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Q1

Central Bank Quarterly Bulletin

Banc Ceannais na hÉireann
Central Bank of Ireland

Eurosystem

Contents

Notes

1. The permission of the Government has been obtained for the use in this Bulletin of certain material compiled by the Central Statistics Office and Government Departments. The Bulletin also contains material which has been made available by the courtesy of licensed banks and other financial institutions.

2. Unless otherwise stated, statistics refer to the State, i.e., Ireland exclusive of Northern Ireland.

3. In some cases, owing to the rounding of figures, components do not add to the totals shown.

4. The method of seasonal adjustment used in the Bank is that of the US Bureau of the Census X-11 variant.

5. Annual rates of change are annual extrapolations of specific period-to-period percentage changes.

6. The following symbols are used:

e estimated	n.a. not available
p provisional	. . no figure to be expected
r revised	– nil or negligible
q quarter	f forecast

7. Data on euro exchange rates are available on our website at www.centralbank.ie and by telephone at 353 1 2246380.

Forecast Summary Table

	2013	2014	2015ᵉ	2016ᶠ	2017ᶠ
Real Economic Activity					
(% change)					
Personal consumer expenditure	-0.3	2.0	3.2	2.8	2.0
Public consumption	1.4	4.6	3.0	1.1	1.9
Gross fixed capital formation	-6.6	14.3	23.8	11.8	7.4
Exports of goods and services	2.5	12.1	12.5	6.5	4.9
Imports of goods and services	0.0	14.7	14.8	6.9	4.4
Gross Domestic Product (GDP)	1.4	5.2	6.6	4.8	4.4
Gross National Product (GNP)	4.6	6.9	4.9	4.3	3.9
External Trade and Payments					
Balance-of-Payments Current Account (€ million)	5,561	6,833	8,167	9,445	10,261
Current Account (% of GNP)	3.1	3.6	3.8	4.1	4.2
Prices, Costs and Competitiveness					
(% change)					
Harmonised Index of Consumer Prices (HICP)	0.5	0.3	0.0	1.0	1.9
of which: Goods	-0.4	-1.7	-3.0	-1.3	1.1
Services	1.6	2.4	3.0	3.2	2.7
HICP excluding energy	0.6	0.5	1.0	1.8	1.6
Consumer Price Index (CPI)	0.5	0.2	0.1	1.0	1.9
Nominal Harmonised Competitiveness Indicator (Nominal HCI)[1]	3.1	0.2	n.a.	n.a.	n.a.
Compensation per Employee	-0.7	1.7	2.4	2.5	2.6
Labour Market					
(% change year-on-year)					
Total employment	2.2	1.9	2.7	2.4	1.9
Labour force	0.4	-0.3	0.6	1.0	1.1
Unemployment rate (ILO)	13.1	11.2	9.4	8.2	7.4
Technical Assumptions[2]					
EUR/USD exchange rate	1.33	1.33	1.11	1.08	1.08
EUR/GBP exchange rate	0.85	0.81	0.73	0.72	0.72
Oil price ($ per barrel)	108.58	100.10	53.70	42.51	49.72
Interbank market – Euribor[3] (3-month fixed)	0.23	0.21	-0.02	-0.18	-0.13

1 Based upon the annual change in the average nominal HCI.

2 The technical assumption made is that exchange rates remain unchanged at their average levels in mid-December. Oil prices and interest rates are assumed to move in line with the futures market.

3 Euribor is the rate at which euro interbank term deposits are offered by one prime bank to another, within the euro area. Daily data from 30 December 1998 are available from www.euribor.org.

Comment

Economic data confirm the continuation of a strong upswing in Irish economic activity over the past year, with GDP now projected to have grown by just below 7 per cent in 2015. The strong growth performance reflects a recovery which has become broadly based and has increasingly come to be driven by a significant rebound in domestic demand. While methodological changes to the National Accounts and some changes to the activities of multi-national firms complicate the interpretation of the data and overstate the strength of domestic demand, the pick-up in consumption and the continuing strength of employment growth confirm that a convincing recovery is well established on the domestic side of the economy.

Last year also saw an exceptionally strong rise in nominal GDP, likely to have been around 12.5 per cent. The strength of the rise in nominal GDP has contributed significantly to the projected falls in the fiscal deficit and debt ratios in 2015. While partly reflecting the robust increase in real GDP, the rise in nominal GDP was also influenced by the estimated strong rise of 5.6 per cent in the GDP deflator. The latter primarily reflects the impact of external factors, in particular exchange rate and oil price movements last year[1].

On the real side of the economy, the stronger growth performance has been underpinned by both the stabilising influence of the policy and macroeconomic adjustments which have been undertaken, as well as the coming together of a broad set of favourable factors, which have reinforced each other to support growth. In particular, the stimulus to incomes from an employment-rich recovery has been augmented by both the emergence of wage growth and the further boost to purchasing power from lower energy prices[2]. Growth has also benefitted from a more benign policy environment, reflected in both the easing of the pace of fiscal consolidation and continued favourable financial conditions, while additional support has been provided by the on-going improvement in household and firm balance sheets and continuing favourable conditions in Ireland's main export markets. It is the positive alignment of all these factors, many of

which have acted to boost domestic demand, which has helped growth to strengthen and, excepting the uncertainty related to the recent re-emergence of tensions in global financial markets, broadly supports a continued favourable outlook.

On the domestic side, the most direct evidence of improvement has been strong growth in employment, especially full-time employment. Over the past two years, the economy has created jobs at an average rate of around 45,000 per annum, reflecting employment growth of close to 2 1/2 per cent a year. Allied to the return of wage growth, and benefitting also from very low inflation, this has helped to boost real incomes and consumer confidence. Combined, these factors have stimulated a strong pick-up in consumer spending which, last year, grew at its fastest rate since 2007. Looking ahead, the continued favourable labour market outlook, rising real disposable incomes and improved consumer confidence are projected to support the outlook for consumer spending. However, as the pent-up demand which provided some of the boost to consumer spending in 2015 eases and the growth in employment slows a little, a gradual moderation in consumption is in prospect this year and next.

While the growth in overall investment spending was exceptionally strong in 2015, the overall level of investment is distorted

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1   Developments in nominal GDP and the GDP deflator are discussed more fully in Box C on page 21.

2   A more extensive discussion of this is contained in Box A on page 11.

by the impact of investment in aircraft and the transfer of patents into Irish entities by some multinational corporations. However, abstracting from these two categories, underlying investment, net of aircraft and intangibles, is still growing strongly. Looking ahead, the broadly favourable overall economic outlook combined with the fact that underlying investment levels are still recovering, suggests that the pace of expansion in underlying investment is likely to moderate only slightly over the forecast horizon.

On the external side, trade and factor income flows remain heavily influenced by the impact of corporate restructuring in parts of the multinational sector. As a consequence, the growth of both exports and imports has been much stronger than previously projected. Notably, however, exports of indigenous sectors, such as agri-food and tourism, have also performed strongly, supported by favourable demand conditions and exchange rate developments. Looking ahead, overall export growth is expected to come to reflect demand in trading partner countries more closely over the forecast horizon. As a result, exports are now expected to increase at a slightly slower pace than previously projected, although growing concerns about the global outlook increase uncertainties further.

Taking account of the evolution of developments and prospects since the last Bulletin, suggests a stronger outturn for GDP growth last year, and also, on balance, a broadly similar outlook for this year, compared to the previous forecast. Buoyed by the strength of domestic demand, GDP is now estimated to have grown by 6.6 per cent last year. Reflecting a favourable outlook for consumer and investment spending this year, domestic demand will continue to be the main driver of economic growth in 2016. GDP

growth of 4.8 per cent is forecast for 2016, a marginal upward revision to the previous projection, while the forecast for GNP growth, at 4.3 per cent, is marginally lower. In 2017, on the basis of forecasts of growth in trading partner countries consistent with those underlying the latest ECB macroeconomic projections and reflecting some moderation in the growth of domestic demand, GDP is forecast to grow by 4.4 per cent, with GNP projected to rise by 3.9 per cent.

For now, risks to the 2016 forecasts are judged to be balanced, while tilted to the downside for 2017. This reflects some upside potential from the possibility of stronger domestic dynamics and the lagged impact of exchange rate and oil price movements, offset on the downside by rising risks to the global outlook, with potential spillovers to global trade.

The latest forecasts continue to suggest that the economy is going through a period of exceptionally strong growth which is likely to ease only modestly over this year and next. While, in part, the current strong growth phase reflects a rebound from past weakness, to a greater extent, it represents a movement back towards the full utilisation of resources and the realisation of the economy's potential. On the basis of the current projections, there is still sufficient spare capacity to accommodate such growth over the forecast horizon without encountering major constraints. More importantly, the strong growth outlook provides an opportunity to tackle the remaining legacies of the crisis and minimise future risks to economic, fiscal and financial stability. This opportunity needs to be taken. Reducing the remaining vulnerabilities and strengthening economic resilience are necessary to mitigate the risk of future boom-bust cycles and ensure stable and sustainable medium-term growth.

The Domestic Economy

Overview

- Following estimated growth of 6.6 per cent in 2015, real GDP is expected to rise by 4.8 per cent this year, broadly unchanged from the previous Bulletin. Growth of 4.4 per cent is expected for 2017. It is anticipated that domestic demand will continue to be the main driver of economic growth over the forecast horizon, complemented by a stronger contribution from net exports as time progresses. Real GNP is expected to rise this year and next, by 4.3 and 3.9 per cent, respectively.

- Growth in domestic demand, while easing over the forecast horizon, is expected to remain strong at 5 per cent and 3.6 per cent in 2016 and 2017, respectively. The expansion of investment continues to dominate, particularly the impact of outlays on aircraft and intellectual property (IP) assets. More employment intensive forms of investment, such as building and construction and non-aircraft machinery and equipment are expected to grow at over 8 per cent this year and next, a slightly slower pace than previously forecast. Underlying domestic demand (excluding aircraft and intangibles investment) is set to expand by an average of 3.2 per cent per annum over the forecast horizon (see Box B).

- Consumption is expected to rise by 2.8 per cent this year, a somewhat slower pace than 2015 but still higher than previously forecast. The rise in consumption is driven by the growth in real disposable income resulting from employment and wage growth as well as lower inflation due to energy prices. With further large reductions in the household savings ratio unlikely over the forecast horizon, a further moderation in consumption growth in 2017 to 2 per cent is expected.

- The impact of corporate restructuring involving Irish resident multinational firms in high-tech sectors continues to dominate trade and factor income developments. Indigenous exporting sectors are, however, benefitting from the competitive exchange rate and low energy prices. Export growth at 6.5 per cent and 4.9 per cent per annum over the forecast horizon is expected, more closely reflecting trading partner demand than what was the case in 2015. The outlook for external demand for Irish goods and services is slightly weaker than in the previous Bulletin. Imports are also expected to grow at a slightly slower pace than previously forecast for 2016 due to the current outlook for investment and exports, while the easing of consumption growth also contributes to a smaller rise in imports of 4.4 per cent in 2017.

- Employment growth is expected to moderate slightly over the forecast horizon to just below 2 per cent in 2017 from 2.4 per cent in 2016, consistent with the outlook for underlying domestic demand. Alongside a return to labour force growth, reflecting positive demographic effects and slightly higher participation, this should see the unemployment rate averaging 8.2 and 7.4 per cent respectively this year

Chart 1: Contributions to GDP
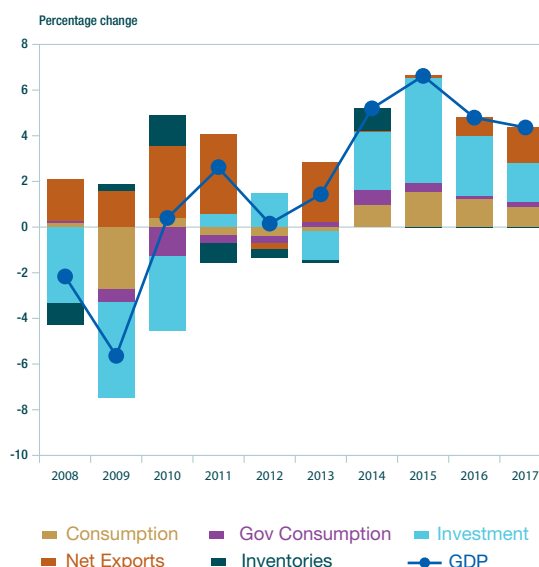
Source: CSO and Central Bank of Ireland.

and next. The improving labour market is expected to support increases in average rates of pay above 2.5 per cent in both 2016 and 2017.

- Inflation is expected to be moderate in 2016, with HICP inflation averaging 1 per cent over the year. Assumptions for global commodity prices in 2016, especially oil, are weaker than at the time of the previous Bulletin, and the pass-through of these to the overall HICP offsets the growth anticipated in more domestically driven consumer services prices. Consumer prices are forecast to rise by 1.9 per cent in 2017, as commodity price growth feeds into positive goods price inflation of 1.1 per cent and prices for consumer services projected to increase by 2.7 per cent.

- Risks to the GDP and GNP forecasts are currently deemed to be broadly balanced for 2016 and marginally on the downside for 2017. The contribution of potentially transitory factors to growth last year may prove to be less durable when considering the performance in 2016 for investment, exports and particularly imports, which may boost GDP. Further boosts to consumption growth beyond current forecasts may be limited by the scope for large reductions in the household savings rate. The rather favourable external environment underlying the current forecast is subject to downside risks. This reflects the risk of a sharper slowdown in emerging market economies, a possibly faster normalisation of monetary policy outside the euro area and uncertainty related to the UK referendum on EU membership.

Table 1: Expenditure on Gross National Product 2014, 2015[f] and 2016[f]

	2015[e] EUR millions	% change in volume	price	2016[f] EUR millions	% change in volume	price	2017[f] EUR millions
Personal Consumption Expenditure	92,448	2.8	1.1	96,082	2.0	1.9	99,866
Public Net Current Expenditure	28,606	1.1	0.8	29,171	1.9	1.5	30,165
Gross Domestic Fixed Capital Formation	46,783	11.8	2.3	53,527	7.4	3.2	59,336
Building and Construction	13,321	7.2	2.8	14,655	8.5	4.0	16,481
Machinery and Equipment	12,324	19.8	3.3	15,198	5.5	4.7	16,813
Intangibles	21,138	10.0	2.0	23,674	8.0	2.0	26,042
Value of Physical Changes in Stocks	1,905			1,905			1,905
TOTAL DOMESTIC DEMAND	169,743	5.0	1.4	180,685	3.6	2.2	191,272
Exports of Goods & Services	255,814	6.5	1.4	276,207	4.9	1.5	294,195
FINAL DEMAND	425,557	5.9	1.4	456,893	4.4	1.8	485,467
Imports of Goods & Services	-212,482	6.9	-0.6	-228,695	4.4	-1.7	-242,790
Statistical Discrepancy	-239			-239			-239
GROSS DOMESTIC PRODUCT	212,836	4.8	2.2	227,958	4.4	1.9	242,438
Net Factor Income from Rest of the World	-32,429	7.4	1.4	-35,331	7.1	1.5	-38,408
GROSS NATIONAL PRODUCT	180,407	4.3	2.4	192,627	3.9	2.0	204,031

Demand

Domestic Demand Overview

Similar to 2015, domestic demand is expected to be the main driver of growth over the forecast horizon with a robust outlook for both consumption and investment spending. Overall domestic demand is expected to grow by 5 per cent in 2016 before moderating to 3.6 per cent in 2017. These rates are lower than the estimated growth of 8.1 per cent recorded in 2015. Methodological changes to the *National Income and Expenditure Accounts* (NIE) have had the effect of significantly boosting some of the sub-components of investment spending; specifically transport equipment and intangibles-related expenditures, complicating

their interpretation. In particular, the increase in intangibles was especially sharp in 2015. Still, underlying investment (i.e. investment excluding intangibles and transport items) remains strong and is expected to contribute to growth over the forecast horizon. In Box B, we consider in more detail the links between the components of domestic demand and employment.

Consumption

In 2015, personal consumption expenditure grew by an estimated 3.2 per cent, marking the fastest rate of growth since 2007. *Quarterly National Accounts* (QNA) data were consistently strong throughout last year, with

Chart 2: Index of Volume of Retail Sales

% Change Year-on-Year 3 Month Moving Average

— All Businesses   — Core (excluding Motor Trades)
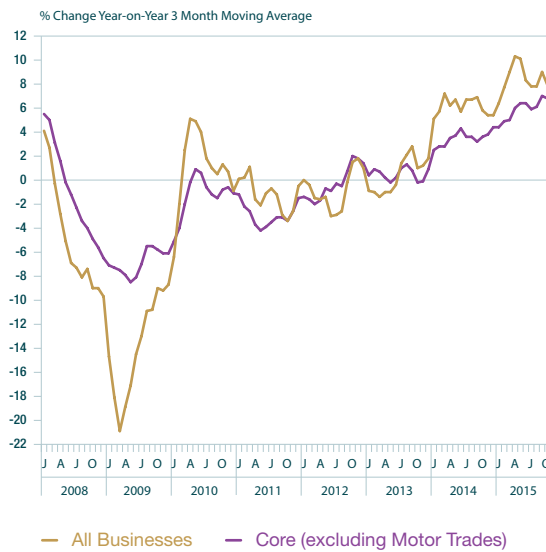
Source: CSO.

a seventh consecutive quarter of expansion recorded in consumer spending in the third quarter. Higher frequency indicators, principally retail sales and taxation data also point to robust activity in the final three months of the year. Retail sales grew by 9.4 per cent in the year to November, with core retail sales up by 8.9 per cent.

In 2016, personal consumption expenditure is forecast to grow by 2.8 per cent before moderating to 2 per cent in 2017. These forecasts are supported by a favourable labour market outlook and rising economy-wide compensation levels (see below) as well as a boost to real incomes arising from low energy prices (see Box A). In addition, the combination of improving sentiment, weak price pressures, rising asset prices and accommodative monetary and fiscal policies should lend further support to the consumption outlook.

Box A: Has real income growth been supported by lower energy prices?
By Reamonn Lydon and Stephen Byrne[1]

A significant decrease in the price of energy has been a feature of the economic landscape over the past 24 months. The price of crude oil in euro terms fell by 51.5 per cent between January 2013 and November 2015. Energy prices faced by consumers have also fallen sharply: the price of Liquid Fuels (Home Heating) and Fuels and Lubricants for Personal Transport have fallen by 31.9 per cent and 18.1 per cent respectively over the same period.[2] In this Box we ask to what extent real income growth has been boosted by the recent decline in energy prices.

Energy Prices Counterfactual

Figure 1 examines developments in real disposable income which we calculate by deflating gross personal disposable income by the consumer price index. The purple line illustrates the decline in real incomes in the period to 2013 and the subsequent recovery thereafter. Downward energy price shocks increase the discretionary income households have available to spend on consumption of other goods and services. In order to examine the magnitude of this support, we conduct a simple counterfactual exercise which is illustrated in figure 1.
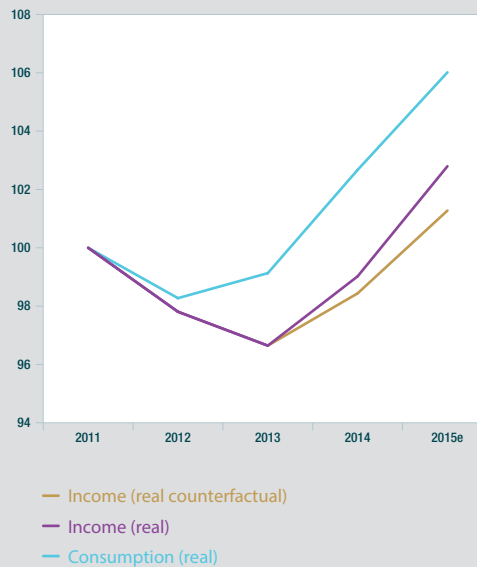
1   Irish Economic Analysis Division.

2   CPI Detailed Sub-Indices

Box A: Has real income growth been supported by lower energy prices?
By Reamonn Lydon and Stephen Byrne

The gold line illustrates the mechanical impact of lower energy prices on real incomes by fixing the price of energy in the CPI basket at its January 2013 level. Using this counterfactual, we can examine what developments in real incomes would have looked like had the subsequent decline in energy prices not occurred. The result shows that while there would still have been a recovery in real incomes, this would not have been as substantial as the outturn. In 2014, the fall in energy prices contributed 0.6 percentage points to the increase in real incomes. Using the Central Bank's current estimates for 2015 Gross Disposable Income, this difference accumulates to around 1.5 percentage points by the end of 2015. In other words, we estimate that energy price falls have provided around a 1.5 percentage point boost to households' purchasing power since January 2013. The overall increase in real incomes during this period is expected to be around 6 per cent. It is important to point out that the consumption impact of this short-term boost to real income depends on how households react, notably their propensity to save or spend the additional income.

Box A Fig 1: Energy prices counterfactual and the developments of real disposable income. (2011=100)

— Income (real counterfactual)
— Income (real)
— Consumption (real)

Source: CSO, Central Bank and Authors' Calculations.

Theory suggests that if households expect lower oil prices to be a permanent feature of the economic landscape then more of the increase in real income will be reflected in spending. If, on the other hand, oil prices are expected to increase in the short- to medium-term households might choose to save more. Gross-savings rates fell by just over 1 percentage point in 2014 and are unlikely to have fallen further in 2015. This suggests that much of the increase in purchasing power from lower energy prices found its way into spending.

Investment

Uncertainty relating to the outlook for investment expenditure increased significantly with the inclusion of intellectual property (IP) assets in gross fixed capital formation,[3] which was the main driver of investment growth in 2015. While this category of intangible investment is related to the exports of high-tech sectors in Ireland, it is not as employment intensive as investment in building and construction or machinery and equipment. Uncertainty and volatility in the investment data is further compounded by the scale of fluctuation in investment in aircraft by Irish resident airlines and leasing companies.[4]

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3   Intangibles investment, which includes spending on patents and intellectual property rights as well as organisational and human capital, amounted to almost €15 billion in the first three quarters of 2015 – an increase of almost 115 per cent in the year. While this was probably related to the reorganisation of activities by a limited number of multinationals, it represents a non-negligible proportion of overall investment and is likely to add considerable noise to the overall investment figures. For further details on the methodological change see "Box A: The Implications of Recent Changes to Macroeconomic Statistics" in the Domestic Economy chapter of the Central Bank of Ireland *Quarterly Bulletin* No.3, 2014.

4   For further details on the issue of aircraft in investment see "Box B: The Impact of Changes in Trade in Aircraft in the National Accounts" in the Domestic Economy chapter of the Central Bank of Ireland *Quarterly Bulletin* No.4 2015.

Chart 3: Volume of Exports

% Change Year-on-Year

— Goods   — Services
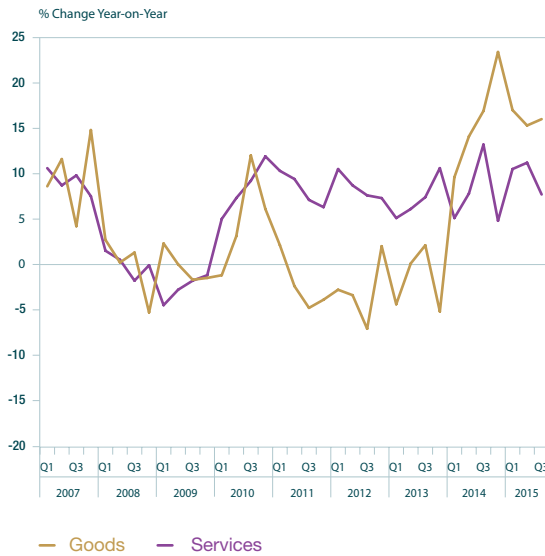
Source: CSO Quarterly National Accounts.

Quarterly National Accounts data for the first three quarters of 2015 indicate that, on the building and construction side, new housing completions increased by almost a fifth on a year-on-year basis. However, this increase is coming from a very low base and further increases will be needed to satisfy current and future demand. Housing output is expected to increase to 14,000 and 18,000 units in 2016 and 2017, respectively.[5] On the non-housing side, expectations have been revised down slightly since the previous *Bulletin* following a lower than expected outturn in the third quarter of 2015. Nonetheless, the low vacancy rate in the commercial sector and a reasonably favourable pipeline of announced projects should see higher single-digit increases in 2016 and 2017.

On the machinery and equipment side, the trend – net of aircraft – continues to be one of re-stocking and new investment, with projected increases of approximately 10 per cent and 8 per cent for 2016 and 2017. In conjunction with the forecasts for building and construction, underlying investment, excluding

intangibles and aircraft, is forecast to increase by 8.3 per cent in 2016 and 2017, with headline investment growth of 11.8 and 7.4 per cent expected over the same period.

Government Consumption

After growing by 2 per cent in the first three quarters, the volume of government consumption is estimated to have increased by 3 per cent in 2015. For 2016 and 2017, government consumption is forecast to grow at a more moderate average pace of 1.5 per cent.

External Demand and the Balance of Payments

Exports and Imports

Developments in both exports and imports are now estimated to have been stronger than previously projected for 2015. With import growth in particular being affected by large IP purchases, the overall contribution of net exports to GDP growth is likely to have been negligible last year. Projections in this *Bulletin* for 2016 and 2017 imply a stronger contribution from net exports to GDP growth over the forecast horizon (Chart 1). This arises as the easing of growth in consumption and investment lead to a more pronounced deceleration in projected import growth whereas export growth, while slowing, is expected to be increasingly supported by a gradual and sustained rise in world demand and, to a lesser extent, a continuation of the favourable factors underpinning the 2015 performance.

Goods exports have been the main contributor to overall export growth in recent quarters, reflecting both activity within the State and production carried out on contract for Irish resident companies outside the State. The high-tech sectors of pharmaceuticals and medical devices continue to feature strongly in goods and total export performance. On the

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5   There appears to be some disengagement between housing output as recorded in the *National Accounts* and completion figures published by the Department of Environment, Community and Local Government. This may relate to previously flagged issues over the use of electricity connections in the DoECLG data.

Table 2: Goods and Services Trade 2015[e], 2016[f], 2017[f]

	2015[e] EUR millions	% change in volume	% change in price	2016[f] EUR millions	% change in volume	% change in price	2017[f] EUR millions
Exports	255,814	6.5	1.4	276,207	4.9	1.5	294,195
Goods	141,446	7.4	0.8	153,128	5.4	1.2	163,322
Services	114,368	5.3	2.2	123,079	4.4	1.9	130,873
Imports	212,482	6.9	0.6	228,695	4.4	1.7	242,790
Goods	79,885	5.8	0.9	85,244	3.6	1.8	89,870
Services	132,597	7.6	0.5	143,452	4.9	1.6	152,920

services side, computer, business and financial services have maintained a strong level of growth over recent quarters. Alongside the export of aircraft this has also supported recent export growth. While the performance of indigenous exporting firms are overshadowed in the aggregate figures by the predominantly foreign-owned high-tech sectors, these too are performing well aided by the competitive euro exchange rate and the lower cost of energy inputs.

Looking forward, the relatively favourable outlook for external factors, such as the cost of energy and exchange rate competitiveness, combined with favourable firm and sector-specific developments are likely to support continued robust growth in exports over the forecast horizon. The recent domiciling of IP assets in Ireland by a number of firms in high-tech sectors should also enable further growth in both goods and services exports. On-going expansion in Ireland through both green-field and mergers and acquisition (M&A) activity by multi-national firms and the related shifts in Ireland's position in global value chains could further boost export activity.[6] Sentiment indicators for both manufacturing and services industries continue to be positive in their outlook for exports. The outlook for demand in our major trading partners based on the most recent external demand assumptions from the ECB indicates an improvement in trading partner demand for Ireland; however the pace of that improvement is marginally weaker than

in the previous *Bulletin*. This is due to the knock-on effect of the relatively weak growth expectations for emerging market economies on global growth and to a fundamental re-appraisal of global trade growth, which has had a comparatively sluggish response to the economic recovery since the Great Recession. A potential emerging factor could be the higher level of uncertainty around the expected referendum on EU membership in the United Kingdom.

With these factors in mind, the latest projection is for overall export growth of 6.5 per cent for 2016 in volume terms, and 4.9 per cent in 2017. Our central assumption is that Irish export growth will respond more in line with trading partner demand by 2017, with goods exports growing at a faster pace than services over the forecast horizon. Given the firm and sector specific and geopolitical issues mentioned above, however, as well as the uncertainty about the scale of base effects from the strong 2015 performance, there is a high degree of uncertainty to the exports outlook, with risks currently judged to be somewhat tilted to the upside.

The fundamental factors underpinning import growth remain strong, but are anticipated to ease somewhat over this year and next. Both domestic demand and export growth are projected to slow over the forecast horizon. Consequently, a 6.9 per cent increase in the volume of imports is expected in 2016 followed

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6   See S. Byrne and M. O'Brien (2015) "The Changing Nature of Irish Exports: Context, Causes and Consequences", Special Article in Central Bank of Ireland *Quarterly Bulletin* No.2.

Table 3: Balance of Payments 2015ᵉ, 2016ᶠ, 2017ᶠ

€ million	2015ᵉ	2016ᶠ	2017ᶠ
Trade Balance	43,332	47,512	51,405
Goods	61,561	67,885	73,452
Services	-18,229	-20,373	-22,046
Net Factor Income from the Rest of the World	-32,429	-35,331	-38,408
Current International Transfers	-2,736	-2,736	-2,736
Balance on Current Account	8,167	9,445	10,261
(% of GDP)	3.8	4.1	4.2

by a 4.4 per cent rise in 2017. As with the export outlook, there is increased uncertainty about the imports projection, where the base effect of the strong 2015 outturn could weigh on import growth this year. Given that the impacted categories of IP related imports account for approximately 45 per cent of all imports, risks to the import outlook are marginally to the downside.

Combined with the export outlook this implies a higher net export contribution to overall GDP growth compared with 2015, rising to 0.8 percentage points and 1.5 percentage points in 2016 and 2017 respectively, with some upside risk particularly for 2016.

Net Trade, Factor Incomes and International Transfers

Despite the faster pace of growth in the volume of imports estimated for 2015, the trade balance is likely to have increased strongly to over 20 per cent of nominal GDP given the growth in the volume of exports and a strong improvement in the terms of trade. On the basis of the outlook for net exports discussed in the previous section, it is expected that the trade balance will rise further over this year and next to just over 21 per cent of GDP, as a surplus in goods trade continues to outweigh the services trade deficit, with the latter being subject to more downside (i.e. positive) risk.

Changes in net factor income flows have been dominated by the profits of non-financial multinational enterprises resident in Ireland, and particularly those headquartered here and receiving investment income inflows from overseas affiliates. This follows from the significant M&A activity and re-domiciling of multinational enterprises noted in the previous section. There was further evidence of such corporate restructuring in 2015, and announcements of future activity in this space which may well increase factor income inflows into Ireland over the forecast horizon. However, with the recent tendency of the domiciling of IP assets in Ireland for certain sectors, which may be indicative of a wider trend in response to domestic and global policy initiatives on corporations profit tax, there could be a higher level of factor income outflows in terms of dividends and retained earnings in future years.

Given the scale of factor income flows, the uncertainty of their timing, and the potential response of multi-national enterprises to changes in the global policy framework on corporations profit tax, small changes in outflows or inflows could have a significant impact on balance of payments projections in this *Bulletin*. Taking this into account, along with the trade developments noted above, the central projection implies a current account surplus of slightly above 4 per cent of GDP in both 2016 and 2017.

Chart 4: Volume of Industrial Production

% Change Year-on-Year

— Manufacturing Industries — Modern Sector
— Traditional Sector
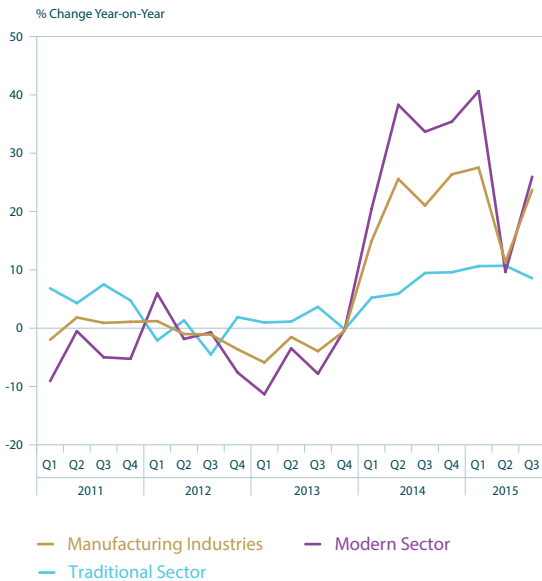
Source: CSO.

Supply

The latest *Quarterly National Accounts* show growth in most sectors of the economy in the third quarter of 2015. In total, Gross Domestic Product expanded by 7 per cent compared with the same period in 2014. This expansion has been broad based, but the agricultural and industrial sectors performed particularly robustly, growing by 16 and 16.1 per cent respectively. Within the industrial sector, the transportable goods industries and utilities sub-sector grew by 17.9 per cent year-on-year in Q3. This sector, which is dominated by multinational corporations, was the biggest contributor to output in the economy in Q3 2015, accounting for just less than 25 per cent of GDP.

The latest high-frequency industrial production data are consistent with continued expansion in the latter part of 2015. The modern sector, which is dominated by the pharmaceutical and chemicals sectors, grew by 26 per cent year-on-year in the third quarter. The traditional sector also performed well in Q3 growing by

10.3 per cent year-on-year. The manufacturing sector grew by 23 per cent year-on-year in Q3.

More timely survey data point towards continued expansion in the period ahead. Both the Investec Purchasing Managers' Indices (PMI) and ESRI/KBC Consumer Sentiment Index have continued to improve over the past number of months. In the services sector, purchasing managers' responses in November indicated the sharpest rate of expansion, at 63.6, since June 2006 and confidence in the sector was boosted by growth in new business and new export orders. The CSO's Monthly Services Index expanded by 5 per cent year-on-year in October, driven principally by wholesale trade, and accommodation and food services. In the manufacturing sector, the PMI in November was 53.3, suggesting expansion, though the rate of growth has weakened slightly over the past few months. In addition, the most recent Bank Lending Survey for Ireland indicated that credit standards with respect to loans to enterprises were unchanged in the third quarter; though demand for loans, in particular loans to fund fixed investment, increased.

The Labour Market

The robust recovery in the labour market is expected to continue over the forecast horizon with employment projected to grow by 2.4 per cent in 2016 and by 1.9 per cent in 2017. In headline numbers this translates into an additional 85,000 persons in employment over the forecast period. This follows (estimated) growth in employment of 2.7 per cent (51,000 persons) in 2015, the fastest rate of increase since 2007. The outlook for employment remains favourable particularly given current and expected developments in domestic demand (see Box B for more details).

Numbers in the labour force are expected to exceed 2.2 million persons in 2017 following anticipated annual growth of about 1 per cent in 2016 and 2017. This combination of labour force and employment growth should see the

Table 4: Employment, Labour Force and Unemployment 2014, 2015[e] , 2016[f] and 2017[f]				
	2014	**2015[e]**	**2016[f]**	**2017[f]**
Agriculture	109	111	113	114
Industry (including construction)	348	376	397	410
Services	1,458	1,479	1,504	1,528
Total Employment	**1,916**	**1,967**	**2,013**	**2,052**
Unemployment	241	203	179	164
Labour Force	2,157	2,170	2,192	2,215
Unemployment Rate (%)	11.2	9.4	8.2	7.4

Note: Figures may not sum due to rounding.

unemployment rate declining further towards an average rate of 7.4 per cent in 2017.

The *Quarterly National Household Survey* (QNHS) indicates that consistently strong gains in employment were recorded in 2015. Numbers at work increased by 2.7 per cent in the first three quarters of the year (to just fewer than 2 million persons). Numbers in full-time employment grew by nearly 4 per cent over the period. Gains in employment were also broad-based with 12 of the 14 sectors recording increases led by construction, manufacturing and most services sectors.

Labour force growth has lagged the recovery in employment with growth of 0.7 per cent estimated for 2015. The unemployment rate averaged 9.4 per cent in 2015, with the seasonally adjusted rate ending the year at 8.8 per cent, down from a peak of 15.2 per cent in January 2012.

Box B: Linking Employment to Underlying Economic Activity
By Diarmaid Smyth[7]

The labour market has rebounded strongly since mid-2012 with twelve consecutive quarters of rising employment translating into an additional 140,000 persons at work. Typically employment tends to lag GDP growth as employers wait for concrete evidence of an upturn in the economy before deciding to hire workers. In Figure 1, the annual growth rate in GDP is plotted against employment. The volatility in the GDP series both in an absolute sense but also relative to employment is apparent. In addition, while GDP tends to lead employment growth, there appears to have been some decoupling in the two series in recent years. This suggests that caution is needed in predicting employment growth based on GDP developments.

Much of the volatility in GDP reflects the activities of the multinational sector, which is a significant contributor to GDP but less important in terms of employment effects.[8] To better link labour market developments to 'job rich' economic activity, domestic demand growth is also included in Figure 1. The relationship between this series and employment also appears to have diminished in recent quarters. Two possible explanations spring to mind – first, the National Accounts (NIE) data could be revised – bringing domestic demand (and GDP) more in line with employment. Second, methodological changes in the NIE may have resulted in a breakdown in the normal link between demand and employment. This is explored in more detail below.

7   Irish Economic Analysis Division.

8   For example, in 2012, foreign owned enterprises accounted for 58.4 per cent of Gross Value Added and 22.5 per cent of employment in the business economy. See: http://www.cso.ie/en/media/csoie/releasespublications/documents/multisectoral/2012/businessinireland2012.pdf

Box B: Linking Employment to Underlying Economic Activity
*By Diarmaid Smyth*

The movement to ESA 2010 resulted in significant changes to the NIE in Ireland. Investment spending in particular is now a much larger component of domestic demand with an upward revision of close to 20 per cent in NIE 2014. This reflects changes to the classification of both transport related and R&D type investment (see Box B, *Quarterly Bulletin* 4, 2015).[9] These changes may have contributed to a breakdown in the relationship between demand and employment. To explore this possibility further we define a series business investment, that is, overall investment less transport and intangibles related investment expenditures, and combine this with consumption and government spending. We refer to these three combined series as 'underlying domestic demand'. The growth in this aggregate appears to be more closely correlated with employment (Figure 2). If anything, one might expect a number of quarters of robust employment growth given the marked recovery in underlying demand in recent quarters.
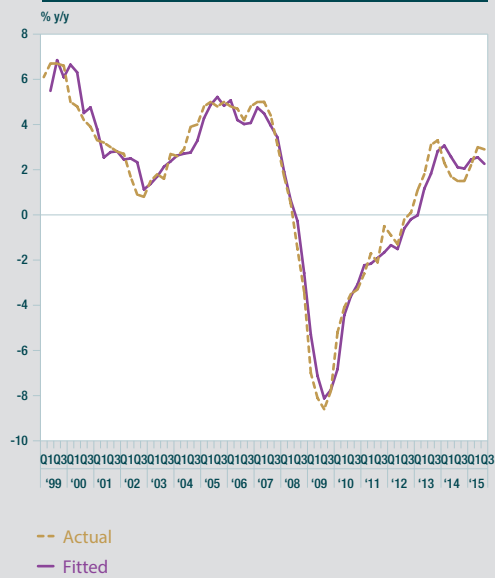
Box B Fig 1: Employment and Demand

- - Employment
— GDP
— Domestic Demand
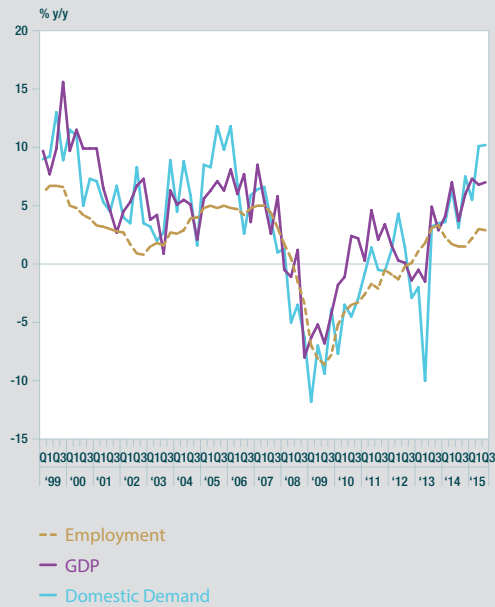
Source: CSO and author's calculations.

Box B Fig 2: Employment and Underlying Demand

- - Employment
— Underlying Demand
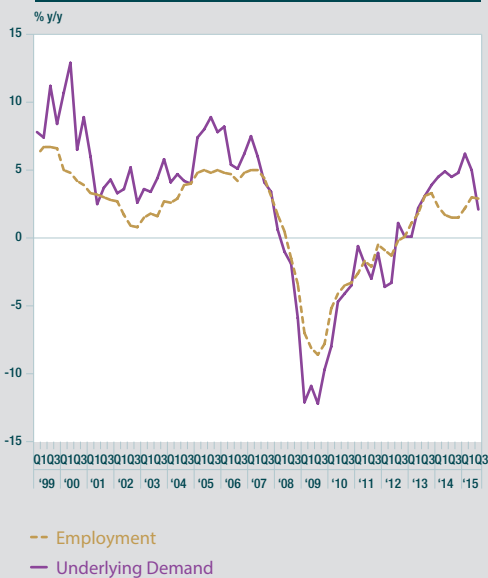
Source: CSO and author's calculations.

Box B Fig 3: Actual and Fitted Employment using Underlying Demand

- - Actual
— Fitted

Source: CSO and author's calculations.

9 Partly as a result of methodological changes, the share of domestic demand accounted for by intangibles and transport related investment has been increasing – averaging 12 per cent in the most recent four quarters to 2015 Q2, up from a long-term average share of 7 per cent.

Box B: Linking Employment to Underlying Economic Activity
By Diarmaid Smyth

More formally, we find that underlying demand performs well in predicting employment growth in regressions linking employment to demand (Figure 3).[10] Including underlying demand in standard regression equations points to increases in employment of approximately 2.3 per cent in 2016, and 1.9 per cent in 2017. These results were considered, as well as a range of other factors, in formulating the labour market forecasts for this *Bulletin*.

10 Underlying demand fared better in predicting employment relative to equations with GDP and unadjusted domestic demand, based on the sample 1999 Q1 to 2015 Q3. A variety of estimation techniques (including VAR and ARDL approaches) were used. The fitted series in Figure 3 is based on a regression of employment growth on its own lag and underlying demand.

Pay

Compensation per employee is expected to rise by an average of 2.5 per cent per annum in 2016 and 2017, similar to the estimated rate of increase in 2015. Coupled with the outlook for employment detailed above, economy wide compensation is forecast to increase by 4.9 per cent this year and by 4.5 per cent in 2017.

Hourly earnings increased by 2.1 per cent in the year to September, based on the CSO's *Earnings and Labour Costs Survey*. This marked a fourth consecutive quarterly increase in hourly earnings with the rate of increase strengthening for a third consecutive quarter. Increases in hourly earnings were also relatively broad based across the sectors. More recent data from the end-year Exchequer returns also point to momentum in earnings with income tax returns up 7 per cent year-on-year in December 2015. Finally, survey evidence also points to higher wages in the near term.[11]

Inflation

Despite the improving domestic economy, overall inflation has remained subdued, due, for the most part, to external factors; falls in oil and commodity prices have been acting as a drag on price levels for much of the last two years. However, near zero headline inflation masks the underlying divergence in goods and services price developments. As expected, lower global commodity prices are feeding into lower goods price inflation. Services prices,

on the other hand, are counterbalancing this with relatively strong positive increases. HICP inflation, excluding the energy component is thus higher than the headline rate.

The latest available inflation data indicate that the HICP recorded a year-on-year decrease of 0.1 per cent in November 2015. Negative HICP year-on-year inflation in the first four months of the year turned marginally positive as the year progressed, so that, on average, for the year to November 2015, the HICP was only slightly negative. As indicated, pressures coming from buoyant domestic economic activity – mainly on the services side - are being offset by lower commodity and, in particular, lower oil prices; at the time of writing, the price of Brent Crude oil had fallen to $37 a barrel – a decline of 18 per cent compared to the previous *Bulletin*.

Following on from flat HICP inflation in 2015, and on the basis of currently available information and prevailing oil futures prices, HICP inflation is expected to increase to 1 per cent in 2016, a downward revision of 0.5 per cent compared with the previous *Bulletin* – attributable mainly to the lower oil price assumptions. The CPI, which includes a mortgage interest component, is also expected to increase by 1 per cent in 2016. Reflecting strength in domestic demand, services inflation is projected to increase by 3.2 per cent in 2016. Goods price inflation, on the other hand is expected to decline by 1.3 per cent in 2016, driven in the main by lower energy, industrial goods and processed food prices.

11 IBEC reported that 71 per cent of companies expected to increase basic pay in 2016, up from 67 per cent in 2015. See https:// www.ibec.ie/IBEC/Press/PressPublicationsdoclib3.nsf/vPages/Newsroom~q4-outlook-ireland-unprepared-for-surging-growth-14-12-2015/$file/Ibec+2015+Q4+Economic+Outlook.pdf

Table 5: Inflation Measures - Annual Averages, Per Cent

Measure	HICP	HICP excluding Energy	Services[a]	Goods[a]	CPI
2011	1.2	0.0	0.8	1.5	2.6
2012	1.9	0.9	1.9	1.9	1.7
2013	0.5	0.6	1.6	-0.4	0.5
2014	0.3	0.6	2.4	-1.7	0.1
2015[e]	0.0	1.0	3.5	-3.4	0.0
2016[f]	1.0	1.7	3.2	-1.3	1.0
2017[f]	1.9	1.6	2.7	1.1	1.9

a Goods and services inflation refers to the HICP goods and services components.
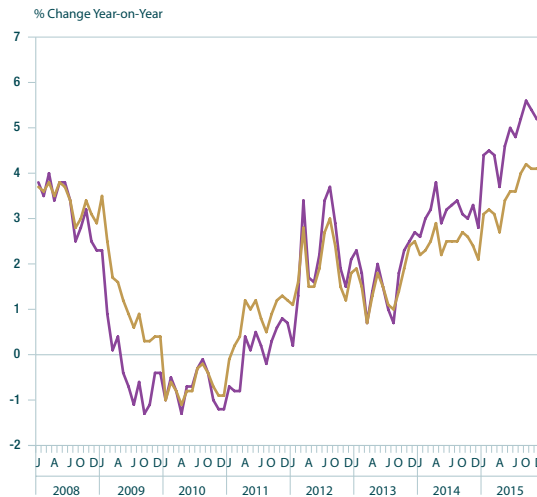
Chart 5: Consumer Prices

% Change Year-on-Year
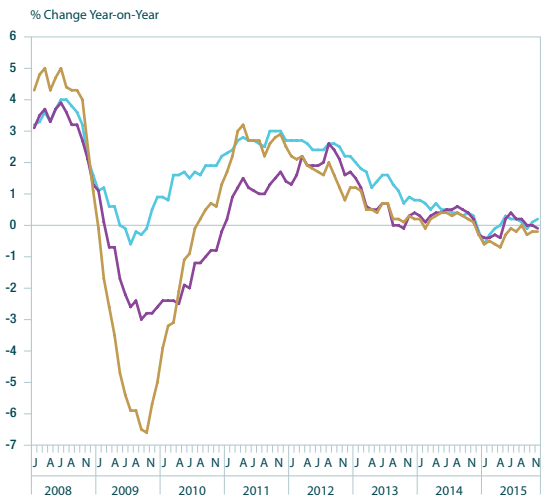
— Ireland: Consumer Price Index
— Ireland: Harmonised Index of Consumer Prices (HICP)
— EA-17: Monetary Union Index of Consumer Prices (MUICP)

Source: CSO.

Chart 6: Services Sector Inflation

% Change Year-on-Year

— HICP Services (Overall)   — HICP Core Services

Note: Core Services equals HICP services excluding telecommunications, alcohol and administered services.
Source: CSO.

In 2015, the downward pressure coming from lower global commodity prices was partially offset by depreciation in the euro, currencies relative to Ireland's main trading partners' currencies – the US dollar and the pound sterling; there was some strengthening of the euro in the later stages of 2015 and into 2016 partially reversing this upward pressure. All else being equal, a decline in the value of the euro serves to increase the euro price that foreign producers selling in Ireland need

to charge to maintain profits in their own currency. Since the last *Bulletin*, the technical assumptions underlying the forecasts with regard to the pound sterling and the US dollar are approximately 1.4 and 3.6 per cent lower, respectively.

Looking to 2017, some pick-up in headline HICP inflation is envisaged, driven mainly by a recovery in the goods component, as the moderating influence of external factors seems

set to wane. The most prominent driver of the projected recovery in goods inflation is expected to be the energy component, with oil prices assumed to recover modestly after the sharp falls seen in 2014/2015. Services inflation in 2017 is expected to moderate slightly from 3.2 per cent in 2016 to 2.7 per cent as domestic demand growth moderates. Core services inflation is expected to increase by close to 4.1 per cent in 2016, before slowing to 3.4 per cent in 2017. Reflecting this combination of developments, both HICP and CPI inflation are projected to rise to 1 per cent in 2016 and 1.9 per cent in 2017. The projected profile for headline HICP and CPI inflation is lower compared with the previous *Bulletin*, due for the most part to external assumptions.

Box C: Developments in nominal GDP and the GDP deflator
By Martin O'Brien[12]

Nominal GDP is likely to have grown by circa 12.5 per cent in 2015. While the bulk of this increase was reflected in volume growth, the general level of prices in the economy as measured by the GDP deflator, is also estimated to have made a significant contribution in rising by 5.6 per cent. This rise in the GDP deflator stands in contrast to the developments in consumer prices with the HICP being relatively unchanged and, at a first glance, the dynamics of the other main expenditure component deflators in the *National Accounts* (private and government consumption, investment, exports and imports). As the level of nominal GDP is a key input in measuring fiscal targets in the Stability and Growth Pact, as well as benchmarks for evaluating other issues such as credit growth or the labour share of income, it is informative to understand the drivers of the GDP deflator. In this Box we evaluate whether they have changed over time, and what are the implications for our understanding of economy wide price developments and nominal GDP.

In broad terms, changes in the GDP deflator can be decomposed into the changes in domestic demand related prices (private and government consumption and investment) and the terms of trade (export prices expressed relative to import prices). We can use regression analysis to evaluate the relative importance of domestic and trade related price developments in determining the changes in the GDP deflator. Of particular interest is whether their relative importance has changed over time. Figure 1 shows the variation over time of the regression coefficient of year-on-year changes in domestic prices and the terms of trade in explaining contemporaneous changes in the GDP deflator.[13]

12 Irish Economic Analysis Division.

13 To conduct the analysis the following regression is estimated using maximum likelihood on quarterly data, t = 1998Q1-2015Q3: $\Delta YED_t = \alpha_t + \beta_{1t}\Delta DTD_t + \beta_{2t}\Delta TOT_t + \beta_{3t}\Delta YED_{t-1}$. YED is the GDP deflator, DTD is the domestic demand deflator, TOT is the terms of trade, which itself is equal to the export deflator divided by the import deflator, and Δ is the year-on-year percentage change in the variable. The estimation allows for the coefficients of interest on domestic prices (β_1) and terms of trade (β_2) to change over time to reflect any changes in the relative importance of each in explaining the year-on-year change in the GDP deflator.

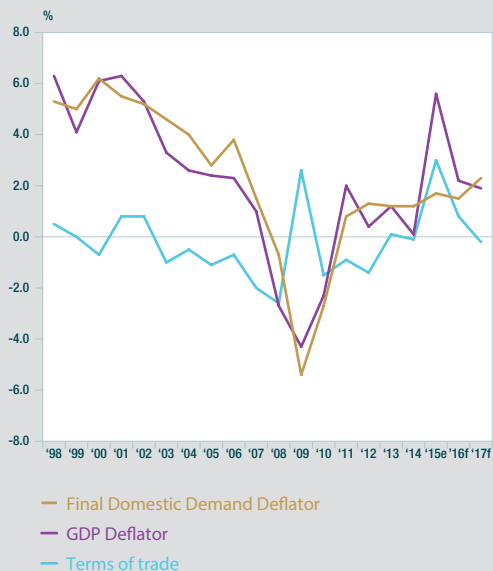**Box C:** Developments in nominal GDP and the GDP deflator
By Martin O'Brien[12]

Box C Fig 1: Relative Importance of Domestic Prices and Terms of Trade on Changes in GDP Deflator

— Domestic Prices

— Terms of Trade
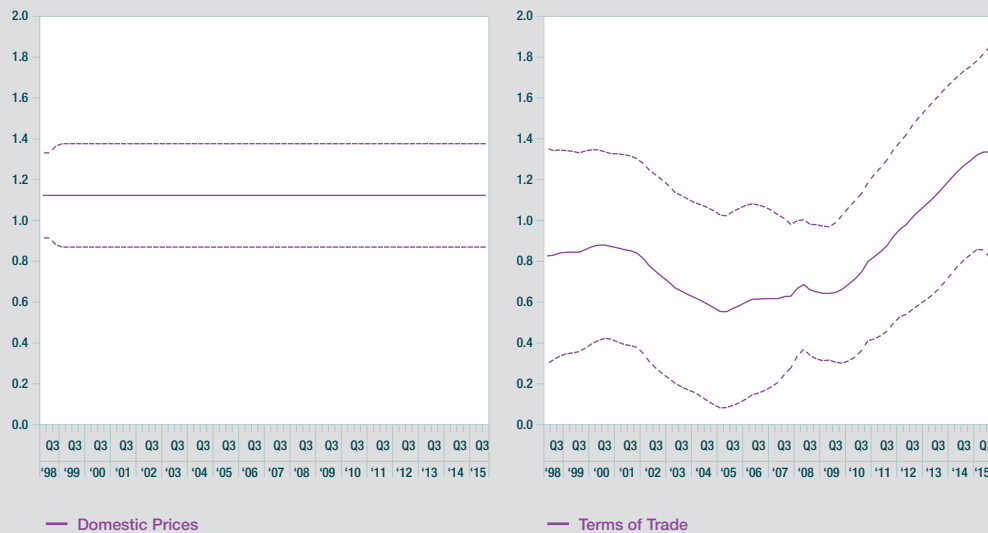
Source: Author's calculations based on data from the Quarterly National Accounts (CSO).
Dashed lines are confidence bands +/- 2 standard errors around the estimated coefficient.

As can be seen, the role of domestic prices in determining the GDP deflator has remained steady over time at just above 1 for 1, whereas the impact of changes in the terms of trade on the GDP deflator has risen in recent years. Towards the end of the sample, for every 1 per cent change in the terms of trade, the GDP deflator changes by approximately 1.3 per cent. This in part explains the GDP deflator increase in 2015 being so large relative to the changes in domestic prices and the terms of trade. It also compounds the impact arising from the strong increase in the terms of trade likely to have been registered in 2015 (Figure 2). The increasing importance of the terms of trade in explaining GDP deflator dynamics corresponds with the rising share of trade in nominal GDP in recent years, as the share of domestic demand has fallen marginally (Figure 3).

Box C Fig 2: Change in Domestic Prices, Terms of Trade and GDP Deflator

— Final Domestic Demand Deflator

— GDP Deflator

— Terms of trade

Source: Author's calculations based on data from the Quarterly National Accounts (CSO) and Central Bank of Ireland forecasts.

Box C: Developments in nominal GDP and the GDP deflator
By Martin O'Brien[12]

Given that the dynamics of the terms of trade are increasingly important in explaining changes in the GDP deflator, it is informative to examine what factors underlie developments in the terms of trade itself, and in particular how much of these are in any way controlled domestically or driven by external factors. There are a number of factors that can reasonably be expected to determine export and import prices and consequently the terms of trade. Initially we can consider the role of the euro exchange rate. The US dollar is particularly relevant here as a significant portion of Irish trade is denominated in dollars. Also the price of oil in euro terms can be considered a proxy for global commodity prices which affect the price of imports directly and the price of exports indirectly. Similarly, a broader measure of relative costs in our trading partner economies can be expected to impact export prices directly and import prices indirectly.
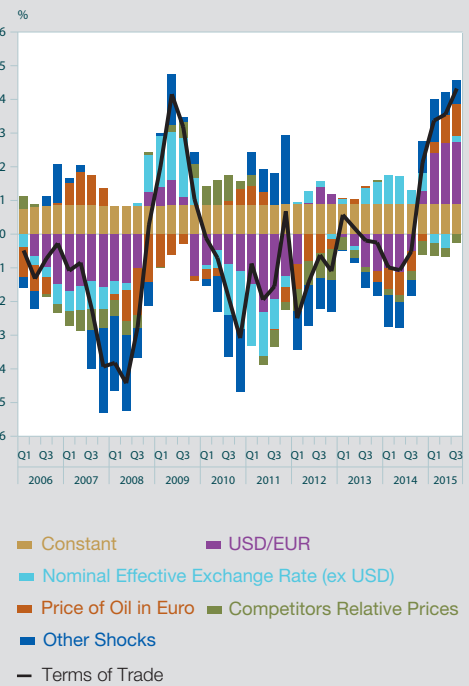
To examine the relative role of these factors more formally we can analyse the historical decomposition of the terms of trade series following a vector autregression (VAR) analysis including these variables and other shocks which are not identified by the model (Figure 4).[14] The decomposition shows the influence of shocks to the variables in the system on the change in the terms of trade. Dynamics in the terms of trade tend to be significantly affected by developments in the euro/USD exchange rate and the price of oil. This was particularly the case in 2015, where both the appreciation of the USD and the large fall in the price of oil both contributed to the faster pace of growth in the terms of trade.

Box C Fig 3: Domestic Demand and Trade as a Proportion of Nominal GDP
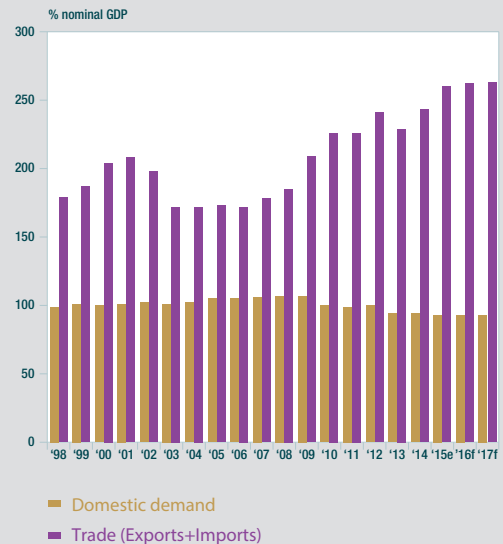
% nominal GDP

- Domestic demand
- Trade (Exports+Imports)

Source: Author's calculations based on data from the Quarterly National Accounts (CSO) and Central Bank of Ireland forecasts.

Box C Fig 4: Historical Decomposition of the Terms of Trade

%

- Constant
- USD/EUR
- Nominal Effective Exchange Rate (ex USD)
- Price of Oil in Euro
- Competitors Relative Prices
- Other Shocks
- Terms of Trade

Source: Author's calculations.

14 The VAR is estimated over 1998 Q1-2015 Q3 and includes the year-on-year percentage change in the terms of trade, the USD/euro exchange rate, the trade-weighted nominal effective exchange rate (excluding USD), the price of oil in euro terms (Brent crude), and the trade-weighted relative consumer price index. The system included two lags of each variable as per the Akaike Information Criterion, and is identified using a simple recursive scheme (Cholesky), where any variables that are in part determined domestically (trade-weighted relative consumer price index and the terms of trade) do not contemporaneously affect globally determined variables.

Box C: Developments in nominal GDP and the GDP deflator
By Martin O'Brien[12]

As a result, the rising terms of trade, driven by globally determined factors such as the euro/USD exchange rate and the price of oil, led to the increase in the GDP deflator witnessed in 2015. Aside from the 2015 development itself, the role of these external factors in determining the GDP deflator has become more important than domestically determined prices over recent years. Given that the GDP deflator is now more responsive to globally determined factors, it adds a further element of uncertainty for domestic policy makers on the future path for nominal GDP when evaluating issues such as the fiscal deficit and debt ratios. Understanding the relative importance of these global factors on the GDP deflator also provides important context for backward looking indicators using nominal GDP for policy analysis, such as the credit-to-GDP gap when framing the countercyclical capital buffer.
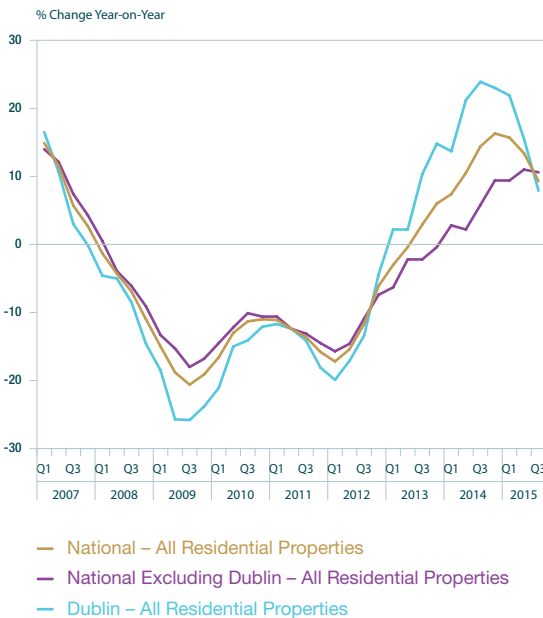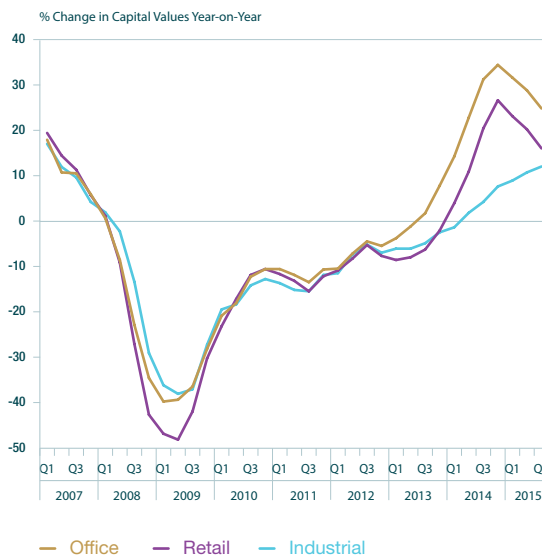
Chart 7: Residential Property Price Indices

% Change Year-on-Year

— National – All Residential Properties
— National Excluding Dublin – All Residential Properties
— Dublin – All Residential Properties

Source: CSO.

Chart 8: SCS/IPD Irish Commercial Property Index

% Change in Capital Values Year-on-Year

— Office   — Retail   — Industrial

Source: SCS/IPD.

Residential Property

Residential property prices continued to increase in the final months of 2015, although the rate of growth moderated compared with the start of the year. In November, the latest month for which data is available, prices grew nationally by 6.5 per cent compared with the same month in 2014. The moderation in price increases has been most noticeable in the Dublin region, where prices grew by 3.3 per cent year-on-year. Outside of Dublin, prices grew by 9.6 per cent. Apartment prices are growing faster than house prices at 7.4 per cent nationally, but there are a low volume of transactions underlying this data and as

such it is prone to volatility. Given increasing demand supported by the more favourable labour market, supply constraints are placing upward pressure on prices. Department of Environment statistics show that 10,052 houses were completed in the year to October 2015. Building commencements, a key leading indicator of supply, totalled 7,016 by October 2015.

Commercial Property

The latest data from the Society of Chartered Surveyors/Investment Property Databank show that commercial property prices

Chart 9: Harmonised Competitiveness Indicators

Base: Quarter 1, 1999=100

— Nominal HCI — Consumer Price Deflated HCI
— Producer Price Deflated HCI

Source: Central Bank of Ireland and ECB.

Chart 10: Divergence of Tax Heads from Profile

■ Income Tax ■ Corporation Tax ■ VAT
■ Local Property Tax ■ Excise Duties ■ Stamps ■ Other
— Total

Source: Department of Finance.

continued to grow strongly in the third quarter of 2015. Growth is strongest in the office and retail sectors, at 24.9 and 16.1 per cent, respectively. In the industrial sector, year-on-year growth of 16.1 per cent was recorded in Q3 2015. Overall commercial property prices expanded by 21.7 per cent year-on-year. The Bank's latest Macrofinancial Review (December 2015) conducts a detailed analysis of recent developments in the commercial property sector.

Competitiveness

The euro has remained weak relative to the US dollar and the pound sterling over the past number of quarters. As of the 1st of January 2016, the dollar exchange rate was $1.08 and had stabilised around this level in Q4 2015. In year-on-year terms, the euro has declined against the dollar by 10 per cent. The situation is similar for the euro against the pound as the rate was at £0.74 on the 1st January 2016 – down over 6 per cent on a year-on-year basis.

The latest Harmonised Competitiveness Index (HCI) data for November 2015 show that the nominal HCI depreciated by 5.8 per cent on a year-on-year basis. When deflated by consumer prices and producer prices, the real

HCI decreased by 6.5 per cent and 8 per cent, respectively, over the same period. These HCI developments, which suggest an improvement in competiveness, largely reflect movements in the exchange rate.

On the basis of the conventional GDP per worker measure, productivity is estimated to have increased by 3.2 per cent in 2015. Looking ahead, average annual productivity growth of 2.4 per cent (on a GDP per worker basis) for 2016 and 2017, respectively.

Factoring in the projected increases in compensation of employees over the forecast horizon, unit labour costs are expected to fall by 1.4 per cent in 2016 and then remain unchanged in 2017.

The Public Finances

Overview

Government Finance Statistics reveal that the general government deficit and debt declined in the first half of 2015. Exchequer returns data, meanwhile, point to the positive trend continuing in the second half of the year; tax revenue surpassed Department of Finance expectations by €3.3 billion for the year as a

whole, led by rapid growth in corporation tax receipts (see Box D), more than compensating for above profile expenditure. These developments effectively confirm that the 2015 EDP budget target – a general government deficit below 3 per cent of GDP – was met comfortably. A notable further decline in the public debt ratio is also anticipated following further divestment by the State of banking assets.

Exchequer Returns[15]

The latest data reveal that the Exchequer deficit was halved in 2015, declining from €7.6 to €3.8 billion over the course of 12 months (see Table 6). This outturn was substantially better than expected at the time of the last Budget. While an improvement over the period was anticipated, the Exchequer balance was a notable €2.3 billion ahead of profile as favourable revenue developments outweighed higher than budgeted expenditure.

Tax revenue continued to outperform expectations in the final quarter of the year, led by developments in corporation tax. Total taxes ended the year 10.5 per cent higher in year-on-year terms and were €3.3 billion (7.8 per cent) ahead of profile, as receipts surpassed the €45 billion threshold for the first time since 2007. As Chart 10 shows the tax over-performance strengthened over the course of the year, increasing from €1 billion at the end of June and €2.4 billion at the end of Q3. Two-thirds of this over-performance reflected corporation taxes, which increased by 49 per

cent to surpass their pre-crisis level. The other three of the 'big four' tax heads – income tax, VAT and excise duties also grew robustly, with income tax 7 per cent higher in annual terms as the labour market continued to recover. Non-tax revenues were also stronger than expected in 2015, albeit by a much more modest amount, led by developments in PRSI, again highlighting the labour market recovery (8 per cent growth, €239 million ahead of profile). Central Bank surplus income increased by €500 million in 2015, although around half of this does not impact the general government balance (but will improve the debt ratio).

These favourable revenue developments were partly offset by above profile expenditure, following supplementary spending undertaken in the final months of the year. Total expenditure increased 0.5 per cent on an annual basis and was €1.2 billion above profile. In gross terms, both current primary and capital spending increased, with the biggest overruns coming in Health and Social Protection. Higher than anticipated EU Budget contributions also contributed to the overrun. Interest expenditure, by comparison, was sharply weaker in annual terms, reflecting the earlier repayment of IMF Programme loans and more favourable market conditions. Overall the Exchequer data suggest that the positive general government trends observed in the first half of the year, strengthened as 2015 progressed.

In 2015, Corporation Tax (CT) receipts overshot the expected profile set at the beginning of the year by €2.3 billion (Figure 1). The 49 per cent annual increase recorded was one of the driving forces behind a very positive fiscal performance in 2015. For forecasters and policy makers, an overshoot of this scale prompts an important question, namely: why did it occur, and how does it impact on future forecasts?

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15 The figures in this section exclude transactions with no general government impact, giving a closer approximation to the general government balance. These figures are provided by the Department of Finance in its Analytical Exchequer Statement.

Box D: Corporation Tax Receipts in 2015
By Reamonn Lydon, Diarmaid Smyth and Graeme Walsh[16]

From a forecasting perspective, the overshoot could be due to several factors. For example, firms' profits may have been higher than expected or there may have been a fundamental shift in the relationship between profits and taxes paid. Forecasts generally include a judgemental component, and it is possible that this judgement turned out to be too conservative *ex-post*. In order to assess the impact on the forecast of the changing economic climate, we estimate a time-series model which relates monthly CT receipts to the monthly industrial production index (IP).[17] We use this index as it is published at a short lag by the CSO (usually just over one month) and therefore provides potentially useful and timely information on firm activity as the year progresses. Historically this index tends to closely track other variables that can be used to forecast CT receipts, such as GDP and gross operating surplus (GOS).[18]

Box D Fig 1: Monthly Corporation Tax Receipts in 2015

Actual • Expected • Monthly Excess
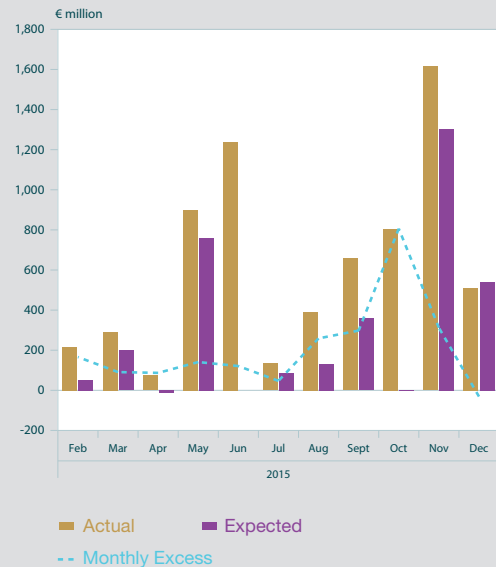
Source: Department of Finance.

On the basis of forecast comparisons from different models (see appendix) our preferred specification relates CT receipts to the IP index for the ICT sector. A dynamic forecast for 2015, incorporating the outturn for IP ICT, predicts total receipts for 2015 of €5.8 billion, still some €1.05 billion below the outturn. Comparing this to the €2.3 billion figure above suggests that a significant proportion of the overshoot (54 per cent) can be explained by firms' profits being significantly higher than expected at the beginning of the year.

The model undershoot can be interpreted as the portion of revenues not accounted for by the statistical and economic (via the proxy) information in the model. It should also be noted that tax forecasts might also be expected to include a judgemental component, such as for example, information on upcoming events (not captured in historical data) which we have not included.[19]

Appendix: Econometric model of monthly Corporate Tax receipts

CT forecasts can be updated throughout the year by combining monthly CT data with proxies for activity or profits in the corporate sector, such as IP indices. We also considered a range of other potential explanatory variables, including exchange rates, exports and competitiveness indicators. The models are specified so as to capture the dynamics of the data, including seasonal variation, whilst also picking up the impact of current trends in the economic variables.

We estimated four ARIMA models using monthly data from 1984M01 to 2015M11. The dependent variable in each is the log of CT receipts and we include seasonal controls. Using the r-squared, root mean squared errors and Theil's U-statistics to inform our forecast comparisons, model 4, which related CT receipts to output in the ICT sector, is our preferred model. In this exercise, our preferred choice of specification is a pragmatic one; however, in recognition of model uncertainty, models containing more broad-based measures, and, indeed, combinations of models, are also likely to be informative.

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17 Details of the model, which includes controls for seasonality, are shown at the end of this box.

18 For details see: http://s3.amazonaws.com/zanran_storage/www.finance.gov.ie/ContentPages/8987749.pdf.

19 For details see (IFAC 2015).

Box D: Corporation Tax Receipts in 2015
By Reamonn Lydon, Diarmaid Smyth and Graeme Walsh[16]

Box D, Table 1: Coefficients on Industrial Production in the four models

	Model 1	Model 2	Model 3	Model 4
IP index manufacturing (10 to 33)	1.09 (5.54)			
IP index modern (18.2, 20, 21, 26, 27, 325)		0.61 (5.39)		
IP index pharm/chem (20, 21)			0.33 (2.45)	
IP index ICT (26, 27)			0.52 (2.84)	0.79 (4.98)
Sample	1984m01 to 2015m11			
R-squared	0.78	0.78	0.78	0.79
Theil's U-stat	0.25	0.29	0.21	0.14

Table 6: Analytical Exchequer Statement for December 2015 (€ millions)

	Jan-Dec 2014 €m	Jan-Dec 2015 €m	Annual Change	Outturn vs Profile
Revenue	**56,041**	**60,160**	**7.4%**	**6.2%**
– Tax revenue	41,282	45,601	10.5%	7.8%
– Appropriations-in-aid	11,781	11,807	0.2%	1.9%
– Other Revenue	2,978	2,751	-7.6%	0.5%
Expenditure	**63,635**	**63,949**	**0.5%**	**1.9%**
– Current Primary Expenditure	52,602	53,131	1.0%	3.3%
– Capital Expenditure	3,562	3,839	7.8%	5.7%
– Interest on National Debt	7,471	6,979	-6.6%	-9.3%
Exchequer Balance	**-7,594**	**-3,789**	**-50.1%**	**-38.2%**

Source: Department of Finance

Note: The figures in the Table exclude transactions with no general government impact, giving a closer approximation to the general government balance.

Funding and Other Developments

In December the State received €1.6 billion in cash following the redemption of AIB's Preference share, bringing the total amount of revenue generated from banking divestments to around €3.5 billion in 2015. While this revenue is not deficit improving it will have a favourable impact on the gross debt position. The final quarter of the year also saw the National Treasury Management Agency (NTMA)

raise €1 billion in a 15-year bond auction and cancel a further €1 billion of floating rate Treasury bonds. The NTMA has announced it intends to issue €6–10 billion of long term bonds over the course of 2016. In 2015 it issued a total of €13 billion while also repaying 80 per cent of Ireland's IMF loan facility early.

An Timpeallacht Gheilleagrach

Deimhníonn na sonraí eacnamaíocha gur lean an cor chun feabhais ar ghníomhaíocht eacnamaíoch na hÉireann le bliain anuas agus meastar gur tháinig méadú díreach faoi bhun 7 faoin gcéad ar OTI in 2015. Le feidhmíocht láidir an fháis, léirítear téarnamh a bhfuil bonn leathan faoi agus atá á spreagadh go mórmhór ag aisphreabadh suntasach ar an éileamh intíre. Cé gur casta léirmhíniú a bhaint as na sonraí agus cé go leagtar róbhéim ar neart an éilimh intíre de thoradh athruithe modheolaíochta ar na Cuntais Náisiúnta agus athruithe áirithe ar ghníomhaíochtaí gnólachtaí ilnáisiúnta, deimhnítear leis an bhfeabhas ar thomhaltas agus le neart leanúnach an fháis ar fhostaíocht go bhfuil dlúth-théarnamh ar an taobh intíre den gheilleagar dea-bhunaithe.

Chonacthas méadú fíorláidir ar OTI ainmniúil anuraidh arbh ionann é agus thart ar 12.5 faoin gcéad. Le neart an mhéadaithe ar OTI ainmniúil, cuireadh go mór leis na laghduithe réamh-mheasta ar an easnamh fioscach agus ar na cóimheasa fiachais in 2015. Cé go bhfreagraíonn an méadú láidir ar OTI ainmniúil, go páirteach, don mhéadú láidir ar fhíor-OTI, bhí sé faoi thionchar ag an méadú láidir ar dhíbhoilsceoir OTI arna mheas mar 5.6 faoin gcéad. Léiríonn an ceann deireanach sin iarmhairt dálaí eachtracha, go háirithe gluaiseachtaí i rátaí malairte agus i bpraghsanna ola anuraidh[1].

Bhí tionchar cobhsaíochta na gcoigeartuithe beartais agus maicreacnamaíocha a glacadh de láimh, mar aon le teacht chun cinn tosca fabhracha lena dtacaítear le fás, mar bhonn taca faoi fheidhmíocht láidir an fháis. Le teacht chun cinn méaduithe ar thuarastail agus neartú na cumhachta ceannaigh de thoradh praghsanna fuinnimh níos ísle, treisítear an spreagadh d'ioncam a thig as téarnamh ina bhfuil fostaíocht láidir le feiceáil[2]. Thairbhigh an fás de thimpeallacht beartais níos neamhurchóidí freisin, rud a léirítear leis an moilliú ar luas an chomhdhlúthaithe fhioscaigh agus leis na dálaí leanúnacha fabhracha airgeadais, fad a cuireadh tacaíocht bhreise ar fáil leis an bhfeabhas leanúnach ar chláir chomhardaithe teaghlach agus gnólachtaí agus le dálaí leanúnacha fabhracha i bpríomh-mhargaí onnmhairíochta na hÉireann. Ba

é ailíniú dearfach na dtosca sin go léir, ar chuidigh a bhformhór díobh le treisiú an éilimh intíre, ba chionsiocair le neartú an fháis agus, cé is moite den éiginnteacht a bhaineann le teacht chun cinn teannas i margaí airgeadais domhanda, tacaíonn sé ar bhonn leathan le hionchas fabhrach leanúnach.

Ar an taobh intíre den gheilleagar, ba é an méadú láidir ar fhostaíocht, go háirithe ar fhostaíocht lánaimseartha, an fhianaise ba shoiléire ar an bhfeabhas. Le dhá bhliain anuas, cruthaíodh thart ar 45,000 post ar an meán in aghaidh na bliana sa gheilleagar, is ionann é sin agus fás 2.5 faoin gcéad ar fhostaíocht in aghaidh na bliana. I dteannta leis an bhfás athuair ar thuarastal agus i bhfianaise an bhoilscithe fhíor-ísil, chuidigh sé seo le fíorioncam agus le muinín tomhaltóirí a threisiú. I dteannta lena chéile, spreag na tosca sin feabhas láidir ar chaiteachas tomhaltóirí agus, an bhliain seo caite, tháinig méadú ar an gcaiteachas sin de réir an ráta is tapúla atá feicthe ó 2007 i leith. Ag féachaint romhainn, meastar go dtacóidh an t-ionchas fabhrach leanúnach do mhargadh an tsaothair, fíorioncam indiúscartha atá ag méadú agus feabhas ar mhuinín tomhaltóirí, leis an ionchas do chaiteachas tomhaltóirí. Ar a shon sin, de réir mar a mhaolóidh an t-éileamh folaigh lenar tugadh borradh do chaiteachas tomhaltóirí in 2015 agus de réir mar a mhoilleoidh an fás ar fhostaíocht beagán, meastar go dtiocfaidh

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1 Tá tuilleadh plé i mBosca C ar leathanach 21 ar na forbairtí ar OTI ainmniúil agus ar dhíbhoilsceoir OTI.

2 Tá plé níos leithne ar an ábhar seo i mBosca A ar leathanach 11.

maolú de réir a chéile ar thomhaltas i mbliana agus an bhliain seo chugainn.

Cé go raibh an fás ar chaiteachas infheistíochta foriomlán fíorláidir in 2015, tá leibhéal foriomlán na hinfheistíochta á shaobhadh ag iarmhairt na hinfheistíochta in aerárthaí agus iarmhairt aistriú paitinní chuig eintitis Éireannacha ag corparáidí ilnáisiúnta. Ar a shon sin, tá an bhuninfheistíocht i mbun fáis i gcónaí, glan ar aerárthaí agus ar shócmhainní doláimhsithe. Ag féachaint romhainn, tugtar le fios leis an ionchas foriomlán eacnamaíoch, atá fabhrach tríd is tríd, i dteannta leis an téarnamh atá ag teacht go fóill ar bhuninfheistíocht, gur dócha nach dtiocfaidh ach maolú beag ar luas an leathnaithe ar bhuninfheistíocht thar thréimhse na réamhaisnéise.

Ar an taobh eachtrach, leanann sreafaí trádála agus ioncaim de réir tosca de bheith go mór faoi thionchar ag iarmhairt an athstruchtúraithe chorparáidigh ar chodanna den earnáil ilnáisiúnta. Dá thairbhe sin, tá an fás ar onnmhairí agus ar allmhairí araon níos láidre ná mar a tuaradh roimhe seo. Is díol suntais é, áfach, go bhfuil feidhmíocht láidir le feiceáil freisin i gcás onnmhairí ó earnálacha dúchasacha amhail gnó agraibhia agus turasóireacht, a bhfuil dálaí fabhracha éilimh mar aon le forbairtí rátaí malairte ag tacú leo. Ag féachaint romhainn, meastar go mbeidh an fás foriomlán ar onnmhairí ag teacht leis an éileamh i gcomhpháirtithe trádála thar thréimhse na réamhaisnéise. Mar thoradh air sin, meastar go méadóidh onnmhairí de réir luais a bheidh beagán níos moille ná mar a tuaradh roimhe seo, cé go méadaítear na héiginnteachtaí atá ann de bharr na himní atá ag teacht chun cinn maidir leis an ionchas domhanda.

I bhfianaise na bhforbairtí agus na n-ionchas atá tagtha chun cinn ó foilsíodh an Feasachán Ráithiúil deireanach, tugtar le tuiscint go raibh aschur ní ba láidre ann i gcás fhás OTI anuraidh, agus go bhfuil ionchas comhchosúil ann don bhliain seo, tríd is tríd, i gcomparáid leis an réamhaisnéis roimhe seo. Agus neart an éilimh intíre ag tacú léi, meastar anois gur tháinig fás 6.6 faoin gcéad ar an OTI anuraidh. Léirítear ionchas fabhrach do chaiteachas tomhaltóirí agus infheistíochta sa mhéid go meastar go leanfaidh an t-éileamh intíre de bheith mar phríomhspreagadh an fháis

eacnamaíoch in 2016. Meastar go mbeidh fás 4.8 faoin gcéad ar OTI i mbliana, is é sin athbhreithniú beag aníos ar an meastachán roimhe seo, fad atá an réamhaisnéis d'fhás OTI, eadhon 4.3 faoin gcéad, beagán níos ísle. Ar bhonn na réamhaisnéisí fáis i gcomhpháirtithe trádála atá i gcomhréir leis na réamhaisnéisí sin ar a bhfuil na hionchais mhaicreacnamaíocha is déanaí ón BCE bunaithe agus ina léirítear maolú áirithe ar an bhfás ar éileamh intíre, meastar go dtiocfaidh méadú 4.4 faoin gcéad ar OTI agus méadú 3.9 faoin gcéad ar OTN in 2017.

Faoi láthair, meastar gur rioscaí cothromaithe iad na rioscaí a bhaineann leis na réamhaisnéisí do 2016, ach go bhfuil siad claonta i dtreo an taoibh thíos do 2017. Léiríonn sé sin ionchas ar an taobh thuas ó thosca intíre níos láidre agus ó iarmhairt mhoillithe gluaiseachtaí i rátaí malairte agus i bpraghsanna ola, ar ionchas é a fhritháirítear le rioscaí ar an taobh thíos don ionchas domhanda a d'fheadfadh iarmhairtí ionchasacha a bheith acu ar thrádáil dhomhanda.

Tugtar le tuiscint leis na réamhaisnéisí is déanaí, go bhfuil tréimhse fhíorláidir fáis i réim don gheilleagar faoi láthair agus is dócha nach mbeidh ach maolú measartha ar an bhfás sin i mbliana agus an bhliain seo chugainn. Cé gurb ionann, go páirteach, an tréimhse láidir fáis atá i réim faoi láthair agus aisphreabadh ó thréimhse lag, léiríonn sí ar bhonn níos leithne go bhfuiltear ag gluaiseacht i dtreo lánacmhainn tháirgiúil agus ionchas an gheilleagair a bhaint amach. Ar bhonn na réamh-mheastachán reatha, tá acmhainn leordhóthanach bhreise ann i gcónaí chun go mbeidh an geilleagar ábalta fás thar thréimhse na réamhaisnéise gan a bheith ag dréim le mórchonstaicí. Níos tábhachtaí fós, leis an ionchas d'fhás láidir, tugtar deis chun dul i ngleic le hiarmhairtí na géarchéime agus chun aon rioscaí amach anseo don chobhsaíocht eacnamaíoch, fhioscach agus airgeadais a íoslaghdú. Ní mór an deis seo a thapú. Tá sé riachtanach go laghdófar na leochaileachtaí atá fós ar marthain agus go neartófar an stóinseacht eacnamaíoch chun go maolófar an baol go mbeidh timthriallta 'borradh agus cliseadh' ann amach anseo agus chun fás cobhsaí inmharthana thar an meántéarma a áirithiú.

Financing Developments in the Irish Economy

Overview

International financing conditions remained favourable in Q3 2015, as the ECB continued its accommodative monetary policy of historically low interest rates and its ongoing Asset Purchase Programme. Despite the ECB's expansionary monetary policy and a recovery in the domestic economy, the outstanding amount of credit extended by domestic banks to the household and non-financial corporate (NFC) sectors continued to decline. Credit extended to households and NFCs by resident credit institutions fell by €19 billion, or 12 per cent, between Q3 2014 and Q3 2015, while nominal GNP grew by over 6 per cent over the same period. The combination of deleveraging and strong economic growth has generated significant improvements in key economic indicators, notably the household debt to disposable income ratio, which has declined by more than 14 per cent over the year ending Q2 2015.

The creditless nature of the recovery[1] is noticeable when credit developments are compared with economic indicators. For instance, nominal GNP and combined household and NFC net credit transactions[2] declined in tandem during the economic crash, but decoupled as the economic recovery gained traction. A similar trend is evident when net credit transactions are compared to employment. Ireland's economic recovery is thus occurring despite ongoing retrenchment in the domestic banking sector. This suggests a lower reliance on bank funding, and greater use of own resources, particularly as deleveraging is occurring in tandem with increased holdings of deposits. There is also evidence from the Quarterly Financial Accounts of a positive trend in the flow of foreign lending into Ireland, but this most likely arises from activity in the multinational sector.

While credit conditions remain constrained in the domestic economy, the trend of positive inflows into the Investment Fund (IF) and Financial Vehicle Corporate (FVC) sectors continued in Q3 2015. However, these inflows were more than offset by valuation declines in financial markets over the quarter.

Household and NFC Sectors

While economic indicators such as consumption and employment have been growing strongly for some time, slight improvements in the net credit flows to the household and NFC sectors are only beginning to emerge. However, they remain negative with repayments continuing to outstrip new lending for both sectors. Furthermore, movements in net credit transactions have increasingly decoupled from GNP data, as the economic recovery gathers pace, as shown in Chart 1. While some concern has been expressed

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1 See Honohan, Patrick (2015) "SME finance in the recovery" speech to the Small Firms Association available at http://www.sfa.ie/
Sectors/SFA/SFA.nsf/vPages/Events~sfa-annual-lunch-2015-06-11-2015/$file/Governor+Honohan+slides_
SFA+Annual+Lunch+2015.pdf

2 As measured by the four-quarter moving average for net transactions.

Chart 1: GNP and Net Credit Transactions of Households and NFCs

€ billion   € billion
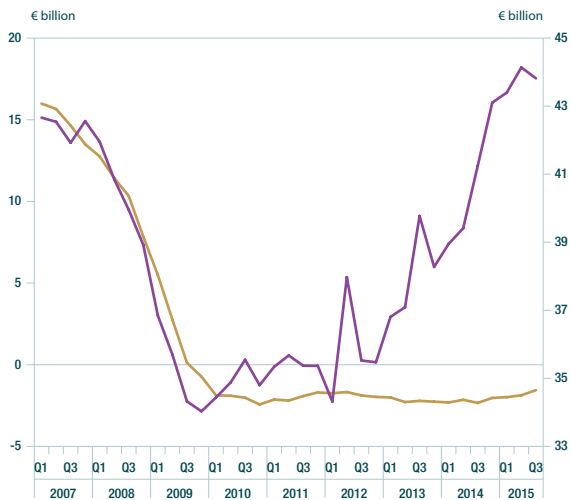
— Net Credit Transactions (LHS)

— GNP (RHS)

Source: Money and Banking Statistics, Central Bank of Ireland; Quarterly National Accounts, CSO.

Note: Credit transactions are calculated as a four-quarter moving average. GNP is seasonally adjusted at nominal value.

Chart 2: Consumption and Net Credit Transactions to Households

€ billion   € billion
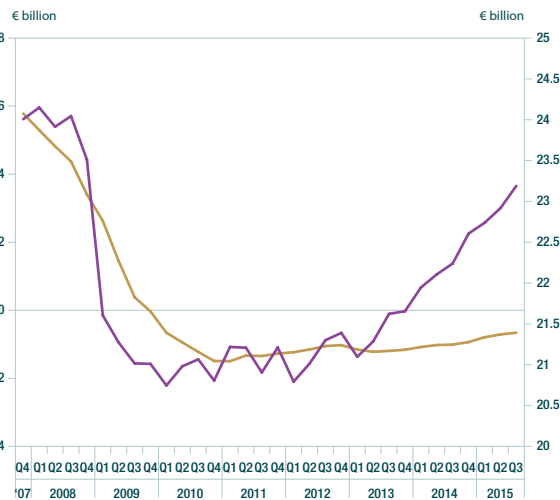
— Households Net Credit Transactions (LHS)

— Consumer Expenditure (RHS)

Source: Money and Banking Statistics, Central Bank of Ireland; Quarterly National Accounts, CSO.

Note: Credit transactions are calculated as a four-quarter moving average. Consumption is seasonally adjusted at nominal value.

about the reliability of GNP as a measure of the domestic economy[3], a similar picture emerges when credit transactions are compared to employment. While household net credit transactions are still negative, the decline has been slowing since early 2011 – driven in part by a slowdown in the decline of consumer

credit. Nevertheless, the change in credit flows to households has lagged significantly behind growth in consumer expenditure, as shown in Chart 2. A new methodology for analysing credit developments in the household and NFC sectors is presented in Box A.

Box A: Enhancements to Household and Non-Financial Corporation Bank Lending Series in Money and Banking Statistics
By Martina Sherman[4]

Money and Banking Statistics play a pivotal role in euro area and domestic policy decision making and are widely used in financial stability analysis and by professional and public analysts. The recently introduced countercyclical capital buffer rules, for example, rely heavily on high-quality credit information. Therefore, the statistics need to be frequently reviewed to ensure they can respond to changes in financing activity in the economy.[5] There is a particularly strong focus on the challenge of ensuring the measurement of transactions in credit is accurate and comprehensive.

4   Economist, Statistics Division, Central Bank of Ireland.

5   The current collection of Money and Banking Statistics underwent a review and significant enhancement in July 2010 including the adoption of new methodology on calculating net flows or transactions, see McElligott, R. and M. O'Brien (2011), 'Irish Money and Banking Statistics: A New Approach', Central Bank of Ireland, Quarterly Bulletin, No. 1.

3   See FitzGerald, John (2013) "The Effect of Redomiciled Plcs on GNP and the Irish Balance of Payments" Research Note, ESRI Quarterly Economic Commentary, Summer.

Box A: Enhancements to Household and Non-Financial Corporation Bank Lending Series in Money and Banking Statistics
By Martina Sherman

In recent years, securitisation activity by Irish resident banks has been relatively high. Approximately 27 per cent of total household loans are now held off-balance sheet, and while almost no non-financial corporation (NFC) loan stock is currently off-balance sheet, NFC securitisation activity was prevalent between 2010 and 2013. From January 2003, transactions and growth rates for on-balance sheet loans are adjusted for loan sales, and securitisations at the time of transfer. The transaction calculations also include adjustments for write-downs of loans held on MFI balance sheets. This methodology ensures that credit transactions and growth rates reflect actual lending activity. To date, data limitations have not allowed for tracking repayments or write-offs/downs after a loan sale had occurred. This Box introduces a revised methodology effective from December 2014 which allows for the calculation of transactions, including the repayments and other activity on loans, not recorded on MFI balance sheets.

The new methodology for transactions and growth rates is detailed in Box A Table 1.

Box A, Table 1: Overview of Adjustment Method for Household and NFC Loan Series		
	Transactions	**Growth rate (in period t)**
Former method	$T_t^{MFI} + N_t^{MFI}$	$(T_t^{MFI} + N_t^{MFI}) / (L_{t-1}^{MFI})$
New method	$T_t^{MFI} + N_t^{MFI} + TX_t^{DR}$	$(T_t^{MFI} + N_t^{MFI} + TX_t^{DR}) / (L_{t-1}^{MFI} + L_{t-1}^{DR})$

L_{t-1}^{MFI} = Outstanding amounts of loans on MFI balance sheets at the end of period t-1;
T_t^{MFI} = Transactions in loans on MFI balance sheets in period t, not adjusted for sales and securitisation;
N_t^{MFI} = Net transfers of loans off MFI balance sheets/derecognised (disposals minus acquisitions) in period t;
L_{t-1}^{DR} = Outstanding amounts of derecognised loans at the end of period t-1; and
TX_t^{DR} = Transactions in derecognised loans excluding transfers during period t, i.e. the loan repayments.

The key change in the new methodology is the inclusion of transactions of securitised loans in the transactions and growth rate calculation. This has the general effect of lowering the growth rate on loans advanced to Irish private sector households and NFCs (Box A Chart 1). The size of the adjustment reflects repayments and write-downs applied to securitised loans, along with the inclusion of securitised stock, which increases the base effect in the calculation of growth rates. The enhanced transactions series, available from end-December 2014, will be published in a revised Table A.6 of the online Money and Banking Statistics.

Box A Chart 1: Household Loans; Annual Growth Rates Before and After Change of Methodology
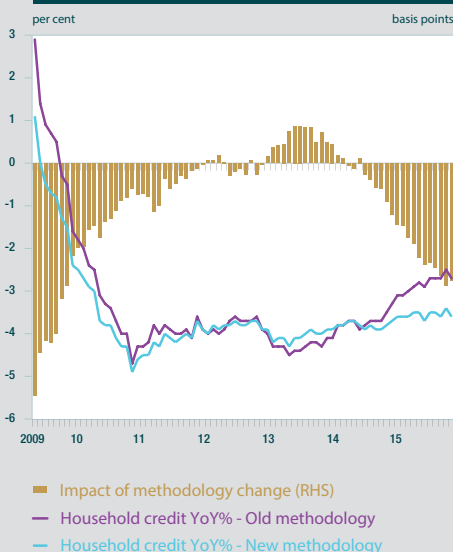
■ Impact of methodology change (RHS)
— Household credit YoY% - Old methodology
— Household credit YoY% - New methodology

Source: Money and Banking Statistics, Central Bank of Ireland.
Note: Data as at November 2015.

Box A Chart 2: NFC Loans; Annual Growth Rates Before and After Change of Methodology
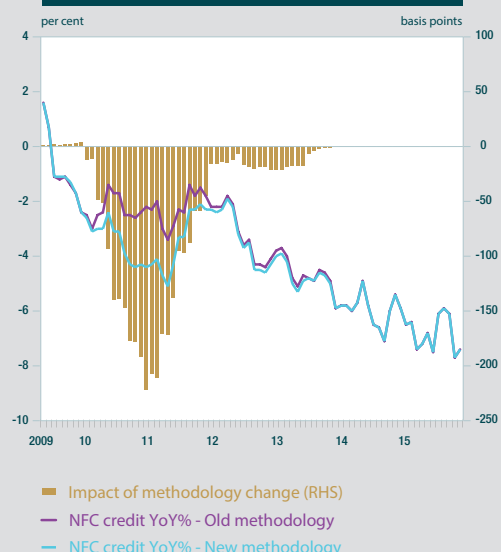
■ Impact of methodology change (RHS)
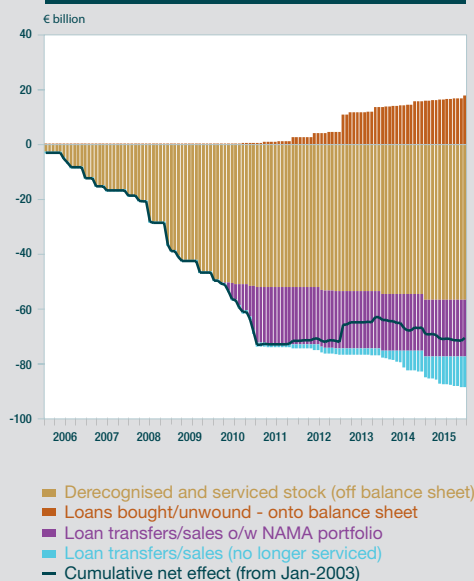— NFC credit YoY% - Old methodology
— NFC credit YoY% - New methodology

Source: Money and Banking Statistics, Central Bank of Ireland.
Note: Data as at November 2015.

Box A: Enhancements to Household and Non-Financial Corporation Bank Lending Series in Money and Banking Statistics
By Martina Sherman

The new methodology covers off-balance sheet loans which continue to be managed by the originator bank. Data are not available for loan portfolios sold by a bank that are no longer serviced by an Irish bank. Box A Chart 3 displays the cumulative stock of loans moved on or off-balance sheet since January 2003. Of the cumulative stock of transferred loans, the 'derecognised and serviced stock' and 'loans bought/unwound' series are entirely covered by the new methodology from end-2014. However, there is no further information available for loans no longer serviced by Irish banks (i.e. the red-coloured series in Box A Chart 3). This would include loans which have been sold or securitised where the servicing rights have also transferred, i.e. loans transferred to NAMA or loan transfers to equity firms and unregulated entities. The servicing rights are usually transferred in loan sales and retained for securitised stock.

Box A Chart 3: Cumulative Gross Loan Transfers/Securitisation Flows (HH and NFC) from January 2003

- Derecognised and serviced stock (off balance sheet)
- Loans bought/unwound - onto balance sheet
- Loan transfers/sales o/w NAMA portfolio
- Loan transfers/sales (no longer serviced)
- Cumulative net effect (from Jan-2003)

Source: Money and Banking Statistics, Central Bank of Ireland.
Note: The chart is sale value of loans, therefore net of write-downs at time of transfer. Data as at November 2015.

While it is only possible to produce an official high-quality series from end-2014, estimates have been calculated from January 2003 to assist in understanding the dynamics of the new methodology. The estimated series has been calculated on a best-efforts basis with both available and calculated data. Prior to December 2014, there is no way to distinguish securitised loan transfers where the servicing rights have been retained and those where the servicing rights were transferred. However, in Ireland, the servicing rights of securitised loans often remain with the originating bank. It is possible therefore, to derive a good approximation of transactions on the serviced loan stock based on reported flows of derecognised loans transfer. This estimated series is also available in Table A.6 of the Money and Banking Statistics.

The enhanced method produces growth rates of loans advanced to both households and NFCs which are mostly lower than the traditional method, albeit trends remain the same (see Box A Chart 1). This is mainly due to the inclusion of additional repayments in the transactions series, thereby reducing the transactions and growth rates. The effect is greater for and mainly driven by loans to households. Under the new method, pre-mid 2009 growth is between 200 and 350 basis points lower than current on-balance sheet-based calculations. Rates of change in 2013, however, are 20 basis points higher on average, under the enhanced method, as on-balance sheet loans declined at a faster rate than securitised loans during this period. Since the beginning of 2015, a slight divergence is also evident, whereby the inclusion of both on-balance sheet and securitised stock, and repayments applies downward pressure to the growth rate, of approximately 70 basis points, on average. This is driven by a higher magnitude of repayments on the securitised loan stock offsetting some of the reduction in negative net lending of the on-balance sheet stock. The stock of securitised loans to Irish households, which are still serviced by Irish credit institutions, were €34.6 billion at end-November 2015.

In summary, the new method of adjustment takes into account all available information on loans advanced to the Irish real economy, regardless of whether they are derecognised from a bank's balance sheet. The enhanced method therefore offers a more complete view of underlying trends. The series are also available on the ECB's Statistical Data Warehouse (SDW) on a euro-area basis, as opposed to loans to Irish residents only. This allows for greater comparison across euro-area countries and nets out different accounting practices in member states in relation to securitised loans and transfers.[6]

6 See http://www.ecb.europa.eu/press/pr/date/2015/html/pr150921.en.html.

The stock of outstanding household debt continued to decline further during the second quarter of 2015, falling to €153.2 billion or €33,056 per capita, reaching its lowest level since Q1 2006. Household debt has decreased steadily since its peak of €203.7 billion in Q3 2008. More recently, declining household debt has coincided with increasing household disposable income, accelerating the improvement in the debt to disposable income ratio, which had fallen by 14.3 percentage points to 167.4 per cent in the year to end-Q2 2015, as shown in Chart 3. Nonetheless, Ireland's ratio of debt to disposable income remains high, with only Denmark and the Netherlands ranked higher in the European Union. Box B discusses recent trends in deleveraging in Ireland and the euro area.

Chart 3: Household Debt to Disposable Income

% of Disposable Income

— Debt to Disposable Income
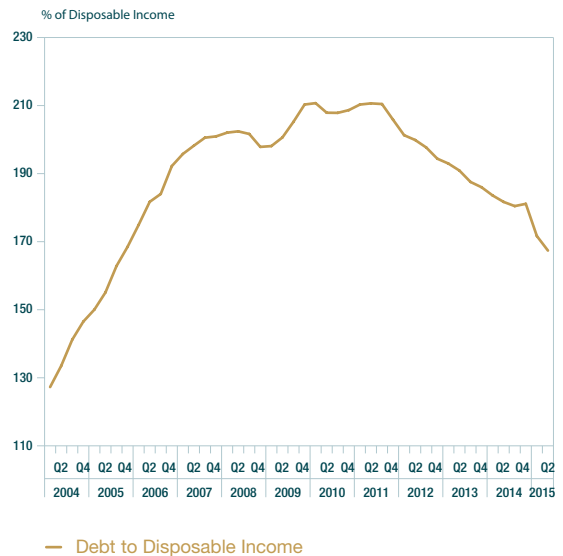
Source: Quarterly Financial Accounts, Central Bank of Ireland; Quarterly Non-Financial Accounts, CSO.

Box B: Trends in Net Lending and Borrowing by Economic Sector – A Euro Area Comparison
By Mary Cussen and Kenneth Devine[7]

Significant attention has focused on the extremely high debt levels accumulated by many sectors of the economy in the lead up to the financial crisis and, consequently, the need for balance sheet repair. In recent years, a number of sectors in the economies of the most affected countries have responded to the crisis by significantly altering their behaviour. In most cases, this involved a sustained period of debt reduction, which required a transition into net lenders[8] for sectors which traditionally were borrowers. Examining the net lending/borrowing of the institutional sectors of the economy allows an assessment of which sectors changed their behaviour following the crisis, and whether they are reverting back towards pre-crisis behaviour. In addition, as all borrowing must be financed by lending, the net lending/borrowing framework also shows which sectors have been borrowing the supplementary funds made available by deleveraging in other sectors. This Box examines sectoral shifts in net lending/borrowing in recent years in some of the euro area economies most severely impacted in the period succeeding the financial crisis.

With the exception of Greece, all households in the countries examined became net lenders, or have increased net lending, from 2009 onwards (Box B Chart 1-5). Households can only be net lenders if their income exceeds their consumption. In the case of Greece, declining disposable income levels have most likely prevented debt reduction on aggregate by Greek households. As shown in Box B Chart 1, Irish households engaged in the highest levels of deleveraging of the countries examined. In fact, from a low point in Q4 2006 to its peak in Q1 2010, the accumulated net lending by Irish households was the equivalent of 14.9 per cent of GDP. However, since Q4 2014, Irish households have reverted to becoming net borrowers, albeit to a much lesser extent that in the pre-crisis years.

7 Senior Economist and Research Assistant, Statistics Division, Central Bank of Ireland.

8 Net lending in non-financial accounts broadly equals household's disposable income minus their consumption. It can also be calculated from financial accounts as transactions in financial assets by households minus their liabilities. When net lending is negative, it is called net borrowing.

Box B: Trends in Net Lending and Borrowing by Economic Sector – A Euro Area Comparison
By Mary Cussen and Kenneth Devine

A large amount of deleveraging by private corporations has also taken place following the crisis, as these entities quickly attempted to repair their balance sheets. Koo (2014)[9] contends that a number of the economies most affected by the crisis are experiencing a recessionary period, which he refers to as a 'balance sheet recession'. This occurs following the bursting of an asset price bubble, in this case property prices, when those sectors of the economy most impacted shift their focus from profit maximisation and instead adopt a debt minimisation approach.

The non-financial corporation (NFC) sectors of all the studied economies became net lenders at some point during the crisis. However, as can be seen in Box B Charts 3 and 5, Italian and Portuguese NFCs became net lenders much later than their Irish and Spanish counterparts, with debt reduction of any significance only taking place from 2011 onwards. NFCs were the principal driver in Italy and Portugal, while deleveraging in Ireland and Spain was also evident in the household sector. In Portugal, between Q4 2008 and Q4 2013, the rate of NFC borrowing slowed, eventually switching to net lending. This signified a movement of 11.9 per cent of GDP over the period, a level far above the largest relative movement experienced by the EU (3.7 per cent). Net lending, while positive across all countries, had fallen from peak levels by Q2 2015, although still remained high in Greece.

In terms of financial corporations, Ireland recorded the highest level of deleveraging as they sought to repair their balance sheets during the recessionary period. The financial corporation sector increased deleveraging by 21.7 per cent of GDP over a four year period from Q4 2006 to Q4 2010, to reach 25 per cent of GDP in Q4 2010. This was the largest debt reduction of any studied sector. This reflects the well-documented difficulties experienced by the Irish banking sector during the crisis. The closest comparable figure is that of Spain, which saw an increase in financial corporation deleveraging of 6 per cent of GDP from Q1 2007 to Q4 2012. Since its peak, the financial sector in Ireland had vastly reduced its deleveraging to sit at a net lending level of 4.4 per cent of GDP at end-Q2 2015. Greece is the only country where the financial corporation sector was a net borrower during the period examined, experiencing 10 consecutive quarters of net borrowing from Q2 2007 to Q3 2009.

Ireland's government borrowing peaked in Q4 2010 at 32.3 per cent of GDP, well above the highest levels experienced by Italy (5.3 per cent), Spain (11.1 per cent) and the EU (7 per cent). The extremely high Irish deficit from 2009 to 2011 reflected, in part, support to the Irish banking system[10]. Since these uncharacteristically high deficits in the midst of the crisis, the level of government borrowing across all countries had, by Q2 2015, fallen significantly from peak levels. The most significant decrease was in Ireland, where the deficit fell by 29.3 per cent of GDP to 3 per cent of GDP between Q4 2010 and Q2 2015, only slightly above the EU figure of 2.6 per cent.

In conclusion, the Irish private sector[11] has experienced the highest level of net lending of the euro area peripheral countries examined, since the financial crisis began. This reflected the considerable deleveraging which has taken place in recent years. The Irish Government also ran the highest deficit of the countries examined in this Box, due in part to its interventions in the banking sector during the crisis. In recent quarters, however, Irish private sector net lending has declined or, in the case of households, reversed. In addition, the State deficit has substantially decreased. Private-sector deleveraging in Spain has followed a similar pattern to Ireland, although smaller in relative terms. In contrast, the NFC sectors in Italy and Portugal only began deleveraging at a much later stage. It is notable that the household sector in Ireland has reverted to a net borrower since Q4 2014. This may indicate that the reversion to pre-crisis net lending/borrowing patterns is further advanced in Ireland, compared to other peripheral countries.
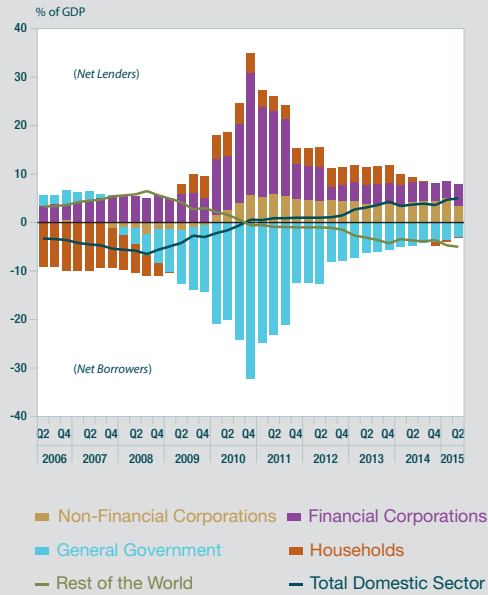
9   Koo, R. C. (2014), 'The Escape from Balance Sheet Recession and the QE Trap: A Hazardous Road for the World Economy', John Wiley & Sons.

10   Cussen, M. and M. Lucey, (2011), 'Treatment of Special Bank Interventions in Irish Government Statistics', Central Bank of Ireland Quarterly Bulletin No. 4, p78-92.
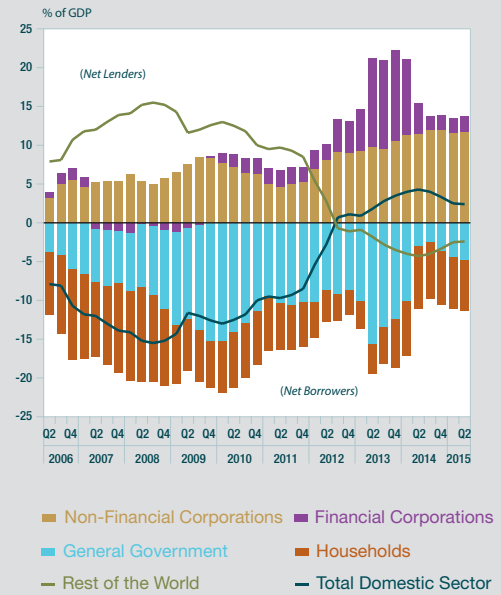
11   The private sector is composed of households, non-financial corporations and financial corporations.

Box B: Trends in Net Lending and Borrowing by Economic Sector – A Euro Area Comparison
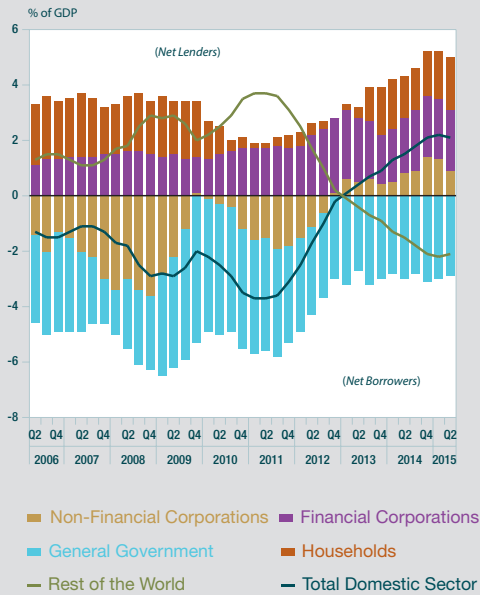*By Mary Cussen and Kenneth Devine*

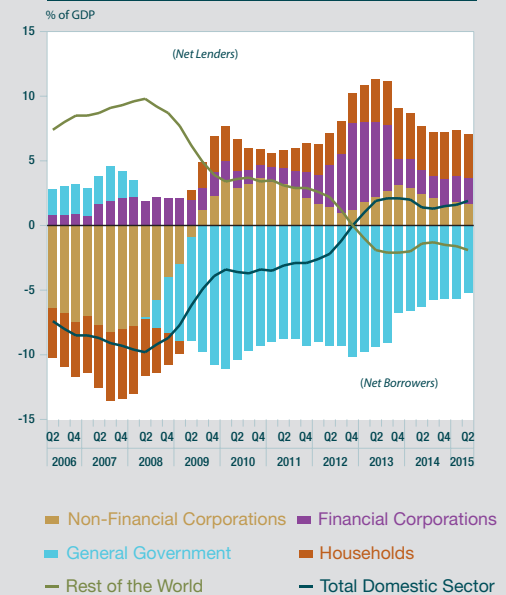**Box B Chart 1:** Net Lending/Borrowing for Ireland

% of GDP

(Net Lenders)

(Net Borrowers)

Q2 Q4 Q2 Q4 Q2 Q4 Q2 Q4 Q2 Q4 Q2 Q4 Q2 Q4 Q2 Q4 Q2 Q4 Q2
2006 2007 2008 2009 2010 2011 2012 2013 2014 2015

- Non-Financial Corporations   - Financial Corporations
- General Government   - Households
- Rest of the World   - Total Domestic Sector

Source: Eurostat.

Box B Chart 2: Net Lending/Borrowing for Greece

% of GDP

(Net Lenders)

(Net Borrowers)

Q2 Q4 Q2 Q4 Q2 Q4 Q2 Q4 Q2 Q4 Q2 Q4 Q2 Q4 Q2 Q4 Q2 Q4 Q2
2006 2007 2008 2009 2010 2011 2012 2013 2014 2015

- Non-Financial Corporations   - Financial Corporations
- General Government   - Households
- Rest of the World   - Total Domestic Sector

Source: Eurostat.

Box B Chart 3: Net Lending/Borrowing for Italy

% of GDP

(Net Lenders)

(Net Borrowers)

Q2 Q4 Q2 Q4 Q2 Q4 Q2 Q4 Q2 Q4 Q2 Q4 Q2 Q4 Q2 Q4 Q2 Q4 Q2
2006 2007 2008 2009 2010 2011 2012 2013 2014 2015

- Non-Financial Corporations   - Financial Corporations
- General Government   - Households
- Rest of the World   - Total Domestic Sector

Source: Eurostat.

Box B Chart 4: Net Lending/Borrowing for Spain

% of GDP

(Net Lenders)

(Net Borrowers)

Q2 Q4 Q2 Q4 Q2 Q4 Q2 Q4 Q2 Q4 Q2 Q4 Q2 Q4 Q2 Q4 Q2 Q4 Q2
2006 2007 2008 2009 2010 2011 2012 2013 2014 2015

- Non-Financial Corporations   - Financial Corporations
- General Government   - Households
- Rest of the World   - Total Domestic Sector

Source: Eurostat.

Box B: Trends in Net Lending and Borrowing by Economic Sector – A Euro Area Comparison
By Mary Cussen and Kenneth Devine

Box B Chart 5: Net Lending/Borrowing for Portugal

Source: Eurostat.
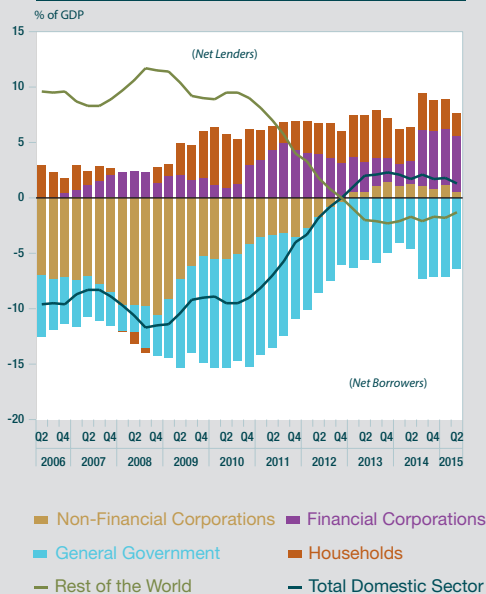
Box B Chart 6: Net Lending/Borrowing for EU

Source: Eurostat.
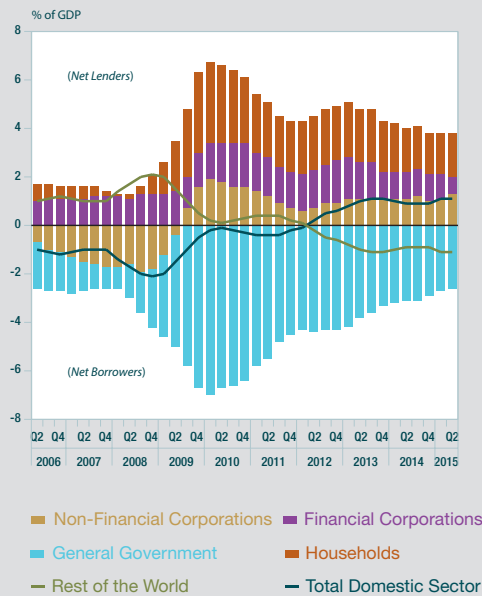
Household net worth, calculated as the sum of household housing and financial assets minus their financial liabilities, increased by €3.5 billion to reach €600.1 billion, or €129,454 per capita, at end–Q2 2015. The largest contributor to this improvement was a rise in the value of housing assets, which increased by €4.8 billion, while financial liabilities decreased by €2.3 billion. Overall household financial assets decreased by €3.6 billion, primarily reflecting valuation changes in insurance technical reserves and broader financial market developments, although holdings of deposits increased by €840 million in Q2 2015. Household deposits have been growing consistently since mid-2014, in tandem with declining borrowing levels. This may indicate a greater reliance on own resources for funding purposes.

While the stock of household debt has continued to fall, the weighted average interest rate on the outstanding stock of household debt also fell in the third quarter of 2015. The interest rate on outstanding loans for house purchase, which account for over 80 per cent of household borrowing, fell marginally from an average of 2.69 per cent in Q2 to 2.66 per cent in Q3. Conversely, interest rates on outstanding

consumer debt with maturities of less than five years and on overdrafts rose sharply.

New business interest rates on floating and up to one year fixation agreements for house purchase (including renegotiations) stood at 3.24 per cent at end–Q3 2015, down from 3.38 per cent in the previous quarter. Interest rates on loans for house purchase fixed for over one year increased over the quarter to 3.73 per cent, up from 3.58 per cent in Q2 2015, but were some 68 basis points lower than the same period in the previous year. In terms of new business volumes, there has been a marked shift towards fixed rate mortgages, which now account for roughly half of new mortgages, up from 39 per cent at the end of 2014. New business fixed rates (excluding renegotiations) are now cheaper than variable rates for all maturity categories.

The number of mortgage accounts for principal dwelling houses (PDH) in arrears continued to fall in Q3 2015, the ninth quarterly decline in a row, as shown in Chart 4. A total of 92,291 (12.3 per cent) of accounts were in arrears at end-Q3, a decline of 6 per cent relative to Q2. PDH mortgage accounts in arrears over 90

Chart 4: Outstanding Balance on PDH Mortgages in Arrears

€ billion   per cent

- Outstanding balance on accounts in arrears >90 days
- Outstanding balance on accounts in arrears 91-180 days
- Outstanding balance on accounts in arrears 181-360 days
- Outstanding balance on accounts in arrears 361- 720 days
- Outstanding balance on accounts in arrears >720 days
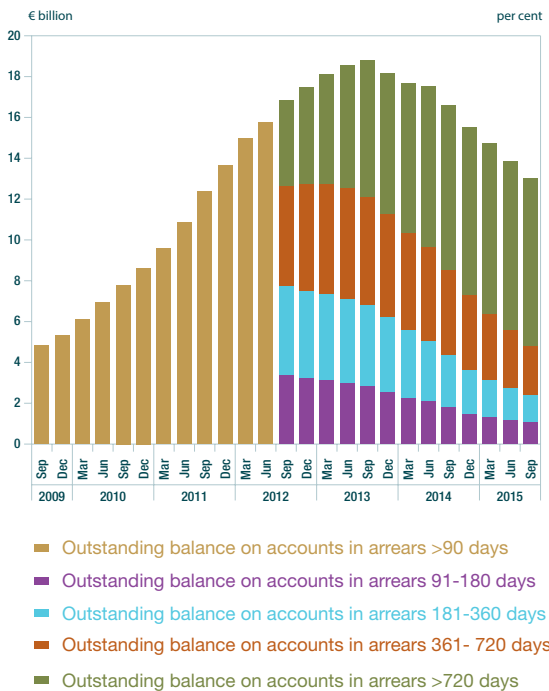
Source: Central Bank of Ireland Residential Mortgage Arrears and Repossession Statistics.

this decline, the levels of long-term mortgage arrears remain a cause for concern.

Buy-to-let (BTL) mortgage accounts in arrears over 90 days decreased by 4.5 per cent during Q3 2015. At end-June, there were 15,275 BTL accounts in arrears over 720 days, with an outstanding balance of €4.6 billion, equivalent to 17.4 per cent of the total outstanding balance on all BTL mortgage accounts.

Similar to households, NFC economic activity has been recovering strongly, despite ongoing deleveraging in relation to resident credit institutions. In this context, non-bank funding for NFCs and particularly small- and medium-sized enterprises (SMEs) is becoming more relevant. For example, trends in venture capital, an alternative source of funding, are discussed in Box C. NFC debt as a percentage of GDP continued to decline in Q2 2015, falling from 193.8 per cent in Q1 2015 to 185.4 per cent. This decline reflects both an increase in the value of annualised GDP, as well as a 1.5 per cent fall in the stock of NFC debt. NFC debt as a percentage of GDP is currently at its lowest level since Q2 2009. It is important to note that Ireland has substantial multinational corporation (MNC) activities, which can cause volatility in debt movements from quarter-to-quarter. NFC debt to GDP ratio in Ireland is relatively high, arising from these MNC activities, similar to Luxembourg (339.1 per cent) and Cyprus (228.2 per cent), who also have large multinational sectors.

days also continued to fall during Q3 2015, standing at 65,584 (8.7 per cent of total) by end-September, reflecting a 6.7 per cent decline over the quarter. For the first time since the onset of the crisis, mortgages in arrears of over 720 days declined during Q3 2015, falling by 2 per cent over the quarter. Notwithstanding

Box C: Recent Developments in the Venture Capital Funding Environment in Ireland
By Dermot Coates, Siobhán O'Connell and Jenny Osborne-Kinch[12]

Venture capital funding, a form of equity-based funding[13], is an important alternative source of finance for the small- and medium-sized enterprise (SME) sector. It is typically targeted at that subset of SMEs with scalable business models and with high growth potential in technology and other science-based spheres. The recent global financial crisis exacerbated the difficulties faced by many SMEs in securing access to finance, undermining prospects for SME survival and growth. The impact of these financial constraints is not limited to more established SMEs but has the potential to severely affect enterprises at the very earliest stages of their lifecycle, where risks and uncertainty are higher. A tighter bank lending environment to private enterprises in Ireland over recent years is in marked contrast to trends in venture capital financing, where the availability of funding has proven to be more robust. The availability of venture capital and historic trends therein provide an important indicator of the capacity of the SME sector to access external equity for start-up, early development and expansion phases[14]. The objective of this Box is to shed some light on the developments in Ireland's venture capital funding environment over recent years.

**12** Economist, Funds Data Analyst and Senior Economist, Statistics Division, Central Bank of Ireland.

13 Venture capital is a specialised funding mechanism for the provision of capital to early-stage, unquoted firms for the purposes of growth or expansion.

14 OECD (2012), 'Financing SMEs and Entrepreneurs 2012: An OECD Scoreboard', OECD: Paris.

**Box C:** Recent Developments in the Venture Capital Funding Environment in Ireland
By Dermot Coates, Siobhán O'Connell and Jenny Osborne-Kinch

Ireland has a well-developed venture capital funding environment and, in recent years, it has been ranked highly amongst developed economies for venture capital investment as a proportion of GDP[15]. This is reflective of a combination of State co-investment and increasing private sector investment (including international investors). Through both public and private investment, a total of €3.3 billion has been invested since 2004 in Irish SMEs. Total venture capital investment to Irish SMEs stood at close to €170 million in 2004 but rose rapidly thereafter to €415 million by end-September 2015 (see Box C Chart 1). The rate of this increase was particularly notable over the period 2008 to 2010, as the financial crisis took hold throughout the economy. In parallel to this increase in investment, the number of Irish SMEs in receipt of venture capital funding also rose. Over the decade to 2014, the number of firms that received investment increased by just over 100 firms to 142 firms. The average value of these investments has also changed over time (see Box C Chart 2).

Box C Chart 1: Annual Venture Capital Investment and Volume of Transactions, 2004-2015

Total (LHS)   No of Companies (RHS)
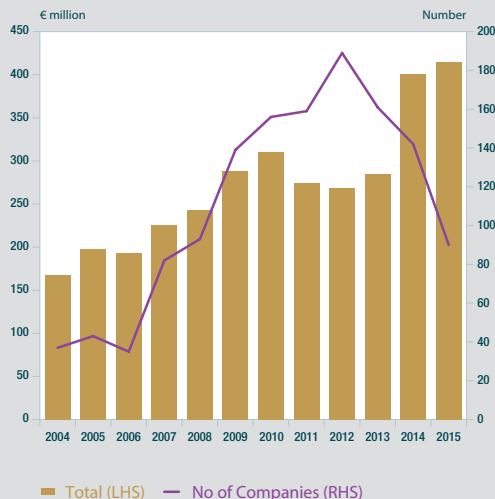
Source: Irish Venture Capital Association (IVCA).

Notes: (i) An individual SME can be in receipt of investment funding in multiple years as it progresses through successive funding rounds. (ii) 2015 data is total up to Q3.

Box C Chart 2: Average Investment per Annum, 2004-2014


Average Investment per Year € mn
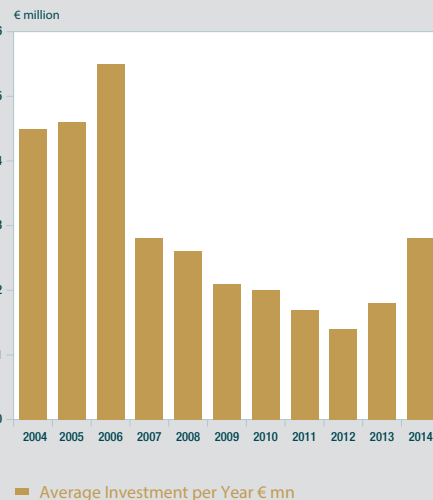
Source: Irish Venture Capital Association (IVCA).

There are a number of sources of venture capital financing. Venture capital managers, including private equity firms, establish funds (sometimes with co-investment from State agencies and credit institutions) to attract investment and channel funding to SMEs. Box C Chart 3 below details the totals invested by various sources of venture capital financing from 2004 to 2014. In 2004 and 2005, Irish venture capital funds represented nearly 60 per cent of venture capital financing. Corporates (effectively, the venture capital arm of multinational corporations operating in Ireland), private investors and Enterprise Ireland represented an average of 21 per cent of the funding over the period 2004 to 2014. International venture capital funds have played an increasing role over the past decade.

15 OECD (2009), 'Financing High-Growth and Innovative Start-Ups and SMEs: Data and Measurement Issues', OECD: Paris & Forfás (2012), 'A Review of the Equity Investment Landscape in Ireland', Forfás: Dublin.

Box C: Recent Developments in the Venture Capital Funding Environment in Ireland
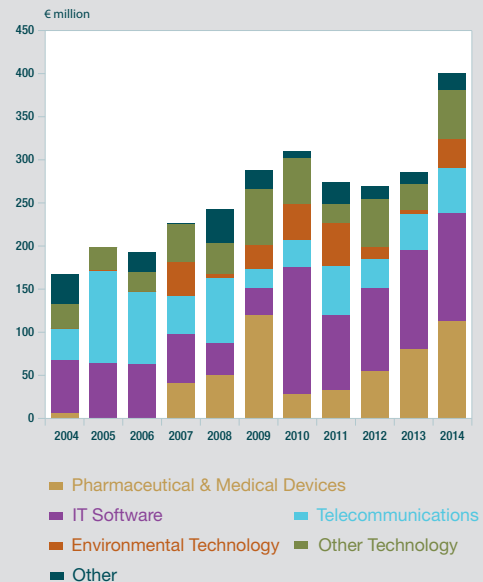*By Dermot Coates, Siobhán O'Connell and Jenny Osborne-Kinch*

Box C Chart 3: Sources of Venture Capital Financing in Ireland

€ million

- Irish VC
- International VC Syndicates
- International VC: IFI (i)
- Corporates/Privates/EI
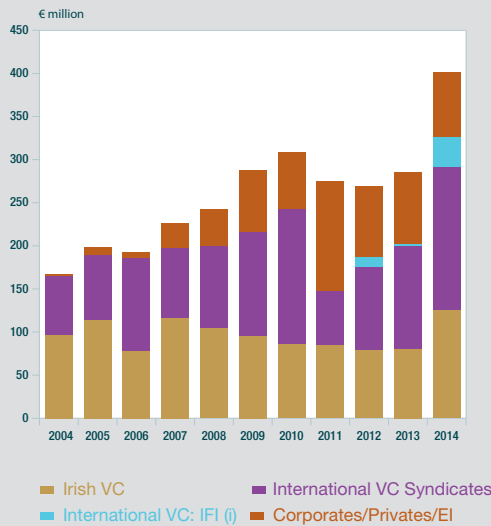
Source: Irish Venture Capital Association (IVCA).

Note: Innovation Fund Ireland (IFI) was established to encourage the set-up of European headquarters and subsequent investment in Ireland by international venture capital funds.

Box C Chart 4: Investment by Sector of Funding

€ million

- Pharmaceutical & Medical Devices
- IT Software
- Telecommunications
- Environmental Technology
- Other Technology
- Other

Source: Irish Venture Capital Association (IVCA).

Note: Other Technology includes Nano, Fibreoptics, Photonics, Semiconductors, etc.
IT software includes medical, business and enterprise.

The profile of those SMEs in receipt of venture capital funding illustrates the target cohort of high potential technology and life sciences-based sectors. These firms are focused on new innovations or product developments within their sectors. In 2014, funding was provided to the software development; pharmaceutical and medical devices; and telecommunication sectors amongst others (Box C Chart 4)[16]. In conclusion, it is clearly evident that venture capital is an important alternative source of funding for innovative and high potential firms.

16 The authors estimate that for firms that received venture capital funding between 2007 and 2010 (at the peak of the financial crisis), 66 per cent of these firms are still currently listed as operational on the records of the Companies' Registration Office (as at Q4 2015), albeit that other factors (i.e. mergers, acquisitions, etc.) might impact upon the interpretation of these figures.

NFC loan liabilities fell in the first two quarters of 2015 to €361 billion. The recent fall masks significant divergence between domestic and foreign sources of financing of NFC loans, which is shown in Chart 5. While loans from domestic entities have fallen by 12.1 per cent since the end of 2014, loans from the rest of the world have increased by 4 per cent over the same period. This again largely reflects the significant activities of MNCs in Ireland, which have access to international sources of funding. Conversely, domestic financing of NFC loans has fallen from €221 billion in Q1 2012 to €157 billion in Q2 2015.

There were, however, some positive developments in gross new lending to the employment-intensive SME sector, which has been traditionally reliant on the domestic banking sector. Gross new lending advanced by Irish credit institutions increased by €400 million in the year ending Q3 2015 compared to the year to Q3 2014, with the agriculture and real estate sectors being the largest recipients. However, repayments continued to outpace new lending, with net lending for SMEs falling at an annual rate of 8.8 per cent in the third quarter of 2015.

Chart 5: Domestic and Foreign Financing of NFC Loans

€ billion

■ Resident ■ Rest of World — Total loans

Source: Quarterly Financial Accounts, Central Bank of Ireland.

Chart 6: Irish Government Ten-Year Bond Yields

%

Source: Thomson Reuters.
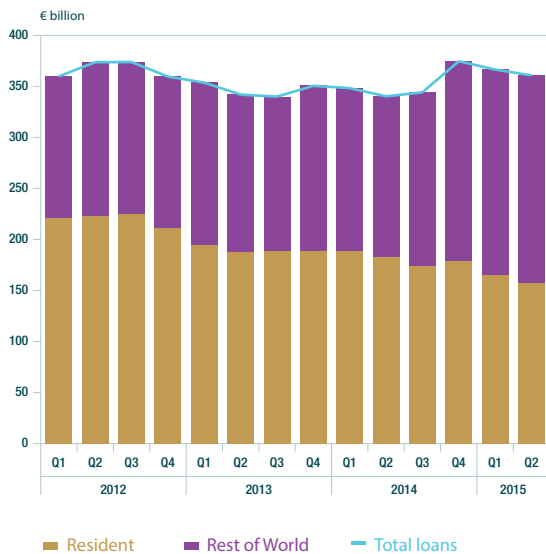
Direct investment by foreign-owned MNCs into their Irish operations increased by €4.6 billion over the third quarter of 2015, with increases in equity and reinvested earnings of €9.8 billion and €9.3 billion, respectively, offset by a €14.5 billion decrease in other capital. Over the same time period, direct investment income earned abroad by Irish-owned multinational MNCs remained steady at €4.8 billion. Foreign direct investment by Irish-owned MNCs abroad remained strong increasing by €16.8 billion during Q3 2015, primarily due to an increase in other capital of €19.2 billion. However, this investment predominantly reflects the operations of multinational NFCs who have established their corporate headquarters in Ireland.

Government

Government financing conditions improved during the third quarter, as bond yields recovered following the successful agreement of a new financial assistance programme for Greece. Yields on Irish government ten-year bonds had been steadily falling in the early part of the year, reaching a record low of 0.6 per cent in April. This reflected the

ongoing economic recovery as well as an increasingly expansionary monetary policy that depressed euro-area sovereign bond yields generally. These trends resumed in the third quarter following uncertainty emanating from the Greek crisis, which saw bond yields increase across the euro area with 10-year yields for Ireland reaching 1.6 per cent in June 2015. Nevertheless, Irish bond yields have remained relatively stable throughout this period compared to other peripheral euro area countries, and ended Q3 2015 at under 1.1 per cent. Chart 6 highlights how the NTMA has availed of the favourable interest rate environment to raise funding in recent months, and how certain international developments have impacted bond yields.

Financial Sector

The funding position of resident credit institutions continued to improve in the third quarter of 2015, with deposits from the private sector increasing at an annual growth rate of 0.6 per cent at end-Q3 2015 and positive net transactions of €1.5 billion over the quarter. This improvement is primarily due to increased investment in deposits by NFCs of

€1.6 billion, although net transactions from households also grew by €0.8 billion during Q3 2015. This reflects a shift from government deposits into bank deposits by households. These movements offset continued outflows of deposits from non-bank financial institutions of just over €1 billion. Reliance on funding from the Central Bank of Ireland amounted to less than €10 billion at the end of the quarter, the lowest level since the series began in 2003, further underscoring the normalisation underway in the funding of the domestic banking system.

The net asset value of Irish resident IFs fell 7 per cent over the third quarter of 2015, from €1,456 billion to €1,355 billion, but was nevertheless €140 billion larger than at end–Q3 2014. Concerns surrounding emerging economies, including China, caused financial markets to fall, confounding market expectations of a Federal Reserve interest rate increase in September. Equity markets in the UK, US, Japan and the euro area declined by an average of 10 per cent over the quarter and, as a result, Irish resident equity funds experienced negative revaluations of €54 billion.

The net asset value of Money Market Funds was €424 billion at end-Q3 2015. Compared to Q2 2015, when outward transactions of €37 billion occurred as markets reacted to US interest rate expectations, transactions in the third quarter were relatively stable, falling by €657 million. There was some increase in the weighting of longer maturity assets. Holdings of debt securities with a residual maturity of less than three months fell by €3 billion compared to an increase of €24 billion in holdings of debt securities with residual maturity of over three months.

Total FVC asset values fell to €415 billion in Q3 2015, despite an increase in FVC reporting numbers. The fall in asset values was primarily attributable to valuation movements, as net transaction flows into Irish FVCs remained positive over the quarter.

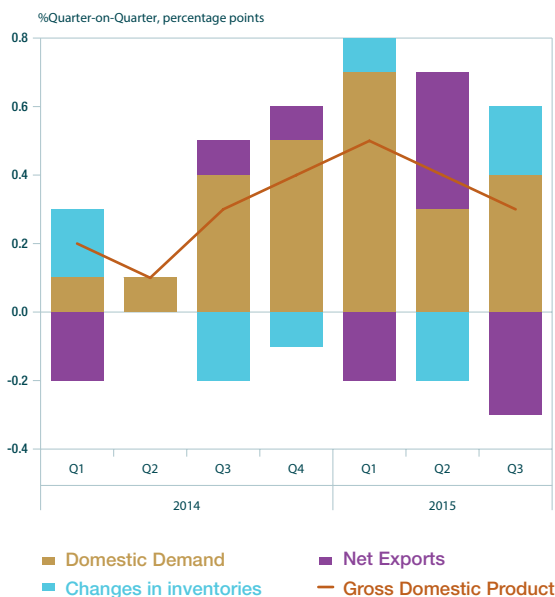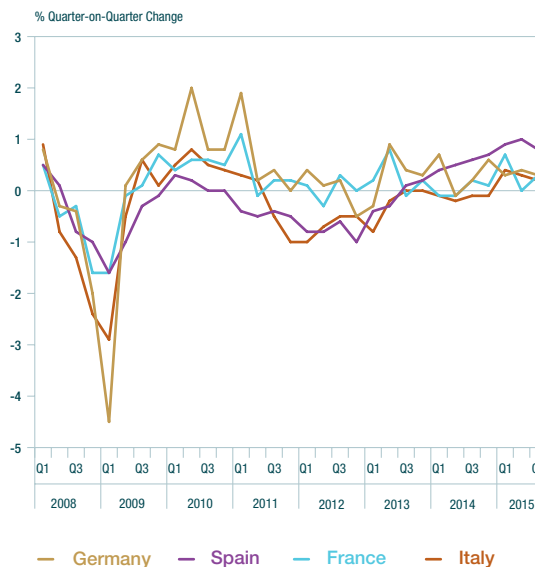# Developments in the Euro Area Economy

Overview

A gradual and timid recovery continues in the euro area amid more challenging external conditions including concerns about the resilience of growth in some emerging market economies and expectations about diverging monetary policies in advanced economies. The recovery continues to be supported by low oil prices, a relatively weak external value of the euro and a very accommodative monetary policy stance. Labour market conditions in the euro area show improvement and recent falls in the unemployment rate and stability in the rate of household deleveraging have underpinned a steady rise in household spending. Business investment, in contrast, has been lagging, despite favourable financing conditions.

Looking ahead, private consumption is projected to remain the main driver of growth in the euro area, supported by rising real wages and employment growth. Investment is expected to pick up over the coming year owing to easing collateral constraints, rising profits and the need to modernise equipment and machinery. As the recovery progresses it should become increasingly broad-based across Member States.

Consumer price inflation is stable around zero and well below the 2 per cent reference rate. While ECB monetary policy has been effective in influencing financing conditions and asset prices, it has yet to fully reach the real economy and inflation. Much of the accommodation from the recent ECB measures may still be in the pipeline. The transmission of monetary policy through the credit channel remains impaired by high levels of non-performing loans, the still significant financial fragmentation and the ongoing deleveraging efforts of businesses and households in some euro area economies.

Developments since the last Bulletin have been characterised by disappointing external demand, notably from large emerging market economies. This remains a downside risk to the outlook, especially in the presence of sluggish commodity markets, tightening monetary conditions of dollarized economies with large external financing needs, and high levels of corporate sector indebtedness. Another potential risk relates to concerns about the resilience of growth in China, the consequences of its ongoing rebalancing, and the global consequences of the depreciation of the renminbi.

These external risks, together with remaining substantial economic slack and very low inflation, were considered by the ECB Governing Council at its December meeting. Quantitative easing measures were expanded up to the end of March 2017 (or beyond if necessary). The decision of the Federal Reserve to raise US interest rates and the communication of possible future gradual increases represent an important divergence in the monetary policy stance among the major advanced economies and reflect different stages in the recovery from the financial crisis.

Chart 1: Contributions to Euro Area Real GDP Growth

%Quarter-on-Quarter, percentage points

- Domestic Demand
- Changes in inventories
- Net Exports
- Gross Domestic Product

Source: Eurostat.

Chart 2: Real GDP Growth in selected Euro Area Economies

% Quarter-on-Quarter Change

— Germany — Spain — France — Italy

Source: Eurostat.

Section 1: Growth and Inflation

Euro Area Growth and Inflation Developments

The outturn for third quarter activity combined with latest hard and sentiment data for the final quarter indicate that the economic recovery in the euro area continues at a moderate pace. Real GDP increased quarter-on-quarter, by 0.3 per cent in Q3, having expanded for two and a half years. The growth drivers have remained largely the same. Private and public consumption, together with changes in inventories, made positive contributions to growth in the third quarter. At the same time, total investment displayed zero growth and net exports subtracted from growth.

The economic recovery has become more broad-based geographically. Germany and France posted gains of 0.3 per cent quarter-on-quarter according to Eurostat's second estimate. Italy has now exited recession and its recovery has been gaining strength while the Spanish economy expanded strongly by 0.8 per cent during the third quarter as did Ireland with 1.4 per cent growth in Q3. However, three

countries – Finland, Greece, and Estonia - recorded negative growth for the quarter.

Since the strong reading in Q1 2015, business investment has remained flat in the euro area, and private investment has not yet returned to its pre-crisis levels. Studies have identified weak demand and profitability, financing constraints, elevated corporate indebtedness and country-specific administrative or regulatory factors as possible determinants.[1] Collateral constraints may also have been playing a role (see Box B). On the other hand, sectoral data up to the second quarter of 2015 suggest that the profits of non-financial corporations are starting to increase after several years of low profitability. Further, the latest responses from the ECB Bank Lending Survey indicate increased loan demand from enterprises during the third quarter (Box A).

The recovery in real GDP is mostly accounted for by private consumption. Consumer confidence is likely to have responded to the recovery in property and equity prices and the improvement in labour markets. Employment increased further by 0.3 per cent, quarter-on-quarter during Q3 and by 1.1 per cent on a

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1 See for example EC 'Investment dynamics in the Euro area since the crisis' (2015)

Chart 3: Investment rate of Non-Financial Corporations

Euro area (19 countries)
Belgium
Germany
Spain
France
Italy
Netherlands
Portugal
Slovenia

0   5   10   15   20   25   30   35

■ 2014   ■ 2007
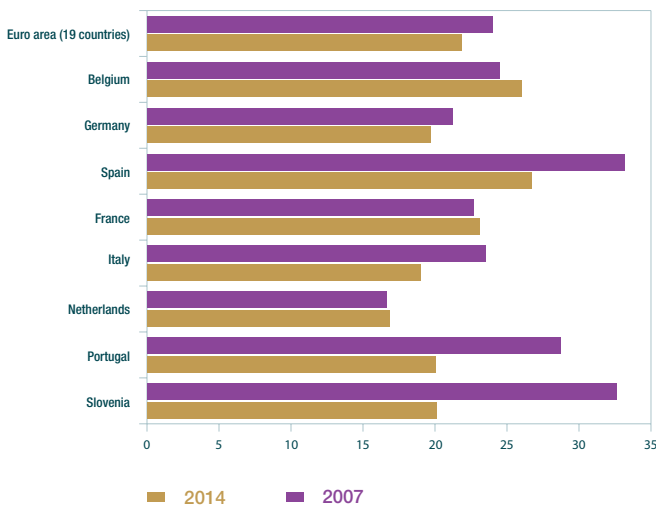
Source: Eurostat.

Note: The gross investment rate of non-financial corporations is defined as gross fixed capital formation divided by gross value added. This ratio relates the investment of non-financial businesses in fixed assets (buildings, machinery etc.) to the value added created during the production process.

year ago. This represents the fastest annual increase since the second quarter of 2008. The unemployment rate for the euro area while remaining elevated, continued the decline that had begun in mid-2013 to 10.5 per cent in November. The job vacancy rate was also down marginally compared with previous quarters.

Inflation rates in the euro area remain very low. According to Eurostat flash estimates, euro area annual HICP inflation was 0.2 per cent in December 2015 unchanged from November and recovering from the negative figure, i.e. -0.1 per cent, of September. The HICP inflation rate excluding energy (see Chart 4) has hovered around 1 per cent since May 2015. Services price inflation has remained around 1.2 per cent since July. The stable inflation rate is partially the result of higher energy inflation and lower unprocessed food inflation. Energy price inflation remained deeply negative at -5.9 per cent as oil prices continued to fall in the fourth quarter of 2015.

Box A: Understanding Credit Developments Through Comparing Firm and Bank Surveys
By David Byrne[1]

Across Europe, small and medium-sized enterprises (SMEs) represent 99.8 per cent of firms, 66.7 per cent of employment and 58.6 per cent of value added.[2] Traditionally, the majority of these firms do not directly access finance through markets and are heavily dependent on bank funding. The ease of access to bank finance for SMEs is therefore an important element of an effective monetary policy transmission mechanism.

In this box, we examine developments in access to credit for SMEs in the euro area from the points of view of firms and banks. Using separate surveys of firms and banks, we can examine the extent to which the perceptions of credit conditions from both parties are aligned. Specifically, we compare firms' reported success rates from applications for credit, and their perceptions of the ease of accessing credit, with banks' reported credit standards for lending to SMEs.

1 Monetary Policy Division.
2 Eurostat, 2011, "Key figures on European business - with a special feature on SMEs", DOI: 10.2785/15193.

Box A: Understanding Credit Developments Through Comparing Firm and Bank Surveys
By David Byrne

SAFE[3] (Survey of Access to Finance for Enterprises) is a bi-annual survey which examines credit market conditions from firms' perspectives. Since its inception in 2009, SAFE has shown that SMEs in the euro area rely primarily on banks for finance, rather than market-based finance or other sources of finance. The most recent edition of SAFE, for the first half of 2015, showed that the most popular type of funding for euro area SMEs was a bank credit line or overdraft, with 37.8 per cent of firms having accessed this source of funding within the last six months. The next most popular sources were longer-term bank loans and leasing or hire-purchase, with 21.2 per cent and 21.1 per cent of SMEs using these sources in the last six months, respectively. SAFE respondents are also asked whether they perceive that the availability of different types of funding has improved, deteriorated or remained unchanged in the past six months. From this we can calculate the net percentage of firms in each country which reported improving standards[4]. In addition, firms are asked for the outcome of credit applications over the last six months, from which we can calculate the percentage of applications which were successful.

To represent banks' perspectives of credit market conditions, we use the quarterly euro area Bank Lending Survey (BLS)[5]. For each country, we average the BLS responses for two quarters to match the half-yearly frequency of SAFE. The BLS asks banks to report changes in their credit standards to SMEs over the preceding quarter, from which we can calculate the net percentage of banks in a given country which tightened standards[6].

Table 1: SAFE credit application success rates by type and country group:

	Application Success Rate (per cent, SAFE)	
	Stressed	**Non-stressed**
Credit line or overdraft	57.9	70.7
Bank Loan	57.5	73.7

Our sample covers 10 euro area countries, which we group into "stressed" and "non-stressed".[7] To provide a benchmark for examining the impact of changes in credit standards between these groups, in Table 1 we show the average success rate of SME applications for credit over the history of the SAFE survey. Firms in non-stressed countries have a greater application success rate for both credit lines and bank loans. Holton (2015) accumulates the quarterly changes in credit standards from the BLS into a measure of the levels of credit standards. She shows that banks in stressed countries had higher levels of credit standards pre-crisis, i.e. that credit standards were tighter in stressed than non-stressed countries. Furthermore, she shows that banks across the euro area tightened during the financial crisis, but that there was relatively more tightening in stressed countries, resulting in the levels of credit standards remaining higher in stressed countries.

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3   SAFE began in 2009, covering 11 countries at its inception, and is a collaboration between the ECB and European Commission.

4   This is the difference in the percentage of firms reporting improvement and deterioration.

5   The BLS began in the fourth quarter of 2002. We are unable to match the SAFE and BLS responses for Finland due to confidentiality concerns on the publication of Finnish BLS responses.

6   This is the percentage of banks reporting a tightening of standards less the percentage reporting an easing of standards. The responses are weighted by whether the banks reported that they tightened (or eased) "considerably" or "somewhat".

7   "Stressed" refers to Greece, Ireland, Italy, Portugal and Spain, while "non-stressed" refers to Austria, Belgium, France, Germany and the Netherlands.

Box A: Understanding Credit Developments Through Comparing Firm and Bank Surveys
By David Byrne

Given that credit standards were already tighter in stressed countries than in non-stressed countries, on the margin if credit standards in the stressed group and non-stressed group tighten by an equal amount, the tightening is proportionately greater in non-stressed countries. We thus expect that, for a given level of tightening, the corresponding decrease in application success and perceived credit availability by firms to be greater in non-stressed countries, everything else equal.

Chart 1 shows the impact of a tightening in credit standards on the success rate of credit applications. For both credit lines and overdrafts and for bank loans, a reported tightening of credit standards from the BLS results in a greater decrease in the application success rate in non-stressed countries. Similarly, Chart 2 shows a negative impact of tightening credit standards on SMEs' perceived availability of credit, with SMEs in non-stressed countries again in both cases being more sensitive to a tightening in credit standards than SMEs in stressed countries.

Conclusion

Small and medium-sized enterprises comprise the overwhelming majority of firms and provide the majority of employment in the euro area. One of the major differences between SMEs and large firms is the reliance of the former on bank finance. Access to finance is thus critical in determining growth in output and employment of euro area SMEs. Comparing responses to the SAFE and BLS surveys, we have shown that there is a positive correlation between firms' and banks' views of credit conditions. Following Holton (2015)[8], however, we acknowledge the possibility that existing differences in the level of credit standards may have a role to play in assessing the impact of a change in credit standards. We provide preliminary evidence that, for a given change in credit standards, the impact on access to finance for SMEs is greater in non-stressed countries than in stressed countries where credit conditions are already tighter ex-ante. While additional data and outlier analysis could strengthen the conclusions, the available data already suggest that when assessing the impact of changes in credit availability according to the BLS, care must be taken when comparing stressed and non-stressed euro area countries.
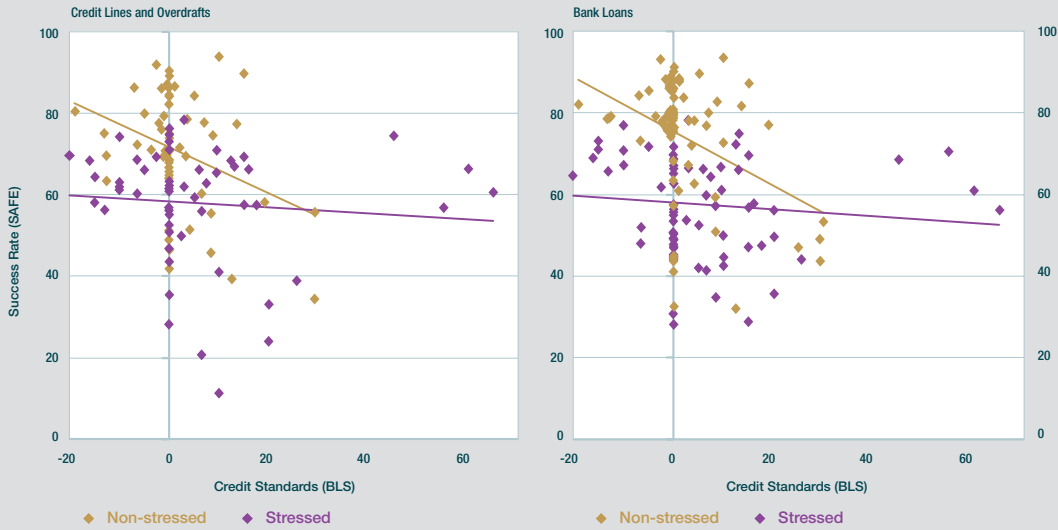
References

Holton, S. (2015) "Trusting the Bankers or the Borrowers? Comparing the credit survey responses of firms and banks", mimeo.

8 See Holton (2015) for a detailed examination of the relationship between SAFE and BLS responses, controlling for a range of external factors.
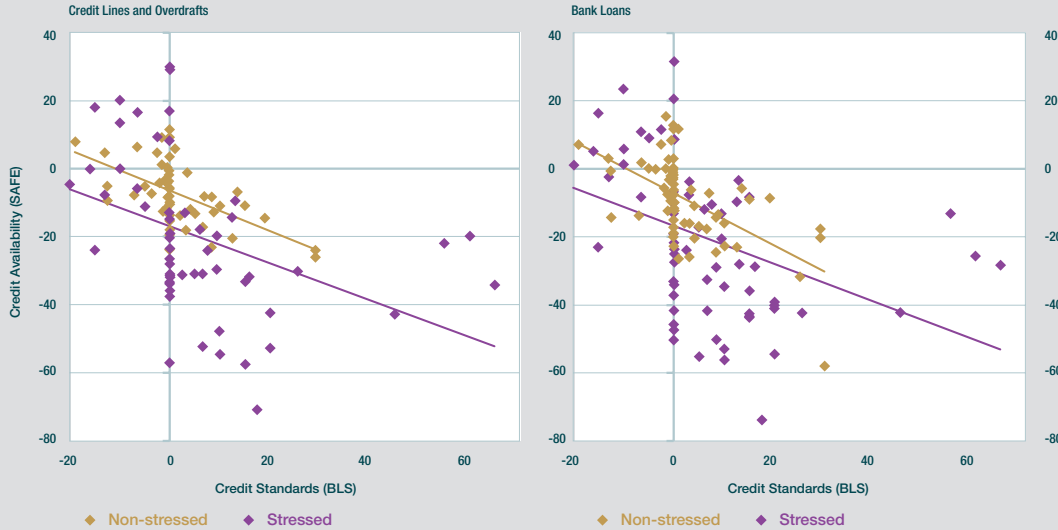
Box A: Understanding Credit Developments Through Comparing Firm and Bank Surveys
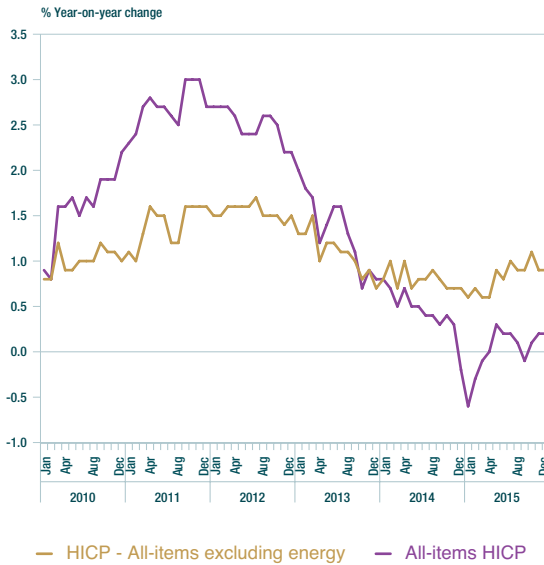*By David Byrne*

Box A Chart 1: Application success rates

Credit Lines and Overdrafts

Bank Loans

◆ Non-stressed   ◆ Stressed

◆ Non-stressed   ◆ Stressed

Source: ECB author's calculations.

Box A Chart 2: Perceived credit availability

Credit Lines and Overdrafts

Bank Loans

◆ Non-stressed   ◆ Stressed

◆ Non-stressed   ◆ Stressed

Source: ECB author's calculations

Chart 4: Euro Area Inflation

% Year-on-year change

— HICP - All-items excluding energy — All-items HICP

Source: Eurostat.

Chart 5: Change in World Trade, Industrial Production & Global New Export Orders PMI

3 month on 3 month % change

■ World Trade
— Industrial Production
— Global New Export Orders (RHS)
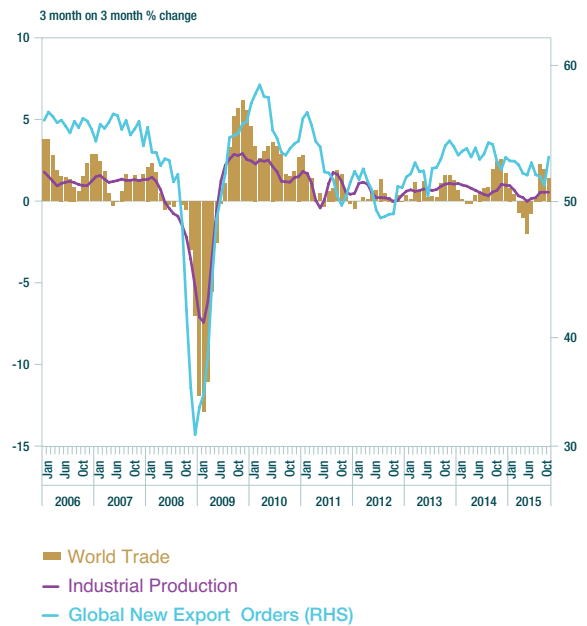
Source: Thomson Reuters Datastream and Central Planning Bureau.

Inflationary pressure from the labour market remains moderate. Wage growth across the euro area slowed in the third quarter of 2015, despite a fall in unemployment, underlining muted price pressures. The annual growth rate in the compensation for employee declined to just over 1 per cent in the third quarter from 1.2 and 1.3 per cent in the previous two quarters respectively.

As regards economic activity in the final quarter of 2015, sentiment indicators point in a positive direction and are in line with the expectation of a continued moderate economic recovery. In December, the economic sentiment indicator (ESI) improved in the euro area by 0.7 points to 106.8 as a result of higher confidence in industry, while confidence in services, construction and among consumers remained broadly unchanged. The composite Purchasing Managers' Index (PMI) also rose from 53.9 to 54.4 in December 2015 and is at its highest level since May 2011. This suggests that quarterly real GDP growth could pick back up to 0.4 – 0.5 per cent in Q4.

Weak external demand represents the biggest macroeconomic development affecting the euro area in the second half of 2015. Over the autumn, Chinese imports of goods, in particular of machinery and transport equipment fell sharply. Commodity-exporting emerging market economies, such as Brazil or Russia, are facing deeper recessions than previously anticipated. Annualised growth in GDP for both countries contracted by -4.5 per cent and -4.1 per cent respectively in Q3.

Most macroeconomic models suggest that the impact of lower world oil prices on global growth has been less than expected – not more than 0.5 per cent of global growth, despite the considerable decline in prices over a relatively short period of time.[2] This reduced impact has been attributed to a larger economic weight of emerging markets: commodity exporters such as Brazil, Mexico or South Africa have suffered from reduced export receipts, while commodity importers such as China and India have changed domestic policies affecting their demand for energy imports.

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2 See K Rogoff (2015), "Oil Prices and Global Growth" Project Syndicate available at https://www.project-syndicate.org/commentary/oil-prices-global-growth-by-kenneth-rogoff-2015-12

Chart 6: Oil and Non-Energy Commodity Prices

Index: January 2010 = 100

— Oil Price Energy Index

— Non Energy Commodity Price Index rebased
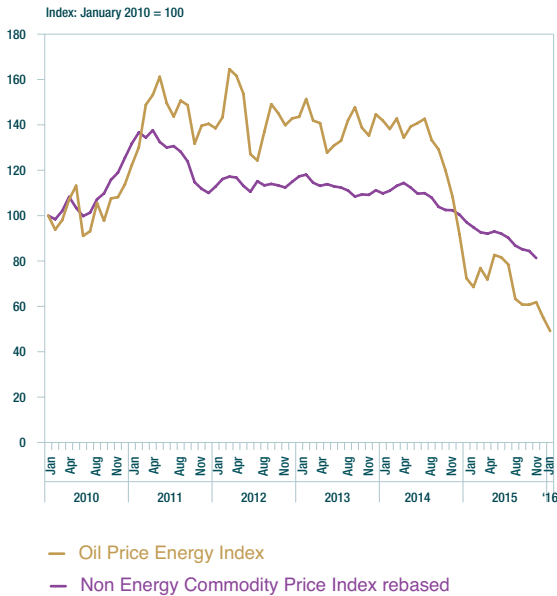
Source: IMF and Thomson Reuters Datastream.

Notes: Both indices are constructed using January 2010 as a base and are measured in dollar terms. The non-energy commodity price index comes from the IMF's International Financial Statistics dataset. The oil index is constructed from data on Brent crude oil.

Chart 7: Financial Market's Future Inflation Expectations Based on Implied Forward Inflation Swap Rates

Index

— 1 year, 1 year   — 5-years,5-years   — 1 year, 9 years
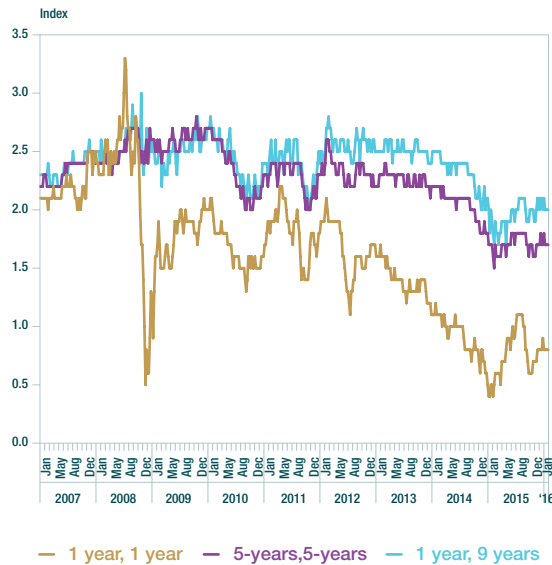
Note: Note: 1 year, 1 year refers to swap rates with a maturity of 1 year beginning in 1 year; 5 years, 5 years refers to swap rates with a maturity of 5 years beginning in 5 years and 1 year, 9 years refers to swap rates with a maturity of 1 year beginning in 9 years.

Source: CBI staff calculations, data extracted from Bloomberg

Relatively weak global trade dynamics, notably in relation to GDP, have been observed since the global financial crisis. Over the period from 2000 to 2008, global trade expanded by 6 per cent per year on average. The rate has fallen to 3-4 per cent in 2010-2015. The underlying reasons and the extent to which this is a cyclical or structural phenomenon remain a subject of debate.[3] Some studies have put this down to a levelling off of the trend towards increasing vertical specialisation in manufacturing production, in particular by China and the US. Additional potential factors include the importance of shifting global demand away from advanced economies – which display higher trade elasticities – towards emerging markets with (still) lower elasticities.

Finally, emerging economies are starting to feel the headwinds from the build-up of significant levels of private sector debts, including in US

dollars, notably in the corporate sector and large external financing needs.[4] These have started to weigh on business decisions as local exchange rates have started depreciating against the US dollar and capital flows have started to reverse back to advanced economies.[5]

Euro area growth and inflation outlook and risks

The latest Broad Macroeconomic Projection Exercise (BMPE), led by the ECB, projects that the GDP growth in 2015 to be at least 1.5 per cent. Annual GDP is projected to increase to 1.7 per cent for this coming year and 1.9 per cent in 2017. Compared with previous forecasts, the prospects for real GDP growth were broadly unchanged. Recently published growth forecasts from the OECD project growth in 2015 and 2016 at 1.5 per cent and

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3   C. Constantinescu, A. Mattoo, M. Ruta (2015), "The Global Trade Slowdown: Cyclical or Structural? IMF Working Paper January 2015 available at https://www.imf.org/external/pubs/ft/wp/2015/wp1506.pdf; ECB Economic Bulletin, "Understanding the weakness in world trade", Issue 3 2015 available at https://www.ecb.europa.eu/pub/pdf/other/eb201503_article01.en.pdf; and Stratford, K. (2015), "Why has world trade been so weak in recent years? 28 October 2015; in Bank Underground available at http://bankunderground.co.uk/2015/10/28/why-has-world-trade-been-so-weak-in-recent-years

4   On the magnitude of US dollar debt of non-financial corporates, see BIS *Quarterly Review* December 2015 "Dollar credit to EMEs".

5   See p.18, Bank of England *Financial Stability Report*, December 2015

Table 1: Latest Forecasts of Euro Area Growth in Real GDP				
	Date	**2015**	**2016**	**2017**
OECD	November 2015	1.5	1.8	1.9
EU Commission	November 2015	1.6	1.8	1.9
Eurosystem Staff (BMPE)	December 2015	1.5	1.7	1.9
IMF	October 2015	1.5	1.6	1.7

Source: IMF *World Economic Outlook October* 2015; OECD *Economic Outlook* 98 November 2015; European Commission, *Winter Forecast 2015*; ECB December 2015 *Broad Macroeconomic Projection Exercise*

Chart 8: Depreciation of Foreign Currencies Relative to US Dollar
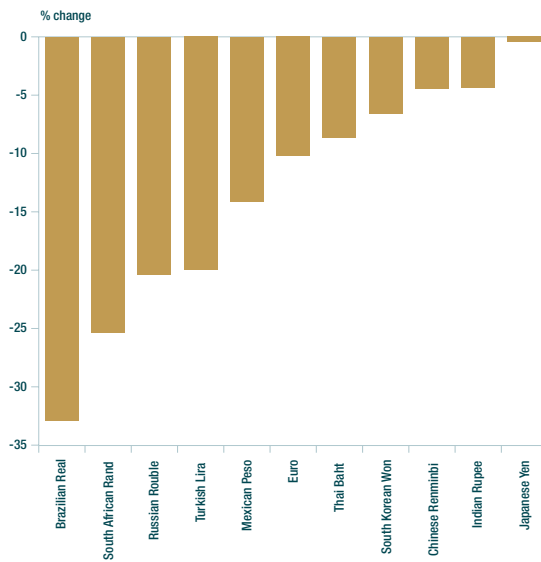
Source: Thomson Reuters Datasream.

Note: Depreciation against the dollar over the period 01/01/15-01/01/16.

1.8 per cent, respectively, while the forecasts for 2017 range between 1.7 per cent and 1.9 per cent (Table 1).

Private consumption expenditure is expected to remain the key positive driver of the euro area economic recovery, supported by accommodative monetary policy, lower cost of energy and ongoing improvements in labour markets. Private consumption in particular is expected to benefit from the recent improvement in the labour market conditions in the euro area and from continuing economic growth. Unemployment is projected

by both the ECB and the EU Commission to fall closer to 10 per cent by 2017 reflecting the downward impact of rising employment, partly offset by a growing labour force. Although lagging private consumption, investment growth is expected to gain some momentum, as capacity utilisation returns to its long-term average and credit supply constraints ease (Box B). The EU Investment Plan and removals of structural rigidities in a number of EU Member States over the past years should also help.

Turning to the inflation outlook, the December Eurosystem staff macroeconomic projections for the euro area were revised slightly downwards with respect to the September ECB staff macroeconomic projections. The annual HICP inflation is expected to reach 1 per cent in 2016 and 1.6 per cent in 2017 downward from 1.1 per cent in 2016 and 1.7 per cent in 2017. Energy prices continue to pose downside risks. However, the depreciation of the euro and the gradual pass through to domestic prices, via import prices, will continue in the forecasting horizon.

Inflation expectations from the Survey of Professional Forecasters were revised down to 1 per cent from 1.3 for 2016 and to 1.5 per cent down from 1.6 per cent for 2017. However, the longer-term inflation expectations (for 2020) remain at 1.9 per cent. It is important to notice that the survey was conducted between the end of September and the beginning of October, thus not taking into account the further monetary policy expansion announced in December (see below). Measures of market-based inflation compensations remain subdued. Longer-term market-based inflation expectations have

Table 2: Latest Forecasts of Euro Area Inflation				
	Date	**2015**	**2016**	**2017**
OECD	November 2015	0.1	0.9	1.3
EU Commission	November 2015	0.1	1.0	1.6
Eurosystem Staff (BMPE)	December 2015	0.1	1.0	1.6
IMF	October 2015	0.2	1.0	1.3

Note: OECD projection covers the euro area countries that are members of the OECD.

Source: IMF *World Economic Outlook* October 2015; OECD *Economic Outlook* 98 November 2015; European Commission, *Winter Forecast 2015*; ECB December 2015 *Broad Macroeconomic Projection Exercise*.

Chart 9: Euro Exchange Rates

EUR/GBP

EUR/USD

— EUR/GBP (Left Axis)   — EUR/USD (Right Axis)
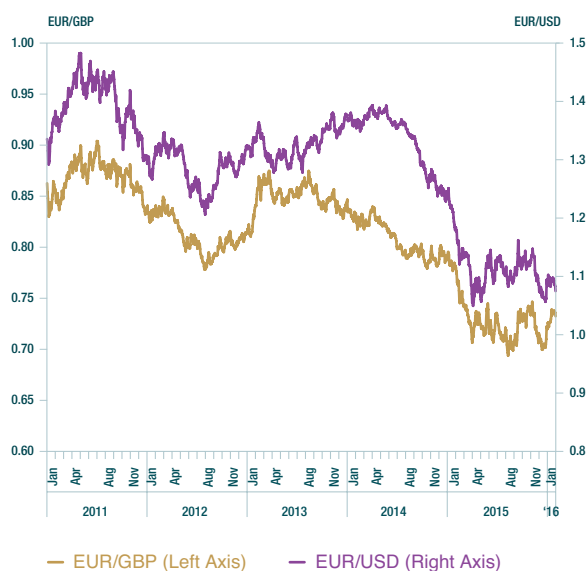
Note: A decrease in the above lines corresponds to a depreciation of the euro.

Source: Thomson Reuters Datastream.

to decline over the projection horizon, on account of the cyclical improvement in the EA economy and declining interest expenditure. According to the ECB projections, the fiscal stance is expected to provide a mildly positive contribution to demand for the next two years, while the EU Commission considered the euro area fiscal stance as broadly neutral for 2016.

Overall, while recent estimates by international institutions, point to a somewhat smaller negative output gap, they still suggest a sizeable amount of slack in the EA economy which is only expected to close gradually in the coming years.

Commodity prices remain a source of uncertainty in 2016. As a lingering risk to the euro area growth outlook, the latest fall in oil prices could indicate renewed weakness in global demand and could further strain commodity exporters. In Europe, the risks from weak commodity prices seem more balanced. While dampening headline inflation may be creating concerns about the impact of persistently low inflation on inflation expectations, the delayed boost to growth and European demand could be stronger than expected.

recovered in the run-up to the December Monetary Policy Council Meeting, but fell back afterwards. The five-in-five inflation swap rate slid from a peak of 1.8 per cent in December to 1.65 per cent in early January (see Chart 7).

Turning to fiscal policies, the government deficit and debt ratios are also expected

The economic impact of the refugee crisis on the euro area is anticipated to be relatively small.[6] In the short run, the main impact on GDP comes from the additional public expenditure needed to support the refugees. An additional positive impact on growth could

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6 See Eurosystem Staff Macroeconomic Projections for the Euro Area, "The impact of the influx of refugees on the euro area economy", Box 2 pp.5-6, December 2015 and European Commission Economic Forecast, Autumn 2015, "A first assessment of the macroeconomic effects of the refugee influx' p.48-52 available at https://www.ecb.europa.eu/pub/pdf/other/ eurosystemstaffprojections201512.en.pdf?f59090e90a0780de9ac58e51e954d48d and http://ec.europa.eu/economy_finance/ publications/eeip/pdf/ip011_en.pdf respectively.

be expected in the medium term from the increase in labour supply, provided the right policies are in place to facilitate access to the labour market. For the EU as a whole, the growth impact is anticipated to be small, but it should be more sizeable in some Member States, particularly Germany.

Despite the support to exports from the depreciation of the euro, the euro area remains vulnerable to external turbulences and, looking ahead, this is perceived to be one of the main risks to the outlook. A renewed weakening of the US economy could significantly impair the euro area growth outlook. Rising global risk aversion, in particular following the start of US policy normalisation, reversal of capital flows and pressure on foreign exchange markets of emerging markets could in turn risk a disorderly unwinding of excess leverage and other global imbalances. Despite China's sizable buffers in the form of foreign exchange reserves, slower GDP growth there has introduced considerable uncertainty as regards the future of global trade. Accordingly, euro area foreign demand is subject to further downward risk.

Section 2: Euro Area Monetary Policy Developments

Governing Council members recognised the positive effects on the economy of the quantitative easing (QE) measures introduced in January 2015. However, they also acknowledged that the changes in the external conditions since the summer, such as the weakening of emerging market economies and a series of downward revisions in inflation projections, required the recalibration of the policies to sustain the return of inflation to the target of below, but close to, 2 per cent over the medium term. At its December 3 monetary policy meeting, the ECB Governing Council decided to ease further the monetary policy stance by adopting a combination of conventional and unconventional monetary policy tools.

The Governing Council decided to extend the €60 billion-a-month asset purchase programme (APP) until the end of March 2017, or beyond, if necessary. Moreover, policy makers decided to reinvest the proceeds of the securities currently purchased under the APP as they mature for as long as necessary, and to expand the eligibility under APP to regional and local governments located in the euro area.

Furthermore, the interest rate on the deposit facility was cut by 10 basis points to -0.30 per cent while the interest rate on the main refinancing operations and on the marginal lending facility were left unchanged at 0.05 per cent and 0.30 per cent respectively. Finally, the main refinancing operations will be conducted as fixed rate tender procedures with full allotment for as long as necessary, and at least until the end of the last reserve maintenance period of 2017.

While the ECB decided to extend the expansionary monetary policy, on December 16 the US Federal Open Market Committee (FOMC) raised the target range of the federal funds rate by 0.25 percentage points, bringing the upper range from 0.25 to 0.5 per cent and ending a seven-year period of near-zero policy rates. Although inflation continues to run below target and measures of market-based inflation remain low, US labour market conditions have shown significant improvements over the past few months. Since March, the FOMC has communicated that further improvements in the labour market and the confidence that inflation would return to the 2 per cent objective over the medium run are the conditions for an interest rate hike. However, at the press conference, Federal Reserve Chair Janet Yellen emphasised that the FOMC expects economic developments to warrant only gradual increases in the federal funds rate.

Elsewhere, the Monetary Policy Committee (MPC) of the Bank of England at its meeting ending on December 9 decided to maintain the Bank Rate at 0.5 per cent fearing downside risks due to external factors. However, in its

communication the MPC provided guidance that, when the UK economic conditions have stabilised, the Bank Rate will be increased "only gradually and to a lower level than in recent cycles".

While the ECB expanded further the quantitative easing measures till the end of March 2017 (or beyond if necessary), the

widely-expected decision of the Federal Reserve to raise interest rates and the communication of the MPC of a possible future gradual increase in the interest rates represent an important divergence in the monetary policy stance among major economies. This reflects different stages in the recovery from the recent financial crisis.

Box B: Non-Standard Monetary Policy, Corporate Lending, and the 'Balance Sheet Channel'
By Giuseppe Corbisiero[1]

With the main refinancing rate reaching 0.05 per cent on September 2014 but still inflation remaining well below 2 per cent, in March 2015 the ECB launched the expanded Asset Purchase Programme (APP).[2] Even before the APP, the ECB introduced a wide range of non-standard measures to counteract financial system impairments, so providing a large amount of liquidity at low cost. Nevertheless, credit flows particularly by the banking sector have remained anaemic, notably in 'periphery' countries (Charts 1 and 2).[3]

Box B Chart 1: Total Credit to Euro Area's NFCs
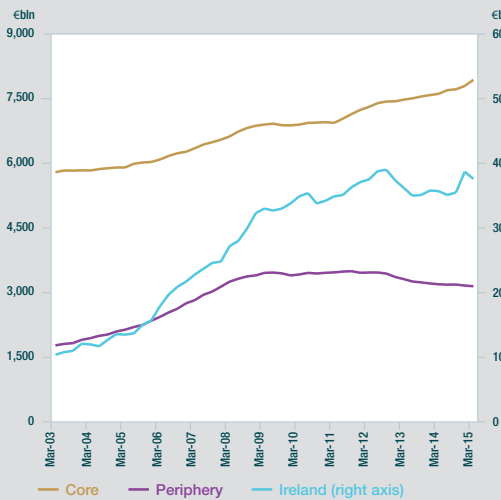
Source: BIS Statistics.

Box B Chart 2: Euro Area Bank Lending to Domestic NFCs
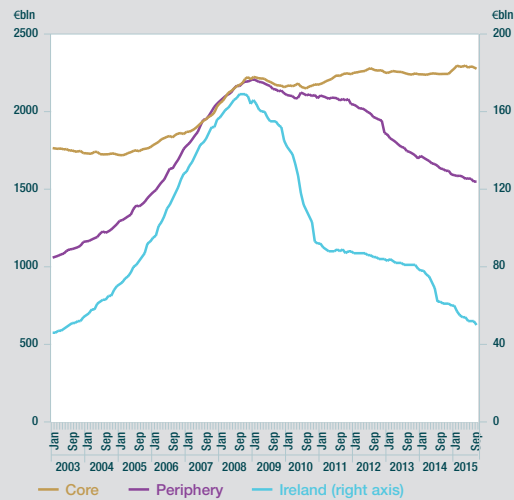
Source: ECB Statistical Data Warehouse.

1   Monetary Policy Division.

2   The APP encompasses purchases of asset-backed securities (ABSPP), covered bonds (CBPP3), and public sector bonds (PSPP) for an amount of €60 billion per month until March 2017 (or beyond, if necessary).

3   Austria, Belgium, Finland, France, Germany, and Netherlands are included in the 'core'; Greece, Ireland, Italy, Portugal, and Spain are included in the 'periphery'.

Box B: Non-Standard Monetary Policy, Corporate Lending, and the 'Balance Sheet Channel'
By Giuseppe Corbisiero

The survey on the access to finance of enterprises (SAFE) suggests that credit constraints, mainly involving small and medium enterprises (SMEs), have stood behind the bank lending reduction: until the first semester of 2014, SMEs constantly reported deterioration, on average, in the availability of bank loans (Chart 3). These facts suggest that pre-crisis credit conditions have not yet been restored and support the implementation of the APP. At this early stage a precise quantification of the effects of the APP is not yet possible. However, it is still useful to describe the theoretical mechanisms through which the programme is expected to stimulate the real economy, not least to have a benchmark against which to evaluate actual outcomes.

A recent article (Dunne et al. 2015) discussed the channels through which the APP is expected to work. This box elaborates further on how the programme can affect corporate lending via the 'balance sheet channel' (Kyiotaki and Moore 1997, Bernanke and Gertler 1989), a mechanism related to the wealth effects of the portfolio rebalancing channel (see Dunne et al. 2015, pp. 66-68). Specifically, through this channel monetary policy would affect real investment beyond the usual cost-of-capital effect of a lending rate reduction, stimulating particularly credit constrained firms.

Box B Chart 3: SAFE: Change in the Availability of Bank Loans
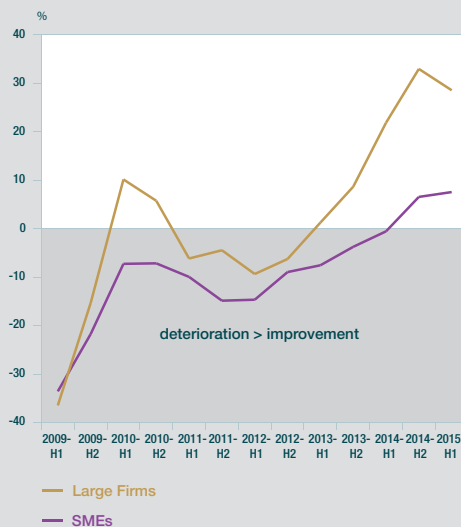
Source: SAFE, ECB.

Note: The vertical axis value represents the difference between the percentage of entrepreneurs reporting an improvement in the availability of bank loans and those reporting a deterioration over the previous six months. In the shaded area, the percentage of firms reporting a deterioration in the availability of bank loans exceeds the percentage of firms reporting an improvement.

Box B Chart 4: SAFE: Change in Collateral Requirements
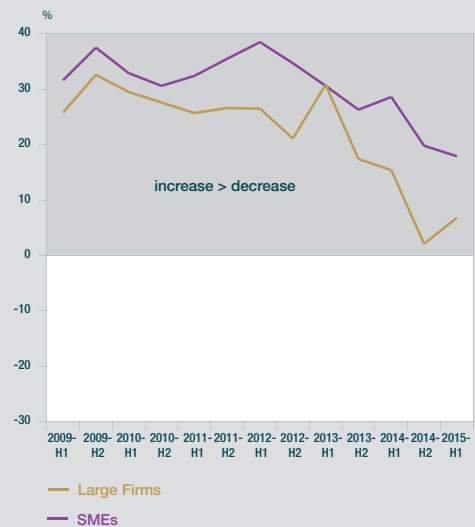
Source: SAFE, ECB.

Note: The vertical axis represents the difference between the percentage of entrepreneurs reporting an increase in collateral requirements for bank loans and those reporting a decrease over the previous six months. In the shaded area, the percentage of firms reporting an increase in collateral requirements exceeds the percentage of firms reporting a decrease.

In the euro area, this channel may be particularly relevant in the current juncture to the extent that the recent macroeconomic downturn has generated higher uncertainty about firms' future liquidity and solvency, leading to increases in collateral requirements for bank loans. Chart 4 provides evidence in this direction: since 2009, particularly SMEs constantly registered, on average, increases in collateral requirements.

Box B: Non-Standard Monetary Policy, Corporate Lending, and the 'Balance Sheet Channel'
By Giuseppe Corbisiero

The following simple model allows us to consider the monetary transmission mechanism according to the balance sheet channel. Firms' production requires fixed capital, a machinery, to transform working capital into goods. Purchases of working capital ($Working\ capital_1$) cannot exceed internal cash flows carried over from the previous period ($Revenues_0$ minus pre-existing debt, $Debt_0$, repaid at the gross interest rate R_0) plus new debt ($Debt_1$):

$$Working\ capital_1 \leq Revenues_0 - R_0\ Debt_0 + Debt_1. \tag{1}$$

In good times, cash flows from the previous period are sufficiently high and new borrowing needs ($Debt_1$) are low; therefore the firm can employ the amount of working capital that will maximize profits ("unconstrained regime").

In bad times, previous cash flows are low, and the desired amount of working capital requires high new debt. However, banks are uncertain about the firm's future solvency and require the machinery, which can be liquidated in case of no repayment, as loan collateral. Hence, the gross amount of debt granted by banks cannot exceed the value of the machinery:

$$R_1\ Debt_1 \leq Value\ of\ Machinery_1 \text{ (collateral-in-advance constraint).}$$

Substituting it in the firm's budget constraint (1), we obtain the amount of working capital that the firm can employ in the "constrained regime":[4]

$$Working\ capital_1 \leq Revenues_0 - R_0\ Debt_0 + \frac{Value\ of\ Machinery_1}{R_1}$$

This equation allows a consideration of the multiple ways through which monetary expansions can stimulate real investment by increasing debt capacity of credit constrained firms, as well as reducing their dependence on external finance. First, by increasing demand,[5] monetary expansions can increase firms' cash flow carried over to the next period, $Revenues_0$, and reduce firms' borrowing needs. Second, an interest rate reduction decreases the cost of carrying existing debt, $R_0\ Debt_0$, and firms' borrowing needs; moreover, it reduces the prospective payment on new debt, R_1, so relaxing the collateral-in-advance constraint and allowing a higher debt capacity. Finally, monetary policy can affect asset prices ("*Value of Machinery*"). During a macroeconomic downturn, fire sales can depress asset prices and debt capacity of other industry participants. A monetary expansion, by easing investment, can reduce episodes of forced liquidation, and also increase asset demand. Asset prices will raise and firms' debt capacity increase.[6]

Recent empirical works show the relevance of collateral constraints in several US industries during the crisis and its aftermath. Benmelech and Bergman (2011) show that bankruptcies raise an industry's cost of capital by deteriorating collateral market conditions. Ortiz-Molina and Phillips (2014) find that collateral market liquidity reduces firms' cost of capital. Adelino et al. (2015) find that the recent real estate boom-and-bust affected employment in small businesses through the collateral channel.

Although insufficient to assess the mechanisms highlighted above, Charts 5 to 8 provide evidence in this direction. The recent increase in demand has likely increased firms' revenues and reduced their borrowing needs; the reduction in lending rates and the positive trend in the stock price index (a proxy for collateral price dynamics) have possibly increased firms' debt capacity. All together, these features have possibly contributed to the recent recovery in the industrial production of consumer goods.[7]

4   See Bernanke et al. (1996) for a more detailed solution of the model.

5   Via the 'signalling channel' (see Dunne et al. 2015), expectations and confidence can expand domestic demand; currency depreciation can expand foreign demand for domestic goods.

6   Similar theoretical mechanisms are described by Shleifer and Vishny (1992) and Benmelech and Bergman (2012).

7   Starting in Q2-14 (vertical line in Charts 5-8), several measures have substantially increased the ECB's monetary policy stance: the targeted longer-term refinancing operations (TLTROs) and outright purchases in the ABS market (announced in June 2014); the ABSPP and the CBPP3 (September 2014); the PSPP (January 2015).
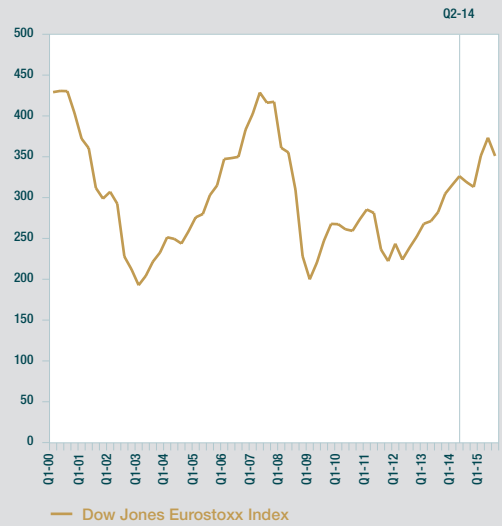
Box B: Non-Standard Monetary Policy, Corporate Lending, and the 'Balance Sheet Channel'
By Giuseppe Corbisiero

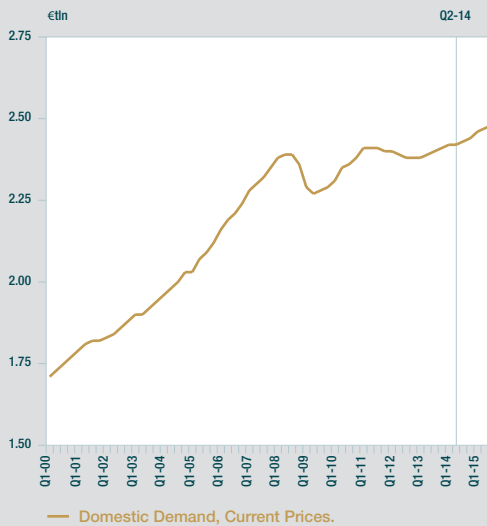**Box B Chart 5:** Euro Area Industrial Production of Consumer Goods

Index 2010 = 100   Q2-14

— Industrial Production of Consumer Goods
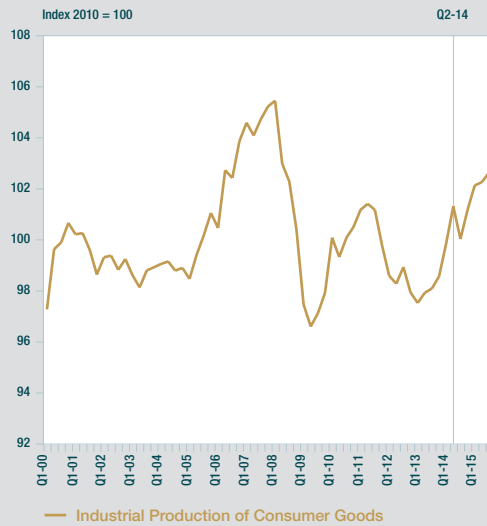
Source: Bloomberg.

Box B Chart 6: Euro Area Stock Prices

Q2-14

— Dow Jones Eurostoxx Index

Source: Bloomberg.

Box B Chart 7: Euro Area Domestic Demand

€tln   Q2-14

— Domestic Demand, Current Prices.

Source: Bloomberg.

Box B Chart 8: Bank Lending Rates to NFCs (up to €1 mln)

%   Q2-14

— Ireland   — Italy   — Portugal   — Spain   — Euro Area
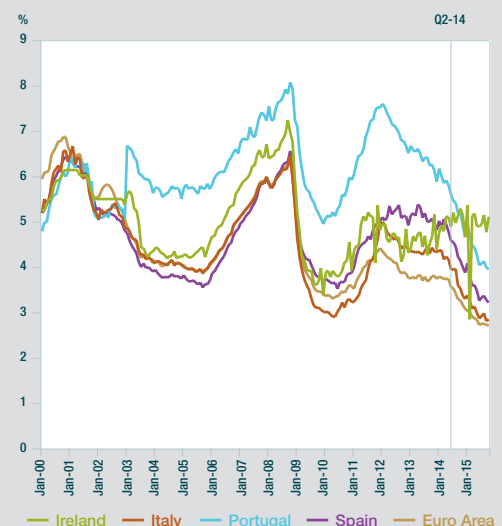
Source: ECB Statistical Data Warehouse.

To conclude, the balance sheet channel can play an important role in the monetary transmission, to the extent that firms' debt capacity in the euro area has being constrained by low collateral values. As smaller and less wealthy firms are more likely both to lack valuable collateral and to rely on bank lending, these mechanisms highlight the ways that the APP can stimulate those suffering the most from the crisis. Empirical analysis aiming at quantifying and identifying the impact of monetary policy can miss important channels by neglecting collateral effects, whose quantification can be instrumental to evaluate whether the policy measures will succeed in stimulating the agents who would benefit the most from them.

Box B: Non-Standard Monetary Policy, Corporate Lending, and the 'Balance Sheet Channel'
By Giuseppe Corbisiero

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Recent developments on resolution planning for credit institutions and investment firms

Central Bank of Ireland designated as national resolution authority (NRA)

On 15 July 2015, the Minister for Finance designated the Central Bank of Ireland as the Irish resolution authority under the transposition of the EU Bank Recovery and Resolution Directive (BRRD) into domestic legislation. In its capacity as resolution authority, the Central Bank is responsible for the orderly resolution of failing credit institutions and certain investment firms.

The new recovery and resolution framework will enhance both the resilience and the resolvability of EU financial institutions, which should now be better prepared to deal with and recover from a crisis situation. Moreover, in the event that an institution does fail, the impact associated with the failure of that institution should be minimised. Specifically, the new framework brings about the following changes:

- Banks and large investment firms are now required to prepare "recovery plans", which identify appropriate options that can be executed in the event of a significant financial deterioration of the institution, thereby reducing the need to take a resolution action.

- In addition, the BRRD grants a new set of early intervention powers to supervisors. These powers include the requirement for institutions to execute recovery options, the removal of management and changing the structure of the institution.

- If required, the Central Bank has at its disposal a set of resolution tools which can be used to resolve failing institutions in order to minimise the impact of failure on the financial system, the real economy, depositors and tax payers.

- Both a domestic and a European resolution fund have been established to help finance the cost of resolution in the future.

In order to ensure that institutions can be resolved in an orderly fashion, the Central Bank is required to undertake an ex-ante resolution planning process, as prescribed by the BRRD. The resolution planning process consists of the development of a "resolution plan" for each in-scope institution. This resolution plan should set out the resolution tools that would be applied to the institution in the event of failure, as well as the general process that would be followed by the relevant authorities, particularly in a cross-border context. Resolution plans are renewed on at least an annual basis to ensure that they remain up to date. In addition, the Central Bank is also required to carry out an annual resolvability assessment for each institution in order to assess whether there are any impediments to the execution of the resolution plan. Where impediments are identified, the institution will be required to address or remove those impediments.

In order to ensure that the Central Bank meets all of its obligations under the BRRD and its strategic responsibility under the Central Bank of Ireland Strategic Plan 2016 - 2018, a new division has been established within the Central Bank. The Resolution Division is located within the Central Banking pillar of the Central Bank and forms part of the Resolution and Corporate Affairs Directorate.

Single Resolution Mechanism

In addition to fulfilling its obligations under the BRRD, the Central Bank, as NRA, is also part of the Single Resolution Mechanism (SRM). From 1 January 2016, resolution planning and decision-making powers in respect of significant institutions and cross-border banks will be transferred to a new Brussels based

Box A: EU Banking Union

	Supervision	Resolution	Deposit Insurance
Single rulebook	**Capital Requirements Directive & Regulation (CRD IV & CRR)** *January 2014*	**Bank Recovery and Resolution Directive (BRRD)** *July 2015*	**Deposit Guarantee Scheme Directive (DGSD)** *November 2015*
Centralised responsibility	**Single Supervisory Mechanism (SSM)** *November 2014*	**Single Resolution Mechanism (SRM)** *January 2016*	**European Deposit Insurance Scheme (EDIS)** *Proposal stage*

institution, known as the Single Resolution Board (SRB). Resolution planning in respect of other licensed banks and larger investment firms will remain the responsibility of the Central Bank.

The SRM is considered to be a key pillar of the EU Banking Union which has been established within the euro area to address the bank-sovereign loop. As a whole, the Banking Union is composed of three pillars:

1. The first pillar consists of the centralised supervision of banks in the euro area under the Single Supervisory Mechanism (SSM). Under the SSM, Significant Institutions are supervised directly by the European Central Bank (ECB).

2. The second pillar consists of the SRM, which centralises responsibility for resolution planning and resolution decisions for significant and cross-border banks within the SRB.

3. The third pillar relates to the EU Commission's proposal for a European Deposit Insurance Scheme in the Banking Union area, which is currently under discussion by the European Parliament and EU Council.

The Banking Union is underpinned by the "single rulebook", which consists of the relevant legislative texts (such as the Capital Requirements Regulation (CRR), the BRRD and the Deposit Guarantee Scheme Directive (DGSD)) which govern the areas of prudential regulation, resolution and deposit insurance.

The Single Resolution Board

The SRB was established on 19 August 2014, following the entry into force of the SRM Regulation. The purpose of the SRB is to ensure that a harmonised approach is applied to resolution planning for banks in the Banking Union area. While the SRB only adopted its full powers on 1 January 2016, the SRB was

responsible for cooperating with national resolution authorities on resolution planning over the course of 2015.

In addition to cooperation with national authorities, another key focus for the SRB in 2015 was to address the logistical challenges associated with setting up a new institution. In contrast, in 2016 the SRB plans to concentrate on the following four areas:

1. Ensuring resolution readiness;
2. Operationalising the Single Resolution Fund;
3. Fostering cooperation with national resolution authorities and other stakeholders; and
4. Consolidating its operational capacity (i.e. building up its HR, finance, procurement and IT departments).

From 2016 onwards cooperation between NRAs and the SRB on resolution planning will occur through so called "internal resolution teams" (IRTs), akin to the joint supervisory team (JST) model employed by the SSM. IRTs will be composed of staff from the relevant NRAs, as well as the SRB. The SRB plans to recruit additional staff over the course of 2016 in order to deliver on its mandate.

Recovery Planning

As noted previously, the BRRD also requires institutions to prepare "recovery plans". These recovery plans involve the identification of options aimed at restoring the viability of the entity in the event of a significant deterioration of the institution's financial position. While recovery planning is a separate process from resolution planning, in that the recovery planning is the direct responsibility of the institution itself, the two processes are closely related. In addition, recovery plans are subject to review by both the competent authority and the resolution authority to ensure the credibility of the proposed recovery options.

MREL and addressing impediments to resolvability

While the drafting of recovery plans will be a significant undertaking for banks and investment firms, involvement from institutions will also extend into resolution planning. In particular, institutions will be required to address or remove any impediments to resolvability which are identified by the resolution authority as part of the annual resolvability assessment process. Institutions may be required to make changes to their operating structure or their balance sheets in order to address these impediments.

For example, in order to ensure that losses can be imposed on creditors in the event of failure, institutions may need to issue additional capital or eligible (i.e. bail-inable) liabilities. Specifically, institutions will be required to meet a minimum requirement for own funds and eligible liabilities (MREL) to ensure that they have a sufficient level of loss absorbing capacity in place. MREL will be set on a case by case basis for each institution, and will depend on a number of relevant factors such as size, systemic risk and the identified resolution strategy for that institution.

The Bank and Investment Firm Resolution Fund

Under the BRRD Member States are required to establish a national financing arrangement which provides a mechanism for financing the use of BRRD resolution tools by the resolution authority, where necessary. The resolution financing arrangement established in Ireland is the Bank and Investment Firm Resolution Fund (BIFR Fund). The BIFR Fund is funded by credit institutions and in-scope investment firms through the payment of ex-ante levies over a 10 year period. Contributions are calculated in accordance with a specific methodology as set out in an EU Commission Delegated Regulation. As resolution authority, the Central Bank is charged with raising levies for the BIFR Fund from 2015, as well as managing and administering its resources.

The Single Resolution Fund

In addition, the SRM Regulation established the Single Resolution Fund (SRF) as a resolution financing arrangement for the euro area for institutions in scope of the SRM Regulation. In this respect, from 2016 onwards Irish credit institutions and certain investment firms[1], will make their contributions directly to the SRF, rather than the BIFR Fund. In addition, contributions collected from relevant institutions in respect of 2015 will be transferred to the SRF in early 2016. While the SRF will be composed of contributions from credit institutions and relevant investment firms across the Banking Union, contributions are only mutualised over the course of a transitional period lasting until 31 December 2023. During the transitional period contributions raised at national level are transferred to a national compartment within the SRF. In the event that recourse to the SRF is needed during the transitional period, costs are first borne by the relevant national compartment. In the event that this is insufficient to fund the resolution action, recourse can be made to other national compartments up to a prescribed limit depending on the year within the transitional period. At the end of the transitional period national compartments are merged and cease to exist, resulting in a fully mutualised Single Resolution Fund to support resolution action in the euro area.

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1 Investment firms are required to contribute to the SRF where they are parented by a credit institution which is subject to direct supervision by the ECB.

Signed Articles

The articles in this section are in the series of signed articles on monetary and general economic topics introduced in the autumn 1969 issue of the Bank's Bulletin. Any views expressed in these articles are not necessarily those held by the Bank and are the personal responsibility of the author.

Interconnectedness of the Irish banking sector with the global financial system

Niamh Hallissey[1]

Abstract

Financial innovation and closer integration of international financial systems have created an environment where banks are highly connected, with each other and with the global financial system. These connections can have both positive and negative effects and understanding these interlinkages is an important area of focus for policymakers. While a full understanding of the connections within the wider financial system is constrained by a lack of complete data, regulatory data sources for the banking sector provide a wealth of information which can be used to analyse the interlinkages of this sector. This article examines a number of regulatory data sources to assess how interconnected Irish-authorised banks (both domestic and international) are with the financial system. It finds that banks with a domestic retail focus have much lower levels of interconnectedness with the financial sector than the internationally-focussed foreign-owned banks, at least partly due to the intragroup exposures of the latter. An analysis of the network of bilateral interbank credit exposures using available data shows that this network is relatively sparse, with just a few key hubs, all of which are large global banks. However, the available data do not capture all exposures and future data collection enhancements will be important for further analysis.

Introduction

The global financial crisis has starkly illustrated the importance of looking at the interconnectedness of the financial system, as shocks in one part of the system can reverberate and have a sizable impact on the stability of institutions and markets around the world. Interconnectedness can arise in several ways. Transactions between entities create a multiplicity of 'financial networks', many of which are opaque. Interconnectedness can also arise in a more indirect fashion, namely through exposure to common risk factors. Connections within the financial system bring many benefits through improving risk sharing and allowing for the absorption of small shocks. However, financial systems tend to be 'robust-yet-fragile', in that connections act as a shock-absorber for smaller shocks but after a certain level of interconnectedness act as shock-amplifiers.

Given their importance and links to the real economy, banks are a key component of many financial networks. Banks can be connected through direct counterparty exposures on the asset side, through funding networks, through the payments system or through common exposures to a certain sector or asset class. The high levels of interconnectedness between these institutions mean that the failure or distress of important banks can lead to contagion across the system. This in turn can have severe consequences for the real economy.

As such, monitoring and analysing these interlinkages is very important and there are several approaches and data sources that can be used to do this. It is important to have the full picture when looking at interconnectivity in order to gain a true understanding of systemic risk. However, in many cases, complete datasets are unavailable.

This article examines the interconnectedness of the banking sector in Ireland. Section 1 briefly introduces the concept of interconnectedness and methodologies which can be used to assess it. Section 2 examines the different data sources, while Section 3 looks at direct interbank credit exposures of the Irish banks and Section 4 discusses indirect interconnectedness through common exposures. Section 5 examines some non-banking data to complement the banking regulatory data and Section 6 concludes.

1. Interconnectedness

Interconnectedness and how it affects financial stability

Financial system interconnectedness arises through the many complex transactions and relationships between institutions. Recent events have shown the need for regular and thorough assessment of these interlinkages. The most direct form of interconnectedness consists of bilateral exposures between institutions. This form of interconnectedness brings with it many positive effects, allowing for diversification of risk and helping smaller shocks to be absorbed by the system. However, connections between institutions can also act as transmission channels for the propagation of shocks across the system.

While it is difficult to estimate the optimal level of interconnectedness, there are some findings in the literature which are of interest. Allen and Gale (2000), using a network structure involving four banks, show that the spread of contagion through direct linkages in financial systems depends on the level of interconnectedness between banks. They find that complete networks, where every institution is connected to every other institution, are more stable than incomplete networks. However, completeness is not a feature of most financial networks.

Gai and Kapadia (2010) find that financial systems tend to be 'robust-yet-fragile' in that connections act as a shock-absorber for smaller shocks but, after a certain tipping point, interconnections act as shock-amplifiers, spreading risk and leading to an impact disproportionate to the size of the initial shock. Sachs (2010) finds that financial stability depends not only on the completeness and

interconnectedness of the network of interbank exposures but also on the distribution of the exposures within the system. In addition, the paper finds that systems with a high degree of asset concentration among core banks are more unstable than networks with banks of homogeneous size that form their links randomly. Battiston et al. (2011) find that a highly connected network can amplify the effect of an initial negative shock.

One empirical study, by Čihák et al. (2011), uses model simulations and econometric estimates based on a world-wide dataset to find that the relationship between the stability of a country's banking sector and its interconnectedness varies according to the level of interconnectedness. For banking sectors which are not as connected with the global banking sector, they find that increases in interconnectedness are associated with a reduced probability of a banking crisis. Once interconnectedness reaches a certain level, further increases in interconnectedness can increase the probability of a banking crisis. When the interconnectedness reaches close to complete network, interconnectedness starts again reducing the likelihood of crisis. Thus, after a certain point, the advantages of increased interconnectedness become less clear. Čihák et al. (2011) do not consider the drivers of interconnectedness, which can be symptomatic of a specific risk rather than the underlying cause.

As well as the significance of the level of interconnectedness, a further finding of Čihák et al. (2011) is that it is important to distinguish whether the cross-border interlinkages arise primarily from banks' asset or liabilities side. They find that the impact of changes in interconnectedness on banking system fragility is more significant for the liability-side than for asset-side interconnectedness. Langfield et al. (2014) also distinguish between types of interconnectedness in their analysis of interbank connections in key markets. They find that network structure varies depending on whether interbank exposures (assets) or interbank funding are being considered.

Network structure also varies within different asset classes (e.g. derivatives, repos, unsecured lending, etc.).

Indirect interconnectedness is also a potential channel for contagion. Indirect linkages can arise from a concentration of common exposures, vulnerability to common shocks, market perceptions of risk, fire sales and informational contagion (Arregui et al., 2013). These factors can be as important as direct exposures during a crisis.

Tools for assessing interconnectedness

The need to monitor and analyse interconnections is very clear. There are several approaches and data sources that have been used to do this. One approach uses market data such as asset prices to estimate interlinkages among financial institutions. Under this approach, methodologies such as CoVaR, distress spillover indicators and probability of default models can be used to identify common risk factors and trace how distress affects different institutions (see Blancher, 2013 for further details). These measures are forward-looking but the early-warning capacity of some of these indicators is at best a few months ahead of the actual crisis events (Arsov et al., 2013). Another approach, known as network analysis, involves looking at balance sheet linkages on both the asset and the liability side to understand how shocks would propagate throughout the system. This approach maps the financial system as a set of nodes connected by links, representing financial relationships between the system's various entities. Network analysis can be used to identify important nodes, be they countries, sectors, or individual institutions, in a given system and provides an analytical framework for assessing the risks posed by interconnectedness. Network analysis allows for a more precise quantification of interconnectedness through network property measures such as density and concentration. Research on financial interlinkages using network analysis has grown rapidly over recent years. Newman (2010) provides a

good introduction to network analysis and describes common network metrics to analyse the stability of a particular network and its key nodes. This analysis can be carried out on a static basis, where the network structure is described using topological indicators, or on a dynamic basis which takes a more forward-looking perspective to see how a shock would propagate through the system and to assess channels of contagion (ESRB, 2013).

Research on interbank networks suggests a number of common themes in the structure of these networks. For example, national interbank networks tend to have a small number of central nodes and many less significant nodes, known as a core-periphery structure. This has been confirmed for several national interbank systems and remains stable over time, as discussed in ESRB (2013). However, Langfield et al. (2014) find that the strength of this core-periphery structure varies significantly by asset class.

2. Data sources

There are a number of data sources which can be used to assess interconnectedness. These include aggregate country level data, such as the Bank for International Settlements (BIS) international banking statistics, or more granular supervisory datasets. Limitations exist in both cases. Aggregation by country can hide important vulnerabilities at an individual bank level and international banking group structures can cause distortions to the data. Supervisory data can be used to give a more detailed breakdown of exposures by sector and by country, and for the relevant legal entity to a country. In addition, there are some supervisory data on banks' bilateral exposures. However, these data are only available nationally, and unless both counterparties are located in the same country only one side of any transaction will be captured. Payments systems data can also be used to assess interconnectedness between institutions by using algorithms to identify interbank transactions (Furfine, 1999). Gaffney (forthcoming) uses these data for the Irish payments system to investigate

the activities of Irish banks in the market for interbank lending between 2008 and 2015.

Complete datasets are rare, but it is important to have as full a picture as possible when looking at interconnectivity. Gauthier et al. (2010) finds that the picture of systemic risk derived from analysis of interbank deposits is significantly different to one based on all interbank exposures including cross-shareholdings and derivatives. As mentioned above, Langfield et al. (2014) also finds that network structure varies according to asset class. Incomplete data can result in an underestimation of systemic risk; this further highlights the need for improved data. New sources of data over the coming year will be beneficial in filling at least some of these gaps.

BIS data

The most common and widely available source of data on cross-border banking sector interconnectedness is the international banking statistics from the BIS. These data are aggregated at the level of national banking systems and track developments in banks' foreign positions and cross-country financial linkages. There are two different datasets: the BIS consolidated banking statistics (CBS) and the BIS locational banking statistics (LBS). The CBS focus on banks headquartered in the reporting country and track their consolidated gross claims and other exposures to individual countries and sectors. This dataset is available on an immediate borrower basis (based on the country of the first counterparty exposure) and an ultimate risk basis (based on the country where the final risk resides). The LBS focus on all banking offices resident in the reporting country and track the unconsolidated cross-border positions and the local positions in foreign currencies of these banks. This dataset is available by residency and by nationality (according to the country where the bank is headquartered). Coates et al. (2015) discusses these datasets and highlights coverage and methodological issues for these data series in Ireland and warns that care must be taken in drawing conclusions from the BIS published

series without an understanding of the underlying factors. The BIS data are the only publically available source of cross-border banking data and are widely used in research on the subject of banking interconnectedness (see, for example, Nimoiu and Reyes, 2013).

Banking regulatory data

Data collected for supervisory reporting purposes can be used to identify systemic risks that arise from common exposures, interbank linkages, and funding concentrations.[2] The large exposures data return can be used to look at interlinkages between banks and other counterparties. A large exposure is defined as an exposure that is 10 per cent or more of a bank's eligible capital base and each bank authorised in Ireland must report these on a quarterly basis.[3] These exposures are mainly on the asset side of the balance sheet. The current regulatory limit on large exposures to a single counterparty or a group of connected counterparties is 25 per cent of a bank's capital. However, the banking regulations allow for a number of exemptions to the large exposures limits, including sovereign exposures and exposures with certain parental guarantees. The large exposure reporting requirements vary by whether a bank falls under the definition of "parent institution in a Member State". These banks report more detail than the other institutions, including every exposure which is greater than €300 million but less than 10 per cent of the institution's eligible capital. The current large exposures return has been collected since Q1 2014 and similar data on large exposures were collected pre-CRR using a different scope and level of detail.

While the large exposures returns provide information on interlinkages through asset exposures, future developments in regulatory data for the banking sector will enhance the data available to look at the interconnectedness on the liabilities of these institutions. Additional data templates for the

supervisory review of banks which are being finalised by the EU Commission will include the top 10 largest counterparties or group of connected clients from which funding obtained exceeds a threshold of 1 per cent of total liabilities. These data will provide more information on the funding network of these banks.

Non-bank regulatory data sources

The banking regulatory data provide much information on the interconnectedness of the Irish banks with the global financial system. These data can be supplemented with data from other financial sectors to give a fuller picture of the interconnectedness of the Irish banking sector. The insurance and the non-bank financial intermediary sectors (together called other financial institutions (OFIs) for the purposes of this paper) are of particular interest in this regard. Existing regulatory data sources include detailed data on the asset and liability exposures of non-bank financial intermediaries. The Irish-resident non-bank financial intermediary sector is large in size relative to the domestic economy and covers a wide range of entities and activities. Money market funds (MMFs), investment funds (IFs) and financial vehicle corporations (FVCs) comprise most of the entities in this sector (see Godfrey and Golden, 2012). Data on derivative markets collected under the European Market Infrastructure Regulation (EMIR) can also be used to examine interconnectedness between banks and other counterparties in these particular markets. Research using these data (Kenny et al., 2015) finds significant interconnectedness and concentration in the Irish credit default swap market.

New data sources for the non-banking sectors will also become available over the coming year, reflecting global and domestic initiatives to fill data gaps. Some special purpose vehicles (SPVs) were not reporting granular data to the Central Bank but are now required to submit the same quarterly reporting as

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2   For further detail on the reporting requirements for credit institutions in Ireland see http://www.centralbank.ie/regulation/industry-sectors/credit-institutions/Pages/reporting.aspx

3   See Articles 387-403 of the Capital Requirements Regulation (CRR) 575/2013 and http://www.eba.europa.eu/regulation-and-policy/large-exposures for details of the large exposures regime. Eligible capital is defined as Tier 1 capital and Tier 2 capital capped at a reducing percentage of Tier 1 capital that will fall to 33 per cent by 1 January 2017.

FVCs (Godfrey et al., 2015). These data can be used to assess the interconnectedness of these vehicles with the regulated banking sector. In addition to these data, detailed aggregate data on the exposure of insurers, including to other parts of the financial sector, will become available in 2016 under the new Solvency II reporting regime.[4] These new data will complement the banking data in assessing financial sector interconnectedness.

3. Direct credit exposures

The most direct form of connections between banks and the rest of the financial system are bilateral credit transactions, most commonly through loans but also through derivatives, guarantees, debt or equity holdings, etc. The large exposures data return can be used to look at these connections. While the large exposures data do not give a complete picture on the direct connections between banks and other institutions, they do highlight exposures which, due to their size relative to capital, pose a risk to the bank. Large exposures are defined relative to capital, so the widespread increase in capital levels since the crisis will also reduce the number of reported large exposures, all else being equal.

There are two ways of analysing the bilateral exposures data. The first is to consider only the large exposures (i.e. any exposure greater than 10 per cent of that institution's capital). This has the benefit of consistency across banks as all banks report large exposures. The Irish banks reported €223 billion of large exposures as at June 2015, which compares to around €480 billion in total assets for the same banks. Section 3.1 considers the large exposures and describes these data. The second approach is to consider all the reported data, which includes large exposures and other reported exposures by consolidated-reporting banks, as is used in section 3.2 for the network analysis. This has the benefit of greater coverage of exposures, but is not consistent as the number of credit exposures a bank has could be driven

by its reporting requirements. While there are a large number of additional exposures captured under the second approach (383 compared to 228 large exposures), the value of the additional exposures is proportionally smaller, at €31 billion. Thus, from this particular dataset, there is coverage of around half of banks' assets. Considering approximately a third of the banks' assets are in mortgages to households, this constitutes a reasonable coverage of bilateral exposures.

### 3.1 Banks' bilateral large exposures

Data as at June 2015

The Irish banks reported €223 billion of large exposures as at June 2015 on a gross basis and €171 billion on a net basis (Chart 1), where net exposures refer to gross exposures after eligible credit risk mitigation (CRM).[5] Of these, large exposures are primarily to sovereigns, at over 50 (60) per cent of gross (net) exposures. Exposures to other credit institutions are also common, with around 40 per cent of gross and net exposures to this sector. Less than 5 per cent of exposures are to financial corporations other than credit institutions (OFIs). As can be seen from Charts 2 and 3, sovereign large exposures are dominated by exposures to Ireland, with nearly €60 billion of Irish sovereign large exposures as at June 2015, while the interbank large exposures are more diversified with very little Irish exposure (only €50 million at June 2015). Of the interbank large exposures, €26 billion originate from Italian domiciled counterparties, with the US and the UK also featuring in the top five. These countries reflect to a large degree the business models and intragroup connections of foreign subsidiaries located in Ireland. The large exposures return also provides a breakdown of the exposure by instrument type (e.g. debt (which includes debt securities and loans and advances), equity, derivatives, loan commitments, guarantees, etc.) and by whether it is on or off-balance-sheet. For the Irish banking system, 85 per cent of the interbank large exposures are in the form of debt instruments (Chart 4).

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4   For more detail see: http://www.centralbank.ie/regulation/industry-sectors/insurance-companies/solvency2/Pages/default.aspx

5   CRM techniques may have three different effects in the large exposures regime: Substitution effect; funded credit protection other than substitution effect; and real estate treatment.
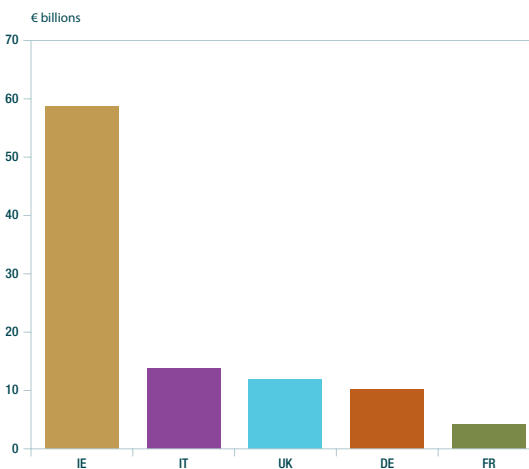
Chart 1: Gross and net reported bilateral large exposures by sector
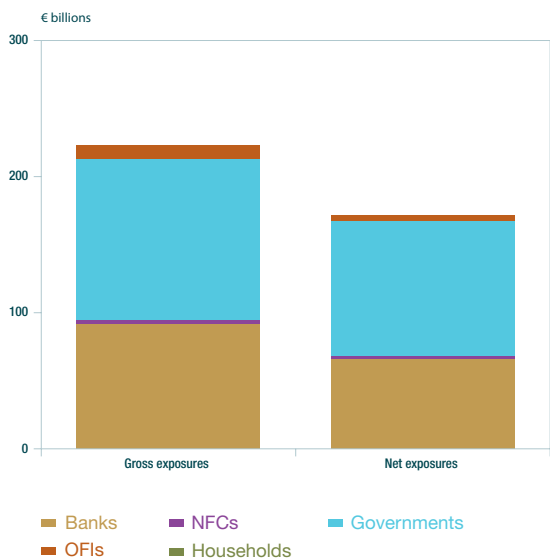
€ billions

- Banks
- NFCs
- Governments
- OFIs
- Households

Source: Central Bank data as at June 2015.

Note: Large exposures refer to exposures greater than 10 per cent of a bank's capital.

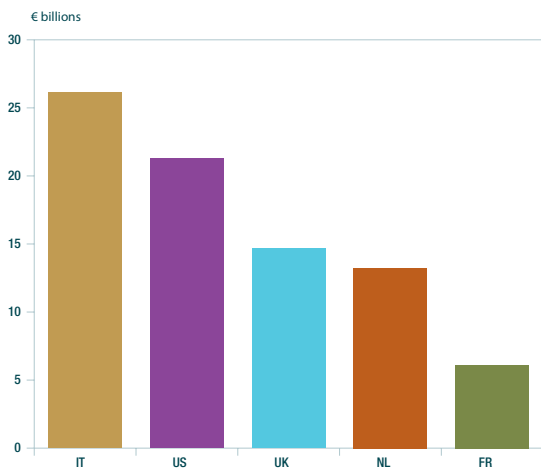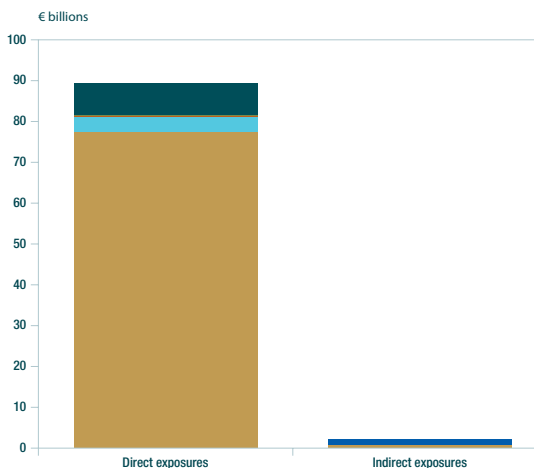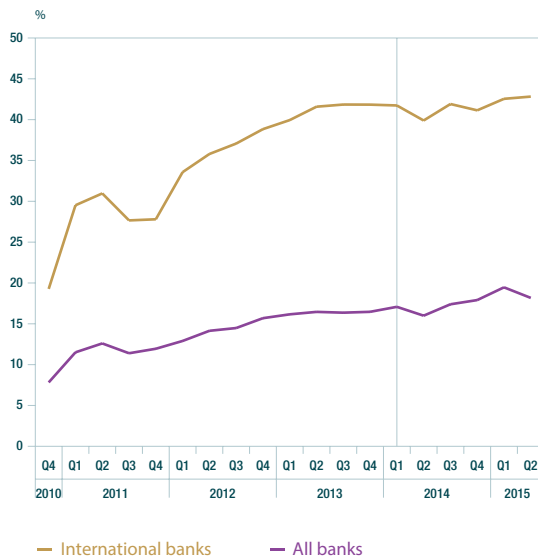**Chart 2:** Gross sovereign large exposures by country of counterparty – top 5

€ billions

Source: Central Bank data as at June 2015.

Note: Large exposures refer to exposures greater than 10 per cent of a bank's capital.

Chart 3: Gross interbank large exposures by country of counterparty – top 5

€ billions

Source: Central Bank data as at June 2015.

Note: Large exposures refer to exposures greater than 10 per cent of a bank's capital.

Chart 4: Breakdown by instrument for gross interbank large exposures

€ billions

- Debt
- Equity
- Derivatives
- OBS loan commitments
- OBS Guarantees
- OBS other commitments
- Exposure to underlying asset

Source: Central Bank data as at June 2015.

Notes: Large exposures refer to exposures greater than 10 per cent of a bank's capital. Debt instruments include debt securities and loans and advances. OBS refers to off-balance sheet exposures.

%

— International banks — All banks

Source: Central Bank data as at June 2015.

Notes: Data are for a continuous sample of banks.
Line indicates data change from Q1 2014.

%

— International banks — All banks

Source: Central Bank data as at June 2015.

Notes: Data are for a continuous sample of banks.
Line indicates data change from Q1 2014.

Data over time

It is also useful to consider the behaviour of these exposures over time. Reported interbank large exposures for the Irish banks tend to be volatile, partly due to swings in intragroup lending by the international banks. One way of smoothing for these factors is compare the figures to total assets of the banks to take into account deleveraging over the period, and to look at the net large exposures after exemptions, as intragroup transactions are largely exempt under the large exposures regime. Gross interbank large exposures amounted to 18 per cent of total assets at June 2015, having increased from 12 per cent in 2011 (Chart 5). Internationally-focussed foreign-owned banks have a much higher proportion of interbank large exposures at 43 per cent and are consistently higher over the time period. This reflects high levels of intragroup transactions. As intragroup lending is exempted in the large exposures regime, the net interbank large exposures after exemptions give an indication of the

magnitude of intragroup transactions.[6] After intragroup and other exempted exposures are removed, interbank large exposures for the internationally-focussed banks comprised only 2.2 per cent of total assets, compared to 1.5 per cent for all banks, and the difference between the two has fallen in recent quarters (Chart 6).

3.2 Interbank connections as a network

There are many different types of financial networks and these networks can vary according to asset class. For example, the network of derivative connections looks very different to the network of interbank lending. The large exposures data represent the network of credit exposures of the Irish-authorised banks.[7] The nodes here represent banks and the links between banks, known as edges, represent a credit exposure from bank A to bank B. This network is known as a directed network, i.e. the links go in one specific direction and a link going from A to B is different from a link going from B to A. As the

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6 Other factors are also behind the change between gross exposures and net exposures after exemptions, including collateral held. However, exempted exposures are the biggest driver in the difference between the two.

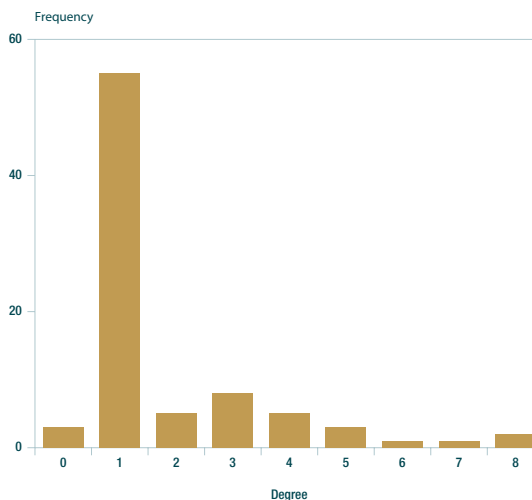7 This is only a partial network as not all interbank credit exposures are reported for all banks.
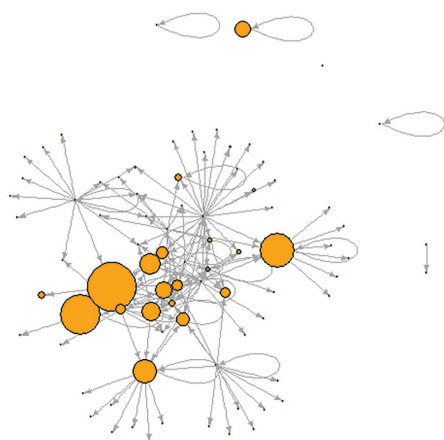
Source: Central Bank data and calculations as at June 2015.
Notes: Node size represents the sum of all exposures to that bank. The largest gross exposure is €14bn.

Chart 8: Histogram of in-degree

Source: Central Bank data and calculations as at June 2015.

number of edges from a bank is driven partly by its reporting requirements as discussed in Section 2, it is the number of edges to a bank which are of most interest.[8]

The first step in analysing the structure of a network is to visualise it. Chart 7 shows this network for all gross credit exposures between banks, with the size of the node representing the sum of all exposures to that bank. From simply looking at this network, we can see that it is relatively sparse, with some nodes which are not connected to other nodes. This could reflect the diversified nature of the Irish financial system. However, it is important to note that these data reflect only one side of the interbank transactions – the asset side - and we do not know what the exposures of non-Irish domiciled banks are back to these institutions. For this reason, this does not show the full level of interconnectedness but does give us a picture of the credit linkages.

Network analysis allows us to go further than just the visualisation of networks, and there are a wide range of measures and metrics which can be used to understand the data further. One simple metric is the degree of a node,

which is the number of edges attached to it. As this is a directed network, the in-degree of a node shows how many banks are exposed to that node / bank and the out-degree shows how many credit exposures a bank has. For this network, the in-degree is of most interest, as the out-degree is driven by the reporting requirements of a given institution. The distribution of the in-degree is shown in Chart 8. This shows that the majority of banks are the recipient of one credit exposure from other banks, with the mean in-degree just under 2. However, there are some banks which are more connected. The maximum in-degree is 8 and this occurs twice, i.e. there are 2 banks which are connected to 8 other banks in the sample. This is a property of many networks (as discussed in Section 1), which often contain a small but significant number of nodes with much higher degree than others. In financial networks, such hubs can indicate systemically important institutions which play a central role in certain markets. Macroprudential policy recognises the importance of these nodes through the global systemically important institutions (G-SII) framework, which identifies these important institutions and requires them to hold additional capital in

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8 This is because different types of banks must report different levels of detail in the large exposures return.

recognition of the greater impact the failure one of these institutions would have. The 5 highest connected banks in the Irish interbank credit network of June 2015 were all identified as G-SIIs at this time.

Another important concept in networks is that of distance. Some banks are isolated and not connected to others, as can be seen in Chart 7. For the banks which are connected, the diameter of the network or the 'longest shortest path' in the network is 6. This means that there are a maximum of 6 connections from one bank to any other bank that is connected to that network.

In summary, an examination of the network of interbank credit exposures using the available data shows that this network is relatively sparse, with just a few key hubs, the most connected of which are large international institutions, as at June 2015. At this date, a maximum of 6 connections from one bank to any other bank are observed. However, this network neither captures all credit exposures nor captures any funding exposures. The literature highlights the need for complete datasets and the difference in network properties across different markets.

4. Asset and liability concentration

Analysing direct counterparty credit exposures of the Irish banks is only one method for looking at the interconnectedness of the sector. As discussed earlier, indirect interconnectedness can arise from a concentration of common exposures, arising from similar business models or regulatory factors, or from other factors such as fire sales and contagion (Arregui et al., 2013). The Irish experience in the lead-up to the crash testifies to this, as the main domestic banks all increased their exposure to the real estate sector to generate returns in the pre-crisis period, resulting in a similar profile of credit risk

across the system. These exposures take a long time to unwind and asset concentration was further increased by the deleveraging programme for non-core assets which the banks had to undertake as part of the PCAR 2011.[9] Concentration of funding sources is another potential source of systemic risk and this was also evident in Ireland as banks expanded their loan books using cheap wholesale funding. As well as further fuelling the asset bubble, this resulted in a similar profile of funding risk for the Irish banks.

Common exposures can be examined using regulatory data and can be considered on both the asset and liability side of the balance sheet. It is interesting to look at this for both domestically-focussed institutions[10] and for the internationally-focussed, other foreign-owned resident banks[11] in Ireland. Total assets of the former were €305 billion and of the latter were €176 billion as at June 2015. While the domestically-focussed institutions' business models are focussed on the Irish retail and corporate sectors, the internationally-focussed foreign-owned institutions have a range of different business models.

Given the importance of the domestic banks' asset and liability profiles, these are regularly discussed in the Central Bank's biannual Macro-Financial Review[12] and are monitored by the Central Bank on an on-going basis. The risks to individual banks arising from common exposures are assessed through on-going supervision and addressed through supervisory measures such as credit concentration risk capital charges and liquidity requirements.

4.1 Asset concentration

Asset concentration can be on the basis of type of counterparty, type of exposure, or country of exposure. Banks' asset positions are dominated by loans and advances, which represent about two thirds of their assets. The following analysis considers the breakdown
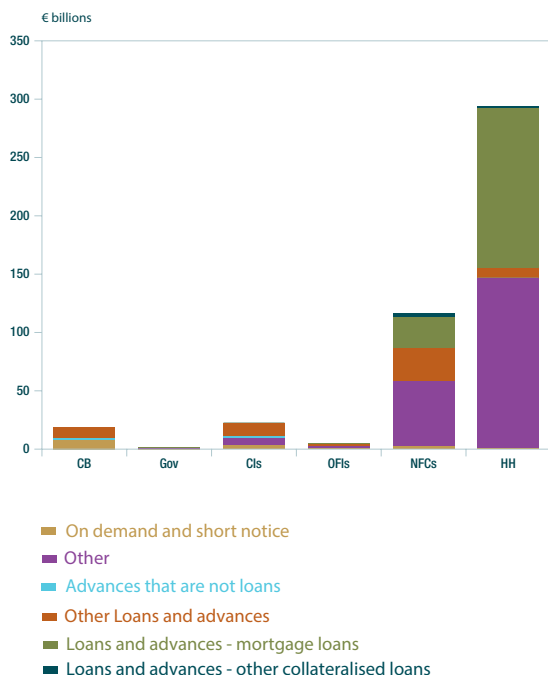
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9 For more detail see: http://www.centralbank.ie/regulation/industry-sectors/credit-institutions/documents/the%20financial%20measures%20programme%20report.pdf

10 The domestically-focussed banks are AIB, BOI, PTSB, Ulster Bank Ireland and KBC Bank Ireland.

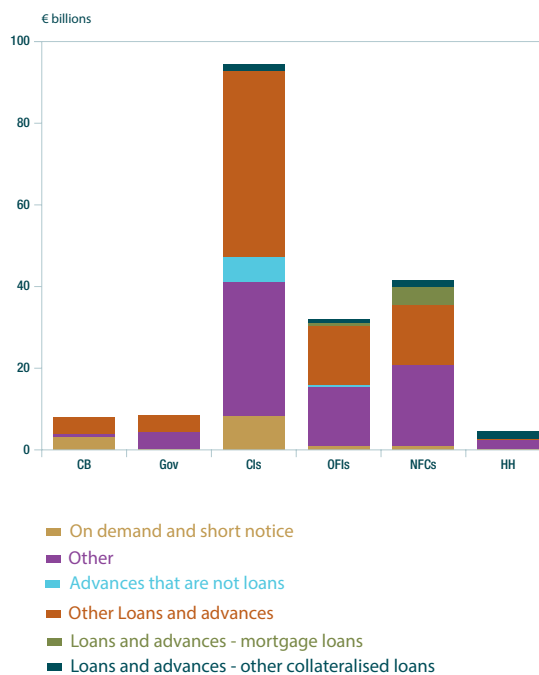11 This includes all non-domestically focussed foreign-owned resident banks authorised in Ireland.

12 http://www.centralbank.ie/publications/Pages/MacroFinancialReviews.aspx

Chart 9: Loans and advances by product and counterparty type for the domestically-focussed banks

€ billions

- On demand and short notice
- Other
- Advances that are not loans
- Other Loans and advances
- Loans and advances - mortgage loans
- Loans and advances - other collateralised loans

Source: Central Bank data as at June 2015.

Notes: CB = Central Bank, CIs = credit institutions, OFIs = other financial corporations, NFCs = non-financial corporates, HH = households. Other includes credit card debt, trade receivables, finance leases, debit balances with contractually fixed maturities or terms that are not included in other items.

Chart 10: Loans and advances by product and counterparty type for the internationally-focussed banks

€ billions

- On demand and short notice
- Other
- Advances that are not loans
- Other Loans and advances
- Loans and advances - mortgage loans
- Loans and advances - other collateralised loans

Source: Central Bank data as at June 2015.

Notes: CB = Central Bank, CIs = credit institutions, OFIs = other financial corporations, NFCs = non-financial corporates, HH = households. Other includes credit card debt, trade receivables, finance leases, debit balances with contractually fixed maturities or terms that are not included in other items.

of loans by counterparty type.[13] The same analysis on banks' financial assets shows similar trends. Chart 9 shows the breakdown of the loan books of the domestically-focussed banks by product and by counterparty type. These banks are heavily exposed to the household sector, which accounts for two thirds of exposures. One third of overall exposures at June 2015 were mortgage loans to households and a further 30 per cent were 'other' loans to households. Non-financial corporates (NFCs) account for a further quarter of exposures as at June 2015. This concentration of loans in mortgages, consumer and NFC lending is not a surprise and reflects the post-crisis business models of the domestically-focussed banks. Chart 10 shows this breakdown for the internationally-focussed (foreign-owned resident) banks and shows a very different asset profile. These banks have negligible exposures to households and much higher exposures to other banks, with over half of all loans and advances extended to other

credit institutions and a further 17 per cent to OFIs. Thus, a simple analysis of counterparty exposures on the asset side would imply that internationally-focussed banks are more interconnected with the financial system than the domestically-focussed banks. These data do not distinguish whether the exposures to credit institutions are intragroup transactions.

Regulatory data also allow for an examination of the breakdown of lending to NFCs by economic sectors. Domestically-focussed banks had total NFC loans of €64 billion and internationally-focussed €32 billion at June 2015. Almost half of lending by the domestically-focussed banks to NFCs is to the construction and real estate sectors. This sector is also a large component of internationally-focussed banks' exposures (around a third of lending), although the euro amount is much lower given the smaller overall NFC loan book. The internationally-focussed banks have higher concentration of lending in

Chart 11: Domestic banks - breakdown of financial liabilities
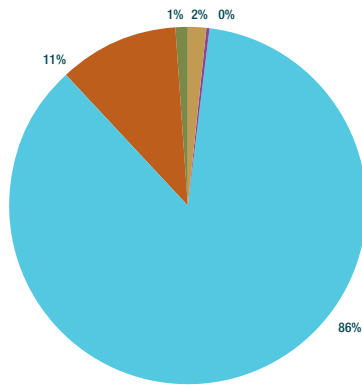
- Derivatives
- Debt securities issued
- Short positions
- Other financial liabilities
- Deposits

Source: Central Bank data as at June 2015.

Chart 12: Internationally-focussed banks - breakdown of financial liabilities
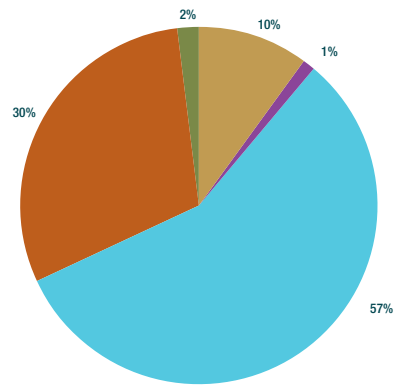
- Derivatives
- Debt securities issued
- Short positions
- Other financial liabilities
- Deposits

Source: Central Bank data as at June 2015.

Chart 13: Domestic banks: breakdown of deposit liabilities by product and by counterparty sector
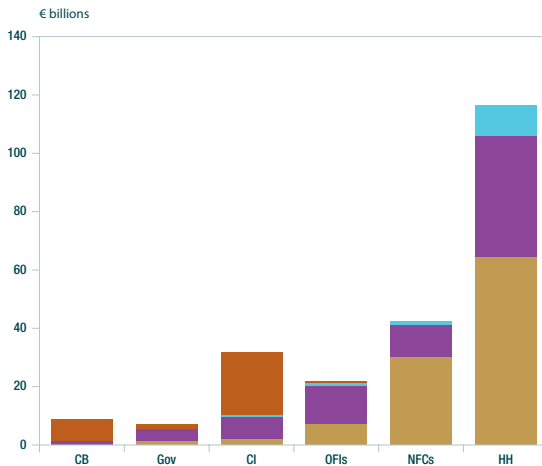
€ billions

- Current accounts / overnight deposits
- Deposits with agreed maturity
- Deposits redeemable at notice
- Repurchase agreements

Source: Central Bank data as at June 2015.

Notes: CB = Central Bank, CIs = credit institutions, OFIs = other financial corporations, NFCs = non-financial corporates, HH = households. Other includes credit card debt, trade receivables, finance leases, debit balances with contractually fixed maturities or terms that are not included in other items.
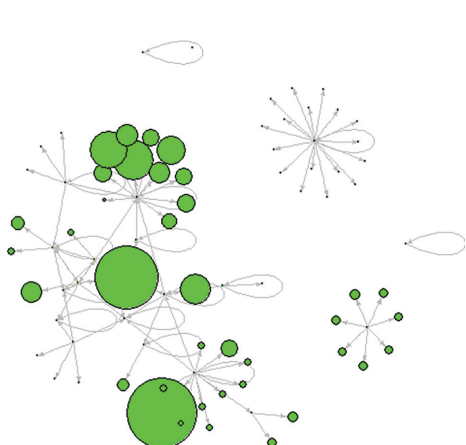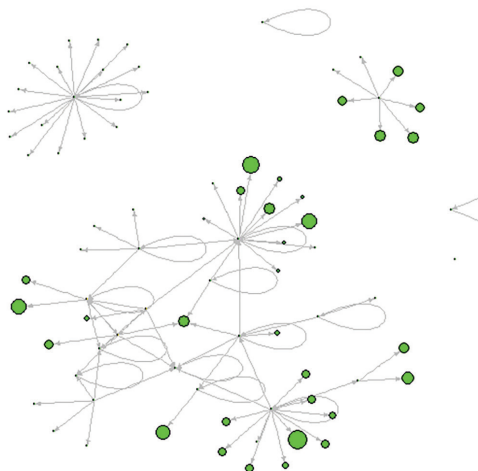
Chart 14: Internationally-focussed banks: breakdown of deposit liabilities by product and by counterparty

€ billions

- Current accounts / overnight deposits
- Deposits with agreed maturity
- Deposits redeemable at notice
- Repurchase agreements

Source: Central Bank data as at June 2015.

Notes: CB = Central Bank, CIs = credit institutions, OFIs = other financial corporations, NFCs = non-financial corporates, HH = households. Other includes credit card debt, trade receivables, finance leases, debit balances with contractually fixed maturities or terms that are not included in other items.

Source: Central Bank data and calculations as at June 2015.
Notes: Node size represents the sum of all exposures to that OFI and nodes are scaled by the same factor in both charts. Largest gross exposure is €1.8bn (€0.01bn net for the same exposure).

the manufacturing and other services sectors (21 per cent and 27 per cent respectively compared to 8 per cent and 12 per cent for the domestically-focussed banks). While the pre-crisis risk profile of the Irish banking sector has changed in many and significant ways, these banks are still highly exposed to common risks in the real estate market, particularly the domestically-focussed banks.

4.2 Liability concentration

Regulatory data also allow for a detailed examination of the sources of banks' funding, which has been an important area of focus for banking supervisors since the crisis. Charts 11 and 12 illustrate the reliance of the Irish banking system on deposit funding, in particular the domestically-focussed banks. Deposits comprised 86 per cent of domestic banks' financial liabilities and 57 per cent of internationally-focussed banks at June 2015. This warrants further exploration and charts 13 and 14 show the breakdown of deposit liabilities by type of deposit and by counterparty. Similar to the asset side of the balance sheet, there is a clear difference between the domestically-focussed banks and the internationally-focussed banks, with the

domestically-focussed banks' deposit funding primarily from households and corporates with only 14 per cent from other banks. In contrast, the majority of the internationally-focussed banks' deposit funding comes from other credit institutions and OFIs (over 80 per cent together). In addition, debt securities comprise almost a third of internationally-focussed banks' funding and only 11 per cent of the domestic banks' (Charts 11 and 12). This further illustrates the higher level of interconnectedness of the internationally-focussed foreign-owned banks with the financial system compared to the domestic banks, whose interconnectedness is perhaps more indirect and as a result of a high level of common exposures, particularly to the household, NFC, and real estate sectors.

5. Interconnectedness with other financial institutions

It is also possible to use the banking regulatory data to look at the network between the Irish credit institutions and financial corporations other than credit institutions (OFIs) (Charts 15 and 16). This network is sparser than the interbank network, gross exposures tend to be much smaller, and there is higher credit risk
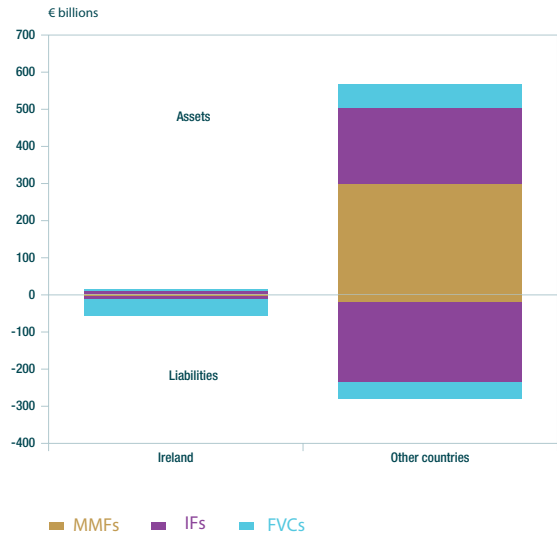
Chart 17: Asset and liability breakdown of MMFs, IFs, and FVCs for Ireland and for all other countries
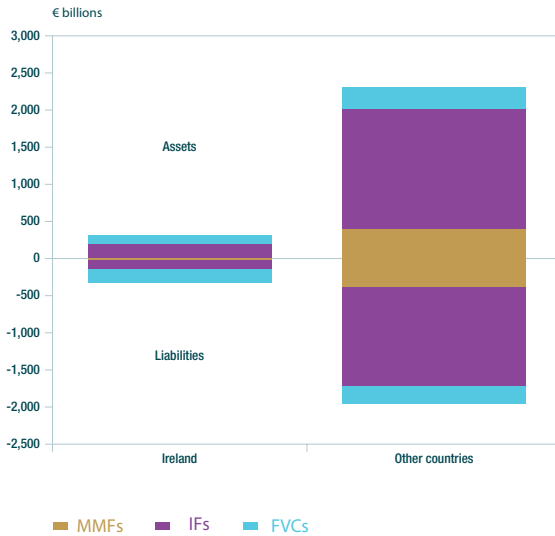
Source: Central Bank data as at June 2015.

Note: MMFs = money market funds,
IFs = investment funds, and
FVCs = financial vehicle corporations

Chart 18: Asset and liability breakdown of exposure to banks of MMFs, IFs, and FVCs for Ireland and for all other countries

Source: Central Bank data as at June 2015.

Note: MMFs = money market funds,
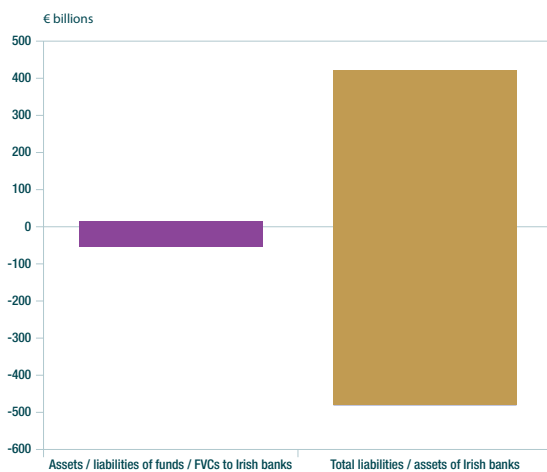IFs = investment funds, and
FVCs = financial vehicle corporations

mitigation. However, it is not possible to draw any meaningful conclusions from this network as we do not have information regarding connections between these OFIs or the connections from OFIs to the banks.

The banking regulatory data can be supplemented with data from other financial sectors to give a more complete picture of the interconnectedness of the Irish banking sector. Chart 17 shows the breakdown of the assets and liabilities of the Irish resident funds (including MMFs) and FVCs (which are one component of the OFI sector) by Irish and all other country exposures. These entities are not heavily exposed to Ireland, with only around 10 per cent of assets / liabilities in the domestic economy. These asset exposures are largely accounted for by cross-share/unit holdings in other Irish resident funds or FVCs and deposits with foreign-owned resident banks or other funds. When looking at the holdings of these entities in the banking sector, Irish banks comprise a small proportion of overall banking sector exposures with only 2 per cent of banking sector assets located in Ireland and 17 per cent of liabilities (Chart 18). The higher Irish liability exposure is due to retained securitisations of some of the Irish banks,

which come under the FVC reporting, while within funds the liability exposure to Irish banks may partly reflect foreign-owned resident bank nominee accounts on behalf of clients. FVCs hold very little Irish banking sector assets (approximately €4 billion at this date). MMFs have very little Irish banking sector asset / liabilities and IFs hold about €10 billion assets and liabilities.

As the funds / FVC sector in Ireland is quite large, it is also useful to consider these numbers relative to the size of the Irish banking sector. Chart 19 shows the exposure of these entities to the Irish banking sector for both assets and liabilities, comparing this to the total liabilities / assets of the Irish banking sector. Comparing the liabilities of these entities to the assets of the Irish banking sector gives an indication of how much exposure the banks have to the Irish funds / FVC sector. These entities have a combined asset holding in Irish banks of nearly €15 billion compared to a total liability position of the banking sector of €420 billion. The funds / FVCs have a combined liability position of €55 billion to the Irish banking sector compared to total assets of €480 billion for the sector.

Chart 19: Asset / liability exposure of funds / FVCs to Irish banks compared to the total liability / assets of the Irish banks

€ billions

Source: Central Bank data as at June 2015.

Note: MMFs = money market funds,
IFs = investment funds, and
FVCs = financial vehicle corporations

The examination of the reporting data of the Irish resident funds and FVCs for information on Irish banking sector interconnectedness shows only a moderate amount of exposure of these OFIs to the Irish banks and at least part of this exposure reflects deposits or nominee accounts on behalf of clients. This is an interesting finding when considering the interconnectedness of the Irish banking sector to the global financial system and these data are regularly monitored to track any changes in these positions which could indicate an increase in this interconnectedness. Insurers and SPVs are other components of the OFI sector and, until now, there has been less data available on connections between these institutions and the banking sector. Solvency II data and the extension of Central Bank quarterly reporting requirements to SPVs will increase the data available to analyse interconnectedness of non-banks with the banking sector and will add significantly to our understanding of this area.

6. Conclusion

Interconnectedness in the financial system can have both positive and negative effects and a full understanding of these is important for policymakers. Theoretical evidence suggests that connections can act as shock-absorbers for smaller shocks but for larger shocks, can act as shock-amplifiers. In addition, the level and the distribution of connections are also important. Due to gaps in the data, empirical evidence on the optimal level of interconnectedness is limited. However, there is some evidence that the stability of a country's banking sector is related to its interconnectedness in a non-linear fashion and that after a certain point, the advantages of increased interconnectedness become less clear. In addition, the type of interconnectedness and whether it is on the asset or liability side is also important. Network analysis is a common approach to analysing interconnectedness and studies have shown that national interbank networks tend to have a core-periphery structure, although the strength of this structure varies by asset class.

This paper uses granular and aggregate regulatory data to examine the interconnectedness of the Irish banking system with the global financial system. These data show the importance of assessing interconnectedness for different groups of banks, as the banks with a domestic retail focus have a very different profile of interconnectedness with the global financial sector than the internationally-focussed foreign-owned banks. The domestically-focussed banks' interbank large exposures are much lower than the internationally-focussed banks relative to the size of their assets, at least partly due to the intragroup exposures of the latter. The internationally-focussed banks have a large proportion of their assets and liabilities with other credit institutions, compared to the domestically-focussed banks which are primarily exposed to households

and corporates. Both types of bank have a large proportion of their corporate lending with the real estate and construction sectors and the domestically-focussed banks in particular remain vulnerable to shocks in these sectors.

An examination of the network of interbank credit exposures using the available data shows that this network is relatively sparse, with just a few key hubs, the most connected of which were on the list of global systemically important institutions as at June 2015. However, this network neither captures all credit exposures nor captures any funding exposures. The literature highlights the need for complete datasets and the difference in network properties across different markets.

Banks' interconnectedness with other (non-bank) financial institutions is also examined. Again, internationally-focussed banks are much more exposed to these institutions, both on the asset and liability side. There are not sufficient data to map a meaningful network of interbank and OFI credit exposures. However, an examination of regulatory data from the Irish resident funds shows that these institutions do not have a large exposure to the Irish banking sector, either in terms of their own size or relative to the size of the Irish banking sector. Detailed data on the exposures of the Irish insurance sector and Irish resident SPVs will be available in 2016 and these data will help develop the picture of the interconnectedness of the Irish financial system with the global financial system.

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Statistical Appendix

Statistical Appendix

The publication of the Statistical Appendix of the Quarterly Bulletin was discontinued from Quarterly Bulletin 1 2014. Statistical data compiled by the Central Bank are accessible on the Statistics page of the Central Bank's website, http://www.centralbank.ie/polstats/stats/Pages/default.aspx. Some tables, previously published in the Statistical Appendix, have been expanded to provide more comprehensive data. A number of statistical tables, which were not published in earlier Bulletins, have also been added.

The list of statistical tables and links to access them on the website are given on the following page.

STATISTICAL TABLES: CENTRAL BANK WEBSITE LINKS

Money and Banking:

http://www.centralbank.ie/polstats/stats/cmab/Pages/Money%20and%20Banking.aspx

- Summary Irish Private Sector Credit and Deposits
- Financial Statement of the Central Bank of Ireland
- Credit Institutions – Aggregate Balance Sheet
- Credit Institutions (Domestic Market Group) – Aggregate Balance Sheet

Business Credit and Deposits:

http://www.centralbank.ie/polstats/stats/cmab/Pages/BusinessCredit.aspx

- Credit Advanced to Irish Resident Private-Sector Enterprises
- Deposits from Irish Resident Private-Sector Enterprises

Private Household Credit and Deposits:

http://www.centralbank.ie/polstats/stats/cmab/Pages/HouseholdCredit.aspx

- Credit Advanced to and Deposits from Irish Private Households

Money Market Funds:

http://www.centralbank.ie/polstats/stats/cmab/Pages/MoneyMarketFunds.aspx

- Money Market Funds Aggregate Balance Sheet
- Money Market Funds Currency Breakdown of Assets

Retail Interest Rates:

http://www.centralbank.ie/POLSTATS/STATS/CMAB/Pages/Retail%20Interest%20Rate%20Statistics.aspx

- Retail Interest Rates - Deposits, Outstanding Amounts
- Retail Interest Rates - Loans, Outstanding Amounts
- Retail Interest Rates and Volumes - Loans and Deposits, New Business
- Official and Selected Interest Rates

Investment Funds:

http://www.centralbank.ie/polstats/stats/investfunds/Pages/data.aspx

- Ireland: Investment Funds Data

Securities Issues:

http://www.centralbank.ie/polstats/stats/sis/Pages/Issues.aspx

- Securities Issues Statistics

Financial Vehicle Corporations:

http://www.centralbank.ie/polstats/stats/fvc/Pages/data.aspx

- Irish Financial Vehicle Corporations

Locational Banking Statistics:

http://www.centralbank.ie/polstats/stats/locational/Pages/data.aspx

- Total Positions of Banking Offices Resident in Ireland vis-a-vis Residents and Non-Residents

Quarterly Financial Accounts:

http://www.centralbank.ie/polstats/stats/qfaccounts/Pages/Data.aspx

- Financial Accounts for Ireland: Q1 2012 to present – ESA 2010

Public Finances and Competitiveness Indicators:

http://www.centralbank.ie/polstats/stats/sis/Pages/SecuritiesHoldingsStatistics.aspx

- Gross National Debt
- Holdings of Irish Government Long-term Bonds

http://www.centralbank.ie/polstats/stats/Pages/hcis.aspx

- Nominal and Real HCIs