

March 2012

# Macro-Financial Review



Banc Ceannais na hÉireann  
Central Bank of Ireland

Eurosystem



## **MACRO-FINANCIAL REVIEW**

## NOTES

1. Unless otherwise stated, this document uses data available on 14 March 2012.
2. Unless otherwise stated, the aggregate banking data refer to all credit institutions operating in the Republic of Ireland. Specific samples used within the report include:
  - Domestic banks/domestic institutions, which are the credit institutions covered by the Eligible Liabilities Guarantee scheme including the Irish Bank Resolution Corporation (IBRC) unless otherwise stated.
  - Foreign-owned resident banks, which are foreign banking groups which have presences (either bank or branch) in the Republic of Ireland.
3. The following symbols are used:

e	estimate	H	half-year
f	forecast	rhs	right-hand side
Q	quarter	lhs	left-hand side

### *About this document*

This document provides a systematic overview of macro-financial conditions in Ireland and forms part of the Bank's internal discussions about financial stability.

While the document has been reviewed by the Bank's Financial Stability Committee, the views expressed are those of the staff of the Financial Stability Division, which is responsible for its preparation.

It is made available to the public to heighten awareness of the current condition of the financial sector.

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## RÉAMHRA

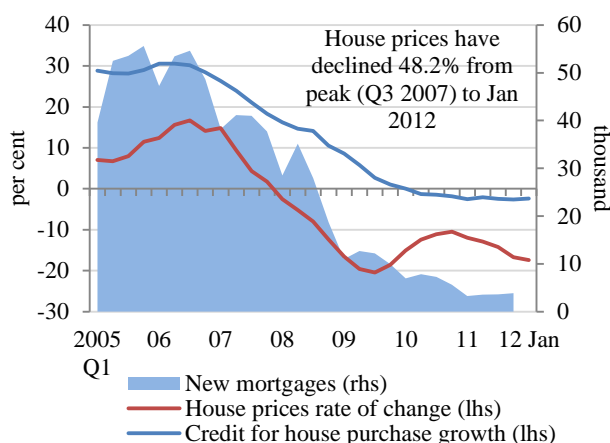
Cé go mbíonn córais airgeadais ina ngné rithabhachtach d'aon gheilleagar rathúil, is foinse riosca iad chomh maith, rud atá feicthe againn in Éirinn ar an drochuair dúinn féin. D'ainneoin scála eisceachtúil na n-idirghabhálacha beartais ar bhonn intíre agus d'ainneoin an dul chun cinn shuntasaigh atá déanta chun an córas airgeadais a chobhsú agus a athstruchtú, is léir nach bhfuil an córas airgeadais tar éis aistriú go hiomlán chuig gnáthmhodh feidhmíochta go fóill. Ina theannta sin, tá rioscaí fós ar marthain. Is cúram tábhachtach é do lucht déanta beartais airgeadais monatóireacht a dhéanamh ar mhéid agus ar ghné rioscaí na hearnála airgeadais, agus is cúram é a chuireann le foirmlíú agus le hoiriúnú beart chun go maolófar na rioscaí sin. San Athbhreithniú seo, bailítear cuid den ábhar a mbíonn faireachán á dhéanamh air ag an Roinn um Chobhsaíocht Airgeadais sa Bhanc Ceannais. Le foilsiú an Athbhreithnithe seo, táthar ag súil go gcuideoidh an Banc Ceannais leis an lucht cinnteoireachta san earnáil airgeadais measúnú ceart a dhéanamh ar rioscaí agus a áirithiú gur iomchuí agus gur leordhóthanach na huirlísí bainistíochta riosca. Ar ndóigh, díritear ar rioscaí ar an taobh thíos ach ní mór a choinneáil i gcuimhne go bhféadfadh na torthaí iarbhrí a bheith níos fearr ná na cinn atá á dtuar. Tá lucht déanta beartais eolach ar na rioscaí sin, ar ndóigh, agus i dteannta na mbeart fairsing atá glactha acu cheana féin, leanfaidh siad d'aghaidh a thabhairt ar na dúshláin a éiríonn as na rioscaí sin agus de fhreagairt a thabhairt ar na dúshláin sin ar bhonn leanúnach. San Athbhreithniú seo, ní fhéachtar le trácht nó measúnú a dhéanamh ar bhearta beartais atá i bhfeidhm nó a bhfuil athbhreithniú á dhéanamh orthu faoi láthair chun rioscaí aitheanta a mhaolú.

## PREFACE

Despite being a crucial component of any successful economy, financial systems can also be a source of risk, as we in Ireland have seen to our cost. It is clear that, despite the exceptional scale of policy interventions domestically and significant progress in the stabilisation and restructuring of the financial system, its transition to a fully normal mode of functioning is not yet complete. In addition, there are risks which remain. Monitoring the dimensions of financial sector risks is an important task for the financial policymaker, and contributes to the formulation and adaptation of policies to mitigate such risks. This Review assembles some of the material which is kept under surveillance by the Financial Stability Division of the Central Bank. It is hoped that by publishing it, the Central Bank will help decision-makers in the financial sector correctly evaluate risks and ensure that the risk management tools are appropriate and adequate. Naturally, the downside risks are focussed upon, but it is worth recalling that better-than-expected outcomes are also possible. Policymakers are, of course, aware of these risks and, in addition to the extensive measures already taken, will continue to address and respond to the challenges posed by them on an on-going basis. The Review does not attempt to discuss or evaluate the overall policy measures that are in effect and currently under review to mitigate known risks.



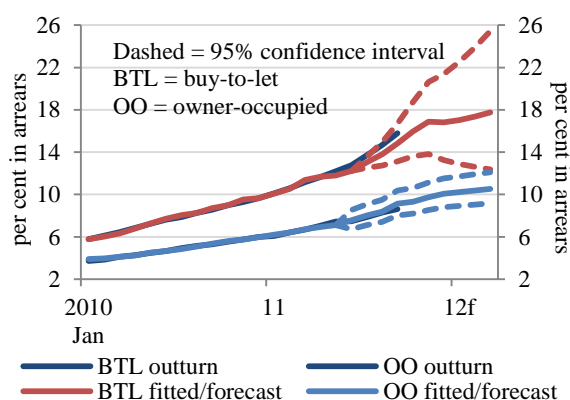
**Chart A1: Credit growth, lending and house prices**



Source: CSO, Central Bank of Ireland, IBF.

Notes: New mortgages defined as the number of new mortgage drawdowns per quarter. Growth rates are shown on a y/y basis.

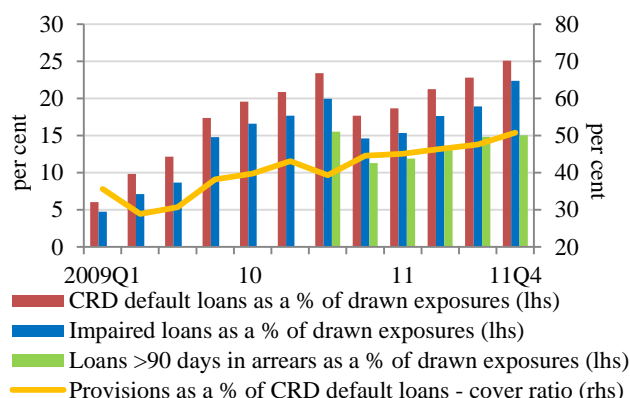
**Chart A2: Model-based mortgage arrears forecasts**



Source: Central Bank of Ireland.

Notes: Graph shows forecast value of mortgages in arrears as a per cent of the total value of mortgages. See Box 7 for further details regarding the data and methodology.

**Chart A3: Domestic banks' asset quality**



Source: Central Bank of Ireland.

Notes: Data are consolidated and include IBRC. The reduction in the impaired loans, loans >90 days in arrears and CRD default figures between 2010Q3 and 2010Q4 relates to NAMA transfers.

## 1. SUMMARY

### 1.1 PRINCIPAL MACRO-FINANCIAL RISKS

Two principal dimensions of domestic macro-financial risk stand out. The first relates to domestic credit risk driven by property price declines, continued economic weakness and over-indebted private and public sectors. The second risk concerns threats to sovereign solvency due to crisis-related bank debt and the sovereign's capacity to service that debt, which depends on economic growth and repayment terms.

Domestic credit risks reflect high debt levels, weak debt service capacity, declining collateral values and limited availability of credit (Chart A1). The Financial Measures Programme (FMP) 2011 resulted in a large recapitalisation of the banking system, which has increased its resilience to property-related and other loan losses. Currently, property prices remain within the FMP 2011 scenario (see Box 2). However, if property prices continue to fall, increased loan losses could result. Commercial property price falls have slowed recently<sup>1</sup> perhaps reflecting legislative certainty about upward-only rent reviews for commercial property and fiscal incentives. However, data suggest that many commercial properties are currently unable to generate sufficient cash flow to repay debt, given credit restrictions and unfavourable broader economic developments. Mortgage distress, strains in household sector finances and the difficulties banks have had to date in reducing the stock of distressed debt on their balance sheets continue to put pressure on property prices (Chart A2). Constraints on new lending, including to small- and medium-sized enterprises (SMEs), may also constrict economic growth.<sup>2</sup> Overall, the domestic financial system remains in the downturn stage of the credit cycle (Chart A3).<sup>3</sup>

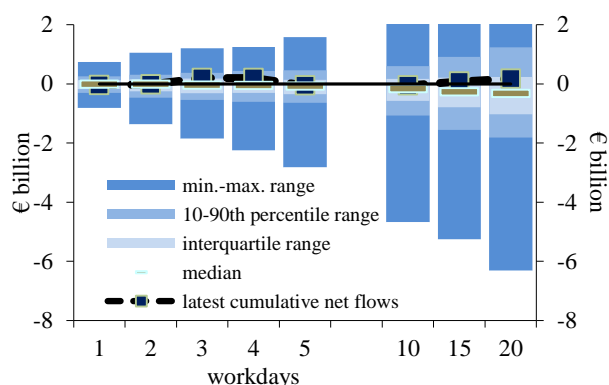
Availability of central bank or other official sector funding can help banks gradually restructure balance sheets and move towards more stable funding profiles. At present, retail deposit flows are relatively stable and corporate deposit levels fell less in 2011 than in 2010 (Chart A4). Nevertheless, the scale of the withdrawal of foreign wholesale funding, banks'

<sup>1</sup> Jones Lang LaSalle, (2012), Irish Property Index, December 2011.

<sup>2</sup> See Lawless, Martina, and Fergal McCann, (2011), "Credit Access for Small and Medium Firms Survey Evidence for Ireland", Central Bank of Ireland Technical Paper, 11/RT/11.

<sup>3</sup> Capital requirements directive (CRD) default loans, refer to exposures which are impaired, (in accordance with "Impairment Provisions for Credit Exposures") and/or classified as greater than 90 days in arrears.

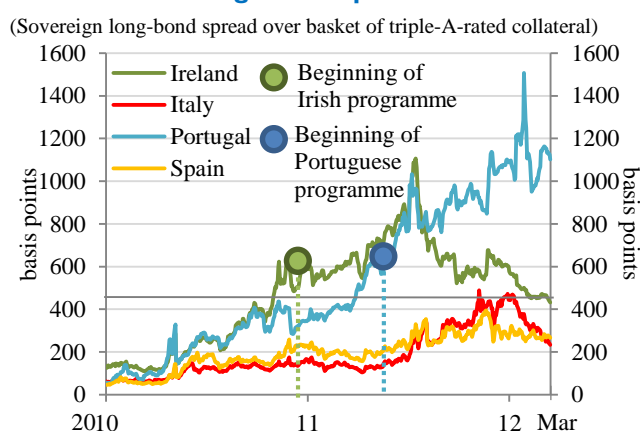
**Chart A4: Domestic banks' net retail deposit flows**



Source: Central Bank of Ireland.

Notes: Data are consolidated and include IBRC. Data refer to the period March 2010 to 12 March 2012.

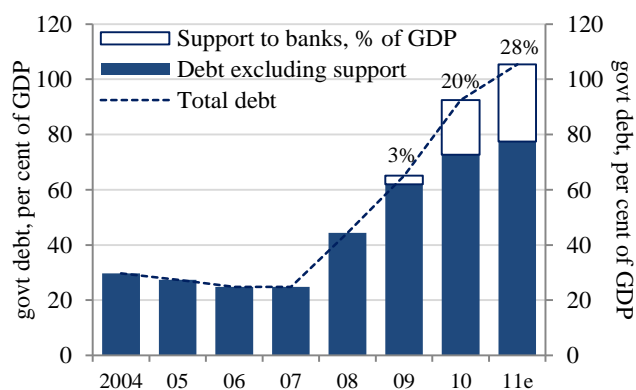
**Chart A5: Sovereign bond spreads**



Source: Central bank of Ireland; LCH Clearnet.

Notes: Horizontal line is the 450bps ceiling over triple-A collateral employed by LCH Clearnet to initiate margin calls on sovereign debt. Irish 9-year bond after 12 Oct 2011. Latest observation: 14 March 2012.

**Chart A6: Impact on Irish General Government debt of state support to banking sector**



Source: Central Bank of Ireland.

Notes: Support includes capital injections (including promissory notes, ordinary shares and preference shares) and associated interest payments.

continued inability to access long-term unsecured debt markets and their need to deleverage under the programme targets has, in part, contributed to constrain bank lending. Although subdued domestic economic activity has also reduced credit demand, distinguishing between demand and supply effects in the current environment is challenging. While the amount of credit that may be required by the SME sector is small compared to the overall stock of credit, ensuring the flow of new credit is not restricted is crucial as the effect on employment in the real economy could be significant. This is because the Irish-owned, non-exporting SME sector employs over half of the private-sector manufacturing and services (non-financial, non-construction) workforce.<sup>4</sup> Balanced personal insolvency legislation and its timely implementation will contribute to managing personal indebtedness. On the whole, the domestic financial system has not yet completed the balance sheet repair phase after the credit bubble.

Turning to the second risk, the reduction in the programme financing costs in late-2011, combined with moderate growth and continued credible fiscal adjustment, has improved domestic sovereign debt sustainability.<sup>5</sup> This is reflected by falls in secondary market yields on Irish sovereign debt and the successful recent bond swap. Furthermore, to date, the State has met the programme targets. However, financial market participants' views of Irish debt sustainability (Chart A5) can change rapidly and remain at a level incompatible with access to long-term sovereign debt markets. Sovereign debt sustainability is vulnerable to further unexpected increases in debt levels or reductions in economic growth (Chart A6).

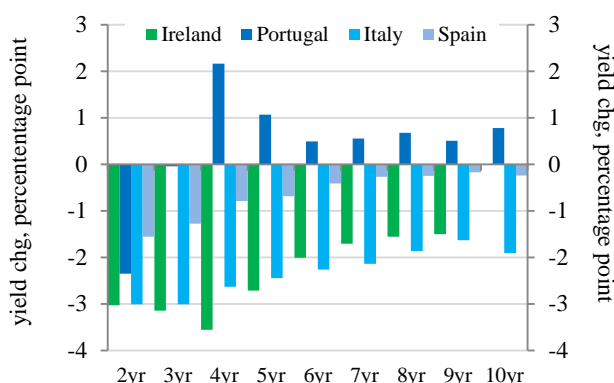
The openness of the Irish economy and its export performance enhances the sovereign's debt service capability. However, the recent worsening in the domestic growth outlook and those of some important trading partners – notably in the euro area – highlight the fragile nature of the Irish economy at present.<sup>6</sup> Policy responses that assist in the management of crisis-related banking sector debt incurred by the

<sup>4</sup> Lawless, Martina, Fergal McCann, and Tara McIndoe Calder, (2012), "The Importance of SMEs in Irish Economic Activity", Draft Technical Paper, Central Bank of Ireland.

<sup>5</sup> See, for instance, page 34, [IMF, \(2012\), "Fifth review under the extended arrangement"](#), IMF Country Report No. 12/48.

<sup>6</sup> These broader issues concerning fiscal adjustment are covered in more detail in [Cottarelli, Carlo, \(2012\), "Fiscal Adjustment: Too Much of a Good Thing?"](#), Vox.eu.org.

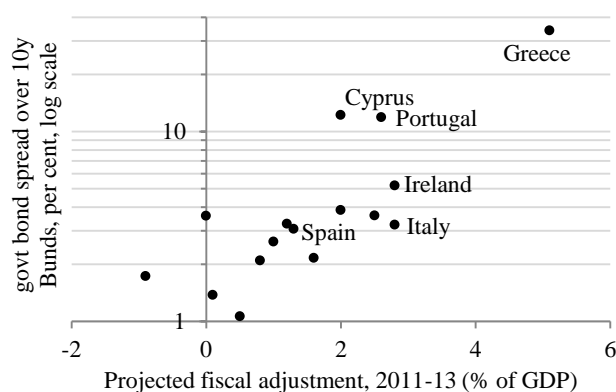
**Chart A7: Sovereign yields, change since introduction of ECB's 3-year refinancing operation**



Source: Bloomberg.

Notes: Change in yields from 21 December 2011 to 14 March 2012.

**Chart A8: Projected fiscal adjustment and sovereign bond spreads**

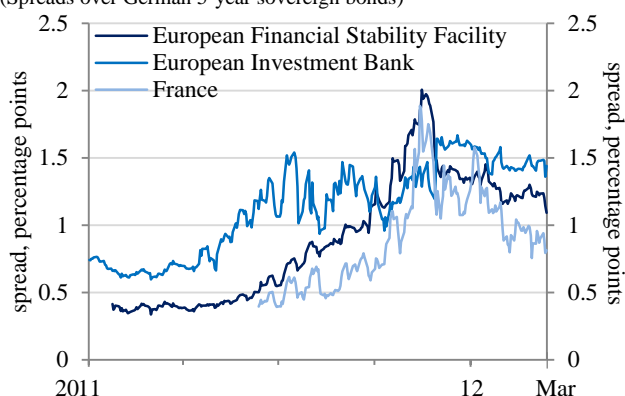


Source: IMF, European Commission, Bloomberg.

Notes: Projected fiscal consolidation during 2011-13 as per cent of GDP and sovereign bond spreads over 10-year Bunds (as of 14 Mar, 2012).

**Chart A9: Increased spreads of EFSF debt related to euro area sovereign stress**

(Spreads over German 5-year sovereign bonds)



Source: Bloomberg.

Notes: Spreads are for bonds maturing in July 2016. Last observation: 14 March 2012.

sovereign would improve financial markets' perception of sovereign creditworthiness.<sup>7</sup> This could include further changes in the terms of official external financing. Conversely, if the State were required to provide additional capital for further unexpected banking sector losses or if domestic economic growth were lower-than-expected, this would be viewed negatively by financial markets.

Irish sovereign risk is also influenced by developments in the domestic banking sector and in the euro area. The significant policy measures recently undertaken by the European Central Bank (ECB) have provided some relief to euro area financial markets. In particular, the two Long-Term Refinancing Operations (LTRO) and revised collateral requirements have reduced uncertainty in financial markets regarding the funding position of the euro area banking sector (Chart A7). This important policy development comes against a backdrop of correlated fiscal contractions in the euro area (Chart A8), as well as risks related to the policy response of EU Member States, which led to more volatility in euro area bank funding and sovereign debt markets. To date, the broader policy response from EU Member States has often not had as positive a reaction from financial markets as may have been hoped for. This has intensified financial market uncertainty and raised the costs of resolving the crisis. In particular, despite insistence by policymakers that it is a unique case, steps taken towards a sovereign debt restructuring mechanism with Private Sector Involvement (PSI) for Greece, have acutely affected euro area sovereign debt markets. This is reflected in recent downgrades of sovereigns and banks located in those sovereigns.

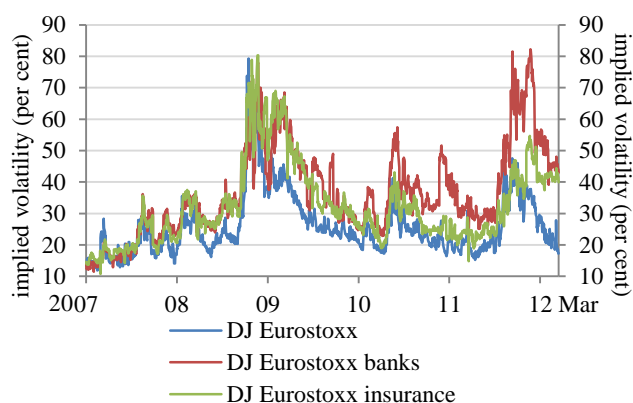
Tensions in sovereign bond markets that spread to Italy and Spain and also affected France and Belgium, have eased somewhat since the LTROs. Nevertheless, market-perceived risk of sovereigns and banks in several countries remains elevated, as reflected in spreads on European Financial Stability Facility (EFSF) debt (Chart A9).

## 1.2 OTHER MACRO-FINANCIAL CONCERNS

A further concern is an increase in counterparty risk arising from direct or indirect exposures of large euro

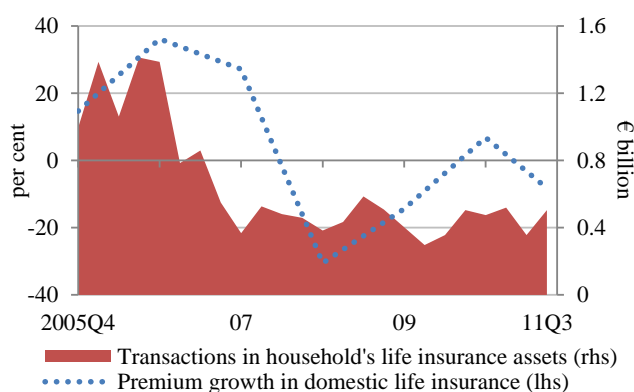
<sup>7</sup> Issues relating to sovereigns' source of support for banking sectors are discussed further in [Caruana, Jaime, \(2012\), "Financial and real sector interactions: enter the sovereign \*ex machina\*", BIS Papers No.62.](#)

**Chart A10: Euro area equity market implied volatility**



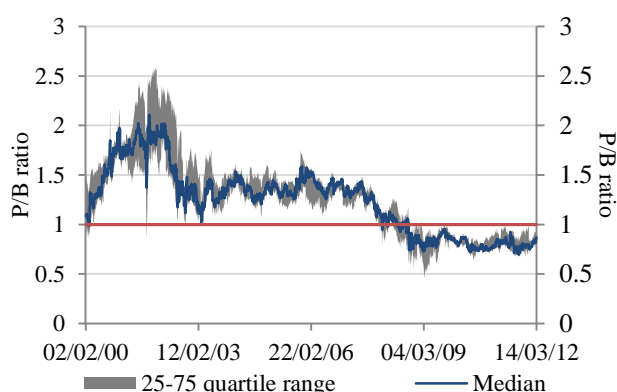
Source: Bloomberg.  
Notes: Last observation: 14 March 2012.

**Chart A11: Premium growth and household life insurance assets**



Source: Central Bank of Ireland.  
Notes: Premium growth is calculated for a sample of major Irish life insurers.

**Chart A12: Reinsurer sector price-to-book ratio**



Source: Bloomberg.  
Notes: Average of ten large global reinsurers; a ratio of less than 1 indicates the equity market valuations are less than accounting book value.  
Last observation: 14 March 2012.

area, UK and US financial institutions to sovereign debt and related financial market volatility (Chart A10). Sovereign debt exposures can be direct via outright holdings and indirect via the strength of home country sovereigns affecting individual financial institution creditworthiness and through common counterparties in OTC derivatives markets. For example, counterparty risk may be magnified through bank-provided guarantees to insurers on guaranteed return policies when the guarantors are located in stressed sovereigns. However, the lack of systematic information on the relative importance of these types of linkages across the euro area makes it difficult to quantify this risk.

Another consequence of tensions in euro area financial markets is potentially lower investment returns for liability-driven investment firms such as insurance companies and pension funds. Hedging strategies related to these liabilities may not be fully effective and may have become costlier to implement. In the UK and US, part of the central bank policy response to the crisis has been large-scale asset purchases. One side effect of these is that the resulting low interest rates on risk-free assets depress the profitability of insurance companies and pension funds.<sup>8</sup> Continued low growth and high unemployment may lead to lower income growth for life and other insurers with exposure to the domestic and other stressed euro area economies (Chart A11). Financial market volatility has also coincided with the depressed valuation of large reinsurance groups' parents with subsidiaries in Ireland (Chart A12). Finally, developments in cross-sector linkages may need to be kept under review in the period ahead. These include the introduction of new products such as liquidity swaps as well as direct, home country sovereign and OTC-related exposures.

<sup>8</sup> However, the European Insurance and Occupational Pensions Authority (EIOPA), the regulatory body responsible for pan-European insurance and occupational pension fund regulation, does not currently classify interest-rate risk as one of its highest risks. See [EIOPA \(2012\), "Financial Stability Report Second Half-Year Report 2011," December, pp.29.](#)

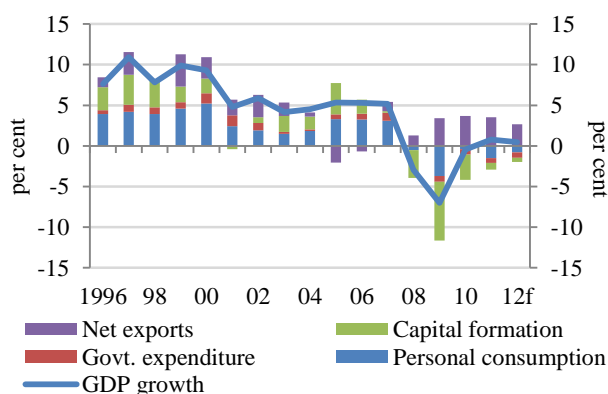
**Chart 1: Debt and deleveraging summary**

		GR	IE	PT	ES	UK	FR	IT	NL	FI	BE	AU	DE
HH	Debt												
	Debt Interest												
	Bal. Sheet												
	Deleveraging												
Gov	Debt												
	Deficit												
	Debt Interest												
	Bal. Sheet												
NFC	Debt												
	Debt Interest												
	Bal. Sheet												
	Deleveraging												
MFI	Liabilities												
	Liab. Growth												
TE	IIP												
	Cur. Acc.												

Source: Central Bank of Ireland.

Notes: HH is household sector. Gov is general government. NFC is non-financial corporate sector. MFI is monetary financial institutions. TE is total economy. Colours red/yellow/green/dark green indicate peer group cross country risk quartile of sector (high/above average/below average/low risk). Data are latest available. See Annex for details of construction.

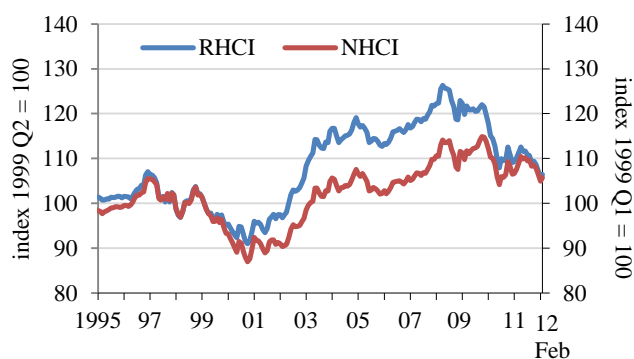
**Chart 2: Sources of domestic GDP growth**



Source: Central Bank of Ireland, CSO.

Notes: Govt expenditure and personal consumption relate to purchases of goods and services.

**Chart 3: Irish competitiveness indicators**



Source: Central Bank of Ireland.

Notes: NHCI is the nominal harmonised competitiveness index and the RHCI is the real harmonised competitiveness index. A rise in an indicator implies a deterioration in competitiveness while a fall represents an improvement.

## 2. THE MACRO-FINANCIAL ENVIRONMENT

### 2.1 OVERVIEW

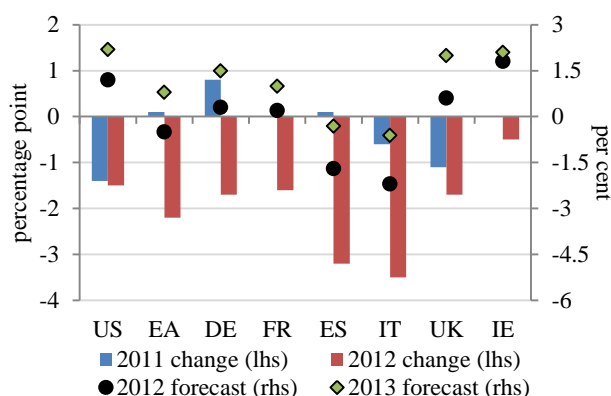
*While developments which are more positive than currently expected are possible, four dimensions of macroeconomic risk warrant particular attention: public and private sector indebtedness and debt sustainability; the sensitivity of the export sector to a reduction in foreign demand; a lack of credit to the real economy; and a worsening of the euro area sovereign debt crisis involving a further negative impact on the domestic economy.*

At present, there are a number of domestic macro-financial risks. The high level of private indebtedness of the Irish economy has been accompanied by a rapid increase in Government borrowing through the crisis (Annex Chart B1). The overall effect has been an increased interest repayment burden across most sectors of the economy and continuing high indebtedness notwithstanding some sector-specific deleveraging (Chart 1). Despite the fiscal measures required to address the build-up of public debt, the level of Irish sovereign debt remains a concern to rating agencies and financial markets.

Sovereign debt sustainability depends not only on the level and interest cost of debt service, but also on nominal economic growth. Chart 2 shows that exports (led by the multinational sector) have supported economic growth in recent years as activity in other sectors, particularly construction, have declined. Domestic demand is expected to remain subdued over the coming years and this reliance on the export sector for growth will persist. Exports depend on competitiveness, exchange rates and growth in key trading partners (Box 1). Competitiveness gains have been substantial in recent years (Chart 3) and exchange rate movements have been beneficial to some exporters. However, Ireland's main trading partners – the UK, euro area and, despite recent positive developments in short-term indicators, the US – continue to have risks to their outlooks (Chart 4). Domestically, some macro indicators are not performing as well as envisaged in the FMP 2011 baseline projections (Box 2). Further negative shocks to the economy associated with the euro area sovereign debt crisis could push levels closer to the adverse scenario.

Credit to the economy continues to fall (Annex Chart B2). In part, this reflects both the economic slowdown and deleveraging process associated with

**Chart 4: Uncertainty in economic outlook – revisions to GDP forecasts**



Source: IMF, Central Bank of Ireland calculations.

Notes: Changes are difference between GDP forecast in Jan 2011 and Jan 2012 WEO Updates, except IE which is change between Central Bank of Ireland QB1 2011 and QB1 2012 forecasts. Forecast are most recent forecast (Jan 2012 WEO Update) and estimate (QB1 2012).

the property bubble (Annex Chart B3). However, a flow of credit is necessary for economic growth, particularly for small and medium enterprises that have limited access to alternative sources of financing (Annex Chart B4). Policies that promote this flow will be important.

Recent developments in the European debt crisis have increased uncertainty, which could make the Irish economy more vulnerable to a confidence-driven demand shock to its main trading partners and associated exchange-rate volatility. Further, the fiscal cost of resolving the debt crisis, coupled with austerity measures undertaken to strengthen sovereign creditworthiness and a tightening of credit conditions across sectors, may dampen euro area growth, thus negatively impacting any export-led recovery in Ireland.

In addition, there is the risk of further sovereign contagion. Despite insistence by policymakers that Greece is a unique case, steps taken towards a sovereign debt restructuring mechanism with Private Sector Involvement (PSI) for Greece have acutely affected euro area sovereign debt markets. For Ireland, this may hinder a return to long-term debt markets.

## BOX 1: THE RISK TO DOMESTIC RECOVERY FROM WEAKER EXTERNAL DEMAND<sup>1</sup>

As the domestic sectors of the Irish economy are expected to remain weak, overall prospects for growth and recovery depend on the performance of exports. However, main trading partners – the UK, euro area and, despite recent positive developments in short-term indicators, the US – continue to have risks to their outlooks. The medium-term growth projections for these economies have been revised downwards recently in an environment of elevated uncertainty. This box examines the effect on the Irish economy of external demand shocks and shows that the domestic economy is quite responsive to changes in international demand.

To study these questions, a statistical model known as a Vector Auto Regression (VAR) is used. Each variable in the model depends on its own past behaviour and the past behaviour of the other variables with no theoretical restrictions imposed on their behaviour. While the VAR model does not contain the level of detail of a more structural model of the economy such as the ESRI's *HERMES*, the choice of variables used here is influenced by the *HERMES* model and the results are cross referenced with the latter to assess their plausibility.

The first model examines how, as a proxy for US demand for Irish exports, US GDP affects Irish GDP, exports, wages and unemployment. In the model, there is a negative shock to US GDP growth and this keeps US GDP growth lower for a number of periods. In other versions of the model, UK and euro area GDP is substituted for US GDP and then the same model is used to assess sensitivity to those trading partners. The model suggests that a temporary reduction in US GDP growth leads to a direct reduction in Irish exports and GDP growth. Lower demand for exports also leads to an increase in the unemployment rate as employment falls. This contraction in economic activity and increase in unemployment leads to a reduction in the wage rate.

The results in Table A show the response of the growth rates of Irish variables following a 1 per cent decrease in the GDP growth rate of the specified trading partner. The first column of numbers shows the response of the domestic variables to a 1 per cent decrease in US GDP growth. Irish GDP growth declines by 1.3 per cent following the decrease in US GDP growth. There is an increase in the unemployment rate amounting to over 5 per cent. This means that the unemployment rate will be 105 per cent of its previous value so that if unemployment was 12.0 per cent before the shock, it would be 12.6 per cent after the shock. The change in euro area GDP has a bigger impact on Irish GDP and so its impact on unemployment is also larger. The elasticity of Irish employment with respect to a given GDP response is highest if the shock is UK based. This finding is consistent with the nature of Irish exports to the UK which tend to be quite labour intensive.

Comparing the GDP results across our main trading partners, the domestic economy growth rate response is greatest to a change in euro area GDP growth at 2.5 per cent while the UK response is lowest at 0.8 per cent. The size of the GDP responses to the external shock in each region corresponds quite closely to the amount Ireland exports to each of these areas. The spectrum of results across Ireland's main trading partners demonstrates the sensitivity of the Irish economy to developments in these countries.

The current model does not allow for the cumulative effects of simultaneous shocks in the US, UK and euro area. However, the estimates presented in this box indicate that a weaker-than-expected growth outturn in the US, the UK or the euro area in the coming years could result in the Irish economy underperforming relative to current growth projections, although other factors such as competitiveness developments and changes in the structure of the economy will also impact how the economy responds. Competitiveness has been boosted by the recent weakness of the euro against both sterling and the US dollar. Were this position to change over the coming years it could damage prospects for the Irish economy through reduced exports.

**Table A: Response of Irish variables to 1 per cent decrease in GDP growth in trading partners**

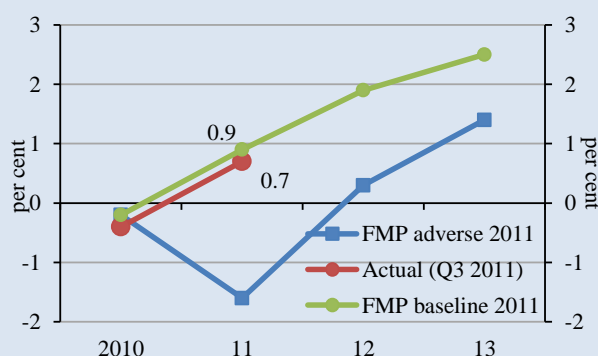
Elasticity	United States	United Kingdom	Euro Area
Irish GDP	-1.3	-0.8	-2.5
Exports	-1.6	-1.1	-2.3
Unemployment rate	5.3	3.6	8.7
Wages	-1.4	-0.9	-1.0

<sup>1</sup> This box is based on [Conefrey, Thomas and Colin Bermingham, \(2011\), "The Irish Macroeconomic Response to an External Demand Shock with an Application to Stress Testing", Central Bank of Ireland, Research Technical Paper 10/RT/11.](#)

## BOX 2: MACROECONOMIC OUTCOMES IN 2011 RELATIVE TO THE FMP BASELINE AND ADVERSE SCENARIOS

As part of the assessment of potential loan losses in the Financial Measures Programme (FMP) 2011, the Central Bank of Ireland set out baseline and adverse macroeconomic scenarios. This box tracks how macroeconomic outcomes compare with these scenarios. Although none of the key macroeconomic aggregates have exceeded the parameters of the stress scenario, the unemployment rate and property prices are currently nearer to the stress than the base scenario. Chart A shows that GDP growth in 2010 (-0.4 per cent) was close to the FMP scenarios (both -0.2 per cent). GDP growth of 0.7 per cent was recorded during the first three quarters of 2011 which is marginally below the 0.9 per cent growth of the baseline scenario and significantly ahead of the -1.6 per cent growth of the adverse scenario. The most recent data from the QNHS show that the seasonally adjusted unemployment rate averaged 14.4 per cent in 2011, 1 percentage point above the 13.4 per cent average rate for 2011 projected in the FMP baseline, but below the adverse scenario of 14.9 per cent.

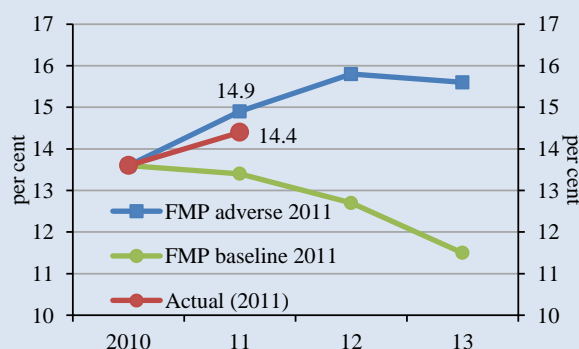
**Chart A: GDP growth rates**



Source: CSO, Central Bank of Ireland calculations.

Notes: As per FMP scenarios, the figures in the chart (both actual and scenarios) refer to average annual changes.

**Chart B: Unemployment rate**

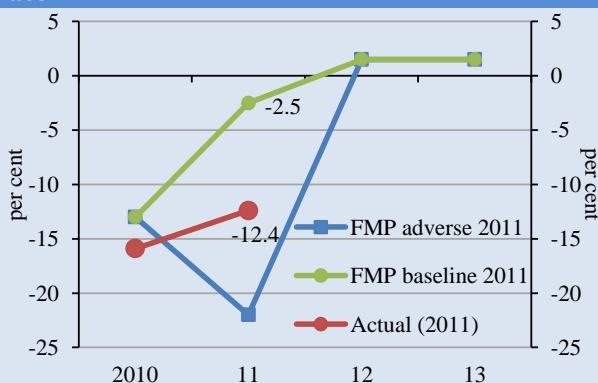


Source: CSO, Central Bank of Ireland calculations.

Notes: As per FMP scenarios, the figures in the chart (both actual and scenarios) refer to average annual changes.

Property prices were the predominant driver of loan losses in residential and commercial real estate portfolios in FMP 2011. The annual changes in the FMP house price scenarios are calculated as December compared with December of the previous year. To be consistent with the FMP calculation, the actual figures in Chart D are calculated in the same manner. The actual year-on-year decline in house prices at end-December 2011 was -16.7 per cent, which is a larger decline than the baseline FMP assumption (-13.4 per cent) but is less than the -17.4 per cent decline in the adverse scenario. The annual average decline in house prices (the change in the average value of the house price index from 2010 to 2011) was -13.2 per cent. Commercial property prices declined by -12.4 per cent in 2011 compared with the previous year. This was significantly larger than the fall assumed in the FMP baseline (-2.5 per cent) but less than the 22 per cent decline in the adverse scenario (Chart C).

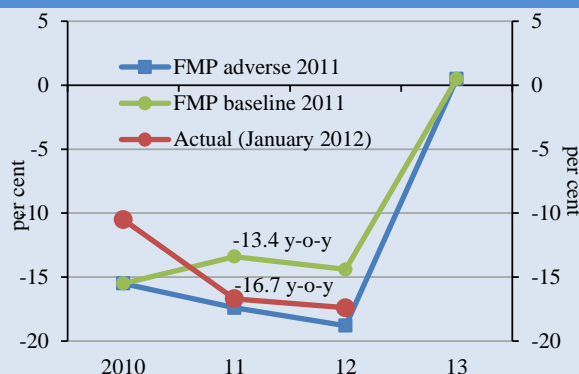
**Chart C: Commercial property price growth rate**



Source: IPD/SCS, Central Bank of Ireland calculations.

Notes: As per FMP scenarios, the figures in the chart (both actual and scenarios) refer to average annual changes.

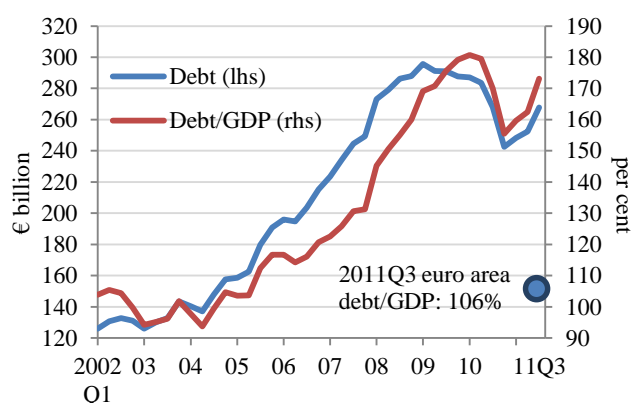
**Chart D: House price growth rate, y-o-y change**



Source: CSO, Central Bank of Ireland calculations.

Notes: As per FMP scenarios, the figures in the chart (both actual and scenarios) refer to year-on-year changes (i.e., December-on-December). 2012 'actual' figure is based on January 2012 data.

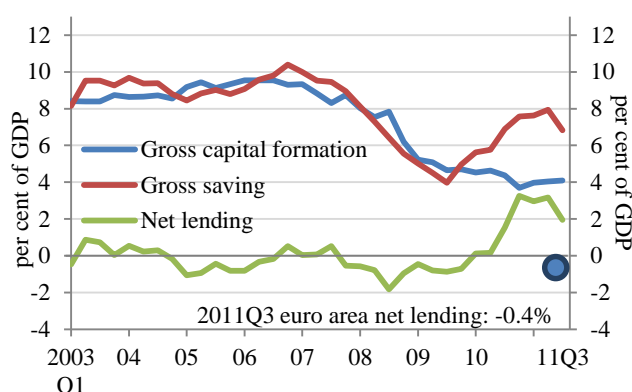
**Chart 5: Non-financial corporations' debt**



Source: Central Bank of Ireland; CSO; ECB.

Notes: Series are for the aggregate NFC sector which includes multinational and domestic firms.

**Chart 6: NFC gross capital formation, gross saving and net lending**

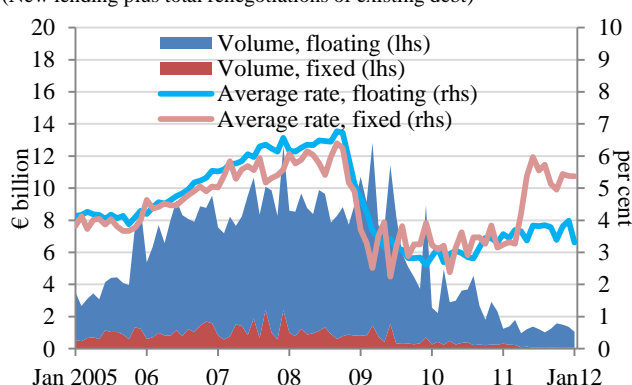


Source: CSO; ECB.

Notes: Series are four-quarter moving averages.

**Chart 7: New lending from Irish banks to NFCs**

(New lending plus total renegotiations of existing debt)



Source: Central Bank of Ireland.

Notes: Floating rate also includes loans with up to 1 year fixed rate component. Fixed rate comprises all loans with over 1 year fixation. Data relates to business conducted through resident offices only and is a sample of institutions operating within the State.

## 2.2 NON-FINANCIAL CORPORATE SECTOR

*The main sources of vulnerability for Irish non-financial corporations (NFCs) include high indebtedness and limited access to finance. NFCs are also exposed to weak domestic and international demand and adverse exchange-rate developments, while low investment rates pose a threat to medium-term growth.*

### 2.2.1 NFC DEBT

The main weakness of the NFC sector is high property- and non-property-related debt indebtedness (Chart 5). This raises the sensitivity of interest repayments to interest-rate changes, reduces capital formation due to deleveraging and ultimately increases the likelihood of bankruptcies. Inter-firm credit facilities add to credit risk, though the increase is difficult to quantify at present.

Though still high, NFC indebtedness is lower than in 2009, as firms have deleveraged. Euro area NFCs are net borrowers, but Irish NFCs are net lenders, since they save more and invest less in capital (Chart 6).<sup>9</sup> In national accounting terms, paying down debt is part of saving, and therefore high savings rates reflect deleveraging by firms.<sup>10</sup>

### 2.2.2 FINANCING AND CAPITAL FORMATION

While new lending from Irish banks has fallen sharply since the start of 2009, average variable interest rates remain broadly unchanged (Chart 7). MNCs tend to function independently of the domestic banking sector whereas firms without overseas parent financing are likely to be especially reliant on domestic banks. Box 3 shows that Irish firms applying for loans had less access to finance than comparable European firms in the period March 2010 to September 2011. There is some evidence to suggest that banks are reducing credit facilities, and at the same time, some firms are demanding less credit to cut costs as demand for their products and services declines. This suggests that both supply and demand for credit have contracted significantly. (Section 3.2 addresses bank credit supply further.)

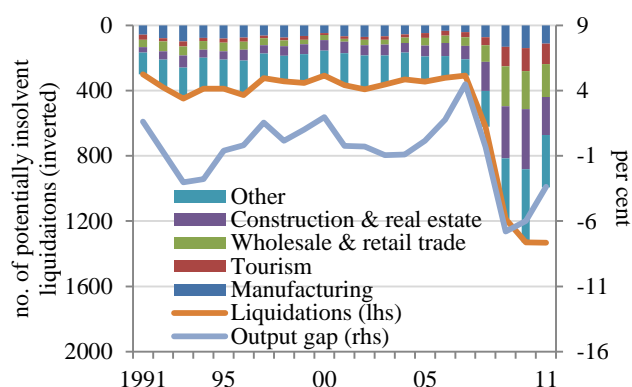
Without reliable access to new debt financing and

<sup>9</sup> 'Net borrowing' is incurrence of liabilities minus acquisition of financial assets.

<sup>10</sup> Saving is the sum of capital formation; net purchases of financial assets; and transactions in liabilities, i.e., debt repayment minus borrowing during the period.

## Chart 8: Potentially insolvent liquidations

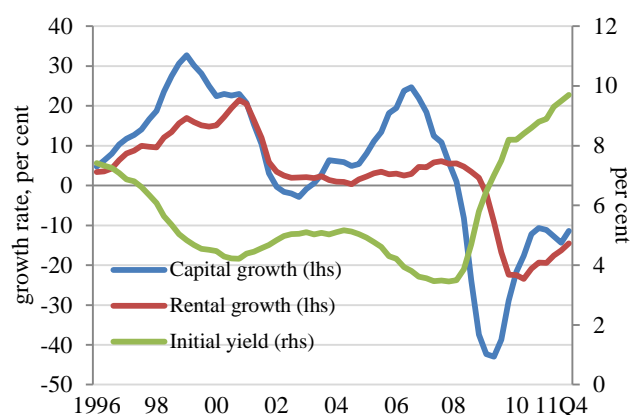
(Creditors' voluntary and courts' windings up of firms)



Source: CSO, Department of Jobs, Enterprise and Innovation, Central Bank of Ireland calculations.

Notes: 2011 figures use data up to Q3: the bar chart shows actual liquidations to Q3 and line chart shows actual liquidations to Q3\*(4/3).

## Chart 9: Commercial property initial yields, capital and rental value growth

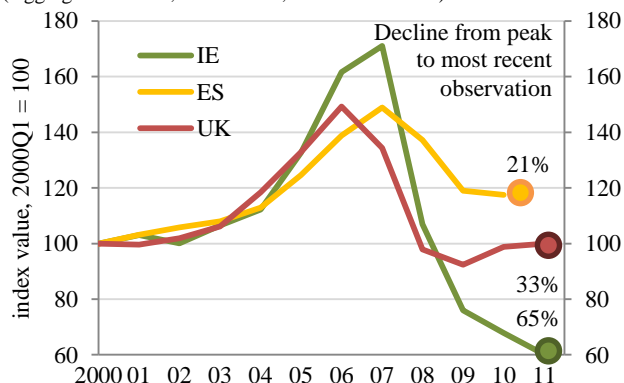


Source: SCS/IPD.

Notes: Initial yield is rent (net of ground rent) divided by capital value.

## Chart 10: Commercial property capital values

(Aggregate of retail, commercial, industrial indices)



Source: SCS/IPD; Central Bank of Ireland calculations.

Notes: Spanish index runs from December 2000 to December 2010.

with cash reserves having declined by 47 per cent since 2009 Q3, NFCs must rely more on equity financing. However, this is costly or unavailable for small firms, while continued financial market volatility raises the cost and limits the quantity of external financing available for large firms.

These limits to financing hinder the rollover of existing debt, threaten liquidity and reduce the scope for growth through capital investment.

Deleveraging and weak financing are associated with low rates of gross capital formation (Chart 6). Households, Government and NFCs are reducing capital investment simultaneously, as they prioritise deleveraging. This partly reflects reduced property-related investment. Low capital investment in other sectors reduces output, employment, and the long-run productive capacity of the economy.

### 2.2.3 INTERCONNECTIONS BETWEEN NFCs AND HOUSEHOLDS

The combination of low investment and high debt limits output growth, employment and debt servicing capacity. For small and medium enterprises (SMEs), this link to employment is critical, as Irish-owned, non-exporting SMEs employ over half of the private-sector manufacturing and non-financial, non-construction services workforce.<sup>11</sup> NFC deleveraging therefore affects households through employment and disposable income.

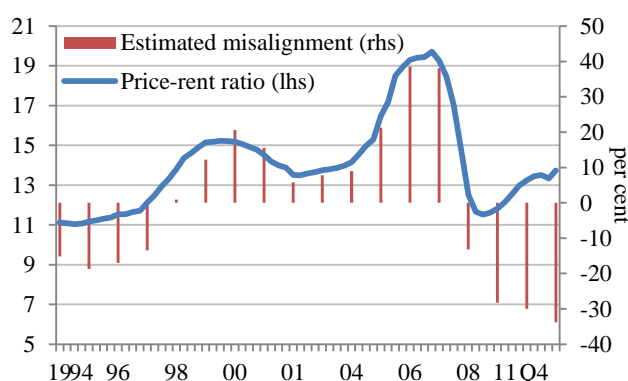
Furthermore, if heavily-indebted households cut spending to repay debt, weak domestic demand for NFC output can result in a self-reinforcing cycle, further raising unemployment and ultimately increasing the credit risk from both sectors (Chart 8; see also Section 2.3).

### 2.2.4 COMMERCIAL PROPERTY

Weak commercial property markets affect NFC debt and profitability directly and indirectly. Firms whose main income derives from the construction sector have been directly affected, while firms that used property as collateral for bank borrowing or as an investment for surplus earnings may find access to finance severely constrained. Given the limited information about individual firm balance sheets, it is

<sup>11</sup> Lawless, Martina, Fergal McCann and Tara McIndoe Calder, (2012), "The Importance of SMEs in Irish Economic Activity", Draft Technical Paper, Central Bank of Ireland. Irish-owned, non-exporting firms with fewer than 250 employees generated 56.4 per cent of employment in these sectors.

**Chart 11: Commercial property values relative to rent and macroeconomic variables**

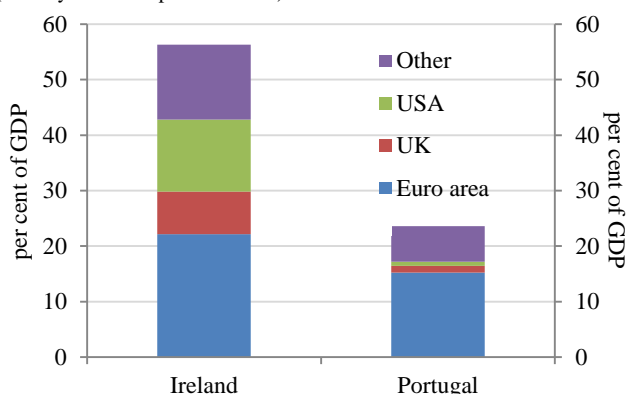


Source: Central Bank of Ireland calculations.

Notes: Price rent ratio is for the Dublin office market based on CBRE data. See Annex for further information on estimates of value misalignment.

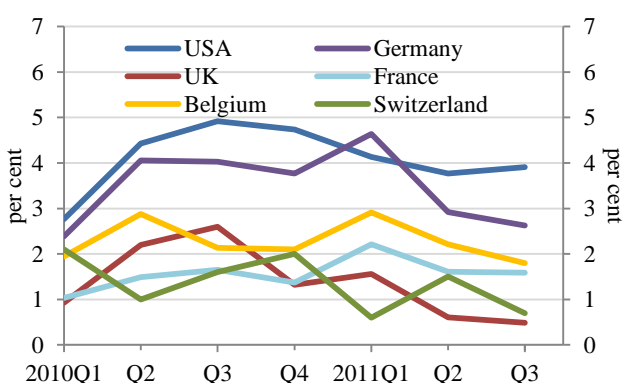
**Chart 12: Goods exports as a share of GDP**

(January 2011 – September 2011)



Source: ECB; CSO; Instituto Nacional de Estatística (Statistics Portugal); Central Bank of Ireland calculations.

**Chart 13: Annual GDP growth in the six largest Irish export markets**



Source: ECB; Bureau for Economic Analysis (USA); Swiss National Bank.

difficult to assess how prevalent this is; however, these property-related debt problems must be resolved to secure the viability of the underlying business.

Despite strong increases in initial yields since the crisis (Chart 9), the outlook for commercial property remains uncertain. Budget 2012 included several measures to facilitate transactions in the market, which had dried up in 2011. Furthermore, capital values have fallen substantially since 2008 (Chart 10), to the extent that certain indicators, although not without caveats, suggest that they are now in line, or possibly below, the level that would be suggested by other economic variables (Chart 11).<sup>12</sup> However, the use of these measures assumes normal market conditions, which is unlikely to be the case at present, given that limited finance coupled with the outlook for the commercial property market and the wider economy are likely to act to dampen demand. Regarding supply, the extent of market availability of the large stock/overhang of property (determined by NAMA and other financial institutions) could also affect capital values.

To some extent, the lack of transactions in 2011 was due to uncertainty over upward-only rent reviews. The decision not to proceed with legislative reform on upward-only rent reviews in existing contracts provided clarity in this regard. This also removed one possible mechanism through which tenants with unsustainable pre-existing rent levels could renegotiate rents. However, market intelligence suggests that break options, surrender and re-lets and rent-free elements are now features of the commercial property rental market.

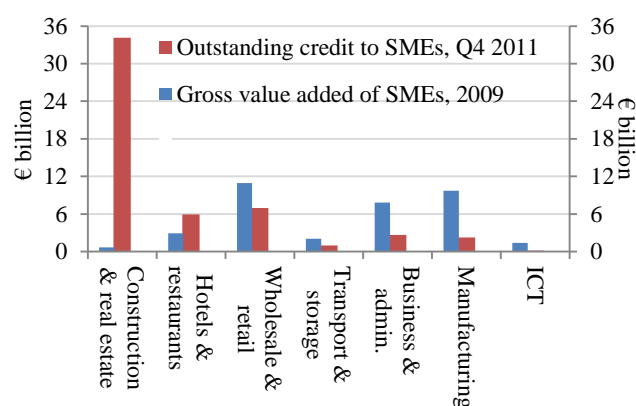
## 2.2.5 MACROECONOMIC FACTORS

Given high debt levels, a fall in profitability or a rise in interest rates would worsen the credit risk profile of NFCs. Strong export demand, led by the multinational sector, has compensated for weak domestic demand. To maintain export growth, a broadening of the export base among indigenous firms will be important. The openness of the Irish economy exposes NFCs to international macroeconomic shocks (Charts 12 and 13). Any shock to exporters' profitability would affect employment and income in the broader economy.

Exchange-rate risk is also important for Irish NFCs,

<sup>12</sup> See Annex for further information on estimates of capital value misalignment.

**Chart 14: SME gross value added and credit**



Source: Central Bank of Ireland; CSO.

Notes: Latest sectoral data for small and medium enterprise gross value added are for year 2009.

because the UK and the US are large export markets. While some exporters have benefitted from recent exchange rate movements, hedging costs may have increased due to recent financial market volatility. The burden of these costs will be lighter for large NFCs with treasury management capabilities than for small firms.

The sector is also subject to interest rate risk, as 92 per cent of new lending from Irish banks to NFCs for the year ending January 2012 was at variable rates or rates fixed for less than one year, in line with lending patterns since 2003 (Chart 7).

## 2.2.6 SMALL AND MEDIUM-SIZED ENTERPRISES

Aggregate data mask differences among NFC sub-sectors. The Irish NFC sector includes both large multi-national companies, often the result of foreign direct investment, and small and medium enterprises. The economic crisis has affected these sub-sectors in different ways, and credit risks and debt are spread unevenly across the sector.

Data for SMEs, which are mainly Irish and non-exporting, show that the existing stock of SME debt is heavily concentrated in the construction and hospitality sub-sectors (Chart 14). There is less debt in the manufacturing and export-oriented services sectors. Overall, deleveraging is likely to be less difficult for exporters and more difficult in sectors sensitive to domestic demand.

### BOX 3: CREDIT CONSTRAINTS AND THE SME SECTOR

In the presence of significant financial sector deleveraging, credit constraints in the real economy are a critical concern. The SME sector is particularly vulnerable, as these firms rely on banks for financing more than larger firms. (SME financing is also discussed in Section 2.2.6.) Since SMEs account for 99 per cent of enterprises and 68 per cent of employment in Ireland, a steady flow of credit is crucial to economic recovery.<sup>1</sup>

Two datasets are used to identify econometrically the relative importance of shifts in credit demand and supply for Irish SMEs. The first is the CSO's *Access to Finance* survey, which asks firms about their experiences in the credit market in 2007 and 2010. The second is the ECB's *Survey of Access to Finance of Small and Medium Enterprises* (SAFE) which, between March 2010 and September 2011 asked firms across the euro area to detail their experiences in the credit market. The research focuses in each case on firms with less than 250 employees.

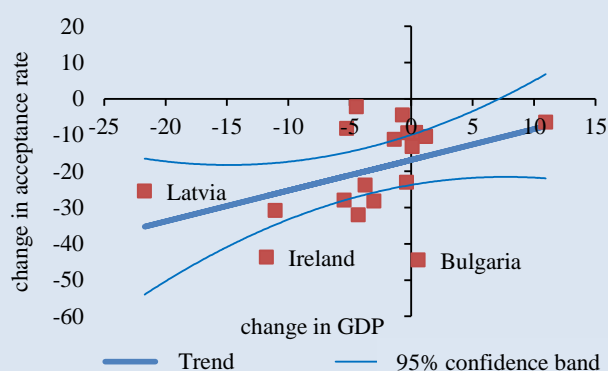
The *Access to Finance* survey shows a marked drop in credit supply to SMEs. The acceptance rate for SME loans fell from 97 per cent in 2007 to 53 per cent in 2010. Although a correction from an unsustainably high level of credit provision is desirable, Chart A shows that, controlling for falls in output in the same period, the Irish decline in bank loan acceptance seems to be the most severe in the euro area, comparable only to that in Bulgaria. Using the CSO's firm-level production data, a test for the separation of accepted and rejected firms according to firm performance found a pattern of rejection consistent with the hypothesis of credit not being offered according to performance.

Using the SAFE data, Irish firms were matched to euro area firms according to firm-level characteristics that measure firm risk, after which one should not expect large differences in rejection rates. After matching, however, Table A reports that Irish SMEs were still found to be 21 per cent more likely to be rejected for a bank loan than their matched euro area SMEs and were 23 per cent more likely to be rejected than non-crisis SMEs.<sup>2</sup>

The measure of formal credit demand in the CSO survey was application rates for loans, which showed a slight decrease from 37 per cent to firms in 2007 to 30 per cent in 2010. The SAFE data indicated changes in the firms' needs for external financing in the previous period. Again, no evidence was found that indicated a lack of credit demand by Irish SMEs compared with euro area SMEs. This measure may be a more precise measure of formal credit demand than application rates, as firms may avoid applying for financing for reasons other than good financial health.

This box has used data from two different sources – the CSO and the ECB – spanning the periods 2007 to 2010 and March 2010 to September 2011, respectively, to examine credit constraints in the SME sector controlling for output and firm-level characteristics. Overall, the analysis of both data sources indicates a significant rationing of credit in Ireland over their sample periods.

**Chart A: Changes in SME loan acceptance rates and GDP, 2007-2010**



Source: Eurostat, World Development Indicators, Central Bank of Ireland calculations.

**Table A: Coefficients for Irish SMEs' probability of bank loan rejection relative to matched euro area control firms, Mar 2010 to Sept 2011**

Control Group	Model result	t-stat	N_Ir	N_cont
All firms	0.214	3.25	112	3111
Firms in ES, GR, IE, IT, PT	0.116	1.64	112	1272
Firms in all other sample economies	0.232	3.56	112	1839

Method: Nearest Neighbour Propensity Score Matching. A coefficient of .21 indicates that Irish firms are 21 per cent more likely to be rejected for a bank loan than a matched control firm elsewhere.

Notes: N\_Ir = number of firms in Irish sample, N\_cont = number of firms in control group;

Source: ECB "Survey of Access to Finance of Small and Medium Enterprises", Central Bank of Ireland calculations.

<sup>1</sup> A large body of literature shows that credit constrained firms are more likely to let workers go, and less likely to expand employment, spend on technology, engage in fixed investment or export than unconstrained firms.

<sup>2</sup> It is difficult to compare survey results across countries, because balance sheet and macroeconomic conditions vary across countries. For instance, Irish SMEs' property debts may not be similar to those of other sample countries' SMEs. When SMEs in Spain, which also had a large increase in lending to the SME sector and which could have also been affected by property price declines, are compared against other European SMEs, they are also 6 per cent more likely to be rejected, compared with the Irish result of 23 per cent.

## BOX 4: THE OUTLOOK FOR CORPORATE LIQUIDATIONS: PRELIMINARY RESULTS BASED ON A TOP-DOWN APPROACH

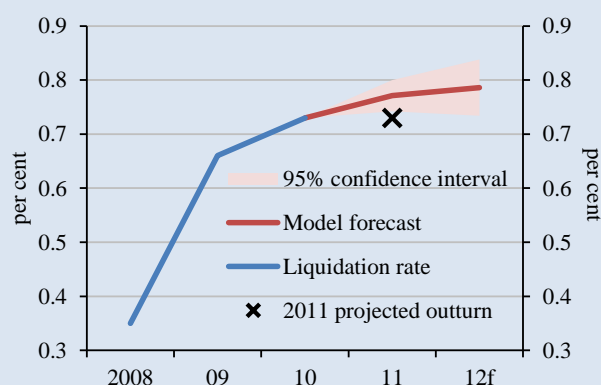
The drivers of loan losses in banks' corporate portfolios are less well understood than those in residential mortgage portfolios. Empirical research<sup>1</sup> suggests macro data can be used to estimate overall corporate insolvency rates. This box models corporate liquidations using macro variables and forecasts a possible future path for the liquidation rate. The model has some success in estimating liquidations over the long-run period, although the recent increase is difficult to capture. Under scenario conditions, the model suggests the liquidation rate will remain around current elevated levels over the coming 12 months.

Data on the Irish corporate liquidations rate, defined as the number of potentially insolvent liquidations as a percentage of total companies on the companies' register, are available annually from the Department of Jobs, Enterprise and Innovation (DJEI) from 1975 to 2011 Q3.<sup>2</sup> The pattern observed in the corporate liquidation rate is broadly in line with the economic development seen in Ireland. The corporate liquidation rate increased substantially over the course of the crisis, from a historical low of 0.20 per cent in 2007 to a peak of 0.73 per cent in 2010. The previous historical peak was 0.62 per cent in 1987.

To explain the change in the liquidation rate, a number of macroeconomic variables were examined (variables not included in the final model include the output gap, interest rate, exports, property prices and housing completions). The final model estimated over the period 1975 to 2010 uses real GDP growth, unemployment and credit growth<sup>3</sup> to non-financial corporates to explain the liquidation rate (Table A). As expected, GDP and credit growth exhibited a negative relationship with the liquidation rate, while the unemployment rate exhibited a positive relationship.

**Chart A: Model forecast results**

(potentially insolvent liquidations as a per cent of total companies)



Source: Central Bank of Ireland.

**Table A: Model results and Forecast Scenario**

Variable (differenced)	Model results	Forecast scenario	
		2011 (%)	2012 (%)
Real GDP growth rate	-0.005 (0.247)	0.8	0.5
Unemployment rate	0.028 (0.001)	14.5	14.6
Credit growth rate	-0.003 (0.017)	-5.0	-5.0
Adjusted R <sup>2</sup>	0.48		
Sample size	35		

Note: p-values in parenthesis.

Source: Central Bank of Ireland calculations.

The scenario analysis was based on assumptions relating to the path of GDP and employment taken from Central Bank Quarterly Bulletin No. 1 of 2012 (Table A). For credit, it was assumed that recent single digit negative growth rates would persist. The resulting forecast suggests that the liquidation rate will remain elevated and in fact may increase slightly over the course of 2011 and 2012 (Chart A). For 2011, the model forecast is similar to the liquidation rate that might be expected if the trend in liquidations through Q3 2011 continues in Q4.

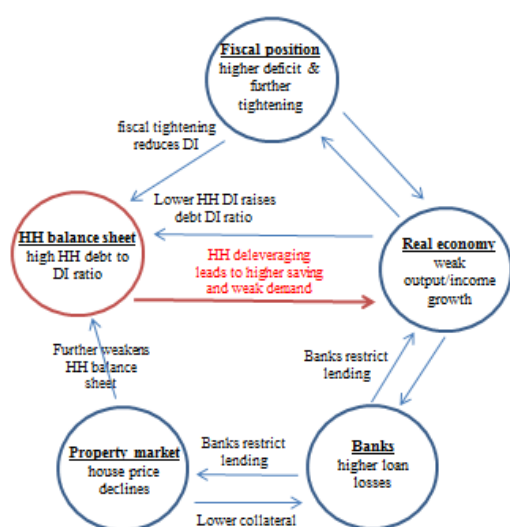
A number of caveats should be taken into consideration in interpreting these results. The recent crisis makes it difficult to estimate a model accurately. In-sample forecasts, based on an estimation period 1975 to 2007, do not track the actual outcome in certain years, making out-of-sample forecasts somewhat unreliable. Also, the small sample size and measurement error in the source data could have a relatively large impact on the liquidation rate.

<sup>1</sup> See for example, [Orzechowska-Fischer, Ewa, and Bruce Taplin, \(2010\), "Forecasting Corporate Insolvency Rates in Australia"](#). Paper presented at the 39th Australian Conference of Economists, 27-29 September.

<sup>2</sup> Preliminary figures for Q4 2011 are available; however, they are subject to upward revision as there is currently a backlog of several months in registering liquidations documents (preliminary Q4 figure is 126, compared with 334, 336 and 329 in the three previous quarters).

<sup>3</sup> These variables, in levels, are likely to be collinear. The model uses differenced growth rates, and was run without GDP with no significant impact on the results.

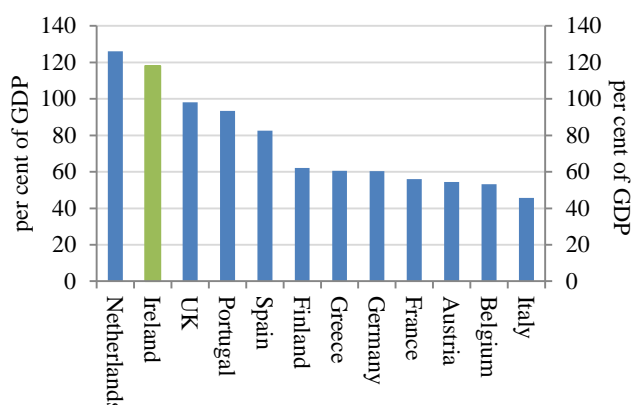
**Chart 15: Household sector feedback dynamic with real economy**



Source: Central Bank of Ireland.

Notes: 'DI' is disposable income. 'HH' is household sector.

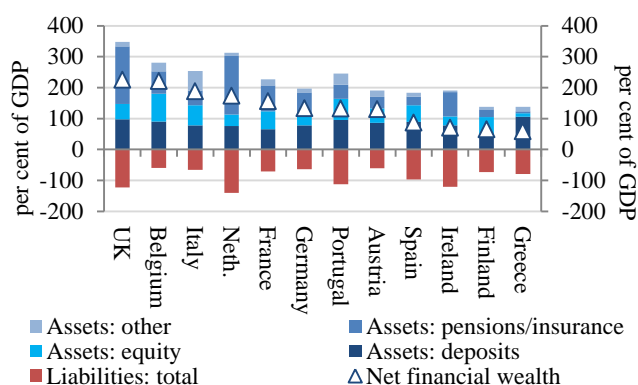
**Chart 16: Household debt to GDP ratio**



Source: ECB, Central Bank of Ireland.

Notes: Household debt includes both long term debt such as mortgages as well as shorter term debt such as credit card and car loans. Data are for Q2 2011.

**Chart 17: Household sector net financial wealth**



Source: ECB, Central Bank of Ireland.

Notes: Net financial wealth equals total financial assets minus liabilities. Data are for Q2 2011. All expressed as per cent of country GDP.

## 2.3 HOUSEHOLD SECTOR

The main financial vulnerabilities facing households are high debt levels and constrained incomes. Household deleveraging is depressing demand and potentially making the necessary fiscal adjustment more difficult. With property prices falling and little new mortgage credit available, mortgage arrears and negative equity are increasing, emphasising credit risk for banks on their existing portfolios. Risks include a further weakening of household incomes, higher mortgage interest rates and further declines in house prices and increases in mortgage arrears/negative equity.

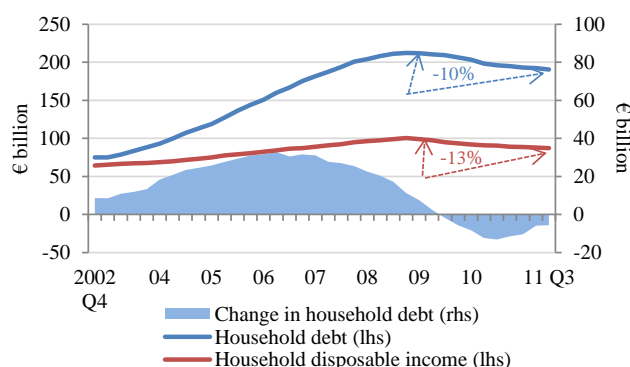
### 2.3.1 HOUSEHOLD SECTOR DEBT AND DISPOSABLE INCOME

The main vulnerabilities of the household sector relate to high household debt levels, the weak position of household financial assets and income due to the difficult macroeconomic environment and the consequent feedback to the real economy (Chart 15). The aggregate balance sheet of the household sector is weak, with household debt levels (dominated by mortgages) high relative to GDP and disposable income, and significantly above the euro area average (Chart 16 and Annex Chart D6).

Households' net financial assets have declined, making them less able to absorb a shock by drawing down savings (Chart 17). Household debt reductions have been offset by falls in disposable income, leaving the household debt-to-disposable income ratio stable (Chart 18). Empirically identifying the overall effects on the macroeconomy is challenging; however, other countries' experiences suggest that further deleveraging is likely. The fact that the household savings rate has increased substantially in recent years reflects increased debt repayment, more than accumulation of financial assets.

A second vulnerability is weak household incomes. Disposable income has fallen significantly, reflecting flat or declining wages, a sharp decline in employment and fiscal tightening that has substantially raised the tax burden on households. Further declines in disposable income seem likely, given the weak economic position and planned fiscal tightening. The ESRI, in its Autumn 2011 Quarterly Economic Commentary, estimated that planned fiscal tightening measures from 2012 to 2015 will reduce average

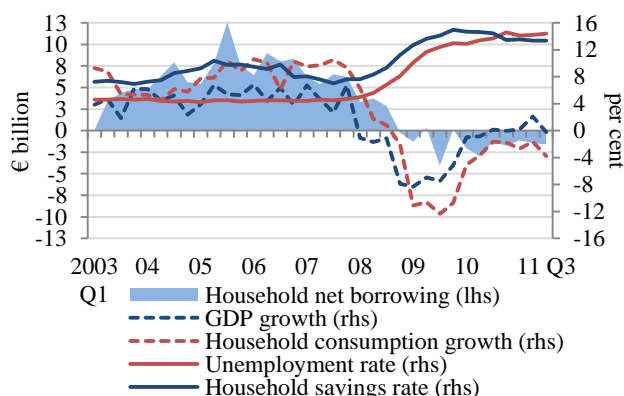
**Chart 18: Household sector debt and deleveraging**



Source: CSO, Central Bank of Ireland.

Notes: Chart shows change in aggregate household debt, in billions of euro, on a y/y basis. Household disposable income is shown on a 4Q rolling sum basis. Household debt equals the total value of household liabilities from Central Bank of Ireland Quarterly Financial Accounts.

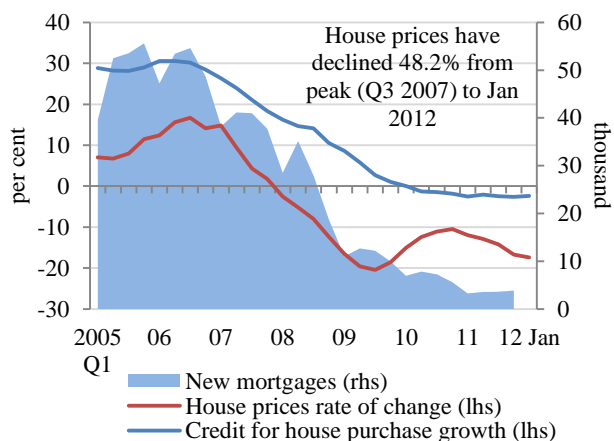
**Chart 19: Household deleveraging and the real economy**



Source: Central Bank of Ireland, CSO.

Notes: Household net borrowing, shown on a per quarter basis, is new borrowing minus debt repayments. Growth rates are shown on a y/y basis. Nominal consumption and real GDP growth are shown.

**Chart 20: Credit growth, mortgage lending and house prices**



Source: CSO, Central Bank of Ireland, IBF.

Notes: New mortgages equals the number of mortgage drawdowns per quarter (Irish Bankers Federation). Growth rates shown are on a y/y basis.

household disposable income by 8 per cent from 2011 levels.

As discussed in Box 5, in recent years, households have deleveraged by substantially increasing their savings and reducing their investment/capital formation, such as new housing construction, resulting in a substantial rise in net lending (Annex Chart D1). This process has contributed to reduced demand in the economy (Chart 19). In turn, this has increased unemployment and reduced incomes, raising the ratio of debt to income and inducing further deleveraging.

This process hinders both the needed fiscal adjustment and property market stabilisation. Weak demand may depress tax revenue more than expected, making fiscal adjustment more challenging. The impact of demand and income on the property market is compounded by a lack of mortgage finance. House prices have continued to fall, and are now approximately half of peak levels (Chart 20 and Annex Chart D3).

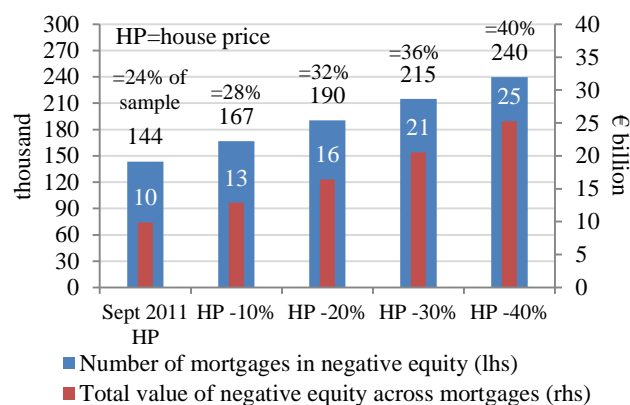
High household debt levels and weak income growth have caused significant increases in mortgage arrears. House prices, unemployment and interest rates are key drivers for owner occupier arrears (see Box 7). As house prices continue to fall, the number of households in negative equity and the value of negative equity across all households increases (Chart 21). The timely implementation of balanced personal insolvency legislation will contribute to managing personal indebtedness. While the majority of borrowers are servicing their mortgages, this trend is contributing to deteriorating credit quality of mortgage loan books and potentially low demand for insurance-related saving products.

### 2.3.2 HOUSEHOLD SECTOR RISKS AND OUTLOOK

Lower-than-expected economic growth and weak household disposable income could increase the aggregate debt-to-income ratio and reduce the capacity to repay debt. This could further dampen demand by accelerating household deleveraging, thus amplifying the slowdown (see Section 2.1).

Weak household incomes and slow economic growth could affect the property market and financial institutions further. Mortgage arrears may increase further even without a further shock to household incomes, if property prices continue to fall (Box 7). This may be particularly relevant to the buy-to-let

**Chart 21: Negative equity and house prices**



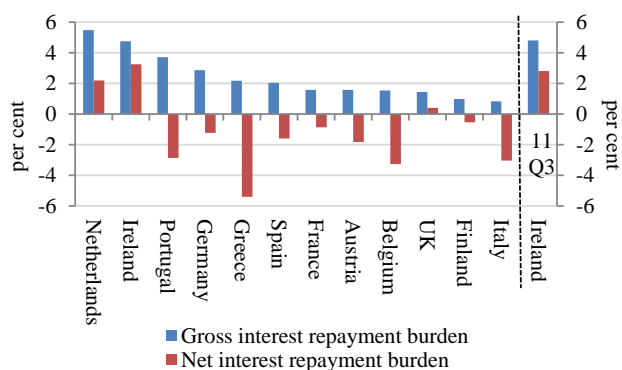
Source: Central Bank of Ireland.

Notes: Graph shows the estimated increase in negative equity under various house price scenarios. Scenarios are relative to Sept 2011 prices. Estimates relate to a sample of 603k mortgages, with a total value of €86.6 billion, drawn from the four FMP institutions.

sector, where arrears have increased more rapidly than for owner-occupied mortgages.

Household finances are vulnerable to an increase in interest repayment costs. Although this repayment measure for Irish households was among the highest compared to other euro area Member States or the UK (Chart 22) in 2010, the low interest-rate environment, at present, is helping to keep interest repayment costs manageable for most households. Interest rates faced by tracker mortgage holders are linked to the ECB policy rate which is not expected by market participants or analysts to increase in the near term (Annex Chart D5). However, further increases in bank funding costs could be passed on to standard variable mortgage holders (see Section 3.2), adding to stress for some households.

**Chart 22: Household interest repayment burden**



Source: ECB and CSO.

Notes: Gross interest repayment burden equals interest paid to disposable income. Net interest repayment burden is interest paid minus interest received to disposable income. Therefore, a negative value for net interest repayment implies that interest received by the household sector exceeds interest paid. Data are for full year 2010. 2011Q3 for Ireland is also shown.

## BOX 5: HOUSEHOLD SAVINGS PATTERNS AND THE DOMESTIC FINANCIAL SYSTEM

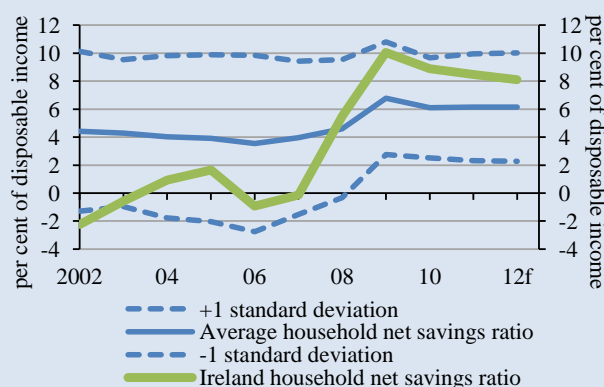
Developments in household savings and investment can affect aggregate demand and overall economic activity and, through these channels, household incomes and Government tax revenues.<sup>1</sup> In recent years, households have increased their savings rate and reduced their investment/capital formation, a change from net borrowing to net lending (Annex Chart D1).

Irish households' net savings rate is now relatively high by OECD standards (Chart A). However, Irish households remain heavily indebted (see Section 2.3). Furthermore, total household wealth, including housing wealth, has fallen substantially from peak levels (Chart D16). As such, it seems likely that the household savings rate will remain elevated and that household investment will remain depressed.

In national accounting terms, household saving is composed of several elements<sup>2</sup>. The first is capital formation, which is predominately purchases of new housing. The second is net purchases of financial assets. If purchases exceed sales then households are saving. The third element is transactions in liabilities - borrowing minus debt repayment. If repayment exceeds borrowing then households are saving.

Currently, households are net repaying debt and this source of saving exceeds saving through net purchases of financial assets (Chart B). Therefore, high saving should not be automatically expected to lead to deposit growth. The data indicate that most aggregate household saving is debt repayment and deposits are reduced in this process. Households are paying down mortgage debt, rather than accumulating financial assets. Overall, given the continuing poor outlook for household disposable incomes and high levels of mortgage debt, this pattern may continue for some time, limiting household deposit growth and potentially deposit inflows to the domestic banking system.

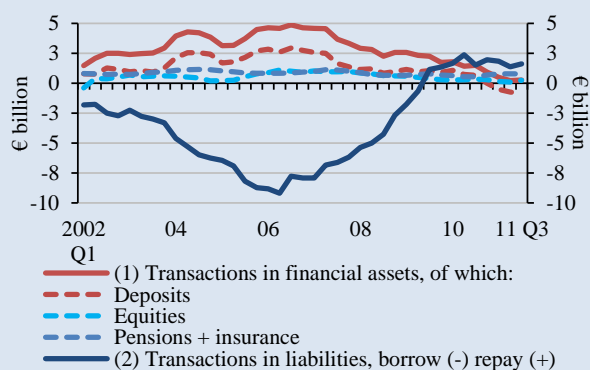
**Chart A: Irish household savings rate in international perspective**



Source: OECD.

Notes: Data show net savings ratio (gross savings minus depreciation), and relates to 21 countries, including nine euro area countries.

**Chart B: Breakdown of household transactions in financial assets and liabilities**



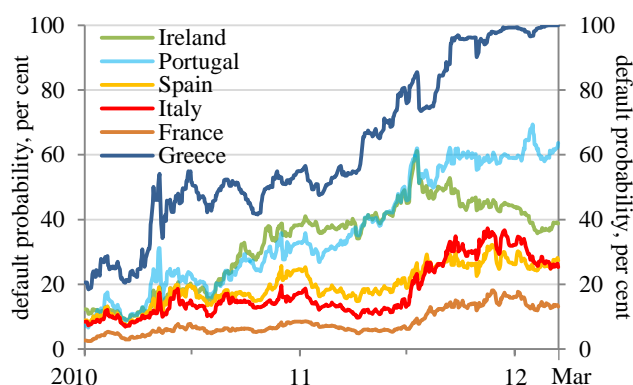
Source: Central Bank of Ireland.

Notes: Net transactions in financial assets can be further decomposed by type of financial asset: deposits/equities/pensions and insurance.

<sup>1</sup> For example, ESRI simulations indicate that a 1pp increase in the household savings rate reduces the level of nominal consumption by €1bn over the following 12 months (approximately 1.2 per cent). See: [Durkan, Joseph, David Duffy and Cormac O'Sullivan, \(2010\), "Quarterly Economic Commentary, Spring 2010", Economic and Social Research Institute.](#)

<sup>2</sup> For a conceptual overview of flow of funds type accounts see: [CSO, \(2011\), "Institutional Sector Accounts Non-Financial and Financial 2010".](#)

**Chart 23: Credit-default-swaps-implied sovereign default probabilities over the next five years**

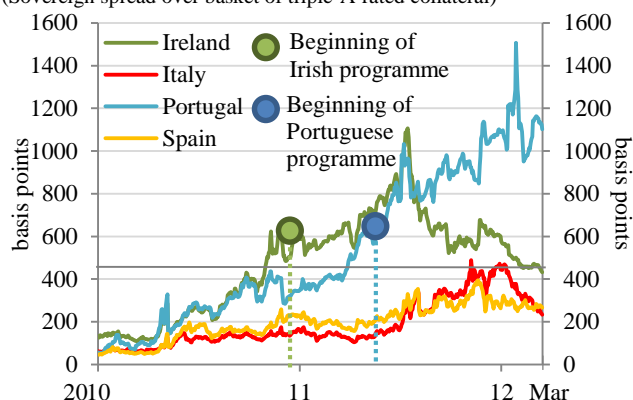


Source: Central Bank of Ireland; Bloomberg.

Notes: Probability of default derived from CDS premia from perspective of a risk-neutral investor. A recovery rate of 40 per cent is assumed. Last observation: 14 March 2012.

**Chart 24: Sovereign spreads, bailouts and trigger levels for margin calls**

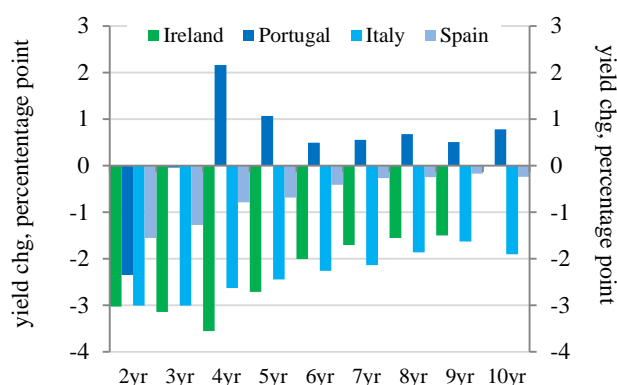
(Sovereign spread over basket of triple-A-rated collateral)



Source: Central Bank of Ireland; LCH Clearnet.

Notes: Grey horizontal line is the 450bps ceiling over triple-A collateral employed by LCH Clearnet to initiate margin calls on sovereign debt. Irish 9-year bond after 12 Oct 2011. Last observation: 14 March 2012.

**Chart 25: Sovereign yields, change since introduction of ECB's 3-year refinancing operation**



Source: Bloomberg.

Notes: Change from 21 December 2011 to 14 March 2012.

## 2.4 SOVEREIGN SECTOR

*This section outlines risks to the Irish sovereign. Risks from international sources are the default of one or more sovereigns; insufficient institutional backstops and an external growth shock. The main domestic sovereign risks are: a domestic growth shock and financial-sector contingent liabilities.*

### 2.4.1 DEFAULT RISK

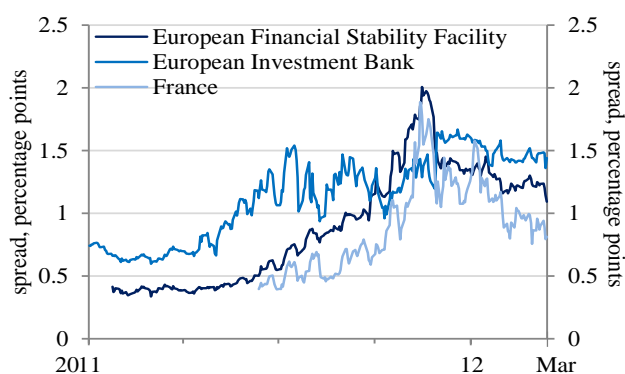
The market's perception of sovereign default risk in the euro area increased sharply during the second half of 2011 as contagion spread from high-yield countries to other euro area Member States (Chart 23). Box 6 shows how Irish sovereign yields had become increasingly correlated with other peripheral euro area yields in early-2011 and decoupled since the start of 2012. This is due in part to the continued execution of the planned fiscal consolidation which, under certain assumptions, should place the debt-to-GDP ratio on a downward path by 2015. The primary surplus is projected by the IMF to be just under 3 percent of GDP, which is around 2.5 percentage points of GDP above primary balance needed to ensure a stable debt ratio.<sup>13</sup> This decline in Irish sovereign bond yields during the past six months (Chart 24) accelerated since the introduction of the ECB's three-year refinancing operation in December 2011 (Chart 25). However, despite both of these positive developments, a renewal of euro area sovereign stress could lead to elevated sovereign yields for euro area members and vulnerable sovereigns, including Ireland.

### 2.4.2 INSTITUTIONAL BACKSTOPS

Steps to copperfasten backstop financial arrangements for euro area sovereigns have been taken over the past several months. It is clear that sufficient backstop financing is an essential prerequisite to ensuring reduced sovereign debt market volatility. This matters in particular for Ireland, where consolidation of the improving market sentiment shown towards the sovereign in the past half-year is of key importance. To date, however, despite considerable relief relative to peak yields, spreads on many euro area sovereigns remain high and volatile. Pricing of EFSF bonds was not immune to stresses in the bond yields of euro area

<sup>13</sup> These assumptions and detail are included on pages 34-40, IMF, (2012), "Fifth review under the extended arrangement", IMF Country Report No. 12/48.

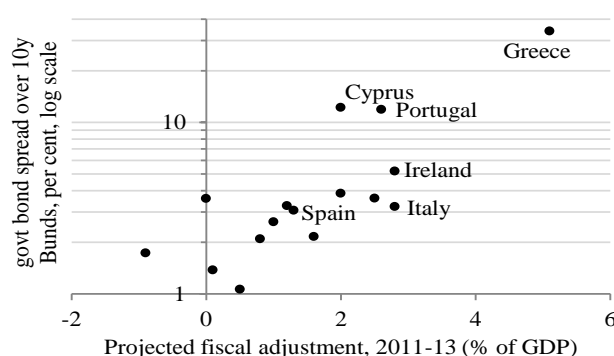
**Chart 26: Yields on European benchmark bonds**



Source: Bloomberg. Last observation 14 March 2012.

Notes: Spreads over German 5-year Bunds maturing in July 2016.

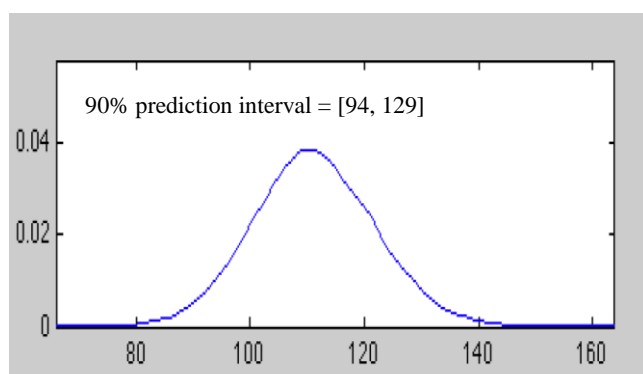
**Chart 27: Projected fiscal adjustment and sovereign bond spreads**



Source: IMF, European Commission, Bloomberg.

Notes: Projected fiscal consolidation during 2011-13 as per cent of GDP and government bond spreads over 10-year Bunds (as of 14 Mar, 2012).

**Chart 28: Probability density of projected Irish government debt-to-GDP ratio in 2015**



Source: Cronin, David and Kevin Dowd, (2011), "Fiscal fan charts - A tool for assessing Member States' (likely?) compliance with EU fiscal rules", Central Bank of Ireland, 15/RT/11.

Notes: Chart shows density of predicted-debt-to-GDP ratio given no policy change where GDP follows a stochastic process.

sovereigns (Chart 26).

### 2.4.3 EXTERNAL GROWTH

Despite some positive recent developments in short-term indicators in some trading partners, notably the US, correlated contraction among euro area Member States (Chart 27) poses a significant external risk to Ireland's open economy by reducing export demand.<sup>14</sup> The intention of fiscal adjustment is to restore debt sustainability among euro area countries. The ECB estimates that, under a scenario whereby, starting in 2012, the primary balance of the euro area improves annually by one half of a percentage point of GDP until the overall General Government budget is balanced, euro area gross General Government debt to GDP would stabilise at 80 per cent by 2030.<sup>15</sup>

### 2.4.4 DOMESTIC GROWTH

Sovereign debt dynamics are vulnerable to adverse shocks stemming from the unwinding of internal economic imbalances, unforeseen additional reductions in credit or larger-than-expected contractionary effects arising from cuts in public spending. While improved secondary market yields on Irish bonds and the recent successful bond swap by the NTMA are positive developments, Irish sovereign debt sustainability remains highly sensitive to future GDP growth (Chart 28). Ireland's Fiscal Advisory Council estimates that if nominal GDP growth were to be 2 percentage points lower than core forecasts over the next four years the public debt ratio would rise above 130 per cent by 2015 and would still not have stabilised.

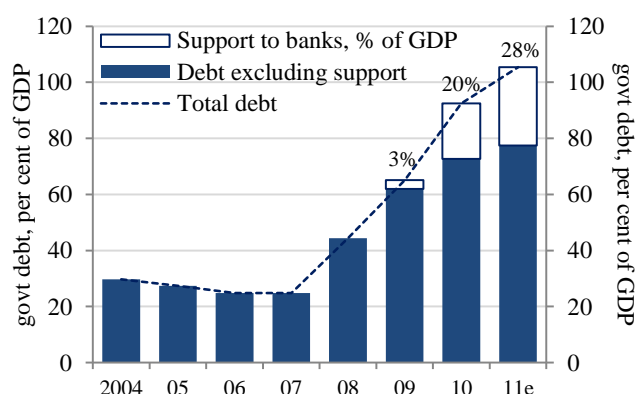
### 2.4.5 BANKING AND CONTINGENT LIABILITIES

Given the scale of the exposure, albeit reduced, the domestic banking sector will remain an important risk for the Irish sovereign in the form of debt incurred and a significant contingent liability. This liability may be direct in terms of equity support and the promissory note (Chart 29), and indirect through the

<sup>14</sup> This risk and other aspects of fiscal consolidations are discussed in [IMF \(2010\), "Will It Hurt: Macroeconomic Effects of Fiscal Consolidation?"](#), IMF WEO, October, [Cottarelli, Carlo, \(2012\), "Fiscal Adjustment: Too Much of a Good Thing?"](#), [Wren-Lewis, Simon, \(2011\), "Lessons from failure: fiscal policy, indulgence and ideology"](#), National Institute for Economic and Social Research, No. 217, and [Corsetti, Giancarlo, Keith Kuester, Andre Meier, and Gernot J. Mueller, \(2012\), "Sovereign Risk, Fiscal Policy and Macroeconomic Stability"](#), IMF Working Paper, WP/12/33.

<sup>15</sup> See [European Central Bank \(2011\), "Ensuring fiscal sustainability in the euro area"](#), Monthly Bulletin, April 2011.

**Chart 29: Impact on Irish General Government debt of state support to banking sector**



Source: Central Bank of Ireland.

Notes: Support includes capital injections (including promissory notes, ordinary shares and preference shares) and associated interest payments.

Eligible Liabilities Guarantee and debt issued by the National Asset Management Agency (NAMA).<sup>16</sup> While NAMA debt is not consolidated as part of the General Government debt it is classed by Standard & Poor's (S&P) as a contingent liability for credit-rating purposes.<sup>17</sup> Any additional significant bank recapitalisation from the State would clearly have an adverse effect on debt sustainability.

<sup>16</sup> The promissory note affects both the general government debt level and deficit. For more details see, [Cussen, Mary, and Mick Lucey. \(2011\). "Treatment of Special Bank Interventions in Irish Government Statistics". Central Bank of Ireland Quarterly Bulletin, Q4, October 2011.](#)

<sup>17</sup> Since the Irish state retains only a minority shareholding in the special purpose vehicle that NAMA uses to issue its bonds, this creates sufficient independence for NAMA debt to be considered as separate to the Irish national debt.

## BOX 6: A SOVEREIGN RISK INDICATOR

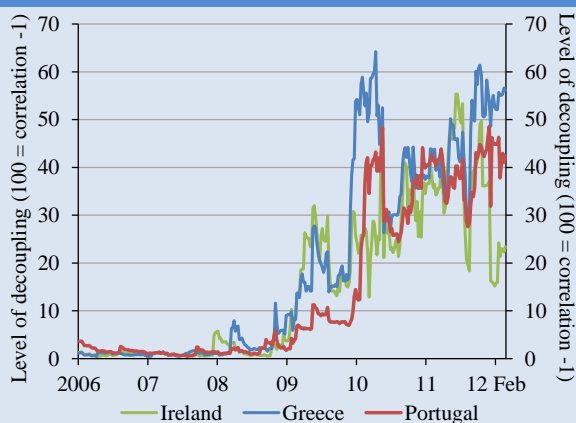
Recent sovereign bond and credit default swap (CDS) developments in the euro area have led to concern regarding sovereign risk given the scale of government support for domestic financial systems. This box describes a sovereign risk indicator based on changes in the co-movement of euro area bonds. Bond yields of the core and periphery countries are shown to diverge from early-2009. As of February 2012, Greece and Portugal continue to show a high level of divergence. For a time during 2010, Ireland had the greatest divergence, but recently moved away from the highest risk countries.

Over the period 1999 to 2006, monetary union resulted in a convergence of government bond yields despite Member States pursuing different fiscal policies. Since 2008, there has been a large dispersion of 10-year government bond yields, at times exceeding 2,500 basis points. This indicator divides risk into euro area-wide risk and country-specific risk. The country-specific risk is measured through deviations in time-varying correlations between 10-year yields on individual euro area members and a benchmark euro area bond.<sup>1</sup> The indicator measures the extent of deviations from a correlation of 1. Correlations are estimated using a Dynamic Conditional Correlation approach which takes into account the large change in the variance of yields over the sample period.<sup>2</sup> The advantage of using this methodology is that it avoids the problem of correlations tending towards one in periods of high volatility as outlined by Forbes and Rigobon (1999).<sup>3</sup> The indicator is then rebased on a 0 to 100 scale representing the range between perfect positive (0) and perfect negative (100) correlation.

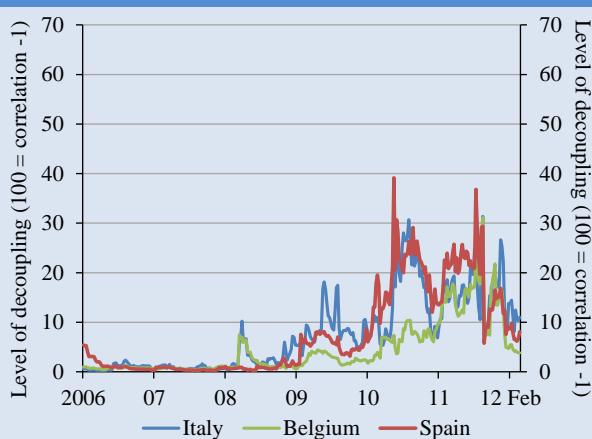
Chart A below presents a time series of the indicator between January 2006 and February 2012. The effect of the current financial crisis is identifiable through the volatility of the indicator from early 2008 onwards. This is mainly due to a credit risk transfer from the banking sector to government after the introduction of support measures. Ireland initially decouples in early-2009, mainly as a response to banking sector support measures. The indicator shows increased risk through 2010 culminating in Ireland's entry into the EU-ECB-IMF programme. Risks remained elevated in 2011, but the impact of the domestic measures taken under the programme are evident with Ireland decoupling from the highest risk countries since mid-2011 as market sentiment towards Ireland improved.

The measure in this box is based on pairwise estimates between sovereigns and a triple-A index. However, other measures of dependence and spillover risk using quantile regression, copulas and other techniques are also possible and can be cross-checked against these results.

**Chart A: Decoupling of euro area sovereign yields, 10-year maturity**



Source: Thomson Reuters Worldscope and Central Bank of Ireland calculations.



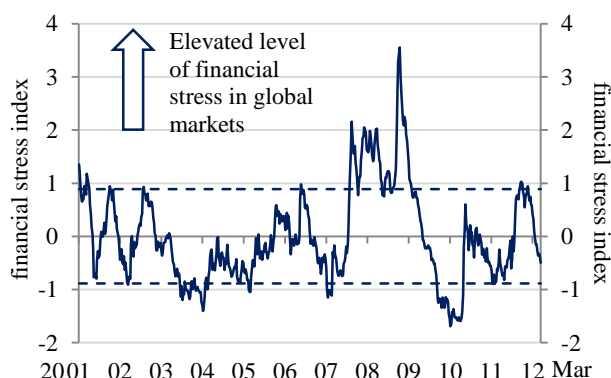
Source: Thomson Reuters Worldscope and Central Bank of Ireland calculations.

<sup>1</sup> The benchmark Eurozone bond is a synthetic bond of Eurozone AAA yields provided by Thomson Reuters Datastream. Estimation is over the period 01/2000 to 02/2012 sample period using a multivariate DCC approach.

<sup>2</sup> Engle, Robert F., (2002), "Dynamic Conditional Correlation - A Simple Class of Multivariate GARCH Models", Journal of Business and Economic Statistics, 20, pp. 339-350.

<sup>3</sup> Forbes, Kristin J., and Roberto Rigobon, (2002), "No Contagion, Only Interdependence: Measuring Stock Market Co-Movements", Journal of Finance, 57(5), pp. 2223-2261.

**Chart 30: Financial stress in global markets**

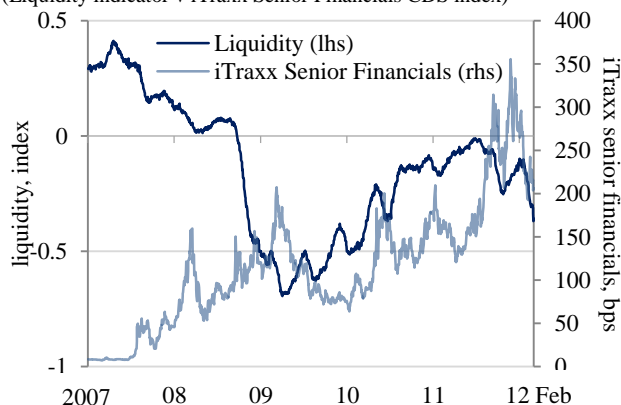


Source: Central Bank of Ireland. Last observation: 14 March 2012.

Notes: Average of three standardised market-based measures of global stress (Citibank, Westpac EU and Westpac US). Dashed lines show plus and minus one standard deviation.

**Chart 31: Financial market liquidity and CDS spreads for European financial firms**

(Liquidity indicator v iTraxx Senior Financials CDS index)

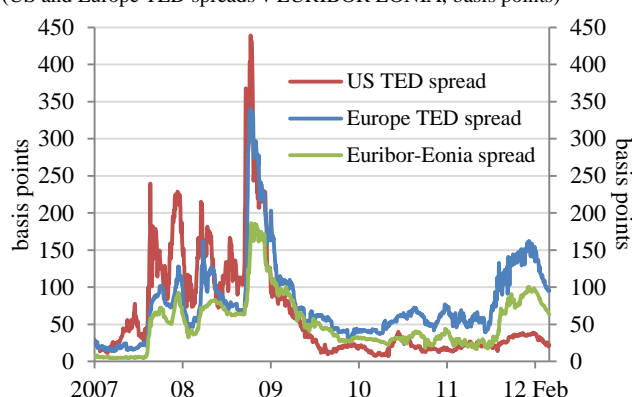


Source: Central Bank of Ireland.

Notes: For indicator methodology see Chart Annex. Last observation 29 February 2012.

**Chart 32: Funding costs in the euro area**

(US and Europe TED spreads v EURIBOR EONIA, basis points)



Source: Bloomberg.

Notes: Latest observation: 29 February 2012.

### 3. FINANCIAL SYSTEM

#### 3.1 FINANCIAL SYSTEM OVERVIEW

*This section outlines three risks in the international financial system: market and liquidity risk; the risk of a sharp depreciation in the value of the euro; and counterparty risk.*

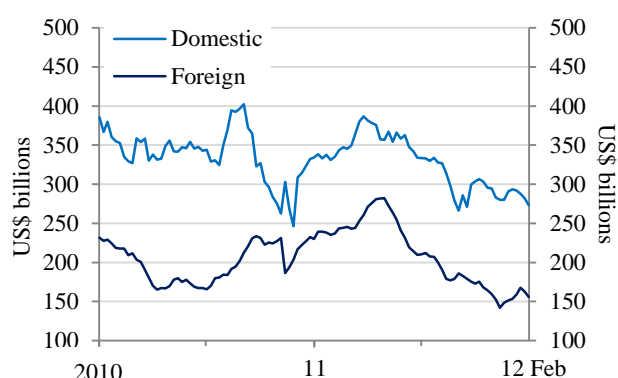
##### 3.1.1 MARKET AND LIQUIDITY RISK

The risk that Irish financial firms will remain excluded from term debt markets for an extended period is high and, if banks continue to respond by contracting their balance sheets, this may contribute further to a prolonged domestic recession. Although the yield on benchmark long-dated Irish bonds has declined by roughly 6 percentage points since July, sovereign yields increased significantly for Italy and Spain in late-2011 before falling back. US money market funds cut their exposure to European banks to record lows<sup>18</sup> and funding costs in the euro area rose to their highest levels since the collapse of Lehman Brothers in 2008 (Charts 30, 31 and 32). Since late-December 2011 there have been some positive developments. Some European banks have been able to regain access to the US market for commercial paper (Chart 33) and issued euro secured funding. Two domestic banks have been able to secure term repo funding of €6.6 billion based on their UK mortgage books. This notwithstanding, any further heightening of international financial market stress would likely further restrict financial market access.

Unsecured medium-term funding markets will remain effectively closed to Irish banks until doubts about sovereign debt sustainability and bank-specific issues are dispelled. In the broader euro area financial system, as banks remain reluctant to lend to each other, much of the interbank market will remain dependent on Eurosystem liquidity provision. On 30 November 2011, the Federal Reserve and the ECB (plus the central banks of Canada, Japan, Switzerland and the UK), agreed to halve the cost of US dollar swap lines to 50 basis points above overnight index swaps. While this alleviated a liquidity squeeze caused by US money market funds withdrawing short-term lending to European banks, it did little to ease the

<sup>18</sup> At the end of 2011 the 10 largest US money market funds held less debt from banks in the euro area than at any point since 2006, according to Fitch Ratings.

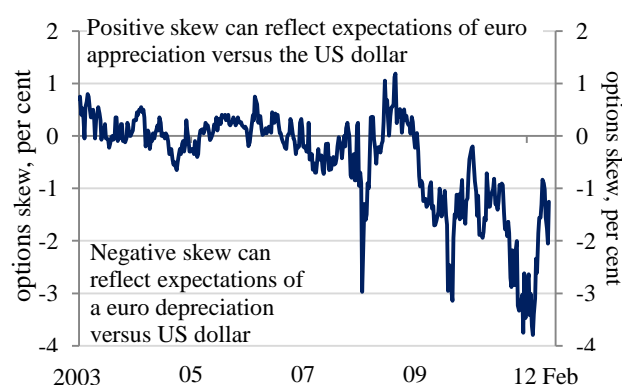
**Chart 33: US foreign financial commercial paper outstanding**



Source: US Federal Reserve.

Notes: Data frequency, weekly. Latest observation: 23 February 2012.

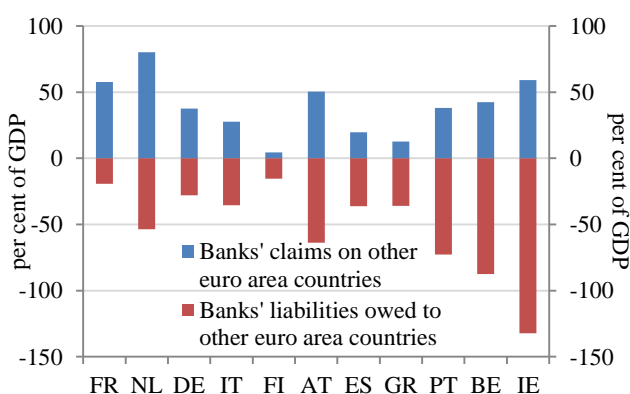
**Chart 34: Options-implied risk of euro appreciation or depreciation against US dollar**



Source: Bloomberg.

Notes: Last observations 29 February 2012. Options skew is derived from the relative price of equally out of the money puts and calls on the euro versus US dollar exchange rate.

**Chart 35: External claims and liabilities of euro area banks, 2011 Q2**



Source: Bank for International Settlements, consolidated basis.

wider funding challenges facing European banks over the medium term. However, the ECB's LTROs have provided significant relief for banks with adequate collateral or sovereigns with the ability to provide guarantees for own-use bonds. Nevertheless, as long as the sovereign crisis continues, euro area banks will remain vulnerable.

Although market and liquidity risk are high, the mechanisms of transmission of this risk to Ireland are somewhat muted as market access is already limited. This is because share prices are already depressed, the Irish sovereign obtains finance through official IMF-EU loans rather than market issuance and the ECB and the Central Bank of Ireland are key residual sources of funding, along with deposits, to some parts of the domestic banking sector. Looking ahead, these risks may delay a return to sovereign debt markets and restoration of partial market access for domestic banks. Important changes in the buyer base of Irish sovereign debt may have altered the dynamics of current and future secondary market developments.<sup>19</sup> This may be especially important for the Irish sovereign as most of its debt is held externally.

### 3.1.2 CURRENCY RISK

The risk of a sharp depreciation of the euro has increased since mid-2011 as the euro area sovereign-debt crisis had intensified but has perhaps diminished more recently (Chart 34). Trade and financial linkages would transmit any currency shock and, given Ireland's strong trade links outside the euro area (see Chart 35 and Section 2.2.5) the shock could be felt intensely. Market concerns during late-2011 about exit risk reflect the undoubted severity of the consequences of such an event for any euro area Member State. Quantifying the potential knock-on consequences for Ireland is difficult.

### 3.1.3 COUNTERPARTY RISK

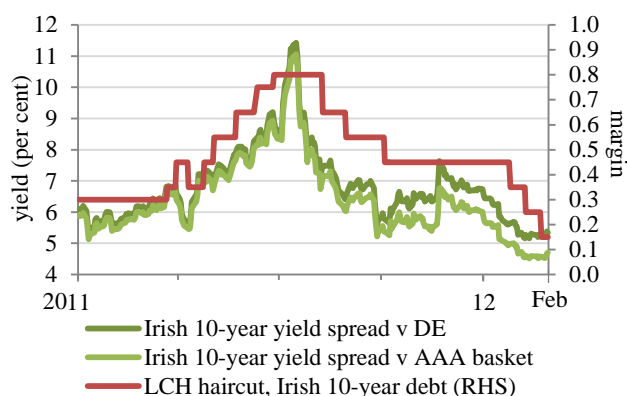
Counterparty and third-party financial risks to Ireland will remain high as long as systemic risk in the euro area remains elevated. The pro-cyclical nature of margin calls by clearing houses and rating agencies (Chart 36) can have effects in the short term (increased volatility) and longer term (removal from benchmark indices).

Credit default swaps bought by Irish and other euro

<sup>19</sup> This risk of secondary market dynamics changing in some euro area countries has also been identified by the IMF in its September 2011 Global Financial Stability Report, September 2011, page 15.

**Chart 36: Pro-cyclicality of margin calls for Irish sovereign debt**

(Margin requirements and Irish sovereign bond spreads)

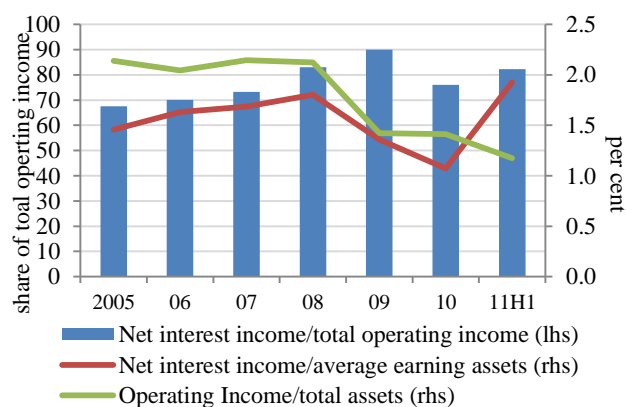


Source: Bloomberg, LCH Clearent.

Notes: Last observations 29 February 2012.

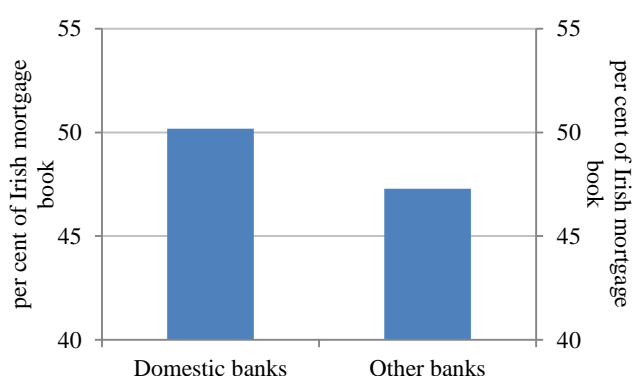
area financial firms are only as sound as the credit quality of the protection seller. While central counterparty clearing houses are a plausible approach to eliminating the counterparty risk stemming from over-the-counter trades, at present, central clearing does not yet cover the majority of outstanding credit default swap trades.

Overall, third-party exposure to sovereign default remains difficult to quantify. This is one reason for the contraction in interbank lending and a broader credit-led contraction in euro area economies. For banks in other countries, incomplete and inconsistent disclosure about the ability to bear this risk amplifies uncertainty about bank resilience. After the rescue of Franco-Belgian bank Dexia and the demise of broker MF Global, markets fear the collapse of another large financial institution.

**Chart 37: Domestic banks' income and margins**

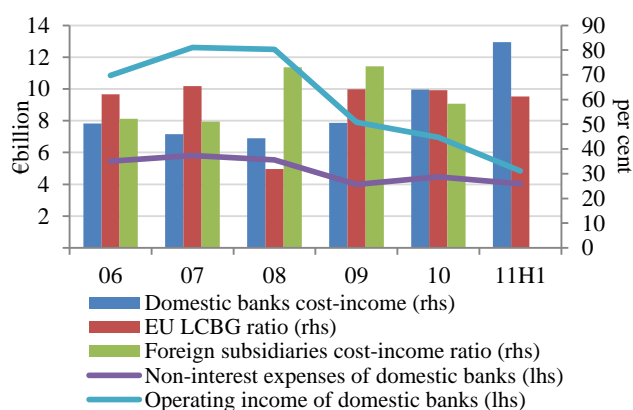
Source: Fitch Ratings.

Notes: "Domestic banks" include IBRC (Anglo and INBS).

**Chart 38: Share of tracker mortgages**

Source: Central Bank of Ireland.

Notes: Data relate to business conducted through resident offices, relates to on-balance sheet mortgages and exclude IBRC. "Other banks" refers to other mortgage lending institutions. Data as at 30 December 2011.

**Chart 39: Cost-income ratios**

Source: Fitch Ratings and Central Bank of Ireland calculations.

Notes: Cost-income ratios are weighted averaged of reported ratios (weights are total assets). "Domestic banks" include IBRC. "Foreign subsidiaries" refer to a sample of foreign banks operating within Ireland.

## 3.2 BANKING SECTOR<sup>20</sup>

*Risks to banks remain acute, but resilience has increased through the FMP recapitalisation in March 2011. However, credit risk remains elevated due to banks' exposure to property lending, the lack of systematic workout of this debt to date, further declines in property prices and concerns about obligors' ability to repay. Funding concerns relate to the continued reliance on official sector funding and the difficulty in attracting deposits in a sustainable manner. Finally, the euro area sovereign debt crisis will impact the banking sector both directly and through events in the European and domestic real economy.*

### 3.2.1 INCOME/EARNINGS RISK

Domestic banks continue to rely heavily on net interest income as their primary source of income (Chart 37). The outlook for interest income is poor as the weak domestic economy leaves banks with limited scope for increasing loan rates without negatively affecting asset quality (see Section 3.2.2). Domestic banks retain sizeable tracker-mortgage books of €46 billion of total loans (Chart 38). Their current funding costs imply that these portfolios are likely to remain loss-making for the foreseeable future. Overall, banks face elevated costs in attracting retail and wholesale deposit funding, placing significant pressure on net interest margins.

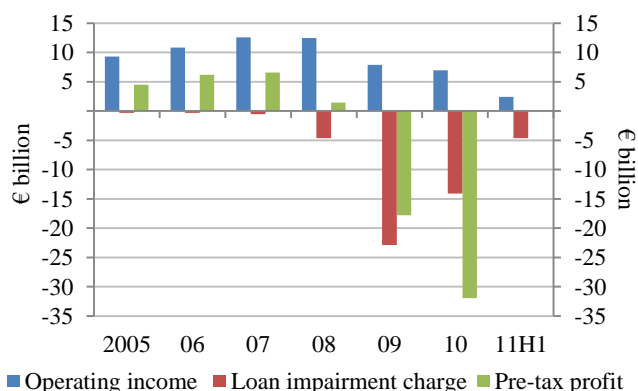
The deleveraging process will also impact on banks' ability to generate new sources of revenue. It is unlikely that domestic banks will be able to diversify their income away from domestic core lending activities, although the significance of such diversification effects has been questioned in academic literature.<sup>21</sup> Conversely, banks that have previously focused on property-related lending must gain expertise in lending to other sectors of the economy, including the non-financial corporate/SME sector.

Regarding banks' ability to increase net interest

<sup>20</sup> Unless otherwise stated, "domestic banks" refer to the institutions covered by the Eligible Liabilities Guarantee scheme.

<sup>21</sup> For example see [Goetz, Martin, Luc Laeven and Ross Levine, \(2011\), "The Valuation Effects of Geographic Diversification: Evidence from U.S. Banks", NBER Working Papers 17660.](#)

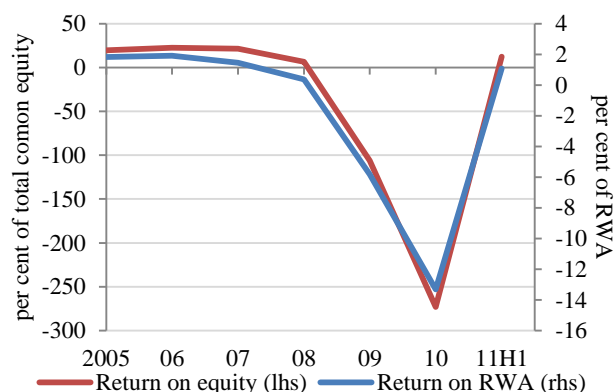
**Chart 40: Domestic banks' profitability**



Source: Fitch Ratings.

Notes: Data include IBRC.

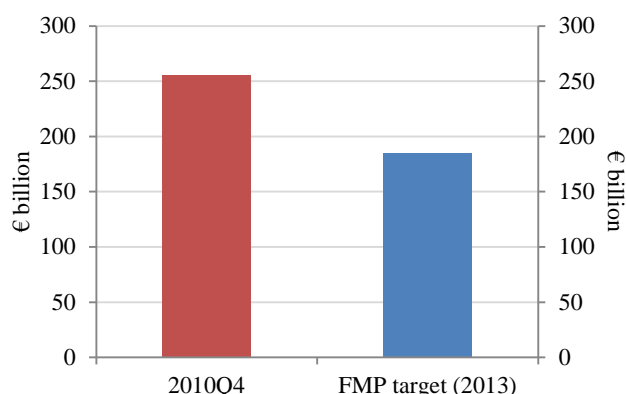
**Chart 41: Domestic banks' returns**



Source: Fitch Ratings and Central bank of Ireland calculations.

Note: Data include IBRC.

**Chart 42: FMP banks' deleveraging**



Source: Central Bank of Ireland.

Notes: Data are consolidated outstanding net loans for the four institutions involved in the Financial Measures Programme (FMP) as published on the 31 March 2011. Data exclude IBRC.

margins, recent research on standard variable rates in Ireland<sup>22</sup> suggests that some lenders with higher rates of mortgage arrears and a greater proportion of tracker rate loans on their books charge higher variable rates. At the same time, bank lending rates cannot be so constrained as to inhibit banks' ability to rebuild their capital bases from retained earnings.

In light of banks' limited scope to raise revenue, the onus will be on them to increase operational efficiency. Although domestic banks have reduced overall costs from pre-crisis levels, the reduction in operating income has been greater, with the overall effect that cost-income ratios have deteriorated (Chart 39). Domestic banks will have to cut further operating costs, to bring expenditures in line with expected future operating income.

Overall, profitability has been significantly eroded due to a combination of impairment charges and past write-downs associated with NAMA transfers (Chart 40). Loan loss impairments will continue to impact on banks' IFRS income in the medium term as banks are required to take a more forward-looking view of impairments as part of a more proactive supervisory approach.

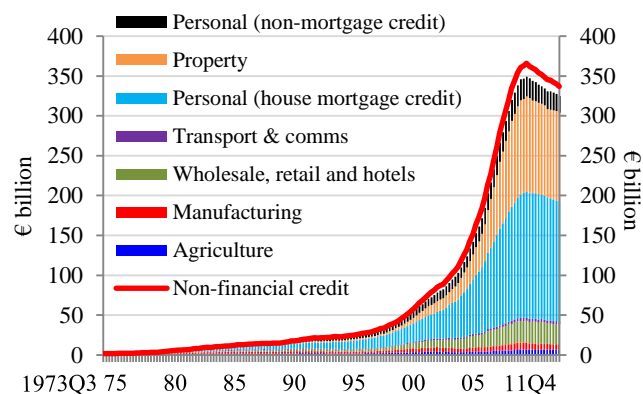
The deterioration in banks' profitability in 2009-10 is particularly stark when presented in terms of Return on Risk-Weighted Assets and Return on Equity (ROE) given the erosion of equity that has occurred (Chart 41).

The challenge facing banks in the short and medium term is to manage impaired assets and maximise returns. This may be particularly challenging as some outlets for distressed assets such as non-performing loan securitisations, which were used by German and Italian banks in their work-out of distressed debt in the early-2000s, are not available to domestic banks at present.

In addition to the above challenges, the deleveraging process impacts on domestic banks' overall profitability through potential haircuts on non-core assets (Chart 42). Furthermore, domestic banks may face operational risks, in the form of execution risk, associated with the planned disposal process. Domestic banks have three ways of reducing their balance sheets: sale of assets, run-off of existing loans

<sup>22</sup> [Goggin, Jean, Sarah Holton, Jane Kelly, Reamonn Lydon and Kieran McQuinn, \(2012\), "Variable Mortgage Rate Pricing in Ireland", Central Bank of Ireland, Economic Letter, No. 2.](#)

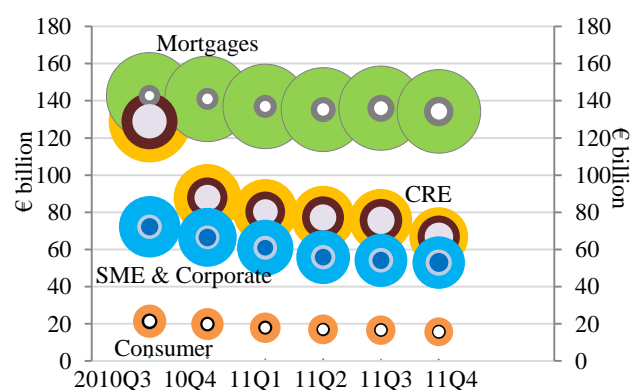
**Chart 43: Breakdown of private-sector credit**



Source: Central Bank of Ireland.

Notes: Data relate to business conducted through resident offices only and are all institutions operating within the State. Post 2003 data are adjusted for transactions such as revaluations, securitisations and NAMA transfers.

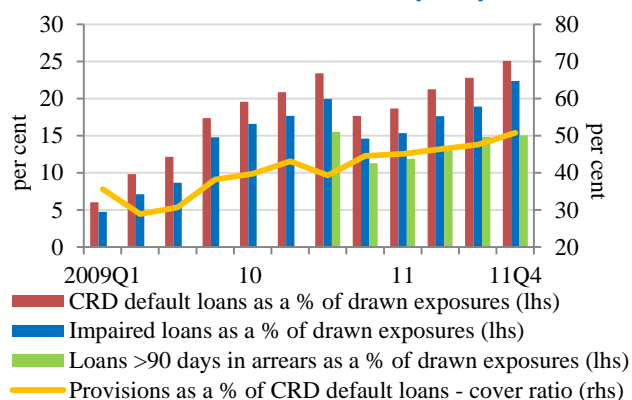
**Chart 44: Domestic banks' credit exposures**



Source: Central Bank of Ireland.

Notes: Data are consolidated and include IBRC. Outer circle: share of drawn exposures per sector, middle circle: impaired loans (CRD default) as a share of drawn exposures, inner circle: provisions as a share of drawn exposures.

**Chart 45: Domestic banks' asset quality**



Source: Central Bank of Ireland.

Notes: Data are consolidated and include IBRC. The reduction in the impaired loans, loans >90 days in arrears and CRD default figures between 2010Q3 and 2010Q4 relates to NAMA transfers.

and non-renewal of existing commitments.

Given the depressed domestic real-estate market, domestic banks have sold assets in the US and the UK. As such, the deleveraging process may be affected by challenging growth outlooks in these economies. A number of UK banks recently disposed of assets similar to those held by domestic banks, suggesting there may be scope for domestic banks to sell these portfolios.

### 3.2.2 CREDIT RISK

The concentration of property-related credit risk in domestic banks is reflected in the overall stock of loans to this sector and their impairment levels (Charts 43 and 44). Given the uncertainty relating to the residential and commercial property markets and the overall macroeconomic outlook (Sections 2.2 and 2.3), it is likely that expected losses and impairments will remain elevated for some time.

In recent quarters, the level of impairment provisions recorded by the banks has tended to rise together with the level of loans in arrears (Chart 45).<sup>23</sup> The measures vary by bank and depend on the exposure of the institution to a particular sector. A more realistic approach to the accounting recognition and disclosure of loan losses by some institutions could also be an explanatory factor.

Similarly, coverage ratios<sup>24</sup> differ across domestic institutions for most of the lending categories (Annex Chart G6). The reason for the lower commercial real-estate (CRE) and residential mortgage cover ratios of some institutions<sup>25</sup> is an area of current supervisory focus (Annex Chart G7).<sup>26</sup>

These credit risk developments have occurred against a background of uncertainty related to the introduction of personal bankruptcy reform and the development of a strategy to deal with mortgage arrears. Additionally, there is still insufficient evidence of a systematic approach by banks to managing distressed personal and SME loans. Action in these areas will aid the return to a functioning banking system.

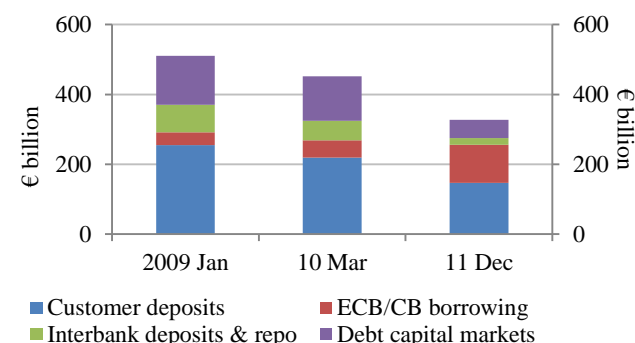
<sup>23</sup> As CRD default is a more standardised definition across banks, it is used as a measure of impaired loans.

<sup>24</sup> The average cover ratio is calculated as Impairment Provisions/CRD default loans.

<sup>25</sup> There is a supervisory intention to focus on coverage levels in 2012.

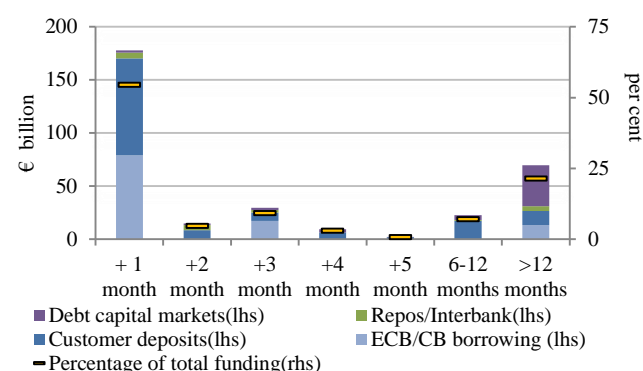
<sup>26</sup> Central Bank of Ireland published [guidance](#) in December 2011 to ensure banks improve estimation, recognition and disclosure of impairments.

**Chart 46: Evolution of domestic banks' funding profile**



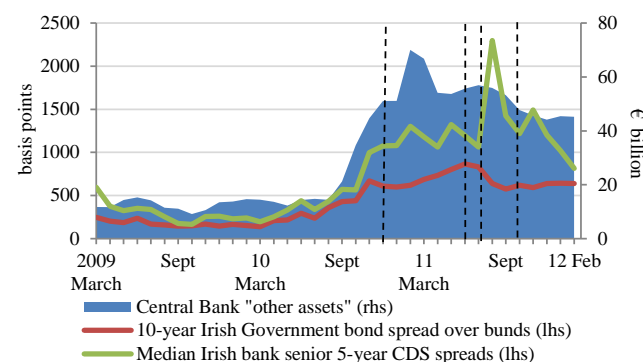
Source: Central Bank of Ireland.  
Notes: Data are consolidated and include IBRC.

**Chart 47: Maturity profile of domestic banks**



Source: Central Bank of Ireland.  
Notes: Data are consolidated and include IBRC. Data as at 31 December 2011.

**Chart 48: Borrowing from Central Bank of Ireland, CDS and Irish Government spreads**



Source: Bloomberg, Thomson Reuters Datastream and Central Bank of Ireland.

Notes: The "Other Assets" category from the Financial Statement of the Central Bank of Ireland provides a broad estimate of ELA. Dashed lines refer to dates of auctions for CDS credit events of the domestic banks on their senior debt. Irish bank CDS spreads refer to a time-varying sample of the domestic banks category for which market data are available and include IBRC.

### 3.2.3 FUNDING RISKS

Despite the recent stabilisation in outflows, the funding conditions of domestic banks remain strained and there are significant near-term risks. Domestic banks' funding profile continues to be characterised by two fundamental weaknesses: first, the shortening maturity of their remaining market-based funding and second, the on-going reliance on official sector funding (Charts 46 and 47). The main short-term risks relate to any renewed escalation of the euro area sovereign debt crisis, in case that might trigger renewed deposit outflows and further increased reliance on Eurosystem or Central Bank funding.

Although there has been some reduction in the level of ECB/CB borrowing recently, the on-going dependence is a significant challenge for domestic banks (Chart 48 and Annex Chart G8).

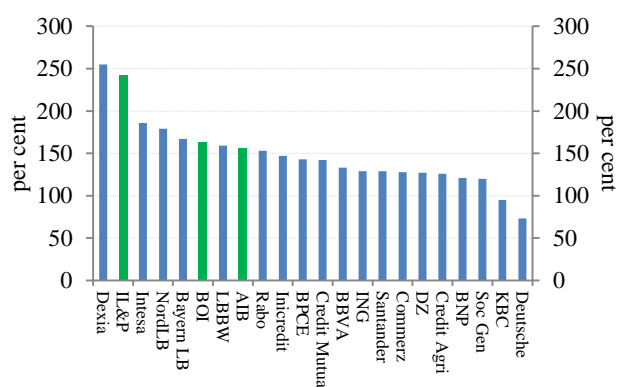
On 8 December 2011, the ECB announced two LTROs with 3-year maturity, a reduction in the reserve requirement from 2 to 1 per cent and an increase in the range of eligible collateral. These initiatives have reduced refinancing risk and freed-up some funding for the domestic banks. However, it is expected that the reduction in the rating for certain types of asset-backed securities may only yield a marginal increase in eligible collateral. There is also a provision for national central banks to take credit claims temporarily as eligible collateral. The Central Bank of Ireland announced its participation in this initiative on 9 February 2012.<sup>27</sup> Although these measures have resulted in some easing of funding pressures in the euro area, conditions remain fragile (see Section 3.1).

Chart 49 shows that domestic banks' loan-to-deposit ratios (LDRs) remain high by international comparison. Under the EU-ECB-IMF programme LDR targets of 122.5 per cent must be met by end-2013. New liquidity requirements under Basel III will also require greater reliance on more stable sources of funding such as core deposits. Reducing LDRs will be challenging in the current environment.

Notwithstanding some seasonal outflows around the end of 2011 and in early-2012, retail deposits continued to record cumulative net inflows in Q3 and Q4 2011 (Charts 50 and 51). The rate of outflows from corporate deposits has also begun to stabilise

<sup>27</sup> See <http://www.centralbank.ie/press-area/press-releases/Pages/EligibilityCriteriaforAdditionalCreditClaims.aspx>.

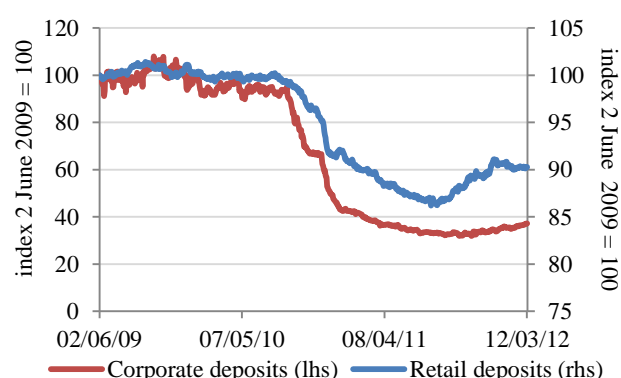
**Chart 49: Loan-to-deposit ratios**



Source: Fitch Ratings.

Notes: Data include interbank lending and deposits. Data are for June 2011.

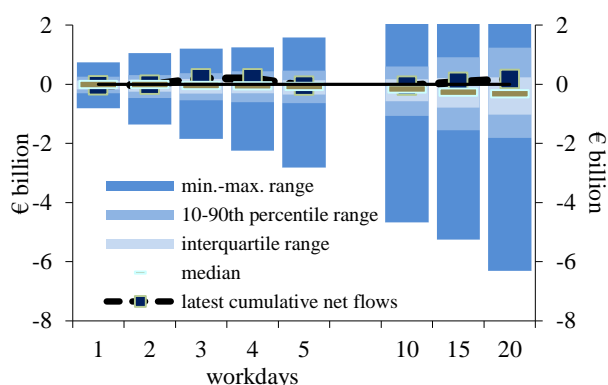
**Chart 50: Domestic banks' customer deposits**



Source: Central Bank of Ireland.

Notes: Index based on outstanding stock of deposits as at February 2012 adjusted for daily net deposit flows. Data are consolidated and include IBRC. Last observation: 12 March 2012. Corporate includes deposits by non-bank financial intermediaries.

**Chart 51: Domestic banks' net retail deposit flows**



Source: Central Bank of Ireland.

Notes: Data are consolidated and include IBRC. Data refer to the period March 2010 to 12 March 2012.

(Charts 50 and 52). Consequently, the stock of customer deposits increased from €142 billion in September to €147 billion in December 2011. Any escalation of the euro area sovereign crisis, however, could lead to outflows of both categories of customer deposits.

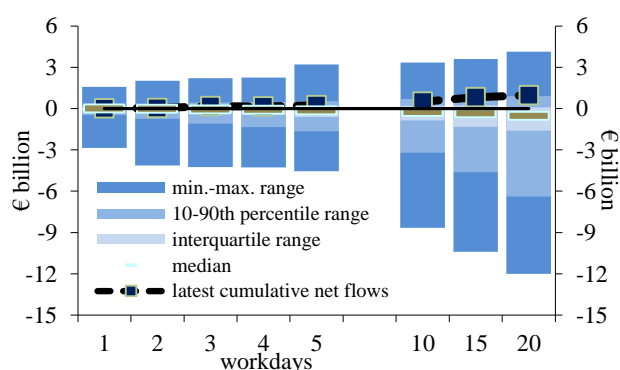
All banks are focused on deposit-gathering strategies from Irish residents (which accounts for 73 per cent of total customer deposits). This has resulted in significant competition for new business. However, as noted in Box 5, many households are using additional savings to reduce debt rather than increase deposit holdings. It is unlikely that in aggregate the domestic banks can significantly increase deposit volumes in the domestic market, given the weak economy.

Much of the competition for deposits has focussed on price, and interest rates on new business for household and non-financial corporate deposits have increased. This is particularly the case in term deposits as banks also attempt to lengthen their maturity profile (Chart 53). Moreover, Chart 54 (and Annex Chart G9) shows that both the upper and lower quartile of the distribution of interest rates on term and redeemable-at-notice deposits have increased significantly, although most rates have recently declined due to the reduction in the ECB policy rate. Competition is also coming from non-domestic banks operating in the Irish market. Overall, despite certain banks gaining new business in some market segments, the large domestic banks constitute the largest portion of new business volumes and the total market.

While it may be rational in the short term for individual banks to increase their deposit rates to gain market share, widespread increases in the costs of deposit funding will erode margins and reduce future earnings capacity of the sector as a whole (Section 3.2.1). Furthermore higher rates may be indicative of riskier business strategies by weaker banks and may require close monitoring.

There has been limited access by domestic banks to debt capital markets and there was no large-value issuance in 2011. Despite the recapitalisation following the FMP, markets continue to link the domestic banks' creditworthiness to that of the Irish sovereign. It is unlikely, therefore, that domestic banks will regain access to debt capital markets until the market perception of domestic sovereign risk improves. With regard to other forms of wholesale

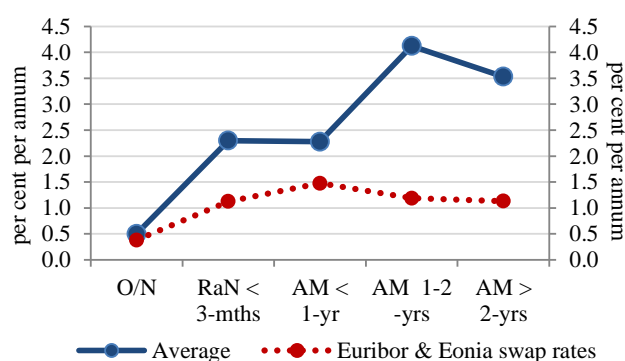
**Chart 52: Domestic banks' net corporate deposit flows**



Source: Central bank of Ireland.

Notes: Data are consolidated and include IBRC. Data are daily and refer to the period March 2010 to 13 March 2012, and includes deposits by non-bank financial intermediaries.

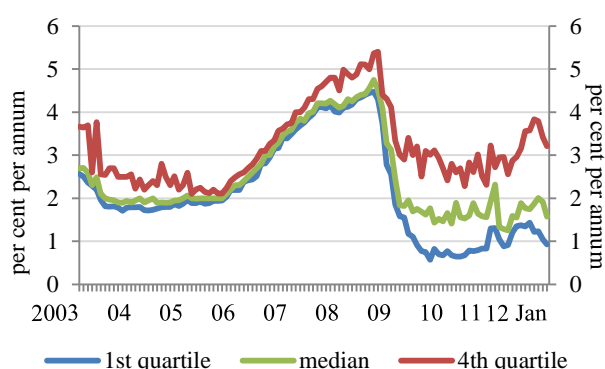
**Chart 53: Household new business rates by maturity vis-à-vis swap/money market rates**



Source: Euribor and Central Bank of Ireland.

Notes: Data relate to business conducted through resident offices of domestic banks which include IBRC. O/N denotes Overnight, RaN Redeemable at Notice and AM Agreed Maturity. Average refers to domestic banks. As at January 2012.

**Chart 54: NFC deposit rates, new business**



Source: Central Bank of Ireland.

Notes: Data relate to business conducted through resident offices of a sample of banks and include IBRC. Rates are a weighted average based on deposit rates (excludes overnight).

funding, two banks have succeeded in engaging in a number of 1- to 3-year repos with international banks.

Despite this recent positive development, in the longer term domestic banks will need to rebalance their funding profiles as soon as market conditions are normalised. As previously mentioned, new liquidity requirements under Basel III and the FMP will have significant implications for their future funding strategy. The two minimum standards under Basel III, the Liquidity Coverage Ratio (LCR) and the Net Stable Funding Ratio (NSFR), will become operational by 2015 and 2018, respectively. A comparative analysis by the BIS found that a sample of internationally active and well-diversified banks had an average LCR of 83 per cent and an average NSFR of 93 per cent indicating some of the challenges for Irish banks.<sup>28</sup> As part of the FMP 2011, liquidity targets were set for the Irish banks to ensure convergence to the Basel III standards over time.

### 3.2.4 BANK CAPITAL AND RESILIENCE

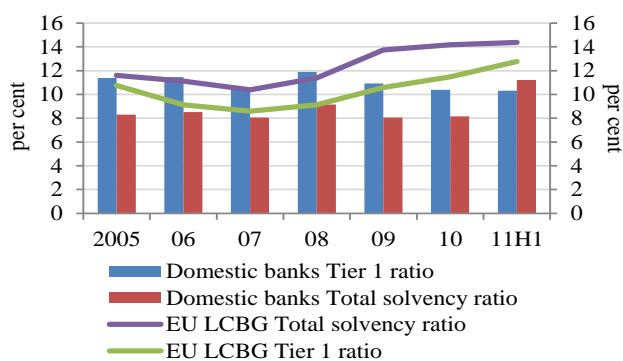
Prior to the FMP recapitalisation exercise, domestic banks' capital and solvency ratios compared unfavourably with euro area peers (Chart 55) as reserves had been steadily eroded by loan losses. However, the very large FMP capital injections and Bank of Ireland's rights issue have had a mitigating effect (Charts 56 and 57). The quality of capital also improved following the injection of equity capital and the exchange of sub-ordinated and hybrid debt for Tier 1 instruments in the Liquidity Management Exercises (LME).

Although the capital injected as part of the FMP included a significant buffer, with some macro variables closer to the stress scenario than the base scenario (Box 2), capital could be eroded more quickly than expected if stresses intensify. Banks face the challenge of generating recurring earnings in an environment of limited ability to re-price tight loan margins and funding cost pressures. In particular, some combination of the factors above and/or a further escalation of the euro area sovereign debt crisis, could lead to greater losses than anticipated during FMP 2011.

It is important to note that a number of one-off

<sup>28</sup> Data refer to a sample of 94 banks within the category of Group 1 banks which had Tier 1 capital in excess of €3 billion, were internationally active and considered well diversified. See: <http://www.bis.org/publ/bcbs186.pdf>.

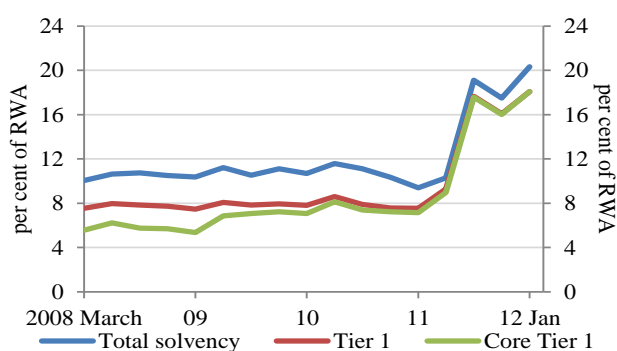
**Chart 55: International comparison of solvency**



Source: Fitch Ratings.

Notes: LCBG is a sample of large and complex banking groups operating in the EU. IBRC excluded from domestic banks from January 2011.

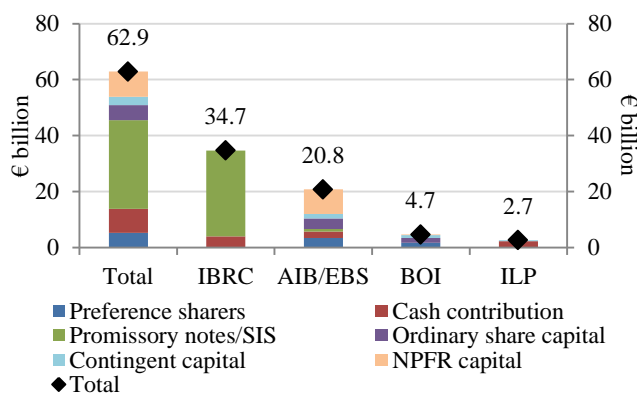
**Chart 56: Solvency ratios, domestic banks**



Source: Central Bank of Ireland.

Notes: Data are consolidated. Core Tier 1 calculated as per FMP guidelines. IBRC excluded from January 2011.

**Chart 57: Government capital injections**



Source: NTMA.

Notes: Data as at January 2012. NPFR capital figure for Bank of Ireland

transactions have also contributed to reserves and capital.<sup>29</sup> However, rebuilding reserves from recurring earnings remains challenging.

The introduction of Basel III capital rules for deferred tax assets (DTA)<sup>30</sup>, expected loss IRB provision shortfall and the exclusion of pension obligation from Common Equity Tier 1 capital pose challenges in the medium term.<sup>31</sup> Preliminary data from the latest Basel III impact study suggest that Common Equity Tier 1 capital ratios for the main domestic banks would fall significantly if Basel III were implemented today rather than in 2019 as proposed. This may present an additional – albeit longer term – strain on domestic banks' capital levels which will need to be addressed.

### 3.2.5 MARKET INDICATORS

A range of forward-looking market indicators reflect the considerable uncertainty surrounding the health of the domestic banking sector.

Chart 58 illustrates one equity market based measure of domestic banks' risk which, although it declined in late-2011, remains much higher relative to the European banks at longer horizons (Annex Chart G10).<sup>32</sup>

An alternative market-based indicator which shows the continued weakness of domestic banks is distance-to-distress (Chart 59). The indicator uses implied asset values to infer the likelihood of distress.<sup>33</sup> Banking sectors in other periphery countries which experienced an increase in default probabilities during 2007/2008, have weakened further.

Similarly, CDS spreads indicate a large degree of uncertainty regarding domestic banks (Chart 60). With the exception of two Greek banks, domestic banks have among the widest CDS spreads in Europe, despite easing in recent months. However, this is related to the triggering of CDS contracts on

<sup>29</sup> For example, on 1 April 2011, AIB completed the sale of its Polish operation BZWBK. The proceeds of the sale amounted to €3.1 billion giving rise to a profit on disposal of €1.5 billion. See: [note 13, AIB interim report 2011](#).

<sup>30</sup> DTAs which rely on future profitability of the bank to be realised should be deducted from capital.

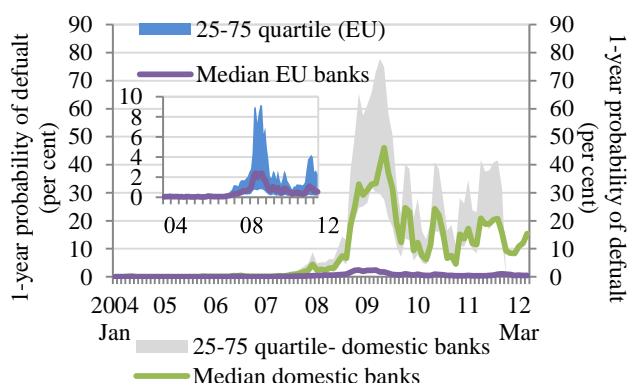
<sup>31</sup> New capital rules will be phased in from 2013. See: [Appendix D of the FMP for summary of details](#).

<sup>32</sup> These market implied measures are a vendor provided estimates based on similar methodology to Jarrow, Robert, and Sunheer Chava, (2004), "Bankruptcy prediction with industry effects", Review of Finance, 8 (4), pp. 537-569.

<sup>33</sup> Based on a Merton option pricing model.

is net of share sale to private investors. SIS refers to special investment shares.

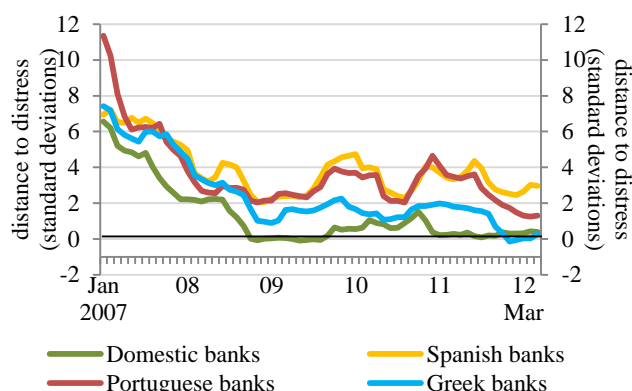
**Chart 58: Unconditional default probabilities implied by equity market prices**



Source: Kamakura and Central Bank of Ireland calculations

Notes: Domestic banks are a time-varying sample of the domestic banks category for which market data are available and include IBRC. EU banks refer to a sample of EU banks for which data are available. Last observation: 14 March 2012.

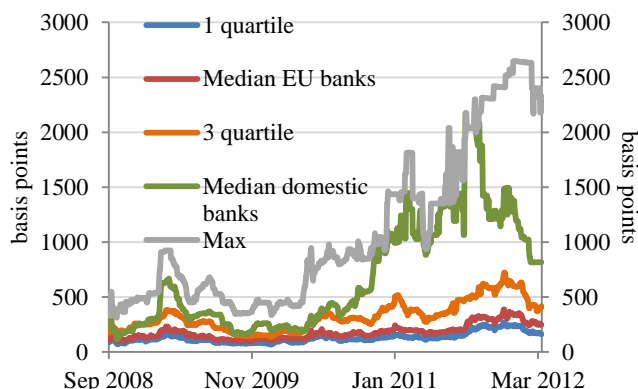
**Chart 59: Median distance to distress measures**



Source: Thomson Reuters Datastream; Thomson Reuters Worldscope and Central Bank of Ireland calculations.

Notes: Distance to distress is a forward-looking indicator of bank failure calculated by applying the Merton model of derivatives pricing to financial institutions. "Domestic banks" are a time-varying sample of the domestic banks category for which market data are available and include IBRC.

**Chart 60: Irish and EU bank sample CDS spreads**



Source: Thomson Reuters Datastream.

Note: Domestic banks are a time-varying sample of the domestic banks category for which market data are available and include IBRC. EU banks

subordinated/senior debt during LMEs.<sup>34</sup>

### 3.2.6 FOREIGN-OWNED RESIDENT BANKS<sup>35</sup>

Foreign-owned resident banks have followed the global trend of consolidation and deleveraging with total assets declining by almost 22 per cent in 2011.

These banks may have benefited from the outflow of deposits from domestic banks. Over the last 18 months Irish non-MFI private-sector deposits at domestic banks have declined by approximately 18 per cent while foreign-owned banks have seen a corresponding deposit increase of 12 per cent. Any continuation of this trend will increase the importance of these foreign institutions in the Irish economy.

A large number of these banks use Ireland as a hub for their international activities. As a result, these international banks with Irish operations account for a large portion of the foreign activity of the Irish banking system (Annex Chart G11).

The composition of their assets reflects the different focus of activity of these banks compared with domestic banks. A much larger proportion of their assets are categorised as financial assets held for trading as opposed to loans (Chart 61).

Unlike domestic banks, foreign-owned banks rely to varying degrees on the support of their parents for liquidity (Chart 62). This reliance on group support may be a channel for shock transmission in the unlikely event of the parent losing market confidence.

Turning to capital adequacy, the overall solvency position of these banks has remained relatively strong throughout the last number of years (Chart 63).

### 3.2.7 CREDIT UNION RESOLUTION

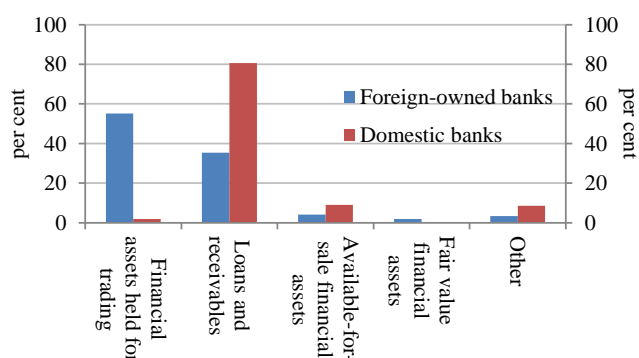
The Central Bank conducted a stress test review of credit unions in 2011 as part of the FMP. This loan book review and stress test for all credit unions enabled an assessment of the likely impact of a given stress scenario on the capital buffers of all credit unions. Where credit unions do not have the financial strength to weather the current difficulties, various options can be followed to reduce risk in the credit union sector. This includes a transfer of engagements of the weak credit union to a strong one.

<sup>34</sup> The auctions for the CDS contracts were settled in February (Anglo/IBRC) and in June/July (AIB, BOI, ILP) and October 2011. See: <http://www.creditfixings.com/CreditEventAuctions/AuctionByYear.jsp?year=2011>.

<sup>35</sup> Foreign-owned banks are subsidiaries of foreign headquartered banking groups with a presence within the State.

refer to a sample of EU banks for which data are available. Last observation: 14 March 2012.

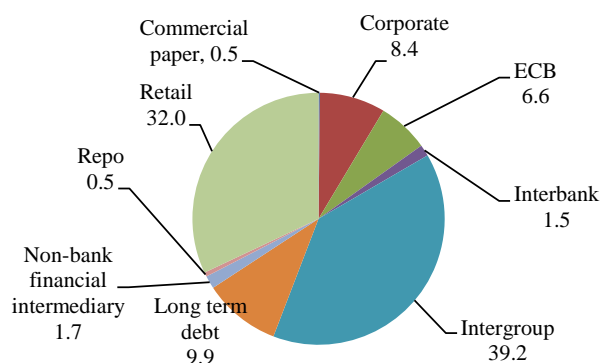
**Chart 61: Asset composition of foreign-owned banks**



Source: Central Bank of Ireland.

Notes: Data are consolidated as at 31 December 2011. Domestic banks include IBRC.

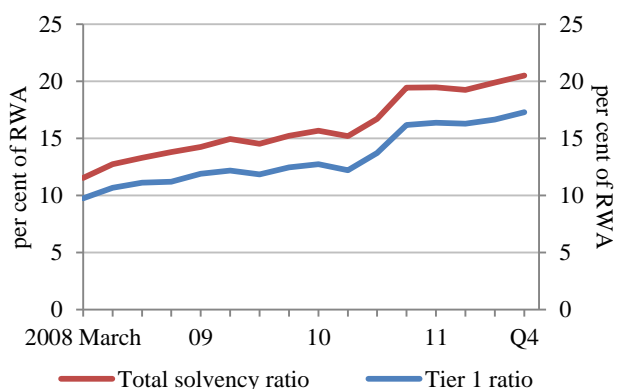
**Chart 62: Foreign-owned banks' - breakdown of funding**



Source: Central Bank of Ireland.

Notes: Data are consolidated as at 31 December 2011.

**Chart 63: Foreign-owned banks' solvency**



Source: Central Bank of Ireland.

Notes: Data are consolidated.

The offices of the transferred credit union remain open and carry on business as usual, albeit under the control of the acquiring entity.

Other tools can also be deployed, through the statutory resolution mechanism, to stand ready to help credit unions falling into financial difficulty. This is important to maintain members' confidence, prevent contagion and protect members' savings.<sup>36</sup>

<sup>36</sup> This mechanism was used in the case of Newbridge Credit Union. See: <http://www.centralbank.ie/press-area/press-releases/Pages/SpecialManagerAppointedtoNewbridgeCreditUnion.aspx>.

## BOX 7: WHAT DRIVES MORTGAGE ARREARS?

Household arrears on payment obligations are a key indicator of household financial distress. Mortgage arrears have been increasing steadily since early-2008. The 90-day plus arrears rate for owner-occupiers stood at 9.2 per cent of mortgages and 12.3 per cent of balances in December 2011.

Understanding what drives mortgage arrears is important for developing policies to address the build-up of arrears in recent years and in order to understand how arrears might evolve in response to changes in the economic and policy environment. One approach to this issue is to use arrears data on a time series or panel basis to study how changes in the arrears rates respond to changes in economic conditions such as unemployment, interest rates and house prices

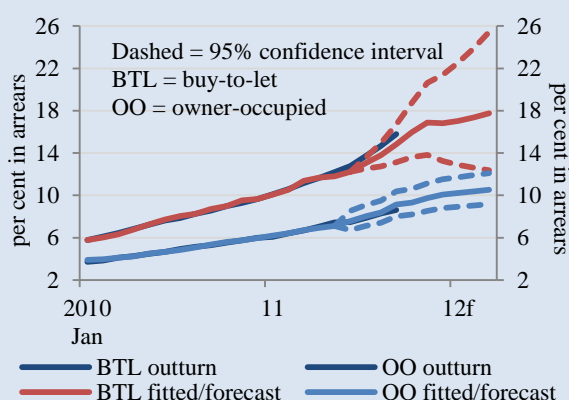
The mortgage arrears data used in this box are unpublished bank-level data aggregated to the market-level over the period September 2007-May 2011. This is because the published official series, available from September 2009, is not of sufficient length for reliable estimation and does not include buy-to-let borrowers. The data used here also differ from the published owner-occupier arrears figures provided by the Central Bank in that it *excludes* impairments. However, a comparison of the two series for the period for which they overlap (September 2009 onwards) shows that the trends are very similar. There is a small difference between the series, accounted for by impairments, and is broadly constant throughout the estimation period.

The first column in Table A shows the results from estimating a long-run model of owner-occupier arrears on unemployment, house prices, interest rates and income gearing. The model is estimated by OLS using data up to end-May 2011. Alternatives, such as ARIMA and Error Correction Models, give similar results (not shown). Chart A shows the fitted values and out-of-sample forecast from the long-run model. The out-of-sample period begins in June 2011, and there are four months of outturn data in 2011 against which to compare model performance. For the forecast period (October 2011 to March 2012) it is assumed that unemployment and interest rates remain at October 2011 levels; house price growth is as per the base case in FMP 2011. The chart shows both the outturn arrears rate and the rate as predicted by the model. The dotted lines in the chart are  $\pm 95$  per cent confidence intervals based on the standard error of the regression only, and their width is reflective of the imprecision of the model.

Chart A and the second column in Table A also show the results from estimating a similar long-run model for buy-to-let mortgages, a segment of the market which accounts for almost one-quarter of all Republic of Ireland mortgage balances. The buy-to-let model is estimated in first differences and includes a lagged dependent variable. In contrast to the owner-occupier model, the inclusion of a lagged dependent variable in the buy-to-let model significantly boosts the accuracy of the (within sample) forecasts. For the forecast, rental rates are held at September 2011 levels.

The models track the evolution of owner-occupier arrears. However, given that the time series is short, and the difficulties with modelling in the current environment, the conclusions can only be regarded as tentative.

**Chart A: Mortgage arrears – outturns and projections**



Source: Central Bank of Ireland.

**Table A: Modelling the 90-days arrears rate**

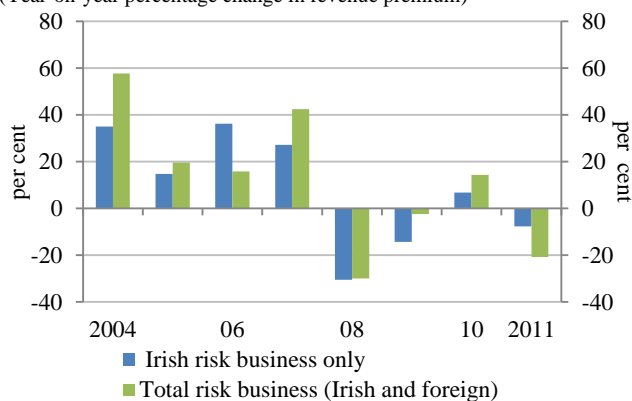
	Owner-occupier	Buy-to-let
Constant	13.078 (15.95)	0.134 (1.32)
House prices (t-3)	-2.689 (15.08)	0.542 (0.40)
Interest rates (t-3)	0.539 (7.37)	0.573 (3.04)
Unemployment (t-3)	1.039 (13.27)	1.214 (3.50)
Rental rates (t-3)		-0.094 (-0.28)
Arrears (t-1)		0.469 (3.64)
R-sq., Observations	0.99, 45	0.57, 44
Sample period	Sep 2007 – May 2010	Sep 2007 – May 2010

Source: Central Bank of Ireland.

Notes: The model is log-log. The house price variable is the log of the CSO house price index. t-statistics in parentheses.

**Chart 64: Premium growth of life sector**

(Year-on-year percentage change in revenue premium)



Source: Central Bank of Ireland.

Notes: The chart is constructed from a sample of major Irish life insurers.

### 3.3 THE INSURANCE SECTOR AND OTHER FINANCIAL INSTITUTIONS

*This section provides an overview of risks to the insurance sector in Ireland arising from: continued fluctuating premium growth; the effect of sovereign distress on portfolio valuation and counterparty risk resulting from banking sector contagion.*

*The section also considers risks stemming from money market funds. A continued reduction in their exposure to Europe will impact European and domestic banks' access to short-term market-based funding.*

#### 3.3.1 INSURANCE SECTOR

##### 3.3.1.1 PREMIUM GROWTH

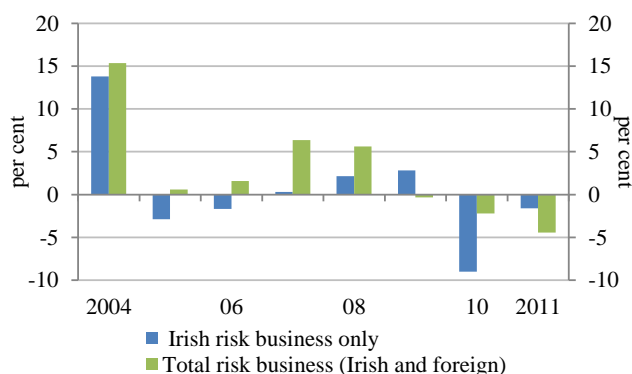
The continuation of a challenging economic environment may exert downward pressure on business written in Ireland. The large presence of international insurers may also leave the sector vulnerable to slowdowns in the euro area and US economies (also see Section 2.1). Premium growth tends to be linked to trends in the overall economy and as a result, underwriting income may remain subdued (Charts 64 and 65).

Premium growth in the life sector has fluctuated in recent years (Chart 64). This is not unexpected as consumer spending on life products is relatively discretionary. The rate of policy surrenders has been rising (Annex Chart H5) resulting in actual cash outflows for firms and some increased pressure on underwriting profitability.

Furthermore, for life insurance firms that provide guaranteed products, the current low bond yields make it difficult to match pledged liabilities (Chart 66). The market for guaranteed or variable annuity products is negligible domestically; however, Ireland has developed as a hub for insurance products sold in Europe and Irish located subsidiaries employ various strategies to manage the cost of their guarantees.<sup>37</sup> Implementing a bond/equity delta hedge is one of the most common methods for hedging variable annuities guarantees. However, this strategy leaves the insurer exposed to high levels of volatility, and additional

**Chart 65: Premium growth of non-life sector**

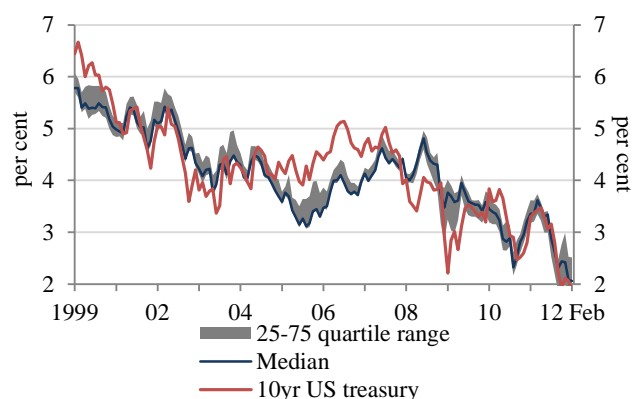
(Year-on-year percentage change in net earned premium)



Source: Central Bank of Ireland.

Notes: The chart is constructed from a sample of major Irish non-life insurers.

**Chart 66: Yields on highly rated sovereigns**

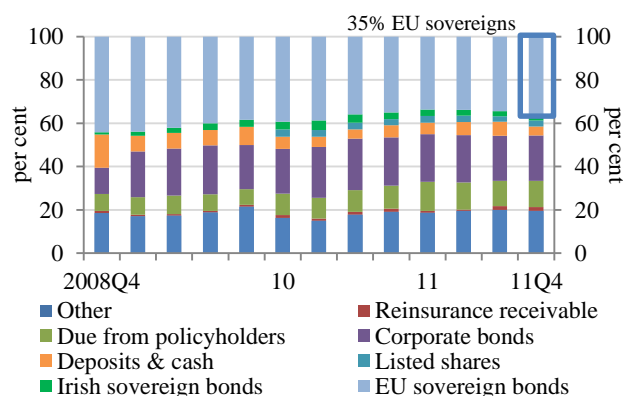


Source: Bloomberg.

Notes: Chart is constructed using 10yr generic bid yields for S&P AAA rated sovereigns and 10yr US Treasuries.

<sup>37</sup> Guidance on these products was issued by the Central Bank of Ireland in December 2010: [“Requirements on Reserving and Risk Governance for Variable Annuities”](#).

**Chart 67: Insurer asset allocation**

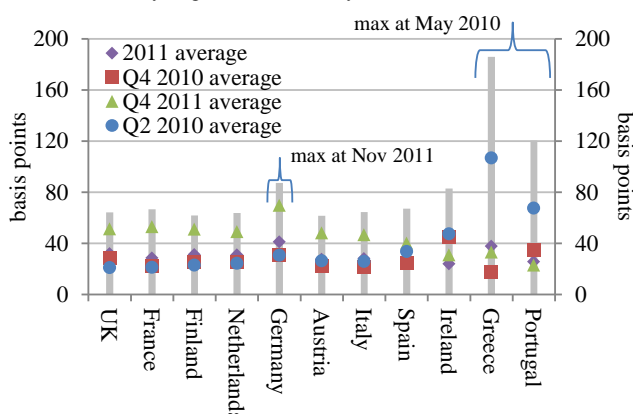


Source: Central Bank of Ireland.

Notes: This chart is constructed from a sample of major non-life insurers.

**Chart 68: Sovereign bond yield volatility**

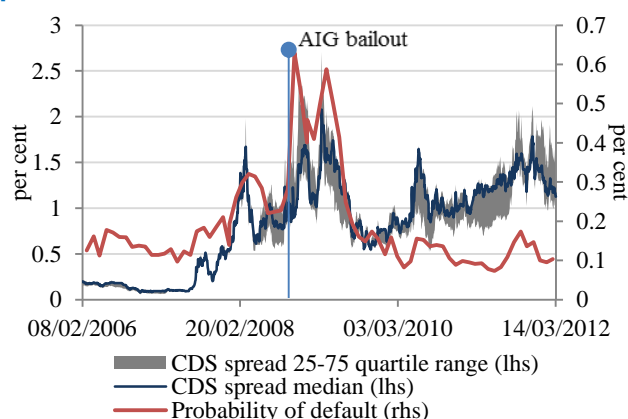
(Realised volatility of government bond yields, 01 Jan 2010- 23 Feb 2012)



Source: Bloomberg.

Notes: Volatility calculated on the annualised 20-day standard deviation of the per cent change in zero coupon 10yr government bond yields. Grey bars represent the maximum 20-day realised volatility for the period.

**Chart 69: CDS spreads and unconditional probabilities of default**



Source: Bloomberg and Kamakura.

Note: This chart is constructed from a sample of major quoted insurers.

Last observation: 14 March 2012.

option-based hedges to cover these risks may become more expensive if market volatility remains elevated.

### 3.3.1.2 SOVEREIGN AND STRUCTURAL RISK

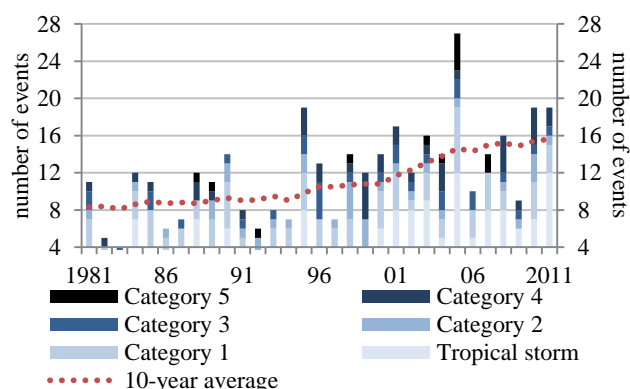
Government bonds constitute a significant proportion of the assets held by non-life insurers (Chart 67). Further deterioration in credit quality or a default of a peripheral euro sovereign is an important risk and could impact directly upon insurers' balance sheets in different ways. As insurance firms in Ireland are already marking-to-market assets, much of this risk is already accounted for. However, insurers must maintain sufficient capital to absorb any losses on these assets, which have displayed heightened volatility over the past two years (Chart 68). Euro area-related sovereign risk has also led to an increase in CDS spreads of parent companies of Irish domiciled insurers and unconditional probabilities of default over recent months (Chart 69). In January 2012, S&P downgraded numerous European insurers and left many others on negative watch, reflecting the effects of the sovereign debt crisis. Overall, however, the level of credit risk implied in absolute terms remains significantly lower than for most European banks and some sovereigns.

Contagion stemming from the euro area sovereign debt crisis could also affect insurers through the banking sector, as banks are key counterparties for hedge-related trades, including interest rate, currency and inflation swaps. The destabilising effect of continued sovereign stress may therefore impact the credit quality and value of an insurer's hedged positions. However, the quality of margin and collateral posted for these positions should help to mitigate this.

Another possible consequence of the low yield environment is increased interconnectedness between banks and insurers via the use of liquidity swaps. These transactions provide an enhanced yield to insurers in return for the loan of high quality assets to banks. Such positions present the possibility of regulatory arbitrage and may increase wrong-way risk. The latter refers to a situation when exposure to a counterparty is adversely correlated with the credit quality of that counterparty.<sup>38</sup> This could potentially

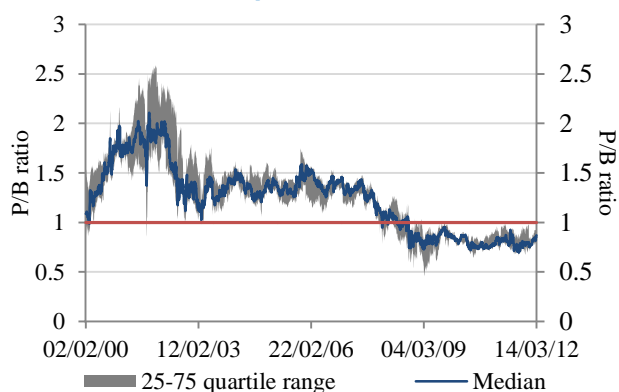
<sup>38</sup> In a liquidity swap, because collateral is the main credit risk mitigant at default, the extent of correlation between the collateral and the credit quality of the bank is extremely important.

**Chart 70: Hurricane frequency and intensity**



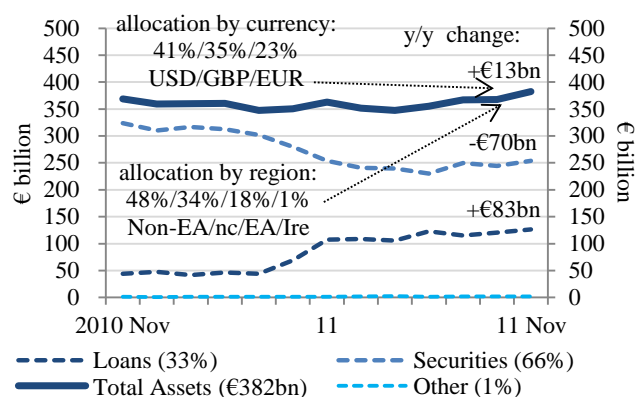
Source: National weather service, US National hurricane centre.  
Notes: This chart is constructed for Atlantic storms and illustrates a trend observed in one type of catastrophe event.

**Chart 71: Reinsurer price-to-book ratio**



Source: Bloomberg.  
Notes: Average of ten large global reinsurers. A P/B < 1 may indicate the market believes the firm's equity values are over stated. Last observation: 14 March 2012.

**Chart 72: Irish resident money market funds**



Source: Central Bank of Ireland.  
Notes: 'nc' indicates not classified. 'Securities' refers to 'securities other than shares'. Shift in allocation from 'securities' to 'loans' over 2011 due to reclassifications rather than active changes to asset allocation.

increase the risk of contagion from the banking sector.<sup>39</sup>

### 3.3.1.3 CATASTROPHE RISK

The high number of natural catastrophe events in 2011 affected the profitability of the reinsurance sector globally, including firms located in Ireland. Over the past 20 years, the frequency of some types of natural catastrophe events has risen (Chart 70).<sup>40</sup> This may create difficulty in accurately pricing the risk being assumed. Major natural catastrophes affect profitability and ultimately capital adequacy. However, this is counterbalanced by improved modelling of the insured risk and possibly excess capitalisation. Reinsurers remain highly rated, and CDS spreads and default probabilities are low at present. In the unlikely event that a global reinsurer should fail, a significant replacement cost to an individual insurer could result, particularly where the defaulting company has a significant share of the Irish market. The combined effects of these pressures and investment asset performance have resulted in reinsurers' equity multiples trading at historically low levels, with average share prices currently below book value (Chart 71).

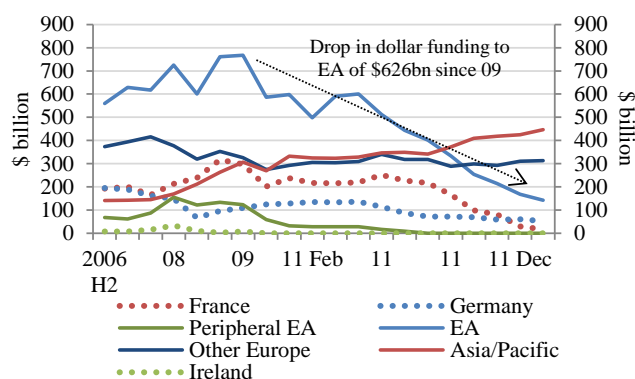
### 3.3.2 MONEY MARKET FUNDS

In contrast to developments in the domestic banking sector, total assets under management (AUM) of Irish resident money market funds (MMFs) amounted to €382 billion as of November 2011, an increase of 3.7 per cent year-on-year (Chart 72). There are two notable features regarding Irish MMFs that are important for macro-financial risk analysis. First, the dominant investors are non-euro area residents, holding 79 per cent of AUM (November 2011), with euro area and Irish investors holding 14 per cent and 5 per cent, respectively. Second, most of the investment in assets by MMFs is made outside of Ireland. In terms of asset allocation, investments in securities issued by non-euro area residents, at 48 per cent of AUM, remained the largest allocation, with 18 per cent of AUM invested in securities issued by euro area residents and only 0.7 per cent in Irish resident issuers. This is reflected in the currency composition of assets, with the US dollar and sterling ranking ahead of the euro. Focusing on allocation by

<sup>39</sup> This topic is currently the subject of supervisory attention in some jurisdictions including Ireland. Recently, the FSA issued a guidance consultation document on the use of liquidity swaps.

<sup>40</sup> See: [Munich RE's, \(2011\), "Half-year Natural Catastrophe Review USA", 12 July.](#)

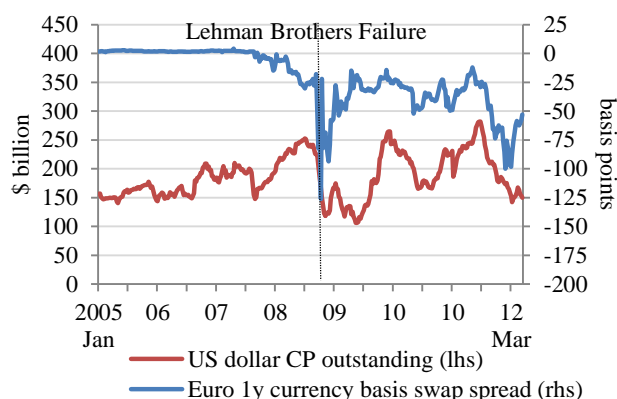
**Chart 73: US MMF exposure to non-US financial institutions**



Source: Fitch Ratings, Investment Company Institute (ICI), Central Bank of Ireland.

Notes: Chart shows estimated value of US MMF exposure to non-US institutions, estimated using Fitch and ICI data. Break in frequency of observation from 6 monthly to monthly at end 2010.

**Chart 74: US dollar CP issuance by non-US institutions and cross currency basis swap spreads**



Source: Bloomberg.

Notes: Data starts on Jan 1 2005 and ends on Feb 29 2012. US dollar commercial paper (CP) issuance and euro vs. US dollar currency basis swap spread considered indicative of the availability of USD funding to non-US markets.

instrument shows that 66 per cent of AUM is invested in securities, which includes commercial paper and debt securities, while 33 per cent is invested in loans, which includes deposits and repurchase agreements.

More broadly, MMFs play an important role as providers of liquidity to banking systems in the euro area. The main domestic banks have lost their prime short-term commercial paper ratings, curtailing issuance of commercial paper to MMFs. However, MMFs continue to provide liquidity to other euro area banking systems.

For example, US-based MMFs have traditionally been an important source of US dollar funding for euro area banks, some of which are important counterparties for domestic banks and insurers. However, since the second half of 2009, amidst concerns regarding sovereigns and banks in the euro area, US MMFs have reduced their euro area exposure. Initially this trend most impacted banks in 'peripheral' economies, but over 2011 it increasingly affected banks in 'core' economies (Chart 73). This significant decrease in dollar funding resulted in increasing stress in dollar funding markets in Europe (Chart 74). To compensate for this loss of dollar funding, euro area banks turned to the currency basis swap market. However, this shift into the basis swap market resulted in a significant widening of the euro versus dollar basis swap spread over H2 2011, raising the cost of this funding and raising sustainability issues. US dollar swap lines, established between the ECB and the Federal Reserve on 30 November 2011, have alleviated strains to some degree, but the dollar funding environment remains challenging.

At present, MMFs in both the US and Europe are cautious regarding their exposure to euro area banks. As part of this repositioning, MMFs have increased their allocations to secured lending and to US Treasuries and have rebalanced allocations within Europe to highly-rated issuers. The MMF industry in general faces challenges in 2012, including pressure on commercial viability due to low interest rates, a declining pool of highly rated investment assets and likely regulatory changes.

Overall, the reluctance of US-based institutions to provide dollar funding to European institutions, combined with rating downgrades of issuers, if it continues, may also change the structure of both assets and liabilities of European banks and may increase reliance on central bank or secured funding.

## 4 CONCLUSIONS

This review has provided a systematic overview of macro-financial developments in Ireland and forms part of the Bank's internal analysis of financial stability risks. It identifies two areas of particular concern: the effect of the unwinding of domestic imbalances, in particular the deflation of the property bubble, and sovereign risk.

To support policy formulation, further analytical work is planned in the following areas:

### **Debt restructuring and deleveraging**

At present, more information is needed on the economic characteristics of personal or SME/corporate borrowers to assess how these groups of borrowers can manage their debt burden. This is because most of the information available within the Bank at present is based on loan level information which often does not include some of these vital details. While significant work had been undertaken for Financial Measures Programme (FMP) 2011 on residential mortgages, this now needs to be extended to other loan portfolios including SME/corporate and unsecured personal lending. This work will inform FMP 2012. Some key priorities are:

- Continue to develop an understanding of arrears and distressed borrower characteristics and

contribute to improving the understanding of loan losses.

- Conduct a survey of households to determine the characteristics of a sample of households including those in or potentially at risk of distress. Further analyse the impact of aggregate household saving and investment trends.
- Analysis of SME/corporate creditworthiness based on firm level information.

### **Assessment of sovereign and financial sector spill-over risk**

This work has two main strands and may involve:

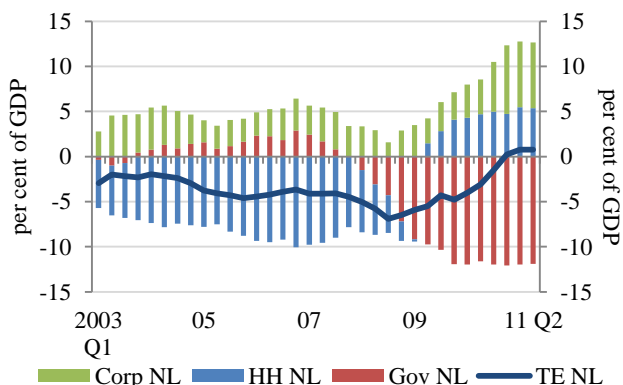
- Improving tools available for evaluation of banking/insurance sector and sovereign risk, including the quantification of spill-over risks between sovereigns.
- Developing indicators of interconnectedness of the domestic banking system with other banking systems through the analysis of interbank data. This will assist in macro-financial surveillance through identifying key interbank nodes or relationships as well as deepening the analysis of developments in the financial system.

## STATISTICAL ANNEX

## ANNEX

### MACRO OVERVIEW CHARTS

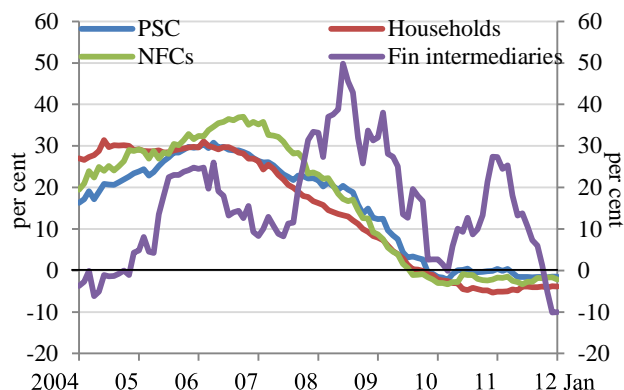
**Chart B1: Irish sectoral net lending/borrowing**



Source: CSO and Central Bank of Ireland calculations.

Notes: Corp is corporate; HH is household; Gov is General Government; TE is total economy. Data adjusted to remove the impact of bank support measures on reported net lending.

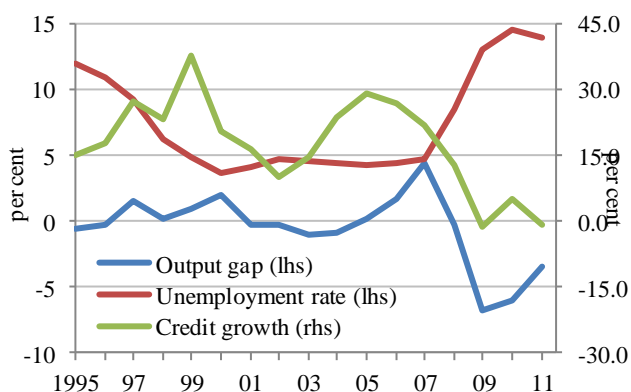
**Chart B2: Change in private sector credit**



Source: Central Bank of Ireland.

Notes: Data adjusted for writedowns and includes securities.

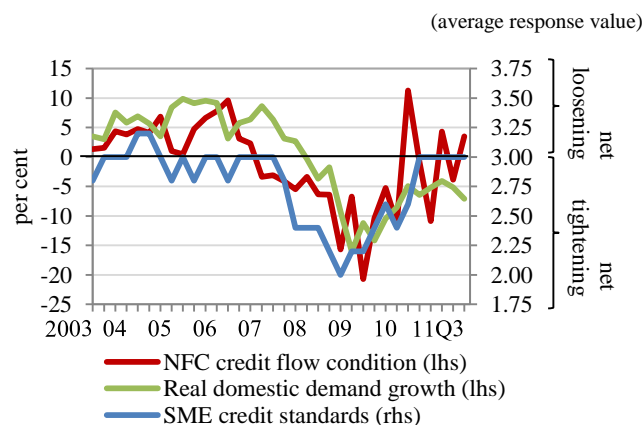
**Chart B3: Unemployment, credit and output**



Source: CSO and Central Bank of Ireland.

Notes: Output gap measured as a percentage of potential GDP, unemployment rate measured to September 2011.

**Chart B4: Credit flows, changes in credit standards and domestic demand**



Source: CSO and Central Bank of Ireland.

Notes: Credit flow condition (CFC) is calculated as the quarterly change in the flow of credit as a percentage of quarterly GDP. Regarding credit standards, a response less than 3 denotes a tightening of credit standards since the last quarter, a response equal to 3 indicates unchanged credit standards, and a response greater than 3 denotes an easing of credit standards (Bank Lending Survey).

## SECTOR LEVEL DEBT AND DELEVERAGING: CROSS COUNTRY ANALYSIS

This annex presents the methodology, underlying input data and preliminary conclusions of the sector level cross country analysis of debt and deleveraging presented in Chart 1 of Section 2.1. The focus of some of the recent policy measures in the euro area has been on fiscal balances. From a macroprudential perspective, a wider set of measures to detect imbalances in economies needs to be considered. Indeed, this has been recognised by the EU in terms of the enhanced economic and financial surveillance approach which will be applied in future to Member States.<sup>1</sup> A wide variety of information on debt levels and debt service, and related information on balance sheet strength, is useful for macroprudential risk assessment. The level of total economy-wide debt, and the debt burden of different sectors of an economy, is important for a number of reasons. High levels of debt may constrain aggregate demand and output growth as the economy undergoes deleveraging.<sup>2</sup> High levels of debt may present a risk to a country's financial system, as heavily indebted borrowers may have a greater risk of default.<sup>3</sup> In addition, the level of sovereign debt is a determinant of the sovereign financing costs. Finally, high levels of debt may have negative supply side consequences, as highly indebted firms cut back on investment, and as highly indebted households become more risk averse.<sup>4,5</sup>

To summarise these various measures, several approaches are possible. One such approach is a sector level cross country analysis (Figure A). This allows a large amount of information, on individual institutional sectors (the main sectors of the economy classified by the type of institution in the sector) within an economy, and on different economies, to be summarised in an easy-to-interpret tabular format. The data used in the construction of the table are outlined below. Each column in the table relates to a different country. The rows relate to institutional sectors and, within each institutional sector, to measures of debt and deleveraging. These measures are similar across sectors, but may differ slightly in definition to ensure the most relevant measures for each sector are used. Each cell in the table therefore relates to a particular economy, a particular sector within that economy, and a particular measure within that sector. Each of these cells is then compared to the values for other countries and ranked into quartiles according to the risk of the country on the measure in question. Higher debt levels, fiscal deficits, lower levels of financial wealth, higher interest repayment burden ratios, higher levels of MFI liabilities to GDP, less positive/more negative current account and international investment positions, and lower levels of realised deleveraging are considered higher risk. The cells are coloured based on this classification by risk, with higher risk cells coloured red and lowest risk green. Countries are then ranked overall based on their risk profile across sectors and measures. One drawback of this approach is that it shows relative rankings compared to peer economies, while absolute levels of debt matter for individual countries' debt sustainability. This is particularly relevant now, as many peer economies also have high debt levels. Absolute values of these measures are also used for surveillance and are included in the statistical annex.

**Figure A: Sector level debt and deleveraging cross country analysis**

		Country
HH (Household sector)	Debt	Household debt to GDP ratio
	Debt Interest	Household net interest payments to disposable income ratio
	Bal. Sheet	Household net financial wealth to GDP ratio
	Deleveraging	Year-over-year change in household debt to GDP ratio
Gov (General government sector)	Debt	Government debt to GDP ratio
	Deficit	Government fiscal balance to GDP ratio
	Debt Interest	Government gross interest payments to government revenue ratio
	Bal. Sheet	Government net debt to GDP ratio
NFC (Non-financial corporate sector)	Debt	NFC debt to GDP ratio
	Debt Interest	NFC net interest payments to gross operating surplus (profits) ratio
	Deleveraging	Year-over-year change in NFC debt to GDP ratio
MFI (Monetary financial institution sector)	Liabilities	MFI total liabilities to GDP ratio
	Liab. Growth	Year-over-year growth rate of MFI liabilities
TE (Total economy)	IIP	International investment position to GDP ratio
	Cur. Acc.	Current account balance to GDP ratio

Source: ECB, IMF, OECD, CSO, National Sources, Fitch Ratings, Central Bank of Ireland, External Debt Hub.

Notes: Latest period available for each measure is used – predominantly Q1/Q2 2011 for all measures and countries, bar interest repayment burden measures which relate to 2010. Peer group is Austria (AT), Belgium (BE), Germany (DE), France (FR), Finland (FI), Greece (GR), Spain (ES), Portugal (PT), Italy (IT), Netherlands (NL) and the United Kingdom (UK). Net financial wealth equals financial asset holdings minus financial liabilities. Gross interest repayment burden equals interest paid to income. Net interest repayment burden equals interest paid minus interest received to income. Government net debt equals government debt minus government financial assets. International investment position (IIP) equals the net balance of a country's external assets (resident claims on non-residents) and liabilities (non-resident claims on residents).

In a relative ranking of Ireland versus other euro area countries and the UK, despite the deleveraging that has taken place since the start of the crisis, Ireland is one of the most leveraged in terms of debt levels. For example, based on a BIS working paper, Ireland significantly exceeds what the BIS had found as ‘healthy’ debt levels beyond which debt is a drag on growth.<sup>1</sup> Overall, Households and the General Government sector have particularly high debt levels compared to peers, and interest repayment burden ratios are higher than peer economies. The picture is more mixed for NFCs, with high aggregate NFC debt levels concentrated in certain property related sectors. The NFC sector aggregate data, as they are based on standard national accounting conventions, includes both Multi-National Corporations (MNC) and Irish firms, which cannot be disaggregated at present, and thus complicate the interpretation of the data. A further complication relates to aggregate sector level interest repayment burdens. The Irish NFC sector interest repayment burden is currently low by international standards. However, this may be due in part to a particular type of adjustment related to the measurement of financial services<sup>6</sup>. Irish households and the NFC sector are undertaking significant efforts to deleverage, and have reduced debt levels in the past few years. However, the actual effect in terms of lowering debt to GDP/income ratios has not yet been significant for the household sector due to the fact that GDP/income has fallen significantly over recent years. The General Government sector, however, continues to accumulate debt, though significant fiscal adjustment has taken place to bring public finances back in line. The overall household sector balance sheet is in a weaker position than other peer economies, as households have lower levels of financial assets relative to GDP. The high debt levels of the institutional sectors is reflected in external measures, with a negative net international investment position. However, the current account position is close to balance, in contrast to other ‘peripheral’ economies.

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<sup>1</sup> [European Commission \(2011\), “Scoreboard for the Surveillance of Macroeconomic Imbalances”, Commission Staff Working Paper](#). This surveillance will focus on imbalances including current account balances, international investment positions, competitiveness, credit growth, sectoral debt and interest repayment burden ratios (households, non-financial corporations as well as government).

<sup>2</sup> [Cecchetti S., M. Mohanty and F. Zampolli \(2011\), “The Real Effects of Debt”, Bank for International Settlements Working Paper 352](#).

<sup>3</sup> Rogoff K. and C. Reinhart (2010), “This Time is Different”, Princeton University Press.

<sup>4</sup> [McKinsey & Company \(2011\), “Debt and Deleveraging: The Global Credit Bubble and its Economic Consequences”, McKinsey Global Institute Report](#).

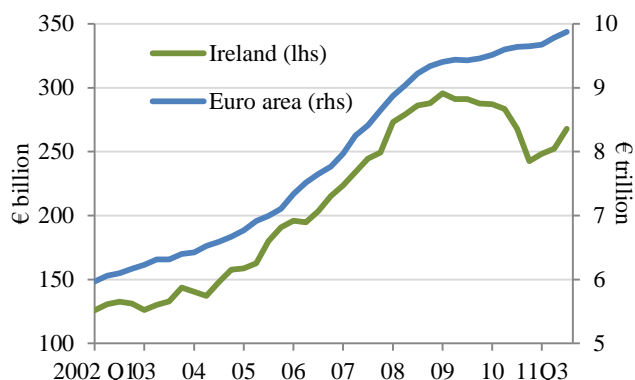
<sup>5</sup> [IMF \(2011\), “Global Prospects and Policies”, Chapter 1 World Economic Outlook, September](#).

<sup>6</sup> The interpretation of national accounts measures of interest paid and received by institutional sectors is complicated somewhat by adjustment for Financial Intermediation Services Indirectly Measured (FISIM), which has been volatile in recent years. See: [Central Statistics Office \(2011\), “National Income and Expenditure 2010”, pp. 36](#).

## ANNEX

### NON-FINANCIAL CORPORATE SECTOR CHARTS

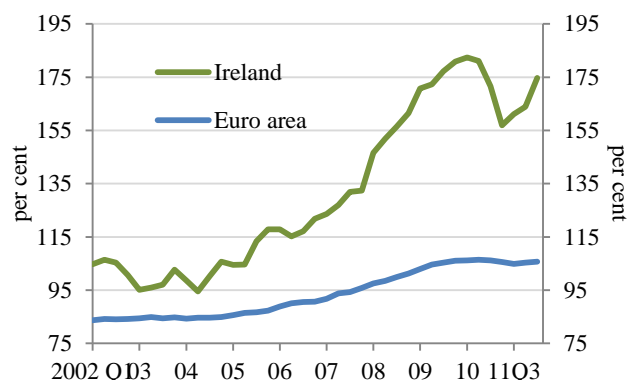
**Chart C1: Irish and euro area NFC debt**



Source: ECB and Central Bank of Ireland.

Notes: Series are for the aggregate NFC sector which includes multinational and domestic firms.

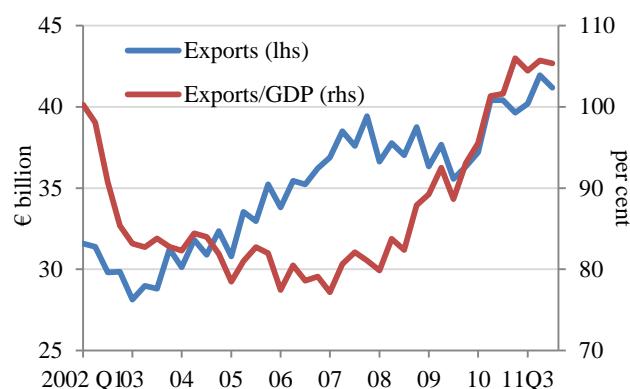
**Chart C2: Irish and euro area NFC debt as a share of GDP**



Source: ECB and Central Bank of Ireland.

Notes: Series are for the aggregate NFC sector which includes multinational and domestic firms.

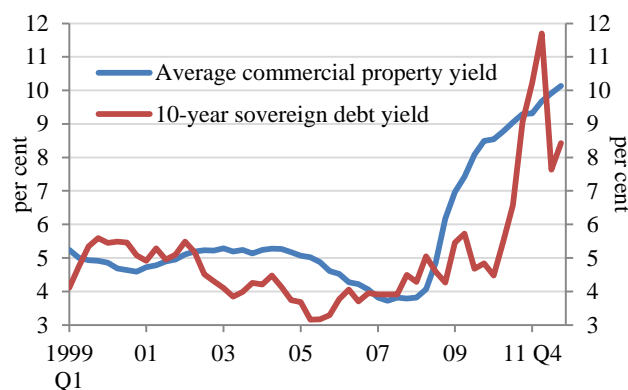
**Chart C3: Irish exports**



Source: ECB and Central Bank of Ireland.

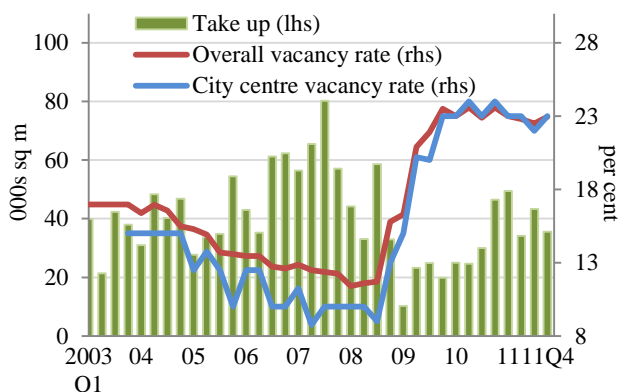
Notes: Series not seasonally adjusted.

**Chart C4: Irish rental yields and sovereign yields**



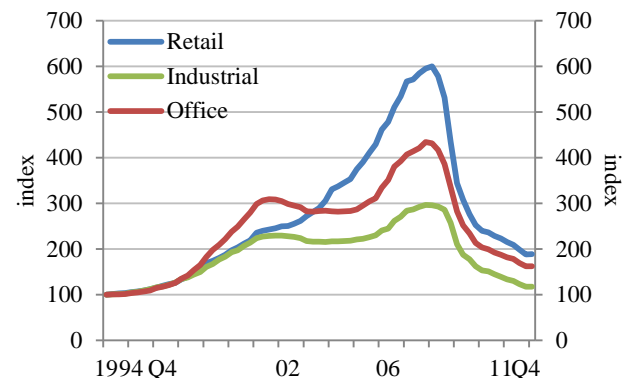
Source: SCS/IPD and Bloomberg.

**Chart C5: Dublin office market activity**



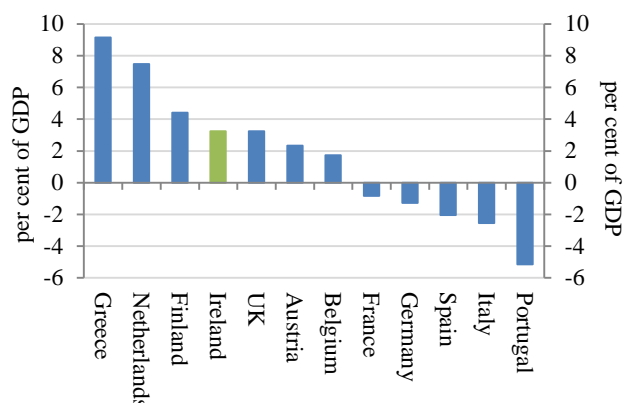
Source: CBRE MarketView Dublin Office, 2011 Q4.

**Chart C6: Commercial property – capital value index by sector**



Source: SCS/IPD.

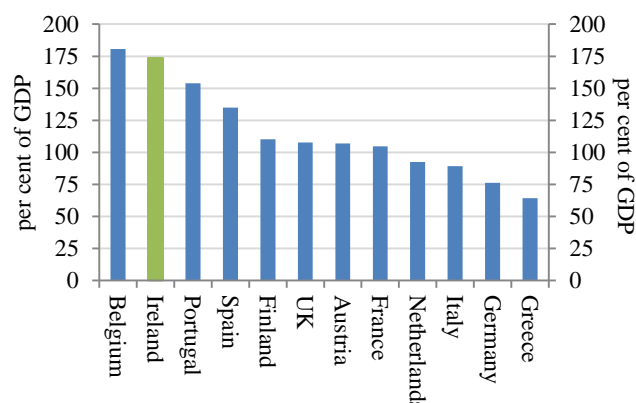
Chart C7: NFC net lending



Source: ECB and CSO.

Notes: NFC net lending equals NFC saving minus NFC investment. Annual data for 2010.

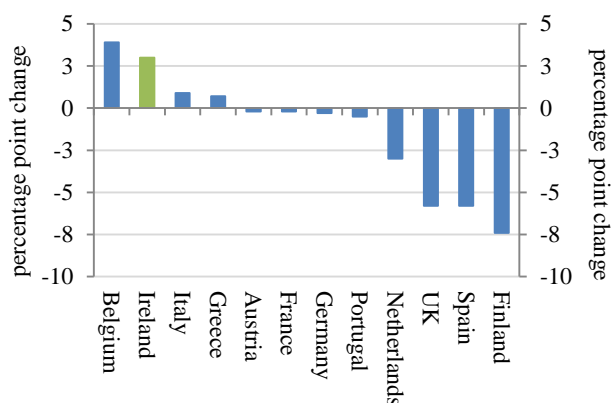
Chart C8: NFC debt to GDP



Source: ECB and Central Bank of Ireland.

Notes: NFC debt includes all debt liabilities – short term debt and long term debt. Data as at 2011Q2.

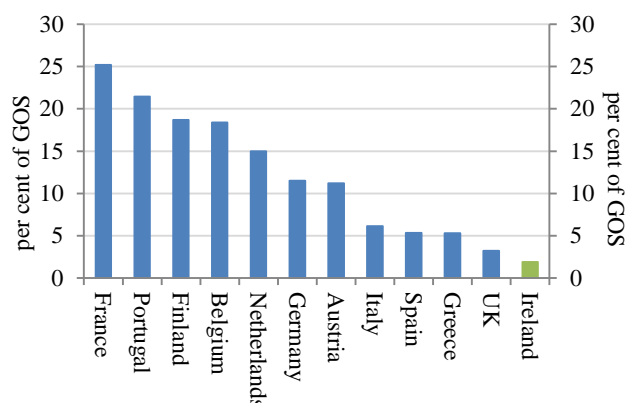
Chart C9: NFC deleveraging



Source: ECB and Central Bank of Ireland.

Notes: Chart shows percentage point change in NFC debt to GDP ratio between 2010Q2 and 2011Q2.

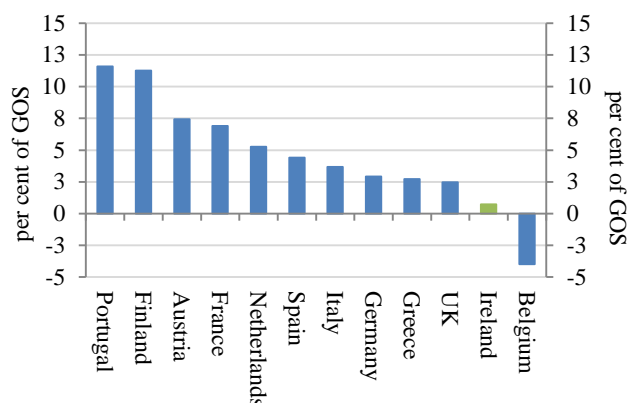
Chart C10: NFC interest repayment burden



Source: ECB and CSO.

Notes: Gross interest payment burden equals interest payments to gross operating surplus (GOS). Gross operating surplus is a national accounts measure of corporate profits. Annual data for 2010.

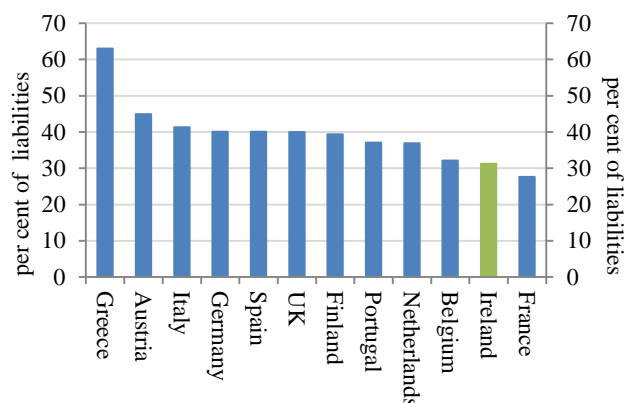
Chart C11: NFC net interest repayment burden



Source: ECB and CSO.

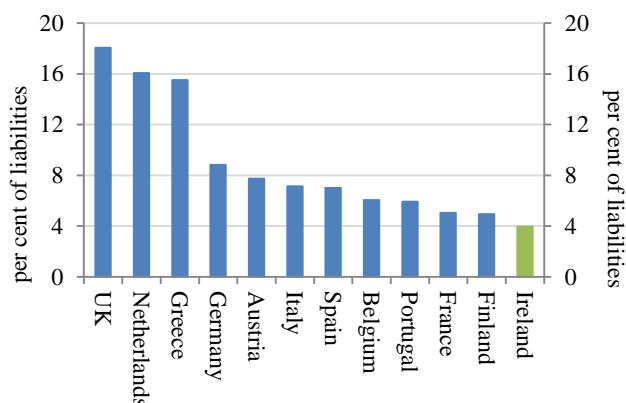
Notes: Net interest payment burden equals interest payments minus interest receipts to gross operating surplus (GOS). Annual data for 2010.

Chart C12: NFC debt to total financial liabilities



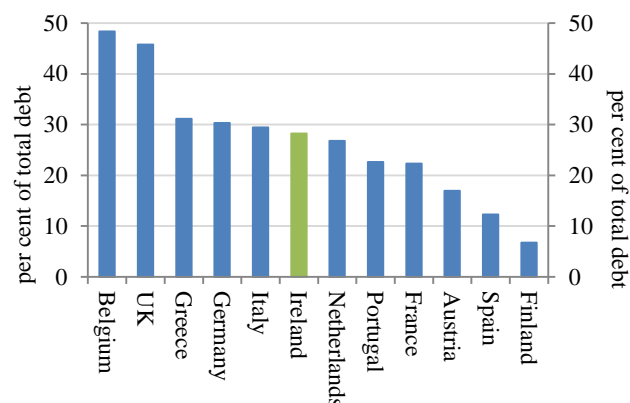
Source: ECB and Central Bank of Ireland.

Notes: Debt liabilities as a proportion of all liabilities, including equity. Data as at 2011Q2.

**Chart C13: NFC cash holdings to total liabilities**

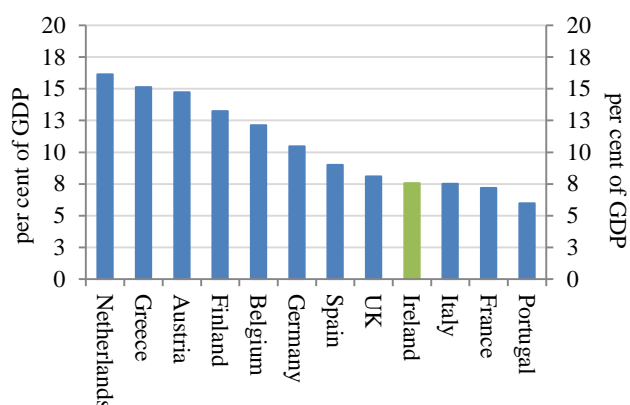
Source: ECB and Central Bank of Ireland.

Notes: Cash holdings to total liabilities may be indicative of NFC funding/liquidity risk. Data as at 2011Q2.

**Chart C14: NFC short term debt to total debt**

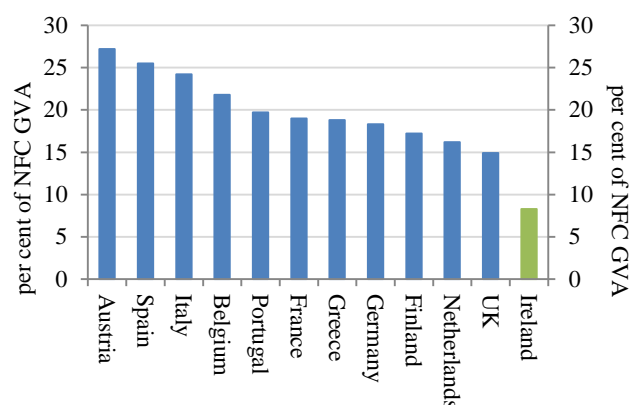
Source: ECB and Central Bank of Ireland.

Notes: Short term debt is debt with a time to maturity of less than one year. Data as at 2011Q2.

**Chart C15: NFC saving**

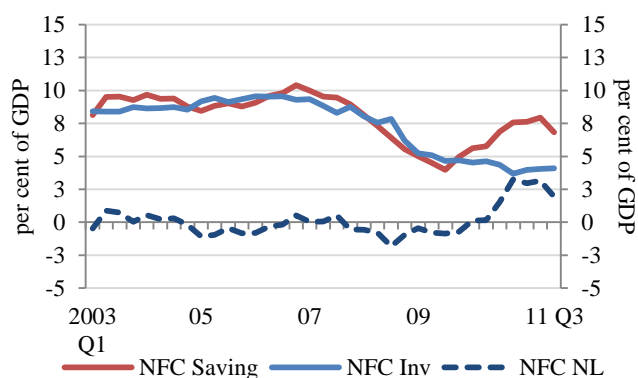
Source: ECB and Central Bank of Ireland.

Notes: Annual data for 2010.

**Chart C16: NFC investment**

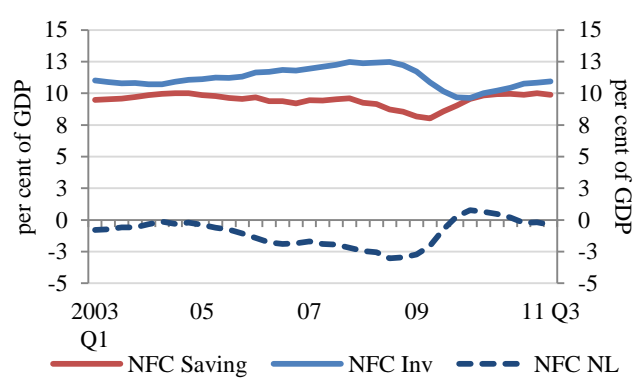
Source: ECB and Central Bank of Ireland.

Notes: Investment is NFC fixed capital formation. GVA is gross value added. Data as at 2011Q2.

**Chart C17: NFC saving, investment and net lending: Ireland**

Source: CSO.

Notes: Saving is disposable income minus consumption. Investment is fixed capital formation. Net lending is saving minus investment. Values are 4-quarter moving average.

**Chart C18: NFC saving, investment and net lending: euro area**

Source: ECB.

Notes: See chart C17.

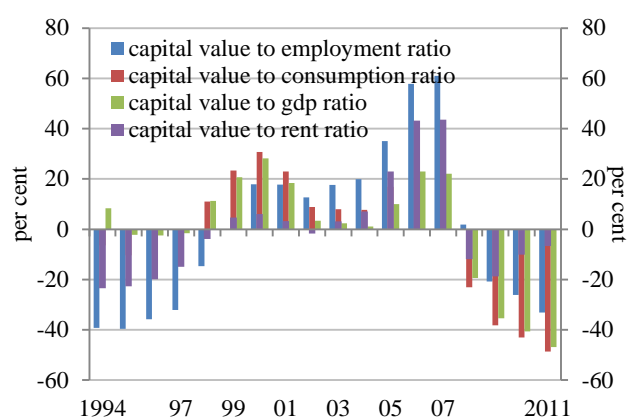
## POTENTIAL MISALIGNMENT IN COMMERCIAL PROPERTY VALUES RELATIVE TO MACROECONOMIC VARIABLES.

Commercial property values tend to follow the economic cycle. Therefore, looking at economic variables might provide an insight into misalignments in property values. This approach has been used by the ECB in its December 2011 FSR (see [Box 6 – page 44](#)). Apart from standard measures of prices, rents, and yields, it may be possible to gauge misalignment by comparing property values with macroeconomic variables which might be expected to have a bearing on property demand (e.g. GDP, employment, consumption). Misalignment at each point in time is measured as the deviation in the current level of each indicator from the average level over the sample period (1994-2011).

Charts A and B below show the level of misalignment suggested by these indicators for Ireland. Chart A shows each indicator over the period 1994-2011. It can be seen that the general trend across indicators is similar, suggesting the level of positive misalignment increased during the 2000's before the collapse in the property market brought about a reversal, although the level of misalignment can vary significantly across indicators. Chart B shows the average level of misalignment across indicators.

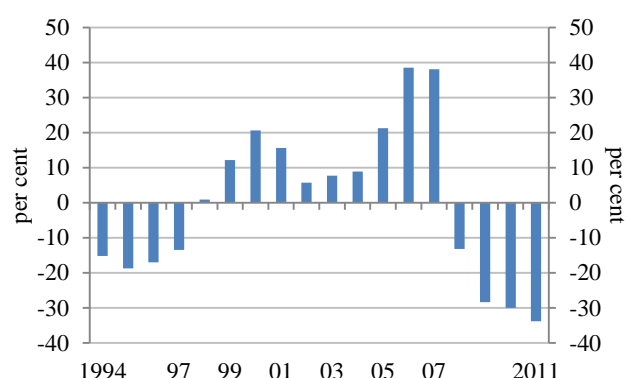
When interpreting the indicators it is important to be aware that they are subject to a number of caveats. First, there is no reduced form or structural econometric model behind these relationships; the indicators are deviations from average values over the sample period. Second, once again due to misalignment being measured relative to the average level of the indicator, the time period chosen will impact on the level of misalignment observed. Finally, capital values may adjust more rapidly than other variables, thus indicators may potentially overstate (negative) misalignment at a particular point in time.

**Chart A: Misalignment in commercial property values relative to macroeconomic variables – individual indicators**



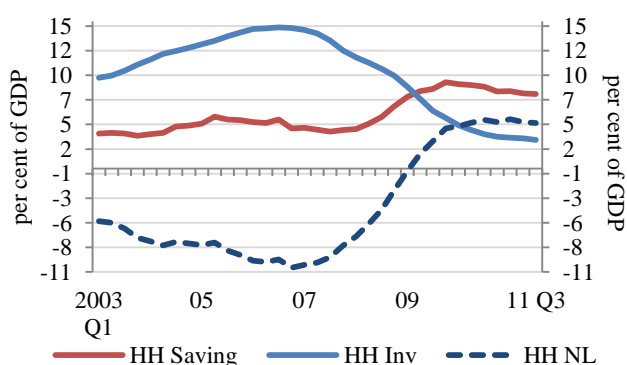
Source: Central Bank of Ireland calculations.

**Chart B: Misalignment in commercial property values relative to macroeconomic variables – average**



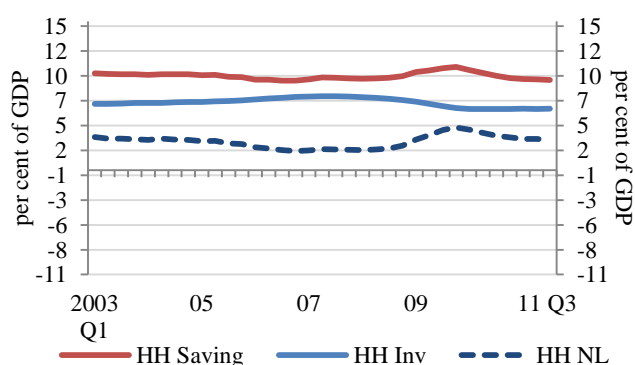
Source: Central Bank of Ireland calculations.

## HOUSEHOLD SECTOR CHARTS

**Chart D1: Household saving, investment and net lending/borrowing: Ireland**

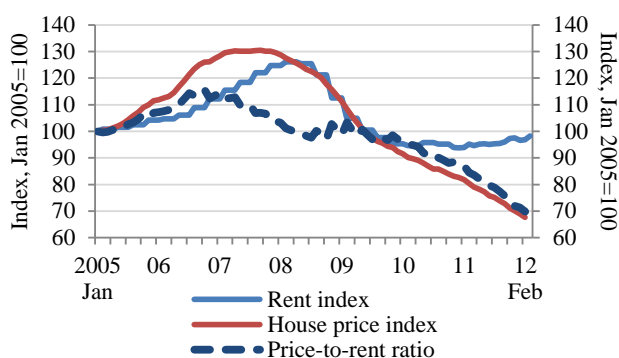
Source: CSO.

Notes: Saving is disposable income minus consumption expenditure. Investment is household spending on capital formation. Net lending is saving minus investment.

**Chart D2: Household sector saving, investment and net lending: euro area**

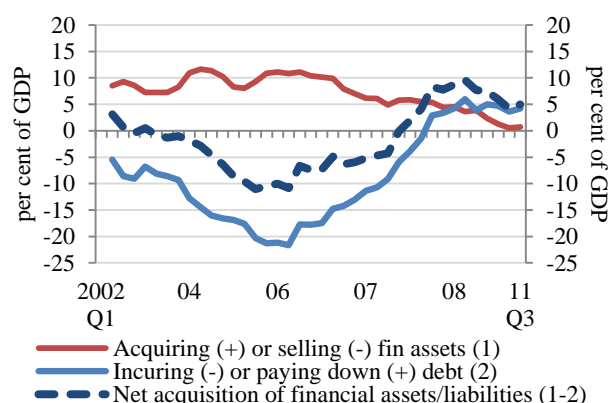
Source: ECB.

Notes: See chart D1.

**Chart D3: House price-to-rent ratio**

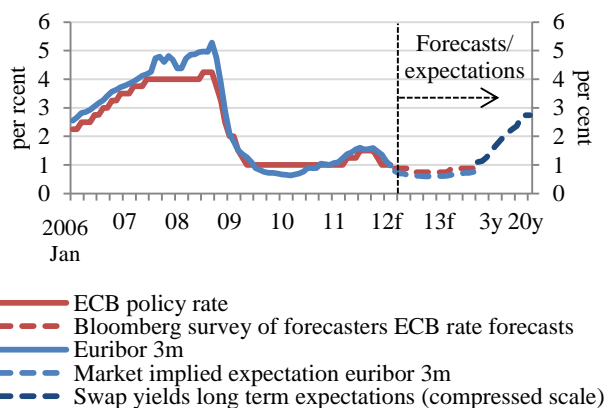
Source: CSO.

Notes: Rent index is the rental component of the CPI (consumer price index). House prices refer to CSO index for all residential properties nationwide.

**Chart D4: Decomposition of household net acquisition of financial assets/liabilities**

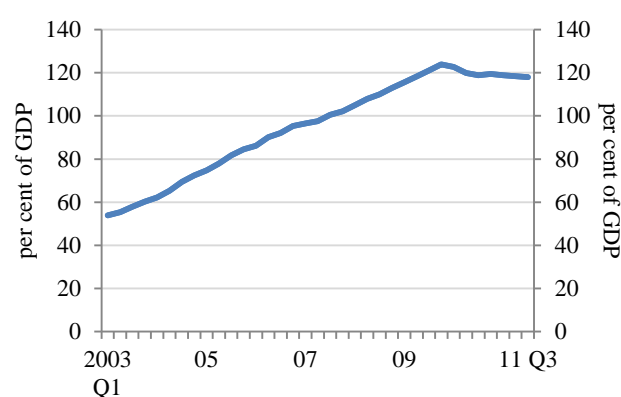
Source: CSO and Central Bank of Ireland.

Notes: The counterpart to net lending is net acquisition of financial assets/liabilities.

**Chart D5: Market implied interest rate forecasts**

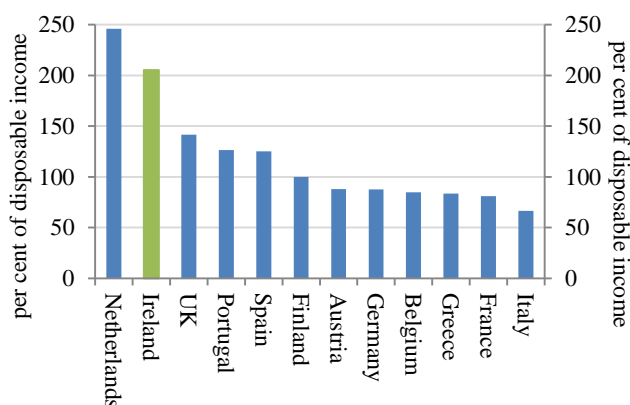
Source: Bloomberg.

Notes: Expectations for policy rate from Bloomberg survey of market participants. Market implied rate expectations from Bloomberg estimates of the expected path of rates. Long term swap yields are current market rates.

**Chart D6: Household debt to GDP**

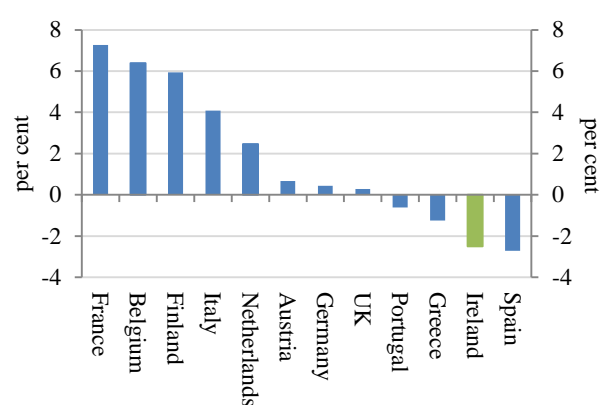
Source: CSO and Central Bank of Ireland.

Notes: Household debt includes short term debt such as credit cards or personal loans, and long term debt such as mortgages.

**Chart D7: Household debt to disposable income**

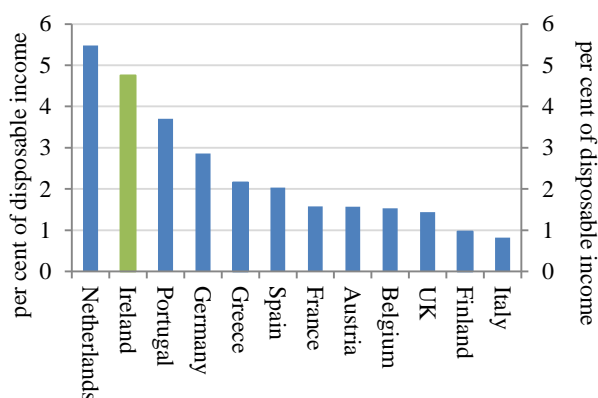
Source: ECB and Central Bank of Ireland.

Notes: Data as at 2011Q2.

**Chart D8: Household debt growth rate**

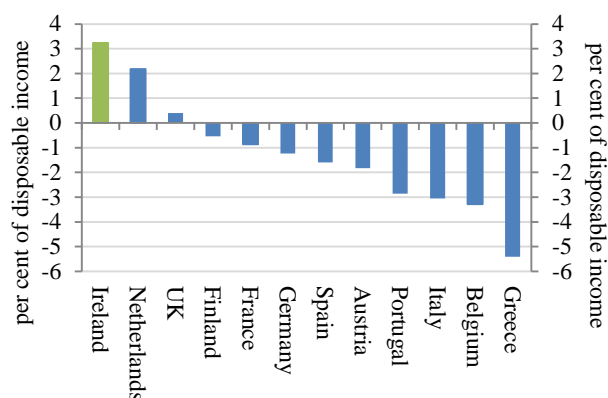
Source: ECB and Central Bank of Ireland.

Notes: Chart shows y/y growth rate of household debt liabilities. Data as at 2011Q2.

**Chart D9: Household gross interest repayment burden**

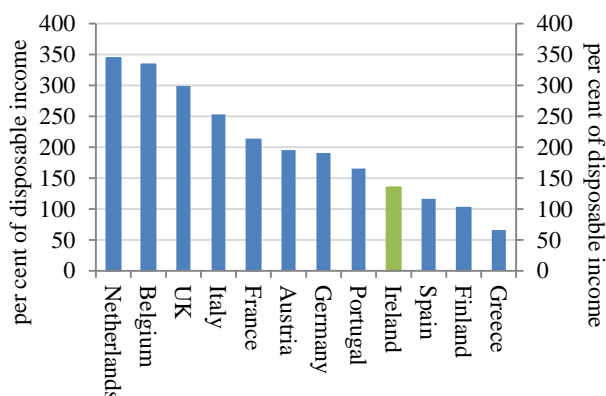
Source: CSO and ECB.

Notes: Gross interest payment burden equals interest paid to disposable income. Annual data for 2010.

**Chart D10: Household net interest repayment burden**

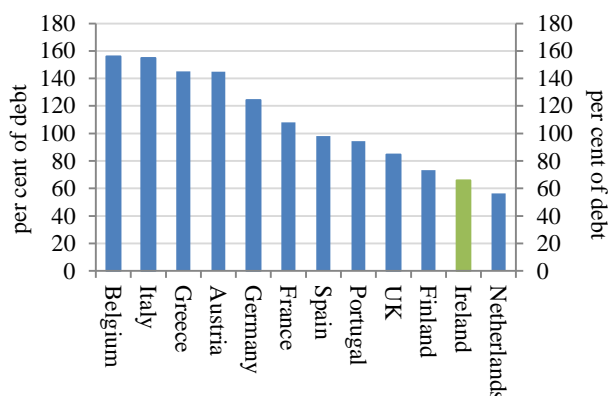
Source: CSO and ECB.

Notes: Net interest payment burden equals interest payments minus interest receipts to disposable income. Annual data for 2010.

**Chart D11: Household net financial assets**

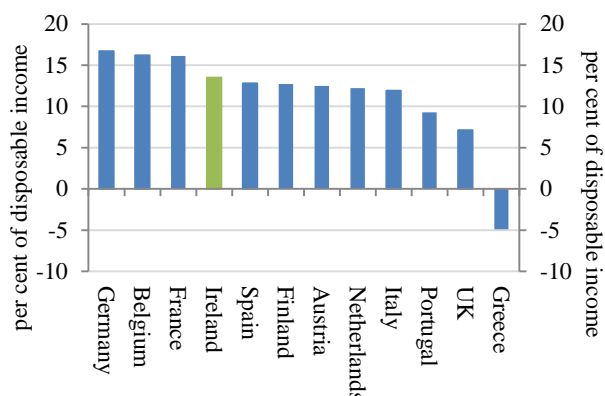
Source: ECB and Central Bank of Ireland.

Notes: Net financial assets equal financial assets (i.e. excluding housing wealth) held by the household sector minus household liabilities. Data as at 2011Q2.

**Chart D12: Household cash holdings to debt**

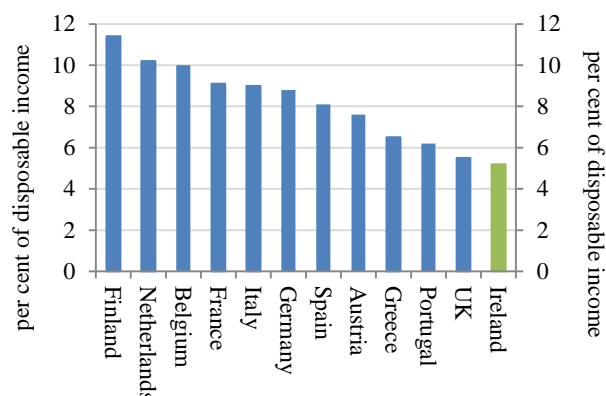
Source: ECB and Central Bank of Ireland.

Notes: Cash holdings are household deposits, and are expressed as a per cent of total debt liabilities. Cash holdings relative to debt may be indicative of potential household resilience to income or funding shocks. Data as at 2011Q2.

**Chart DI3: Household saving**

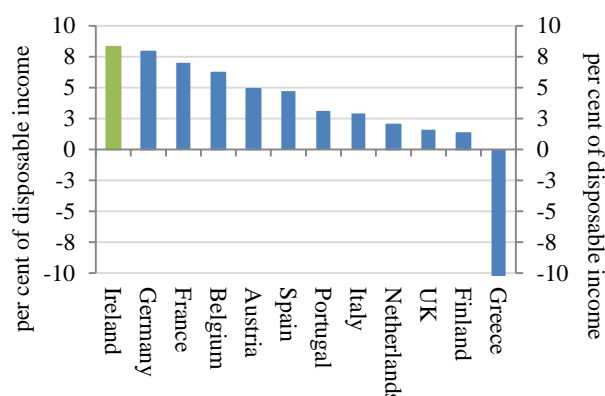
Source: ECB and CSO.

Notes: Saving is equal to disposable income minus consumption expenditure. Rate shown is 4-quarter moving average of savings rate. Data as at 2011Q2.

**Chart DI4: Household investment**

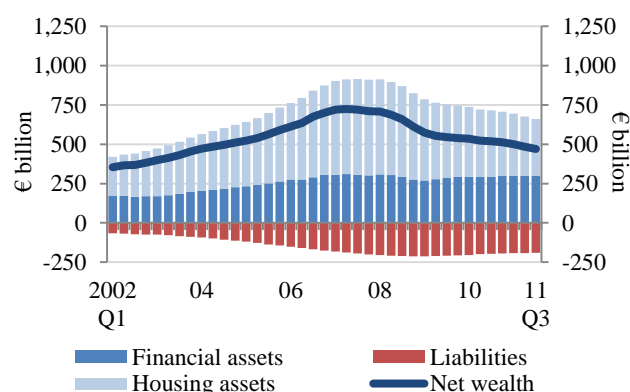
Source: ECB and CSO.

Notes: Investment is expenditure on fixed capital formation, predominantly new housing. Rate shown is 4-quarter moving average of investment rate. Data as at 2011Q2.

**Chart DI5: Household net lending**

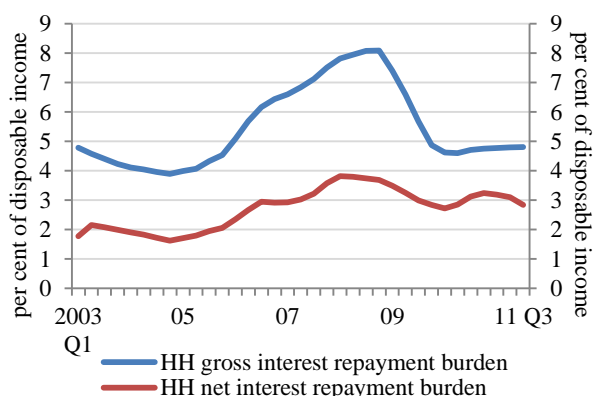
Source: ECB and CSO.

Notes: Net lending equals saving minus investment. Rate shown is 4-quarter moving average of net lending. Data as at 2011Q2.

**Chart DI6: Household wealth**

Source: Central Bank of Ireland.

Notes: Net wealth equals financial and housing assets less liabilities.

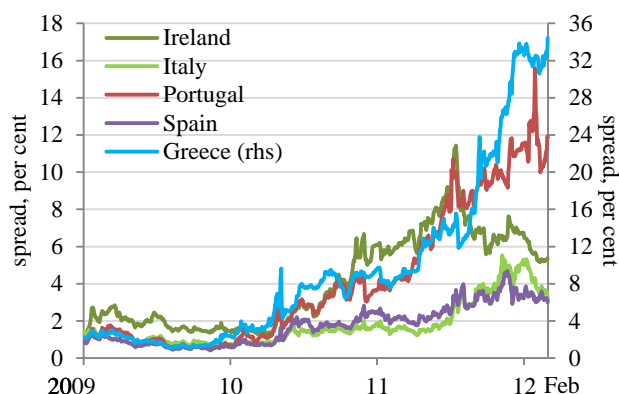
**Chart DI7: Household interest repayment burden**

Notes: Gross interest payment burden equals interest paid to disposable income. Net interest payment burden equals interest payments minus interest receipts to disposable income.

# ANNEX

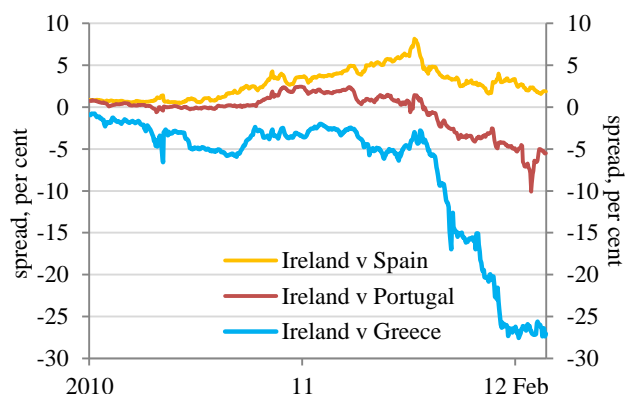
## SOVEREIGN RISK CHARTS

**Chart E1: Sovereign spreads in the euro area: 10-year benchmark bonds versus Germany**



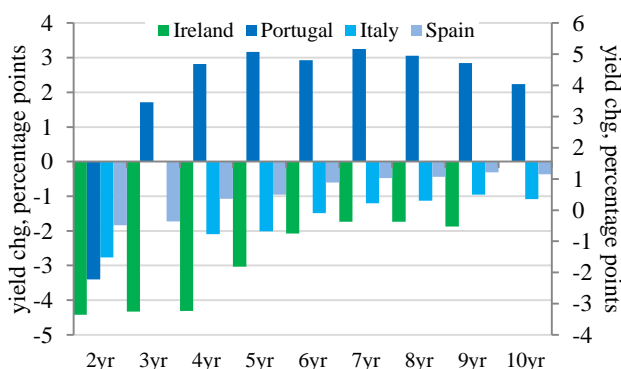
Source: Bloomberg.  
Notes: Last observation: 29 February 2012.

**Chart E2: Irish sovereign spreads (10-year maturity) over key crisis countries**



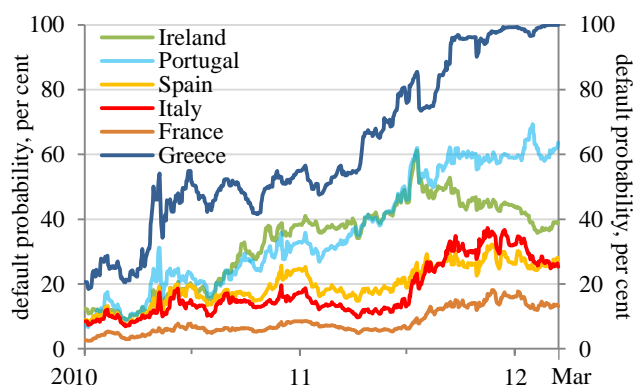
Source: Bloomberg.  
Notes: Last observation: 29 February 2012.

**Chart E3: Sovereign yield changes (over past 6 months) for selected euro area countries**



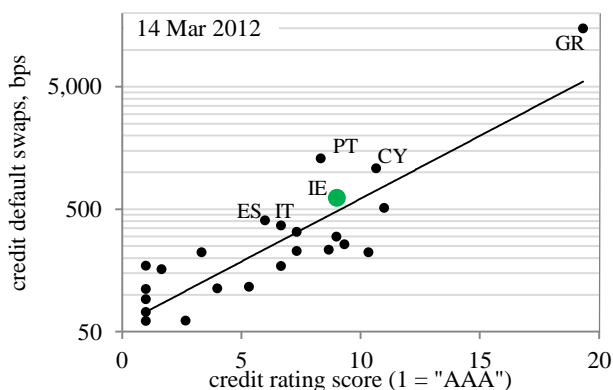
Source: Bloomberg.  
Notes: Change in yields from 29 August 2011 to 29 February 2012.

**Chart E4: Credit-default-swaps-implied sovereign default probabilities over the next five years**



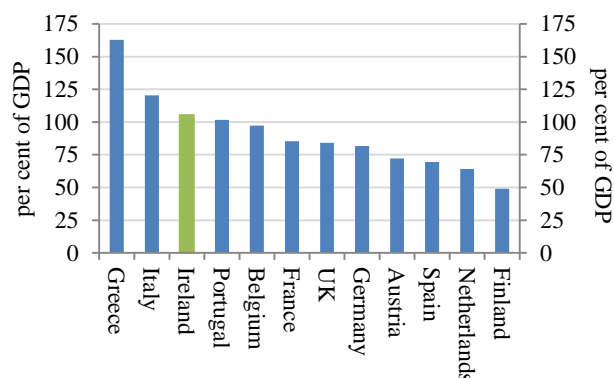
Source: Central Bank of Ireland and Bloomberg.  
Notes: Probability of default, derived from CDS premia, from the perspective of a risk-neutral investor. A recovery rate of 40 per cent is assumed. Last observation is 14 March 2012.

**Chart E5: Sovereign credit default swap premia and credit ratings**

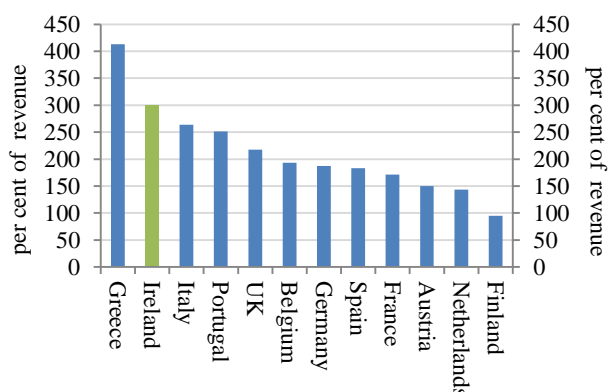


Source: Central Bank of Ireland and Bloomberg.  
Notes: Chart shows log of current CDS spreads regressed using robust regression against current credit ratings. Horizontal scale, low number equates to higher rating (1 = AAA).

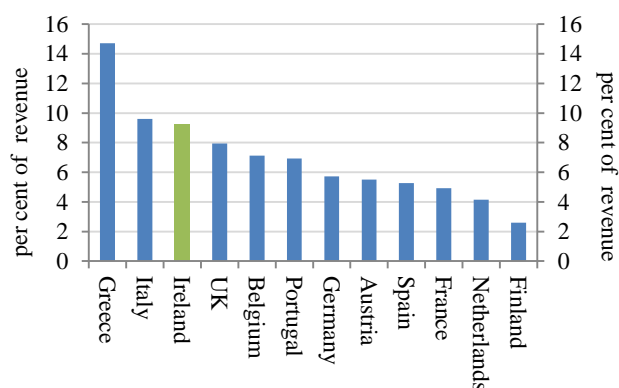
**Chart E6: General Government debt to GDP**



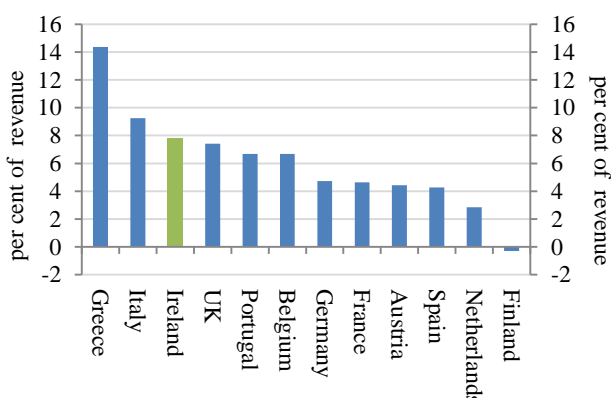
Source: ECB and Department of Finance (Maastricht Returns/EDP).  
Notes: General Government consolidated gross debt shown, as per Maastricht Returns/Excessive Deficit Procedure. Annual estimates for 2011.

**Chart E7: General Government debt to Government revenue**

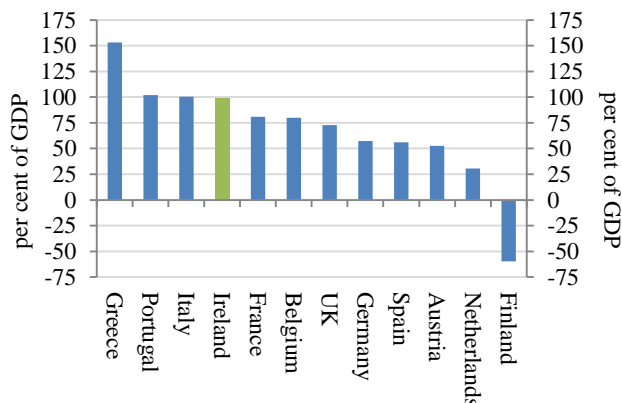
Source: IMF World Economic Outlook Database (WEO) September 2011.  
Notes: Forecast debt to tax revenue for 2011. IMF definition of revenue consists of taxes, social contributions, grants receivable, and other revenue.

**Chart E8: General Government gross interest repayment burden**

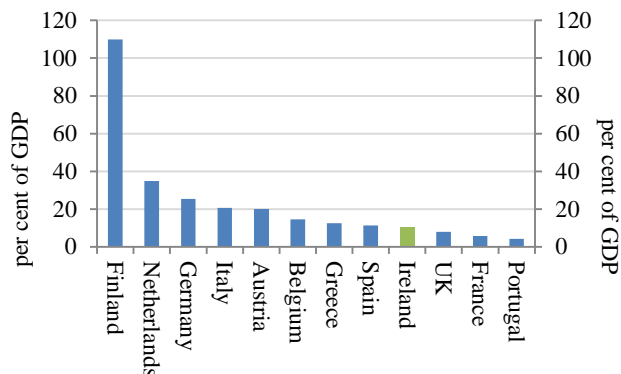
Source: CSO, ECB and IMF WEO Database September 2011.  
Notes: Gross interest repayment burden equals interest paid to Government revenue. Annual data for 2010.

**Chart E9: General Government net interest repayment burden**

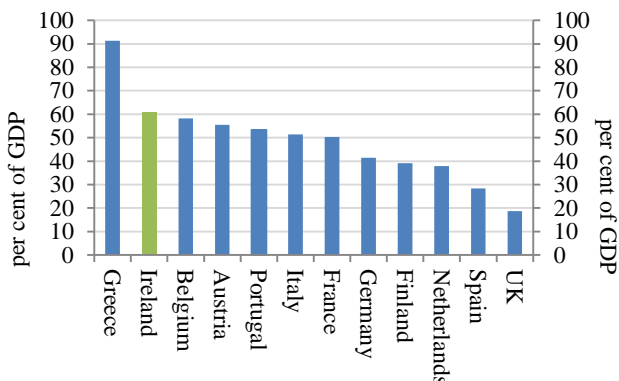
Source: CSO, ECB and IMF WEO Database September 2011.  
Notes: Net interest repayment burden equals interest paid minus interest received to Government revenue. Negative value implies interest received exceeds interest paid. Annual data for 2010.

**Chart E10: General Government net debt to GDP**

Source: IMF World Economic Outlook Database September 2011.  
Notes: Net debt equals gross debt minus government financial assets (see Chart E11). Forecast net debt for 2011.

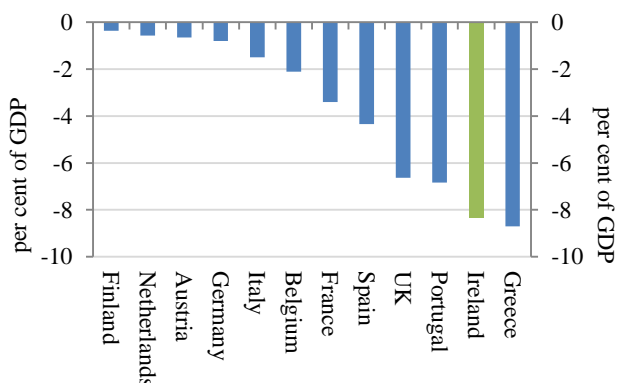
**Chart E11: General Government financial assets**

Source: IMF World Economic Outlook September 2011.  
Notes: Financial assets calculated as the difference between net and gross government debt. IMF methodology for calculation of government financial assets includes cash and low risk fixed income assets only and excludes equity. Data are forecast financial assets for 2011.

**Chart E12: General Government external debt to GDP**

Source: Joint IMF/World Bank/BIS/OECD External Debt Hub and CSO.  
Notes: Government external debt is government debt held by non-residents. Data as at 2011Q1.

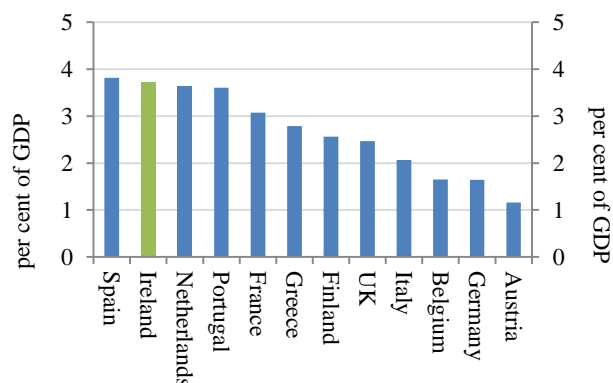
Chart E13: Government saving



Source: CSO and ECB.

Notes: Government saving equals government disposable income minus government consumption expenditure. Annual estimates for 2010.

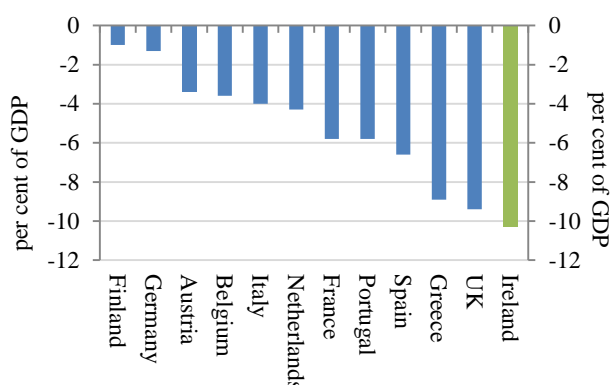
Chart E14: Government investment



Source: CSO and ECB.

Notes: Investment is fixed capital formation (broadly equivalent to government capital expenditure). Annual data for 2010.

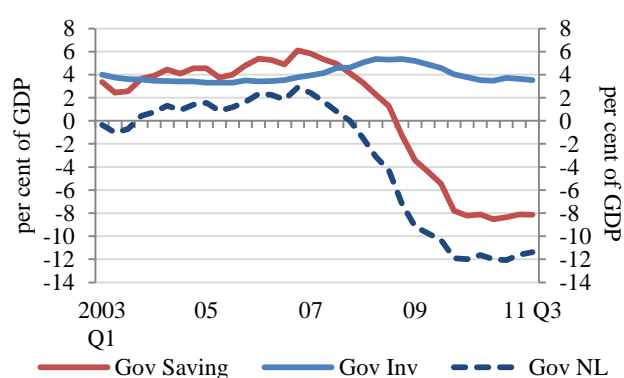
Chart E15: Government net lending



Source: ECB and Department of Finance (Maastricht Returns/EDP).

Notes: Net lending equals saving minus investment. As per Maastricht Returns/Excessive Deficit Procedure. Annual estimates for 2011.

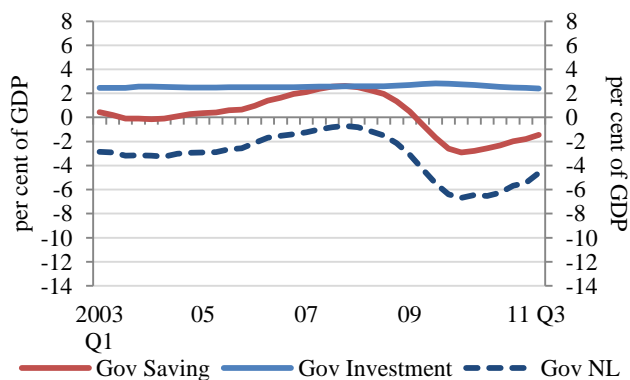
Chart E16: Government saving, investment and net lending: Ireland



Source: CSO.

Notes: Saving is disposable income minus consumption. Investment is fixed capital formation. Net lending is saving minus investment. Data adjusted to remove the impact of bank support measures on reported net lending. Values are 4-quarter moving average.

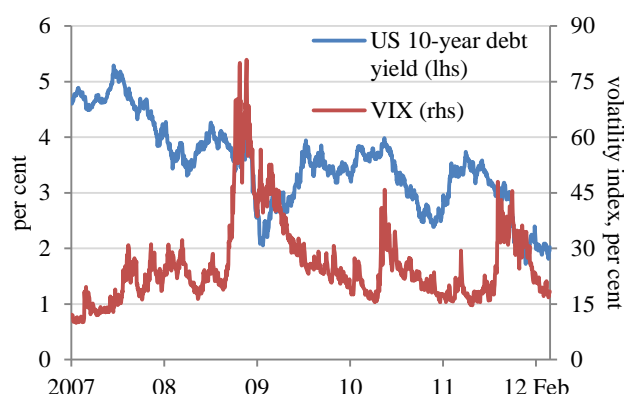
Chart E17: Government saving, investment and net lending: euro area



Source: ECB.

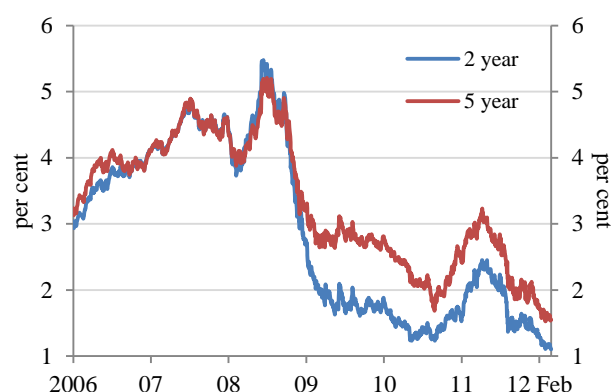
Notes: See chart E16.

## FINANCIAL SYSTEM OVERVIEW CHARTS

**Chart F1: 10 year US treasury yield and US equity market volatility**

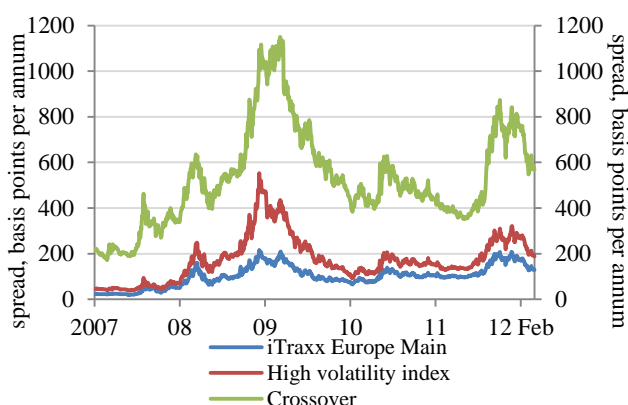
Source: Bloomberg.

Notes: Last observation: 29 February 2012.

**Chart F2: Euro interest rate swap rates**

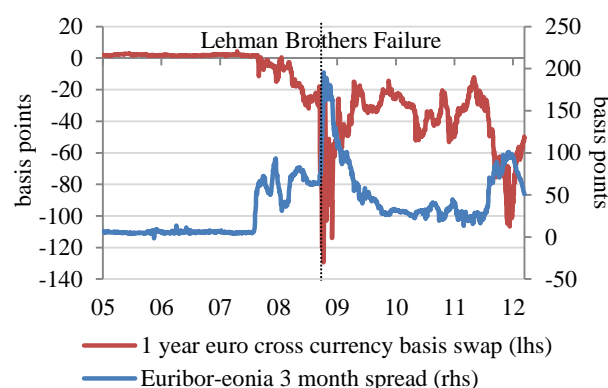
Source: Bloomberg.

Notes: Last observation: 29 February 2012.

**Chart F3: Credit default swap indices**

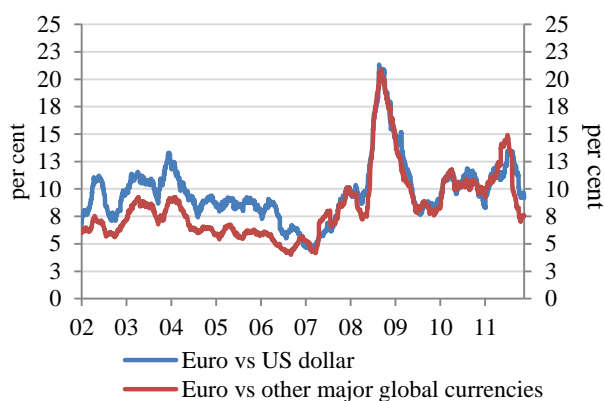
Source: Bloomberg.

Notes: Last observation: 29 February 2012.

**Chart F4: Euro currency basis swap and euribor spread**

Source: Bloomberg.

Notes: Euribor-eonia spread is indicative of stress in interbank funding markets. Euro vs. US dollar cross currency basis swap spread is indicative of stress in US dollar funding markets. Last observation: 29 February 2012.

**Chart F5: Realised currency volatility**

Source: Central Bank of Ireland.

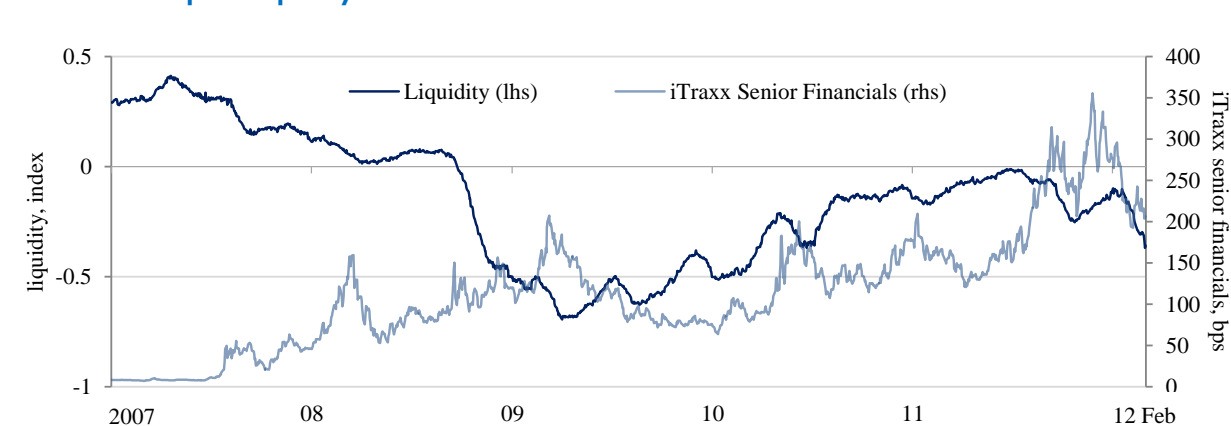
Notes: Daily volatility, annualised, basis points. Other major global currencies are Pound/Yen/Yuan/Swiss Franc, equally weighted. Data starts on Jan 1 2002 and ends on Feb 29 2012.

## FINANCIAL MARKET LIQUIDITY INDICATOR

Assessing overall financial market liquidity<sup>1</sup> and liquidity conditions across various financial markets is important for macro-financial risk assessment as sudden changes in conditions may be indicative of stress within the financial system. This box presents a liquidity measure used by several central banks, with some modifications. It is constructed by combining such information across several asset markets and attempts to incorporate aspects such as market tightness, depth and resiliency.<sup>2</sup> The indicator suggests that conditions have deteriorated significantly since the start of 2011, though not as severely as 2008 levels. This measure is associated with other measures of financial sector risk increasing over the same period. The main liquidity measure consists of the bid-ask spread, the return-to-volume ratio and numerous measures of liquidity premia.

Chart A displays the EU liquidity indicator. The indicator includes data from the markets for corporate bonds, interest rates, equities, currencies and options. The data are standardised on the period from January 1999 to December 2006. Prior to 2007, liquidity increased steadily and was largely due to the increased ability to obtain finance and improved conditions relating to the availability of repo and margin finance. In a study of the recent crisis, Gorton and Metrick (2009)<sup>3</sup> find that the more information-sensitive that assets become, the more illiquid the asset. According to these indicators, the first signals of a decrease in liquidity conditions occurred in early-2007 in coordination with the onset of the sub-prime crisis. This continued until early-2009 after significant policy responses by both central banks and governments. However, from early-2011, the euro area sovereign debt crisis caused significant volatility in the liquidity indicator and is also associated with reduced liquidity in the money market elements of the indicator's composition.

**Chart A: European liquidity indicator**



Source: Bloomberg, Thomson Reuters Datastream and Central Bank Calculations.

Notes: The data are normalised and smoothed based on the 1999-2006 period. Last observation: 29 February 2012.

<sup>1</sup> The financial market liquidity indicator began in the Bank of England Financial Stability Review in April 2007 (See: [Box 2 – Page 18](#)) and was further developed by the ECB in June 2007 (See: [Box 9 – Page 81](#)).

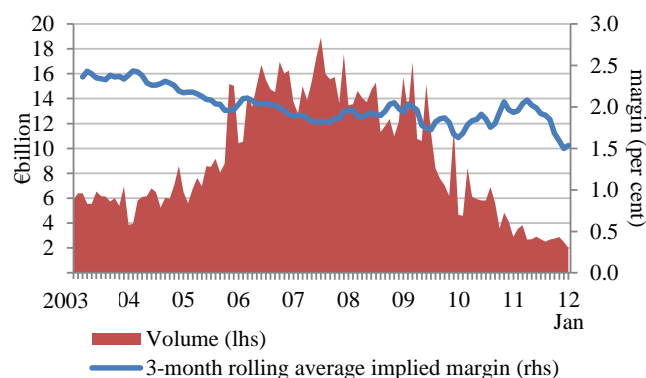
<sup>2</sup> The tightness of the market represents the magnitude of the risk premiums required by market makers for holding inventories of securities and is usually proxied by the width of the bid-ask spreads. Market depth and resiliency is the degree to which trading impacts on asset prices and can be gauged using ratios of price movements to transactions in the relative markets, while market liquidity risk premia is the compensation required by investors for the risk of uncertain market conditions.

<sup>3</sup> Gorton, Gary B. and Andrew Metrick, (2009), "Securitized Banking and the Run on Repo", Yale ICF Working Paper No. 09-14.

# ANNEX

## BANKING CHARTS

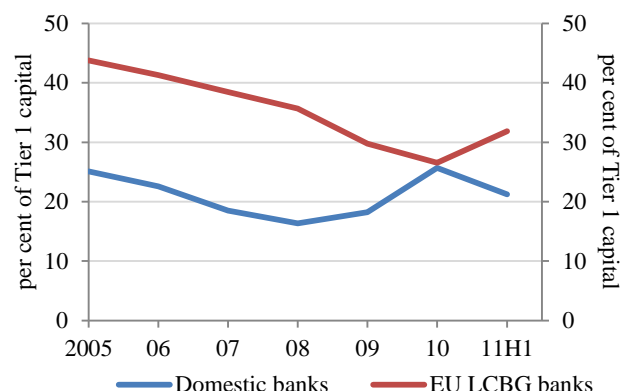
**Chart G1: New business lending**



Source: Central Bank of Ireland.

Notes: Data are resident statistics for all credit institutions in Ireland. Volumes and implied margins relate to new lending. Implied margins are the weighted averages of new lending rate less new deposit rate.

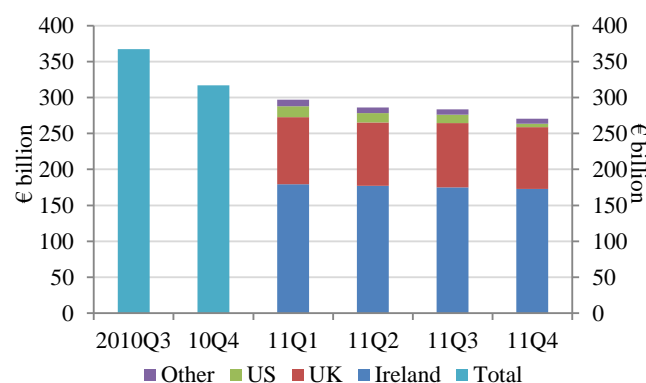
**Chart G2: Domestic banks leverage ratios**



Source: Fitch Ratings.

Notes: Leverage is defined as total consolidated assets less intangible assets as a percentage of Tier 1 capital. Data include IBRC.

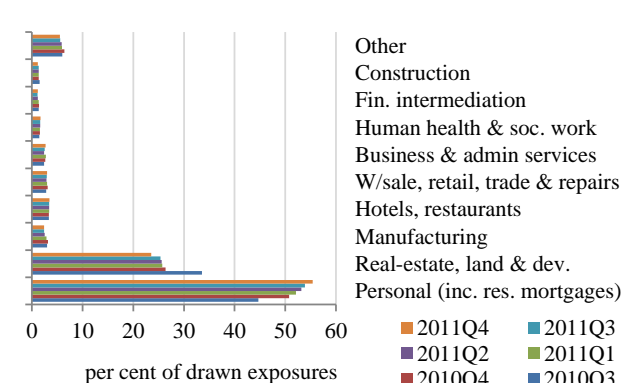
**Chart G3: Domestic banks' lending by geography**



Source: Central Bank of Ireland.

Notes: Data are consolidated and include IBRC. A geographical breakdown of customer's loans is not available prior to 2011.

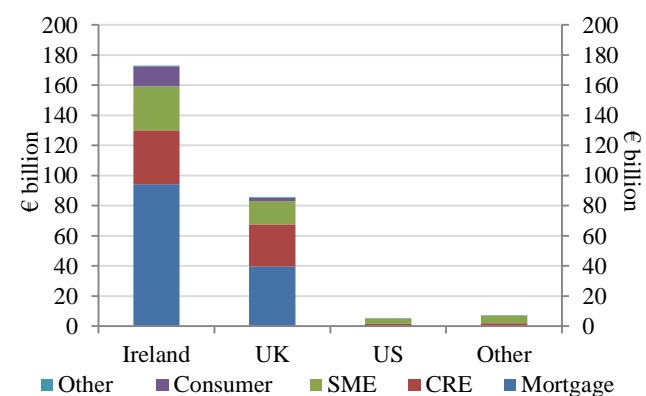
**Chart G4: Domestic banks' lending by sector**



Source: Central Bank of Ireland.

Notes: Data are consolidated and include IBRC.

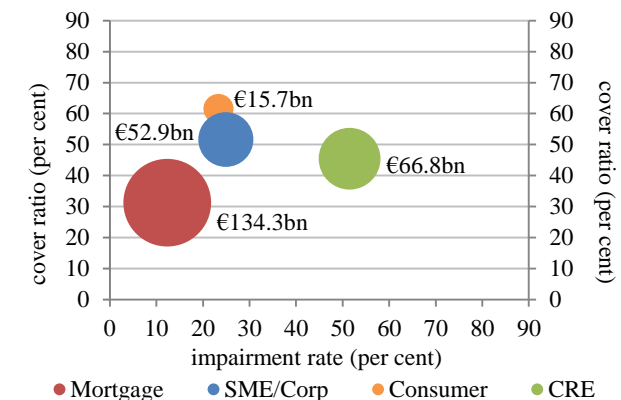
**Chart G5: Domestic banks' lending by geography and sector**



Source: Central Bank of Ireland.

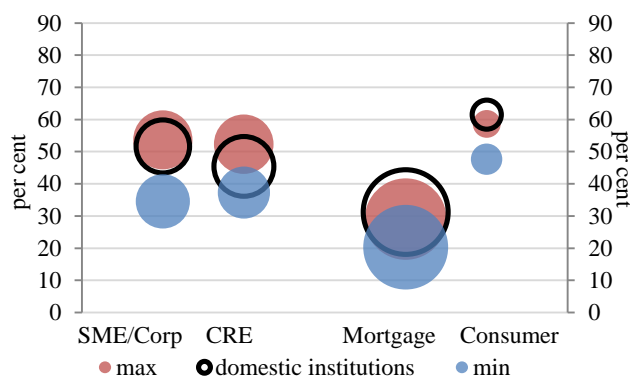
Notes: Data are consolidated and include IBRC. Data as at 30 December 2011.

**Chart G6: Domestic banks' cover ratios (provisions/CRD default loans) and impairment rates (CRD default loans/drawn exposures)**



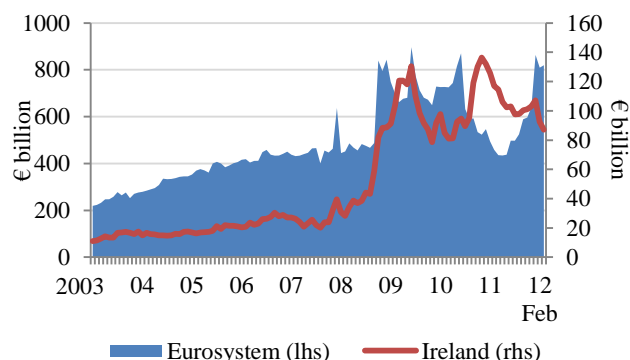
Source: Central Bank of Ireland.

Notes: Size of circle represents the share of overall lending to that particular sector. Data are consolidated and include IBRC. Data as at 30 December 2011.

**Chart G7: Cover ratios: min, max vs. domestic banks' – (provisions/CRD default loans)**

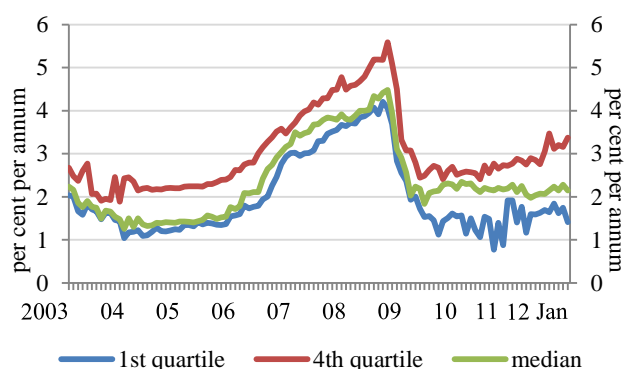
Source: Central Bank of Ireland.

Notes: Data are consolidated and include IBRC. Size of circle represents the share of overall lending to that particular sector. Cover ratio is calculated as provisions/CRD default loans. Min/max refer to the domestic bank with the lowest/highest cover ratio. Data as at 30 December 2011

**Chart G8: Eurosystem borrowing: total and Irish**

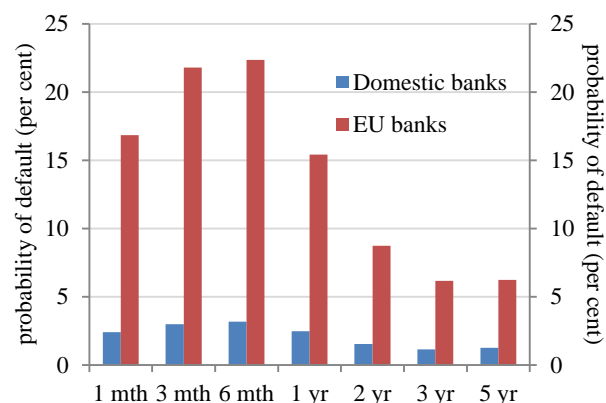
Source: ECB and Central Bank of Ireland.

Notes: Data refer to lending to Euro area residents related to monetary policy operations denominated in Euro. Irish data includes all credit institutions availing of Eurosystem borrowing from Central Bank of Ireland.

**Chart G9: Household deposit rates, new business**

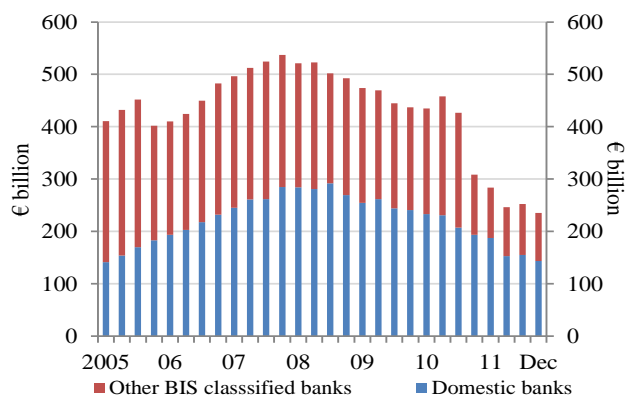
Source: Central Bank of Ireland.

Notes: Data relates to business conducted through resident offices of a sample of banks and include IBRC. Rates are a weighted average based on deposit rates (excludes overnight).

**Chart G10: Term structure of unconditional default probabilities**

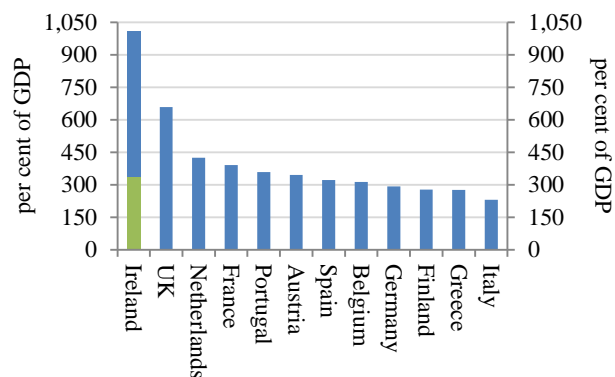
Source: Kamakura.

Note: "Domestic banks" refers to sample of the domestic banks for which market data are available and includes IBRC. EU banks refer to a sample of EU banks for which market data are available. Data as at 14 Mar 2012.

**Chart G11: Foreign claims of the Irish banking system**

Source: Central Bank of Ireland.

Notes: Data are consolidated and include IBRC

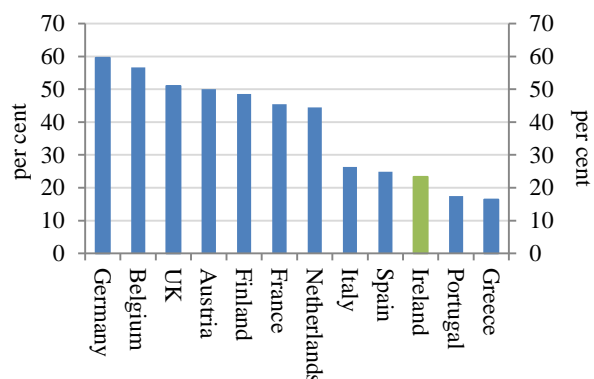
**Chart G12: Monetary financial institutions (MFI) liabilities to GDP**

Source: ECB and Central Bank of Ireland.

Notes: MFI liabilities broken out into covered institutions (domestic banks and IBRC, in green) and other institutions (including IFSC institutions, in blue) for Ireland. Non-consolidated data. Data as at 2011 Q2.

## ANNEX

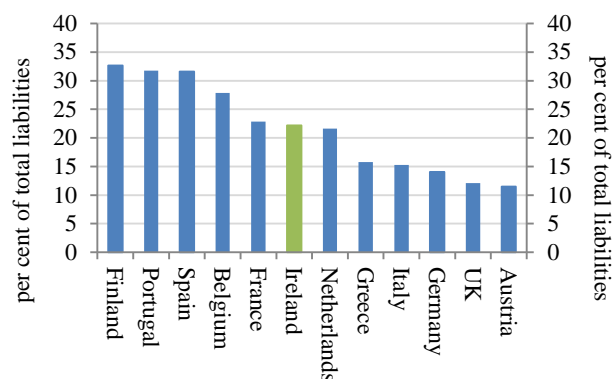
**Chart G13: MFI liquid assets to deposits/short term funding**



Source: Fitch Ratings.

Notes: Liquid assets are defined as cash, interbank deposits and unpledged securities. Chart shows liquid assets as a proportion of deposits and short term funding. Data are latest available for each country, ranging from 2010Q4 to 2011Q2.

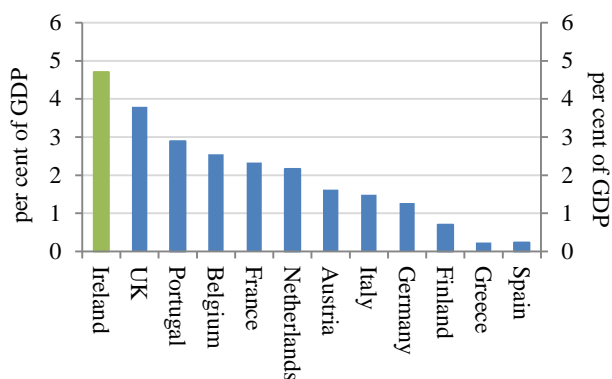
**Chart G14: MFI short term debt to total financial liabilities**



Source: Fitch Ratings.

Notes: Short term debt is debt with a time to maturity of less than one year. Data are latest available for each country, ranging from 2010Q4 to 2011Q2.

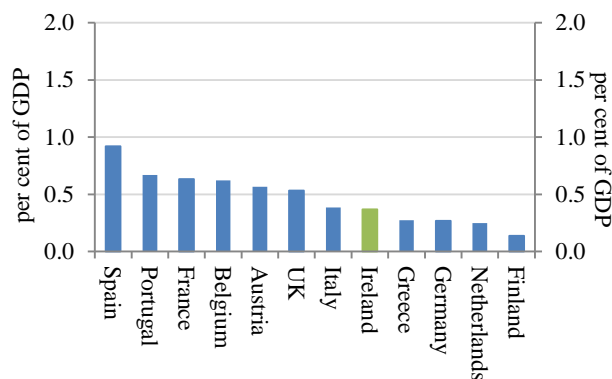
**Chart G15: Financial corporates (FC) saving rate to GDP**



Source: ECB and CSO.

Notes: Financial corporates include MFIs (banks and money market funds), OFIs (mutual funds, SPVs, hedge funds) and ICPFs (insurance companies and pension funds). Annual data for 2010.

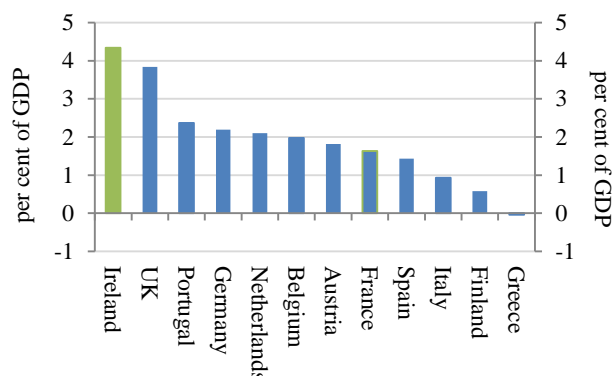
**Chart G16: Financial corporates (FC) investment rate to GDP**



Source: ECB and CSO.

Notes: Investment is FC fixed capital formation. See G15 for FC definition. Annual data for 2010.

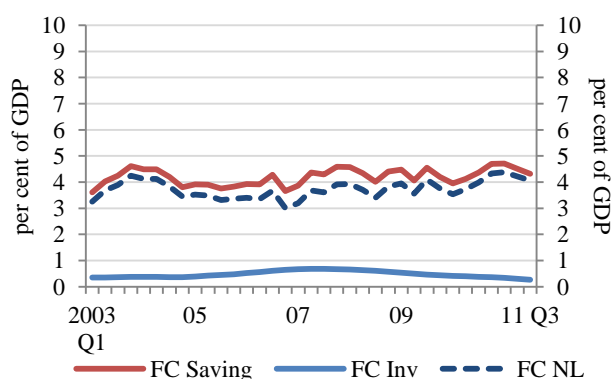
**Chart G17: Financial corporates (FC) net lending to GDP**



Source: ECB and CSO.

Notes: FC net lending equals FC saving minus FC investment. Adjusted to remove effect of bank transfers. Figure for Greece -0.04per cent. See G15 for FC definition. Annual data for 2010.

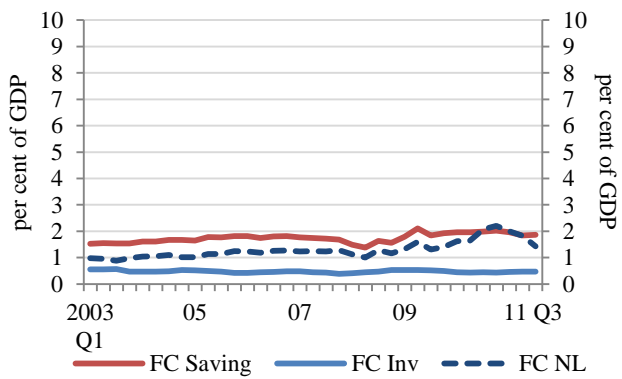
**Chart G18: Financial corporates (FC) saving, investment and net lending: Ireland**



Source: CSO.

Notes: Saving is income minus consumption. Investment is fixed capital formation. Net lending is saving minus investment. Values are 4-quarter moving average. See G15 for FC definition.

**Chart G19: Financial corporates (FC) saving, investment and net lending: euro area**



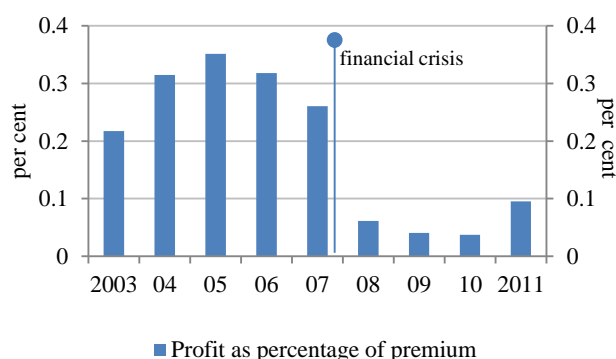
Source: ECB.

Notes: See chart G18. See G15 for FC definition.

## ANNEX

### INSURANCE CHARTS

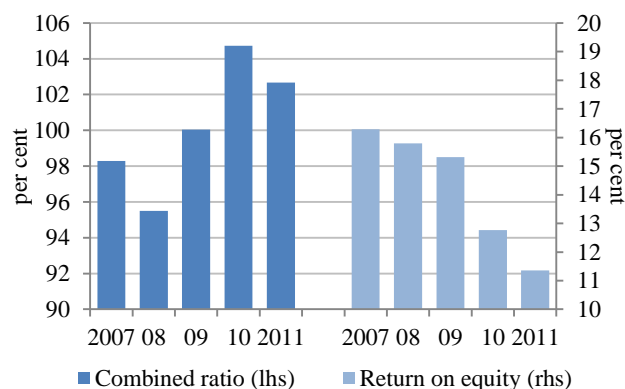
**Chart H1: Non-life sector – profit as a percentage of premium**



Source: Central Bank of Ireland.

Notes: Chart is constructed from a sample of major non-life insurers.

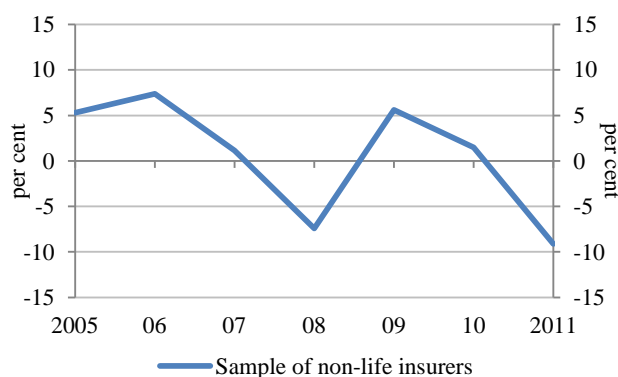
**Chart H2: Non-life sector – efficiency and return**



Source: Bloomberg.

Notes: Chart is constructed from a sample of public non-life insurers. An increasing combined ratio indicates decreasing underwriting profitability.

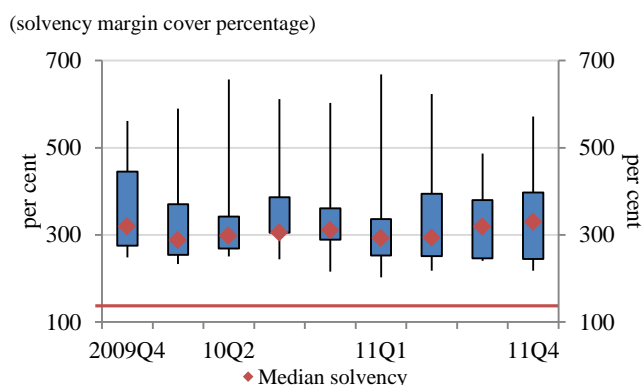
**Chart H3: Non-life sector - asset growth**



Source: Central Bank of Ireland.

Notes: Chart is constructed from a sample of major non-life insurers.

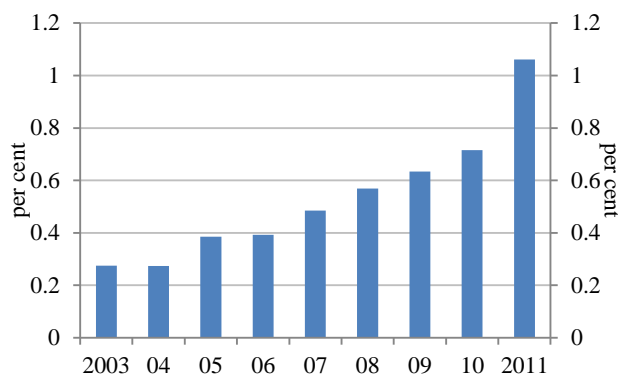
**Chart H4: Non-life sector – solvency**



Source: Central Bank of Ireland.

Notes: The blue box shows the interquartile range of solvency position for a sample of major non-life insurers that were a going concern over the whole period. Min solvency cover to be maintained is 150 per cent.

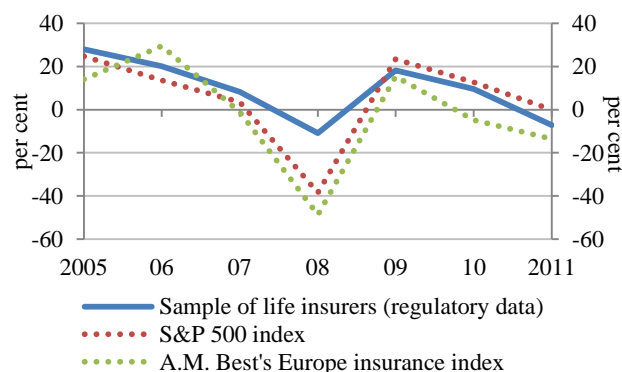
**Chart H5: Life sector – surrenders as a percentage of premium**



Source: Central Bank of Ireland.

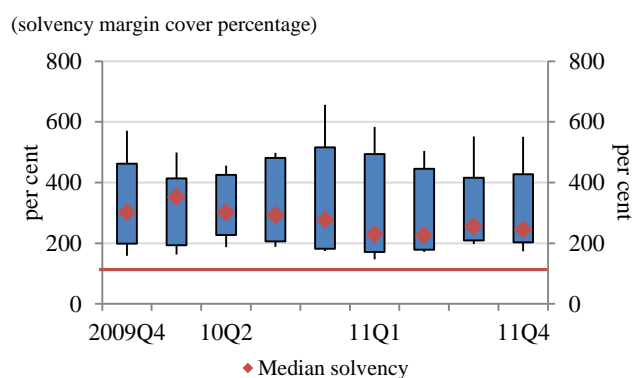
Notes: Chart is constructed from a sample of major Irish-risk life insurers.

**Chart H6: Life sector – asset growth**



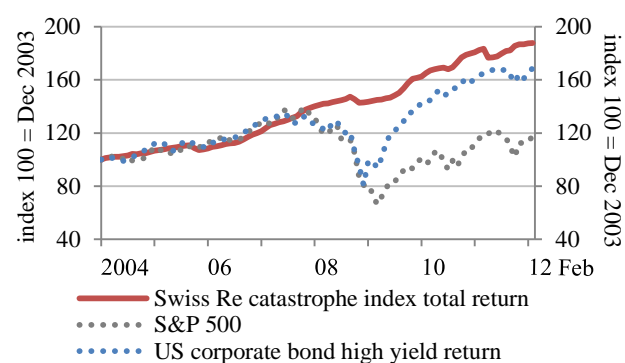
Source: Central Bank of Ireland and Bloomberg.

Notes: Chart is constructed from a sample of major life insurers.

**Chart H7: Life sector – solvency**

Source: Central Bank of Ireland.

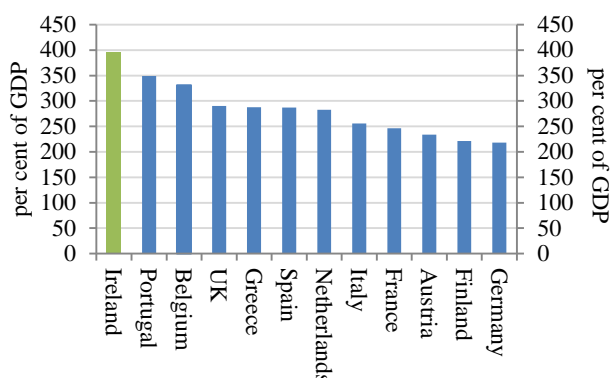
Notes: The blue box shows the interquartile range of solvency position for a sample of major life insurers. Min solvency cover to be maintained is 150 per cent.

**Chart H8: Return on catastrophe bonds**

Source: Bloomberg.

## TOTAL ECONOMY CHARTS

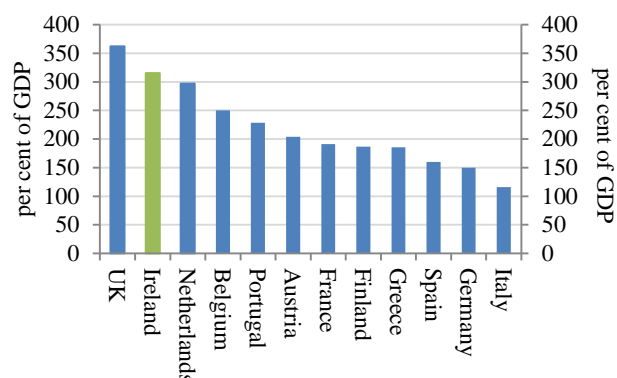
Chart J1: Total economy debt to GDP



Source: ECB and Central Bank of Ireland.

Notes: Total economy debt is the combined debt of the household, government and NFC sectors. NFC sector includes multinational and domestic firms. FCs are excluded. Data as at 2011Q1/Q2.

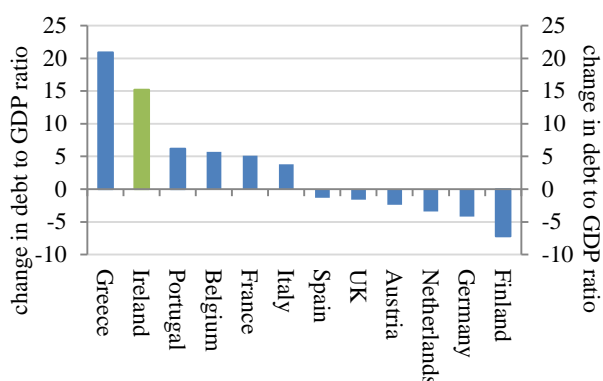
Chart J2: External debt to GDP



Source: Joint IMF/World Bank/BIS/OECD External Debt Hub and CSO.

Notes: Total economy external debt is the debt of resident sectors (excluding IFSC institutions in the case of Ireland) held by non-residents. Data as at 2011Q1.

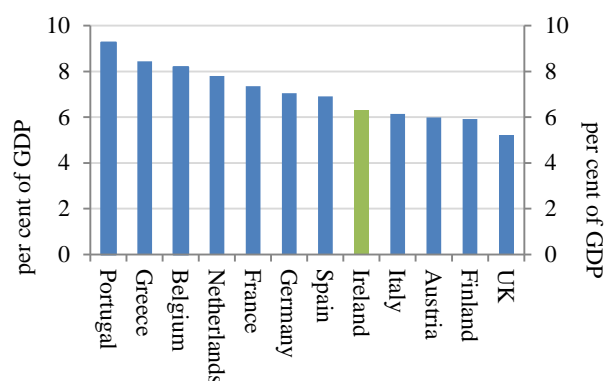
Chart J3: Growth rate of total debt to GDP ratio



Source: ECB and Central Bank of Ireland.

Notes: Total economy debt is the combined debt of the household, government and NFC sectors. NFC sector includes multinational and domestic firms. Chart shows percentage point change in total debt to GDP ratio between 2010Q2 and 2011Q2.

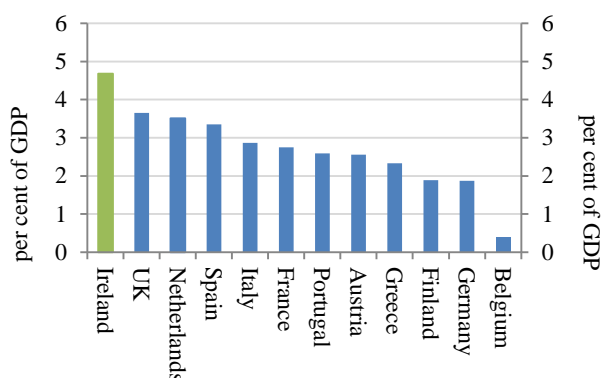
Chart J4: Total economy gross interest repayment burden



Source: CSO and ECB.

Notes: Total economy gross interest repayment burden is interest paid by households, government and NFCs to GDP. Financial Corporates are excluded. Data are for full year 2010.

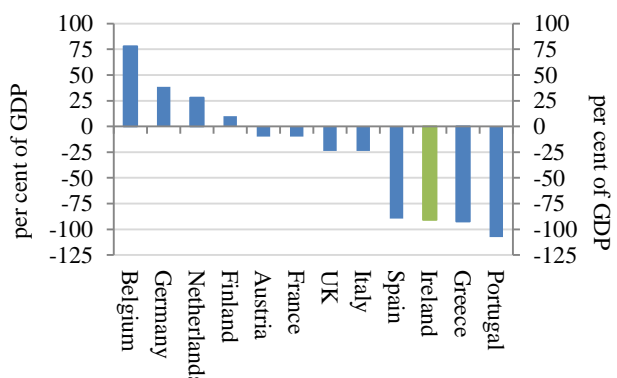
Chart J5: Total economy net interest repayment burden



Source: CSO and ECB.

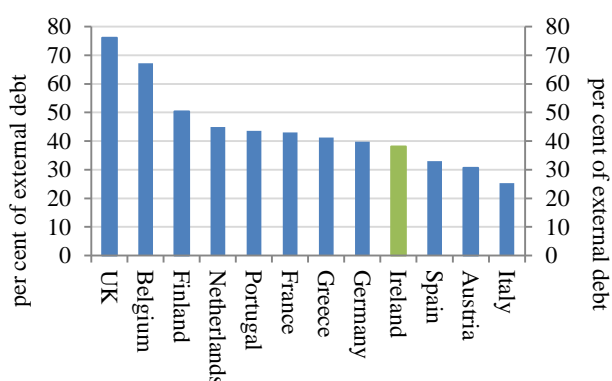
Notes: Total economy net interest repayment burden is interest paid less interest received to GDP for households, government and NFCs. Financial Corporates are excluded. Data are for full year 2010.

Chart J6: International investment position (IIP)

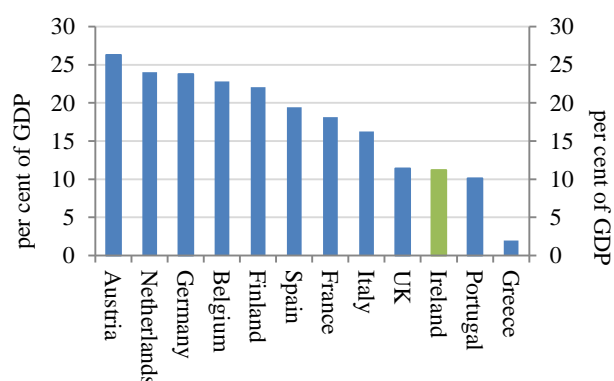


Source: CSO and EU Commission.

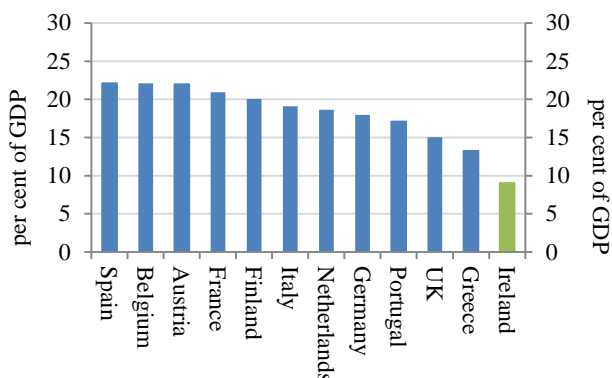
Notes: IIP equals the net balance of a country's external assets (resident claims on non-residents) and liabilities (non-resident claims on residents). Data are for full year 2010.

**Chart J7: Short term external debt to total external debt**

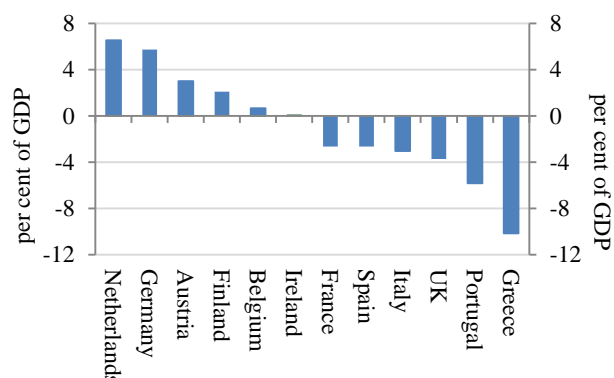
Source: Joint IMF/World Bank/BIS/OECD External Debt Hub and CSO.  
 Notes: Short term external debt is external debt with a time to maturity of less than one year. Data as at 2011Q1.

**Chart J8: Total economy saving**

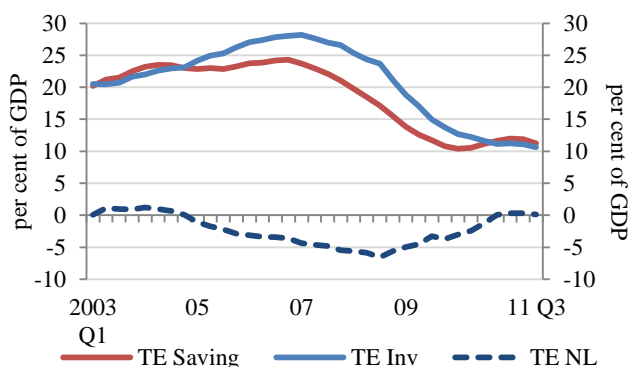
Source: CSO and ECB.  
 Notes: Total economy saving is the combined saving of all sectors of the economy. Data as at 2011Q3.

**Chart J9: Total economy investment**

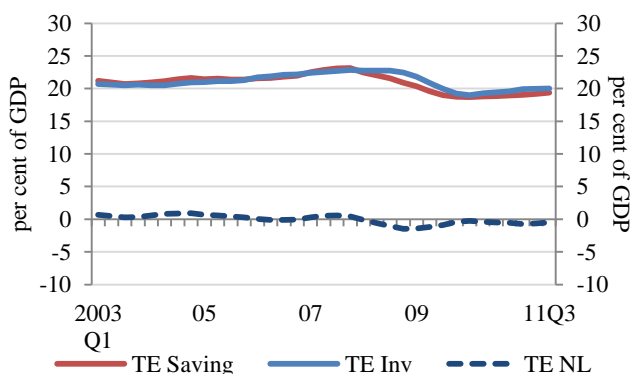
Source: CSO and ECB.  
 Notes: Total economy investment is the combined investment (capital formation) of all sectors of the economy. Data as at 2011Q3.

**Chart J10: Total economy net lending/borrowing**

Source: CSO and ECB.  
 Notes: Total economy net lending/borrowing is the combined net lending/borrowing of all sectors of the economy. It is broadly equivalent to the current account balance. Data as at 2011Q3.

**Chart J11: Total economy saving, investment and net lending: Ireland**

Source: CSO.  
 Notes: Saving is income minus consumption. Investment is fixed capital formation. Net lending is saving minus investment. Values are 4-quarter moving averages. Total economy net lending is broadly equivalent to the current account balance.

**Chart J12: Total economy saving, investment and net lending: euro area**

Source: ECB.  
 Notes: See Chart J11.





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