovakia has progressively tightened its share of loans with LTV ratios and introduced recommendations on maximum maturity, requirements for income verification and internal borrower repayment assessment for banks. Lithuania has been implementing its Responsible Lending Regulation since autumn 2011 (Constancio 2015).

Borrower-based tools appear to be especially important for the effective conduct of macro-prudential policy because of the strong link between housing and credit growth, which puts the housing market at the origin of potential financial stability risk. These tools have the advantage of allowing the regulator to target particular sectors affected by financial imbalances and can be tailored to country-specific circumstances, which is especially important in a heterogeneous monetary union like the Euro area (Claeys and Darvas 2015)⁴⁶. However, since they do not fall under European legislation (i.e. they are not included in CRR/CRD IV), borrower-based tools can be used in countries that include them in their national legislation but cannot be used by the SSM.

This level of national discretion on borrower-based macro-prudential measures is problematic because it implies potentially significant coordination issues. The few examples quoted in previous paragraphs serve as an illustration of the degree of heterogeneity in countries' preferences regarding borrower-based macro-prudential tools. Differences in how these measures are formally codified at the national level add to this complication. In some countries, borrower-based measures are codified in the context of financial stability while in others like the Netherlands and Latvia they fall under consumer protection law (Constancio 2015). The different classification is not a mere formality because it determines who retains decision power on these measures at the national level. Hartmann (2015) refers to an unpublished survey by the ESRB conducted in the summer of 2013 which found that 16 EU countries can potentially use LTVs, 6 DTIs, 2 LTIs and 3 payment-to-income limits but that not all of the national macro-prudential authorities have the power to determine these limits. In countries where their primary purpose is consumer protection (3 cases) or bank solvency requirements (4 cases), other authorities may have the primary power to determine them (Hartmann 2015). This heterogeneity implies the potential need for coordination among different types of institutions with different mandates and time horizons,

⁴⁵ Basel Committee on Banking Supervision (2010), "An assessment of the long-term economic impact of stronger capital and liquidity requirements". Constancio, V. (2014), "The ECB and Macroprudential policy: from research to implementation", speech at the Third Conference of the Macroprudential Research Network, Frankfurt am Main, 23 June 2014.

and given the high political and social sensitivity of implementing borrower-based measures, the risk of paralysis and inaction is significant.

In conclusion, there appears to be a strong rationale for increasing ECB macro-prudential powers for a number of reasons (Darvas and Merler 2013; Claey's and Darvas 2015). First, monetary policy targets CPI and not asset prices, but risk may be building up (especially in the current very low interest rate environment) even without showing up in the CPI. Second, in a heterogeneous monetary union, monetary policy is even less able to address risks to financial stability than it would be in a standalone country and may to some extent reinforce financial sector divergence (Darvas and Merler 2013). Third, the ECB is in a position to internalise potentially significant cross-country spillovers. Section 4.3 has shown that financial cycles diverged at the country level in the euro area over the decade before the crisis, suggesting that if this were to characterise the euro area in the future, macro-prudential policy would need to cater to country specificities. However, as shown in Section 4.2, financial stability in a monetary union is a supra-national issue, and cross-country financial spillovers can be especially strong within a single currency area. This is an externality that national macro-prudential authorities may fail to internalise, as the systemic dimension they are concerned with is that of their own country. It is therefore very important that a supra-national institution like the ECB be able to exercise oversight over the system as a whole.

The ECB has been given potentially relevant new competencies, but these are substantially limited in practice by the fact that the ECB cannot directly use the tools that could be most effective in preventing the build-up of financial stability risk in a low interest rate environment because they are not included in EU legislation. The result is a two-tier system in which national authorities co-exist with the ECB in a relationship where the "stronger wins" and where the application of borrower-based tools is entirely left to the national level, with the risk of inaction due to the highly political nature of these tools. The ESRB could issue recommendations to promote the consistent implementation of these tools across the EU, but they are also subject to complex "comply or explain" mechanisms, and Constancio (2015) points out that up until today no such recommendation exists for the real estate market. At present, this framework for macro-prudential policy in the euro area seems unfit to deal effectively with the special challenges that macro-prudential policy presents in the context of a heterogeneous monetary union.

One obvious way to reinforce and improve this framework would be to strengthen the legal basis of the macro-prudential framework for borrow-based instruments, allowing the SSM to access this part of the toolkit that is currently left to national discretion. This would reduce heterogeneity in the application of these tools and limit the risk of inaction due to their politically sensitive nature, but it would necessarily require initiative from the Commission to open a review of the European framework under CRR/CRD IV.

Finally, Section 4.4 has shown the close link between domestic financial cycles and intra-euro area capital flows, raising the question of whether macro-prudential policy in the euro area would be compatible with free flows of capital. The overlap between capital flows management (CFM) measures and macro-prudential policy measures (MPM) has been recognised by the G20⁴⁷ and both the OECD and IMF. The primary objectives of CFMs and MPMs do not necessarily overlap. CFMs are

⁴⁷ G20 Coherent Conclusions for the Management of Capital Flows Drawing on Country Experiences (2011).

measures (often price-based or administrative) designed to contain the scale or influence the composition of capital flows while MPMs are prudential tools primarily designed to limit systemic financial risk and maintain financial system stability, irrespective of whether the origin of the risk is domestic or cross-border (IMF 2012). Both the OECD and IMF, however, stress that there are situations when CFMs and MPMs overlap: to the extent that capital flows are the source of systemic financial sector risks, the tools used to address those risks can be seen as both CFMs and MPMs. The typical example of this situation is when capital inflows into the banking sector contribute to a boom in domestic credit and asset prices. A restriction on banks' foreign borrowing, for example through a levy on bank foreign exchange inflows or required reserves on banks' foreign exchange liabilities, would aim to limit capital inflows, slow down domestic credit and asset price increases and reduce banks' liquidity and exchange rate risks. In such cases, the measures are designed to limit capital inflows as well as reduce systemic financial risk and would be considered both CFMs and MPMs (IMF 2012). Both the IMF and OECD framework are not thought for countries in monetary union, where the use of instruments would be significantly more constrained. A good example of this is a reserve requirement on banks' credit lines and other external obligations with non-residents. According to the OECD, such a measure is expected "to increase the cost of banks' reliance on external funding" and "prevent the build-up of systemic risk associated with FX lending in the context of a highly dollarized economy and strong capital inflows". The IMF's institutional view would suggest that this measure is a macro-prudential measure (MPM) – to the extent that "it increases the cost of banks' reliance on external funding and the exposure of the financial sector to systemic risks associated with currency mismatches on banks' balance sheets and a sudden stop in capital flows" – but since the measure discriminates between resident and non-resident lenders, it is also considered a Capital Flow Management instrument (CFM). The second part of this assessment would suggest that the use of different reserve requirements (or any other macro-prudential tool that has the indirect effect of limiting capital flows) would not be compatible with a currency union, where capital flows must be free and unrestricted by definition. Handling the macro-prudential policy toolkit will therefore be especially difficult in the case of the euro area, where capital flows must be free but have also been the most important driver of financial cycle divergence and financial instability.

Members of the currency union are in fact subject to a common monetary policy and in principle cannot impose direct limits/controls on the flow of capital to curb the domestic credit cycle. In light of this, an especially important role could be played by the Macroeconomic Imbalance Procedure (MIP), established in 2011 to monitor and deal with excessive macroeconomic imbalances in euro area member states. If effectively run, the MIP could potentially tackle underlying macroeconomic drivers of the financial cycle in a pre-emptive way, thus having important synergies with macro-prudential policy.

4.7 Conclusion

The purpose of this analysis is to contribute to the European macro-prudential discussion by analysing the special challenges for the setup of macro-prudential policy in the euro area, which is a heterogeneous currency union. We investigated the effect of the euro introduction on financial integration in Europe and financial cycles in the euro area. We highlighted a number of special challenges for the setup of macro-prudential policy in the Euro area, linked to strong financial integration and the free flow of capital. The currency unification prompted an

unprecedented surge in financial integration, strongly based on the banking sector's intermediation. The macroeconomic counterpart of the massive financial flows spurred by currency unification was the dis-anchoring of countries' domestic savings and investment in the period from 1999-2007 across the euro area. Evidence of dis-anchoring is significantly weaker when all 27 EU countries are considered, though by 2007 non-euro area EU countries achieved the same level of dis-anchoring that persisted in the euro area for a decade. While the euro-area aggregate financial cycle fluctuated rather moderately, a major divergence of domestic financial cycles can be observed within the euro area.

Data are less readily available for non-euro area countries, but estimated credit cycles for the UK, Denmark and Sweden are found to have been close to the euro-area cycle and thereby different from the credit cycles of individual euro-area countries. This suggests that credit developments in the euro area as a whole (i.e. considered as if it were a single country) were very much in line with what was going on in the rest of the EU. The credit boom in the south of the euro area was stirred by the rapid convergence of interest rates, which resulted in historically low rates in these countries. This fuelled credit demand, while banks were able to meet the higher credit demand due to increased cross-border banking flows within the euro area. In turn, cross-border banking flows were facilitated by the currency unification. Credit growth in the south was closely associated with a strong increase in banks' volatile non-core liabilities, leading to the build-up of significant financial stability risk. We also showed that the divergence in financial cycles at the country level was very much linked to capital flows and especially to intra-euro area debt flows. In light of these facts, we drew some important policy implications.

While the unique episode that followed the euro introduction in 1999 may not be repeated in the future, the euro area will likely remain heterogeneous and financial and economic cycles will likely deviate across member states. Given that monetary policy cannot be country-specific and may even reinforce the build-up of imbalances in some parts of the euro area while being too restrictive in other parts, the rationale for an effective macro-prudential policy is especially strong. However, the set-up of macro-prudential policy in a heterogeneous monetary union with free capital flows is especially challenging. Heterogeneity implies that macro-prudential policy will need to cater to country specificities, yet financial stability in a monetary union is a supra-national issue. Cross-country financial spillovers can be especially strong and national authorities would have little incentive to internalise them. Therefore, there is a rationale for entrusting the ECB with strong macro-prudential powers. While the ECB has been given potentially relevant new competences, its effectiveness is limited by the fact that the ECB cannot directly use those tools that could be most effective in preventing the build-up of financial stability risk in a low interest rate environment because these tools are not included in EU legislation. The euro area's macro-prudential system became a two-tier system in which national authorities and the ECB have certain tools governed in a complex relationship. Coordination problems are potentially very relevant, as is the risk of inaction by national authorities due to the political sensitivity of these tools.

This framework for macro-prudential policy in the euro area seems unfit to deal effectively with the special challenges that macro-prudential policy presents in the context of a heterogeneous monetary union. It should be reinforced by allowing the ECB to adopt borrower-based tools, which requires a modification of the SSM legal framework.

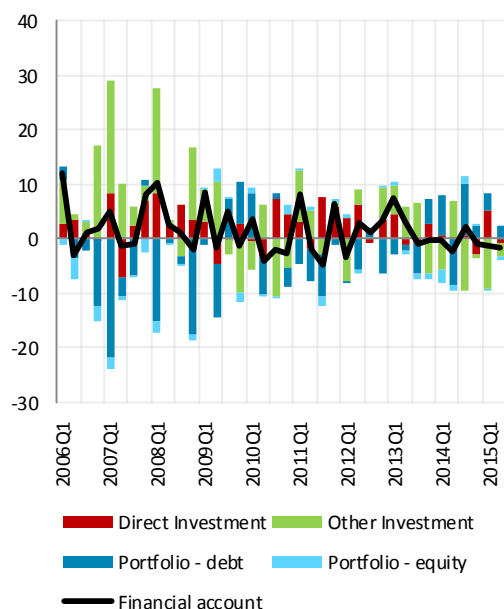
The close link between domestic financial cycles and intra-euro area capital flows raises the question of whether macro-prudential policy in the euro area would be compatible with free flows of capital.

There is a synergy between the EU's Macroeconomic Imbalance Procedure (MIP) and macro-prudential policy. Many of the macroeconomic variables that form the MIP's "scoreboard" for assessing the existence of excessive imbalances are also important in the context of macro-prudential early warning. Consistent and effective implementation of the MIP would be synergic with macro-prudential policy and could facilitate the ECB's task to prevent the build-up of excessive financial risk at the country level.

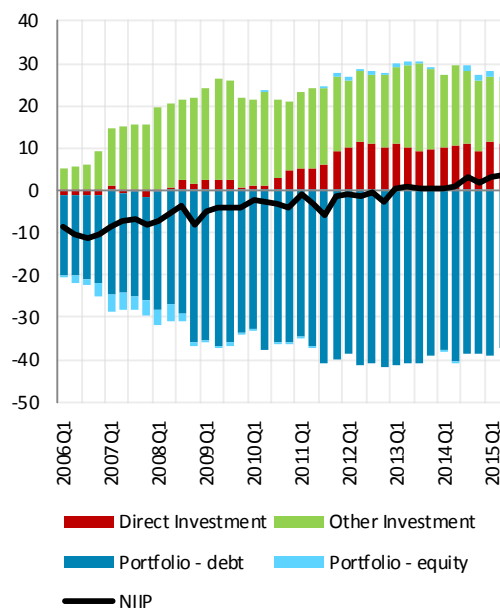
5 Appendix

5.1 Appendix A to Section 3: financial accounts of each EU country

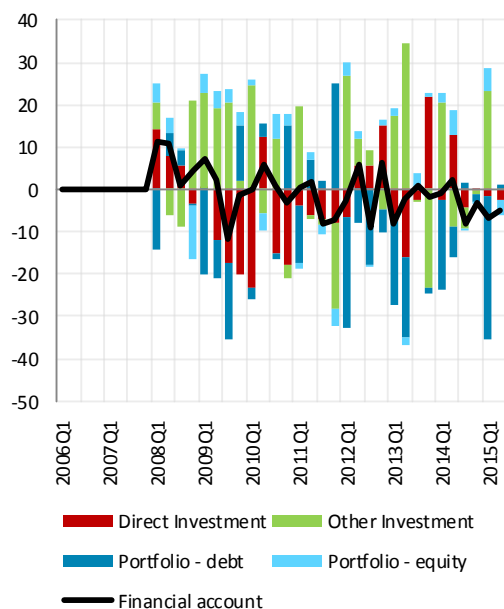
Austria - Financial Account - net components (% of GDP)



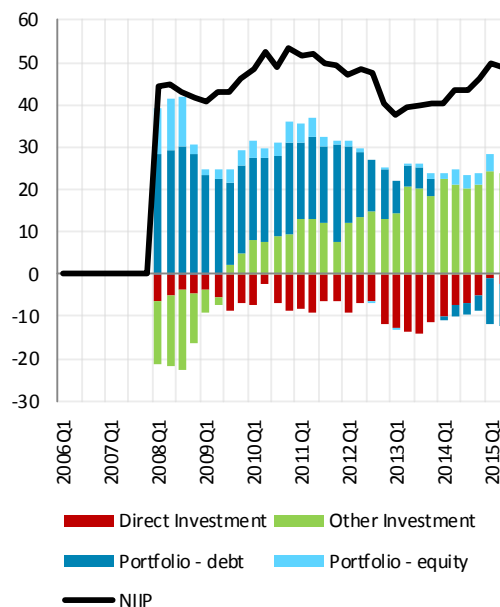
Austria - Net International Investment Position net components (% of GDP)

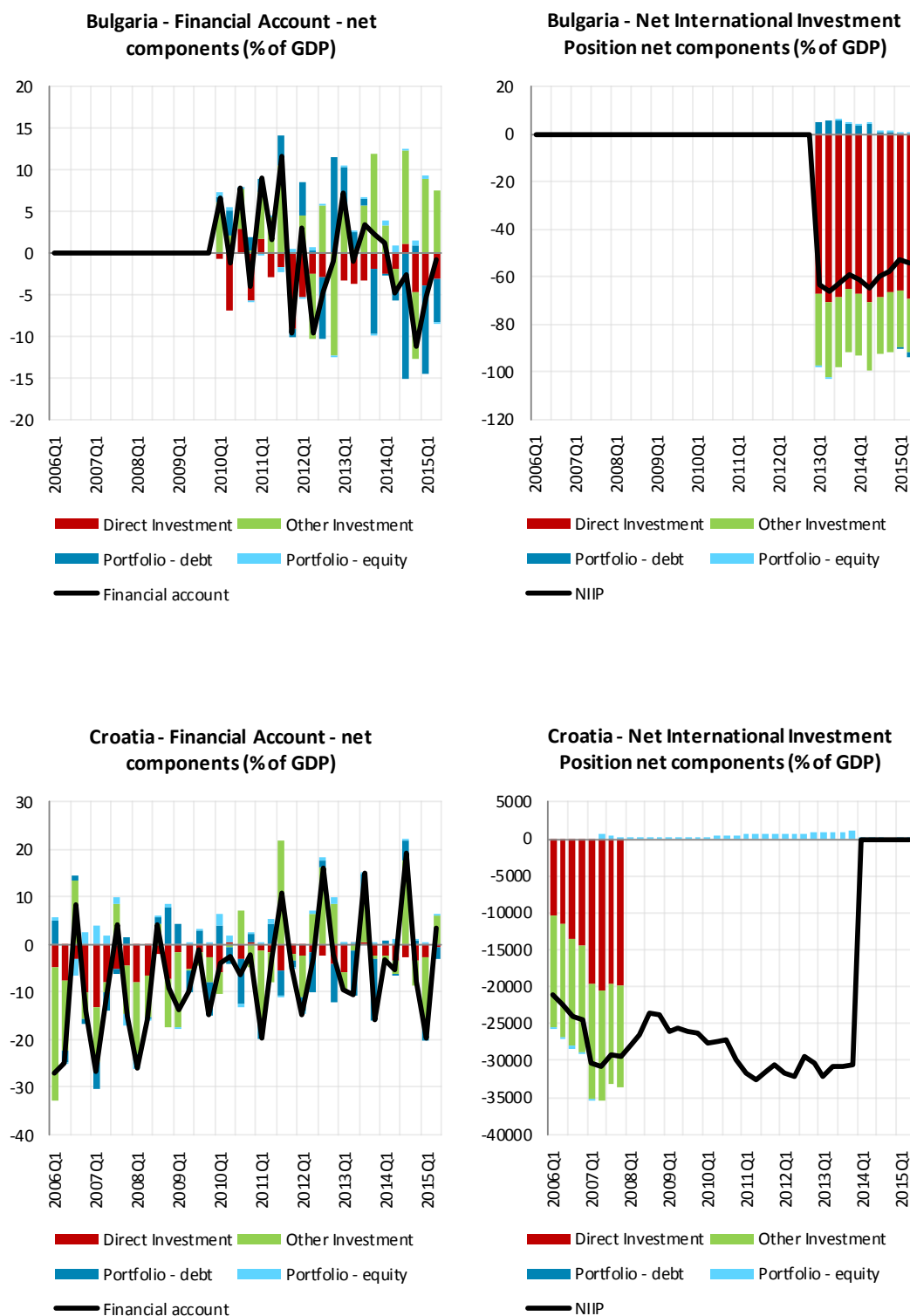


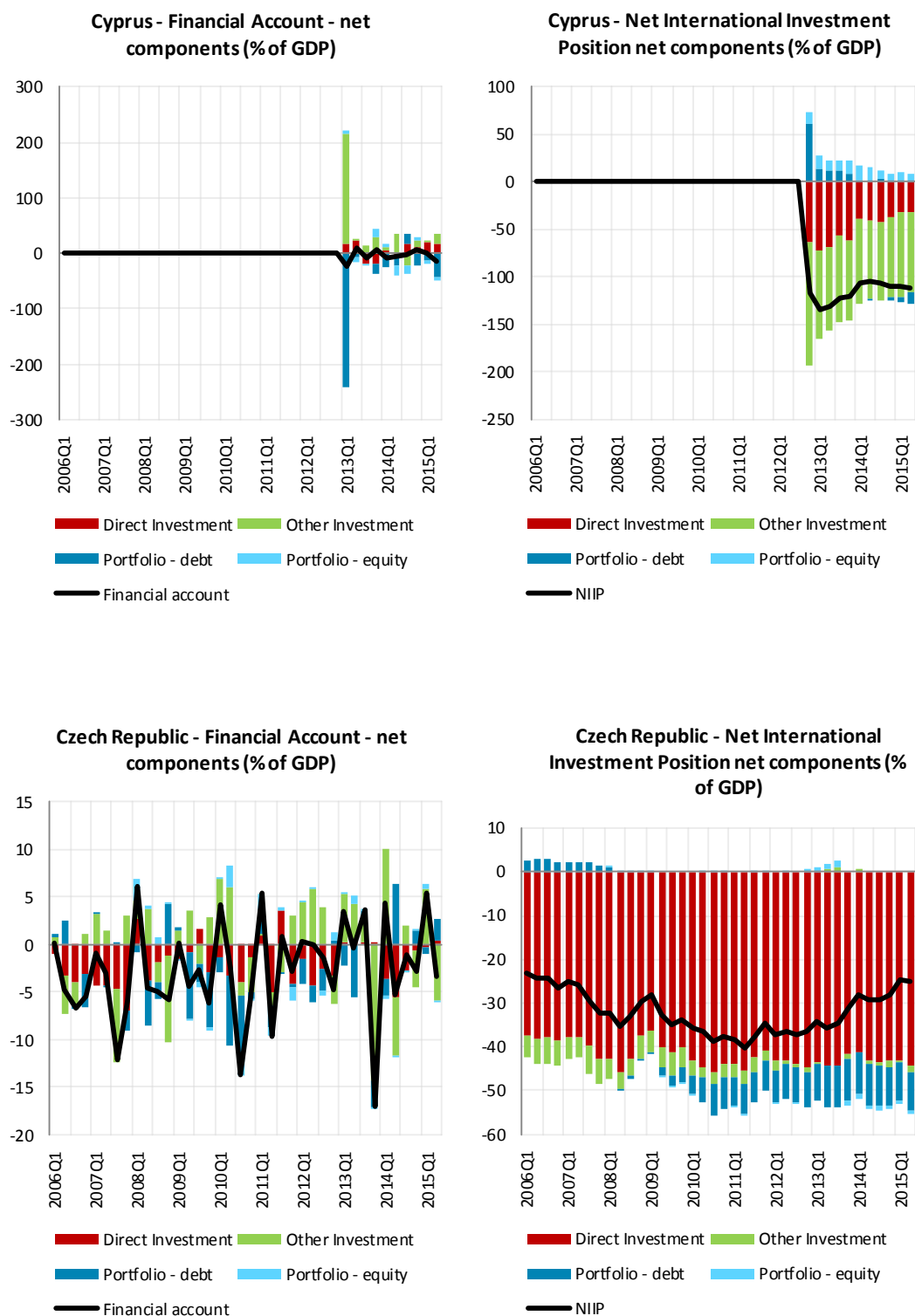
Belgium - Financial Account - net components (% of GDP)



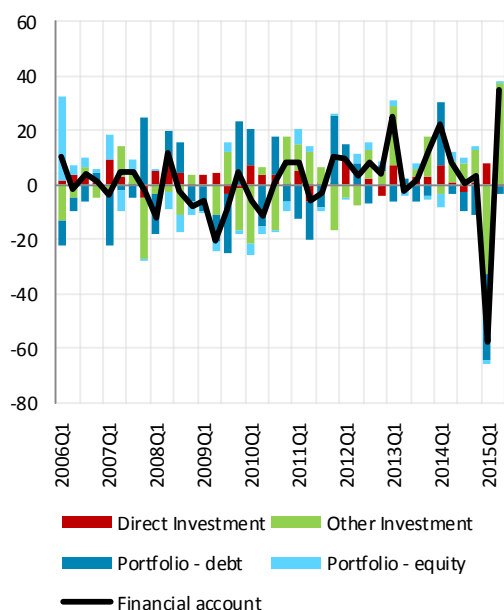
Belgium - Net International Investment Position net components (% of GDP)



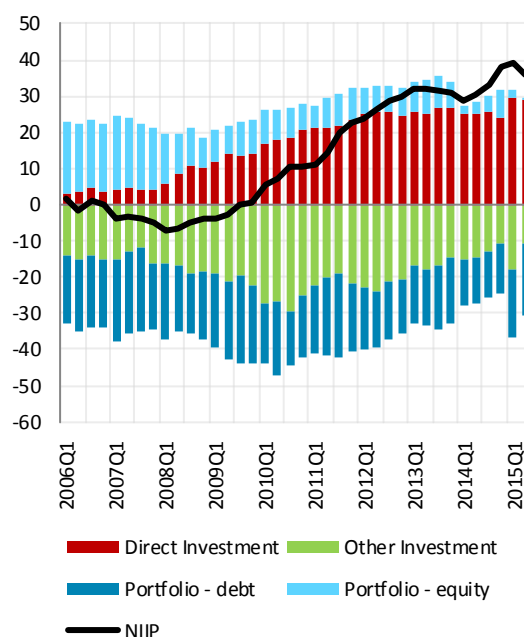




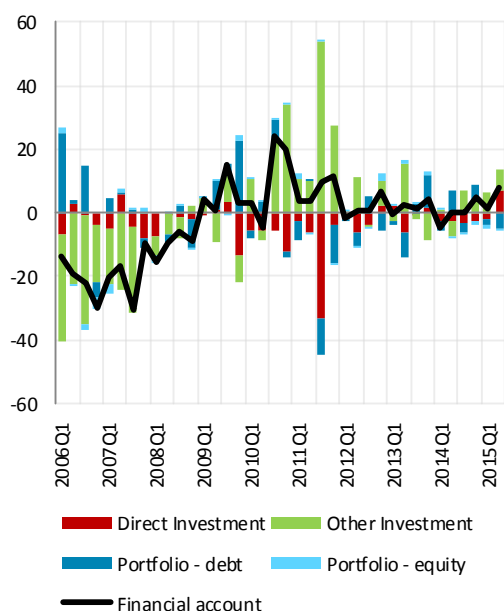
Denmark - Financial Account - net components (% of GDP)



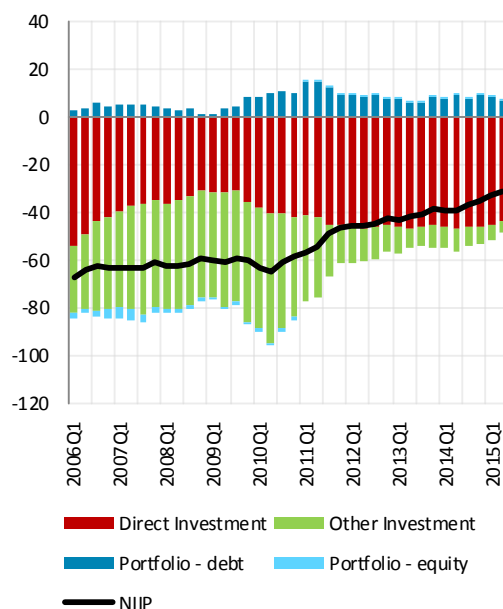
Denmark - Net International Investment Position net components (% of GDP)



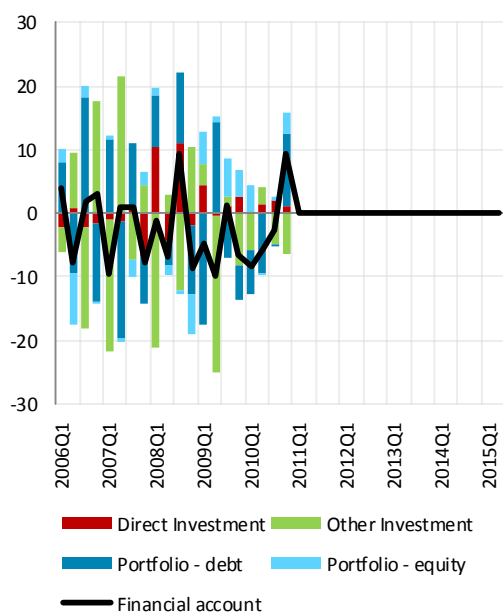
Estonia - Financial Account - net components (% of GDP)



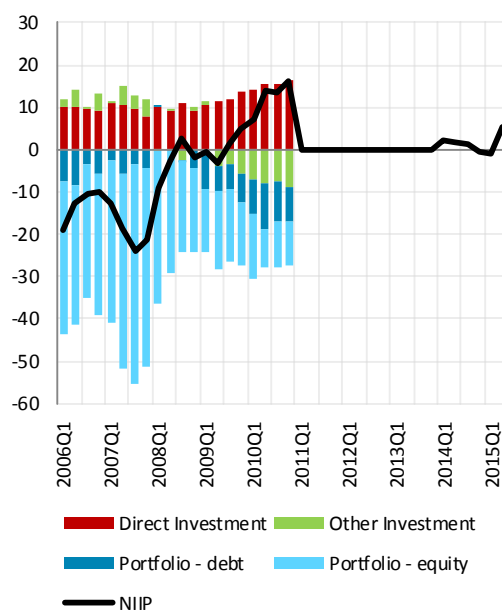
Estonia - Net International Investment Position net components (% of GDP)



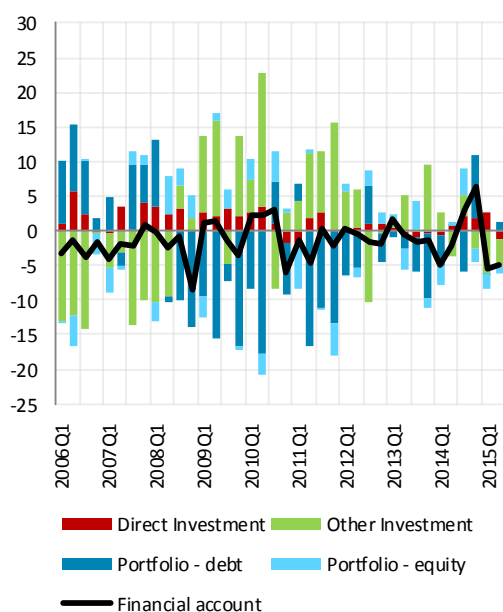
Finland - Financial Account - net components (% of GDP)



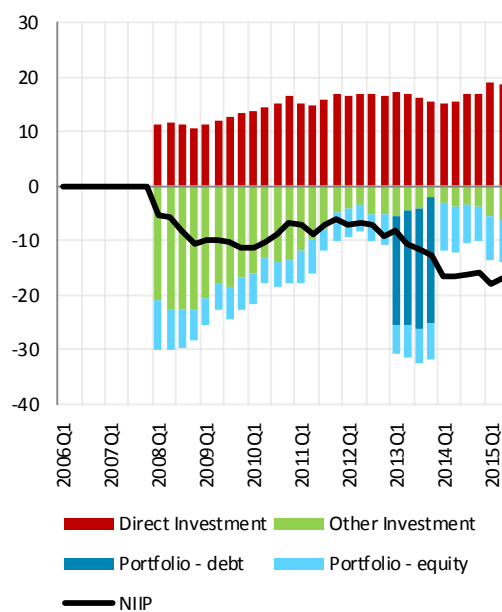
Finland - Net International Investment Position net components (% of GDP)



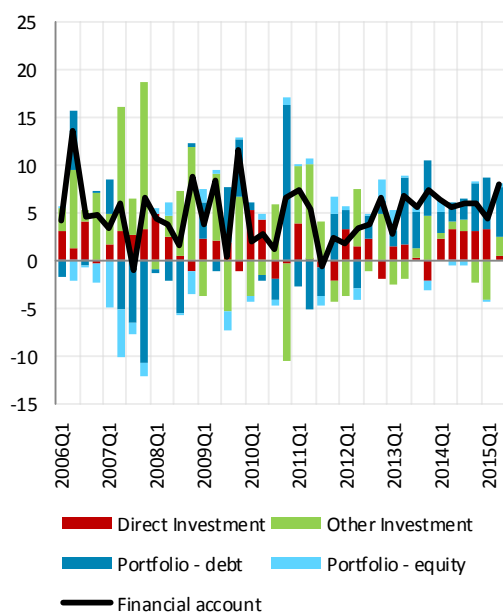
France - Financial Account - net components (% of GDP)



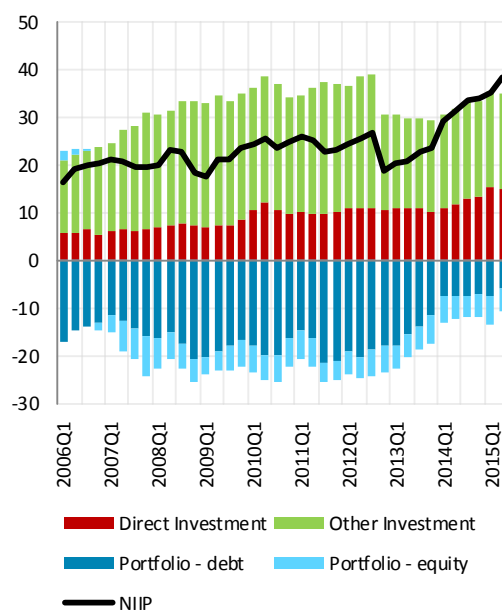
France - Net International Investment Position net components (% of GDP)



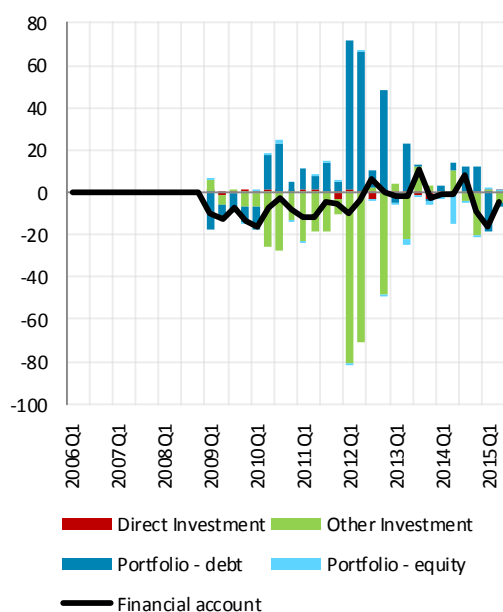
Germany - Financial Account - net components (% of GDP)



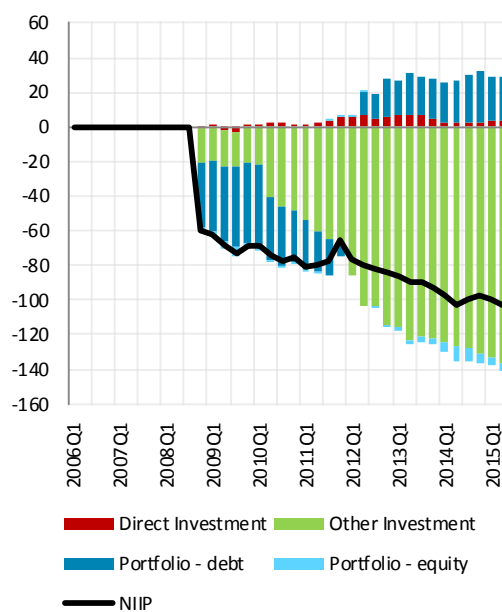
Germany - Net International Investment Position net components (% of GDP)



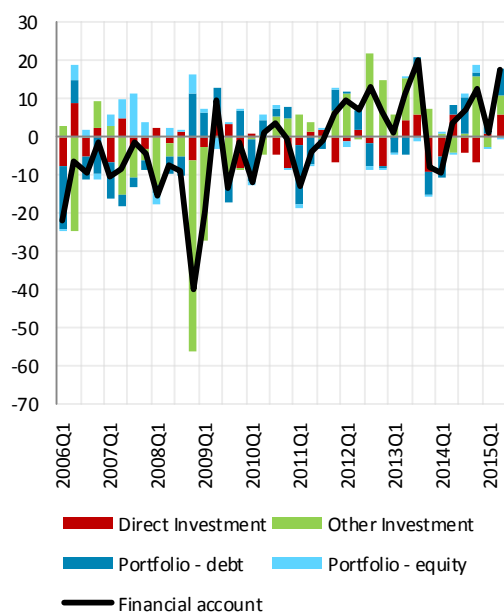
Greece - Financial Account - net components (% of GDP)



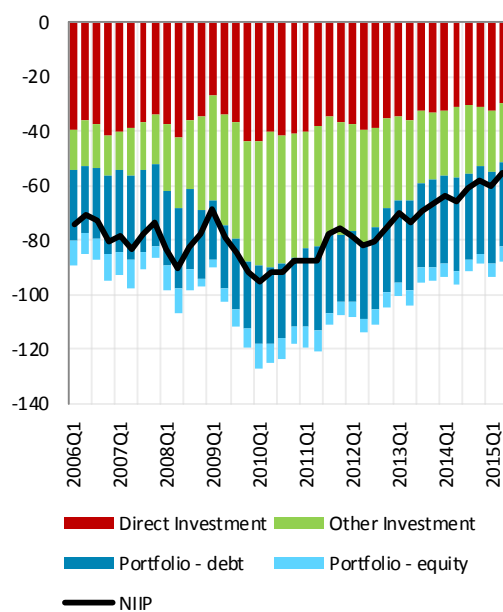
Greece - Net International Investment Position net components (% of GDP)



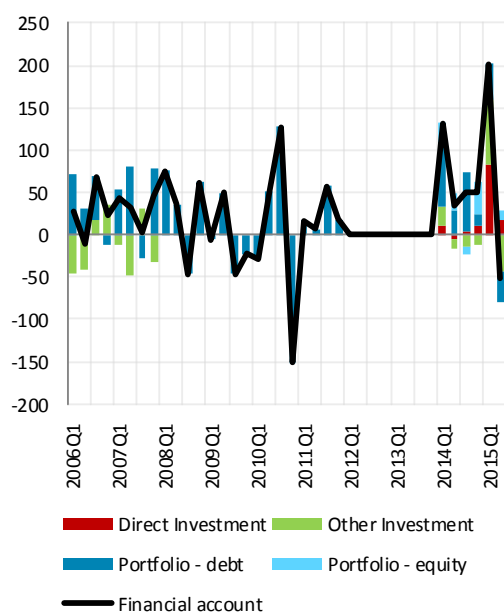
Hungary - Financial Account - net components (% of GDP)



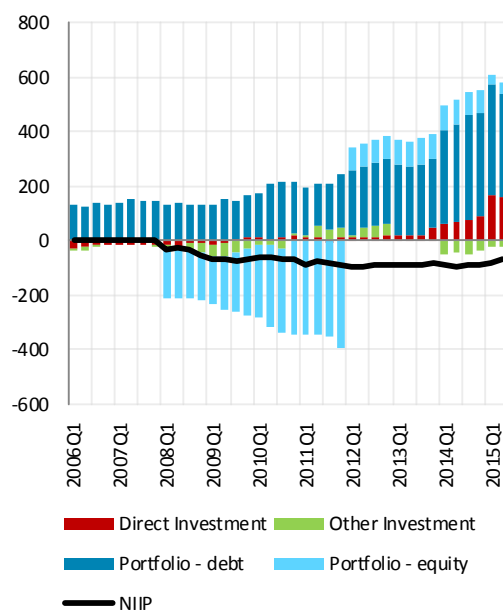
Hungary - Net International Investment Position net components (% of GDP)



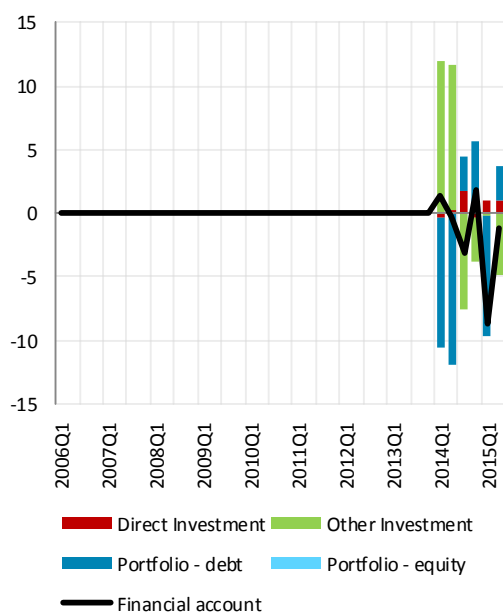
Ireland - Financial Account - net components (% of GDP)



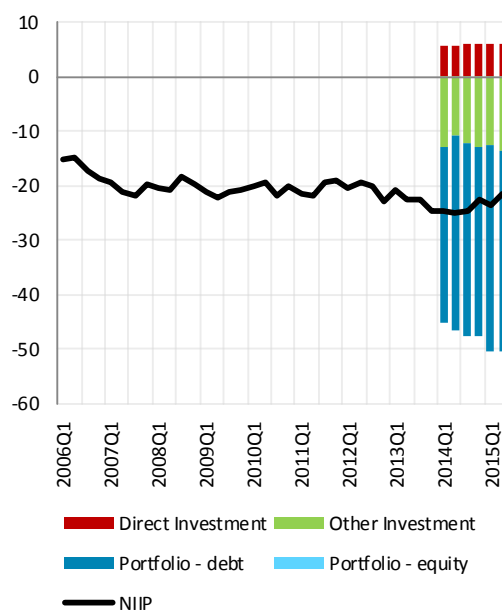
Ireland - Net International Investment Position net components (% of GDP)



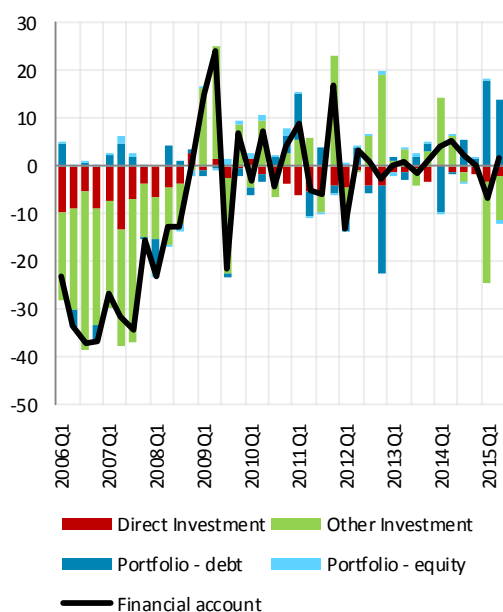
Italy - Financial Account - net components (% of GDP)



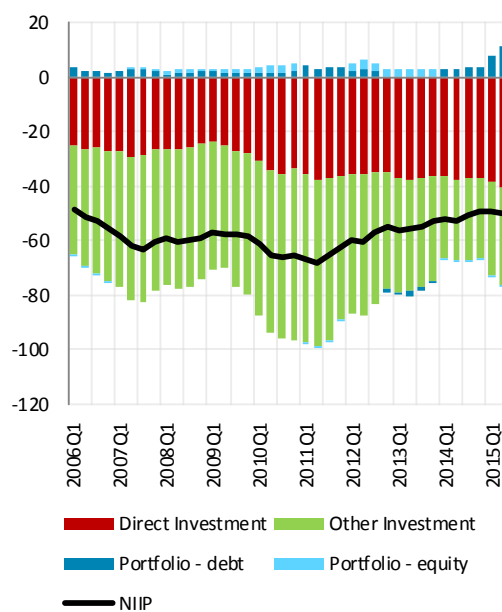
Italy - Net International Investment Position net components (% of GDP)

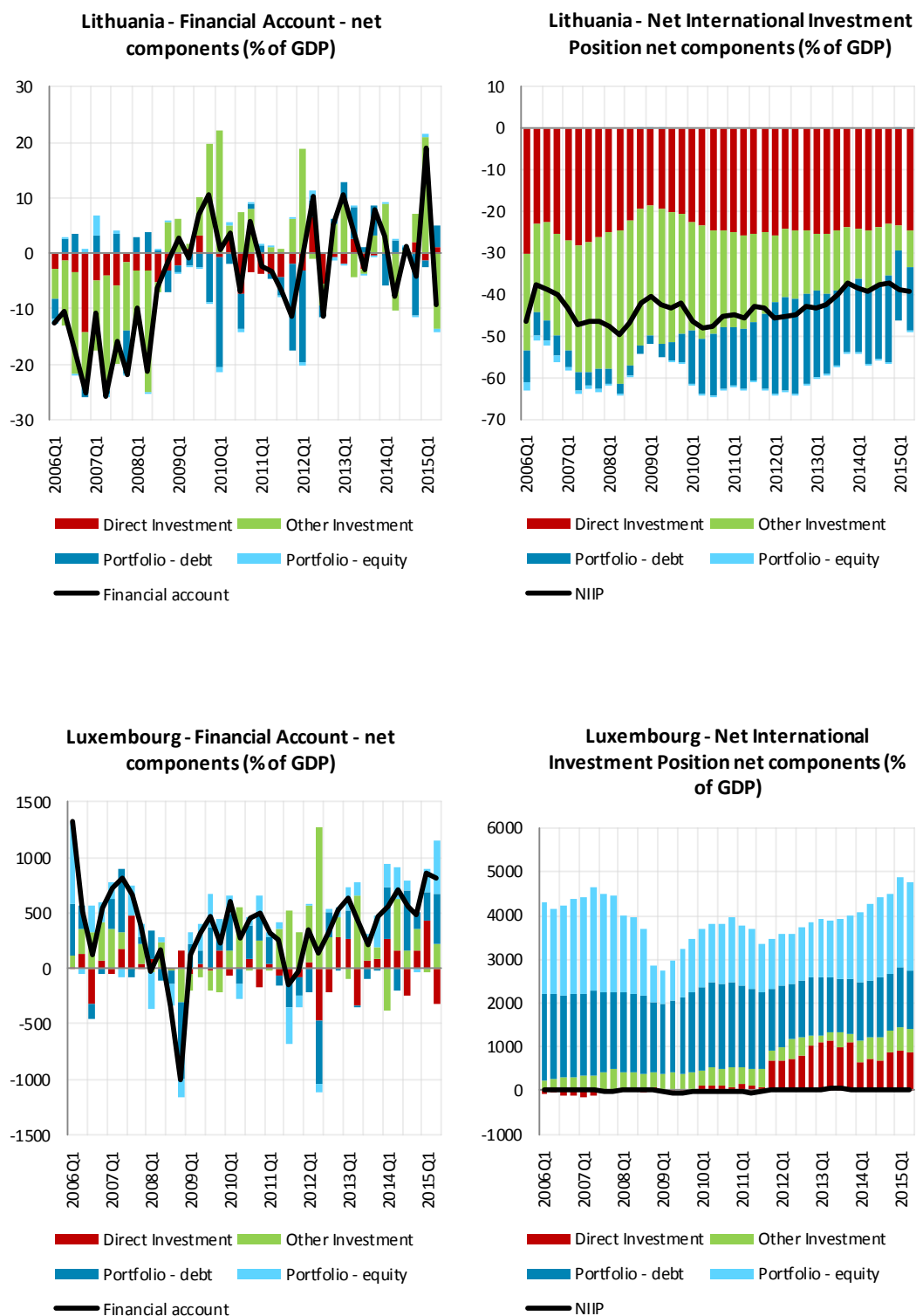


Latvia - Financial Account - net components (% of GDP)

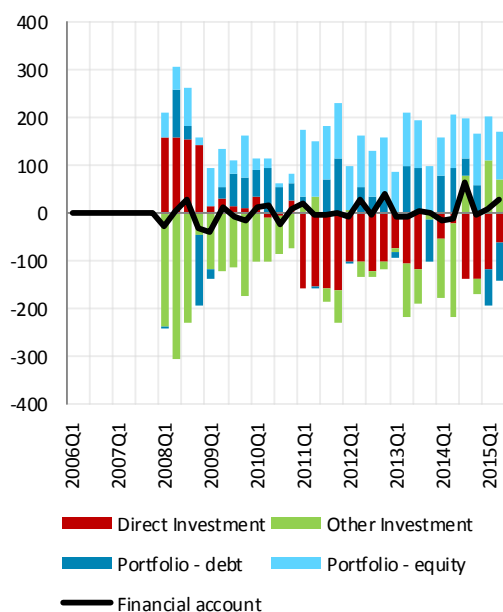


Latvia - Net International Investment Position net components (% of GDP)

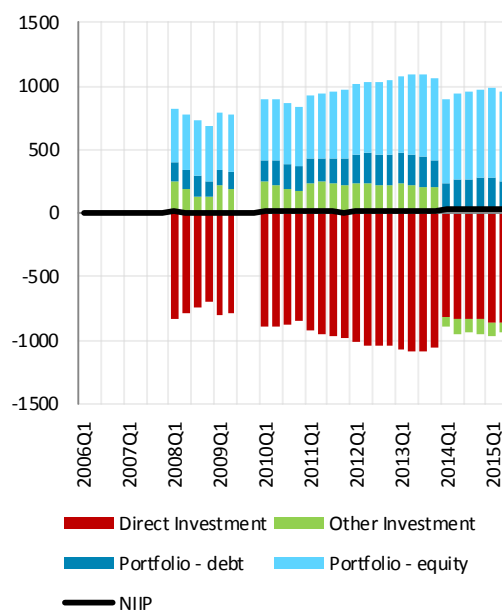




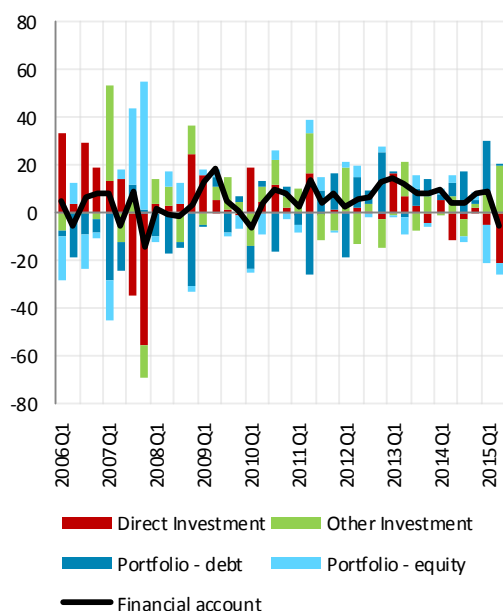
Malta - Financial Account - net components (% of GDP)



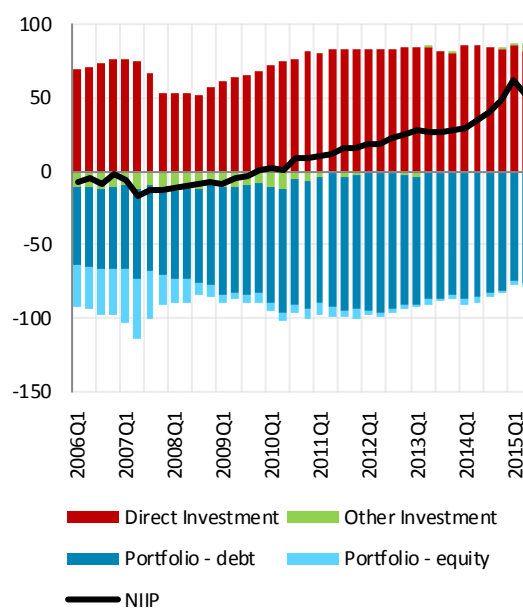
Malta - Net International Investment Position net components (% of GDP)

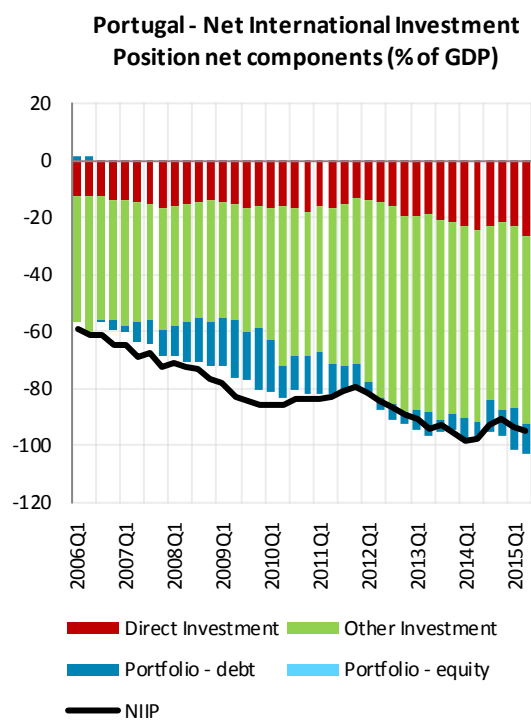
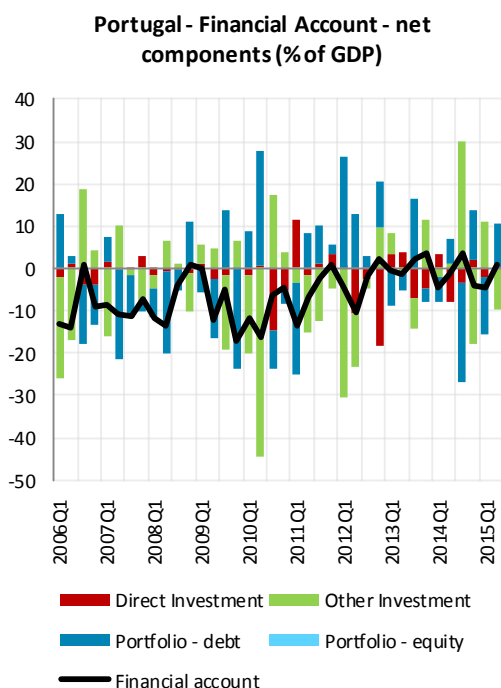
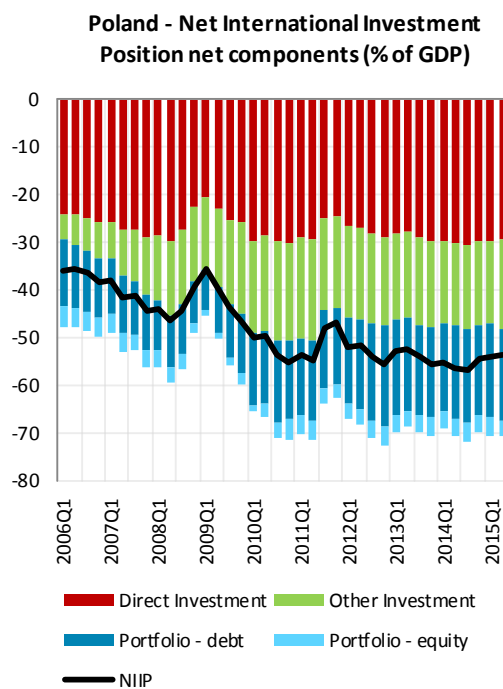
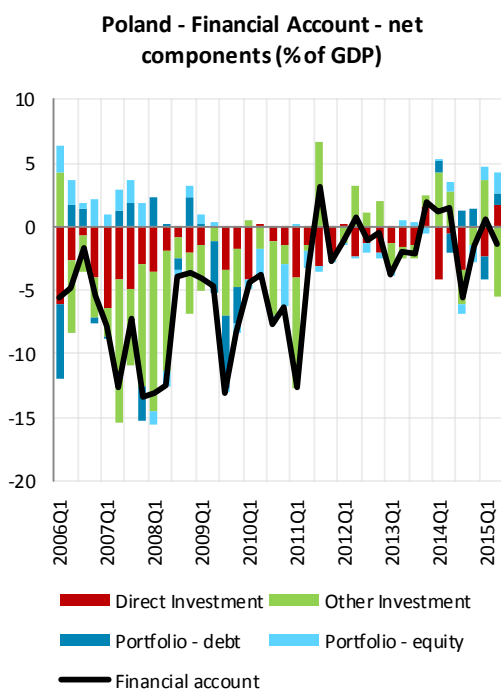


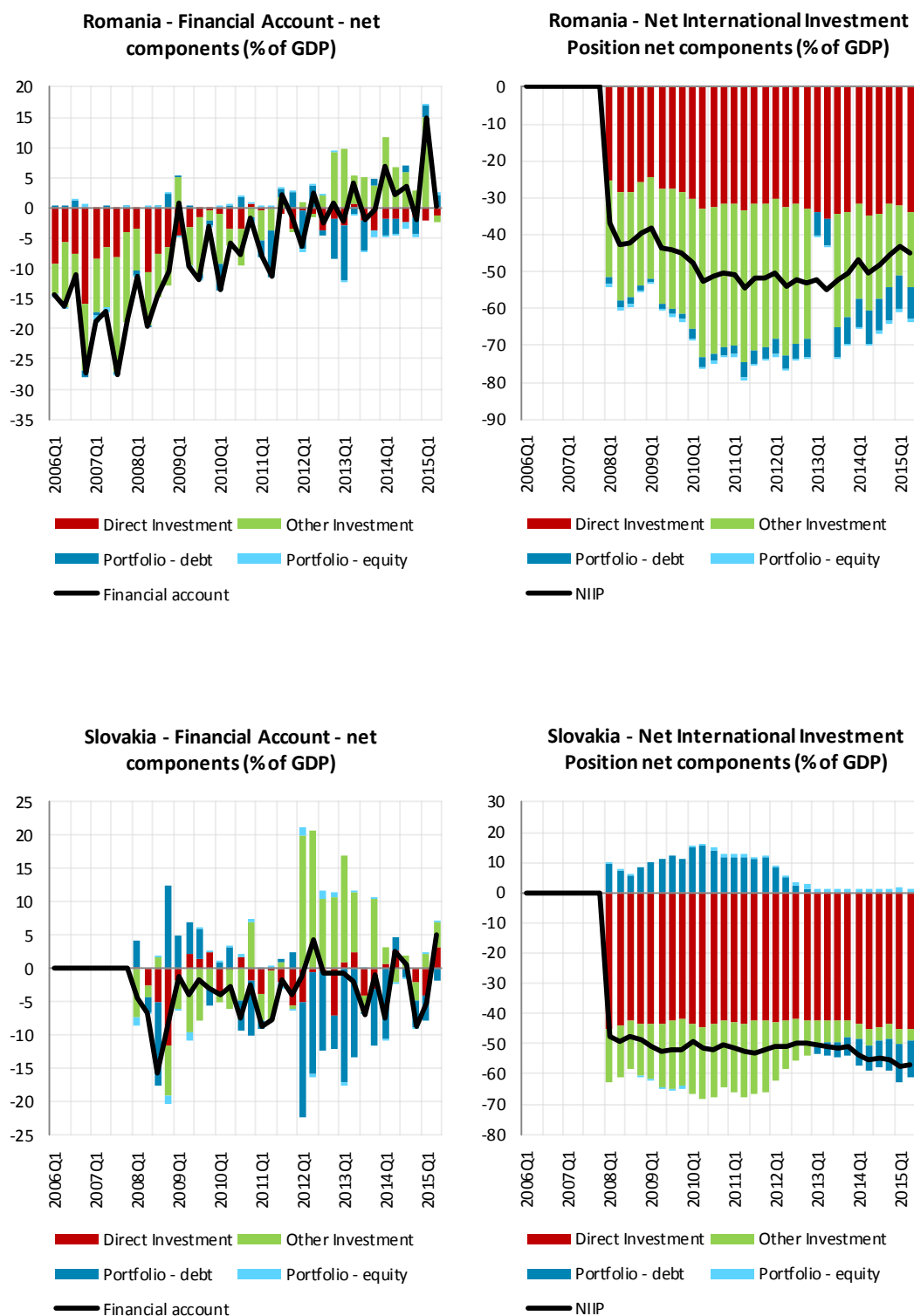
Netherlands - Financial Account - net components (% of GDP)



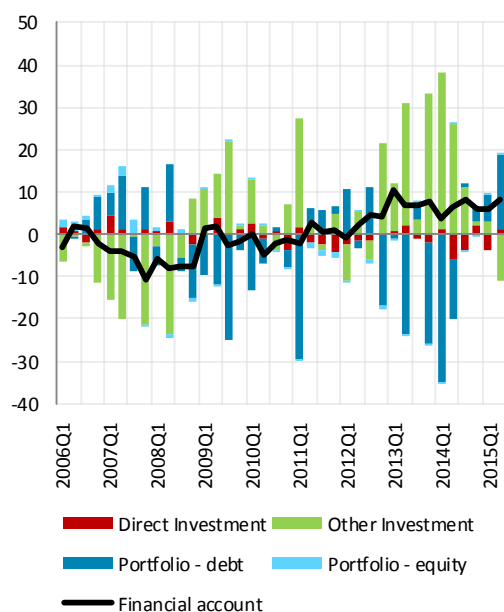
Netherlands - Net International Investment Position net components (% of GDP)



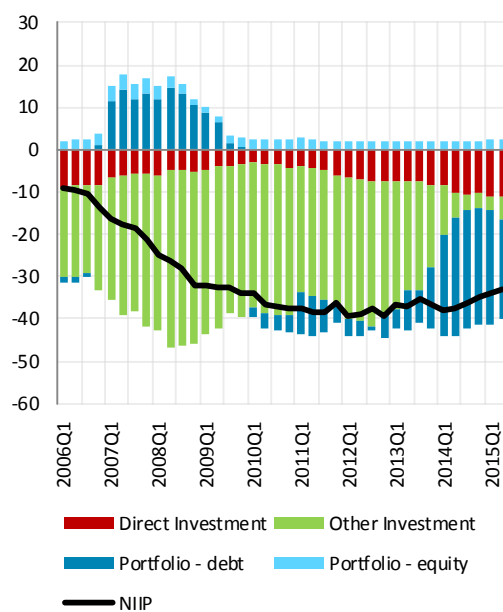




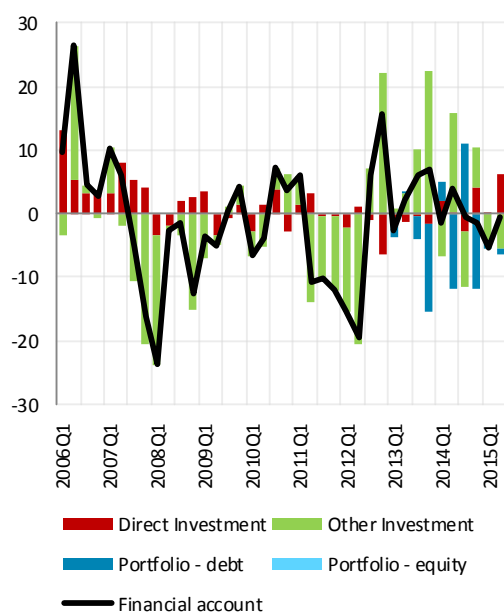
Slovenia - Financial Account - net components (% of GDP)



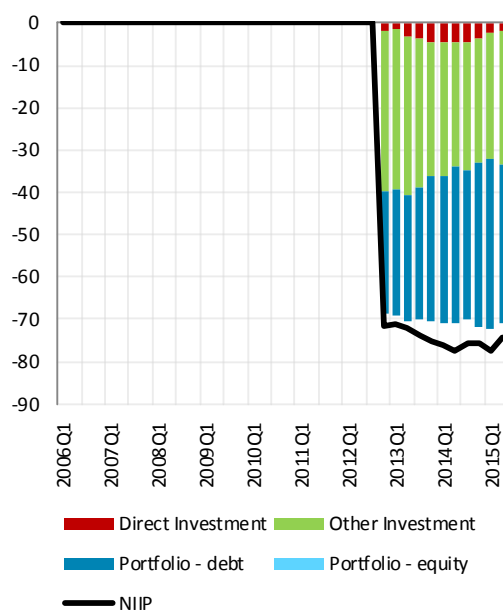
Slovenia - Net International Investment Position net components (% of GDP)



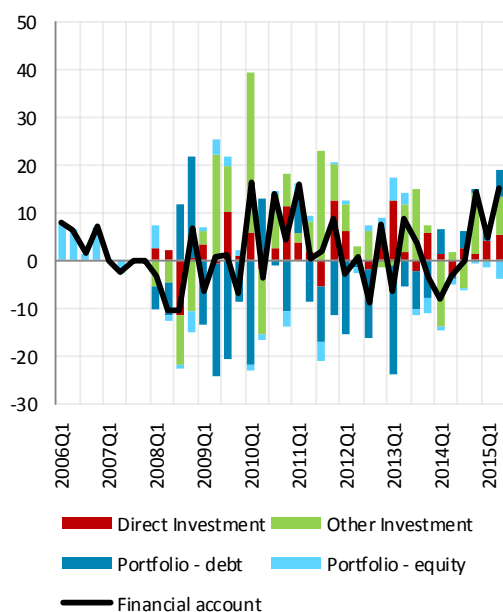
Spain - Financial Account - net components (% of GDP)



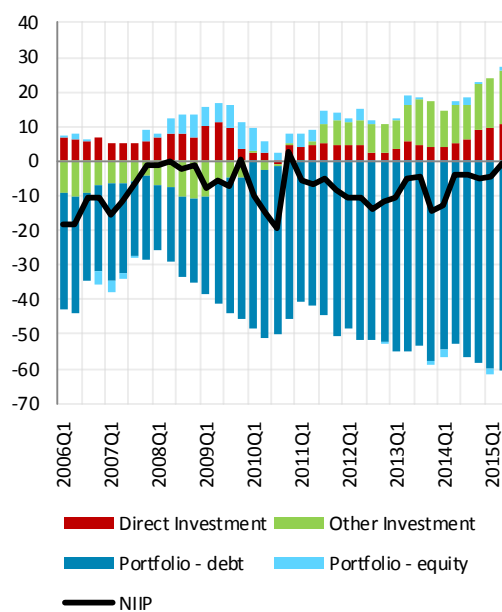
Spain - Net International Investment Position net components (% of GDP)



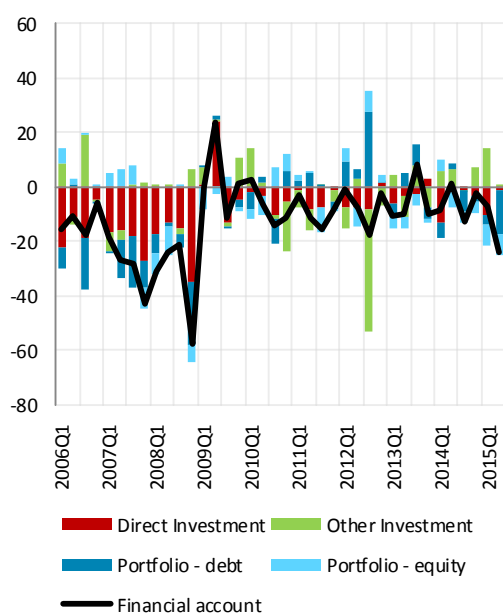
Sweden - Financial Account - net components (% of GDP)



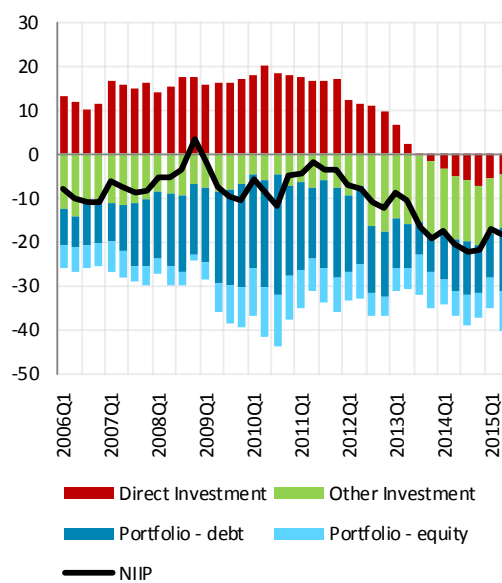
Sweden - Net International Investment Position net components (% of GDP)



United Kingdom - Financial Account - net components (% of GDP)



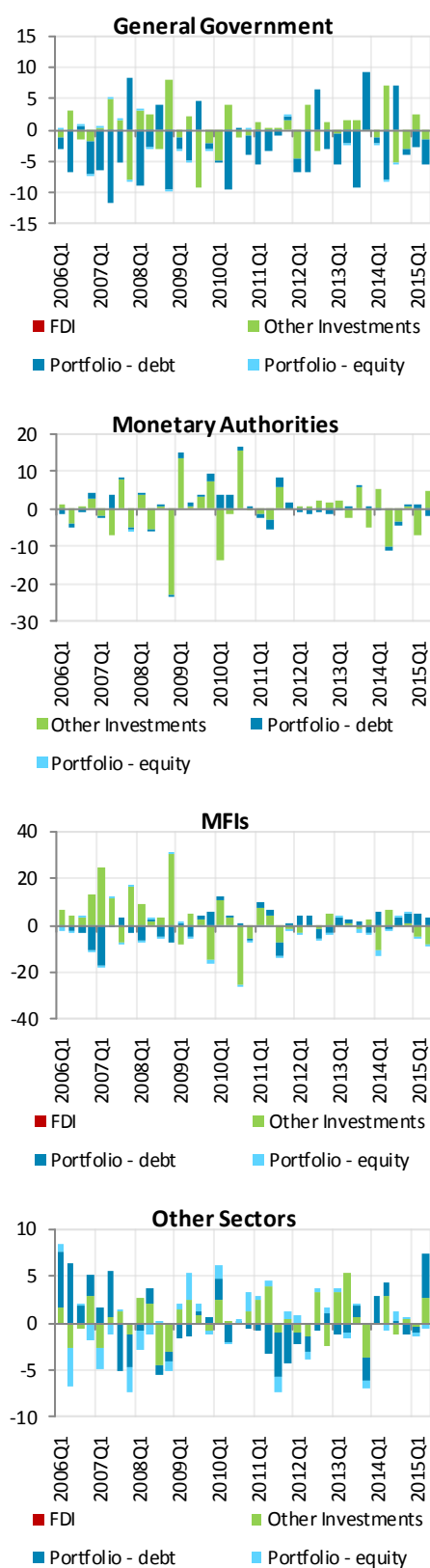
United Kingdom - Net International Investment Position net components (% of GDP)



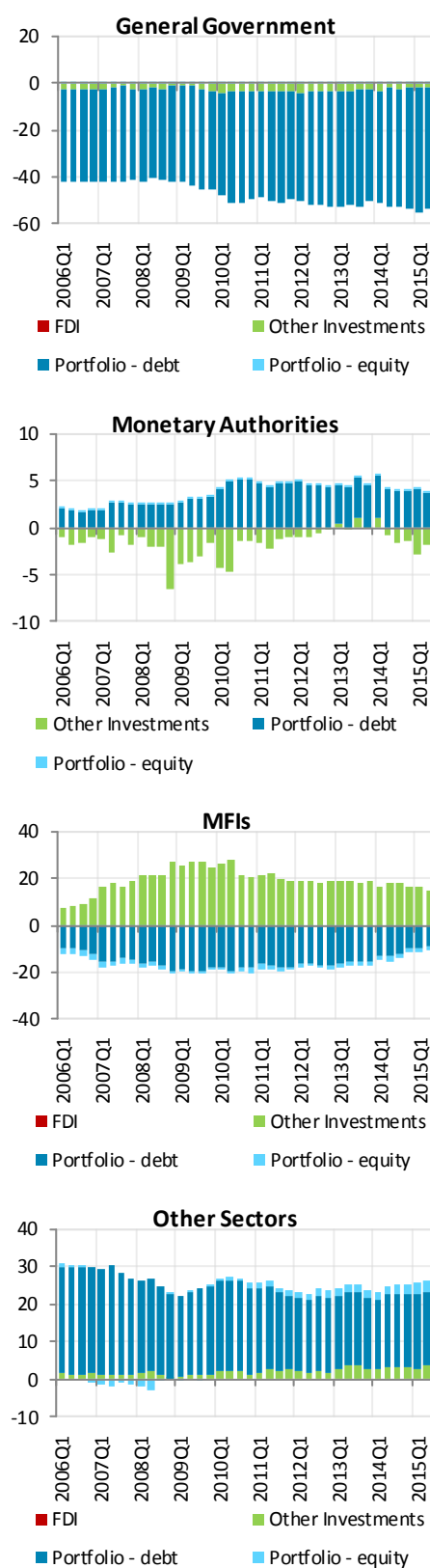
5.2 Appendix B to Section 3: financial accounts by sector of each EU country

Austria (in % of GDP)

Flows



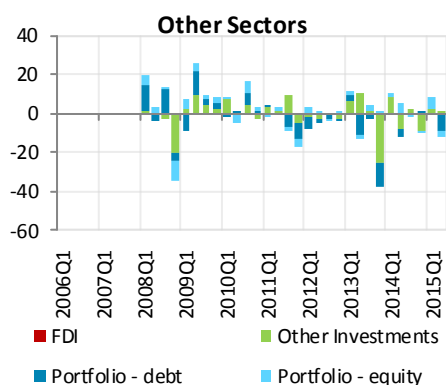
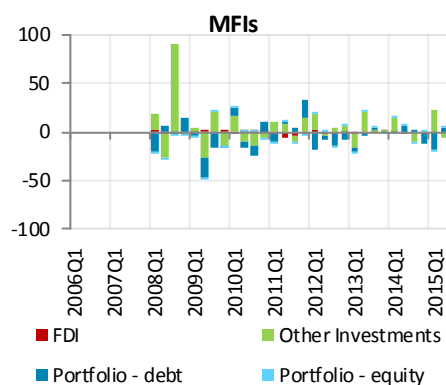
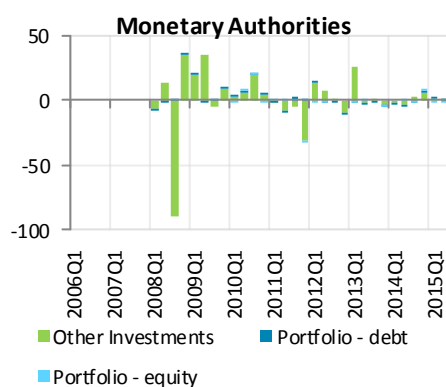
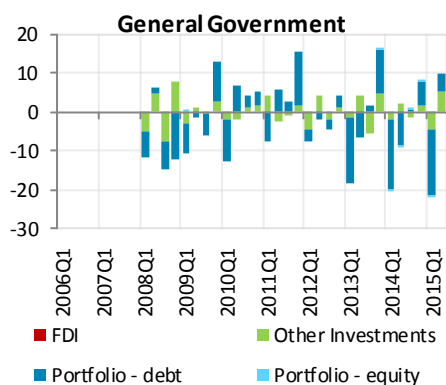
Stocks



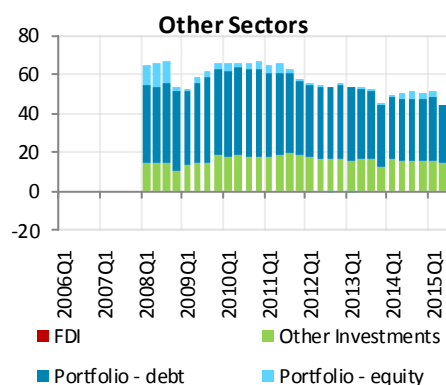
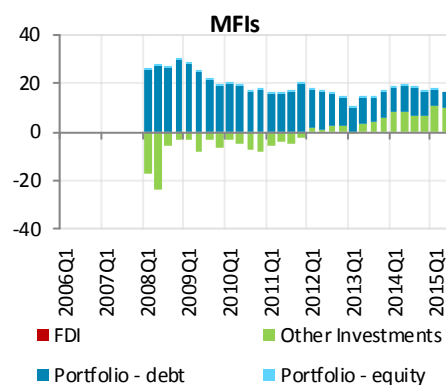
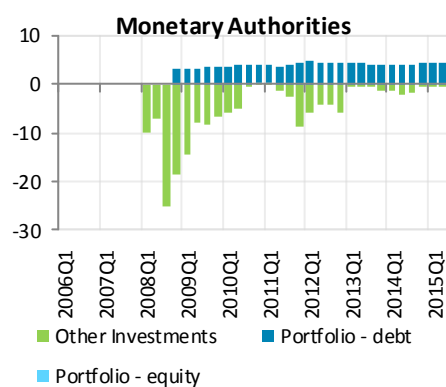
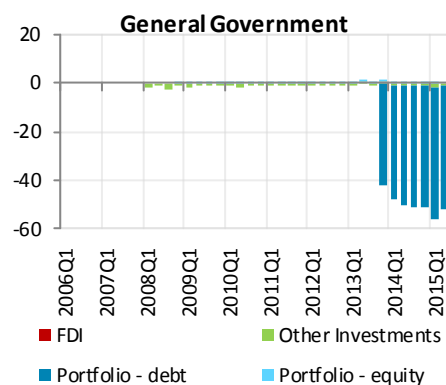
Belgium

(in % of GDP)

Flows



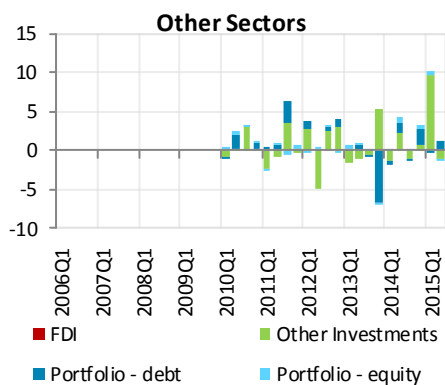
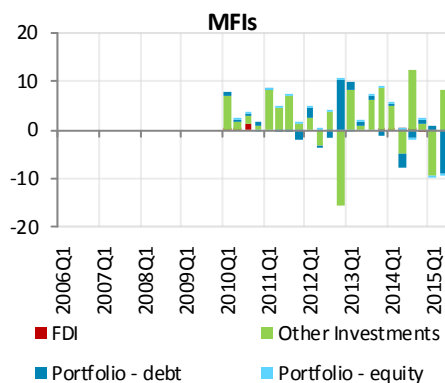
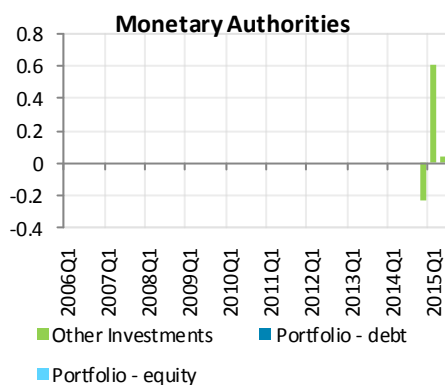
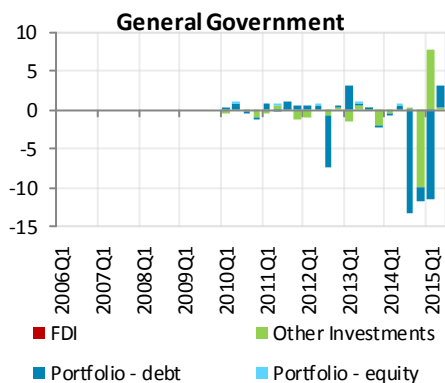
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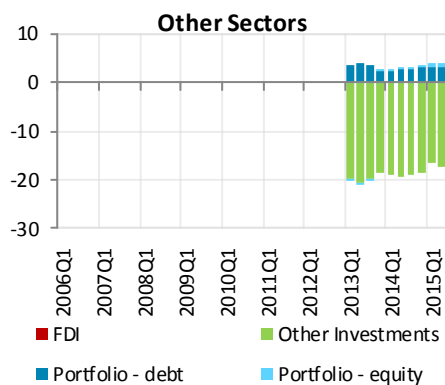
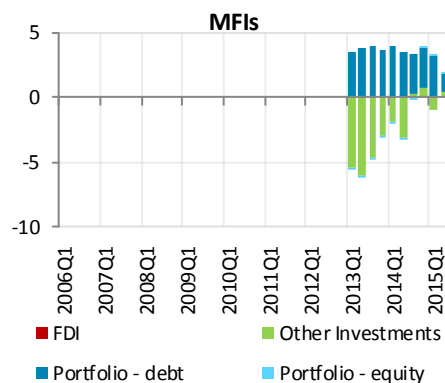
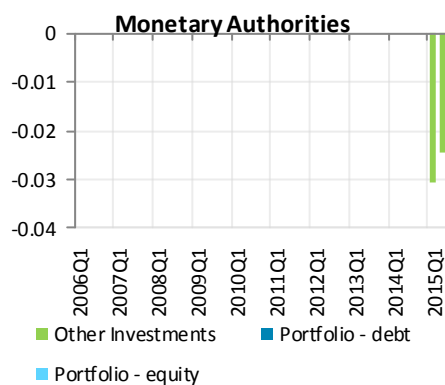
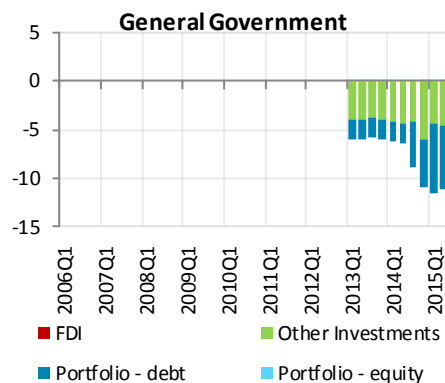
Bulgaria

(in % of GDP)

Flows



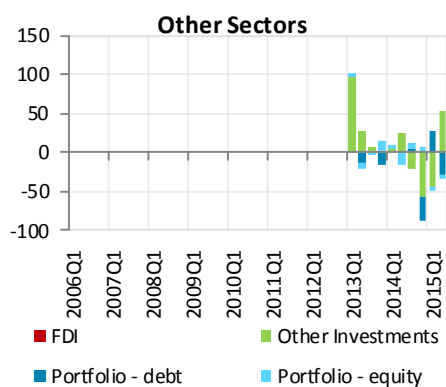
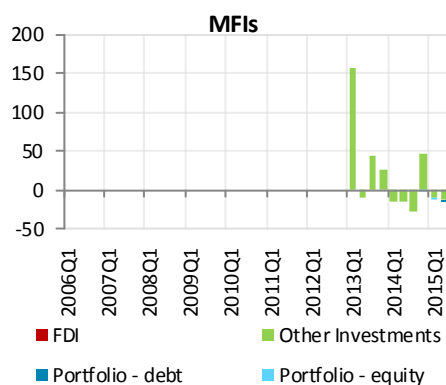
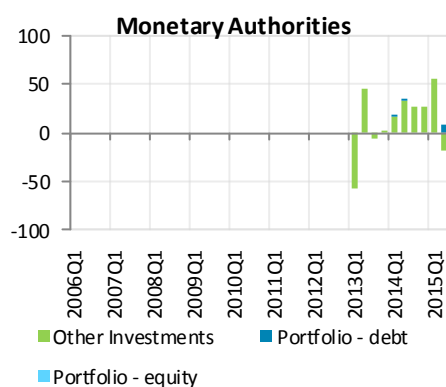
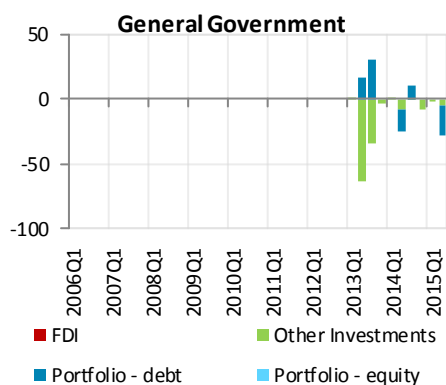
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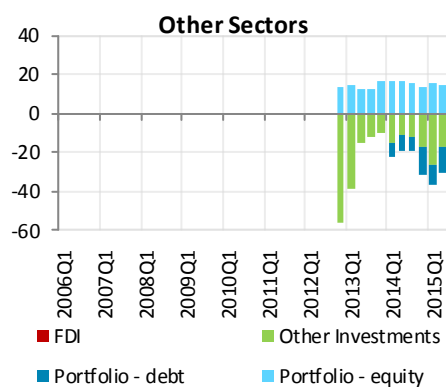
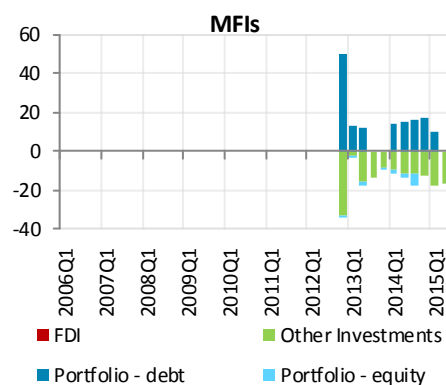
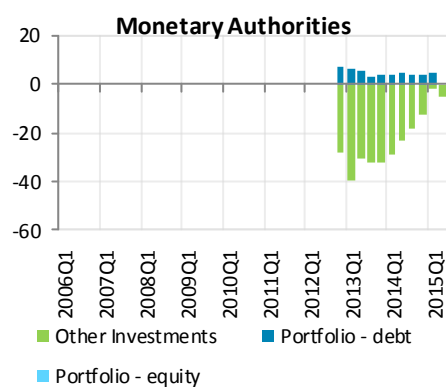
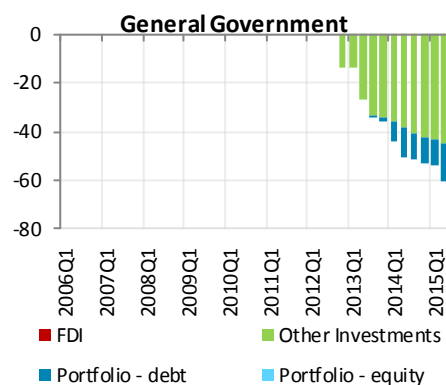
Cyprus

(in % of GDP)

Flows



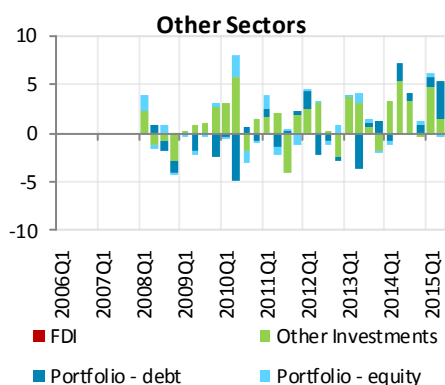
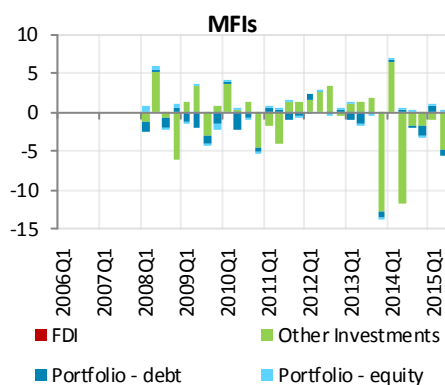
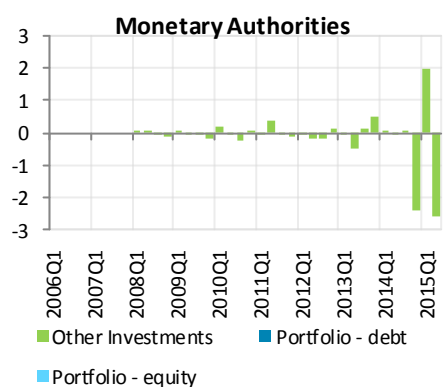
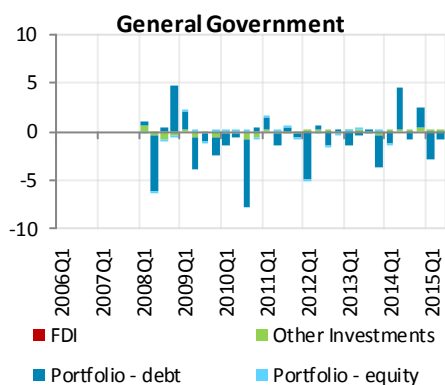
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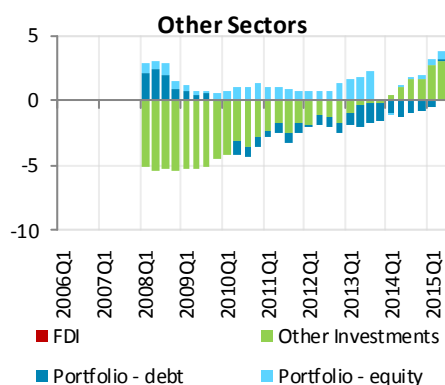
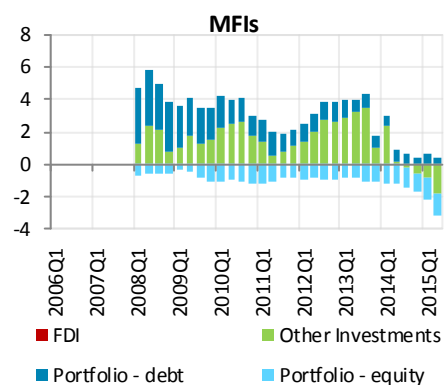
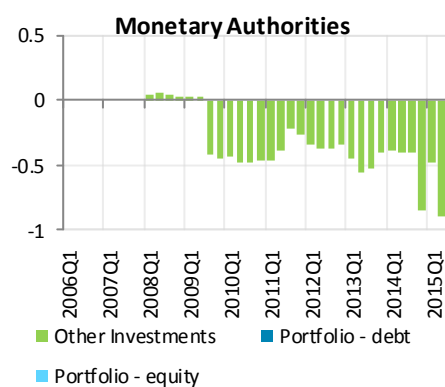
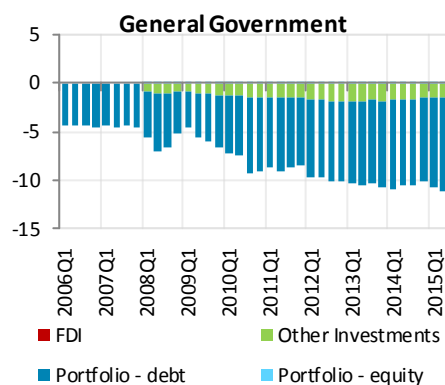
Czech Republic

(in % of GDP)

Flows



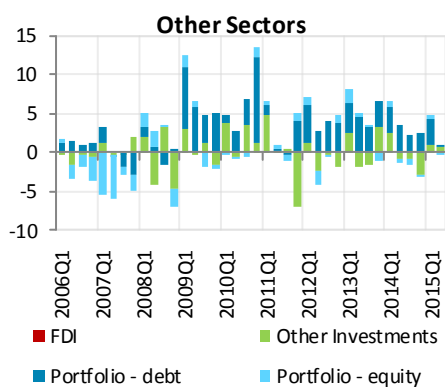
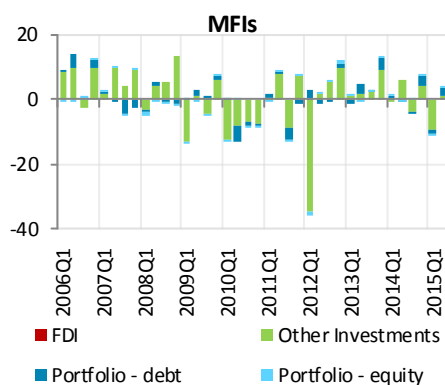
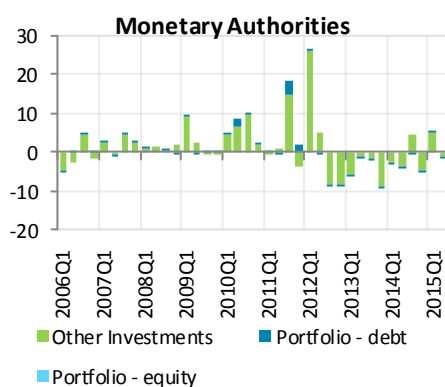
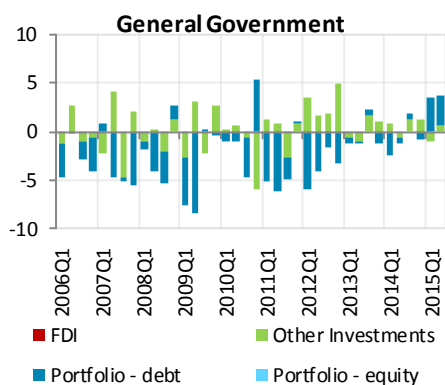
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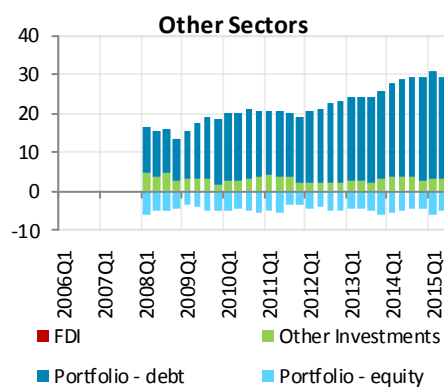
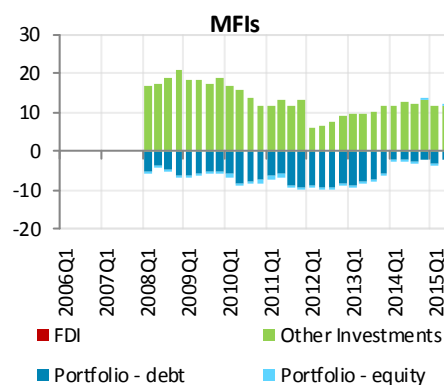
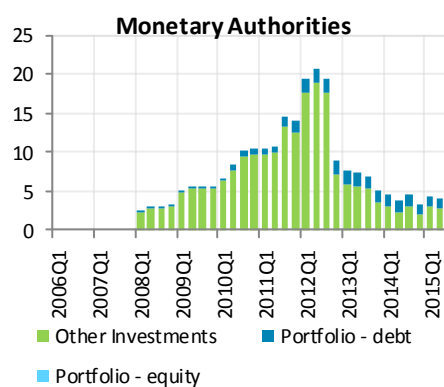
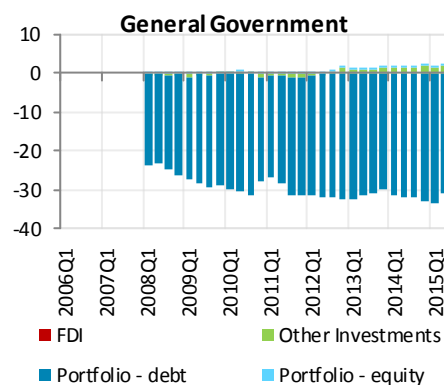
Germany

(in % of GDP)

Flows



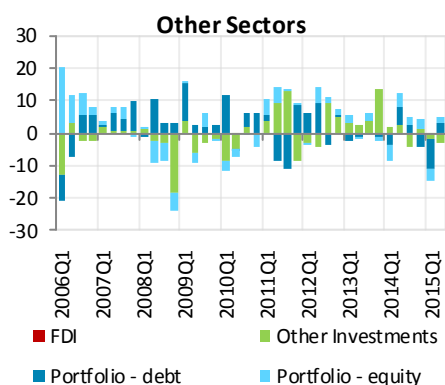
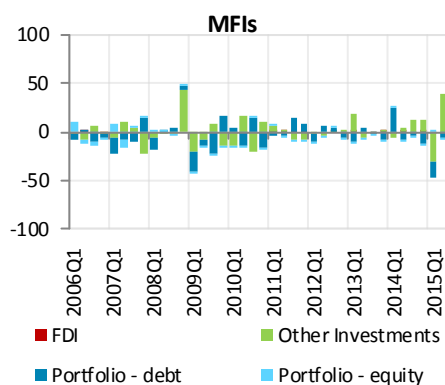
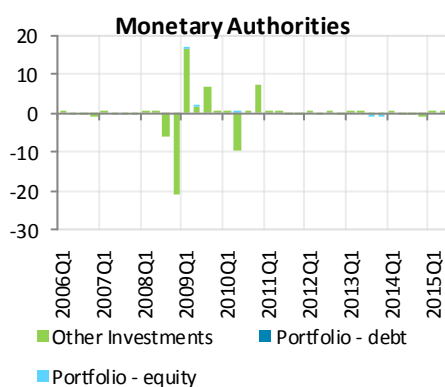
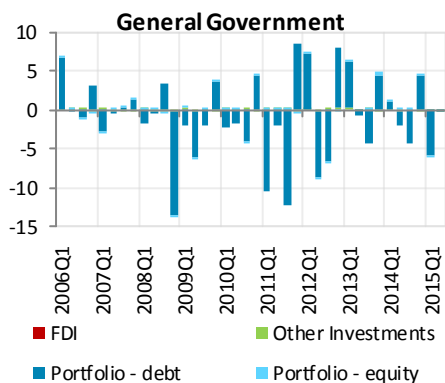
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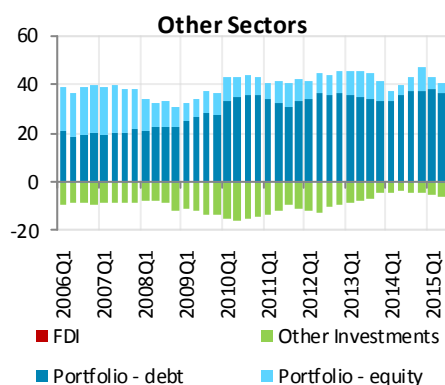
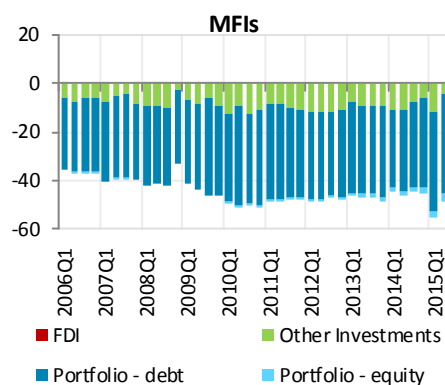
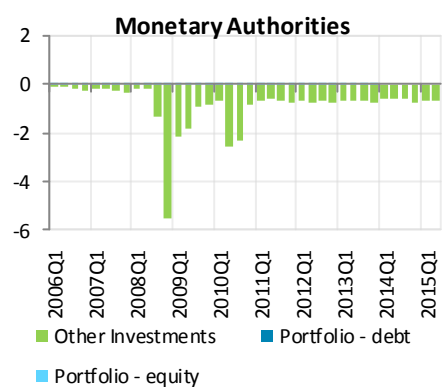
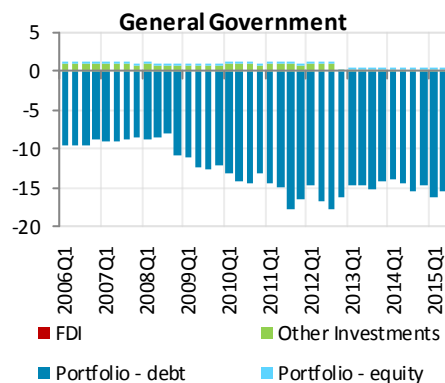
Denmark

(in % of GDP)

Flows



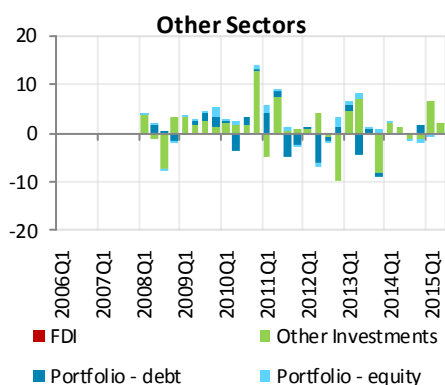
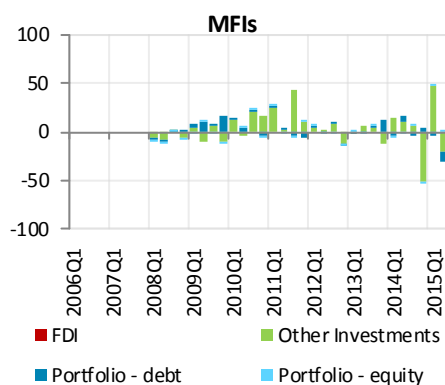
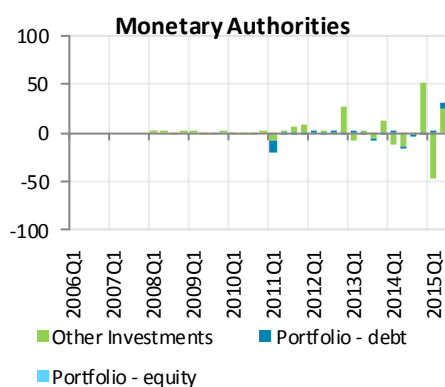
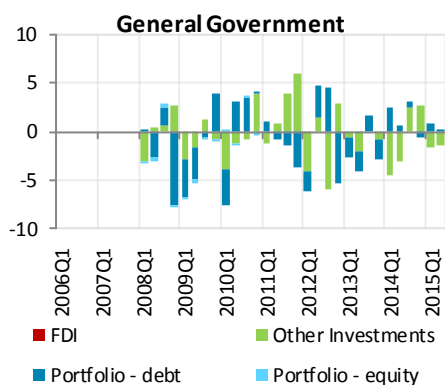
Stocks



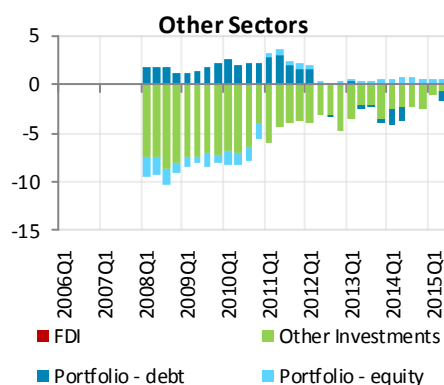
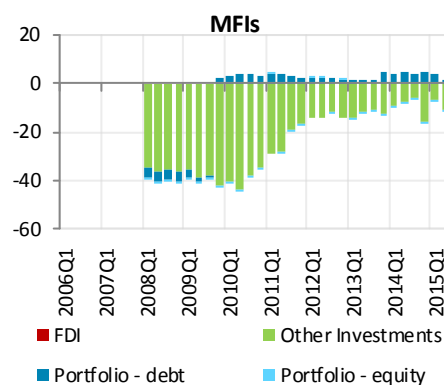
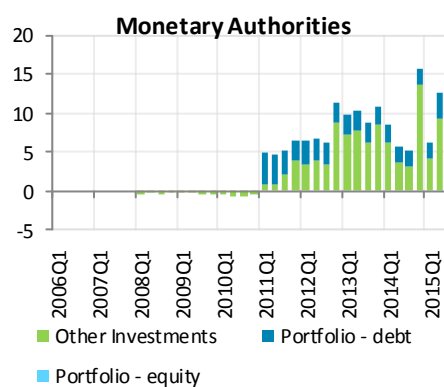
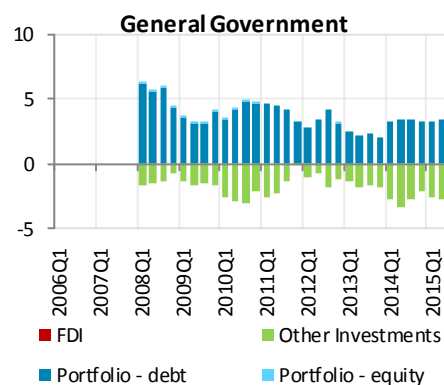
Estonia

(in % of GDP)

Flows



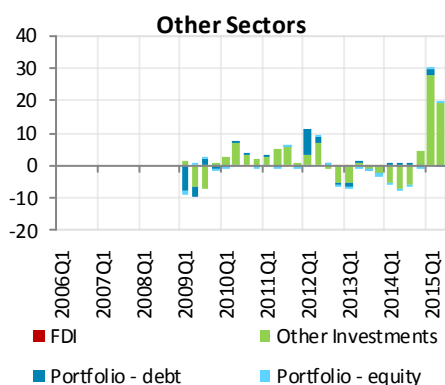
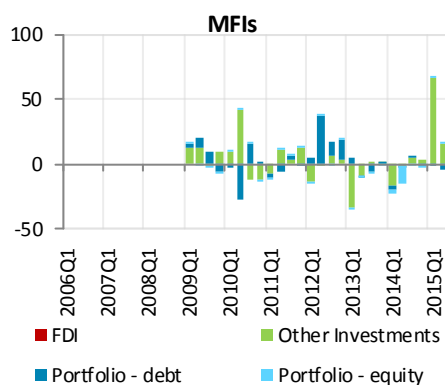
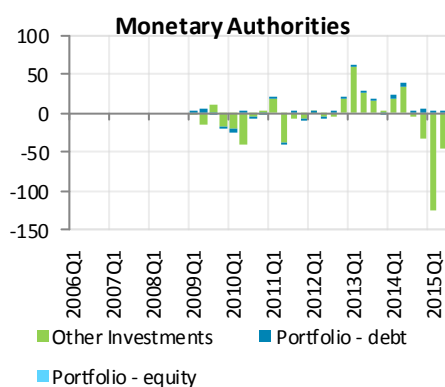
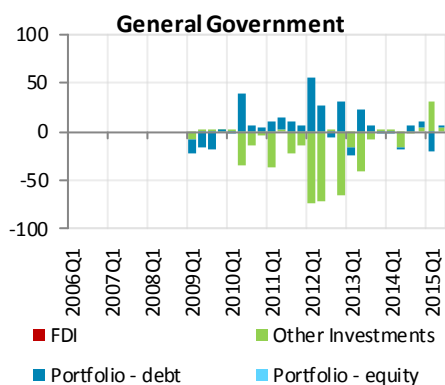
Stocks



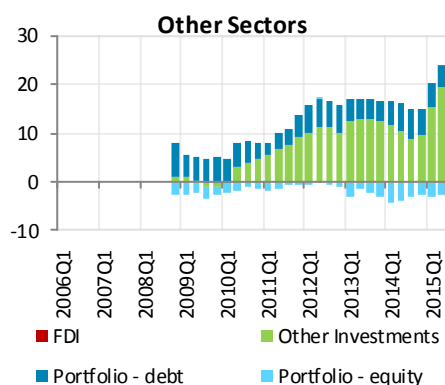
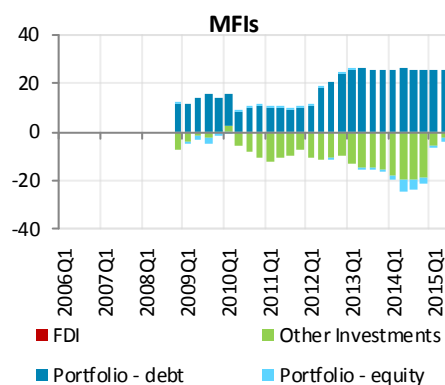
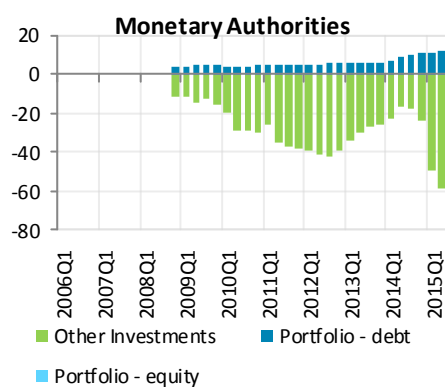
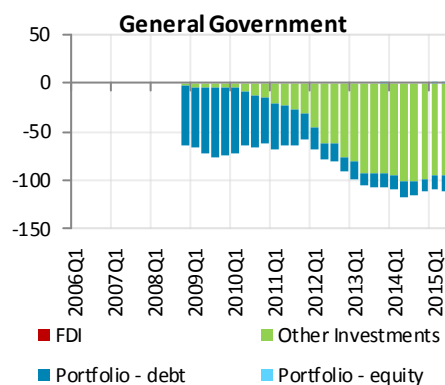
Greece

(in % of GDP)

Flows



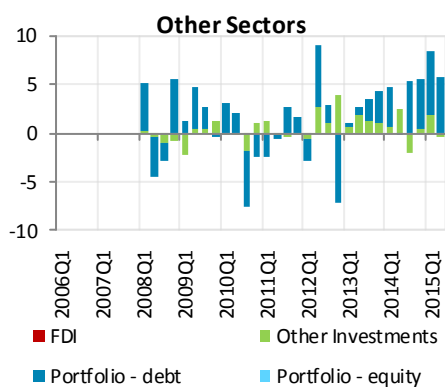
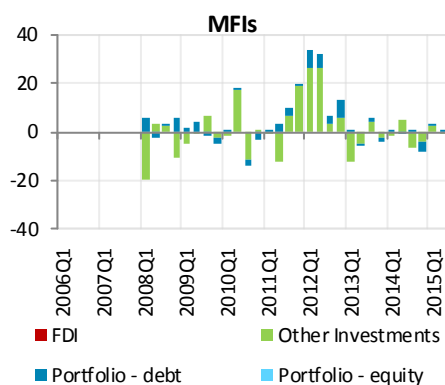
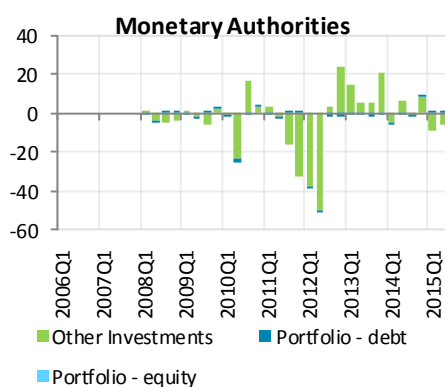
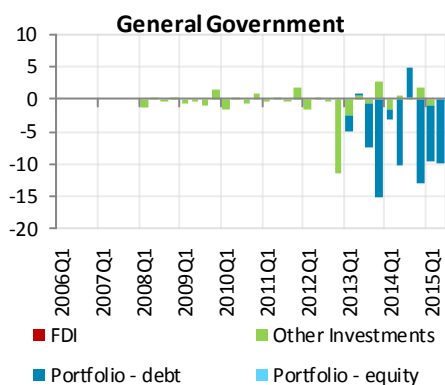
Stocks



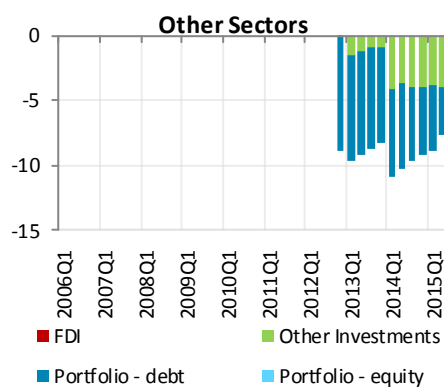
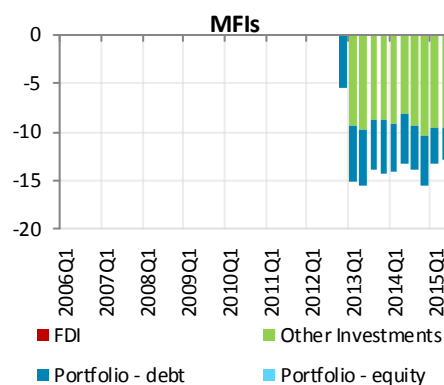
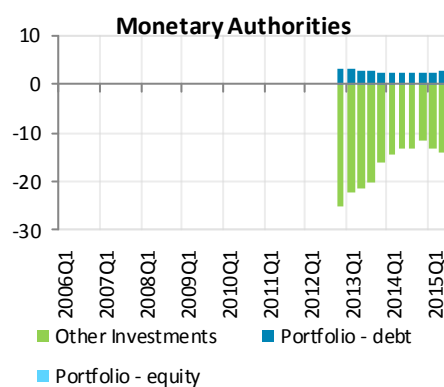
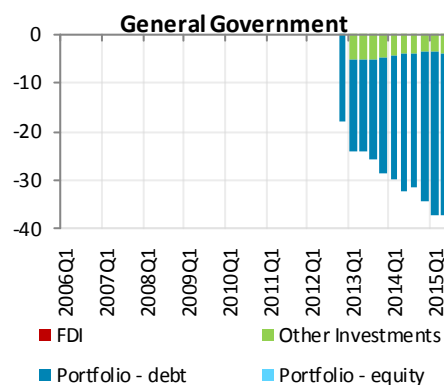
Spain

(in % of GDP)

Flows



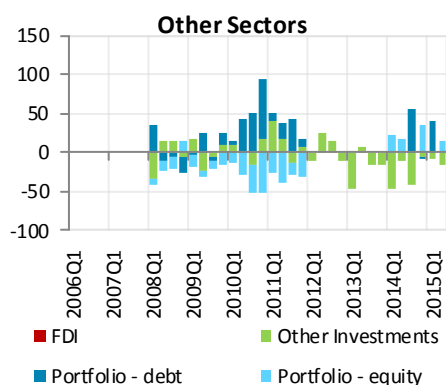
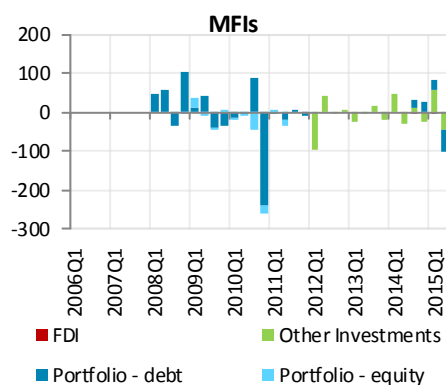
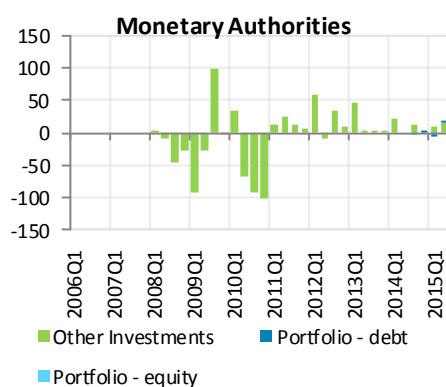
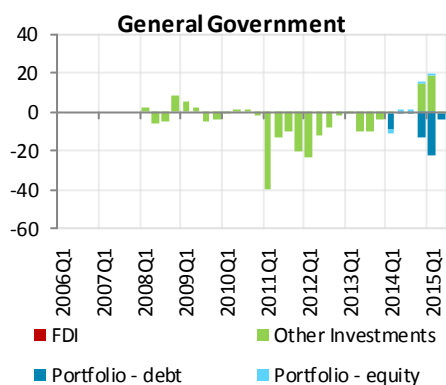
Stocks



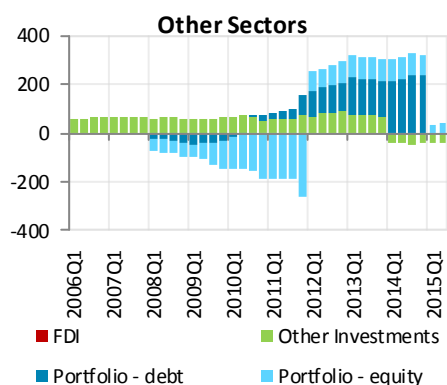
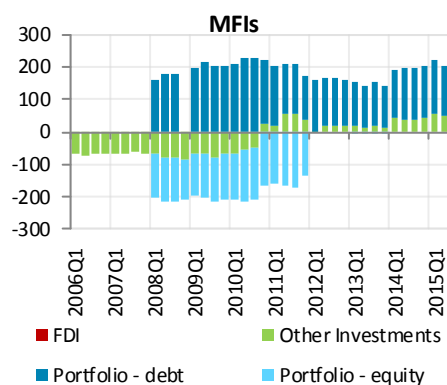
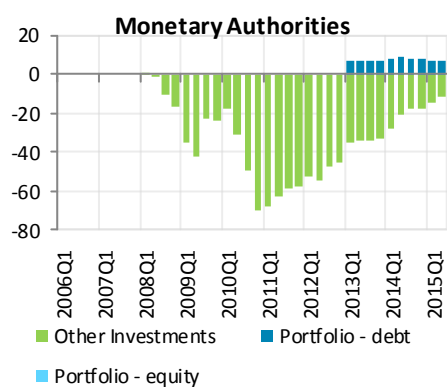
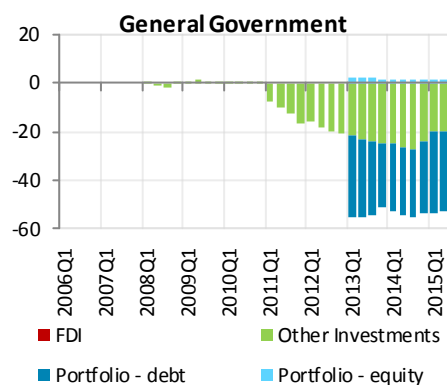
Ireland

(in % of GDP)

Flows



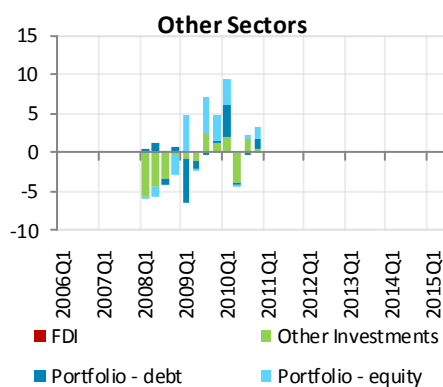
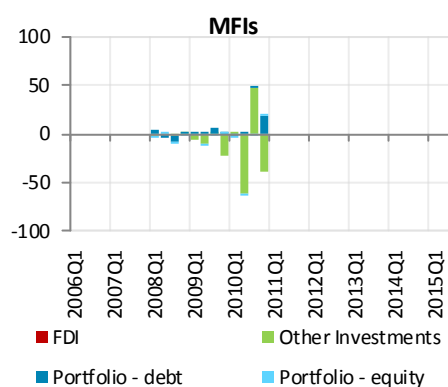
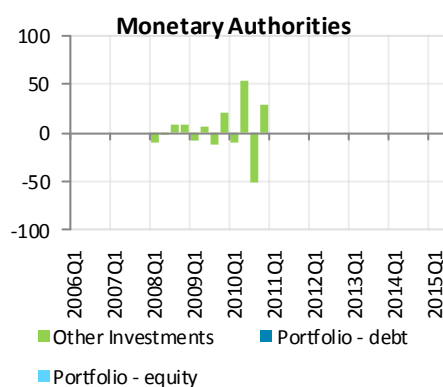
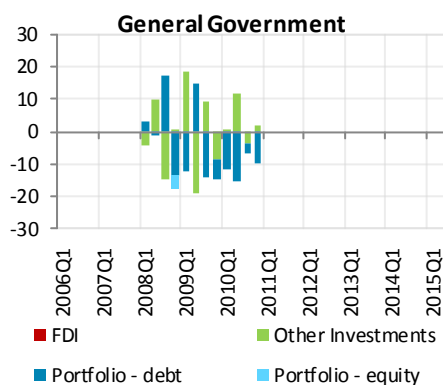
Stocks



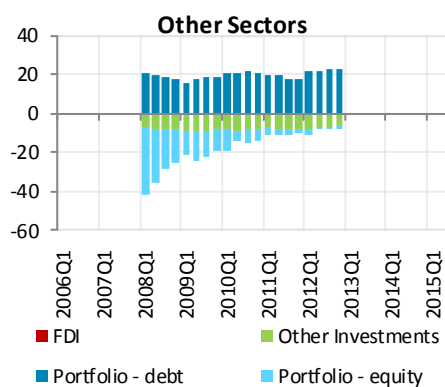
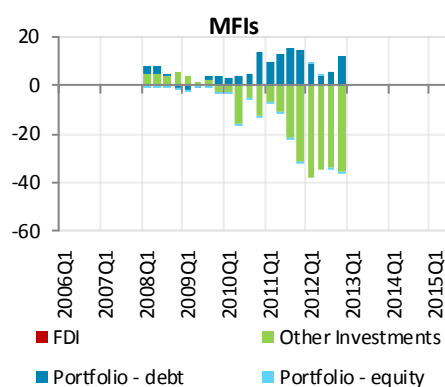
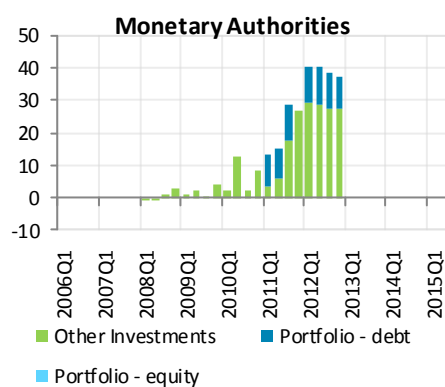
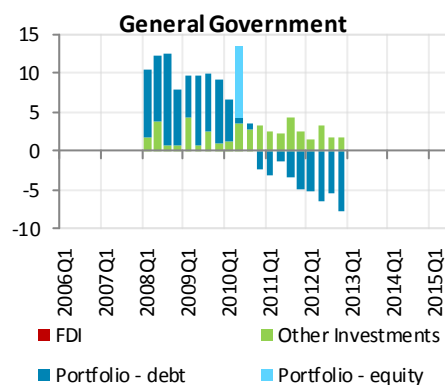
Finland

(in % of GDP)

Flows



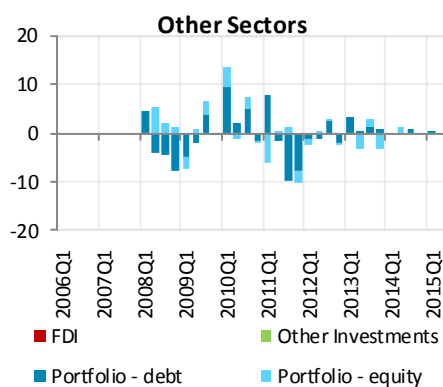
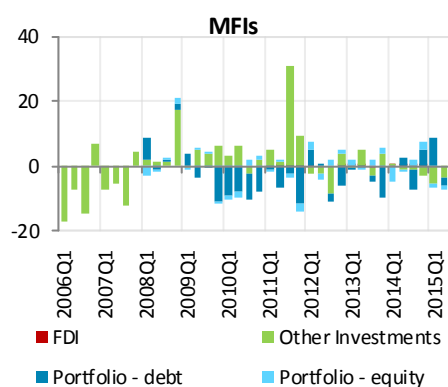
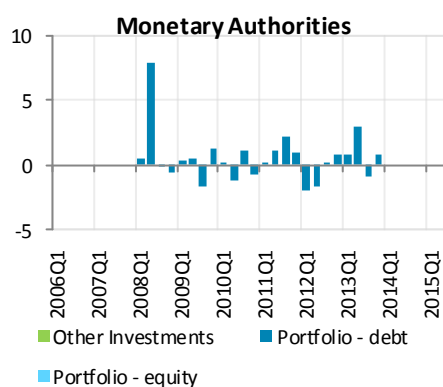
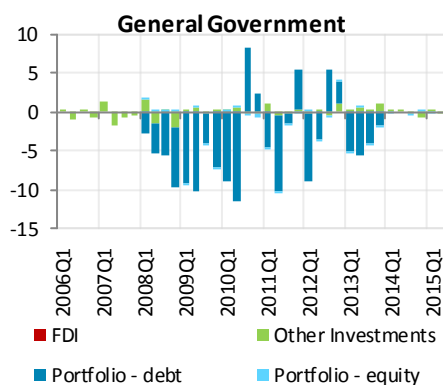
Stocks



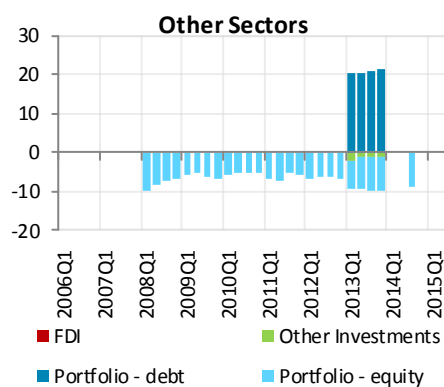
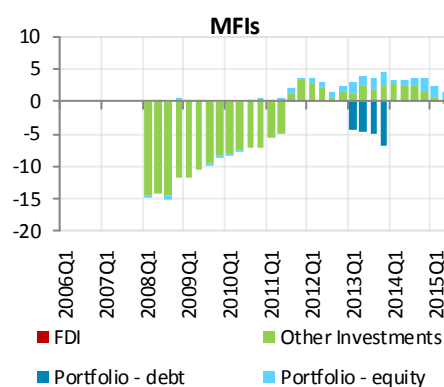
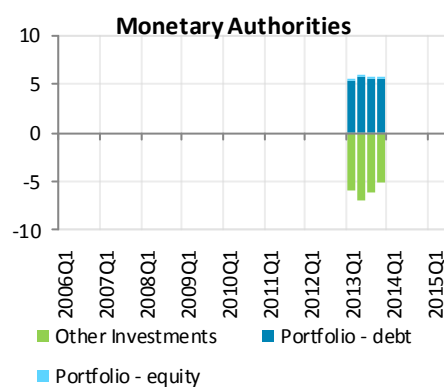
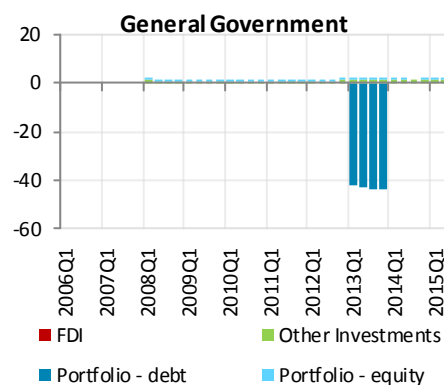
France

(in % of GDP)

Flows



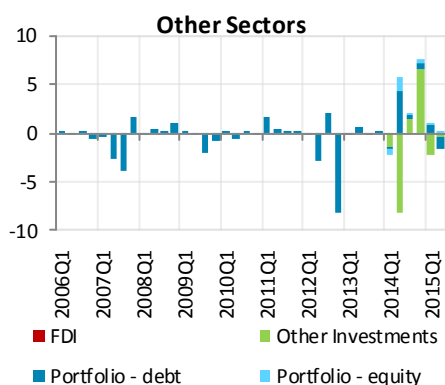
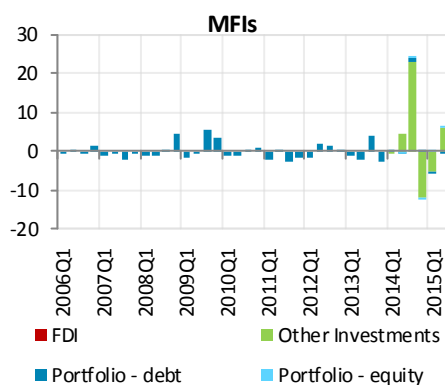
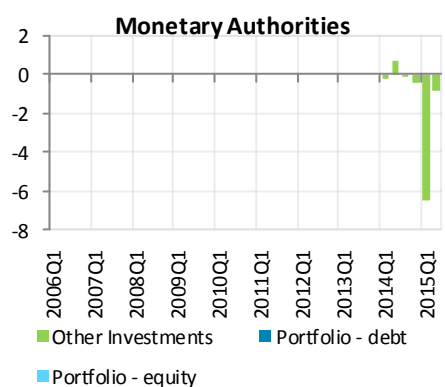
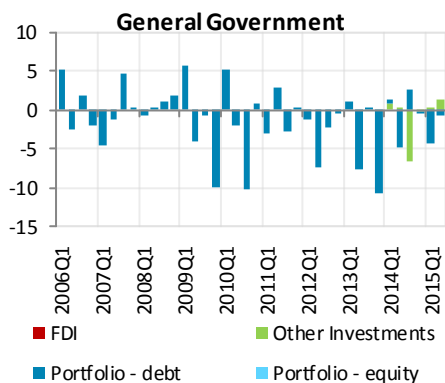
Stocks



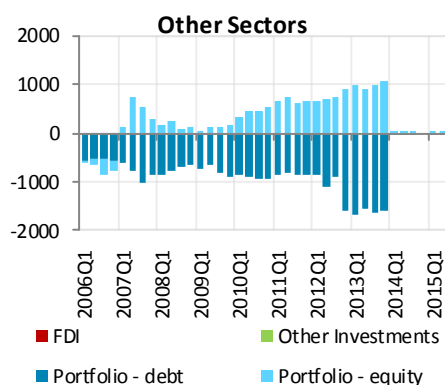
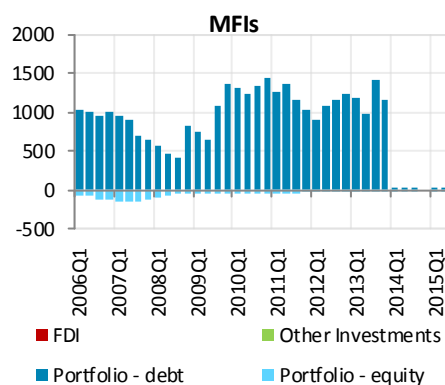
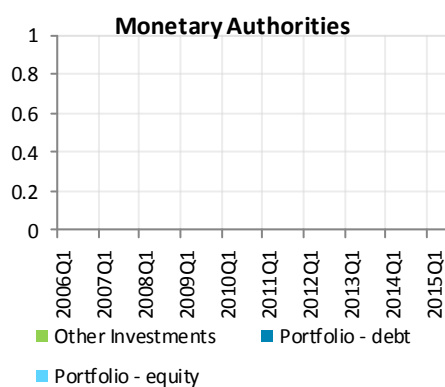
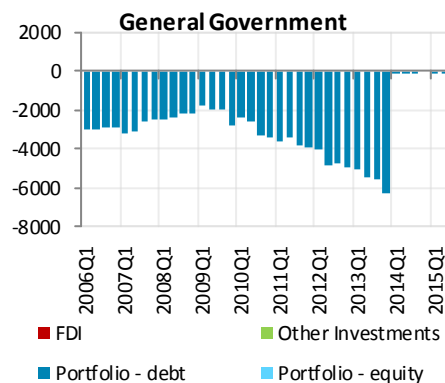
Croatia

(in % of GDP)

Flows



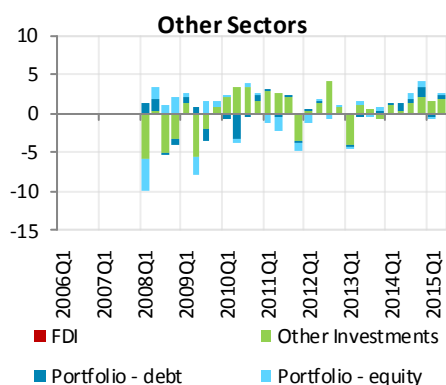
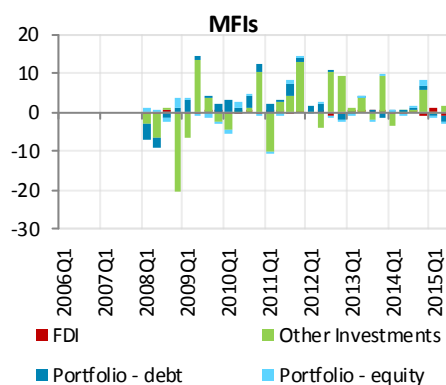
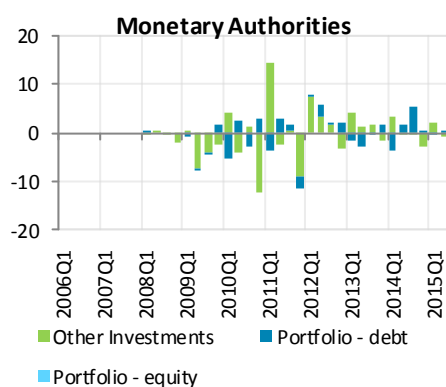
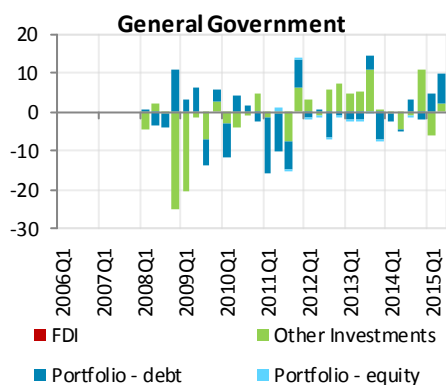
Stocks



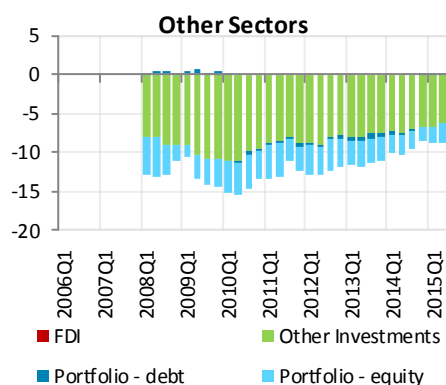
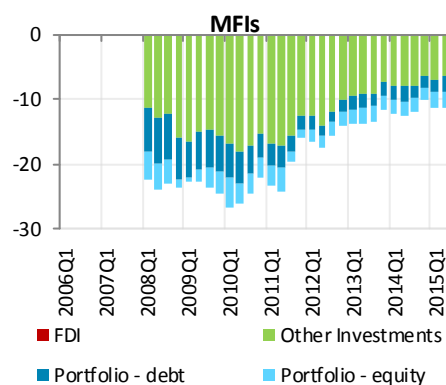
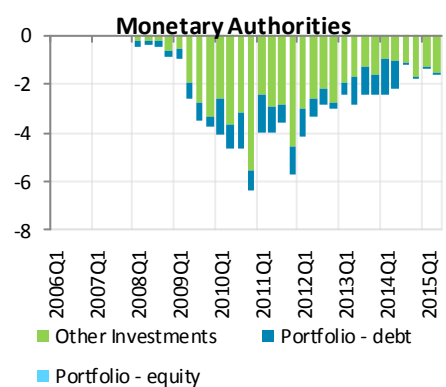
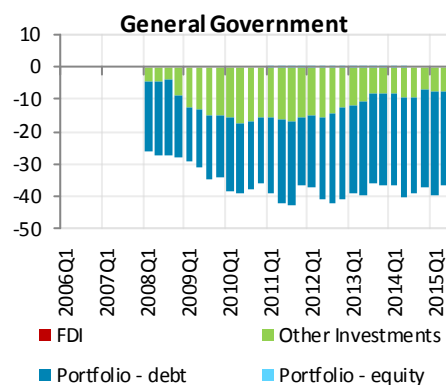
Hungary

(in % of GDP)

Flows



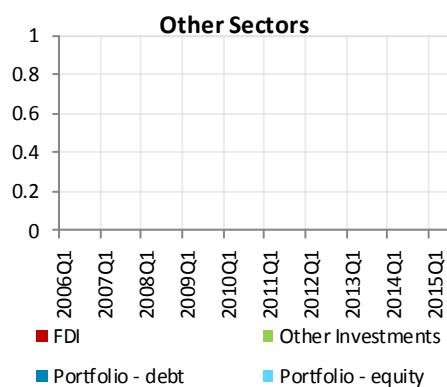
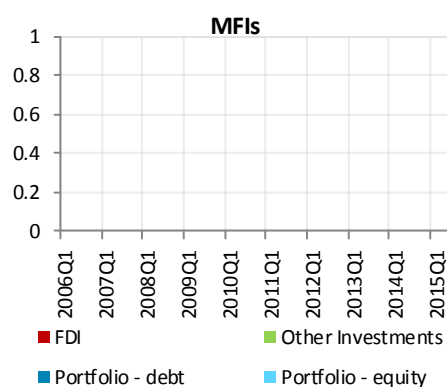
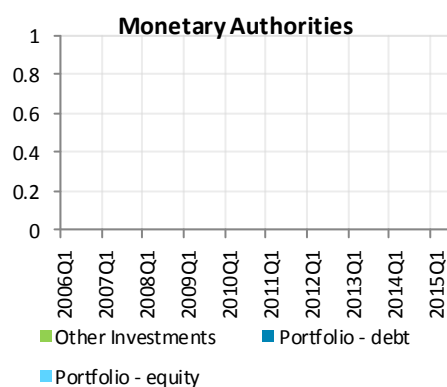
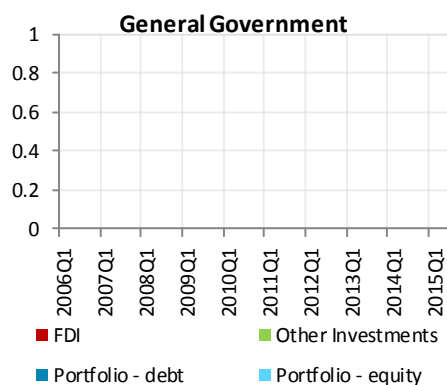
Stocks



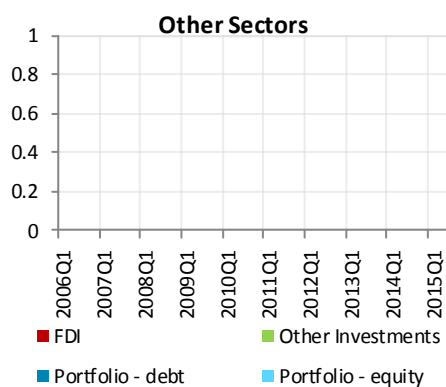
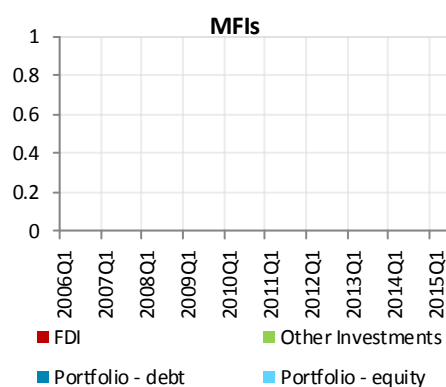
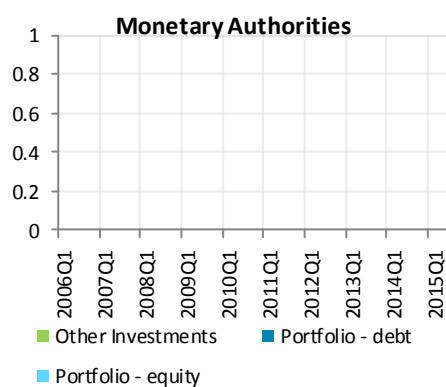
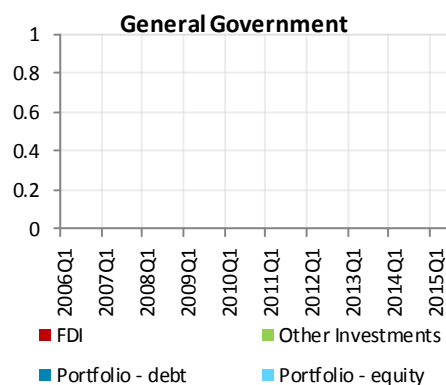
Italy

(in % of GDP)

Flows



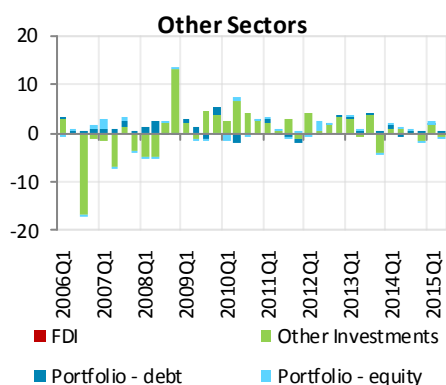
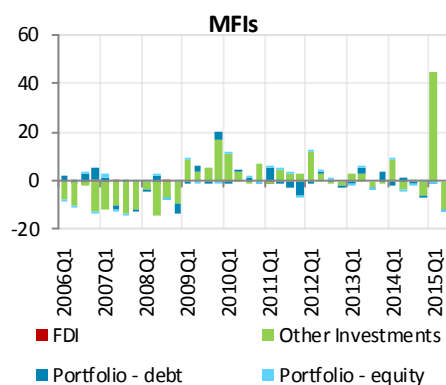
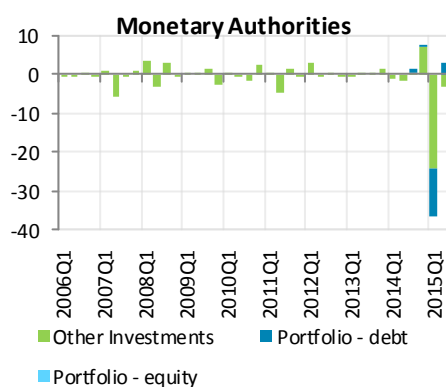
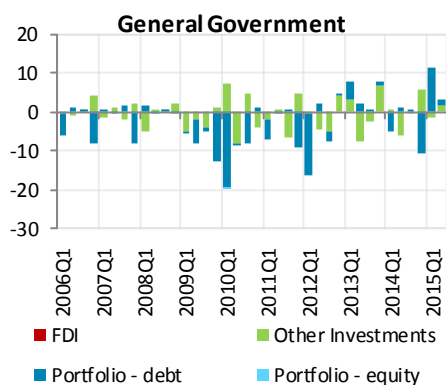
Stocks



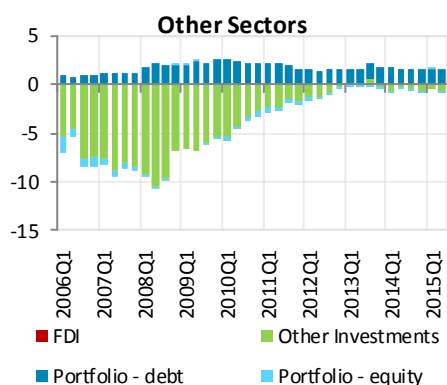
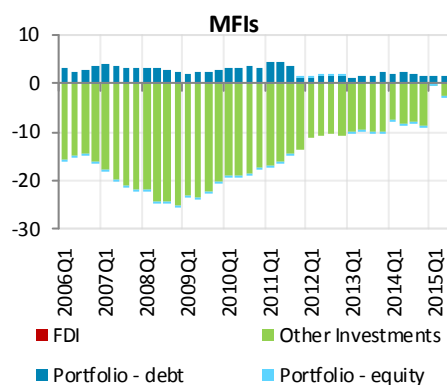
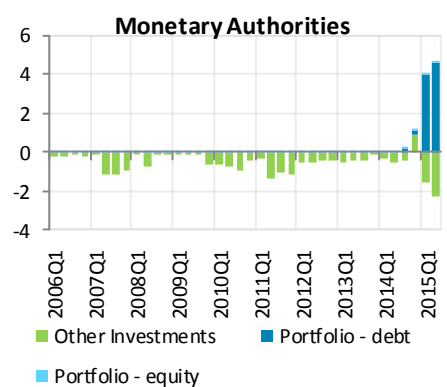
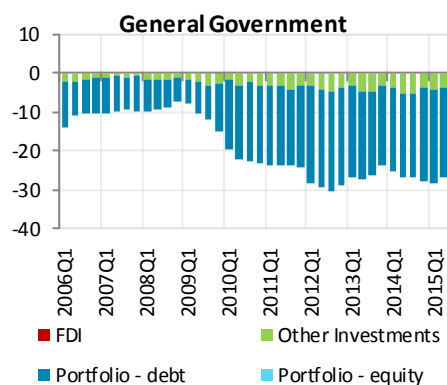
Lithuania

(in % of GDP)

Flows



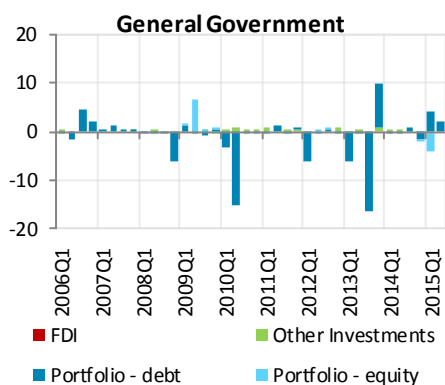
Stocks



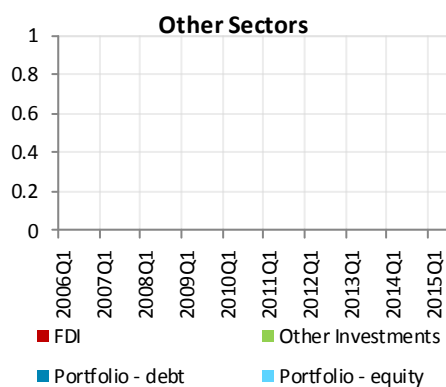
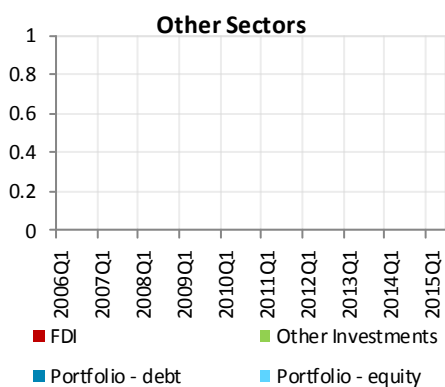
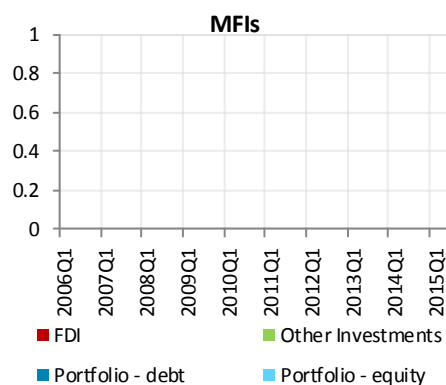
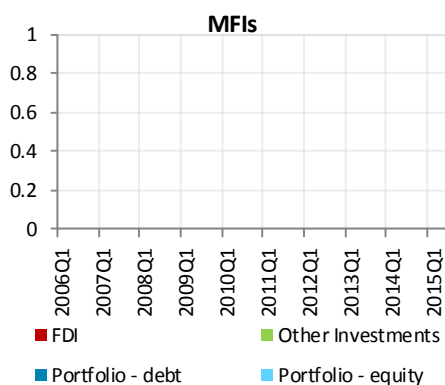
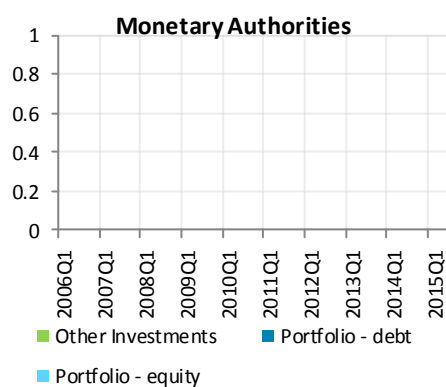
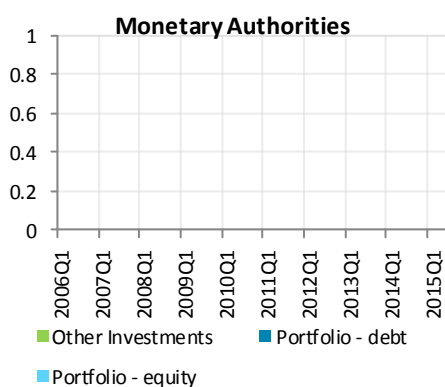
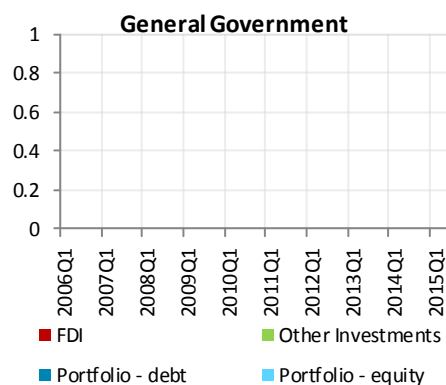
Luxembourg

(in % of GDP)

Flows



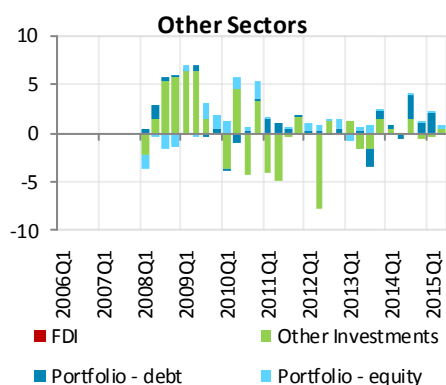
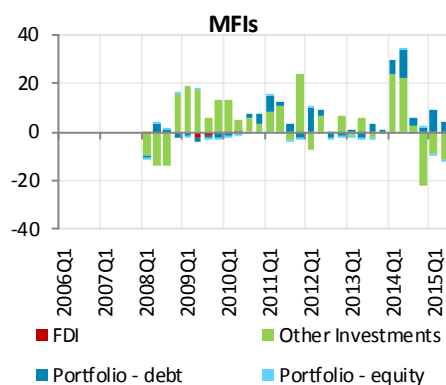
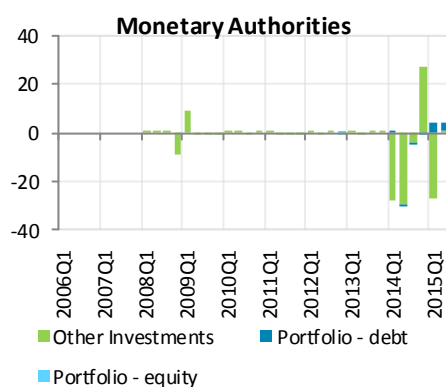
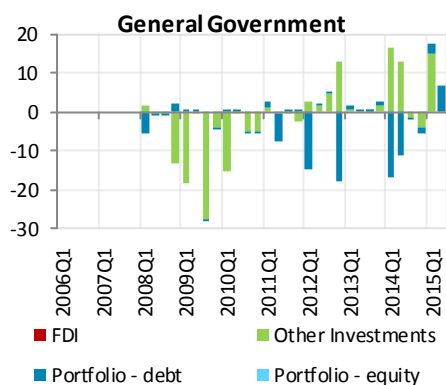
Stocks



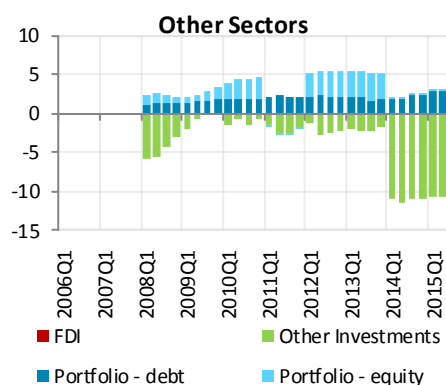
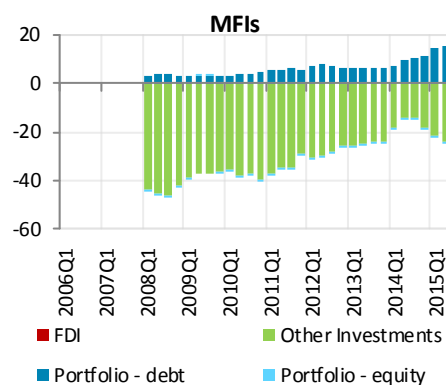
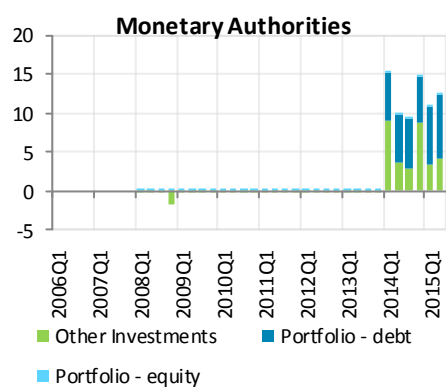
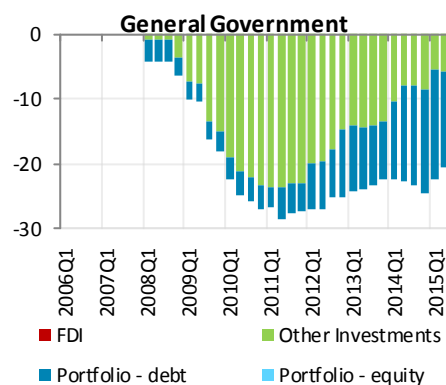
Latvia

(in % of GDP)

Flows



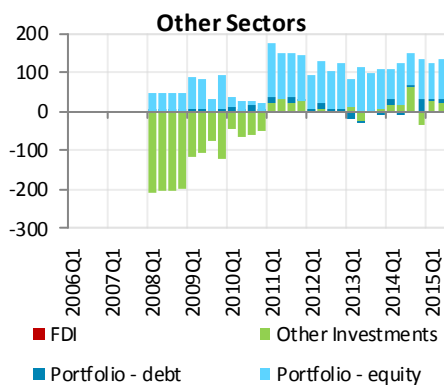
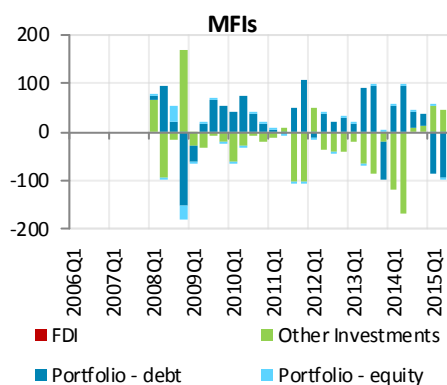
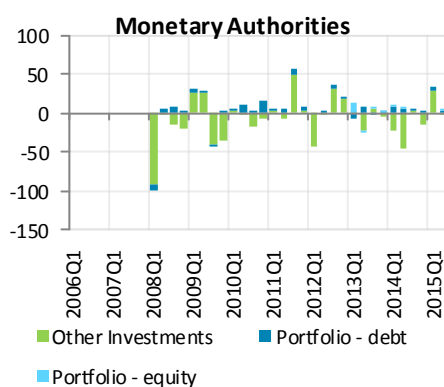
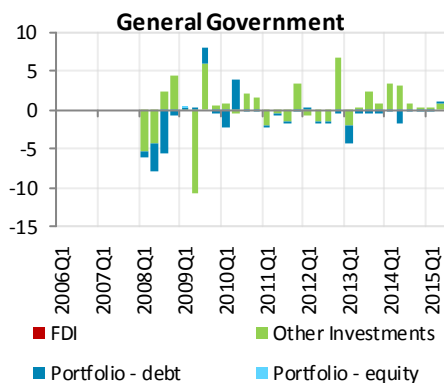
Stocks



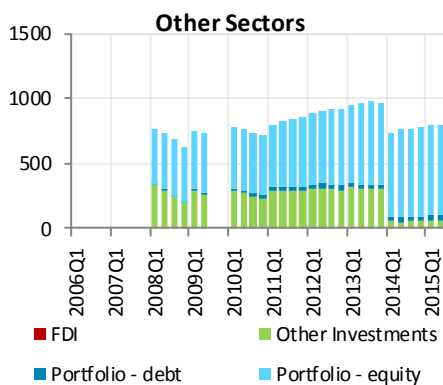
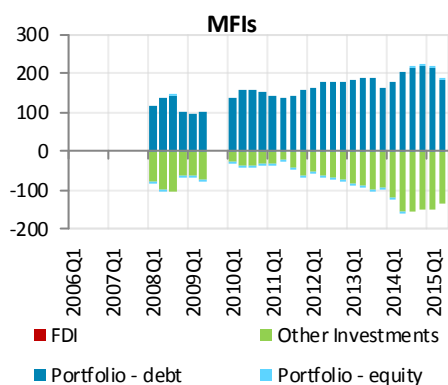
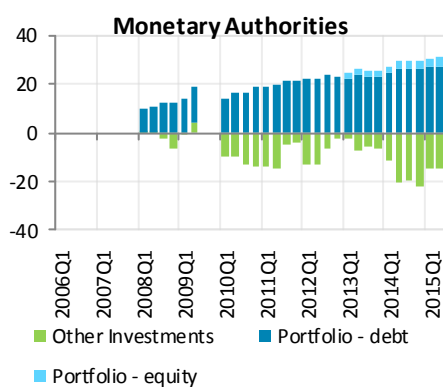
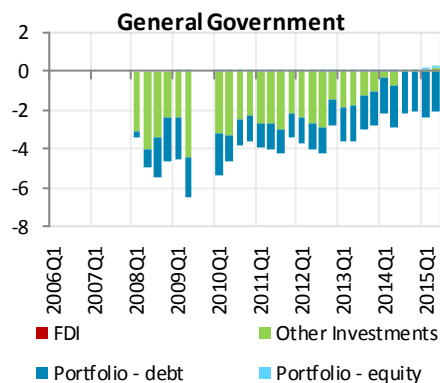
Malta

(in % of GDP)

Flows



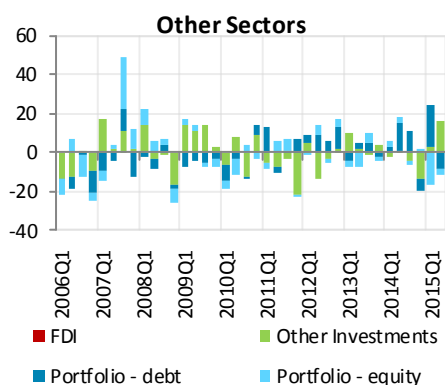
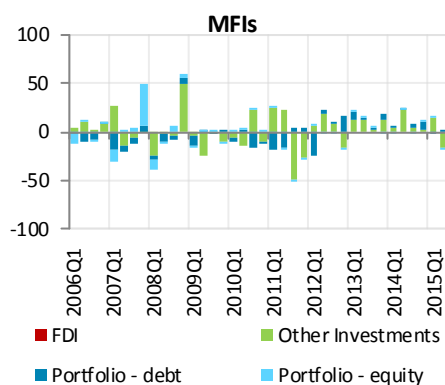
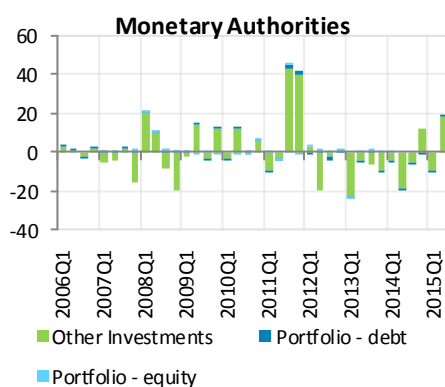
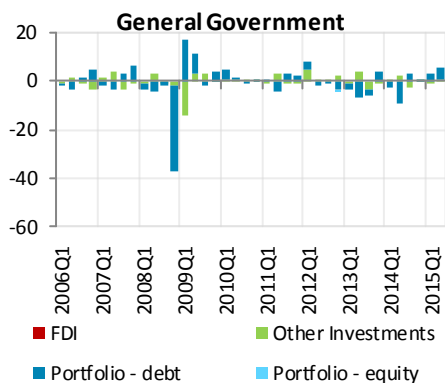
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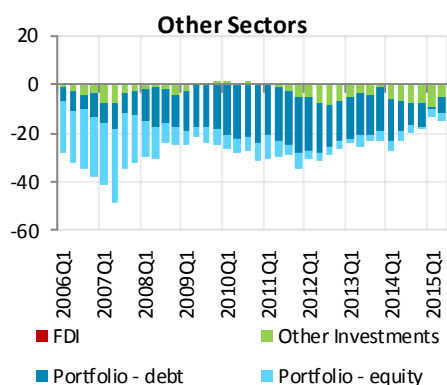
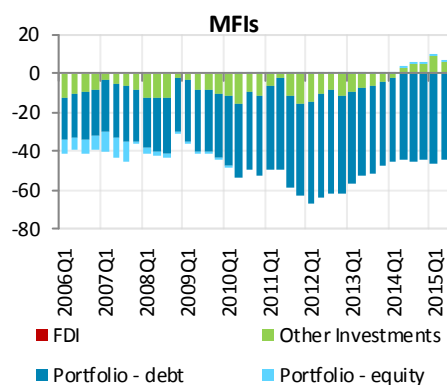
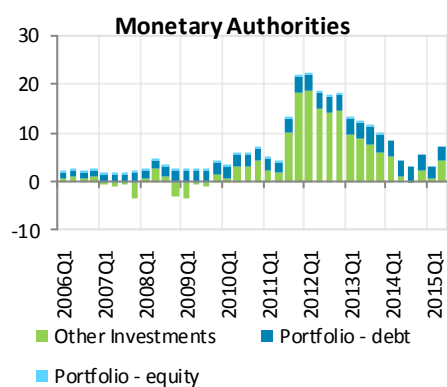
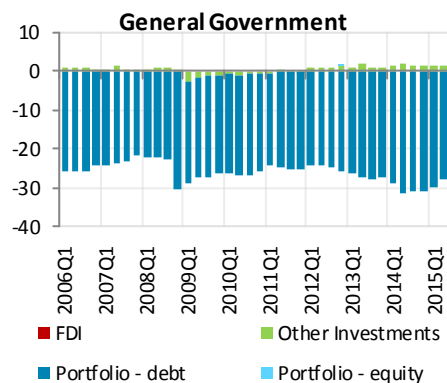
Netherlands

(in % of GDP)

Flows



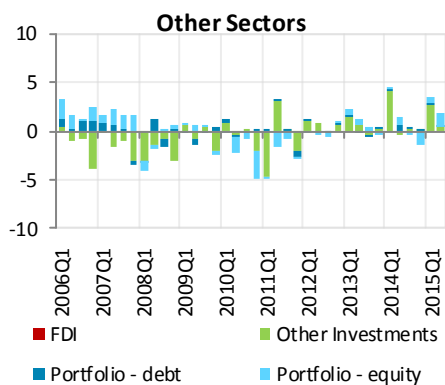
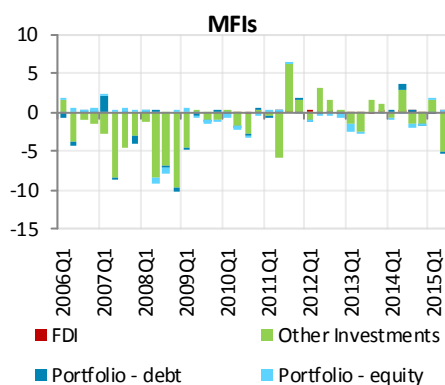
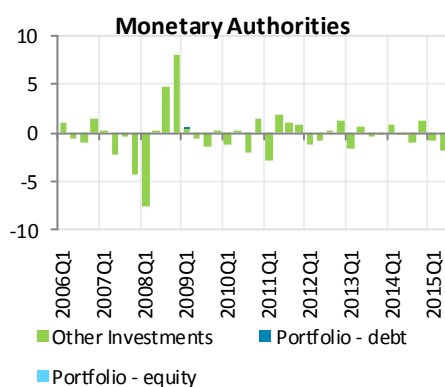
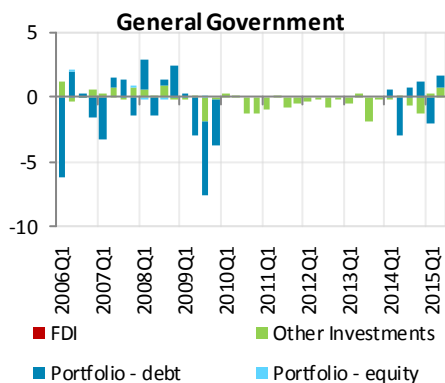
Stocks



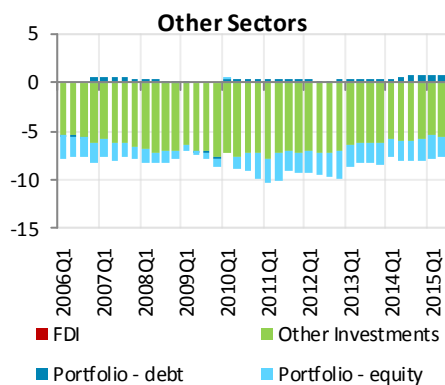
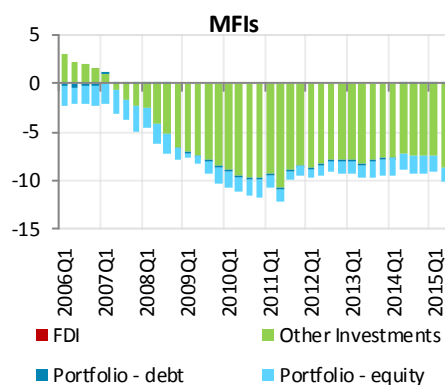
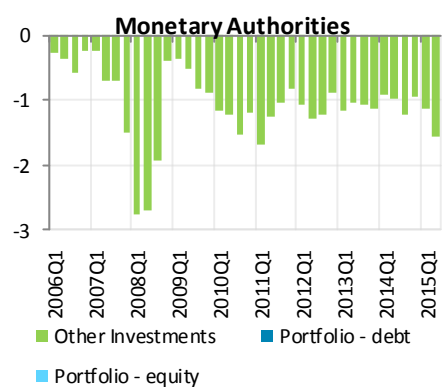
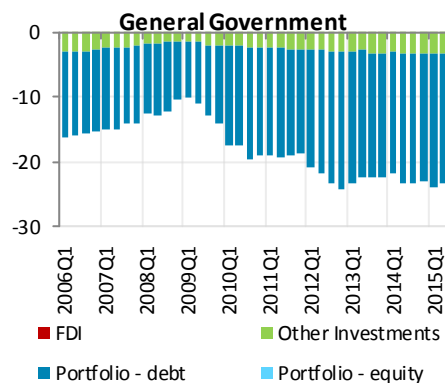
Poland

(in % of GDP)

Flows



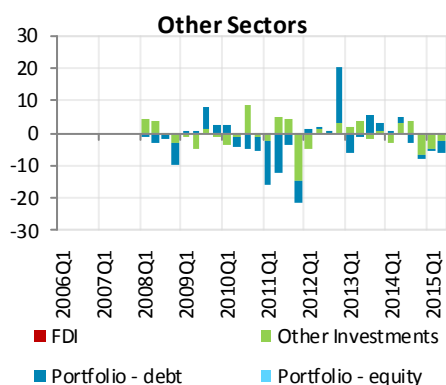
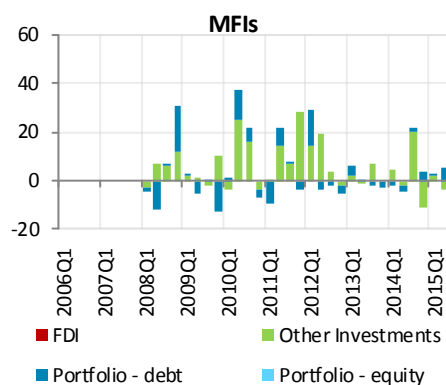
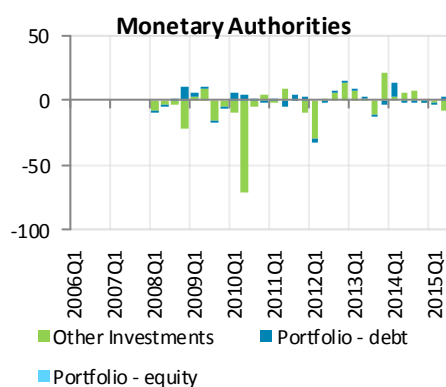
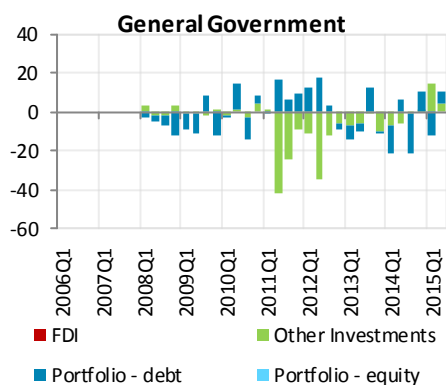
Stocks



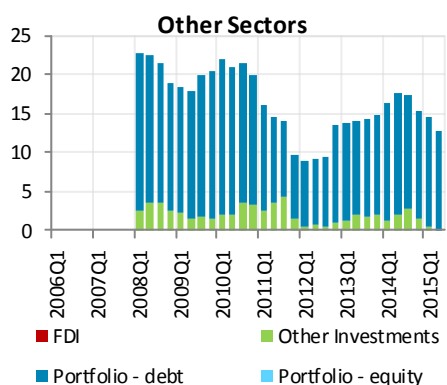
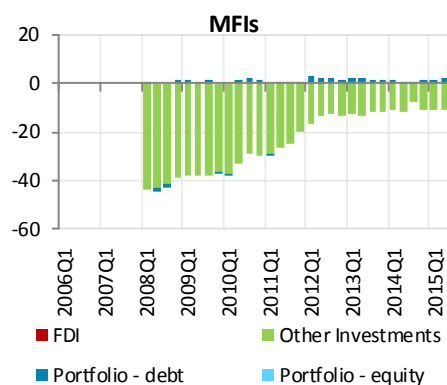
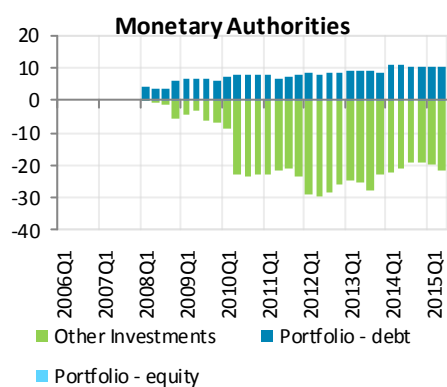
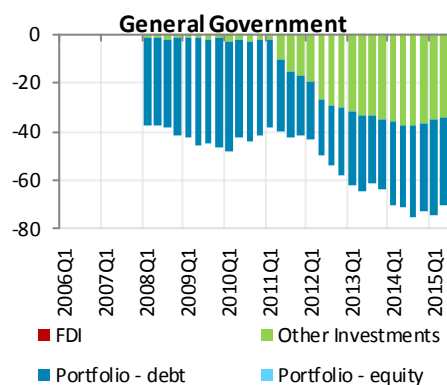
Portugal

(in % of GDP)

Flows



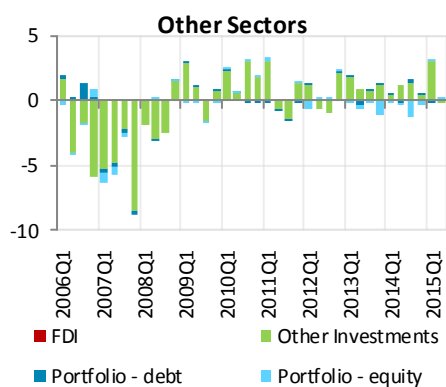
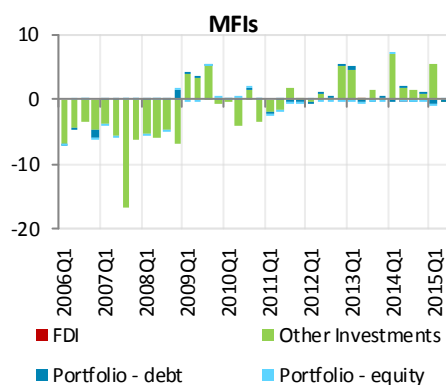
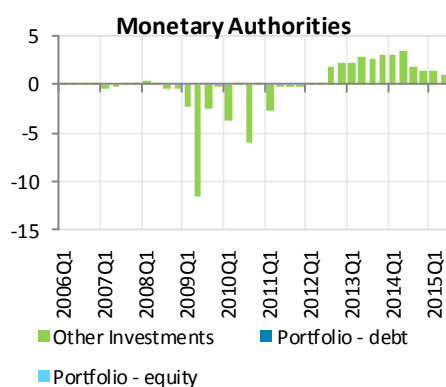
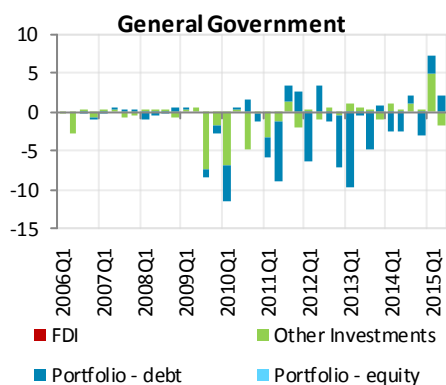
Stocks



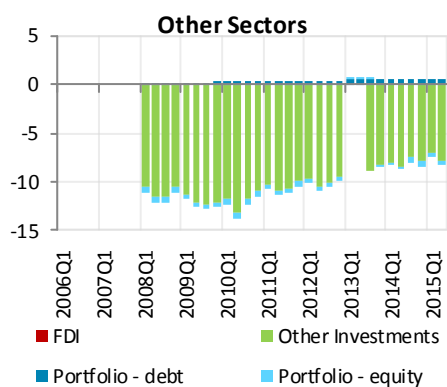
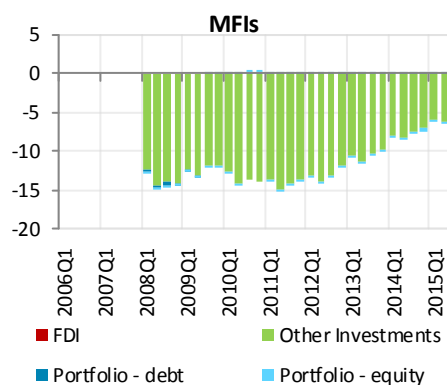
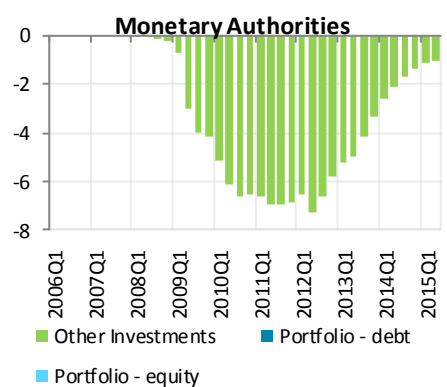
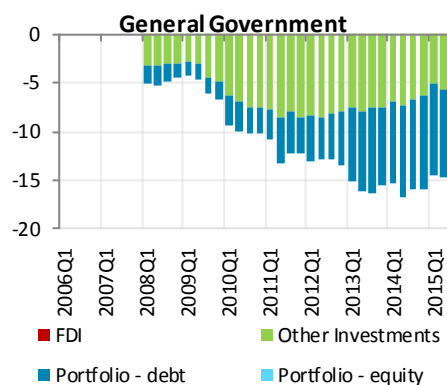
Romania

(in % of GDP)

Flows



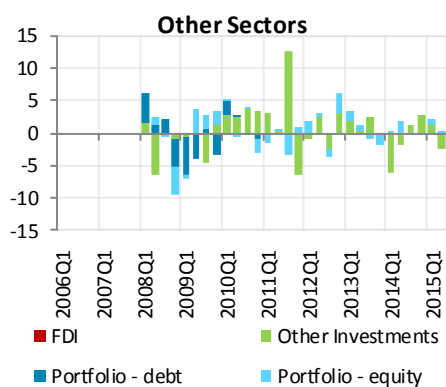
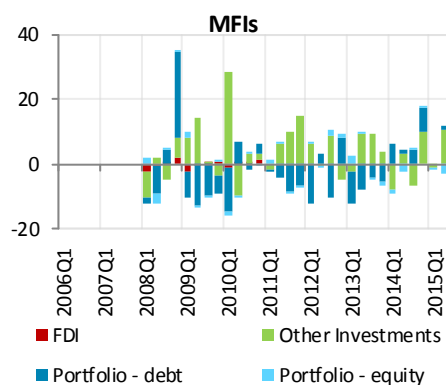
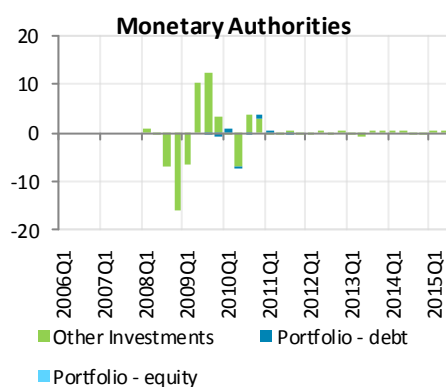
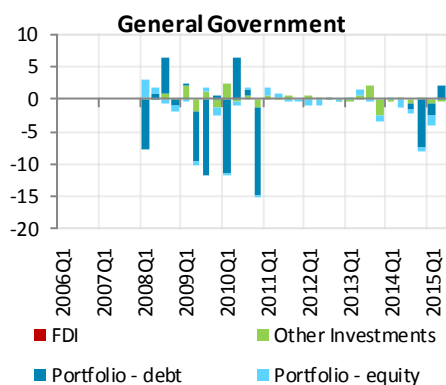
Stocks



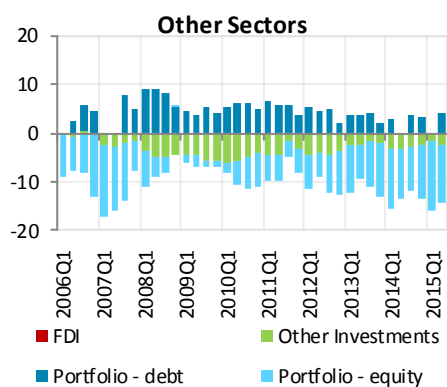
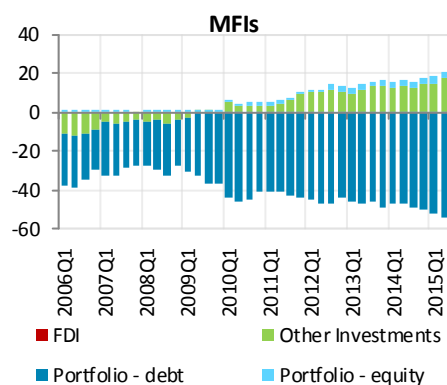
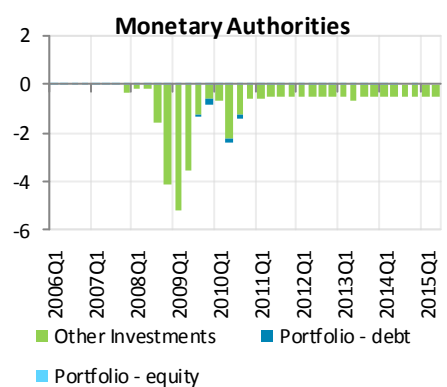
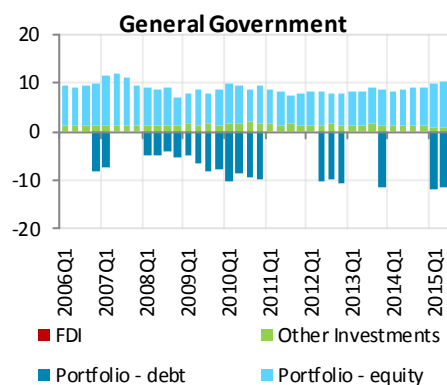
Sweden

(in % of GDP)

Flows



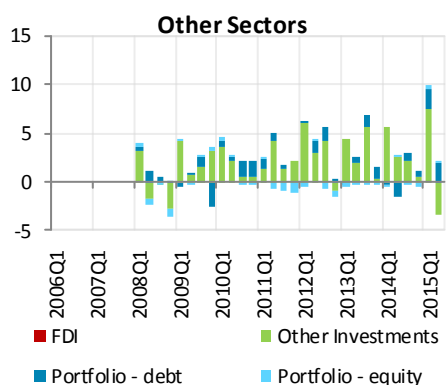
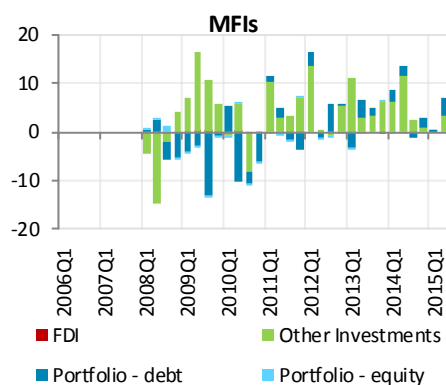
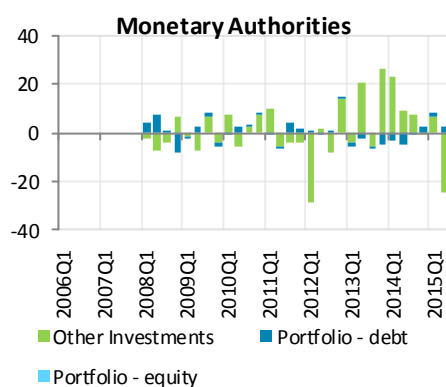
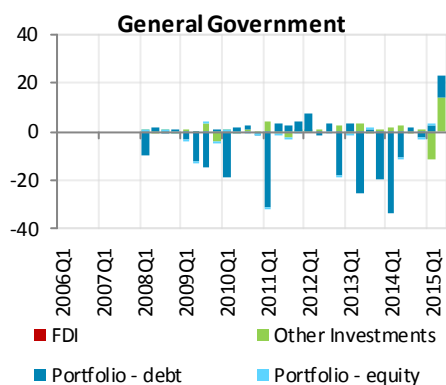
Stocks



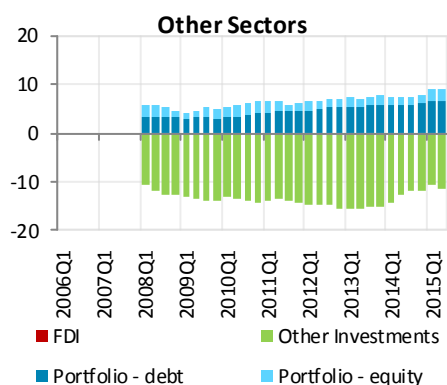
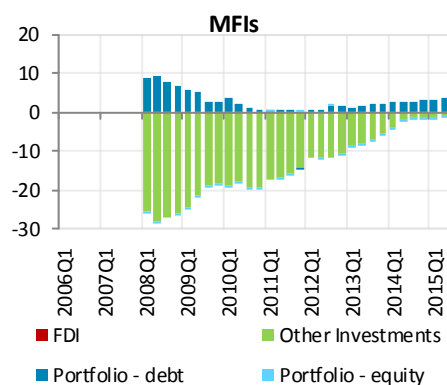
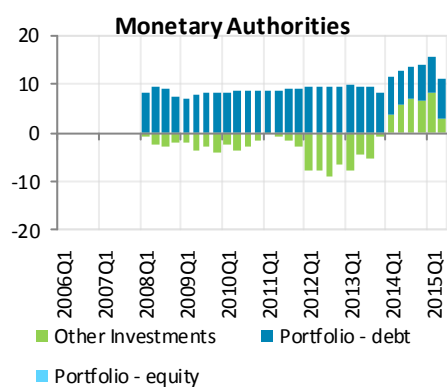
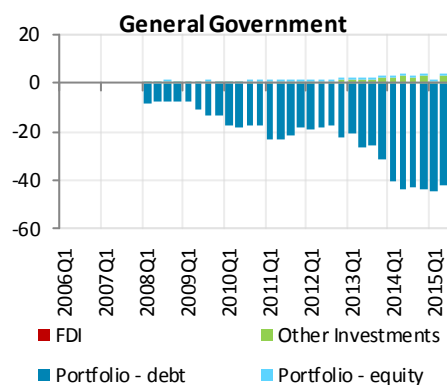
Slovenia

(in % of GDP)

Flows



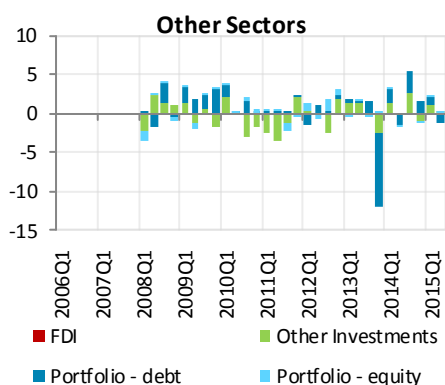
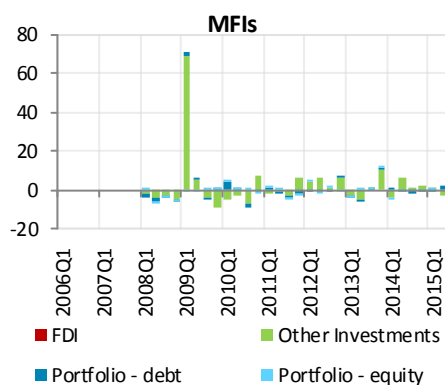
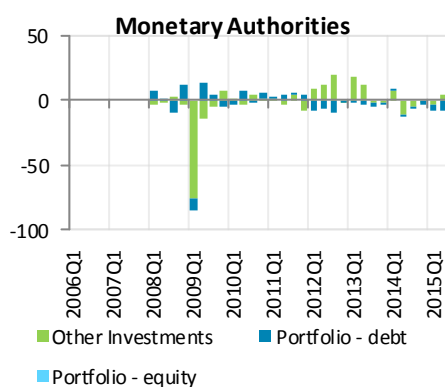
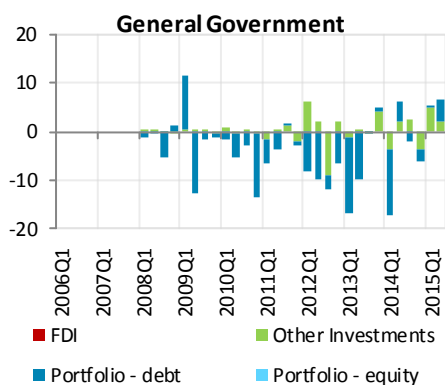
Stocks



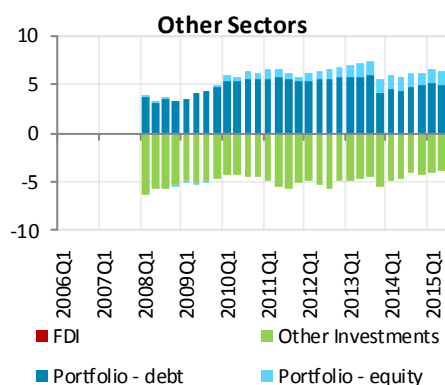
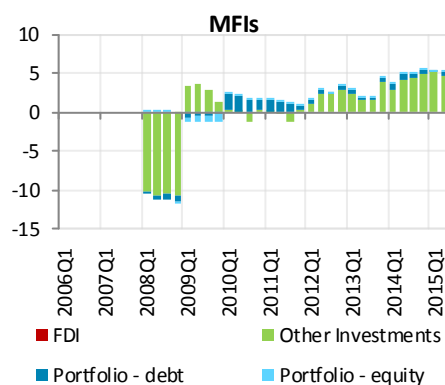
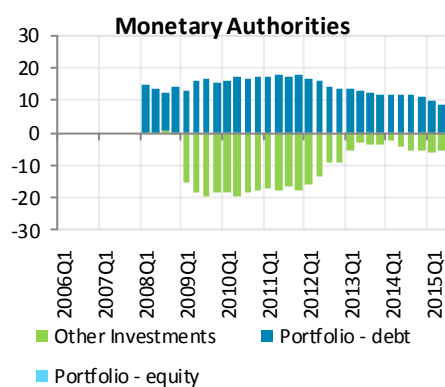
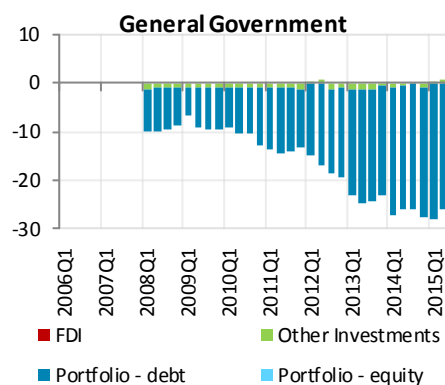
Slovakia

(in % of GDP)

Flows



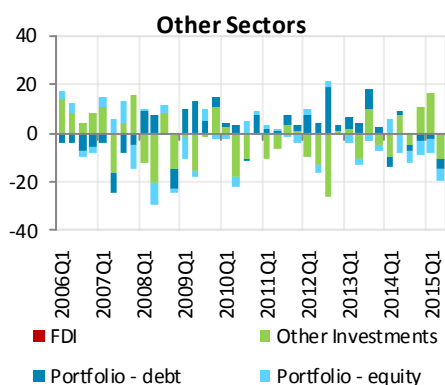
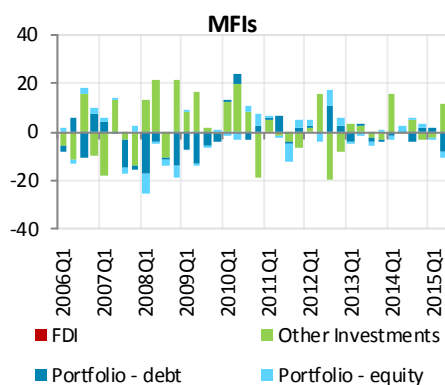
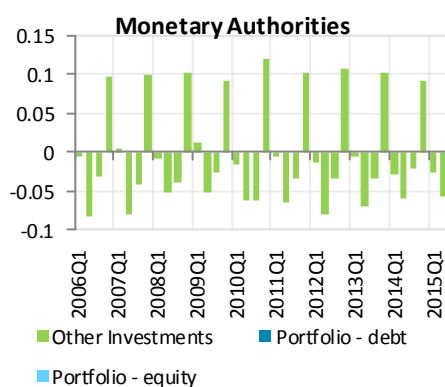
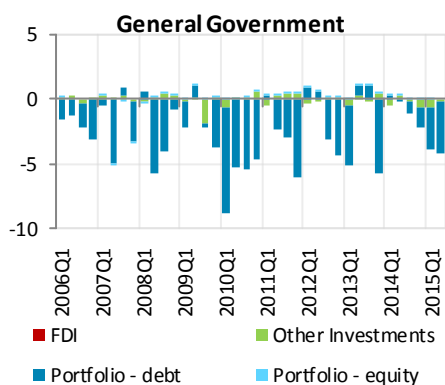
Stocks



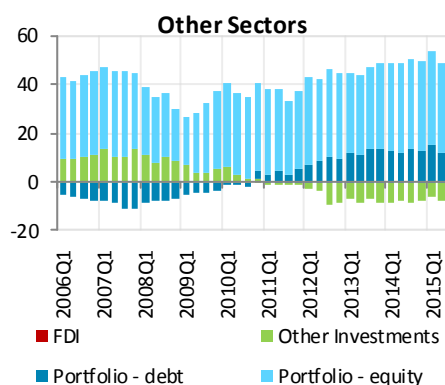
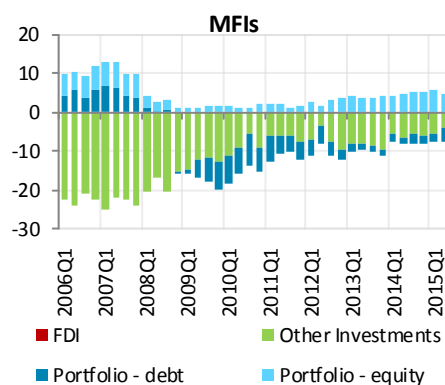
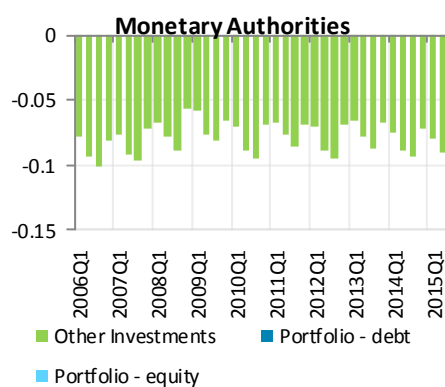
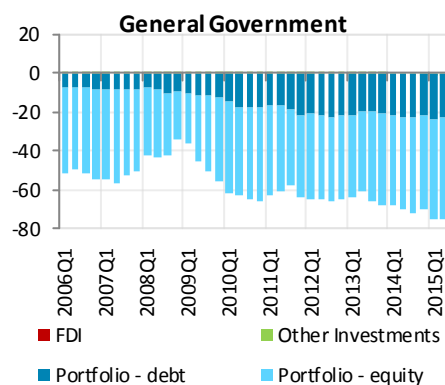
United Kingdom

(in % of GDP)

Flows



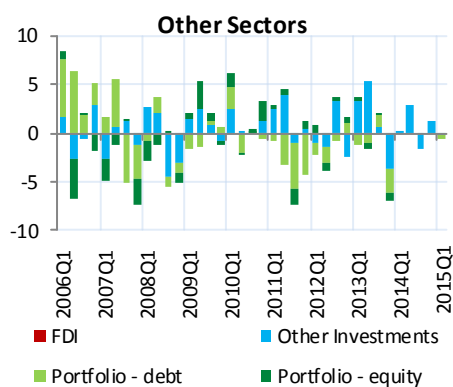
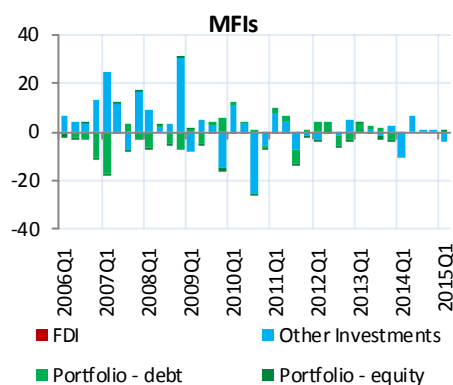
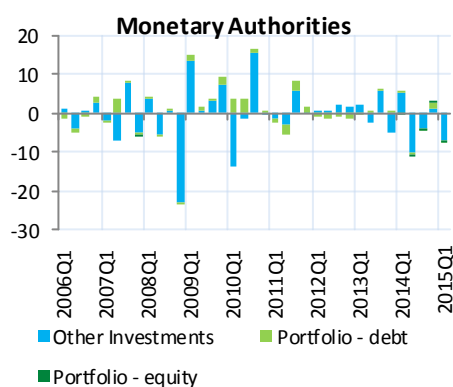
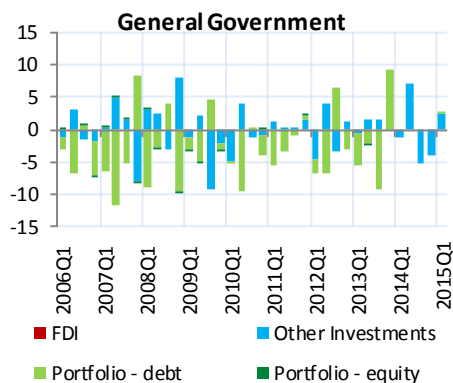
Stocks



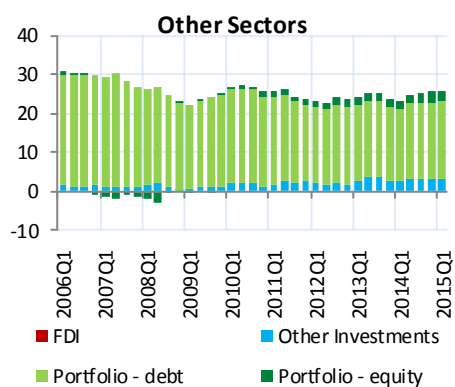
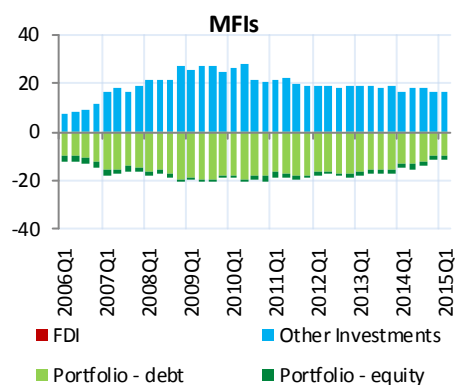
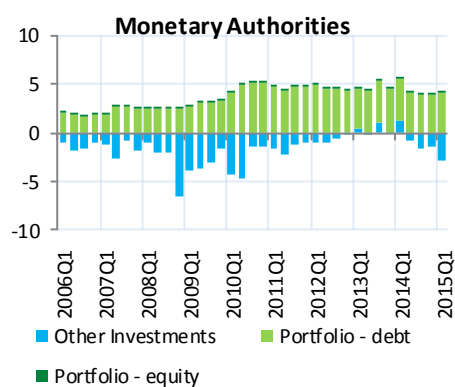
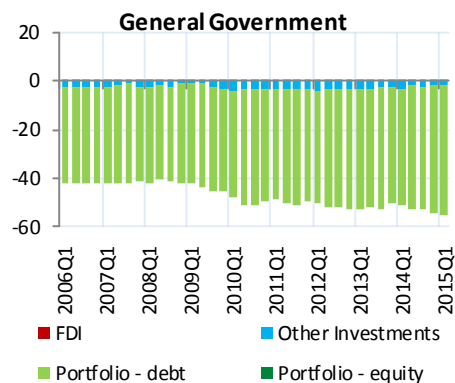
Austria

(in % of GDP)

Flows



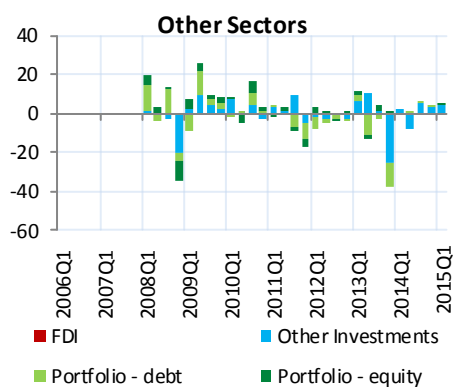
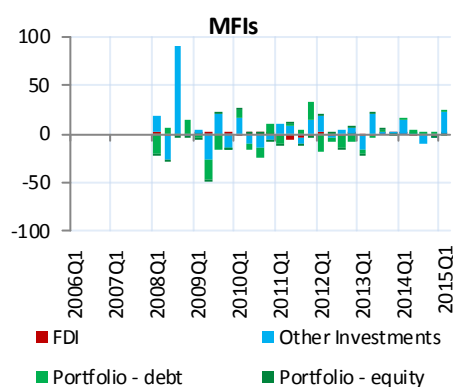
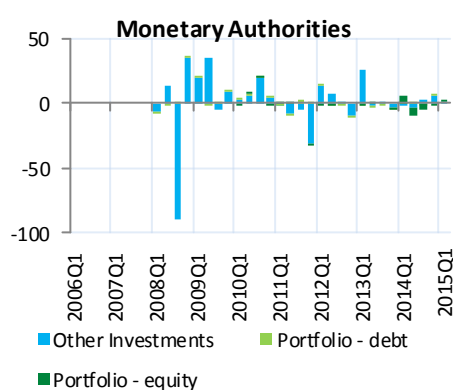
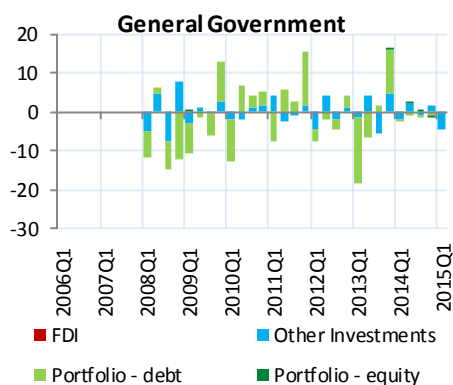
Stocks



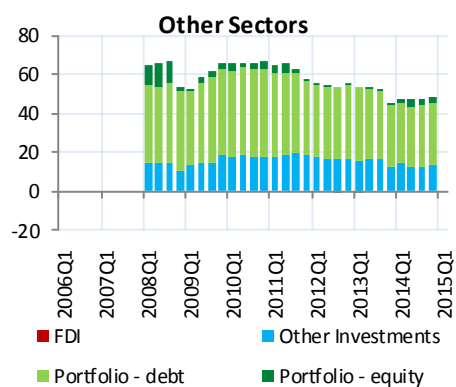
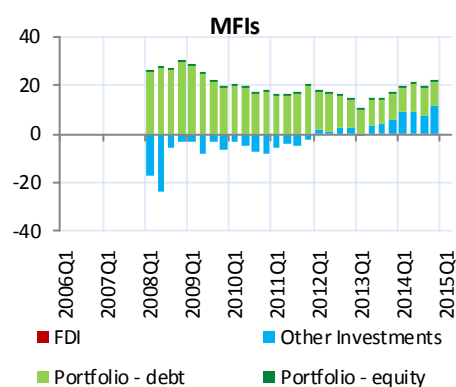
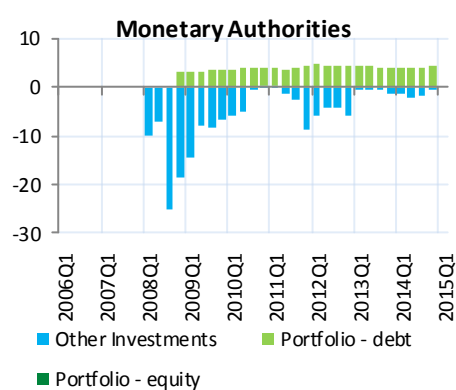
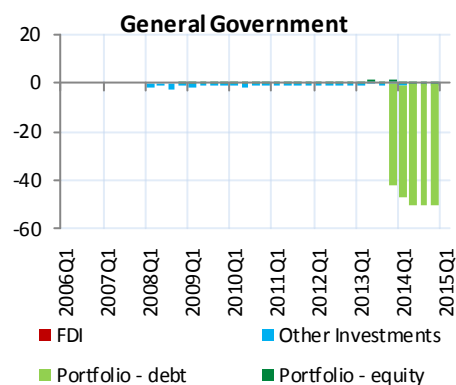
Belgium

(in % of GDP)

Flows



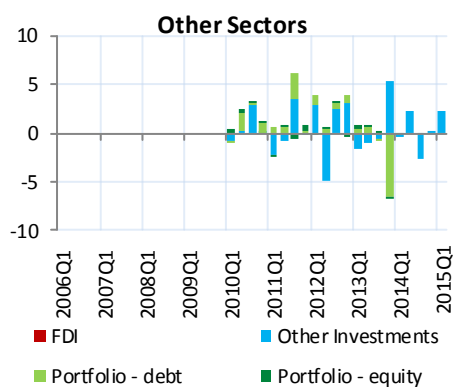
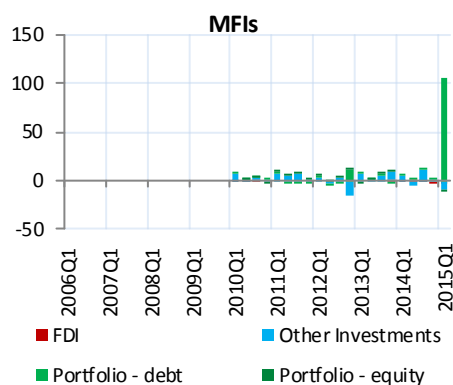
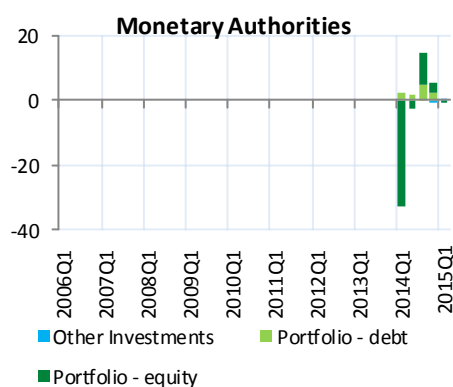
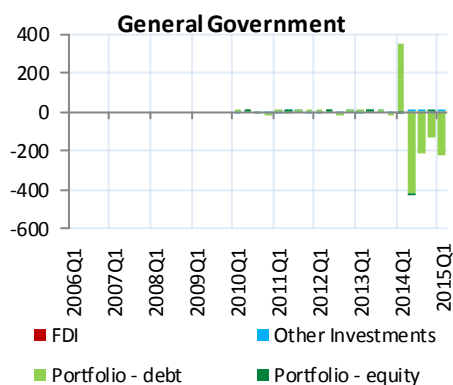
Stocks



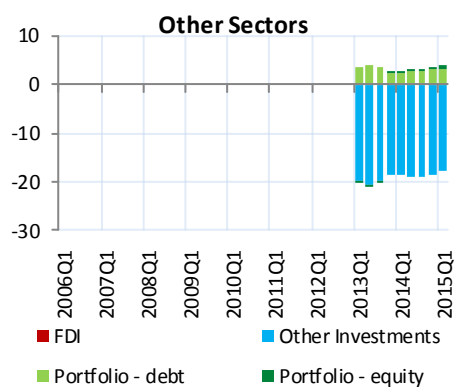
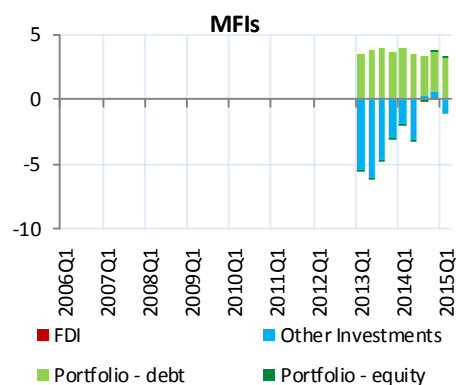
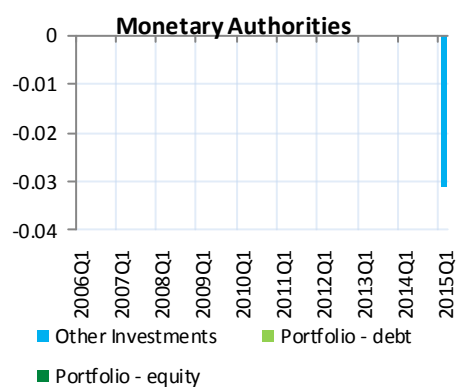
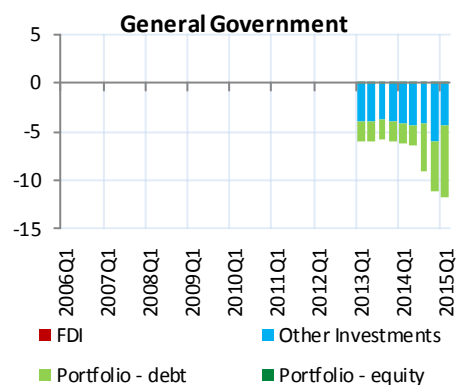
Bulgaria

(in % of GDP)

Flows



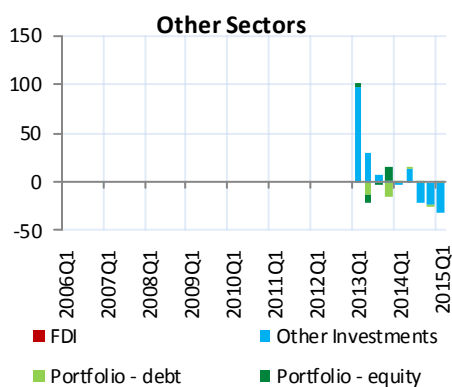
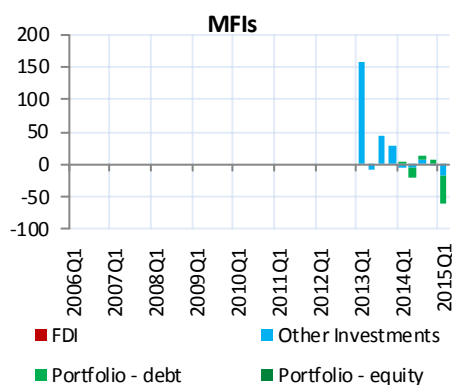
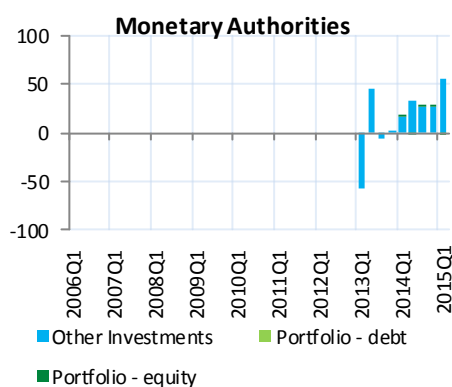
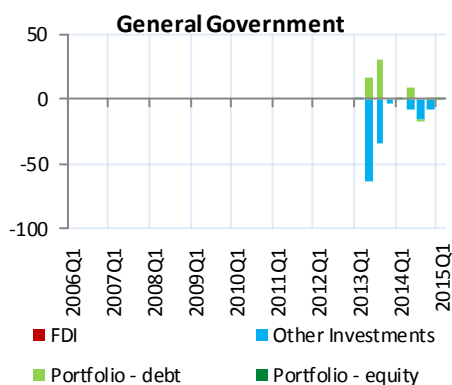
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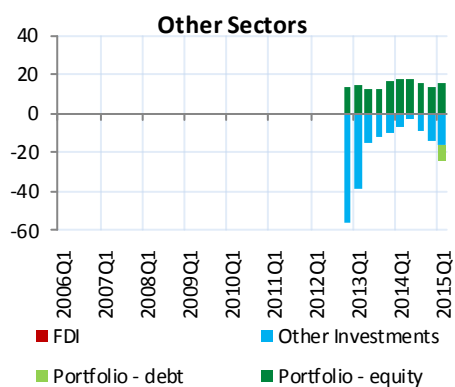
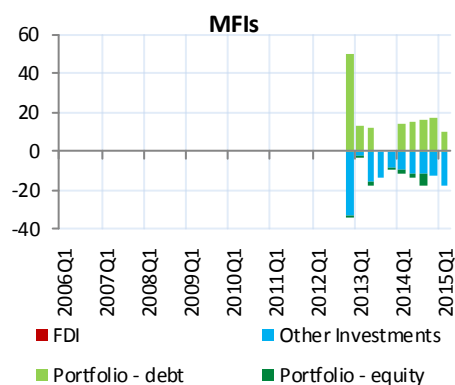
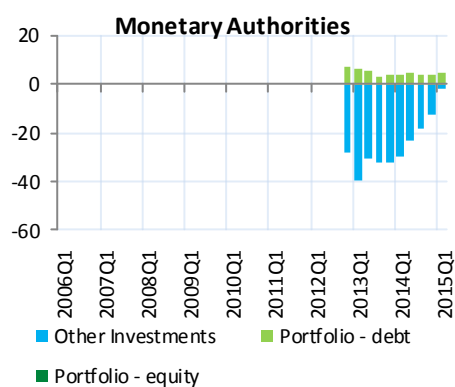
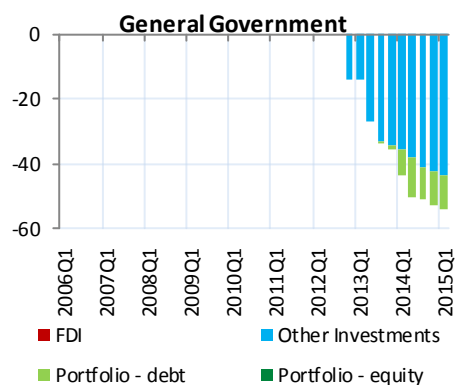
Cyprus

(in % of GDP)

Flows



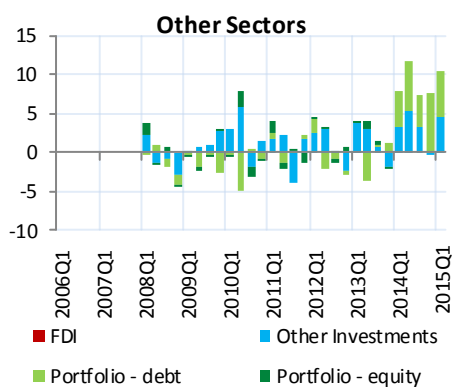
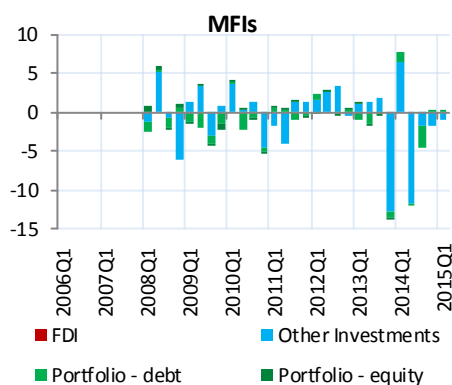
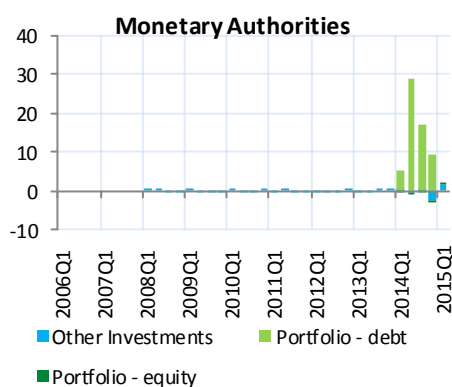
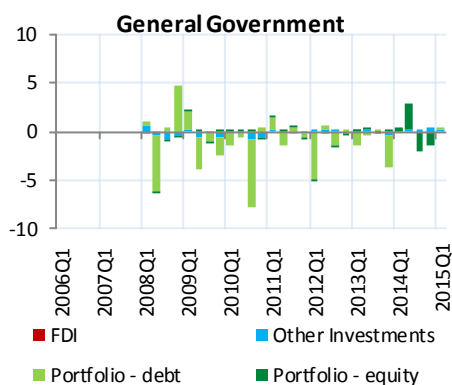
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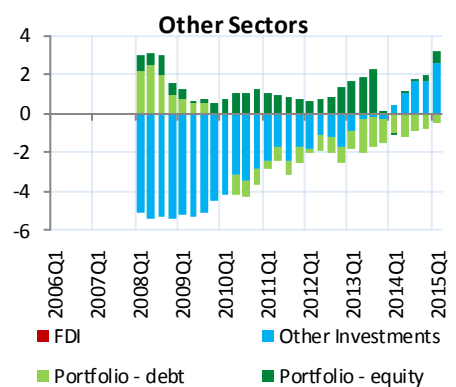
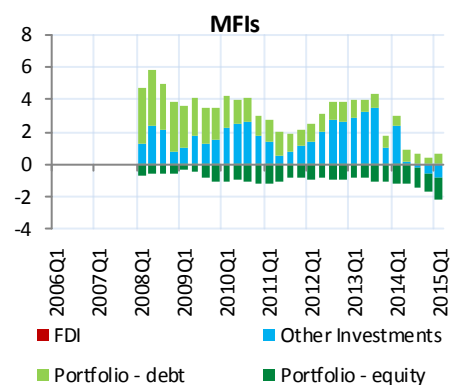
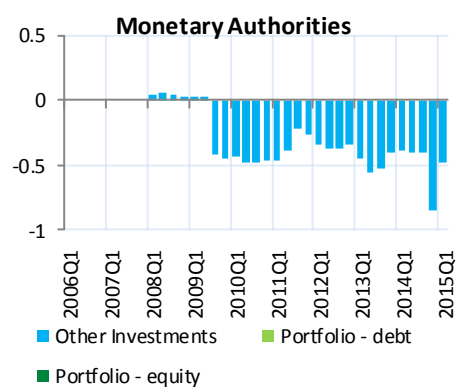
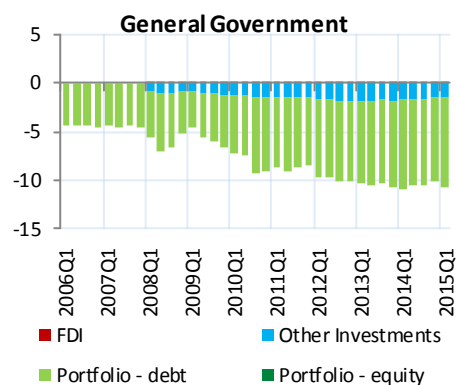
Czech Republic

(in % of GDP)

Flows



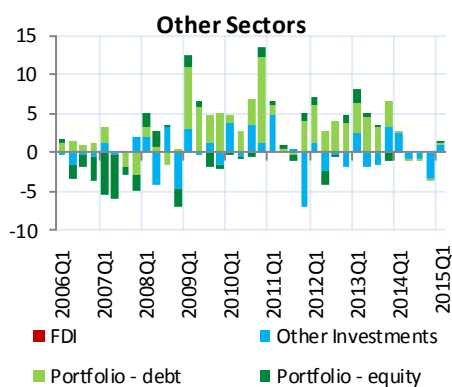
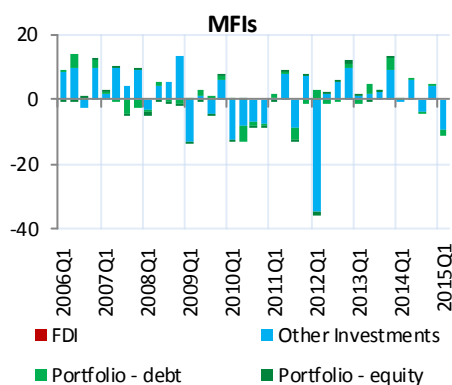
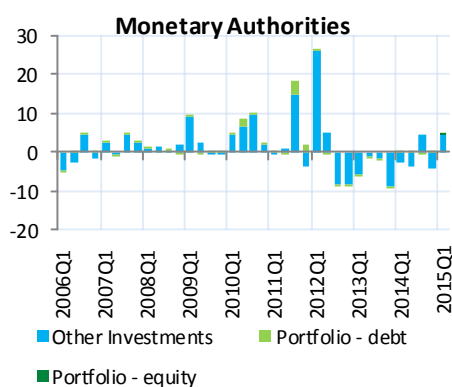
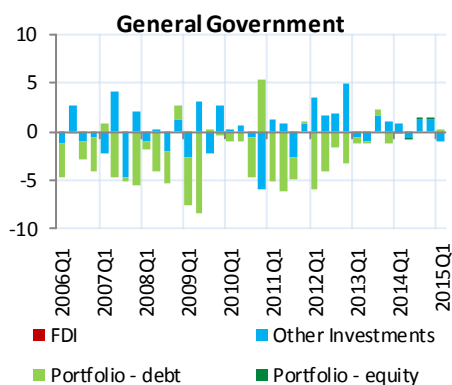
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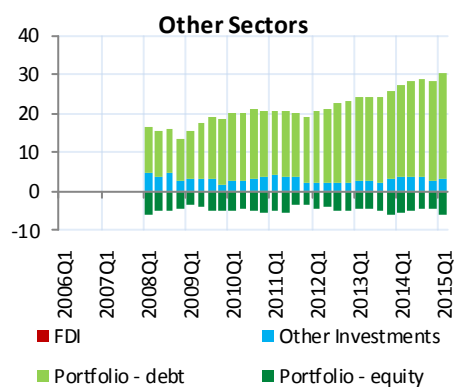
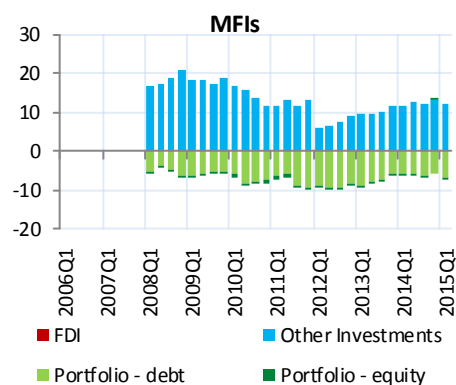
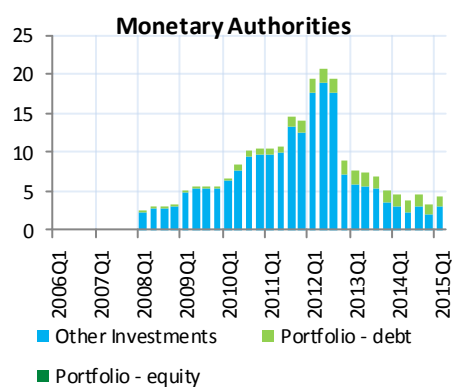
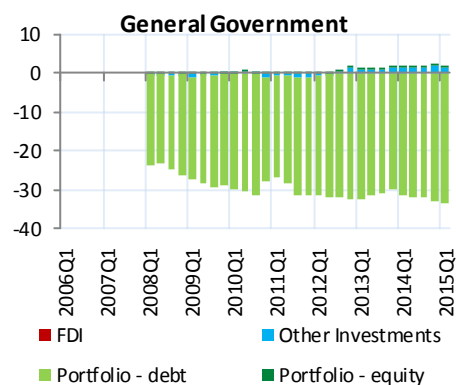
Germany

(in % of GDP)

Flows



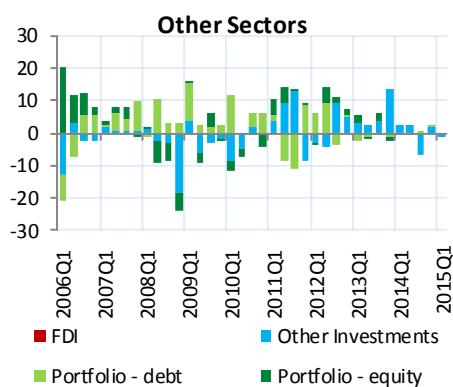
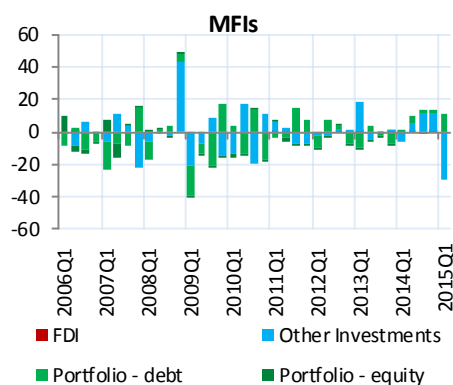
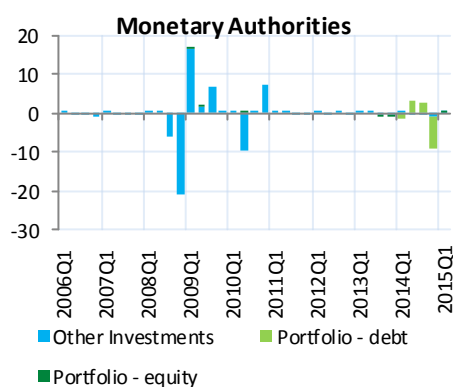
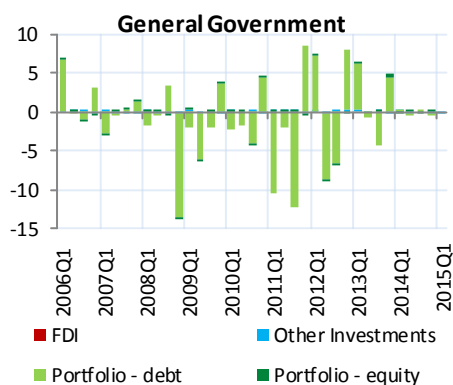
Stocks



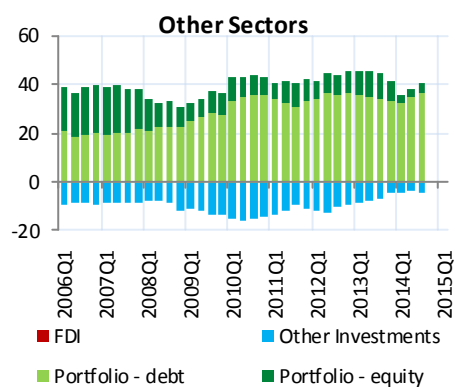
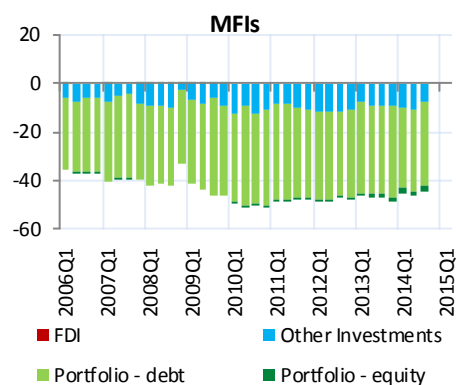
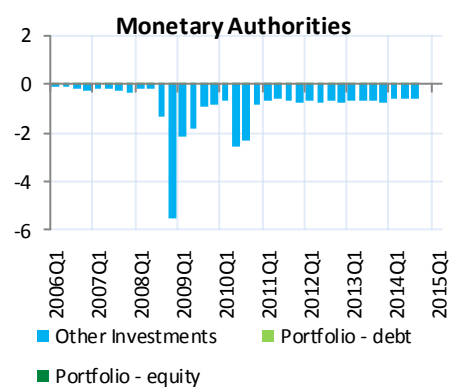
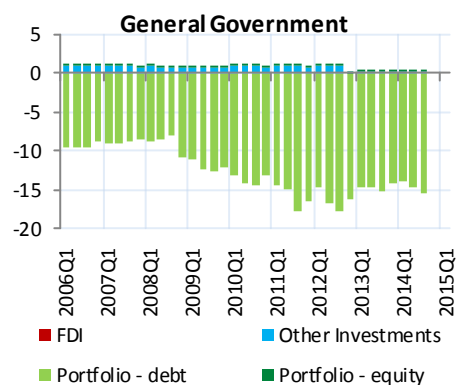
Denmark

(in % of GDP)

Flows



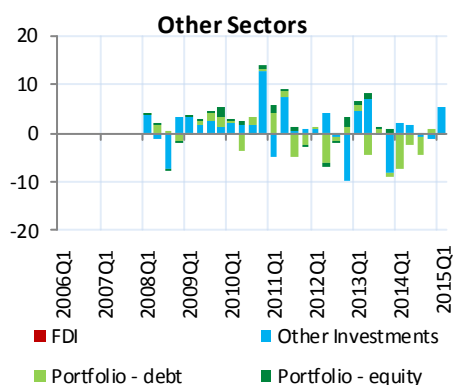
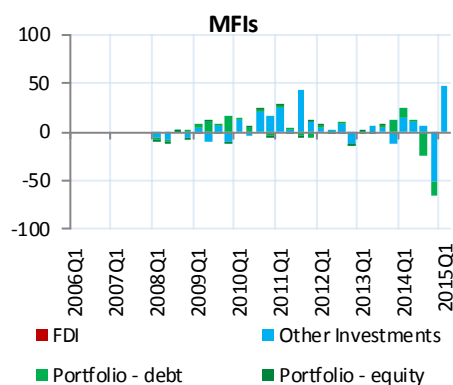
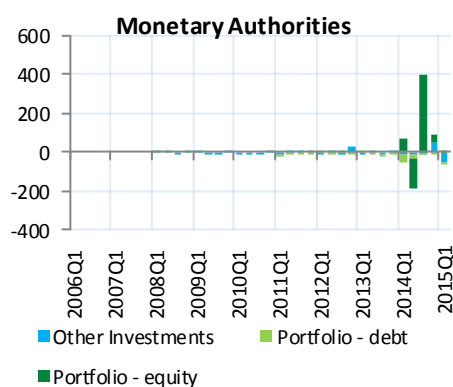
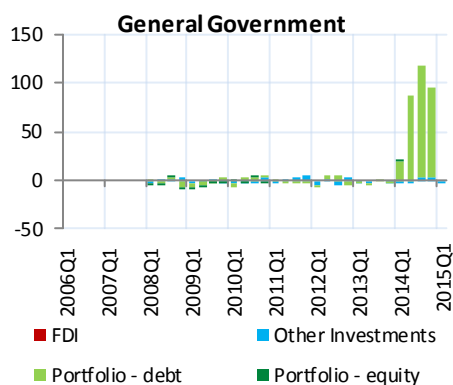
Stocks



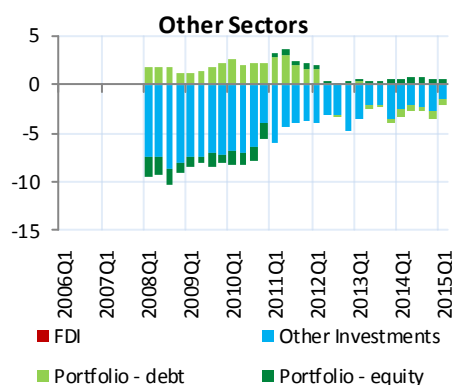
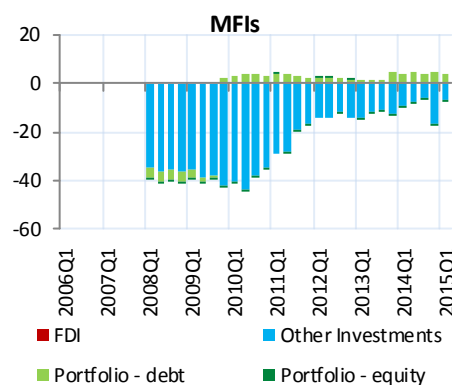
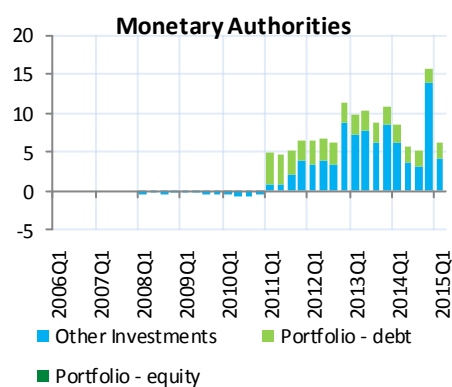
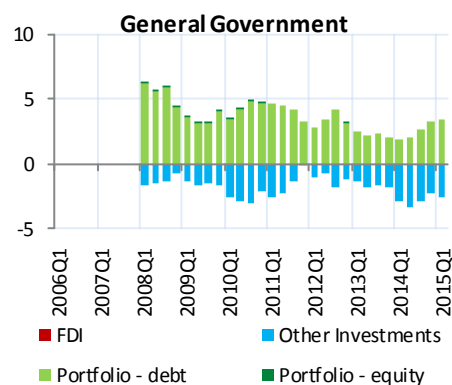
Estonia

(in % of GDP)

Flows



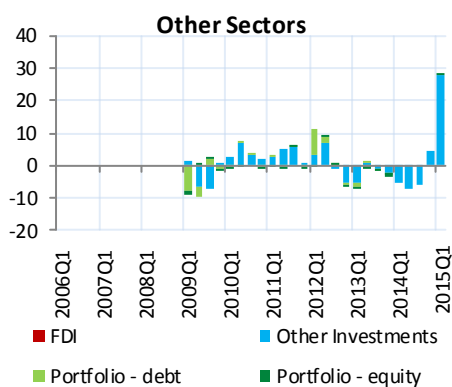
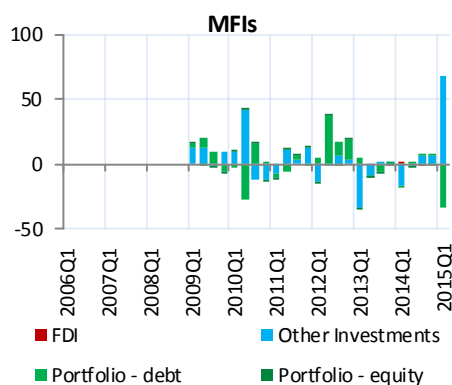
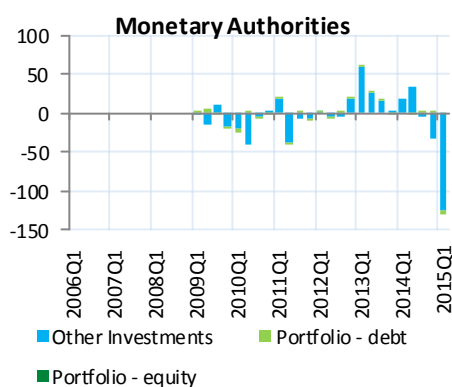
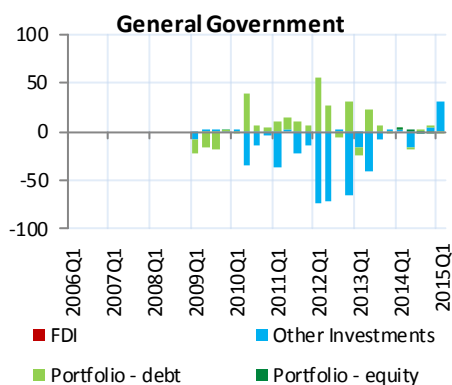
Stocks



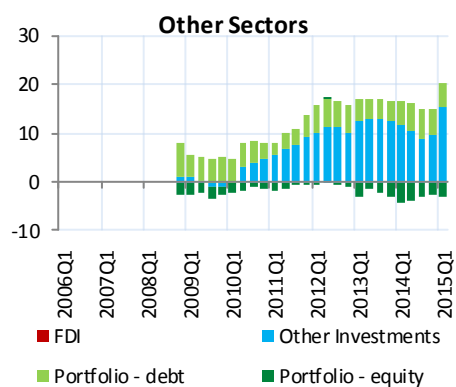
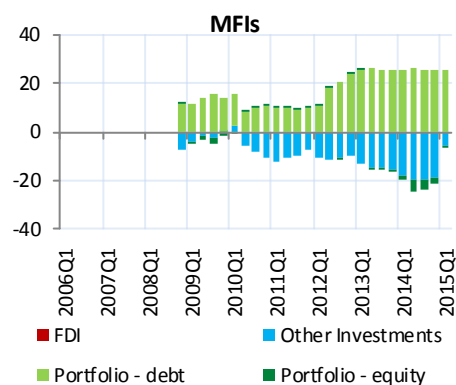
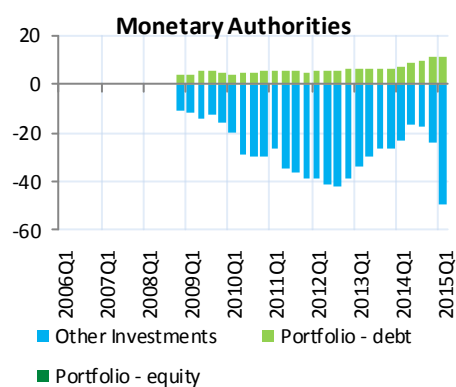
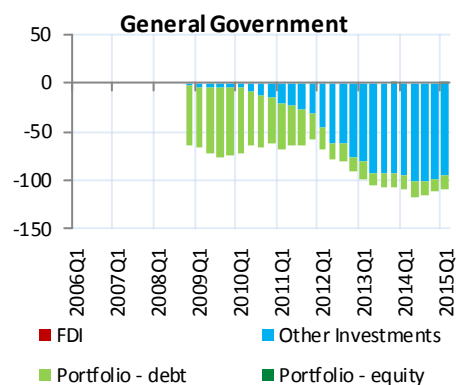
Greece

(in % of GDP)

Flows



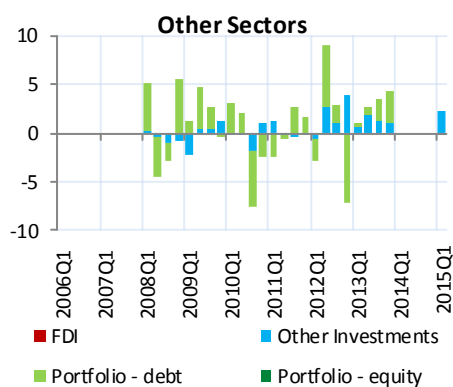
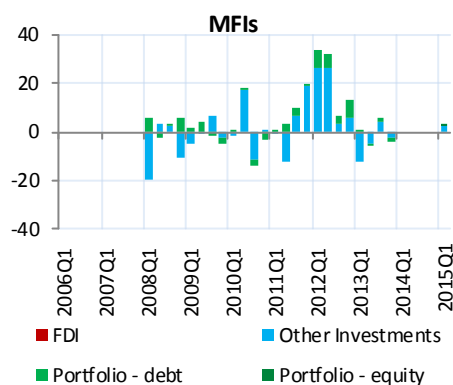
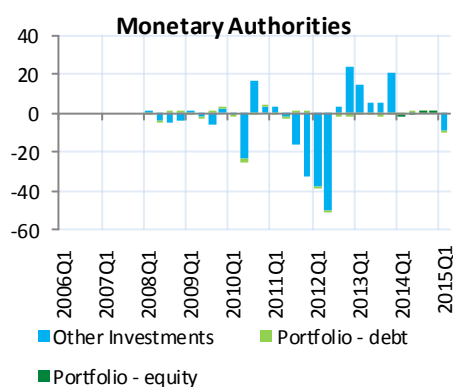
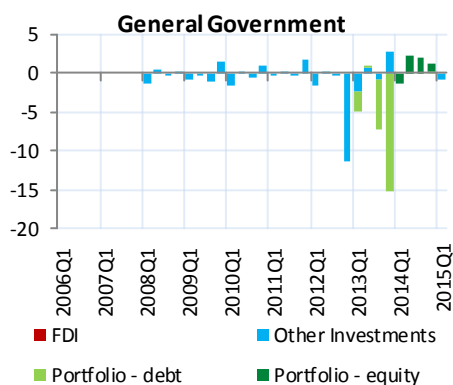
Stocks



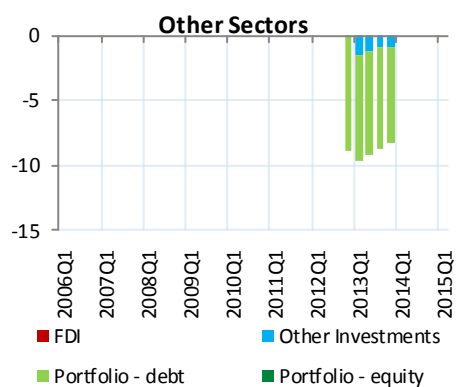
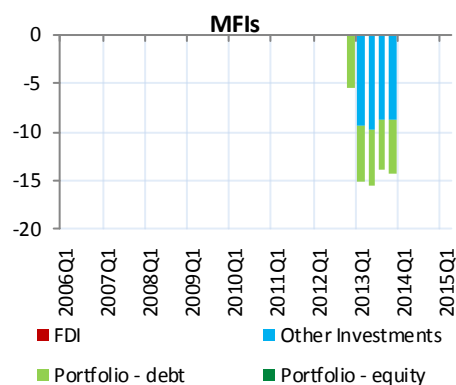
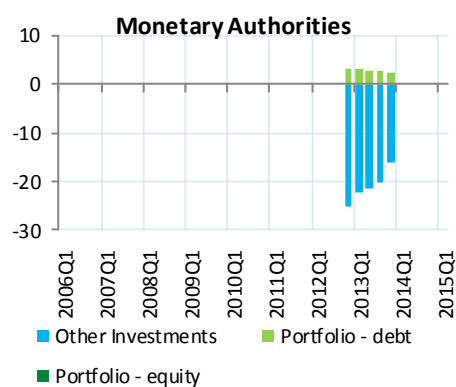
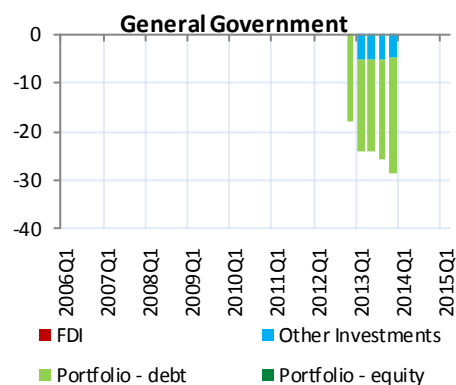
Spain

(in % of GDP)

Flows



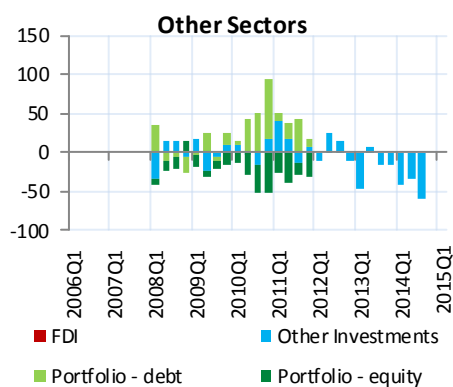
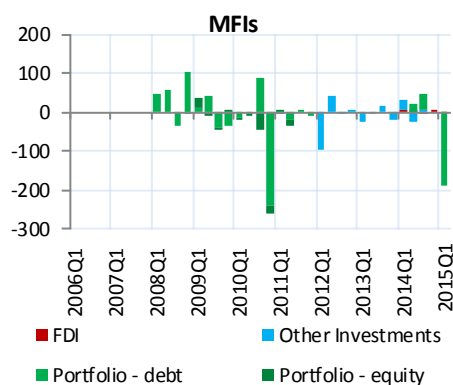
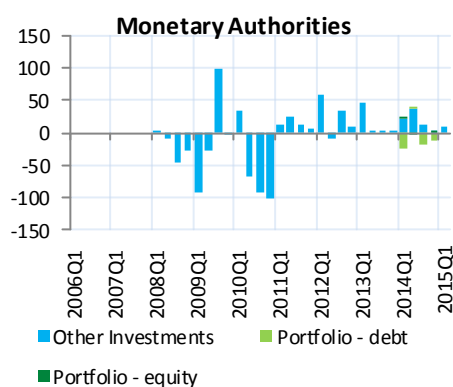
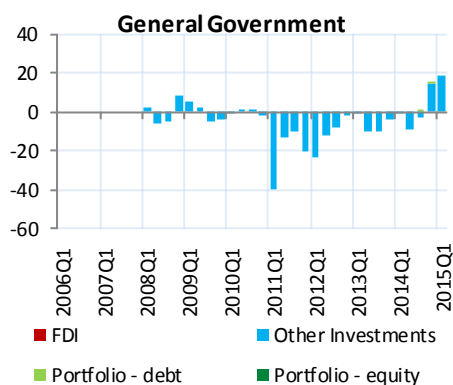
Stocks



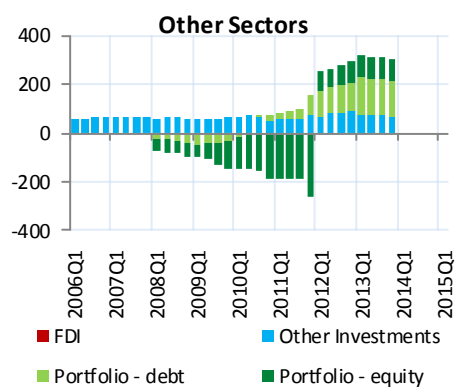
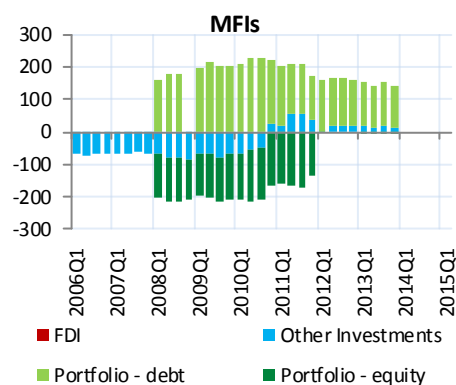
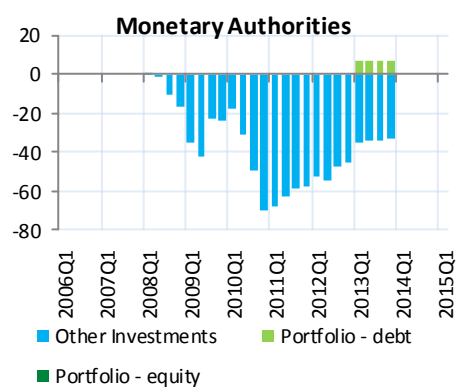
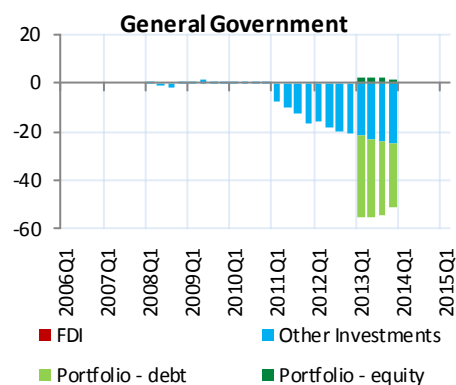
Ireland

(in % of GDP)

Flows



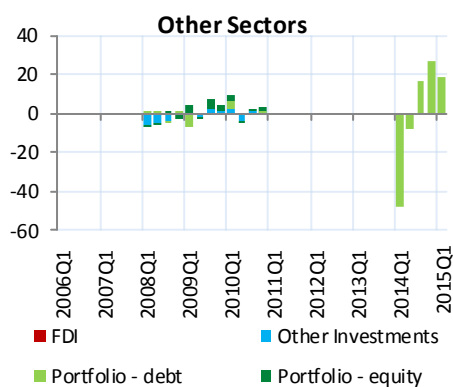
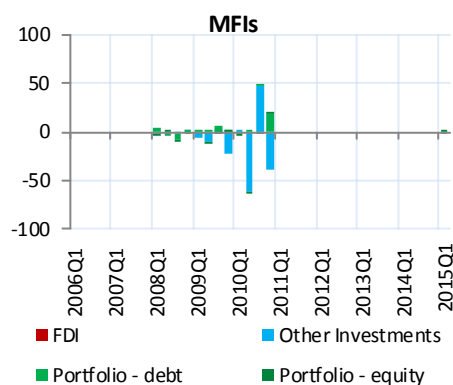
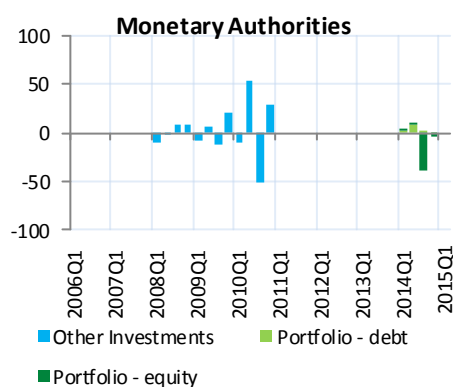
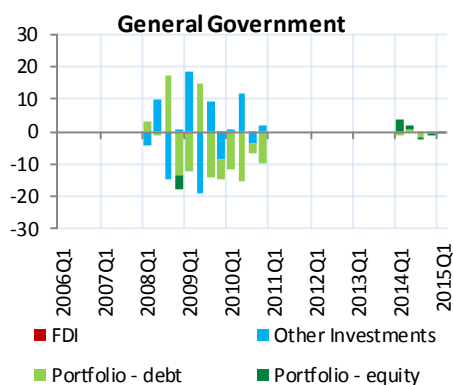
Stocks



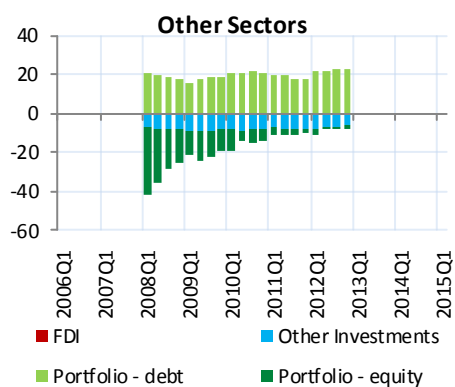
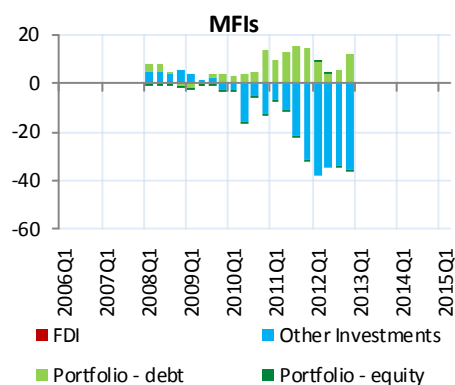
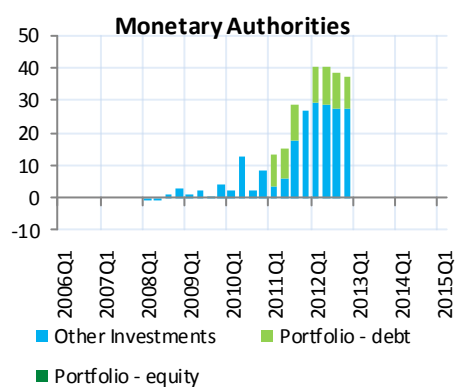
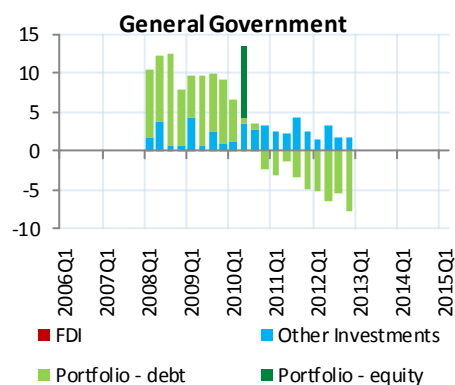
Finland

(in % of GDP)

Flows



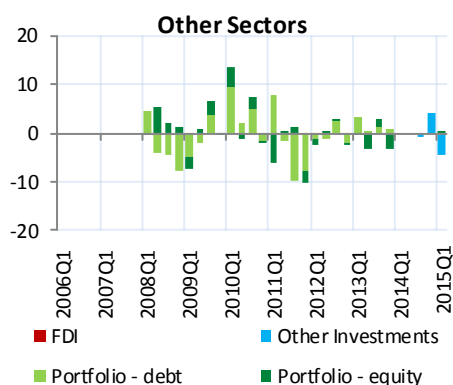
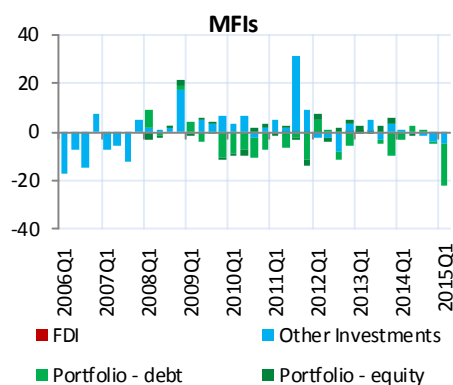
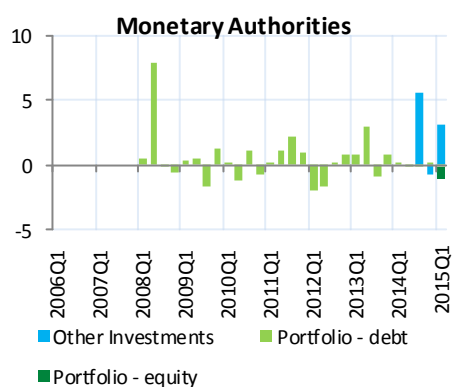
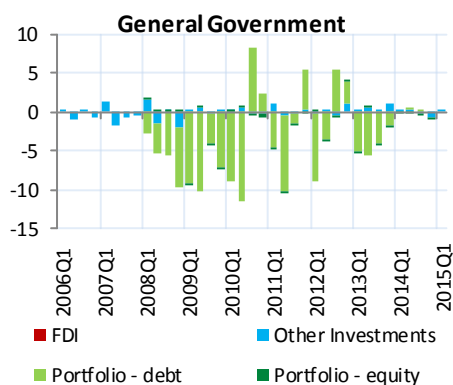
Stocks



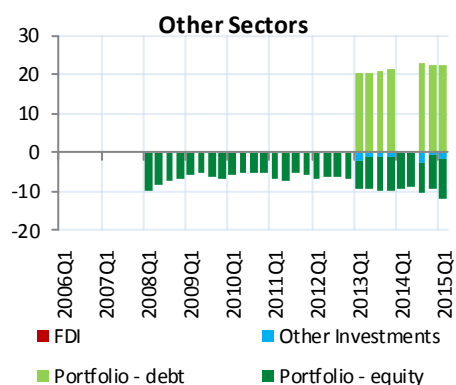
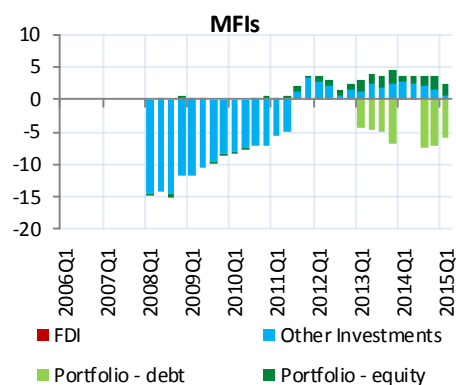
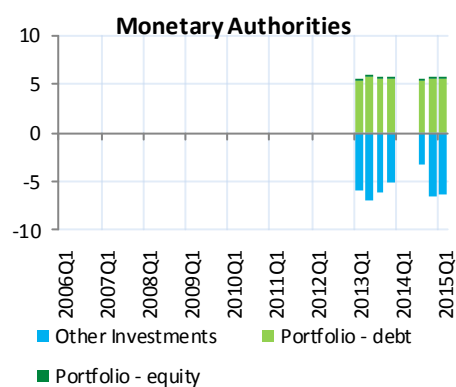
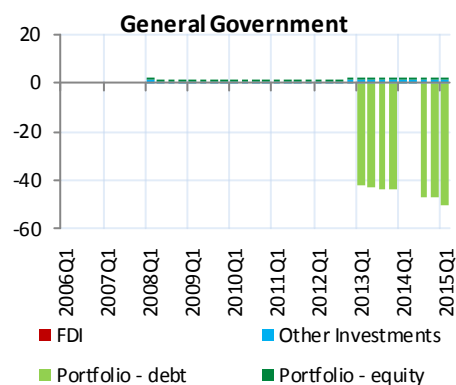
France

(in % of GDP)

Flows



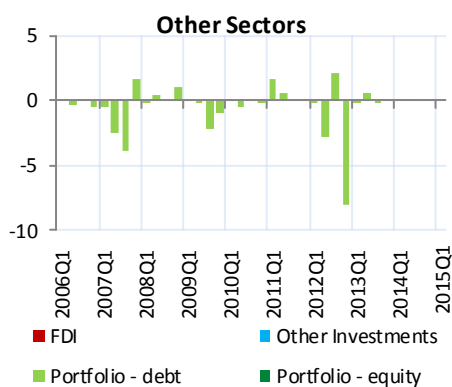
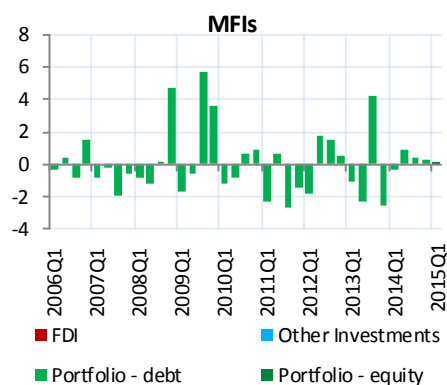
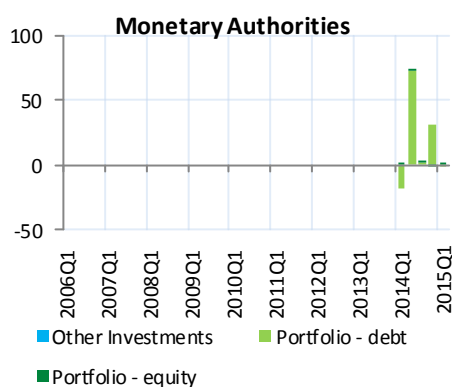
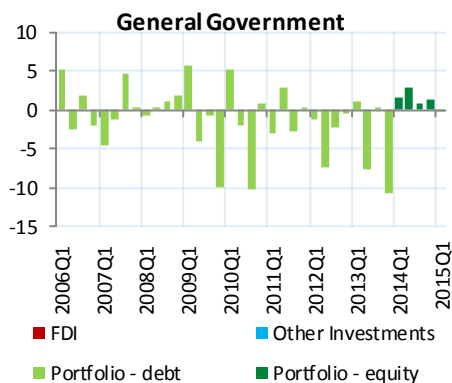
Stocks



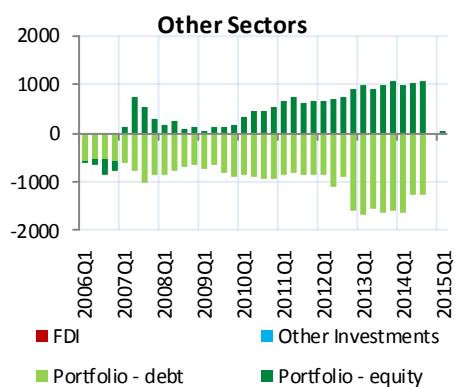
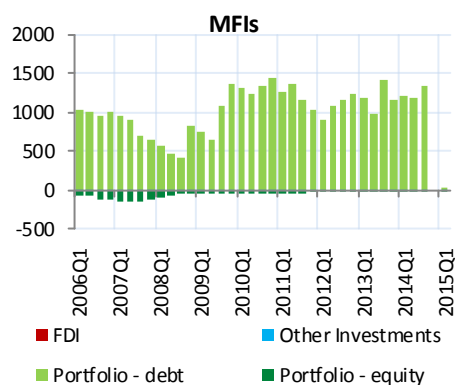
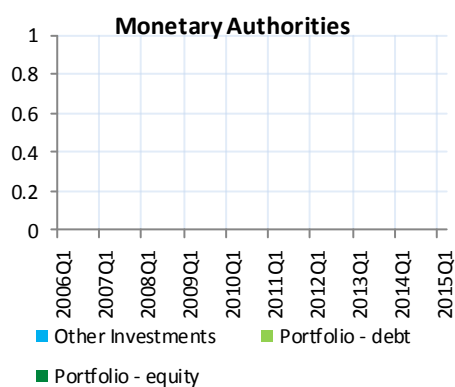
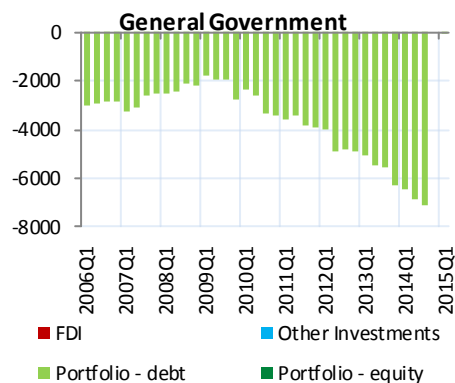
Croatia

(in % of GDP)

Flows



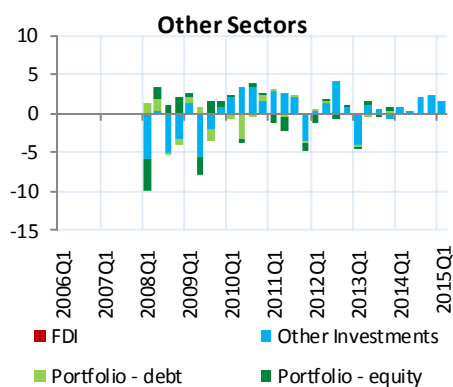
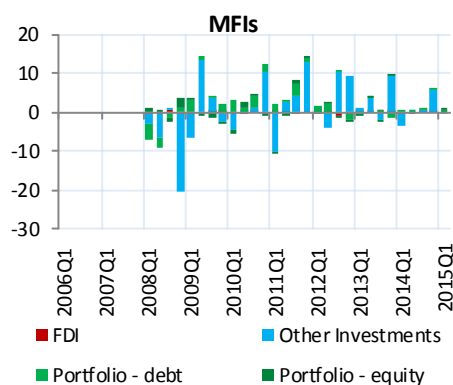
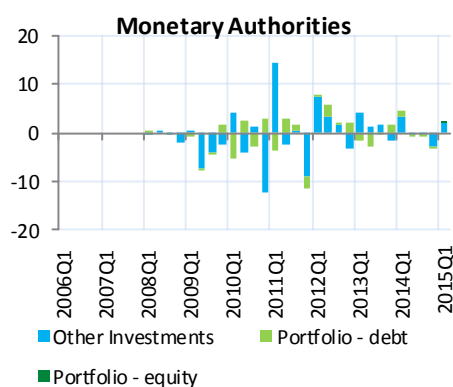
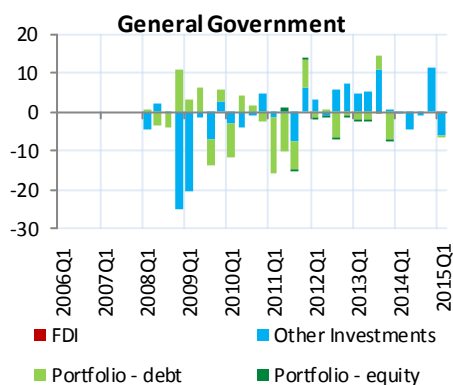
Stocks



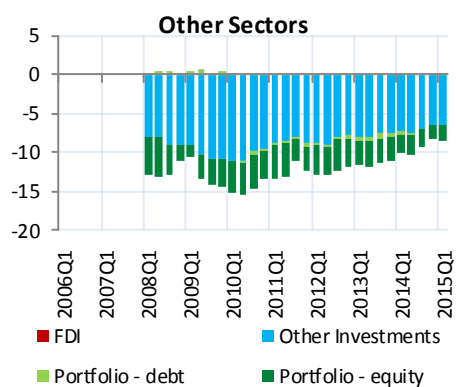
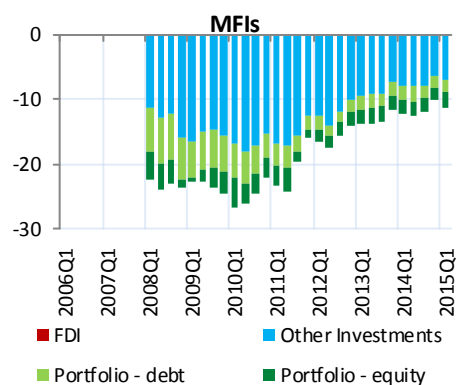
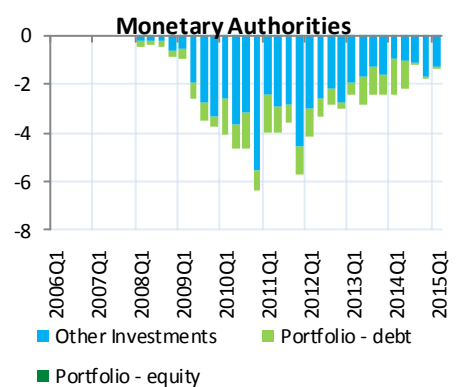
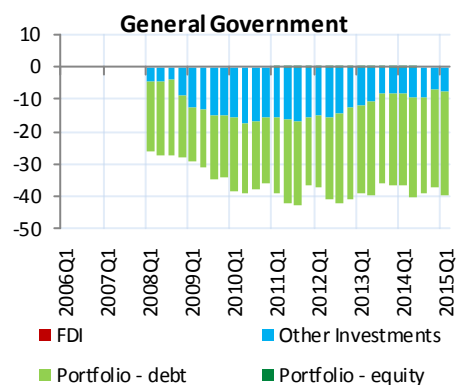
Hungary

(in % of GDP)

Flows



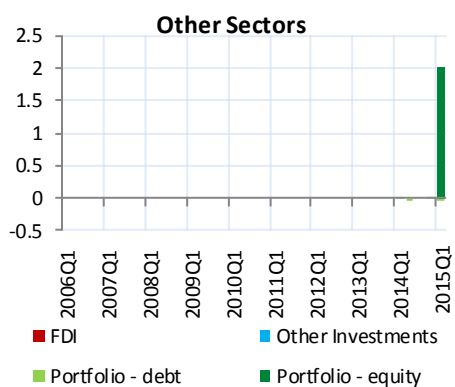
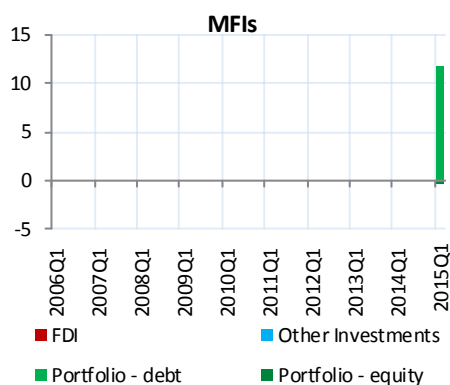
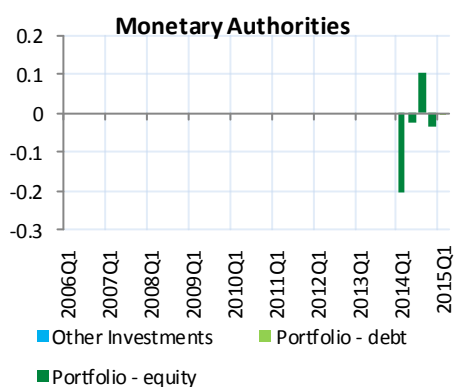
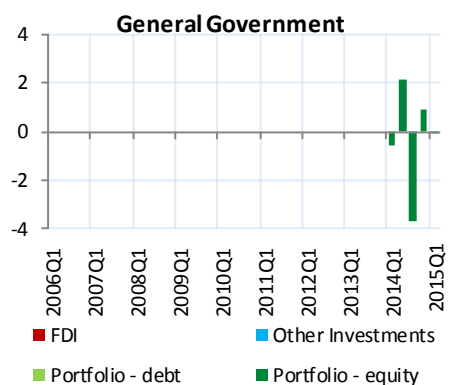
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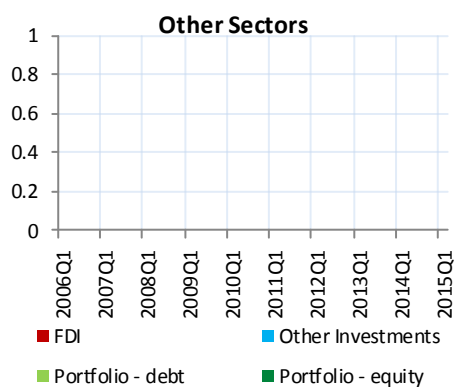
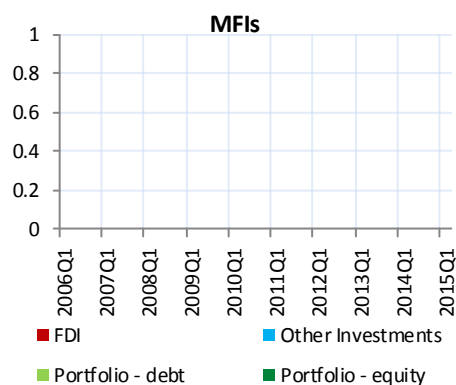
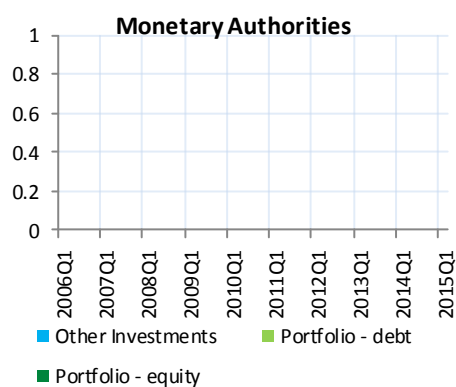
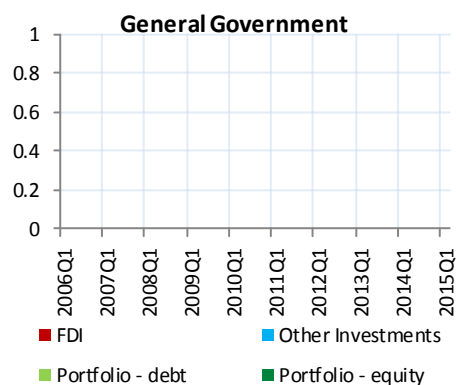
Italy

(in % of GDP)

Flows



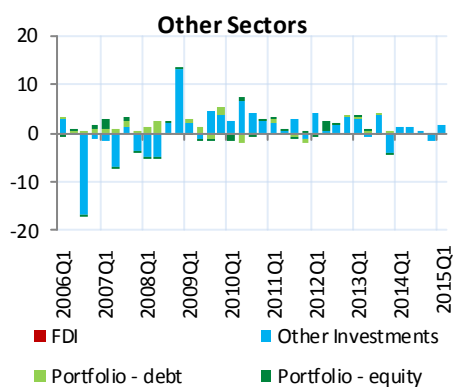
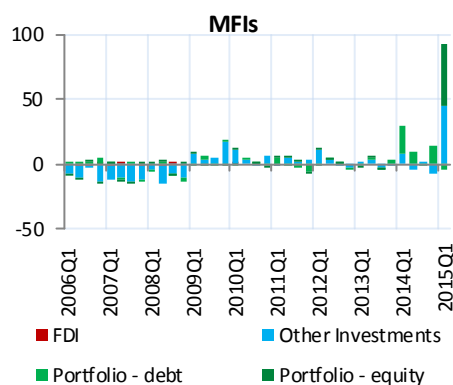
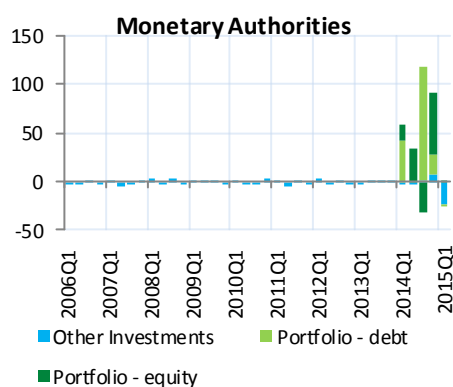
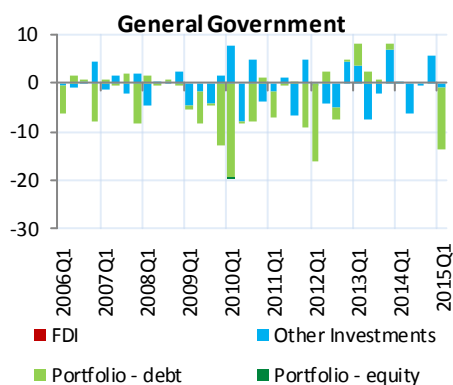
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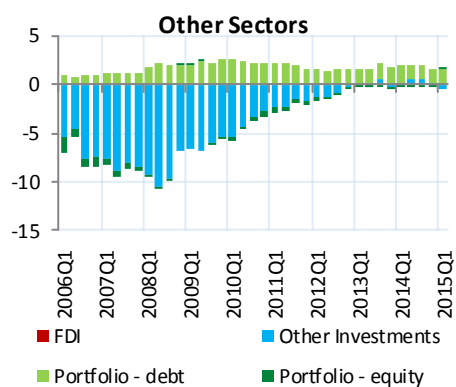
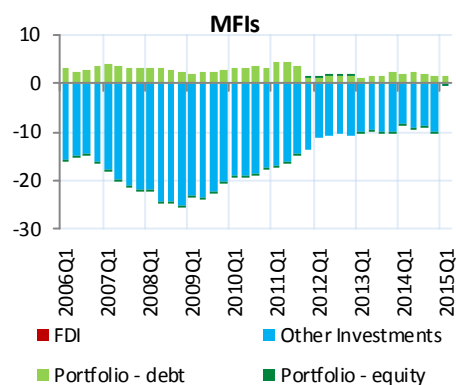
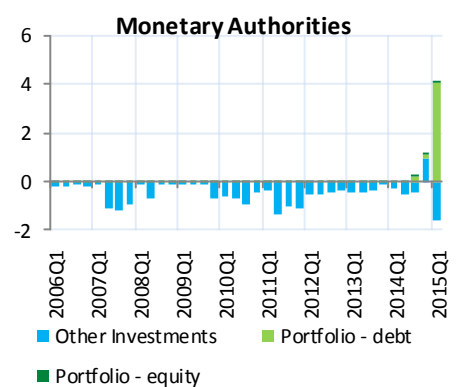
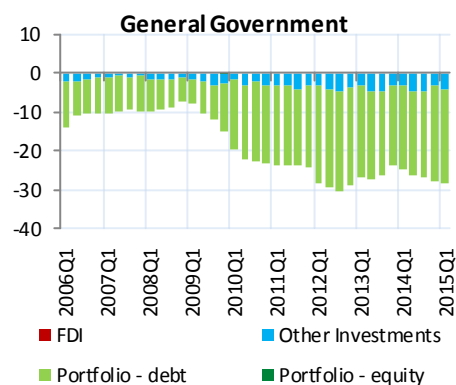
Lithuania

(in % of GDP)

Flows



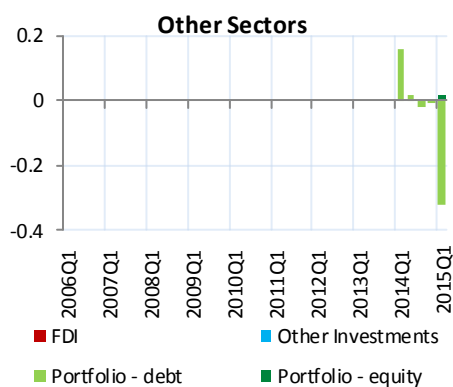
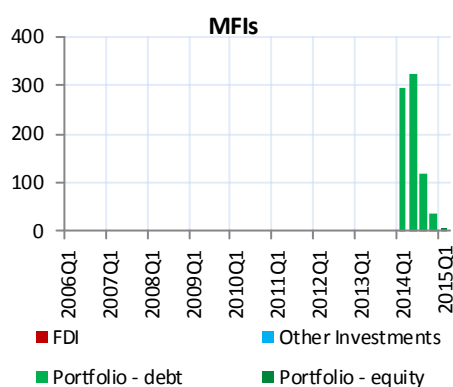
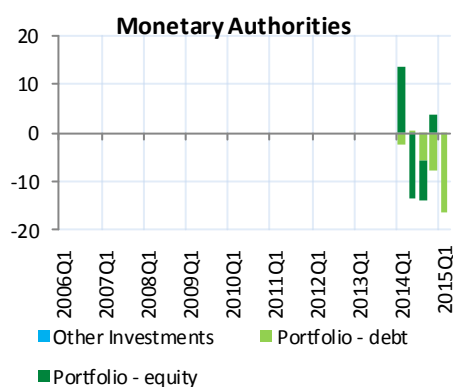
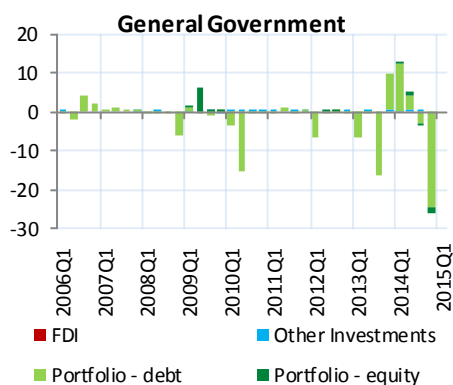
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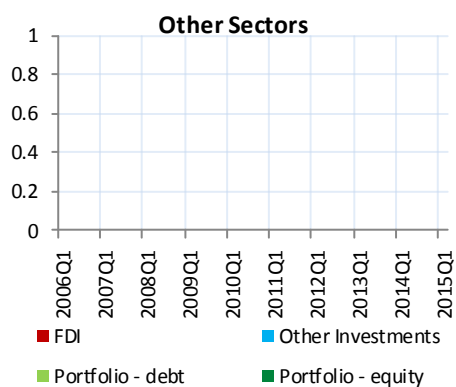
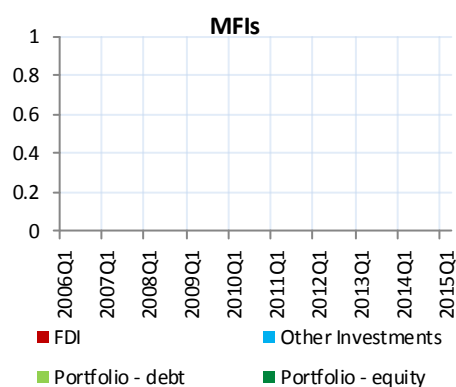
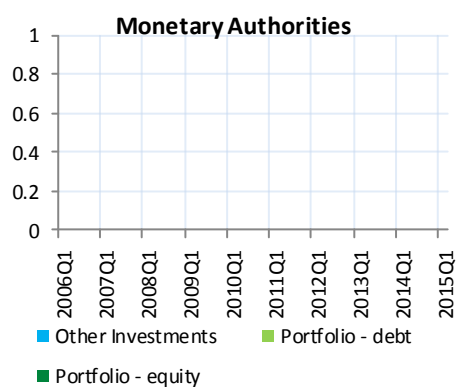
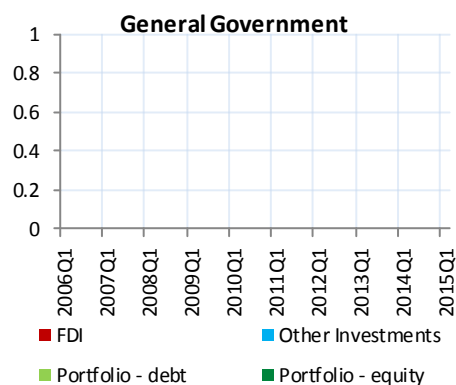
Luxembourg

(in % of GDP)

Flows



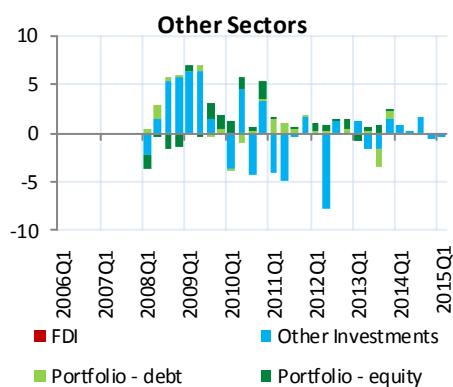
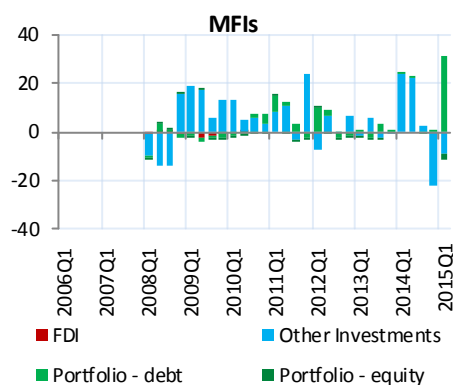
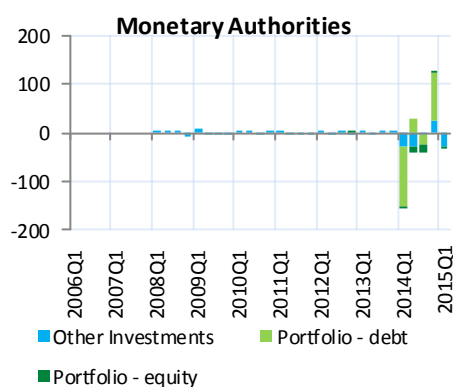
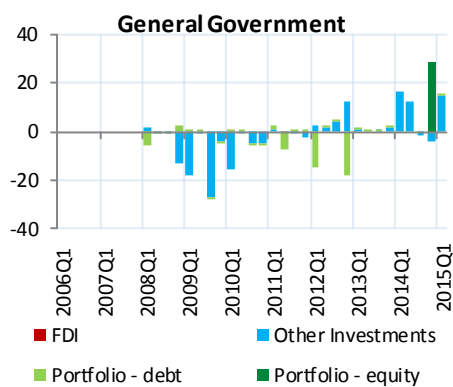
Stocks



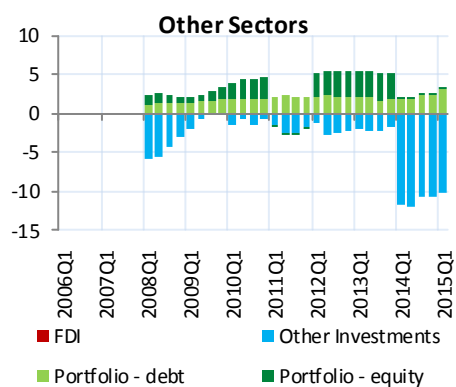
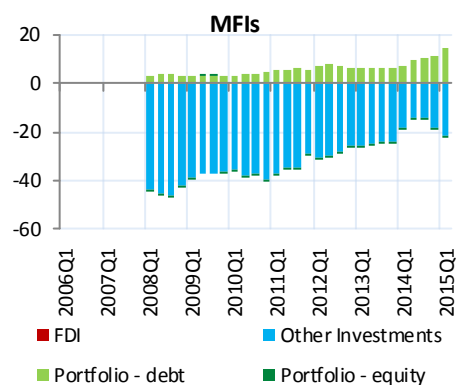
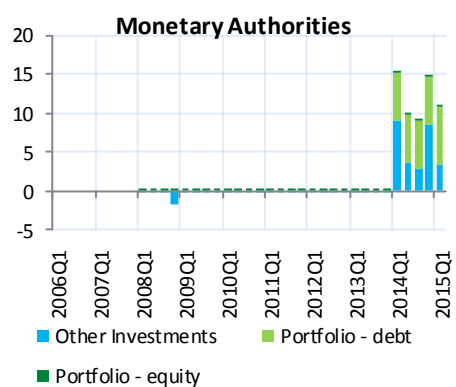
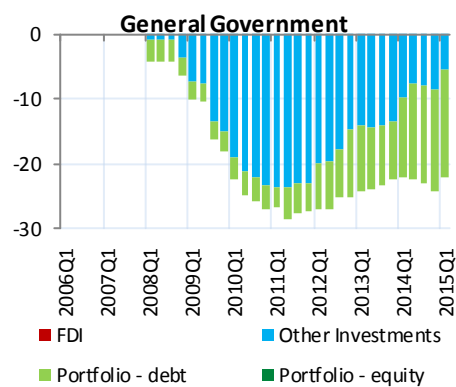
Latvia

(in % of GDP)

Flows



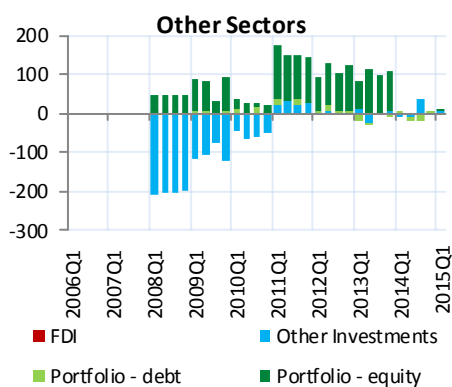
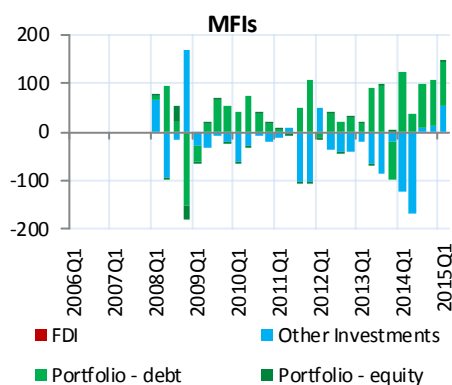
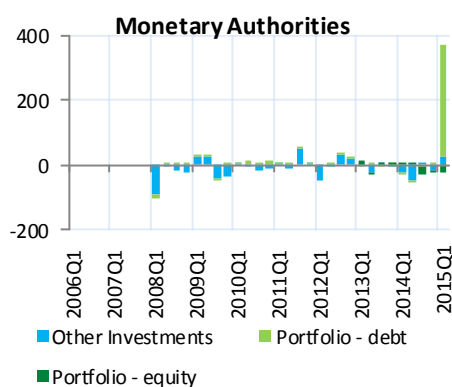
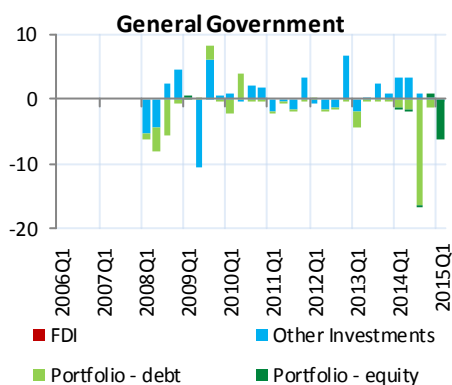
Stocks



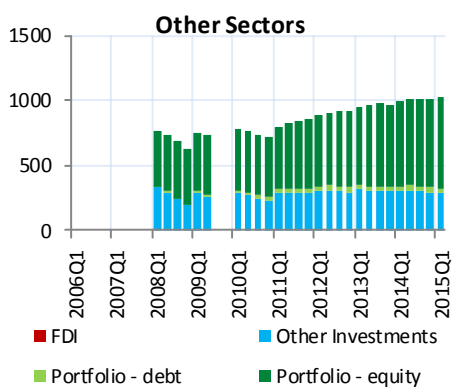
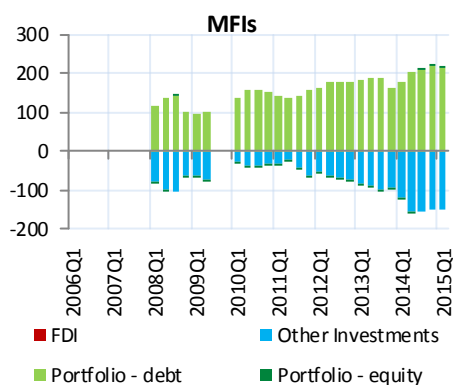
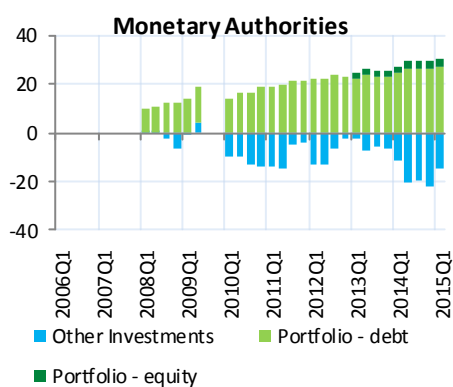
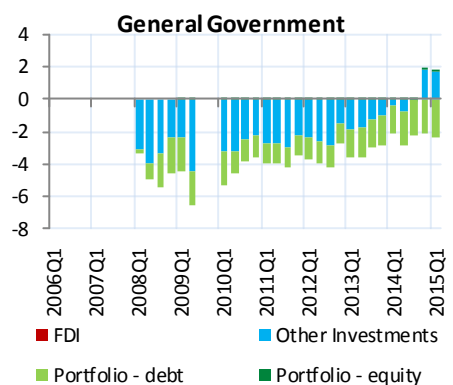
Malta

(in % of GDP)

Flows



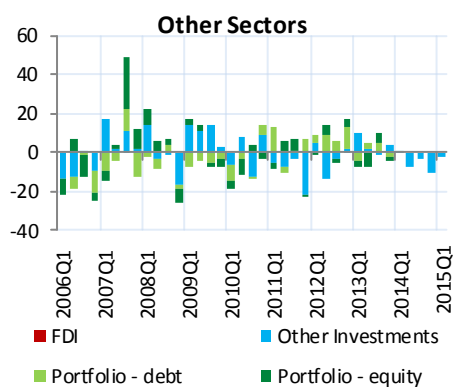
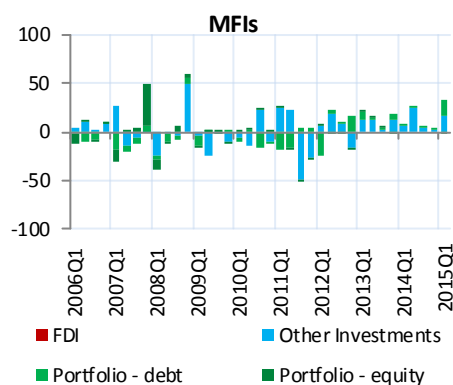
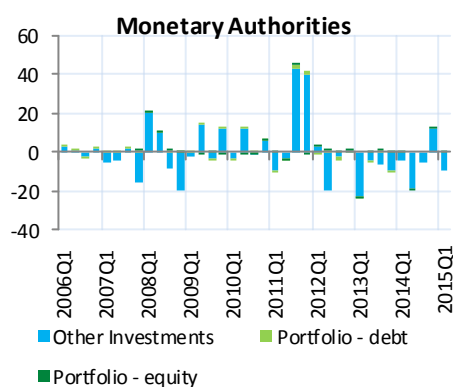
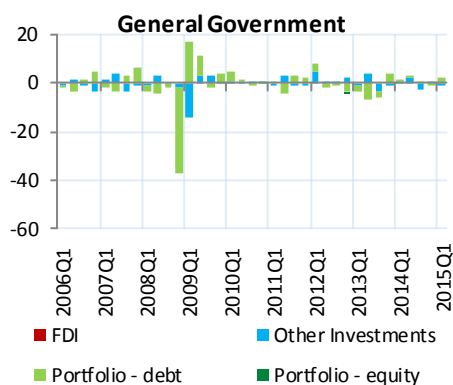
Stocks



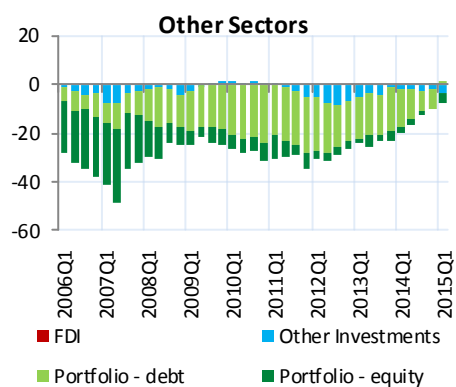
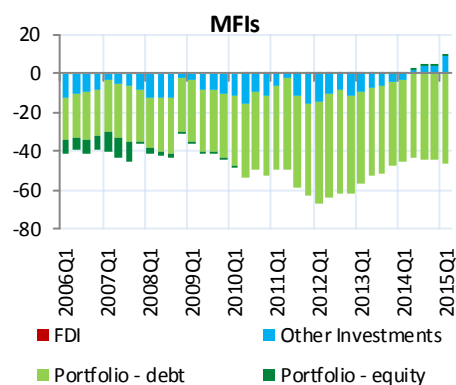
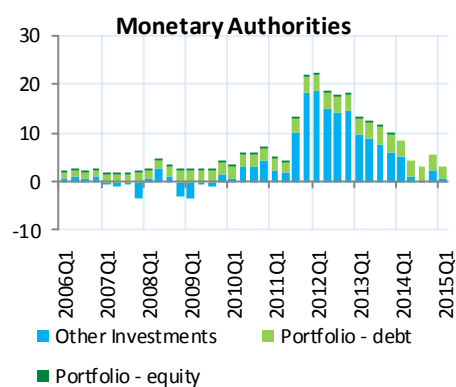
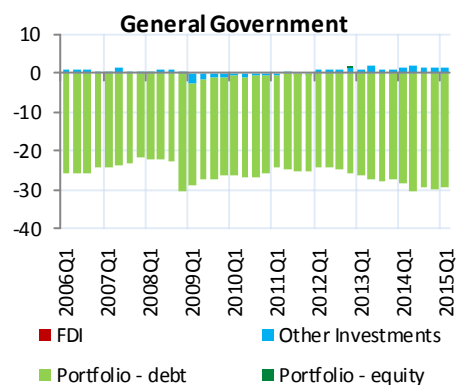
Netherlands

(in % of GDP)

Flows



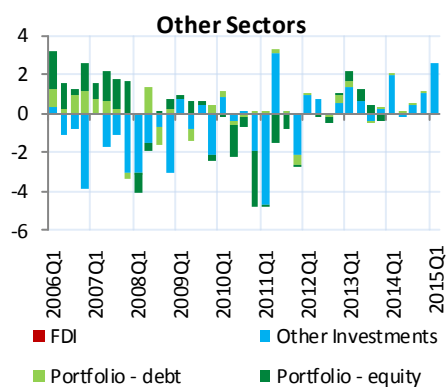
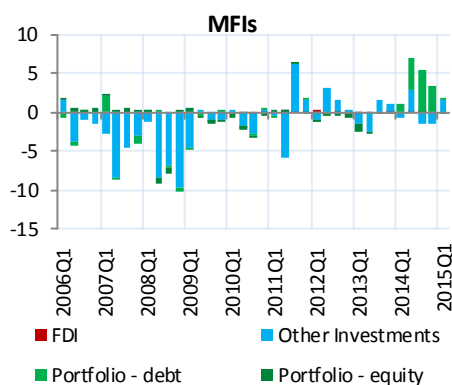
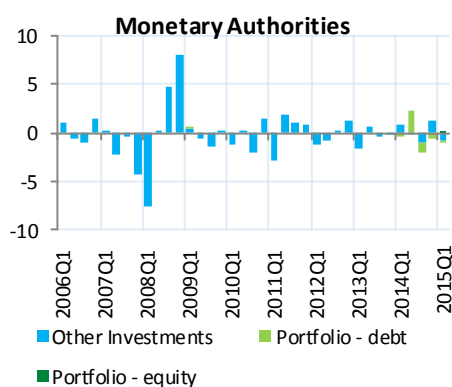
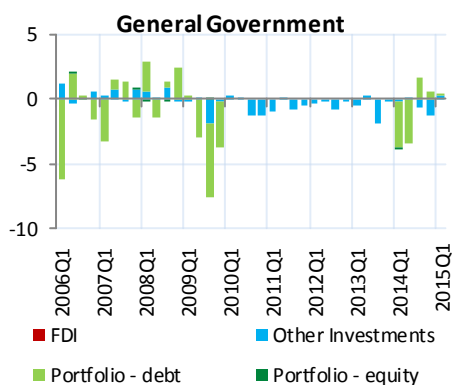
Stocks



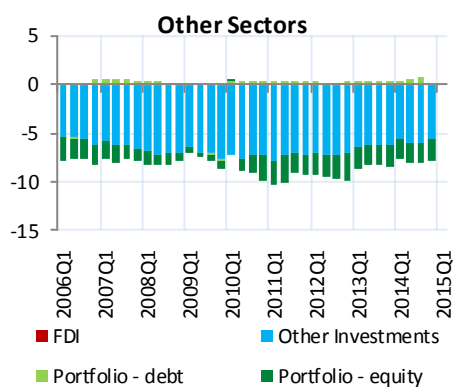
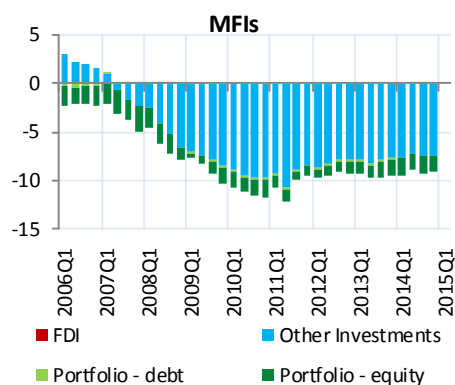
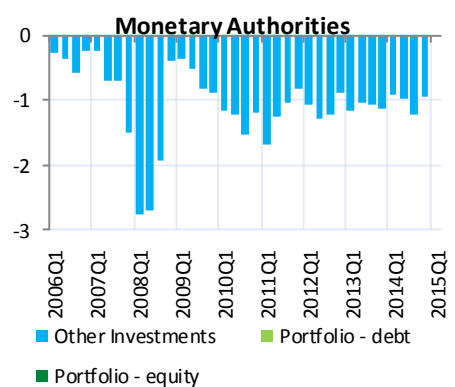
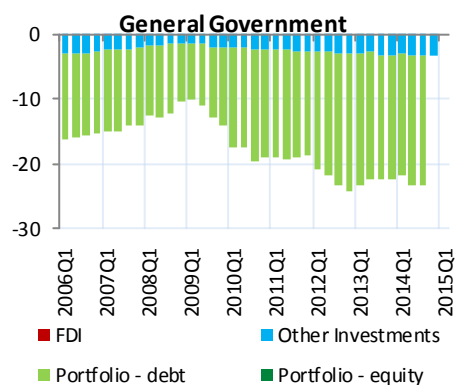
Poland

(in % of GDP)

Flows



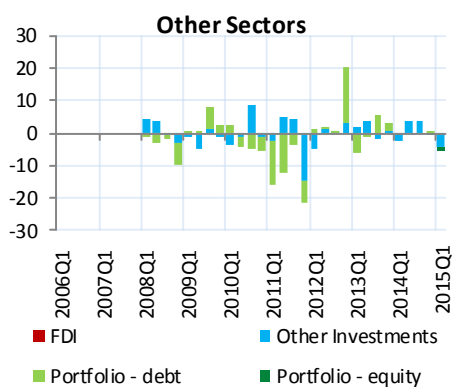
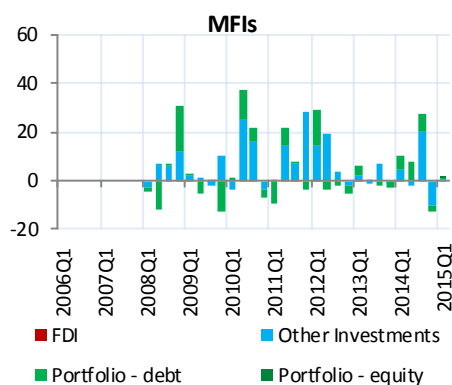
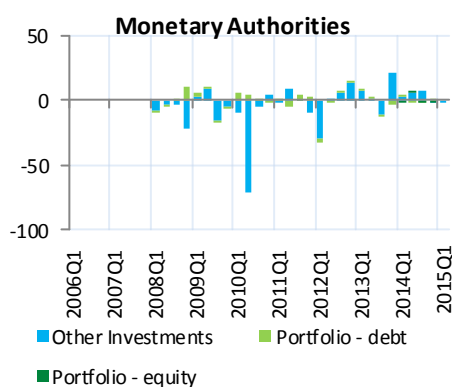
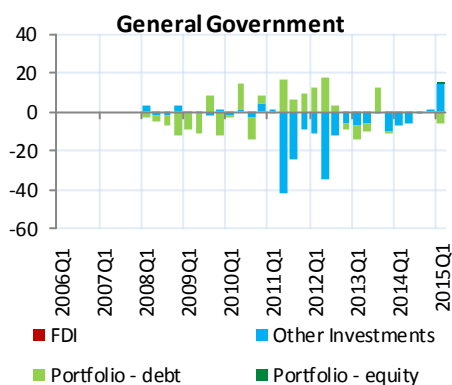
Stocks



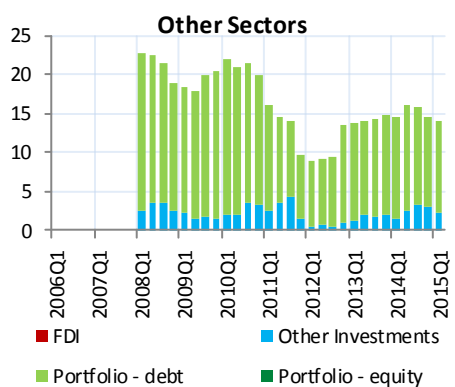
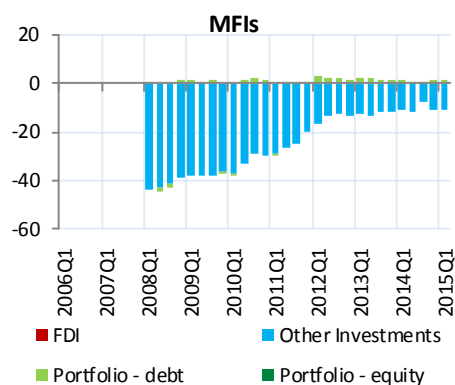
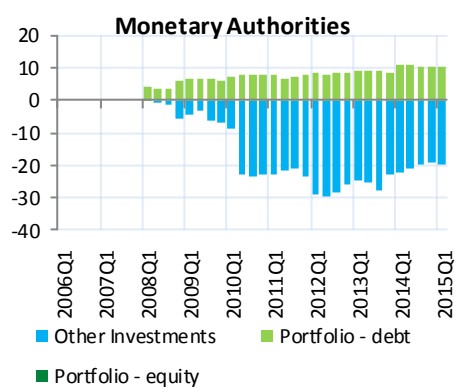
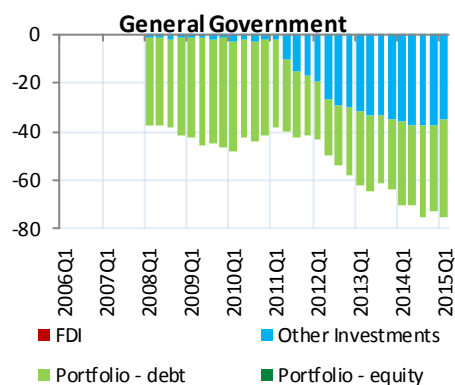
Portugal

(in % of GDP)

Flows



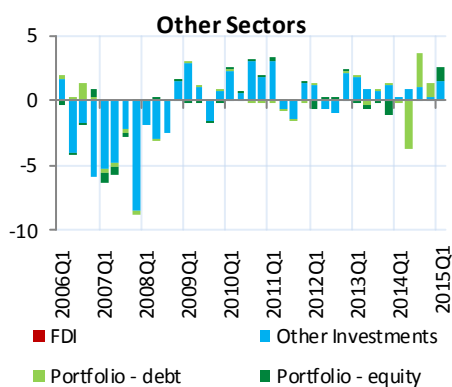
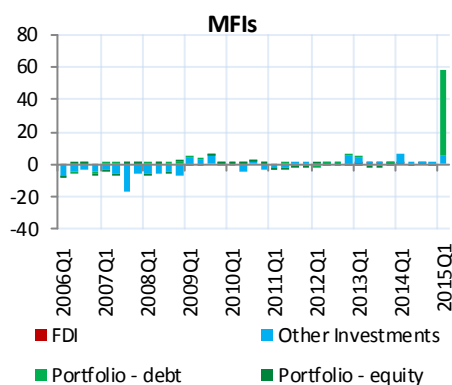
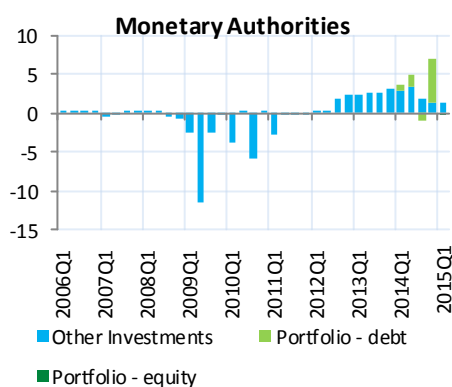
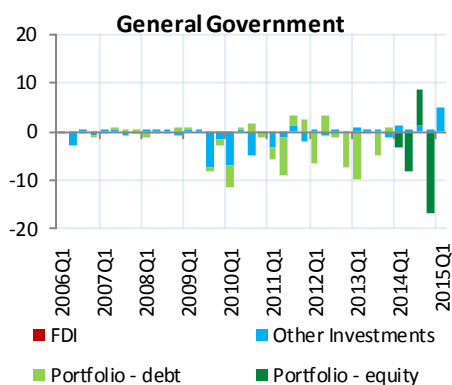
Stocks



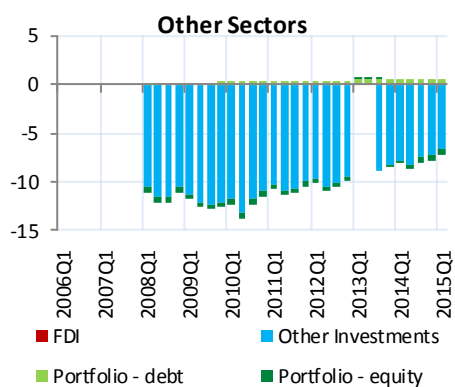
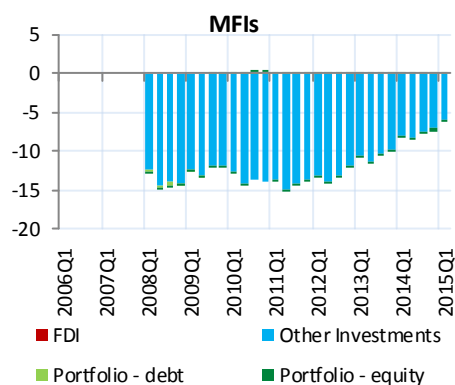
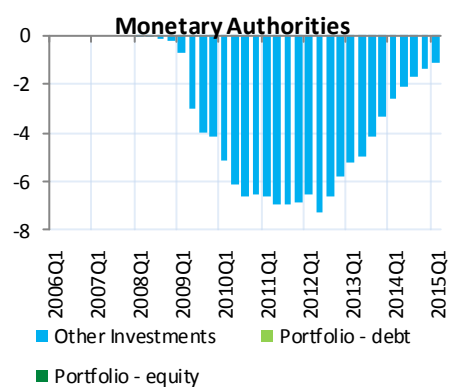
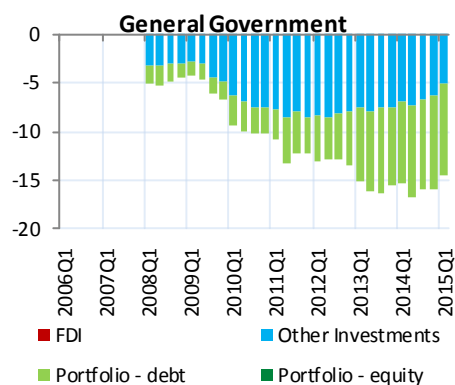
Romania

(in % of GDP)

Flows



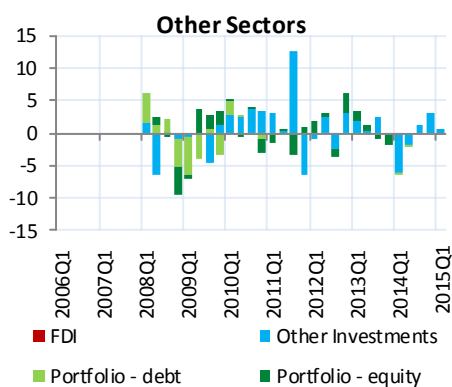
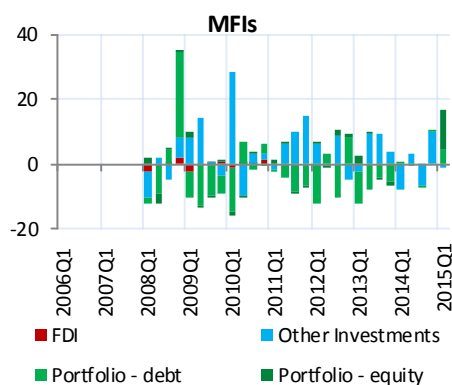
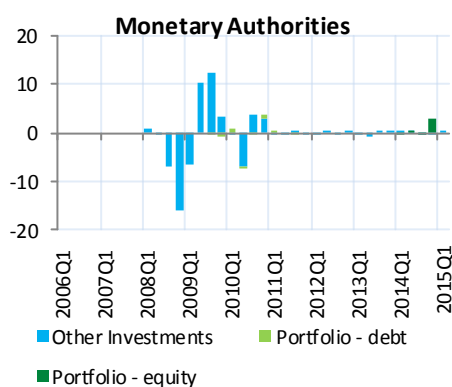
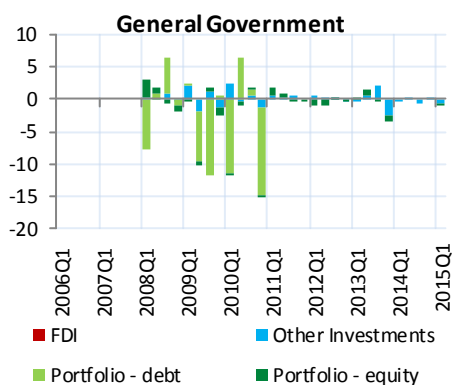
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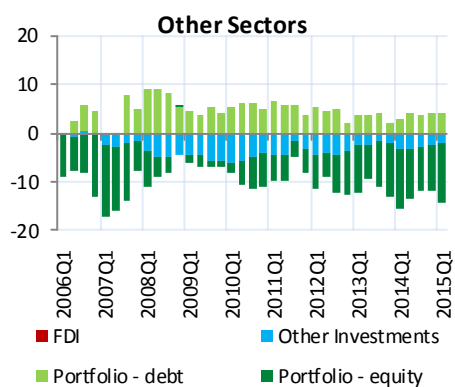
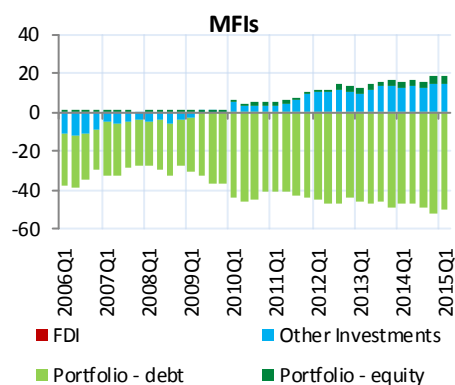
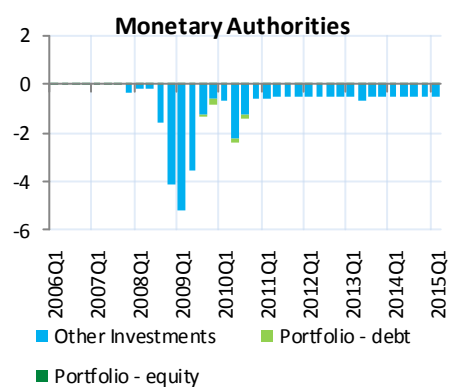
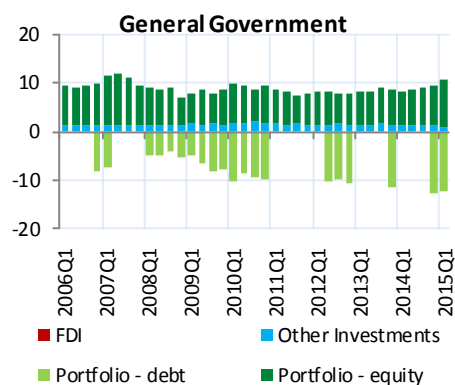
Sweden

(in % of GDP)

Flows



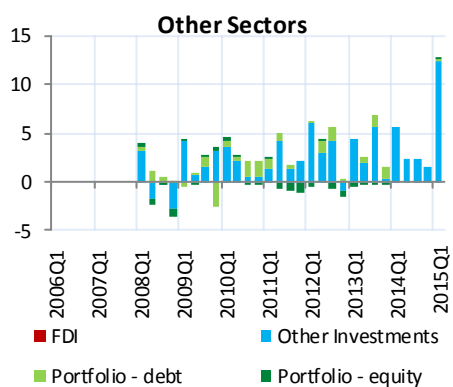
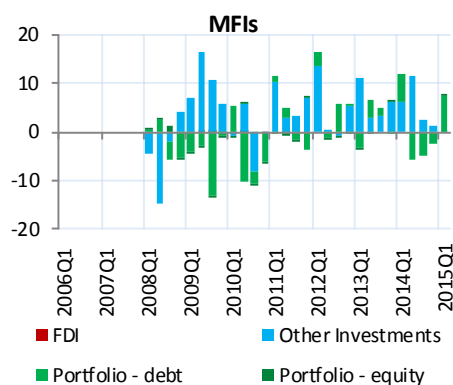
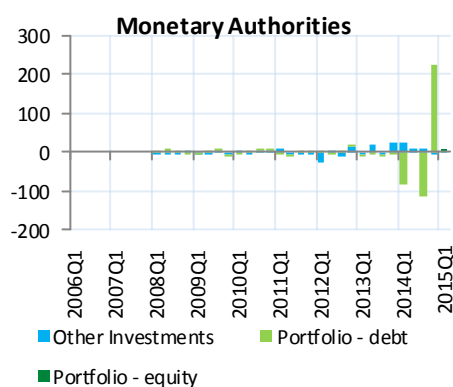
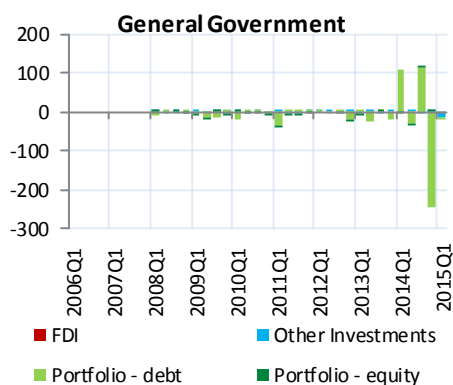
Stocks



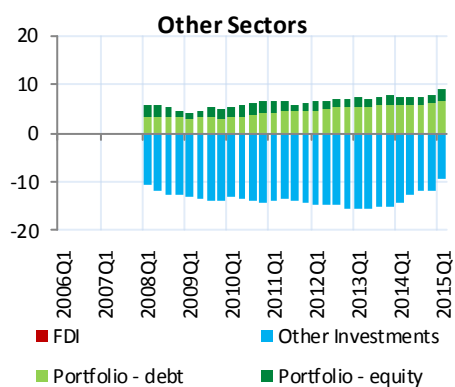
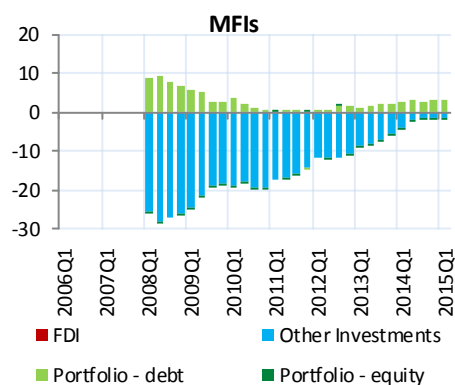
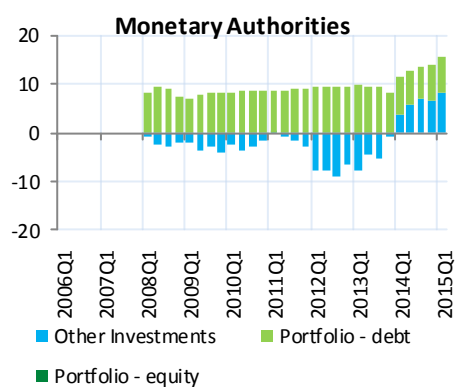
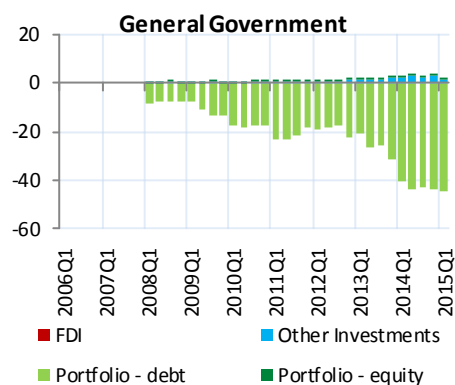
Slovenia

(in % of GDP)

Flows



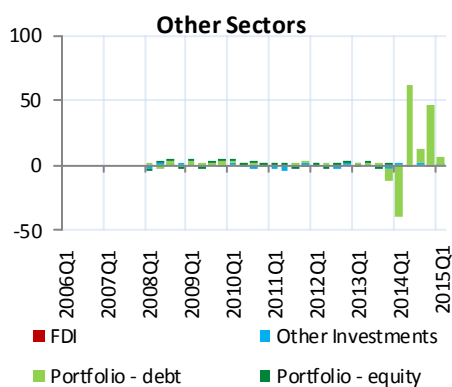
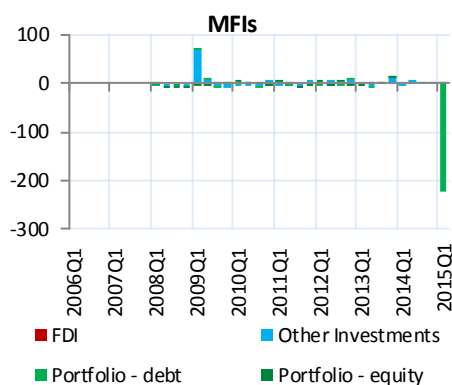
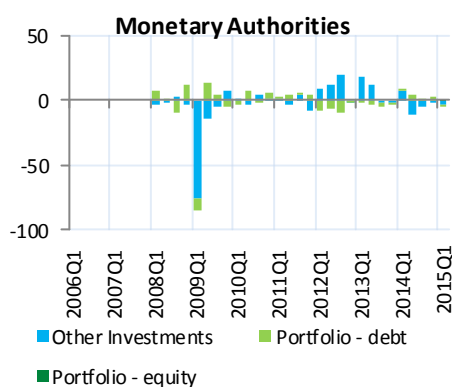
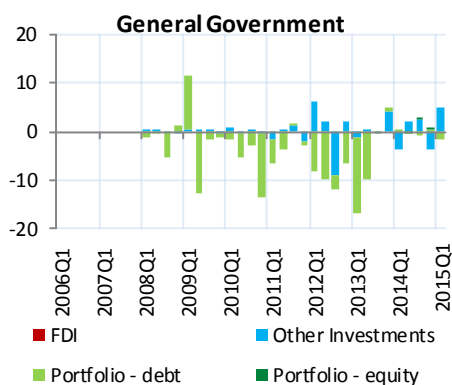
Stocks



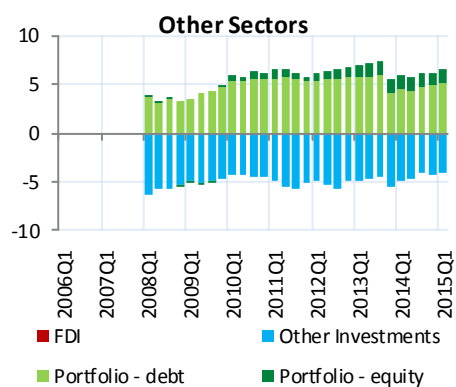
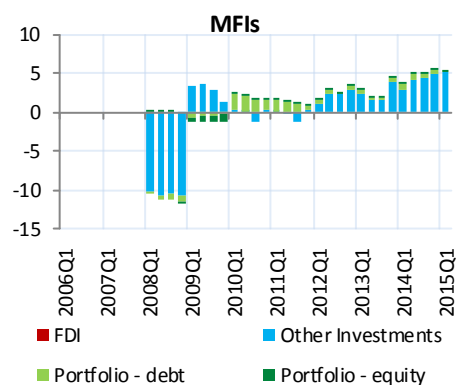
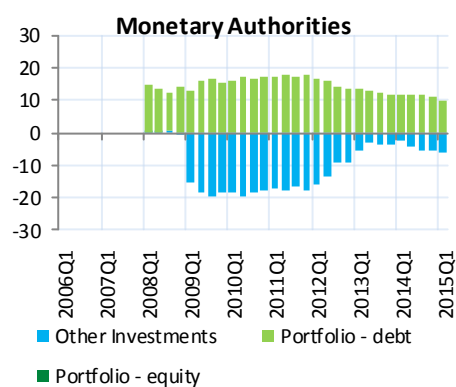
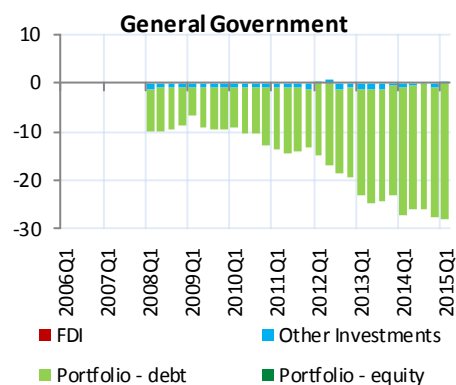
Slovakia

(in % of GDP)

Flows



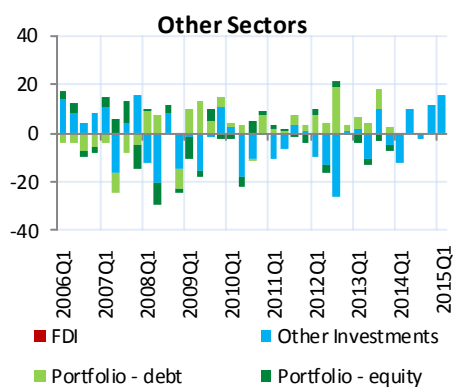
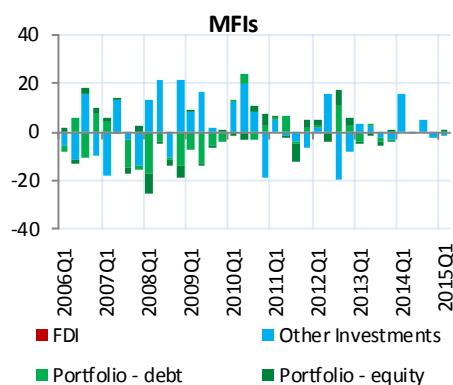
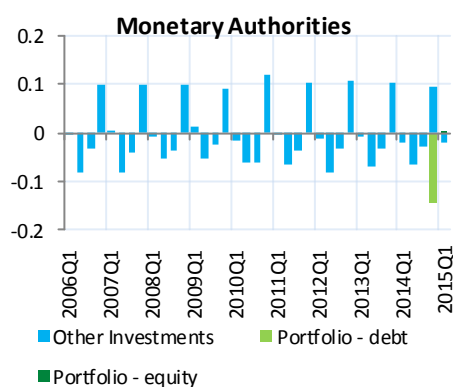
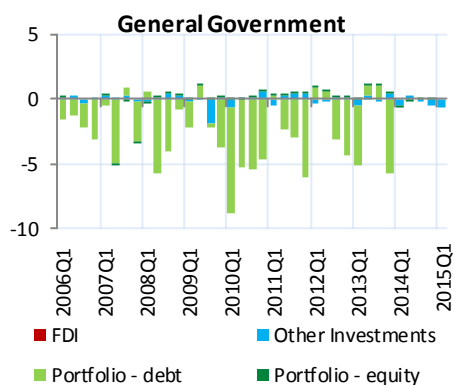
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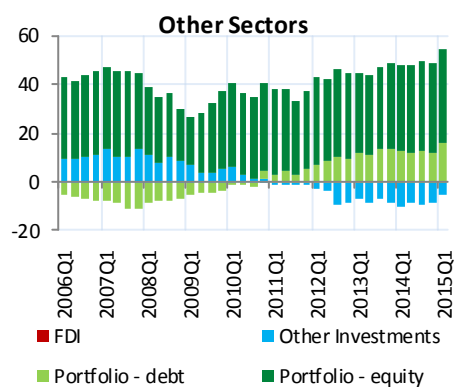
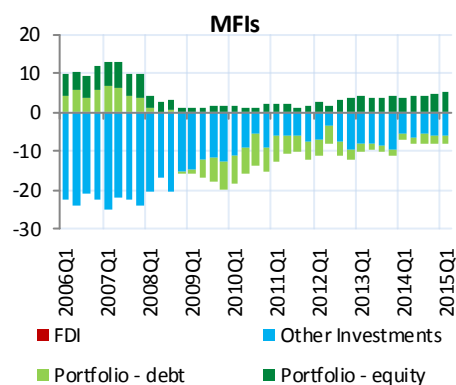
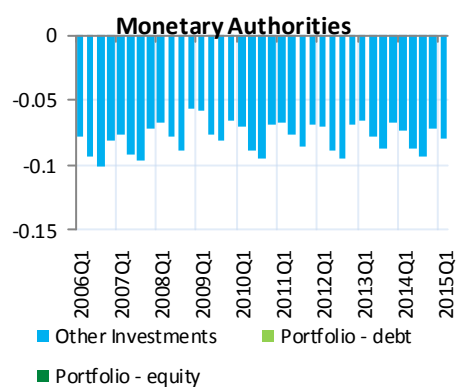
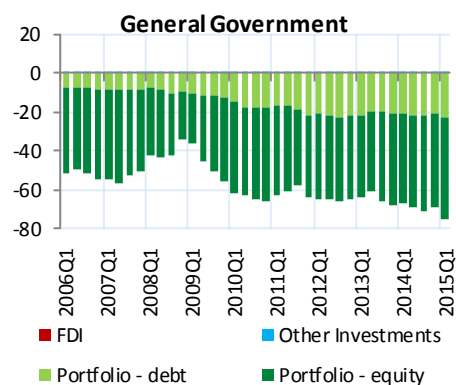
United Kingdom

(in % of GDP)

Flows



Stocks



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