



Banc Ceannais na hÉireann
Central Bank of Ireland

Eurosystem



Quarterly Bulletin

QB4 – October 2018

Contents

Section 1

Forecast Summary Table	8
------------------------	---

Comment	9
---------	---

The Irish Economy **11**

Box A: Macroeconomic Implications of the UK Government Brexit White Paper: A Preliminary Analysis	13
--	----

Box B: The International Economic Outlook	17
---	----

Box C: Risks Related to Corporation Tax Flows	33
---	----

An Timpeallacht Gheilleagrach **38**

Financing Developments in the Irish Economy **40**

Box A: Income Statement Statistics and Ireland's Banking System	48
---	----

Box B: Retrocession: Reinsuring the Reinsurer	52
---	----

Section 2

Assessing the Financial Risks and Buffers of the Central Bank **58**

David Doran, Ruth Gleeson, Steve Kilkenny and Šarūnas Ramanauskas

Section 3

Statistical Appendix	74
-----------------------------	-----------

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.

Designed by: Vermillion Design

Enquiries relating to this Bulletin should be addressed to:

Central Bank of Ireland (Publications),
Bosca PO 559, Baile Átha Cliath 1, Éire
PO Box 559, Dublin 1, Ireland
Phone 353 1 2246278; Fax 6716561
www.centralbank.ie
Email: Publications@centralbank.ie

ISSN 0332-2645

Section 1

Forecast Summary Table

	2016	2017	2018 ^f	2019 ^f	2020 ^f
Real Economic Activity					
(% change)					
Personal consumer expenditure	4.0	1.6	3.0	2.5	2.3
Public consumption	3.5	3.9	3.5	2.0	1.8
Gross fixed capital formation	51.7	-31.0	-2.8	13.5	7.5
Underlying Domestic Demand (unpublished) ¹	5.1	2.9	5.6	4.2	3.6
Exports of goods and services	4.4	7.8	5.0	4.6	3.8
Imports of goods and services	18.5	-9.4	0.0	5.3	4.1
Gross Domestic Product (GDP)²	5.0	7.2	6.7	4.8	3.7
Gross National Product (GNP)	11.5	4.4	5.9	4.2	3.4
External Trade and Payments					
Balance-of-Payments Current Account (€ million)	-11,375	24,920	36,912	35,880	35,377
Current Account (% of GDP)	-4.2	8.5	11.5	10.5	9.8
Prices, Costs and Competitiveness					
(% change)					
Harmonised Index of Consumer Prices (HICP)	-0.2	0.3	0.8	0.8	1.1
of which: Goods	-3.1	-2.1	-0.3	-1.1	-1.2
Services	2.5	2.5	1.9	2.5	3.1
HICP excluding energy	0.4	-0.1	0.2	0.6	1.4
Consumer Price Index (CPI)	0.0	0.3	0.6	0.9	1.0
Compensation per Employee	2.2	0.8	2.8	3.3	3.4
Labour Market					
(% change year-on-year)					
Total employment	3.6	2.9	3.0	2.2	1.7
Labour force	1.9	1.1	1.8	1.5	1.5
Unemployment rate (ILO)	8.4	6.7	5.6	4.9	4.7
Technical Assumptions³					
EUR/USD exchange rate	1.11	1.13	1.17	1.17	1.17
EUR/GBP exchange rate	0.82	0.88	0.89	0.88	0.88
Oil price (\$ per barrel)	44.05	54.40	74.49	73.54	68.68
Interbank market - Euribor[(3-month fixed)	-0.26	-0.33	-0.31	-0.16	0.22

¹ Underlying Domestic Demand is the sum of consumption, government and underlying investment spending. The latter excludes intangibles and transport related spending from total investment.

² Ireland's headline national account aggregates and their components have become significantly affected by the globalised activities of Irish resident multi-national enterprises. Consequently, GDP does not accurately measure the income flowing to Irish residents. GNI* along with corresponding adjusted presentations of the BOP/IIP provide more reliable and accurate estimates of the resources available to domestic residents and Ireland's international balance sheet. Nominal GNI* is estimated to have increased by 9.0 per cent and 3.0 per cent in 2016 and 2017, respectively.

³ The technical assumption made is that exchange rates remain unchanged over the forecast horizon. Oil prices and interest rates are assumed to move in line with the futures market. Euribor is the rate at which euro interbank term deposits are offered by one prime bank to another, within the euro area.

Comment

The Irish economy continues to grow at a strong pace supported by the buoyancy of domestic economic activity. The current phase of strong economic performance continues to be underpinned by robust and broad-based growth in employment, which is driving an increase in incomes and supporting the growth of consumer spending. In addition, growth in some key components of domestic investment has picked up strongly. Looking ahead, the Central Bank's central forecast⁴ is that underlying economic activity will grow at a relatively strong pace in 2018, with some moderation in growth in prospect in 2019 and 2020. However, material domestic and external risks to this forecast persist.

Abstracting from the ongoing volatility in the headline national accounts data arising from distortions to the trade and investment data, which continues to inflate both the level and growth rate of GDP, the underlying picture suggests that the growth of domestic economic activity gathered pace in the first half of 2018. Importantly, the current phase of strong economic performance has not been fuelled by unsustainable increases in domestic credit or net financial inflows. Instead, supported by strong and sustained employment growth and improving household balance sheets, growth in consumer spending has gained momentum. With regard to investment, while the headline measure remains volatile, the evidence suggests a marked acceleration in the growth of some important domestic components, particularly housing and non-residential construction.

Looking ahead, the central forecast remains positive. The main impetus to growth in coming years is expected to come from the projected strength of domestic demand, reflected in solid growth in consumer spending and underlying investment (which excludes the volatile categories of investment in intangibles and aircraft). The main driver of growth in underlying activity is projected to be continuing gains in employment and incomes. On the basis of evidence of continuing strength in the labour market, the projections for employment growth have been revised up since the last Bulletin, though, following a period of very strong increases, employment growth is expected to moderate in 2019 and 2020.

The more favourable labour market outlook supports an upward revision to the forecast for growth in underlying domestic demand, which reflects slightly stronger projections for both consumer spending and underlying investment in coming years. Reflecting this, underlying domestic demand is projected to grow by 5.6 per cent this year, moderating to 4.2 per cent in 2019 and 3.6 per cent in 2020.

The projections for the labour market continue to signal that the economy is moving towards full employment, although some extra capacity is possible through further inward migration and increased participation in the labour market. Nevertheless, under the central forecast, capacity is set to tighten further in coming years.

While the central forecast is favourable, there are material downside risks to these forecasts. On the domestic side, the main vulnerabilities continue to be related to the cyclical strength of the economy.

⁴ In relation to Brexit, the central forecasts have been prepared on the basis of a two-year transition period applying before any potential new post-Brexit trading relationship becomes operational.

While inflation remains subdued and wage growth is still relatively moderate, the strength of domestic demand and tightening labour market conditions highlight the need to guard against the risk of strong cyclical conditions giving rise to overheating dynamics. Looking ahead, and consistent with the outlook for the labour market, some further gradual increase in the growth of earnings is forecast in coming years, suggesting that wage pressures are projected to remain largely contained. However, as the economy move closer to full employment, the risk of overheating emerging remains.

On the external side, as has been the case for some time now, there are some clear downside risks facing the Irish economy. An unexpected tightening in international financial conditions or a downgrading of future global growth prospects, relative to the benign environment that has been in place for an extended period of time, could induce an international slowdown in investment and consumption. Shifts in international trade and tax regimes could adversely affect the Irish business model, while a disorderly Brexit would pose immediate challenges for the Irish economy and financial system. Risks related to corporation tax flows and the potential vulnerability of the Irish fiscal position to changes in international tax and trade policies are examined in Box C (page 33). With regard to Brexit, one scenario, which looks at the impact of the macroeconomic implications of the proposals contained in the UK Government White Paper, is examined in Box A (page 13). The results of this simulation show that while the decline in Irish economic activity based on the White Paper proposals is just over half as severe as in the WTO-scenario, a trading relationship along the lines of the White Paper proposals would still have a significant negative long-run impact on Irish output and employment.

Given this current configuration of risks, macro-financial risk management should have two aims. First, policy actions should not amplify pro-cyclical dynamics, if overheating risks in the economy and the financial system are to be contained. Second, macro-financial resilience is enhanced if buffers can be built during good times that will enable Ireland to cope more easily with future downside shocks. As a general rule, the running of budget surpluses during phases of strong economic performance is a pre-condition for the running of stabilising counter-cyclical deficits in the event of a future downturn. If fiscal buffers are not built up, there is a risk of repeating the historical patterns by which economic downturns have been amplified by pro-cyclical fiscal corrections. The current economic performance is very welcome - but it is important to be pro-active in mitigating pro-cyclical dynamics and building up buffers to limit the costs of future downturns.

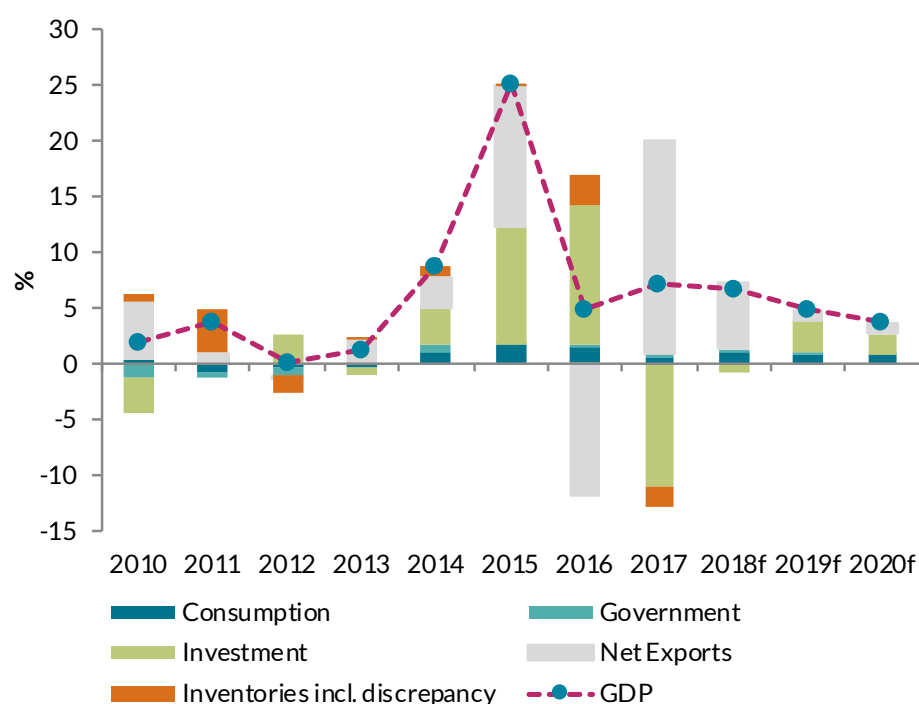
The Irish Economy

Overview

- The Irish economy grew strongly in the first half of the year underpinned by robust domestic demand and a strong net export performance. Reflecting the strength of the first half outturn, the prospects for growth in 2018 have improved markedly compared to the previous Quarterly Bulletin. Underlying domestic demand is forecast to increase by 5.6 per cent in 2018, moderating to growth of 4.2 per cent in 2019. This represents an upward revision to the outlook of 1.2 per cent for 2018 and 0.1 per cent for next year, reflecting the increased momentum in the domestic economy. These projections are in line with the forecast from the Central Bank's new domestic economic activity indicator (Box C, Quarterly Bulletin 3, 2018). As the economy approaches full employment and spare capacity diminishes, growth in underlying domestic demand is projected to moderate to 3.6 per cent in 2020.
- Forecast GDP growth, which continues to overstate underlying developments, is revised upwards by 2 percentage points to 6.7 per cent this year and by 0.4 of a percentage point to 4.8 per cent in 2019. These revisions reflect both the more positive outlook for underlying growth and a significant downward revision to the outlook for imports. GDP growth of 3.7 per cent in 2020 would be broadly in line with underlying developments.
- Growth in underlying domestic demand picked up strongly in the first half of the year reflecting increased momentum in consumer spending and a marked acceleration in underlying investment. Following a surprisingly muted outturn last year, consumer spending accelerated to 3.9 per cent, year-on-year, in the first half of 2018. This pick-up in consumption growth reflected the positive trend in disposable incomes and the strength of high frequency indicators such as retail sales and consumer confidence. The stronger first half outturn has prompted an upward revision in the forecast for consumption growth to 3 per cent this year. Forecast growth in consumer spending remains unchanged at 2.5 per cent in 2019, with a further moderation to 2.3 per cent forecast in 2020.
- There were contrasting trends in headline and underlying investment in the first half of the year. Headline investment dropped sharply due to a significant fall in intellectual property (IP) investment, while growth in underlying investment expenditure picked up strongly, reflecting continued strength in building and construction activity and a rebound in underlying machinery and equipment investment. In the construction sector, the recovery in both housing and non-residential building is forecast to continue, while projected growth in underlying machinery and equipment investment has been revised upwards. Overall, while headline investment is likely to decline this year due to the impact of lower IP investment, the outlook for underlying investment has strengthened. Underlying investment is forecast to increase by 16.4 per cent this year, by 11.2 per cent in 2019 and by 8.2 per cent in 2020.
- Exports increased by 8.8 per cent, in year-on-year terms, in the first half of this year reflecting a very strong trend in underlying goods exports and a more muted performance from services exports. Contract manufacturing activity, which boosted headline export growth in the second half of last year, has eased significantly in the first half of the year and is projected to have a neutral impact on headline export growth this year. For the year as a whole, export growth is now projected at 5.0 per cent in 2018 and 4.6 per cent in 2019, broadly in line with the outlook for world demand. Looking ahead to 2020, abstracting from any volatility that might arise from contract manufacturing, a more disruptive Brexit transition or increased protectionism in world trade, the outlook for growth in Ireland's main trading partners points to export growth of 3.8 per cent in volume terms.

- *Import volumes declined in year-on year terms in the first half of this year despite strong growth in both exports and final domestic demand. The weakness in overall import demand reflects a sharp decline in services imports, specifically imports of intellectual property assets, which offset modest growth in goods imports. As a result, projected import growth in 2018 has been revised downwards and this accounts for much of the upward revision to headline GDP growth for this year. The outlook for both domestic demand and export growth points to a recovery in import growth to 5.3 per cent and 4.1 per cent in 2019 and 2020, respectively.*
- *The strength of activity in the domestic economy is reflected in corresponding strength in the performance of the labour market. Employment growth averaged 3.1 per cent, year-on-year, in the first half of 2018. With labour supply growth also picking up, the pace of decline in unemployment has slowed but, at 5.8 per cent in the second quarter, the unemployment rate is over ten percentage points lower than its peak six years ago. For 2018 as a whole, with employment projected to grow more strongly than labour supply, the unemployment rate is projected to fall to an average rate of 5.6 per cent this year. Employment growth is set to moderate, with the unemployment rate projected to average 4.9 per cent next year and 4.7 per cent in 2020.*
- *Inflationary pressures remain well contained in the Irish economy despite the strength of domestic demand and tightening labour market conditions. While headline inflation, as measured by the Harmonised Index of consumer Prices (HICP) picked up to 0.9 per cent in August on foot of rising energy prices, the underlying rate, excluding energy remained close to zero. A gradual pick up in wage levels as the labour market approaches full employment should contribute to some pick-up in underlying inflation in 2019 and 2020 and a narrowing of the gap between the headline and underlying measures. Headline HICP inflation is projected to remain stable at 0.8 per cent in 2018 and 2019, rising marginally to 1.1 per cent in 2020.*
- *Risks to the outlook emanate from both domestic and external factors. On the domestic side, risks relate to the strength of domestic economic activity and the cyclically advanced state of the economy. On the external side, there are a number of risk factors, with uncertainty surrounding the terms of Brexit being the most prominent of these. One scenario, which looks at the impact of the macroeconomic implications of the UK Government Brexit White Paper, is examined in Box A below. The results of this simulation show that while the decline in Irish economic activity based on the White Paper proposals is smaller than in a WTO-scenario, a future trading relationship along the lines of the White Paper proposals would still have a significant negative long-run impact on Irish output and employment.*
- *Other external risks that have the potential to undermine Ireland's growth prospects include changes to international tax regimes that can have an impact on Foreign Direct Investment (FDI) decisions by multinational firms, disruptive movements in bilateral exchange rates and risks to the world trading architecture. The latter risk was highlighted by recent unilateral tariff increases by the US and retaliatory measures by its trading partners, including the EU, China and Canada.*

Figure 1: Contributions to GDP Growth



Source: CSO and Central Bank of Ireland

Box A: Macroeconomic Implications of the UK Government Brexit White Paper: A Preliminary Analysis

By Thomas Conefrey and Graeme Walsh

On 12 July 2018, the UK Government published a White Paper (WP) titled “*The Future Relationship between the United Kingdom and the European Union*”.^{5 6} The White Paper sets out the UK Government’s proposals for a future relationship with the EU. In previous research, the Central Bank has examined the possible macroeconomic implications for Ireland in the event that the post-Brexit trading relationship between the UK and the EU takes the form of a WTO-type agreement.^{7 8} In this Box, we outline some of the key elements of the White Paper and, drawing on analysis for the UK, examine the potential impact on the Irish economy in a scenario where the White Paper proposals define the EU-UK trading relationship after Brexit.

5 See: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/725288/The_future_relationship_between_the_United_Kingdom_and_the_European_Union.pdf

6 At the time of writing, a number of issues in relation to the feasibility of a future trading relationship based on the White Paper remain to be resolved between the EU and UK. Nevertheless, it is useful to consider the possible impact of a final Brexit agreement based on the main elements of the White Paper, in particular a future arrangement which involves free movement of goods but limited EU market access for UK services.

7 See “Modelling external Shocks in a Small Open Economy: the Case of Ireland”. Available at: <https://www.niesr.ac.uk/publications/modelling-external-shocks-small-open-economy-case-ireland>

8 See “Box B: The Impact of Brexit on the Short-term Outlook”, QB 3, 2016 <https://www.centralbank.ie/docs/default-source/publications/quarterly-bulletins/qb-archive/2016/qb3-16/gns-5-1-1-1-quarterly-bulletin-no-3-2016.pdf?sfvrsn=10> See

The White Paper outlines plans for future cooperation around three main pillars: economic partnership, security partnership and cross-cutting and other cooperation. Focussing on economic partnership, the White Paper contains a number of proposals which aim to provide the basis for a close economic relationship between the EU and UK. Some of the key elements, with particular relevance to Ireland-UK economic relations, include:

- **A Facilitated Customs Arrangement:** Under this plan, the UK and EU would become a “combined customs territory” for goods, in which the UK would apply the EU’s tariffs and trade policies for goods intended for the bloc, with domestic tariffs imposed for goods heading to the UK. The UK would commit to mirroring the EU’s customs rules and no quotas, tariffs or rules of origin restrictions would apply to UK-EU trade in goods. According to the White Paper, this facilitated customs arrangement would “preserve frictionless trade for the majority of UK goods trade and reduce frictions for UK exporters and importers”. Services would be excluded from the agreement, and the UK would pursue Free Trade Agreements (FTAs) with other countries.
- **A Common Rule Book for Free Trade in Goods:** To avoid checks at the border, including between Ireland and Northern Ireland, the UK would selectively apply EU regulation (by maintaining a “common rulebook”) for manufactured goods – excluding all regulations that could be checked remotely, and it would expedite declarations relying on technology.
- **Movement of People:** The White Paper states that free movement of labour between the EU and UK will end when the UK leaves. The document outlines a desire for a migration system that will allow continued immigration of the “brightest and the best” from EU countries.

Using a World Bank database of preferential trade agreements, the National Institute for Economic and Social Research (NIESR) in the UK has benchmarked the White Paper proposals against all existing trade agreements worldwide that were signed after 1957. The results of this exercise suggest that the trade intensity of the White Paper proposals is comparable to the current Canada or Switzerland agreements with the EU, but less comprehensive than a Norway-style EEA arrangement. According to NIESR, the White Paper proposals match closely the characteristics of a comprehensive FTA for goods. The shortfall in trade intensity relative to an EEA arrangement is explained by the WP proposals for services.

NIESR has simulated the effects of a deal as implied by the White Paper on the UK economy using the NiGEM model.⁹ To carry out the simulation, the following key assumptions are made. These are assumed to apply immediately after the end of a two-year transition period.

- **UK exports:** after the end of the transition period, financial services that require passporting rights will no longer be exported to the EU. Overall, the scenario assumes that trade between the EU and the UK is reduced by around 40 per cent in the long run relative to a soft-Brexit baseline, compared to a reduction of around 60 per cent in a WTO case.
- **Business investment:** the reduction in trade intensity and heightened uncertainty is assumed to reduce investment spending by UK firms. FDI is also assumed to be lower

⁹ See Box A “UK government Brexit White Paper” in National Institute Economic Review, August 2018. Available at: <http://journals.sagepub.com/doi/pdf/10.1177/002795011824500104>.

compared to a soft-Brexit baseline. The reduction in FDI of 12 per cent is around half the decline assumed in the case of a WTO-style deal.

- **Migration:** To take account of a more restrictive migration system after Brexit, as well as a potential decline in the attractiveness of the UK for migrants, the WP-Brexit scenario assumes a reduction in net migration of around 50,000 per annum compared to the UK Office for National Statistics' (ONS) principal population projection. The resulting path for the population is roughly half way between the ONS' principal and low migration projections.
- **Fiscal:** After the current EU budgetary framework ends in 2020, it is assumed that the UK continues to service existing commitments and makes a negligible ongoing contribution. As outlined in the Phase 1 Agreement with the EU, the UK is also due to make a financial settlement with the EU of £35-£39 billion, although the schedule of payments has yet to be decided. Overall the scenario assumes the UK's net annual contributions to the EU budget reduce by approximately 25 per cent.

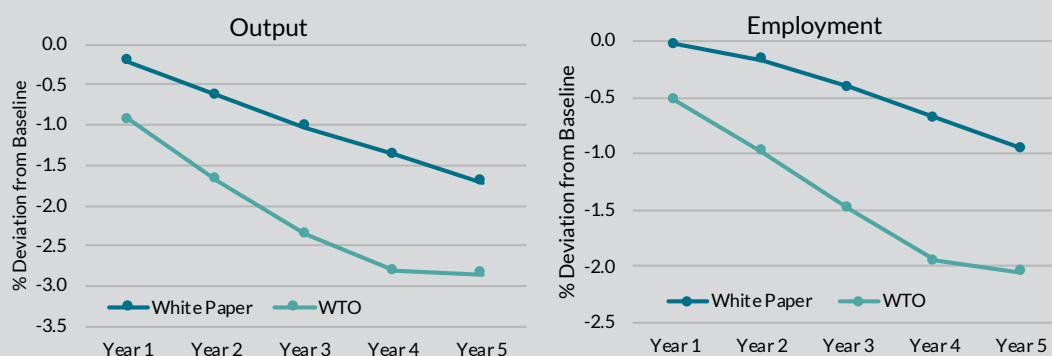
Before tracing out the potential implications of these shocks on the UK economy and on Ireland, it is important to point out a number of limitations to the analysis. Since the UK is the first country to leave the EU, there is no precedent for gauging the potential economic impact of this event. While the White Paper proposals provide the basis of the UK's current negotiating position with the EU, the precise nature of the future EU-UK trading relationship has yet to be determined, and the UK's level of engagement with the EU in trade could be more or less than envisaged in the current WP proposals. In terms of the specific modelling assumptions used in this scenario, these are based on a synthesis of the available academic evidence on the effect of membership of a free trade area on exports and FDI. At the same time, there is a degree of judgement involved in calibrating the size of the four shocks above. In addition, it is important to note that model-based assessments of the implications of Brexit for both the UK and Ireland are highly uncertain and the models capture only some of the likely consequences for key variables such as trade, investment, financial markets, and the labour market. The scenario we examine does not take into account any potential benefits to Ireland from the diversion of UK FDI or the re-location of high-skilled workers to Ireland. Despite these limitations, the scenario analysis is useful in illustrating the channels through which a Brexit shock would affect the economy, as well as providing an indication as to the potential long-run macroeconomic effects of possible future Brexit outcomes.

With these caveats in mind and using the assumptions above, NIESR examine the impact on the UK economy of a White Paper Brexit deal relative to a baseline scenario where the UK maintains a close trading relationship with the EU. As a result of the immediate reduction in market access for services, overall output and activity would be reduced. A depreciation of sterling would help to moderate the decline in UK exports but would raise import prices which result in higher consumer price inflation. The reduction in UK households' purchasing power would lower consumption and overall domestic demand by around 3.8 per cent. Combining the direct effect of the sterling depreciation – which make imports to the UK more expensive – along with the reduced demand from UK firms and households, overall UK import volumes would be almost 11 per cent lower after five years (Table 1).

Box A Table 1: Effect on Key External Variables in WP Brexit Scenario, % Deviation from Baseline (levels)

	Year 1	Year 2	Year 3	Year 4	Year 5
UK GDP	-0.4	-0.8	-1.0	-1.1	-1.2
UK Imports	-3.4	-7.5	-9.1	-10.1	-11.0
UK Domestic Demand	-1.4	-2.9	-3.5	-3.7	-3.8
Euro Area GDP	0.0	-0.1	-0.1	-0.1	-0.1

Source: Own calculations based on NiGEM.

Box A Figure 1: Effect of WP and WTO Brexit Scenarios on Irish GDP and Employment, % Deviation from Baseline

Source: Own calculations based on COSMO.

Notes: Chart shows the deviation in the level of GDP from the baseline in a WTO Brexit scenario and in a scenario based on the UK's White Paper proposals.

To examine the potential impact of this scenario on the Irish economy, we take these results for the UK from NIESR and feed them through the Central Bank's macroeconomic model called COSMO.¹⁰ The negative effect of the Brexit shock is transmitted to the Irish economy predominately through the trade channel. The projected reduction in import volumes from the UK and other EU countries would result in a significant decline in the level of external demand for Irish exports. Lower external demand (mainly from the UK, but also from other EU countries) would reduce output and exports in the tradable sector of the Irish economy. In turn, this would lead to lower investment spending by firms which would reduce output in the non-traded sector. Lower economic activity would lead to a fall in employment of around 1 per cent (Figure 1) and would cause the unemployment rate to rise.

¹⁰ COSMO was developed by the Central Bank of Ireland and the Economic and Social Research Institute (ESRI) as part of a joint modelling project that ran from 2013–15. The Central Bank of Ireland's version of the COSMO model – used for this paper – may contain some differences compared to the ESRI version.

Overall, the simulations suggest that in the event of a Brexit agreement implied by the White Paper proposals, the level of Irish GDP would be around 1.7 per cent lower in the long run compared to a soft-Brexit baseline.¹¹

As shown in Figure 1, the decline in Irish GDP based on the WP proposals (1.7 per cent) is smaller than the estimated fall in a WTO scenario (2.9 per cent). Nevertheless, the simulation suggests that a future trading relationship along the lines of the WP proposals would have a significant negative long-run impact on Irish output and employment. This is because, while the White Paper marks an improvement relative to a WTO-type agreement, it still implies a significant curtailment in the UK's market access to the EU, when compared to the full access for both goods and services which it currently enjoys. In considering the simulation results, it is important to note that these do not fully take into account possible disruption in financial markets which could arise due to Brexit, including effects on bond and equity markets, or additional currency movements beyond those captured in the models. If such disruption materialised, the impact of Brexit on the Irish economy could be more severe than shown in the results presented in this Box.

Box B: The International Economic Outlook

By Monetary Policy Division

Global economic activity is still growing at above-trend rates, but downside risks have increased. In emerging markets, growth has softened and financial conditions have tightened further, in some cases considerably. Recently announced measures by the United States and China threaten to increase protectionism and negatively affect global growth. The July update of the World Economic Outlook by the IMF confirms previous projections, with global growth reaching 3.9 per cent this year and next, but the expansion is becoming less even, and negative risks to the outlook are assessed to be more prominent.

Euro area economic activity remains solid overall, although growth has moderated from the very high levels registered in 2017, with GDP growing by 0.4 per cent on a quarterly basis and by 2.1 per cent on an annual basis in the second quarter of 2018. Monetary policy remains accommodative and is underpinning domestic demand; with private consumption being supported by ongoing employment gains and rising wages; business investment fostered by favourable financing conditions, rising corporate profitability and solid demand, while housing investment remains robust, and exports are supported by the continued expansion in global activity.

The ECB staff macroeconomic projections released in September broadly reflect this assessment, projecting euro area GDP to increase by 2 per cent in 2018, 1.8 per cent in 2019, and 1.7 per cent in 2020 (slightly revised down for 2018 and 2019 compared with the June projections). While the risks surrounding the growth outlook are still assessed as broadly balanced, risks relating to rising protectionism, vulnerabilities in emerging markets and financial market volatility have gained more prominence recently.

Sentiment indicators for the euro area economy remain expansionary. The Markit PMI Composite Output Index posted 54.2 in September (flash reading), down from 54.5 in August. Rising activity

¹¹ The result that the estimated fall in Irish GDP is similar to the fall in UK GDP is consistent with previous studies on the effect of different Brexit scenarios on the Irish economy by the ESRI and the European Parliament. The result arises in part as Brexit produces negative shocks to both external demand (from lower imports in key trading partners) and Ireland's relative competitiveness (due to the depreciation of sterling).

has now been registered continuously for over five years, although values in recent months remain well below those seen around the turn of the year. At the same time, both the economic sentiment indicator and the business climate indicator by the European Commission decreased slightly in August, by 0.5 points to 111.6 and by 0.08 points to 1.22 respectively. The flash estimate of the consumer confidence indicator decreased in September by 1 point to -2.9.

Euro area annual HICP inflation was 2.0 per cent in August 2018, down from 2.1 per cent in July. Energy prices have driven the pickup in headline inflation seen in recent months, while measures of underlying inflation have remained broadly stable, but subdued overall. HICP excluding energy and unprocessed food increased by 1.2 per cent in August, down from 1.3 per cent in July. The September projections foresee annual HICP inflation at 1.7 per cent in 2018, in 2019 and in 2020 (unchanged compared with the June forecast). The energy component is expected to decline over the forecast horizon, offset by gradually rising underlying inflation as supply constraints become increasingly binding.

In September, the Governing Council of the ECB decided to leave the monetary policy stance unchanged, and confirmed the end of the net asset purchase programme (APP) in December 2018 – unless incoming data does not confirm the current medium-term inflation outlook. Forward guidance on the key ECB interest rates was also confirmed, with rates being expected to remain at their present levels at least through the summer of 2019, and in any case for as long as necessary to ensure that inflation remains aligned with a sustained adjustment path.

Turning to the United States, economic activity has been rising at a strong rate, with real GDP increasing by 1 per cent on a quarterly basis and by 2.9 per cent on an annual basis during the second quarter of 2018. Risks to the economic outlook appear roughly balanced. The labour market has continued to strengthen, with strong job gains and unemployment remaining low. Annual headline inflation and inflation excluding energy and food have remained near 2 per cent.

The US Federal Open Market Committee (FOMC) decided to maintain the target range for the federal funds rate unchanged at 1.75 to 2 per cent at its July/August meeting. The FOMC expects that further gradual increases in the federal funds rate will be consistent with a sustained expansion of economic activity, strong labour market conditions, and inflation near the 2 per cent objective over the medium term.

In the United Kingdom, GDP grew by 0.4 per cent on a quarterly basis in the second quarter of 2018; looking forward, the Bank of England's most recent projections confirm an average GDP growth rate of around 1.75 per cent on an annual basis over the forecast horizon. The labour market has continued to tighten, with the unemployment rate falling to 4.0 per cent and the number of vacancies rising further. Wages have risen further to around 3 per cent on a yearly basis.

After raising the Bank Rate to 0.75 per cent in August, the Bank of England's Monetary Policy Committee voted unanimously, at its September meeting, to leave the interest rate and the stock of bond purchases unchanged. CPI inflation is expected to remain slightly above 2 per cent through the forecast period but external cost pressures, which have mainly contributed to above-target inflation since the beginning of 2017, are projected to ease further. Consequently, CPI inflation is expected to reach the target at the end of the forecast period.

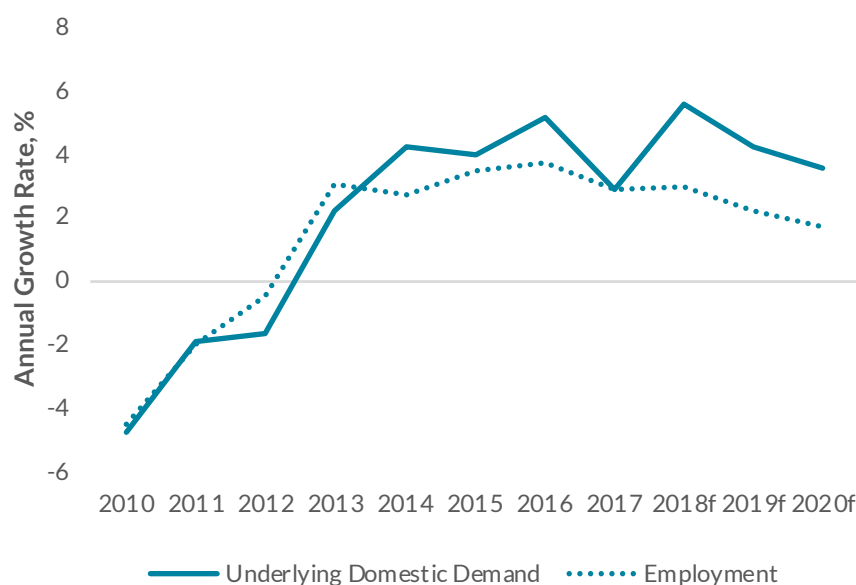
Demand

Overview

The outlook for domestic spending remains robust with both consumption and investment expenditures expected to grow solidly. The Bank's adjusted measure of demand – underlying domestic demand – which removes a number of the volatile investment components, is forecast to grow by 5.6 per cent this year, by 4.2 per cent in 2019 and by 3.6 per cent in 2020. Underlying domestic demand is highly correlated with employment and gives a better sense of real economic activity carried out in Ireland (Figure 2).

Domestic Demand Overview

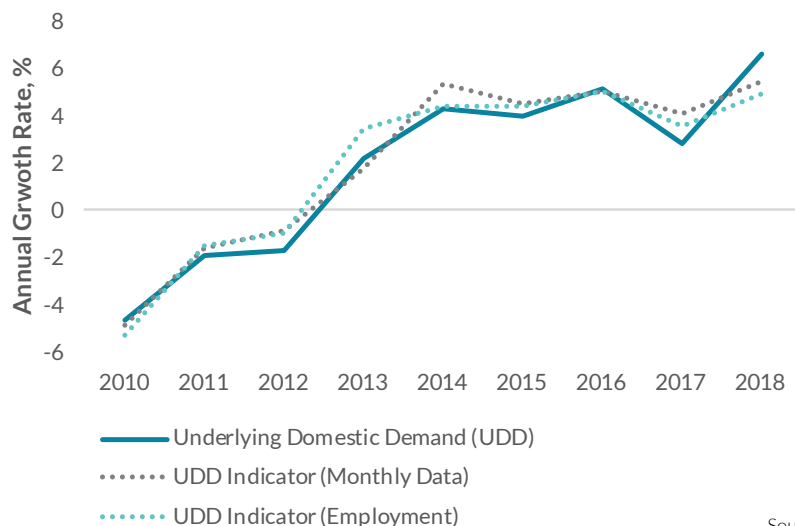
Figure 2: Domestic Demand and Employment



Source: CSO and Central Bank of Ireland.

In addition to the underlying domestic demand measure, the Bank has also developed a new domestic economic activity indicator using a large panel of carefully selected high-frequency data. This indicator (documented in the previous *Quarterly Bulletin*) is designed to capture trends in underlying domestic economic activity – that is, activity that has an impact on the employment and incomes of Irish residents. Figure 3 shows a plot of the growth in underlying domestic demand based on *National Accounts* data and the estimates for underlying domestic demand derived from the new indicator. For 2018, the model suggests that demand is somewhat weaker than suggested by the headline national accounts data, reversing the pattern observed in 2017. Based on the most recent data, the indicator implies that underlying domestic demand is set to grow by 5.5 per cent in 2018.

Figure 3: Underlying Domestic Demand and Indicator



Source: CSO and Central Bank of Ireland.

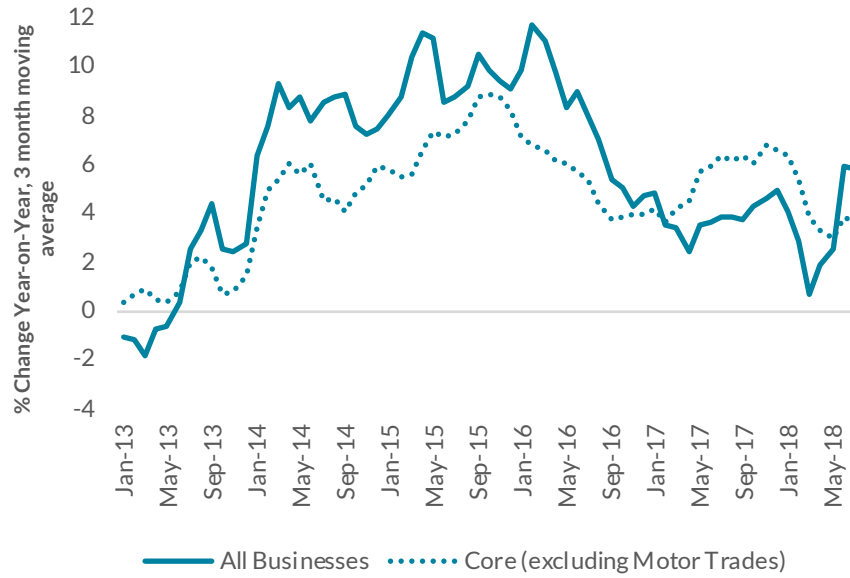
Consumption

Personal consumption expenditure is forecast to grow by 3 per cent this year, 2.5 per cent in 2019 and 2.3 per cent in 2020. The outlook for 2018 was revised upwards since the last *Bulletin* reflecting recent data releases. In particular, *Quarterly National Accounts* (QNA) data for the second quarter were stronger than expected following relatively subdued consumption data in 2017.

In the second quarter, personal consumption grew by 1.5 per cent quarter-on-quarter, with strong contributions from services and goods- related components. This, coupled with the first quarter outturn, means that consumer spending grew by 3.6 per cent in the first half of 2018 and appears to have significant momentum heading into the third quarter of the year. More recent consumption data from the retail sales index points to solid spending in the year to July with the overall index up 3.5 per cent in real terms (Figure 4).¹²

¹² Core retail sales (i.e. sales excluding motor trades) grew by 3.7 per cent over the same period.

Figure 4: Index of Volume of Retail Sales



Source: CSO and Central Bank of Ireland.

Table 1: Expenditure on Gross National Product 2017 to 2020^f[illegible]

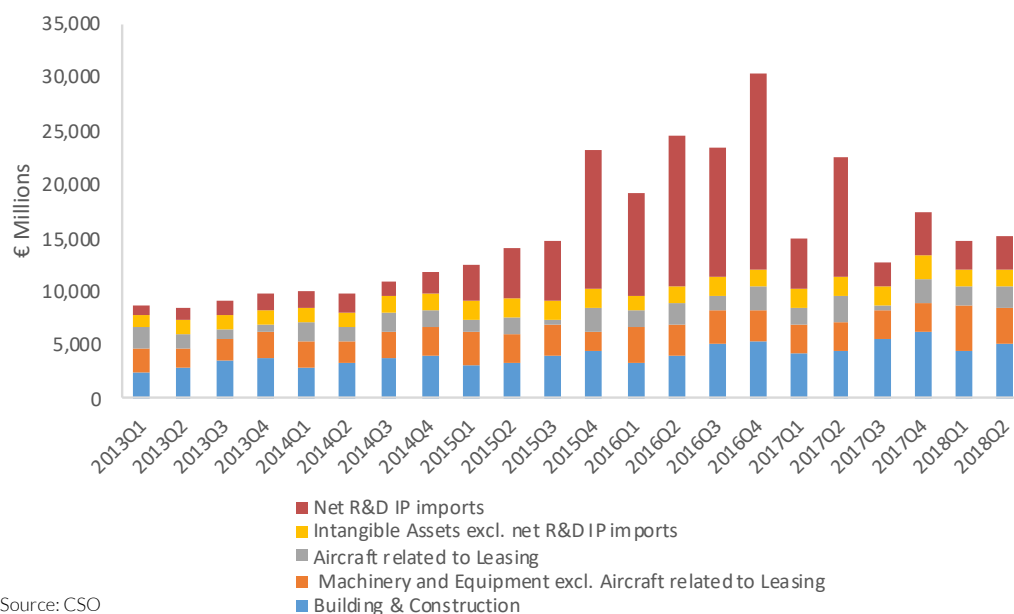
Investment

Continuing the decline in 2017, headline investment fell by almost 20 per cent in the first half of 2018. The decrease, however, was primarily due to a fall in intangible investment spending relating to the transfer of ownership of intellectual property by multinational firms based here. Abstracting from this, underlying investment, which excludes intangible investment and investment by the aircraft sector, increased by a robust 20 per cent in the first half of 2018 (Figure 5). It was underpinned by strong growth of 11.6 per cent in building and construction and by a continued rebound in machinery and equipment investment (excluding aircraft investment). Within the building component, new dwelling investment continued its acceleration – increasing by 32 per cent in the first half of 2018 compared to the previous year, while non-residential investment increased by 10 per cent year-on-year. In contrast, intangible investment fell by 54 per cent in the first half of 2018 compared to the same period in 2017.

With regard to residential investment, available indicators point to an acceleration in housing output, but from a low base. Based on new estimates from the CSO, there were almost 8,000 new dwellings completed in the first half of 2018. Forward-looking indicators suggest that 19,000 new dwellings will be completed this year, increasing to 24,000 in 2019 and 28,500 in 2020. Coupled with forecasts for home improvements – which have displayed weakness in the first-half of 2018 – residential investment is expected to increase by 15.3 per cent this year, 17.8 per cent in 2019 and by 14.4 per cent in 2020.

For the non-residential sector, activity is forecast to increase by 10 per cent in both 2018 and 2019, moderating to 8 per cent growth in 2020. The robust pace of expansion in the construction sector is corroborated by survey data from the Ulster Bank Construction PMI. Overall, building and construction investment is forecast to increase by about 12 per cent in both 2018 and 2019 and by 9.4 per cent in 2020.

The recovery of machinery and equipment investment has continued, with underlying (excluding aircraft investment) machinery and equipment investment increasing by 40 per cent in the first half of 2018 year-on-year. Reflecting the significant rebound from unusual weakness last year, we expect underlying machinery and equipment investment to increase by 25 per cent this year, moderating to 8 per cent growth in 2019 and 5 per cent growth in 2020. Bearing in mind prospects for all components of investment, underlying investment is forecast to increase by 16.4 per cent this year, moderating to 10.7 per cent and 8.2 per cent growth in 2019 and 2020, respectively. This is an upward adjustment of almost 5 percentage points for 2018 compared to the previous Quarterly Bulletin.

Figure 5: Gross Fixed Capital Formation (constant prices)

Government Consumption

Government consumption is projected to grow by 3.5 per cent in 2018, 2.0 per cent in 2019 and 1.8 per cent in 2020. This forecast builds on strong increases in government spending over the past year, evident in both the QNA and in monthly Exchequer data (see below) as well as spending plans set out in recent government publications. In the second quarter of the year, public consumption in the QNA grew 4.2 per cent year-on-year bringing the mid-year growth rate to 3.9 per cent.

External Demand and Balance of Payments

Exports and Imports

Net exports continued to contribute strongly to overall GDP growth in the second quarter of 2018, continuing the trend seen throughout 2017, with solid export growth contrasting with a subdued import performance. On the domestic side, merchandise goods exports grew by 14.2 per cent in the second quarter of 2018 compared with the same quarter in 2017, reflecting strong annual growth in exports to the United States and continental Europe in the first half of the year. Annual growth in exports to the United Kingdom slowed over the same period. At a sectoral level, increases in merchandise exports over the past number of months have been driven by increases in the exports of medical and pharmaceutical products.

Services trade growth in the first half of the year was below historical averages, though still positive. The weakness was predominantly driven by a decline in the exports of business services, in particular there was a decline in exports of research and development and operational leasing services compared with the previous year.

While overall exports have performed strongly in the first half of the year, fully disentangling the impact of globalisation in the data remains challenging. To shed more light on this, the CSO have recently provided data on contract manufacturing at a quarterly frequency back to 2017. While the time span of

the data is currently short, it shows that this component of overall exports displays significant volatility, most likely driven by firm-specific decisions about how they manage their supply chains.

The outlook for exports will depend both on the strength of underlying exports and the volatile contract manufacturing component. While growth in contract manufacturing exports was robust in the second half of last year, this does not appear to have continued into the first half of 2018 and it is expected that contract manufacturing will make a neutral contribution to export growth in 2018.

Looking further ahead, conditional on the latest available data for world demand, exports are expected to continue to make a strongly positive contribution to growth in the coming years. The most recent assumptions for weighted demand in trading partner countries is broadly unchanged for 2019 relative to previous estimates. Furthermore, the new export orders index of the Manufacturing and Services Purchasing Managers Indices (PMI) have continued to exceed long run averages. Reflecting the combination of these factors, the outlook for exports is broadly unchanged relative to the previous Quarterly Bulletin - export volumes are expected to rise by 5 per cent this year, followed by 4.6 per cent in 2019 and 3.8 per cent in 2020.

The decline in imports observed throughout 2017 has continued into the first half of 2018, albeit at more modest rates. Overall import volumes fell 6.7 per cent, year-on-year, in the second quarter of 2018, due solely to a services import volume decline. A buoyant goods import performance, with an annual increase of 3.9 per cent, may relate to high levels of exporting activity. Services import volumes fell by 10.9 per cent annually in the second quarter of 2018, which may be largely attributed to the business services sector and specifically research and development.

Looking ahead, the main drivers of import growth seem set to remain strong, albeit easing somewhat during the course of 2019 and 2020, as both domestic demand and export growth are expected to slow. As a result, overall import volumes are projected to increase by 5.3 per cent next year and 4.1 per cent in 2020. While the projected profile of imports will reflect the final demand outlook as well as its composition, considerable uncertainty surrounds the short-term outlook given the importance of IP imports and how these will evolve, particularly in view of the pronounced weakness in 2017.

Table 2: Goods and Services Trade 2017 to 2020^f

	2017 € millions	% change in volume	% change in price	2018 ^f € millions	% change in volume	% change in price	2019 ^f € millions	% change in volume	% change in price	2020 ^f € millions
Exports	352,556	5.0	0.7	372,577	4.6	1.1	394,051	3.8	1.0	413,138
Goods	192,854	3.4	-0.4	198,613	3.3	0.3	205,783	2.5	0.0	210,928
Services	159,701	6.9	1.9	173,964	6.1	2.0	188,267	5.3	2.0	202,210
Imports	263,268	0.0	0.2	263,745	5.3	1.0	280,621	4.1	1.3	295,859
Goods	85,214	2.4	-1.1	86,334	4.2	1.0	90,827	4.1	0.1	94,608
Services	178,054	-1.2	0.8	177,411	5.9	1.0	189,794	4.1	1.9	201,250

Net Trade, Factor Incomes and International Transfers

Reflecting the distorting impact of globalisation on the headline data, the overall current account balance showed a surplus of over €10 billion, or 13.3 per cent of GDP in the second quarter of 2018. The trade balance, a measure of all goods and services exports minus all goods and services imports, increased by €13 billion, or 94 per cent in annual terms in the second quarter of 2018.

The strong merchandise surplus in the second quarter was partially offset by a deficit on the services side, as described above, and the income side. Investment income earned abroad in the second quarter increased by 14 per cent compared with a year earlier while investment income payable to foreign investors increased by 7.5 per cent driven by an increase in FDI income outflows. Combined, these factors yielded a deficit on the income account of €16.8 billion.

Much of the current account surplus however relates to the depreciation of foreign owned domestic capital, as well as the retained earnings of firms that are owned by foreign portfolio investors. To take account of this, the CSO publish (on an annual basis) a modified measure of the current account which excludes these distortionary effects, as well as the effect of the depreciation of aircraft owned by leasing firms. In 2017, the modified current account surplus was 1.2 per cent of GNI*.

Taking account of the trade forecasts outlined above, the trade balance is projected to average close to 29 per cent of GDP in 2018 and 2019. Net factor income outflows are expected to increase in 2018, with a further pick-up envisaged in 2019, albeit more modest. Reflecting the prospective trends across these components, a headline current account surplus of around 11.5 per cent of GDP is estimated for 2018, followed by a narrowing to 10.5 per cent of GDP in 2019, and 9.8 per cent in 2020.

Table 3: Balance of Payments 2017 to 2020^f

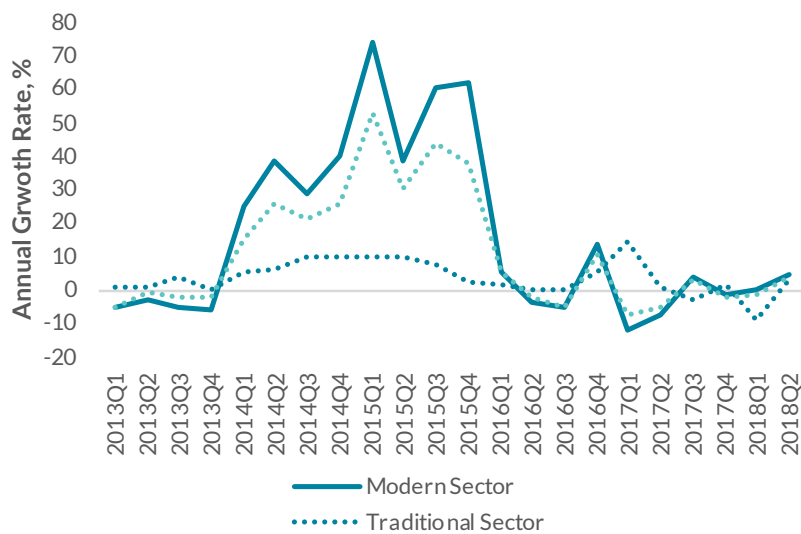
	2017	2018 ^f	2019 ^f	2020 ^f
Trade Balance	89,287	108,832	113,428	117,278
<i>Goods</i>	107,640	109,279	110,186	110,051
<i>Services</i>	-18,353	-446	3,244	7,229
Net Factor Income from the Rest of The World	-59,777	-67,330	-72,958	-77,323
Current International Transfers	-4,590	-4,590	-4,590	-4,590
Balance on Current Account	24,920	36,912	35,880	35,365
(% of GDP)	8.5	11.5	10.5	9.8

Supply

The QNA for the first two quarters of 2018 show strong growth on the output side. In services, the largest growth was seen in the *Information and Communication* sector, where output expanded by 32.8 per cent relative to the first half of 2017. *Financial and Insurance Activities* grew by 7.1 per cent, and *Public Administration, Education and Health*, grew by 5 per cent. *Construction* continued its strong growth, expanding by 11 per cent in H1 2018. *Agriculture, Forestry, and Fishing* was the only sector to show a large decline, with output contracting by 7.1 per cent relative to the same period last year.

Industrial Production data show that total industrial output rose by 0.4 per cent in January to July relative to that period last year. This series is volatile due to the activities of multinational companies, so it is useful to look at the *Modern* and *Traditional* sectors separately. Output in the *Modern* sector expanded by 0.8 per cent relative to the first seven months of 2017, while the traditional sector contracted by 1.6 per cent. The *Modern* sector contains high value added goods like Chemicals, Pharmaceuticals, and Electronics, so it is interesting to note that when these are taken out we see a fall in industrial output growth. Growth in the *Modern*, *Traditional*, and *Manufacturing* sectors is shown in Figure 6.

Figure 6: Volume of Industrial Production



Source: CSO

The Labour Market

The labour market continues to perform extremely well with robust gains in employment. For 2018 as a whole, employment growth of 3.0 per cent is projected, with the pace of employment growth expected to moderate to 2.2 per cent and 1.7 per cent, respectively, in 2019 and 2020. These projections point to an additional 154,000 jobs over the forecast horizon with a new peak employment level of 2.35 million expected in 2020. Annual labour force growth is forecast to pick up notably this year to 1.8 per cent followed by growth of 1.5 per cent in both 2019 and 2020. Taking account of the forecasts for employment and the labour force, numbers unemployed are projected to decline further with an annual average unemployment rate of 5.6 per cent this year falling to 4.9 per cent in 2019 and 4.7 per cent in 2020.

The latest data from the **Labour Force Survey (LFS)** indicate that there were an additional 68,200 persons at work in the first half of 2018 relative to the same period in 2017. As has been the case for some time, the gains were broad based with employment growing strongly in many of the services sectors (principally accommodation, food, administration, education and healthcare), while there was also a large rise in employment in the construction sector (up 17,000) over the year. This brought the number of persons at work to 2.26 million in the second quarter, a new peak level for the Irish economy.

Following a relatively protracted period of weaker growth, the labour force is now growing strongly, with average annual growth of 1.9 per cent in the first half of 2018. This reflects stronger contributions from demographic factors (including net inward migration) and participation. In the year to the second quarter, the former added 27,200 persons to the labour force with the latter adding 30,700. In terms of demographics, the latest **LFS** takes account of the CSO's new population and migration estimates (published in August 2018). These show that net migration increased to 34,000 over the past year (from 19,800 in 2017). There was also a notable pick-up (0.5 percentage points) in the labour force participation rate to 62.3 per cent in the second quarter, driven predominantly by increased female participation.

The seasonally adjusted unemployment rate measured 5.8 per cent in the second quarter (down marginally on the first quarter). As a result, there were 139,300 persons unemployed at the mid-point of the year, with about one third of these classified as long-term unemployed. The long-term unemployment rate has continued to fall rapidly and was just 2.0 per cent in the second quarter, down from a peak of 9.7 per cent in 2012.

Pay

In light of labour market prospects, wage pressures are expected to build over the forecast horizon. Economy-wide compensation (which reflects the growth of employment, hours worked and earnings) is forecast to increase by 5.9 per cent this year, by 5.6 per cent in 2019 and by 5.1 per cent in 2020. Within this aggregate, the balance between wages and employment is likely to be increasingly driven by the former as the economy converges on full employment. Compensation per employee is forecast to increase by 2.8 per cent in 2018, rising to 3.3 per cent in 2019 and 3.4 per cent in 2020. With consumer price inflation projected to remain subdued (see below), this points to the prospect of further significant gains in terms of real purchasing power.

The most recent earnings data point to some increase in wage inflation. The CSO's *Earnings Hours and Employment survey* reported a 2.6 per cent rise in hourly earnings in the first half of 2018. While sectoral results were mixed, there were notable increases in finance and insurance, professional services, education and real estate services.

Table 4: Employment, Labour Force and Unemployment 2017 to 2020^f

	2017	2018 ^f	2019 ^f	2020 ^f
Agriculture	110	105	105	105
Industry (including construction)	412	424	440	455
Services	1,672	1,730	1,765	1,789
Total Employment	2,194	2,260	2,310	2,349
Employment Growth (%)	2.9	3.0	2.2	1.7
Labour Force	2,352	2,393	2,429	2,465
Labour Force (%)	1.1	1.8	1.5	1.5
Unemployment	158	134	119	117
Unemployment Rate (%)	6.7	5.6	4.9	4.7

Note: Figures may not sum due to rounding

Inflation

Prices

HICP inflation registered a year-on-year increase of 0.9 per cent in August 2018. Within this, goods price inflation recorded its third successive month of year-on-year increases, after a five year run in negative territory. The turnaround was largely driven by the energy component of the HICP, as increases in international oil prices passed through to energy products, such as the price of petrol and home heating oil. Services prices moderated slightly as increases in rents and hotel accommodation were offset partially by falls in insurance and airfares (see Figure 7). Despite the strength of domestic activity, overall underlying inflationary pressures remain subdued. The Core HICP Index – HICP excluding the energy component – decreased by 0.1 per cent in August year-on-year.

The weakness of goods price inflation has remained a puzzle over the last number of years. Lower import costs are a major factor. While the euro/sterling exchange rate was 1.5 per cent lower year-on-year in August 2018, and the euro/dollar was 2.2 per cent lower year-on-year, the previous strength of the euro continues to hold down the price of goods with a high import content (Figure 8). There may also be some downward bias related to quality adjustment in the measurement of some goods as shown in previous work.¹³

External cost pressures, external cost pressures have increased since the time of the last Bulletin. Oil prices, both in terms of current spot rates and financial market expectations proxied by futures prices, have increased, albeit marginally. A continued upward trend could lead to further upward pressure in goods price inflation. Domestically generated inflation is, linked in, conditional on the pace of wage growth. With wage growth projected to pick up, it is expected that services inflation will continue to rise over the forecast horizon.

Conditional on the market implied path for oil prices, exchange rates as well as the Bank's own projections for growth in real activity, inflation is projected to pick up moderately this year and next. Current assumptions point to a forecast of 0.8 per cent for HICP inflation in 2018 and 2019. Goods prices are projected to decline by 0.3 and 1.1 per cent in 2018 and 2019, respectively; the more moderate decline in 2018 is due to the rise in energy prices. Services prices, meanwhile, are projected to rise by 1.9 and 2.5 per cent over the same period. The outlook for 2020 is for a pick-up in HICP inflation to 1.1 per cent.

Uncertainty surrounding the forecast primarily relates to external factors. For example, developments in the negotiations surrounding the UK's exit from the European Union may result in a deviation in the path for the Euro/Sterling exchange rate away from that which is assumed in the current forecast.

¹³ Box E: Why are prices for some consumer goods falling in Ireland? QB3 2018, <https://www.centralbank.ie/docs/default-source/publications/quarterly-bulletins/qb-archive/2018/quarterly-bulletin---q3-2018.pdf?sfvrsn=10>

Figure 7: Consumer Prices by Commodity

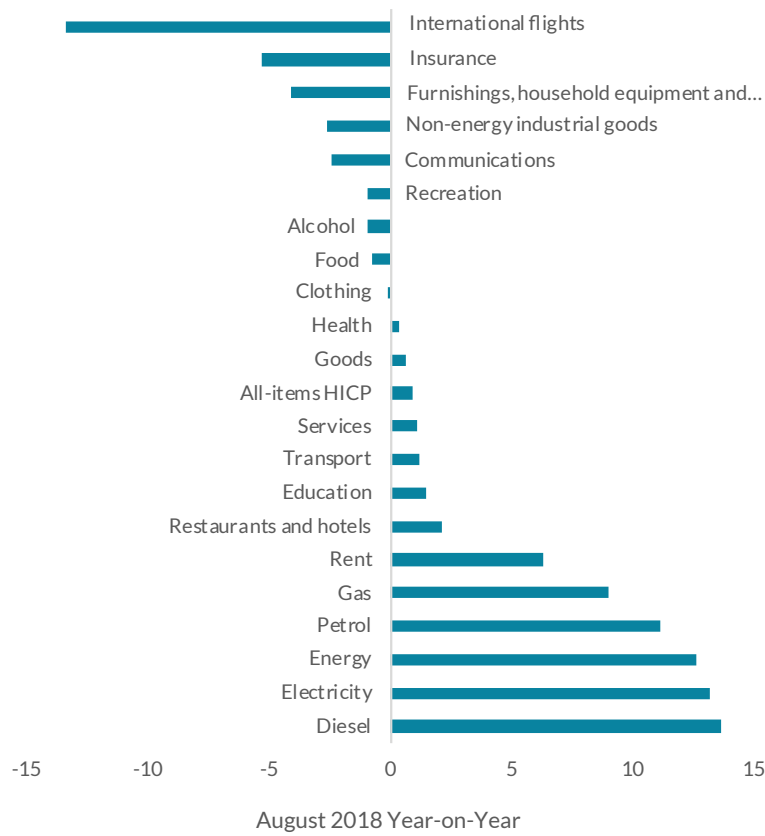


Figure 8: Irish Inflation and Exchange Rate Changes

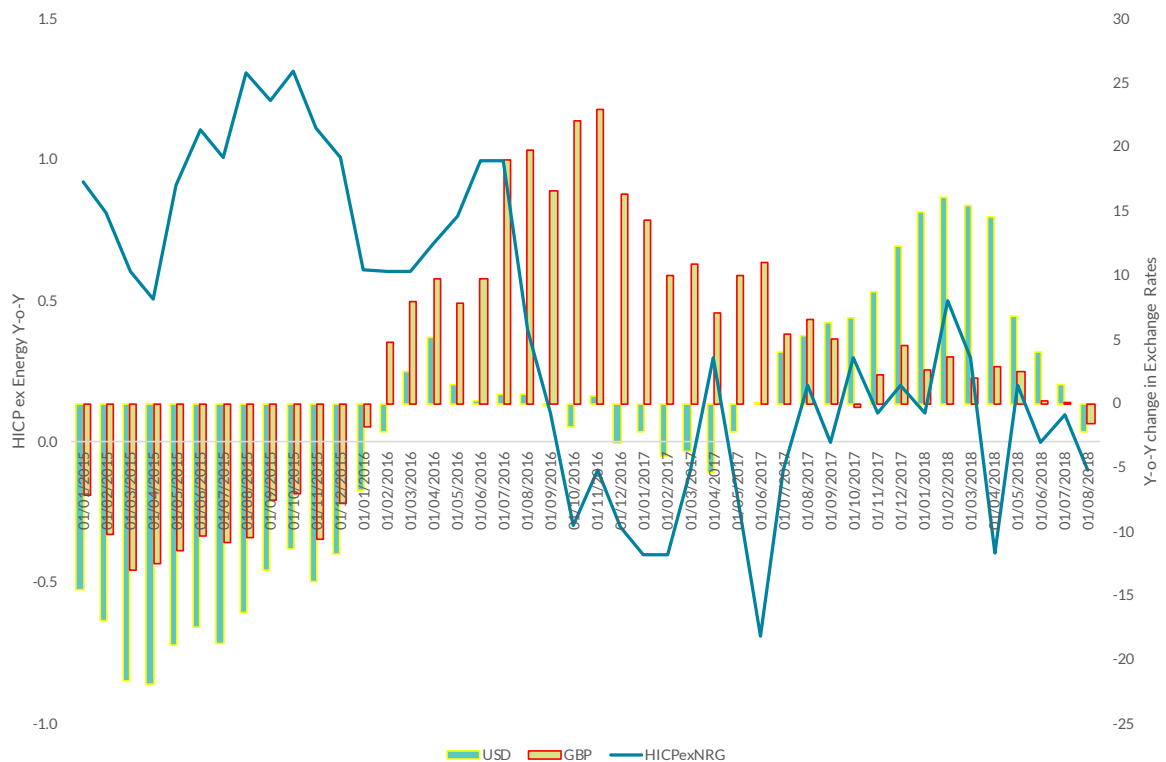


Table 5: Inflation Measures - Annual Averages, 2017 to 2020^f

Measure	HICP	HICP excluding Energy	Services ^a	Goods ^a	CPI
2017	0.3	-0.1	2.5	-2.1	0.3
2018 ^f	0.8	0.2	1.9	-0.3	0.6
2019 ^f	0.8	0.6	2.5	-1.1	0.9
2020 ^f	1.1	1.4	3.1	-1.2	1.0

^a Goods and services inflation refers to the HICP goods and services components

Residential Property

The CSO's Residential Property Price Index for July shows an increase of 10.4 per cent in the last 12 months. The annual rate of price growth has been slowing every month since March, and is currently at its lowest level since April 2017. When broken down into Dublin and non-Dublin regions, the data points to annual increases of 7.2 per cent and 13.7 per cent, respectively, with price growth faster outside of Dublin since mid-2014. On a regional basis, the biggest price increases over the past year have been seen in the mid-West, where house prices rose by 23.7 per cent in the year to July. The national residential price index remains 18.8 per cent below the pre-crisis peak in April 2017. Dublin residential property prices are 21.8 per cent lower than their peak, while residential property prices outside of Dublin remain 23.1 per cent below their peak.

Turning to the rental market, the latest Daft.ie report shows continued increases in rents to Q2 2018. In July, the annual rate of increase in rents throughout Ireland was 12.4 per cent. This can be broken down into city rents, which are up 13 per cent, and non-city rents, which have risen by 10.4 per cent. Despite the continued price inflation, positive signs have been seen in availability, with the number of properties available to rent growing in year-on-year terms on a national basis. Rents now stand 27 per cent higher than 2008 levels. Nationally, average rents have risen by 75 per cent from their low in late 2011. In Dublin, rents are an average of 34 per cent above their previous peak while in Galway, rents are 41 per cent above levels recorded in 2008. Outside cities, the average rent is 17 per cent above its previous high.

Commercial Property

The latest data from MSCI/IPD show the pace of growth in commercial property prices continues to moderate. The Q2 figures show that commercial property increased by 2.2 per cent per year, just marginally higher than the yearly rate of 2.1 per cent recorded in Q1. The Bank's *Macro Financial Review* for H1 2018 provides an in-depth review of the commercial property sector.

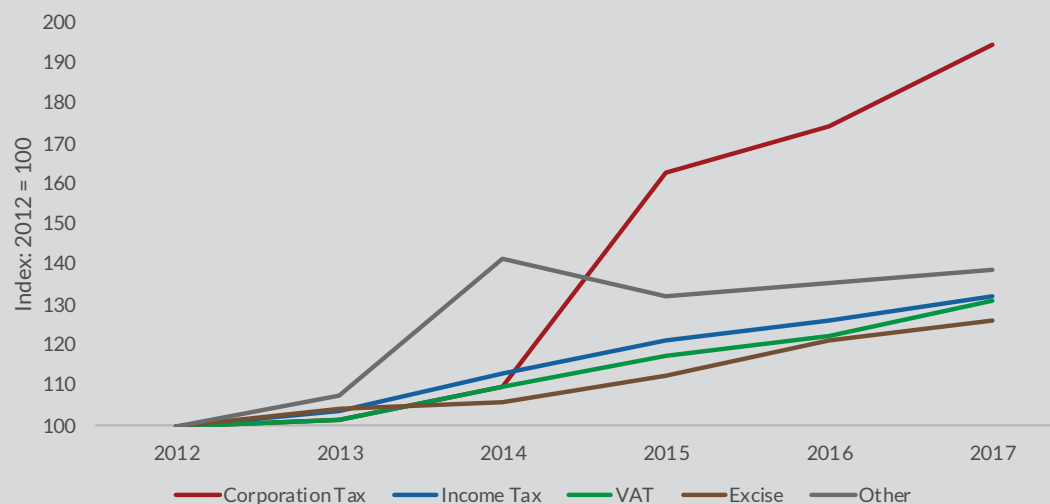
The Public Finances

Overview

The latest fiscal data suggest that there will be a modest improvement in the fiscal position this year. The general government deficit ratio was broadly unchanged in the first quarter of 2018 on an annual basis, while the Exchequer position was better than expected in the year to August. Within the latter, however, tax receipts are weaker than expected – particularly with corporation tax receipts excluded – while current voted spending is above profile. This, alongside the continued elevated level of general government debt, highlights the fiscal challenges that persist.

Box C: Risks related to corporation tax flows*By Linda Kane and Rónán Hickey*

Risks related to Irish corporation tax (CT) receipts have received significant attention as the revenue from this source has grown rapidly in recent years. The Department of Finance noted in its 2018 Annual Taxation Report that 'it is not possible to be definitive regarding the medium term sustainability of CT receipts'. In its Pre Budget Statement, the Irish Fiscal Advisory Council refers to 'a possibly transient surge in CT', while the IMF's Article IV notes vulnerabilities from 'ongoing changes in the international tax landscape'. The Central Bank of Ireland has also noted such risks.¹⁴ Given this background, this Box uses various data sources to highlight risks to the Irish fiscal position in the event of a reversal in CT flows.

Box C Chart 1: Recent Evolution of Irish Tax Heads (2012=100)

Source: Department of Finance

Chart 1 outlines the recent evolution of the main Irish tax heads. It shows that while each of the 'big four' tax heads have recorded strong growth in the past five years, the increase in corporation tax has been particularly striking. This highlights the role that CT receipts have played in supporting overall tax revenue growth in Ireland in this period. They have driven close to 40 per cent of the €9½ billion tax increase since 2014, a greater contribution than income tax despite the latter's significantly larger base.¹⁵ Comparatively, this is also very similar to the contribution made by property related taxes to tax revenue in the period 2003 to 2007.¹⁶ The experience of a decade ago emphasises the dangers of relying on windfall revenues. Given the likelihood that the recent surge in CT revenues may have some temporary elements, it would seem prudent to consider part of that recent surge as transitory rather than permanent.

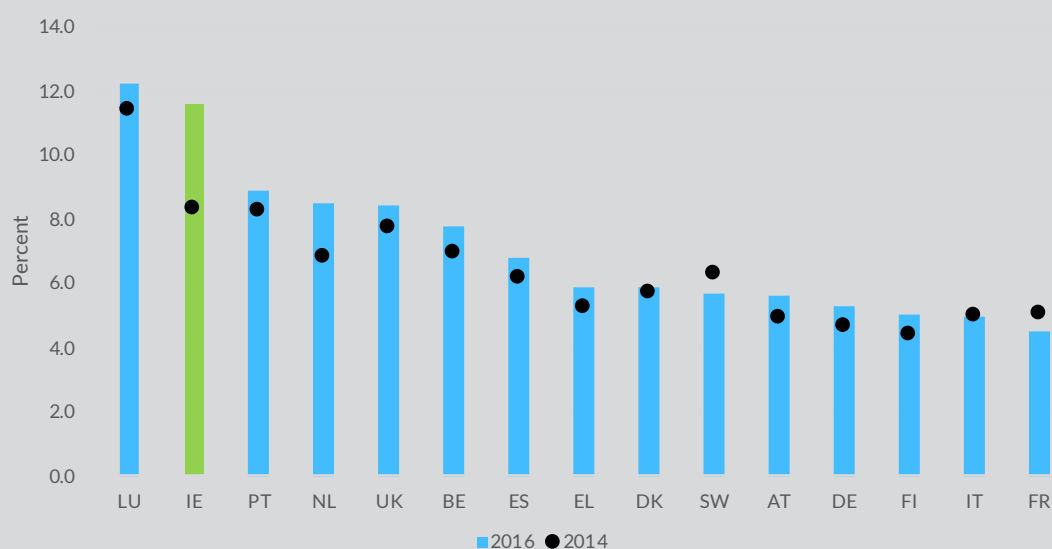
¹⁴ See, for example, Governor Lane's speech at the MacGill Summer School: 'Macro-financial policies for the short term and the long term' (July 2018).

¹⁵ In nominal terms income tax revenue was four times larger than corporation tax revenue in 2014 (€17.2 billion compared to €4.6 billion).

¹⁶ Addison-Smyth, D. and McQuinn, K. 'Quantifying revenue windfalls from the Irish housing market' - *Economic & Social Review*, Vol. 41, No. 2, Summer, 2010, pp. 201-223, Dublin: Economic & Social Research Institute.

Chart 2 uses the OECD's Tax Database to compare the importance of corporation tax in Ireland relative to other EU-15 countries. In 2016, corporation tax represented 11.6 per cent of total taxation in Ireland.¹⁷ This was significantly higher than the EU-15 average (6.1 per cent) and second only to Luxembourg across the region, making Ireland one of only two countries with a ratio above 10 per cent. In addition, the Chart highlights the pace of increase that has occurred in recent years. The increase of 3.3 percentage points since 2014 was significantly higher than elsewhere, with the increase for the EU-15 as a whole just 0.5 percentage points over the same period. There was only a marginal change, meanwhile, in the wider OECD.

Box C Chart 2: Corporation Tax as a Percentage of Total Taxes



Source: OECD Tax Database

Growth in CT revenues has also played a role in compensating for an underperformance in other tax heads in recent years. As Table 1 shows, this has been the case in three of the past five years; in 2017 other taxes were a cumulative €371 million below expectations. Furthermore, the trend has continued in the first eight months of this year. While CT revenue was €276 million or 6.8 per cent ahead of profile¹⁸ in the period January to August, this could not fully offset other taxes, which were €376m below expectations.

¹⁷ The OECD definition of total taxation revenue includes social security contributions.

¹⁸ The Government publishes profiles for each tax head consistent with their Budget day projections. These show how much the tax head is expected to generate in each month of the year.

Box C Table 1: Corporation and Other Taxes Relative to Expectations

	Corporation Tax Receipts, €m	Corporation Tax Forecast, €m	Outturn less forecast, €m	Outturn less forecast for other taxes, €m
2013	4,270	4,135	+135	-278
2014	4,614	4,380	+235	+1,006
2015	6,872	4,575	+2,297	+1,005
2016	7,351	6,615	+737	-99
2017	8,201	7,715	+486	-371
2018 Jan-Aug	4,366	4,090	+276	-376

Source: Department of Finance, Central Bank of Ireland

Risks to CT revenue mainly relate to potential changes in the international tax environment. According to data from the Revenue Commissioners (2018)¹⁹, foreign owned multinationals paid 80 per cent of total corporation tax receipts in 2017. Potential changes include proposed legislation in the European Union – Common Consolidated Corporate Tax Base (CCCTB) and Digital Taxation, broader changes proposed in the Base Erosion and Profit Sharing (BEPS) actions and recent changes to the US corporate tax regime. Focusing on the US, Revenue does not regularly publish statistics regarding the ownership status of companies operating in Ireland.²⁰ However, it is possible to examine this issue by drawing on data from the U.S. Bureau of Economic Analysis (BEA), which details the operations of U.S. multinational enterprises and their foreign affiliates.²¹

Box C Chart 3: Evolution of Corporation Taxes in Ireland

Sources: Department of Finance and Bureau of Economic Analysis²²

¹⁹ See Revenue: Corporation Tax 2017 Payments and 2016 Returns, April 2018.

²⁰ Because ownership does not affect the tax liability of a tax resident company in Ireland, this detail is not typically recorded by the Revenue Commissioners.

²¹ The BEA is the agency of the U.S. Department of Commerce that produces economic accounts statistics.

²² <https://www.bea.gov/international/di1usdop>

There is a long history of U.S. foreign direct investment in Ireland. U.S. multinationals play an important role in Ireland's economy, providing capital investment and employment opportunities across a number of industries, including manufacturing, finance and the information and communication sector. Chart 3 outlines the evolving contribution of these U.S. owned companies to total Irish CT, with the share rising from roughly one third in the early 2000s to more than 50 per cent of all CT revenues in 2016.²³ As Walsh (2010)²⁴ notes, the BEA data differs somewhat from that used by Revenue; most notably it appears to include companies that are registered in Ireland, but are non-resident for tax purposes and this has had the effect of somewhat inflating profit and tax paid in certain years. Nevertheless, the figures in the Chart are broadly consistent with the findings of Revenue that US multi-nationals accounted for at least 50 per cent of CT revenue in 2017.²⁵ The growing reliance on U.S. CT receipts outlined in Chart 3 highlights the vulnerability of the Irish fiscal position to changes in U.S. tax and trade policies and firm specific location decisions. More generally, Ireland's increasing dependence on corporation tax revenues, coupled with the high concentration of foreign owned multinational firms (especially U.S. firms), leaves the Irish fiscal position more exposed than other European countries to changes in the international tax and trade environment.

Exchequer Returns

Exchequer data for the year to August presented a mixed picture. Excluding transactions with no general government impact, the Exchequer balance was 12.6 per cent (€598 million) ahead of profile at €4.2 billion, as both revenue and expenditure outturns were better than expected (see Table 6).

Table 6: Analytical Exchequer Statement, January to August 2018 (€ millions)

	Jan - Aug 2018 €m	Jan - Aug 2017 €m	Annual Change (%)	Outturn vs Profile (€m)
Revenue	41,465	39,301	5.5	+186
Tax Revenue	32,421	30,476	6.4	-100
Appropriations-in-Aid	7,869	7,422	6.0	+77
Other Revenue	1,175	1,403	-16.2	+210
Expenditure	45,620	42,143	8.3	-412
Current Primary Expenditure	38,794	36,044	7.6	+66
Capital Expenditure	2,679	2,158	24.1	-361
Interest on National Debt	4,147	3,941	5.2	-117
Balance	-4,155	-2,842	-46.2	+598

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.

²³ 2016 is the latest year for which full fiscal-year data is published by the BEA. The 2017 data will be available in August 2019.

²⁴ See K. Walsh: The Economic and Fiscal Contribution of US Investment in Ireland, December 2010.

²⁵ When looking at the top 100 largest CT paying companies Revenue (2018) notes that there was 51 US companies paying €4.25 billion CT (around half of total receipts that year).

In the case of revenue, tax receipts continued to record robust growth, increasing by 6.4 per cent on an annual basis. Despite this, however, they were also €100 million below target, a gap that would have been greater were it not for developments in corporation taxes. Corporation taxes came in 6.8 per cent (€276 million) ahead of profile, continuing the trend of recent years that has seen them compensate for weakness in other tax heads (see Table 1 in Box C). Income tax and VAT were marginally below profile, with Excise a more notable 6.7 per cent lower. The underperformance in these tax heads was also compensated for by better than expected receipts from other (non-tax) sources.

Government expenditure was 0.9 per cent below target, led by capital developments. Investment spending was 24 per cent higher on an annual basis, but 12 per cent below what was budgeted. Around half of this relates to timing factors, while, given the ambitious capital plans announced in the National Development Plan, the remainder of the divergence could be closed in the final months of the year. Current primary spending, by comparison, was marginally over budget, as a lower than expected EU budget contribution partly compensated for higher voted expenditure (the latter being €209 million or 0.6 per cent ahead of profile). This highlights the continued challenges that exist on the expenditure side of the public finances.

Funding and Other Developments

The National Treasury Management Agency (NTMA) raised an additional €2.25 billion in the third quarter of the year through Government bond sales. This brought the total raised to date in 2018 to €13.5 billion, just below the lower bound of the NTMA's target of €14 to €18 billion for the year. The State's funding requirements for 2018 are relatively modest, with €9.5 billion of bonds set to mature over the course of the year and an Exchequer deficit of just over €1.5 billion projected in June's Summer Economic Statement. Reflecting recent operations, the NTMA noted in August that the State is fully funded three to four quarters in advance. Recent months also saw the cancellation of a further €1.5 billion of the floating rate treasury bonds issued in connection with the liquidation of Irish Bank Resolution Corporation. As a result, half of these bonds - issued in 2013 - have now been cancelled, with a balance of €12.5 billion outstanding.

An Timpeallacht Gheilleagrach

Leanann geilleagar na hÉireann de bheith ag fás ar luas láidir agus tá buacacht na gníomhaíochta eacnamaíche intíre ag tacú leis an bhfás sin. Tá an fás láidir, leathan ar fhostaíocht, rud a spreagann méaduithe ar ioncaim agus a thacaíonn leis an bhfás ar chaiteachas tomhaltóirí, mar bhonn agus mar thaca faoin tréimhse reatha d'fheidhmíocht láidir eacnamaíoch. De bhreis air sin, tá neartú láidir tagtha ar an bhfás ar phríomhghnéithe áirithe den infheistíocht intíre. Ag féachaint romhainn, tuarar i réamhaisnéis lárnach¹ an Bhainc Ceannais go dtiocfaidh fás ar luas sách láidir ar an mbunghníomhaíocht eacnamaíoch in 2018, agus tá ionchas ann go dtiocfaidh maolú áirithe ar an bhfás sin in 2019 agus in 2020. Ar a shon sin, tá rioscaí ábhartha intíre agus seachtracha ann i gcónaí don réamhaisnéis seo.

Cé is moite den luaineacht leanúnach a bhaineann le sonraí príomha na gcuntas náisiúnta, ar luaineacht í a eascraíonn as saobhadh na sonraí trádála agus infheistíochta, rud a bhoilscíonn leibhéal agus ráta fáis OTI, tugann an bunléargas le tuiscint gur ghéaraigh luas an fháis ar an ngníomhaíocht eacnamaíoch intíre sa chéad leath de 2018. Níl an tréimhse reatha d'fheidhmíocht láidir eacnamaíoch á spreagadh ag méaduithe neamh-inbhuanaithe ar chreidmheas intíre nó ar ghlan-insreabhadh airgeadais, rud atá tábhachtach. Ina ionad sin, tá dlús tagtha faoin méadú ar an bhfás ar chaiteachas tomhaltóirí. Tá fás láidir, inbhuanaithe ar fhostaíocht mar aon le feabhas ar chlár chomhardaithe teaghlach ag tacú leis sin. Ó thaobh na hinfeistíochta de, tugann an fhianaise le tuiscint go bhfuil luathú suntasach tagtha ar an bhfás ar phríomhghnéithe áirithe intíre, go háirithe tithíocht agus foirgníocht neamhchónaitheach, d'ainneoin go bhfuil luaineacht ag baint i gcónaí leis an tomhas príomha.

Ag féachaint romhainn, tá an réamhaisnéis lárnach dearfach i gcónaí. Meastar gur ó neart réamh-mheasta an éilimh intíre a thiocfaidh an príomhspreagadh don fhás sna blianta atá romhainn, rud a léirítear san fhás láidir ar chaiteachas tomhaltóirí agus ar bhuninfheistíocht (lena n-eisiatar na gnéithe luaineacha den infheistíocht i sócmhainní doláimhsithe agus in aerárthaí). Meastar go mbeidh gnóthachain leanúnacha ar fhostaíocht agus ar ioncaim ina bpríomhspreagadh don fhás ar bhunghníomhaíocht. Ar bhonn na fianaise de láidreacht leanúnach sa mhargadh saothair, rinneadh na réamh-mheastacháin maidir le fás ar fhostaíocht a ardú ón bhFaisnéis Ráithiúil deiridh, ach, tar éis tréimhse de mhéaduithe an-mhór, meastar go maolóidh an fás ar fhostaíocht in 2019 agus in 2020.

Tacaíonn an t-ionchas is dearfaí don mhargadh saothair le hathbhreithniú aníos ar an réamhaisnéis don fhás ar an mbunéileamh intíre, rud a léiríonn réamh-mheastacháin infheistíochta beagán níos airde do chaiteachas tomhaltóirí agus do bhuninfheistíocht araon sna blianta atá le teacht. Ag freagairt don mhéid sin, meastar go dtiocfaidh fás 5.6 faoin gcéad ar an mbunéileamh intíre i mbliana agus go maolóidh an fás sin go dtí 4.2 faoin gcéad in 2019 agus go dtí 3.6 faoin in 2020.

Tugann na réamh-mheastacháin don mhargadh saothair le tuiscint i gcónaí go bhfuil an geilleagar ag druidim i dtreo na lánfhostaíochta, ach d'fhéadfadh acmhainn bhreise a bheith ann trí inimirce bhreise agus trí rannpháirtíocht níos leithne sa mhargadh saothair. Mar sin féin, meastar sa réamhaisnéis lárnach go dtiocfaidh cúngú ar an acmhainn sin sna blianta atá le teacht.

¹ Ó thaobh Brexit de, ullmhaíodh na réamhaisnéisí lárnacha ar an mbonn go mbeadh idirthréimhse dhá bhliain i gceist sula dtiocfadh aon chaidreamh nua ionchasach iar-Brexit gnó i ngníomh.

Cé go bhfuil an réamhaisnéis lárnach dearfach, tá rioscaí ábhartha ar an taobh thíos ann do na réamhaisnéisí sin. Ó thaobh cúrsaí intíre, baineann na príomh-leochaileachtaí i gcónaí le neart timthriallach an gheilleagair. Cé go bhfuil an boilsciú maolaithe i gcónaí agus go bhfuil fás ar phánnasách measartha go fóill, léiríonn neart an éilimh intíre agus géarú ar dhálaí an mhargaidh saothair a thábhachtaí atá sé a bheith san airdeall maidir leis an riosca go n-eascróidh dinimic an róbhorrtha as dálaí timthriallacha láidre. Ag féachaint romhainn, tuartar go dtiocfaidh méadú céimseach ar an bhfás ar thuilleamh sna blianta atá le teacht, i gcomhréir leis an ionchas don mhargadh saothair, rud a thugann le tuiscint go meastar go gcoinneofar srian ar bhrúnna pá don chuid is mó. De réir mar a bheidh an geilleagar ag druidim i dtreo na lánfhostaíochta, áfach, tá riosca ann go dtiocfaidh róbhorradh chun cinn.

Ó thaobh cúrsaí seachtracha, tá roinnt rioscaí soiléire ar an taobh thíos ann do gheilleagar na hÉireann le tamall anuas. Dá mbeadh géarú gan choinne ar dhálaí airgeadais idirnáisiúnta nó íosghrádú ar na hionchais don fhás domhanda amach anseo i gcomparáid leis an timpeallacht neamhurchóideach a bhí ann ar feadh tréimhse fada, d'fhéadfaí go spreagfaí moilliú ar bhonn idirnáisiúnta ar infheistíocht agus ar thomhaltas. D'fhéadfadh aistrithe sa chóras trádála agus cánach idirnáisiúnta dífear díobhálach a dhéanamh do shamhail ghnó na hÉireann, fad a chruthódh Brexit mí-ordúil dúshlán láithreacha do gheilleagar agus do chóras airgeadais na hÉireann. I mBosca C (leathanach 29), scrúdaítear na rioscaí a bhaineann le sreafaí cánach corparáide agus leochaileacht ionchasach staid fhioscach na hÉireann d'athruithe ar bheartais cánach agus trádála idirnáisiúnta. Ó thaobh Brexit de, scrúdaítear cás amháin i mBosca A (leathanach 13) ina mbreathnaítear ar iarmhairt impleachtaí maicreacnamaíocha na dtograí atá le fáil i bPáipéar Bán Rialtas na Ríochta Aontaithe. Léiríonn tátail an cháis seo go mbeadh iarmhairt shuntasach dhiúltach fhadtéarmach ar aschur agus ar fhostaíocht na hÉireann ag caidreamh trádála cosúil leis an gceann arna leagan amach i dtograí an Pháipéir Bháin, d'ainneoin nach bhfuil an laghdú ar ghníomhaíocht eacnamaíoch na hÉireann, mar atá bunaithe ar thograí an Pháipéir Bháin, ach leath chomh hól leis an laghdú sa chás arna leagan ag an EDT.

I bhfianaise na rioscaí reatha seo i dteannta a chéile, ba cheart go mbeadh dhá aidhm ag bainistíocht riosca airgeadais. Ar an gcéad dul síos, níor cheart go gcuirfeadh gníomhaíochtaí beartais le dinimic chomhthimthriallach má táthar le rioscaí an róbhorrtha sa gheilleagar agus sa chóras airgeadais a shrianadh. Ar an dara dul síos, feabhsófar athléimneacht macra-airgeadais más féidir maoláin a bhunú le linn tréimhsí maithe lena gcumasófar d'Éirinn déileáil ar mhodh níos fearr le tuaraingí ar an taobh thíos amach anseo. De ghnáth, is ionann barrachas buiséid a choinneáil le linn tréimhsí d'fheidhmíocht láidir eacnamaíoch agus réamhchoinníoll chun easnaimh fhritimthriallacha chobhsaitheacha a bheith ann i gcás cor chun donais amach anseo. Mura méadaítear maoláin fhioscacha, tá riosca ann go dtarlóidh pátrúin stairiúla athuair faoinar chuir leasuithe fioscacha comhthimthriallacha le cor chun donais eacnamaíoch. Cuirtear fáilte roimh an bhfeidhmíocht eacnamaíoch reatha ach tá sé tábhachtach go mbeifear réamhghníomhach ó thaobh dinimic chomhthimthriallach a mhaolú agus ó thaobh maoláin a mhéadú chun costais cor chun donais amach anseo a theorannú.

Financing Developments in the Irish Economy

Overview

The ongoing increases in households' assets and income are boosting net worth and enhancing debt sustainability. Mortgage lending continues to gain momentum, however, the growth in consumer credit has slowed in recent months. This slowdown in consumer lending is partially due to the slowdown in new car sales which are frequently financed by credit. Mortgage interest rates continue to decline gradually and variable interest rates dropped to 3.25 per cent in July 2018. At the same time, fixed rate mortgages continue to gain popularity. While this trend has been evident for some time, approval of longer-term fixed rate mortgages has increased noticeably in recent quarters. This development was supported by declining interest rates on longer-term fixation periods. Since Q4 2017 the interest rates on new mortgages with an initial rate fixation of over three years have dropped below the corresponding rates for both new mortgages with an initial rate fixation of one-to-three years as well standard variable rate mortgages. This move towards fixed rate mortgages should, in turn, lessen the potential scale of any increase in official interest rates in the short term. Notwithstanding these improvements, household debt remains high and a significant number of mortgage accounts are still in arrears.

The improvement in financing conditions for enterprises lags behind the household sector. On the credit side, net lending to Irish-resident enterprises continues to decline, albeit at a reduced rate, as loan repayments still exceed loan drawdowns. Although the growth rate of new lending to small and medium-sized enterprises (SMEs) has lost some momentum over the past year, the total gross new SME lending figure for the year to end-June was €5.3 billion, the highest annual value recorded in the series.

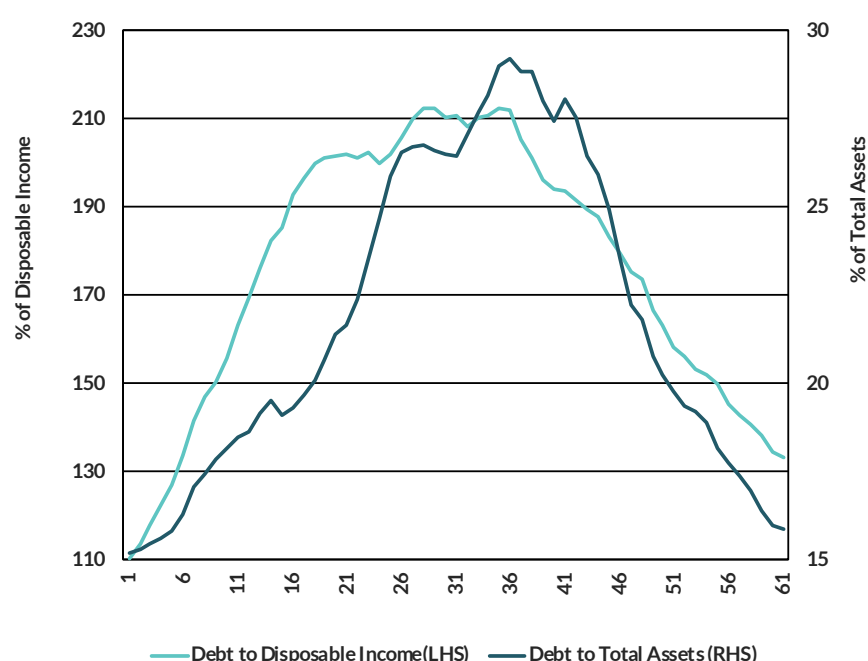
Irish-resident credit institutions continue to rebalance their funding towards deposits as the overall stock of Irish-resident private sector deposits continues to increase. In the case of households and Non-Financial Corporations (NFCs), this increase in deposits has taken the form of a substitution towards deposits with the shortest maturity as historically low rates make term deposits unattractive. Finally, the non-bank financial sector has benefitted from strong inflows and valuation gains.

Household Sector

Irish household wealth is at its highest level and continues to increase. During Q1 2018, household net worth expanded by 0.9 per cent as an increase in the value of households' housing assets more than offset declines in the value of their financial assets and increases in their liabilities. By the end of Q1, household net worth stood at €732.3 billion (or €150,768 per capita), compared with €726 billion in Q4 2017, and its pre-crisis peak of €719 billion in Q2 2007.

The ongoing improvement in households' financial position enhanced the sector's debt sustainability further in early 2018 as the marginal increase in households' borrowings was more than offset by increases in income and assets. In the year to March 2018, households' debt as a proportion of total assets declined by two percentage points and household debt as a proportion of disposable income fell by 9.7 percentage points (Chart 1). Improvements in these indicators, however, mask continued fragility in the household sector as they remain the fourth most indebted in the EU. Furthermore, the distribution of the debt burden across cohorts of the population varies substantially with particularly high debt burdens in mortgaged households aged between 30 and 45 years of age, leaving them more exposed to adverse shocks.¹

Chart 1: Household Debt Sustainability

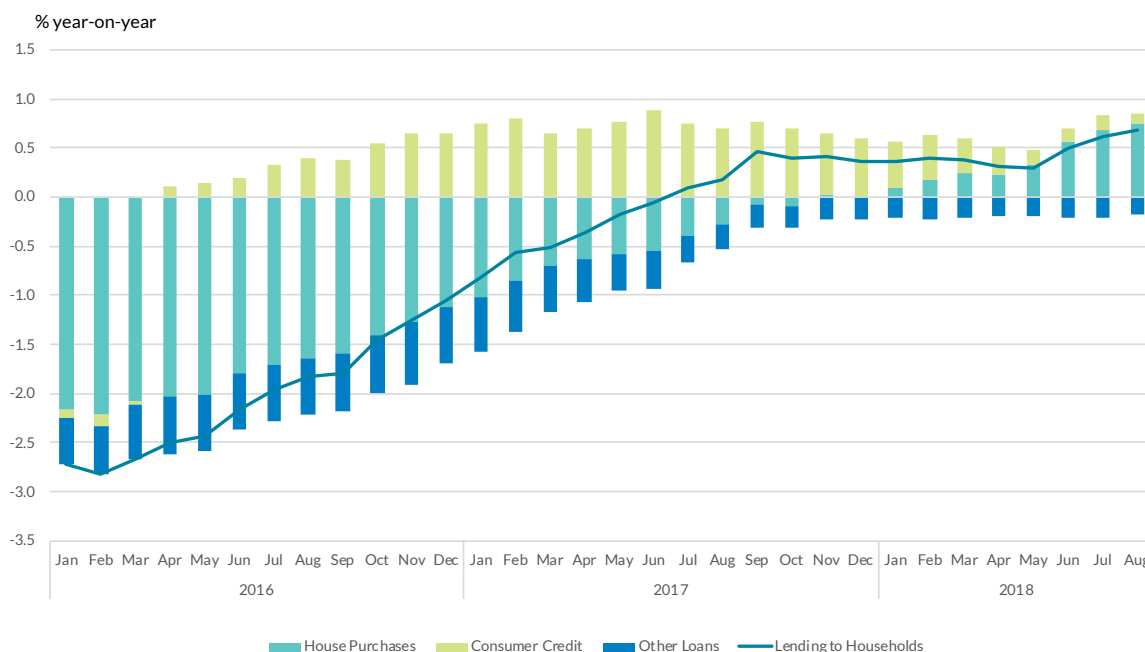


Sources: Quarterly Financial Accounts, Central Bank of Ireland; Quarterly Net Worth, Central Statistics Office.

As this continued improvement in the household balance sheet progresses, total lending to the sector increased by 0.7 per cent year-on-year in August (Chart 2). This increase was driven by a 0.9 per cent rise in lending for house purchases. Looking ahead, the value and volume of mortgage approvals, a leading indicator of mortgage drawdowns, increased by 9.4 per cent and 5.7 per cent, respectively during August, according to Banking & Payments Federation Ireland's Mortgage Approvals report for August 2018.

In contrast, the growth in consumer credit has slowed markedly since the start of 2018 and it contributed just 0.11 percentage points to the growth in total household lending during August. One reason for this slowdown is the decline in new car sales as lending for car purchases makes up approximately one third of total consumer lending. According to the Society of the Irish Motor Industry (SIMI), total new car sales were down 4 per cent year-on-year in the first 8 months of 2018, whereas new car imports – which are typically less credit intensive – increased by 12 per cent over the same period. Furthermore, new lending for Personal Contract Plans (PCPs) during H1 2018, although amounting to €347 million, was down 15 per cent compared with H1 2017.

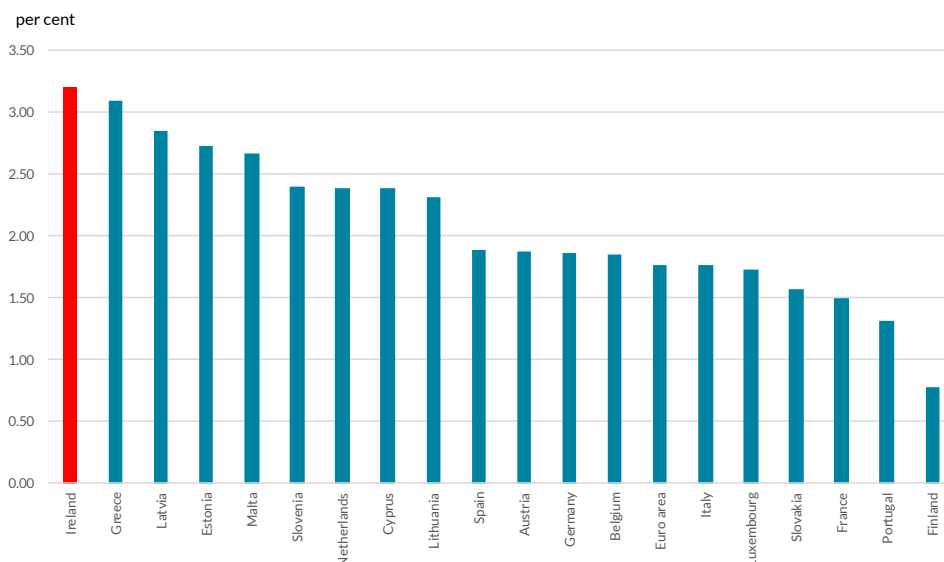
¹ Fasianos, Lydon, and McIndoe-Calder (2017) "The Balancing Act: Household Indebtedness Over the Cycle". Central Bank of Ireland Quarterly Bulletin 2, 2017.

Chart 2: Total Lending to Households and its Contributions

Source: Table A.5.1: Credit and Banking Statistics, Central Bank of Ireland.

Note: The above chart shows the year-on-year growth rate of total lending to households and the contributions made by lending to households for house purchases, consumer credit, and other loans.

While Irish mortgage rates remain the highest across the euro area (Chart 3) their gradual decline over the past year has continued into the third quarter of 2018. The weighted average interest rate on new variable mortgage agreements decreased to 3.25 per cent in July, down from 3.38 per cent in July 2017. The new lending rate for fixed principal dwelling houses (PDH) mortgages with a maturity over 3 years is now below the corresponding rate for 1-3 year fixed rate mortgages.

Chart 3: Average Interest Rate on all new Mortgage Rate Agreements (excluding Renegotiations) across Euro Area Countries

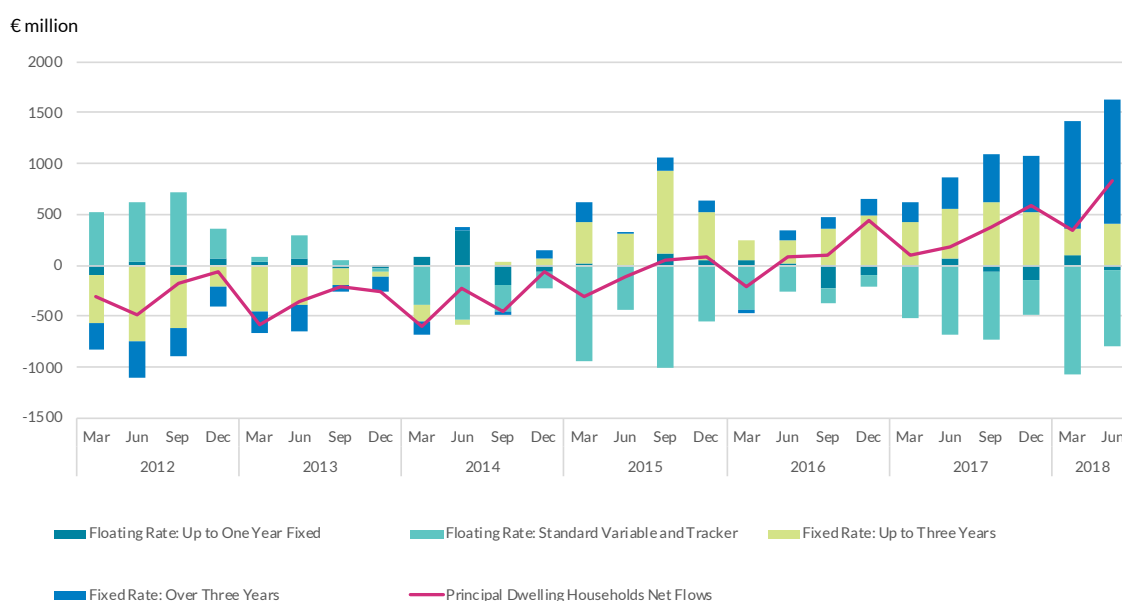
Source: ECB Statistical Data Warehouse (SDW)

Fixed rate mortgages continue to gain popularity. While this trend has been evident for some time, recent quarters have seen a much higher take up of fixed rate mortgages with an initial rate of over 3 years duration (Chart 4). This uptake is not only seen in the new loan drawdowns, but also in significant volumes of renegotiations of existing customers onto fixed rate contracts.² In the three months to end-June 2018, fixed rate mortgages accounted for 58 per cent of new agreements and 50 per cent of renegotiations. Consequently, fixed rate mortgages' share of the PDH market climbed to 24 per cent in Q2 2018, up from 17 per cent in Q2 2017.

The duration of fixed rate PDH mortgages has lengthened over the past year. In Q2 2017, only 43 per cent of outstanding fixed rate mortgages had a duration greater than 3 years and this increased to 51 per cent during Q2 2018, although the majority of these mortgages have a fixed rate duration of over 3 and up to 5 years. This lengthening in the duration of fixed rate mortgages has been supported by recent changes in mortgage rates. In Q3 2017, the average fixed rate on new mortgages with a maturity greater than three years dropped below the standard variable rate before dropping below the fixed rate with a maturity of one-to-three years in Q1 2018. Although the fixed term length remains short relative to some other European countries, the uptake of fixed rate mortgages is at the highest levels seen in Ireland since the current series began in 2003.

Deposits from households increased in net terms by €450 million in August bringing the annual growth rate to 3.5 per cent. Household deposit inflows were €3.5 billion higher than withdrawals. The highest growth was seen in overnight deposits, including current accounts whereas term deposits up to two years, and over two years declined by 14.4 per cent and 20.7 per cent, respectively. Since February 2013, households' overnight deposits (including current accounts), as a share of households' total deposits has increased from around 50 per cent to 78 per cent.

Chart 4: PDH Fixed and Floating Rate Loans



Source: Table A18.1 Credit and Banking Statistics, Central Bank of Ireland.

2 This includes renegotiations of existing fixed rate mortgages and renegotiations from floating to fixed rate.

The high number of mortgage accounts in arrears represents a source of household fragility. The total number of mortgage accounts in arrears declined further to 87,796 during Q2 2018. While this is the lowest level since Q3 2010, it still corresponds to 10.4 per cent of all outstanding mortgages. During Q2 2018, the number of mortgages in long-term arrears (over 720 days), declined from 29,509 to 28,237 for PDH mortgages and from 13,362 to 12,732 for buy-to-let (BTL) mortgages. These 40,969 accounts in long-term mortgage arrears amount to 4.8 per cent of all outstanding mortgages.

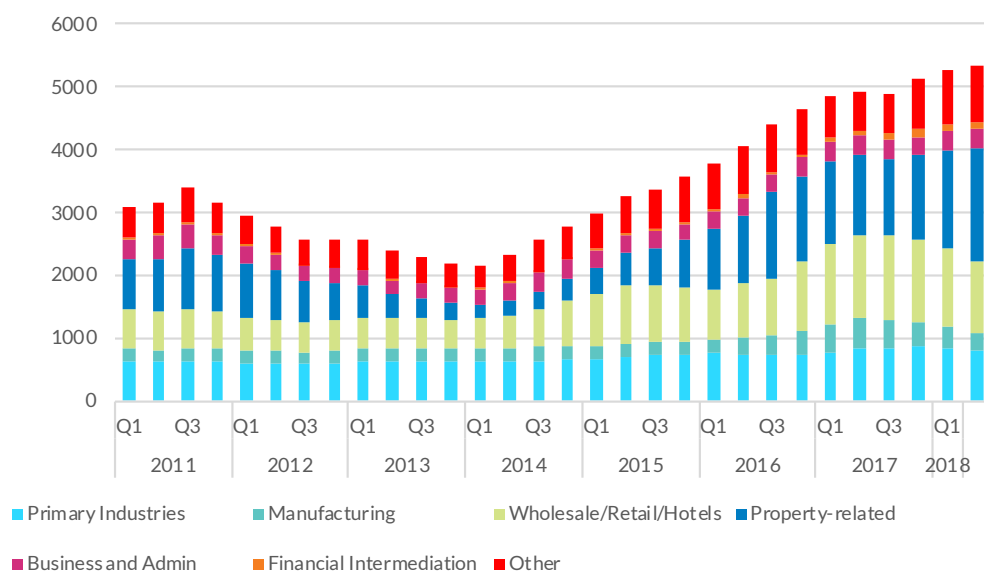
During Q2 2018 7,857 new restructure arrangements were agreed, the highest level of new arrangements since end-2016, with arrears capitalisation the most popular type of restructure. At end-June, 87 and 88 per cent of PDH and BTL mortgages, respectively, were meeting the terms of their arrangement. Of the properties repossessed during the quarter, the majority – 144 – were voluntarily surrendered or abandoned. The remaining 101 were repossessed on foot of a court order.

Non-Financial Corporation Sector

Total credit outstanding to Irish-resident enterprises continues to decline at a reduced rate due to a slower pace of deleveraging and an increase in new lending volumes. During Q2 2018, total credit advanced to Irish-resident NFCs decreased by 5.8 per cent year-on-year, down from 11 per cent in Q2 2017. The overall picture is more positive when the financial intermediation and property-related sectors are excluded. Within this narrower group of NFCs, an increase in credit of €161 million and a growth rate of -0.4 per cent year-on-year was recorded during Q2 2018.

Total credit advanced to Irish-resident SMEs decreased by 3.7 per cent year-on-year, down from 7.5 per cent in Q2 2017. When the financial intermediation and property related sectors are excluded, a decline in credit outstanding of just 1.7 per cent year-on-year was recorded in Q2-2018. However, the deceleration in total outstanding credit is partially due to a slowdown in the pace of loan repayments. Although the growth rate of gross new lending to SMEs has slowed in recent quarters, an increase of 9.3 per cent in the four quarters to Q2 2018 was still recorded based on a four quarter rolling average. Consequently, new lending to SMEs reached an all-time high of €5.3 billion in Q2 2018 (Chart 5). The decline in interest rates on new and outstanding loans to SMEs shows some signs of reversal. Since the start of 2018, interest rates on new loans to SMEs have increased by around 30 to 40 basis points whereas the increase in interest rates on outstanding loans to SMEs has been more modest – around 5-15 basis points.

Chart 5: Gross New Lending to SMEs



Source: Table A.14.1 Credit and Banking Statistics, Central Bank of Ireland. Note: The series in the above chart correspond to total new lending for each sector for the current and previous three quarters.

During Q1 2018, NFCs' debt decreased by €24.8 billion as loan repayments continue to exceed drawdowns. The majority of this decline was due to a decrease in their long-term loan liabilities and a reduction in their stock of loans from non-residents. However, any inference regarding indigenous Irish NFCs' indebtedness and the associated risks is complicated by the outsized presence of multinationals operating in Ireland.

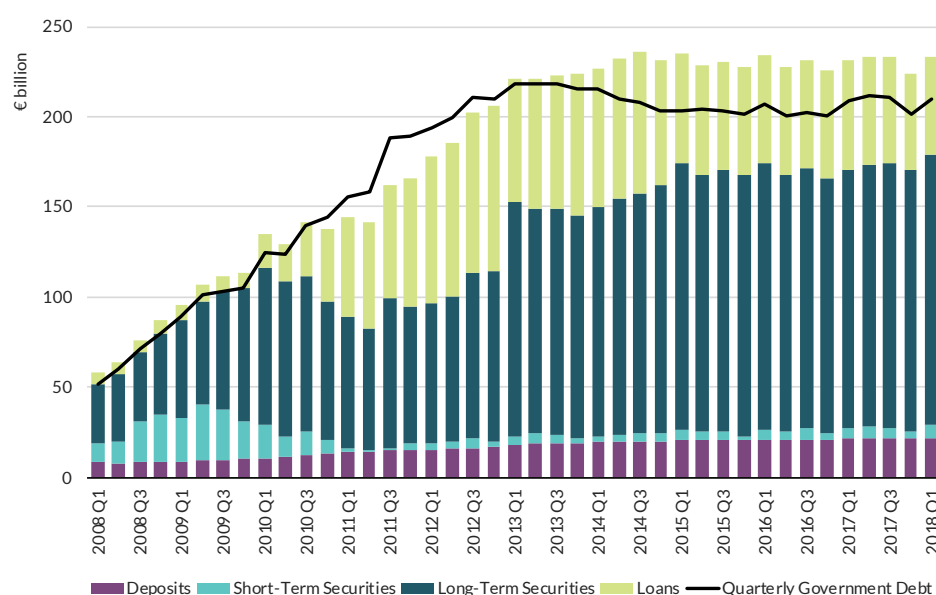
Investment by foreign owned multinational corporations (MNCs) in their Irish operations (FDI inflows) decreased by €44 billion in Q2 2018. This comprises a decrease in equity and other capital of €50.3 and €6.6 billion, respectively and an increase in reinvested earnings of € 12.9 billion. Investment by Irish-owned MNCs abroad (FDI outflows) decreased by €33.8 billion during the quarter, driven by a large fall in equity. Direct investment income earned abroad by this sector increased by €5.8 billion in Q2 2018, up from €3.8 billion in Q1 2018.

Government Sector

Government debt increased by €9.7 billion during Q1 2018 to €232.2 billion compared to a peak of €235.6 billion in Q1 2014 (Chart 6). This increase was mostly due to the issuance of €6.6 billion of government debt securities. The net financial wealth of the Irish Government decreased by €3.2 billion during Q1 2018 as an increase in financial liabilities of €10.2 billion exceeded the increase in financial assets of €7.1 billion. At the end of 2017, government debt amounted to 123 per cent of GNI* or 110* of GNI* based on the measure of debt used in the calculation of the excessive deficit procedure.³

In July, the NTMA completed an auction worth €1.25 billion of two benchmark Irish Government bonds: Treasury Bond 2028 and Treasury Bond 2045. This was followed by the successful auction of the €1 billion benchmark Irish Government bond Treasury Bond 2028 in September. The latter received total bids of €2.395 billion, or a cover ratio of 2.4. Since the start of 2018, the NTMA have issued

Chart 6: Government Debt



Source: Quarterly Financial Accounts, Central Bank of Ireland.

Note: In the above chart, the four components, loans, Long-Term Securities, Short-Term Securities, and Deposits don't add up to Quarterly Government Debt as the latter is calculated based on the excessive deficit procedure.

³ Quarterly data on GNI* is not yet published so the ratio of government debt to GNI* is not available for Q1 2018. Furthermore, Government debt in the Quarterly Financial Accounts differs from the EDP measures of debt as it is calculated on a non-consolidated basis, and uses market rather than nominal values.

€13.5 billion in bonds which is just short of its target of €14 billion to 18 billion that was outlined at the start of the year. Over €40 billion in marketable debt, including €4 billion of EU/IMF bilateral loans, is scheduled to mature between now and 2020.

Financial Sector

Total Irish private sector deposits continue to increase and deposits from Insurance Corporations and Pension Funds (ICPF) are the only sector to show a decline. At the same time, the growth rate of both households' and NFCs' deposits is concentrated in very short-term deposit instruments. In contrast, deposits with an agreed maturity of up to and over two years continue to decline. Furthermore, the year-on-year growth of non-resident private sector deposits from the rest of the euro area, and the rest of the world has averaged -13.4 per cent and -9.9 per cent, respectively since January 2018, as the surge in deposits from these regions during 2015 and 2017, respectively continues to reverse.

The large decline in banks' debt securities that was part of their deleveraging efforts in recent years continues to show signs of stabilising. Total debt securities issued by domestic market groups and Irish-headquartered groups increased by 6.7 per cent year-on-year during July. Elsewhere, the Central Bank of Ireland provides detailed information on the interest payable on loans and deposits by the Irish-resident banks. A summary of these Income Statement statistics is provided in Box A below.

Towards the end of Q3 2018, the Central Bank of Ireland announced that the countercyclical capital buffer (CCyB) which was originally announced in July and comes into effect in July 2019, is to be maintained at 1 per cent. In reaching this decision, the strength in new lending and in particular mortgage lending, the high level of household indebtedness as well as the large stock of NPLs, and the highly open nature of the Irish economy were some of the factors cited.

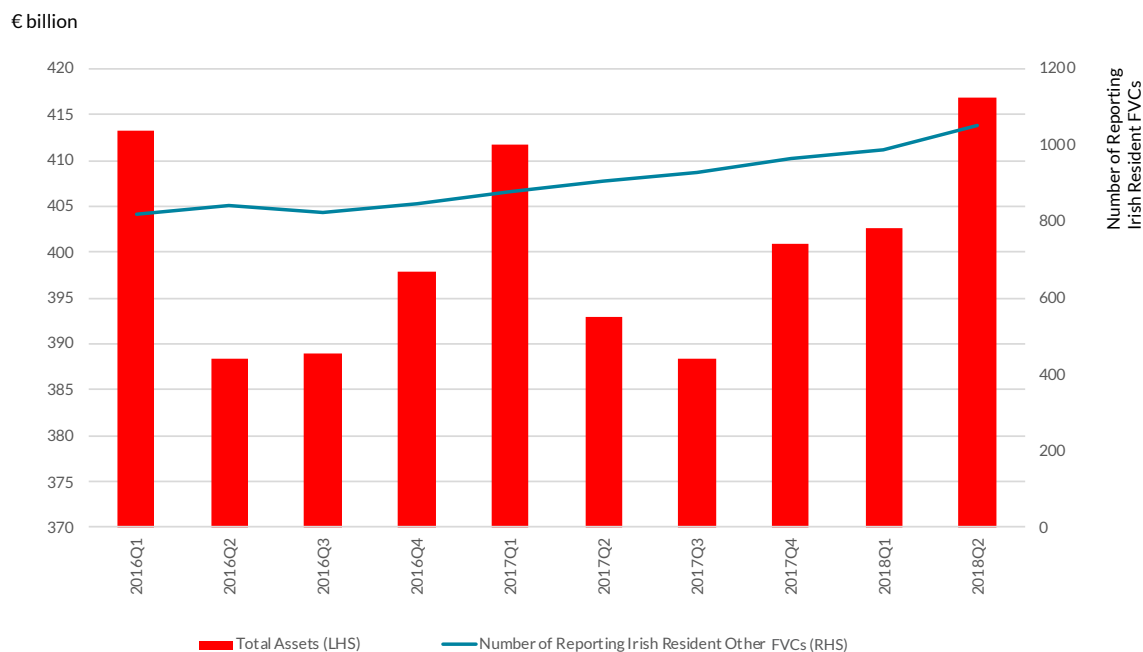
Non-Bank Financial Sector

The net asset value (NAV) of Investment Funds (IFs) resident in Ireland increased by 3.4 per cent, or €66 billion, during Q2 2018 to €2,001 billion. Equity funds, hedge funds, and mixed funds benefitted from a favourable combination of investor inflows of €25 billion and valuation gains of €41 billion. In contrast, bond funds experienced a net investor withdrawal and a mild valuation loss.

The NAV of money market funds (MMFs) resident in Ireland increased by €8.5 billion during Q2 2018 to €488 billion due to a combination of favourable exchange rate movements of €8.3 billion and positive net transactions of €0.2 billion. Euro-denominated funds experienced a small net investor outflow of €0.3 billion during Q2 2018. Elsewhere, GBP-denominated funds experienced outflows of €3.8 billion whereas USD-denominated funds recorded inflows amounting to €4.3 billion.

The total assets of securitised SPEs, or Financial Vehicle Corporations (FVCs), increased to €416.9 billion during Q2 2018 from €402.7 billion in Q1 2018. The number of vehicles also increased strongly to 1,051 from 989 (Chart 7). This increase in total assets was mainly driven by the impact of US dollar appreciation against the euro. Also, 40 non-securitised SPEs with €8 billion in total assets were re-designated as securitised Special Purpose Entities (SPEs), during Q2 2018. Regarding non-securitised SPEs, the number of vehicles declined by 21 to 1,129 in Q2 2018, the first decline since Q3 2016. At the same time, total assets fell by €3.6 billion to €269.2 billion, driven by SPE re-designations.

Chart7: Total Assets and Number of Reporting FVCs



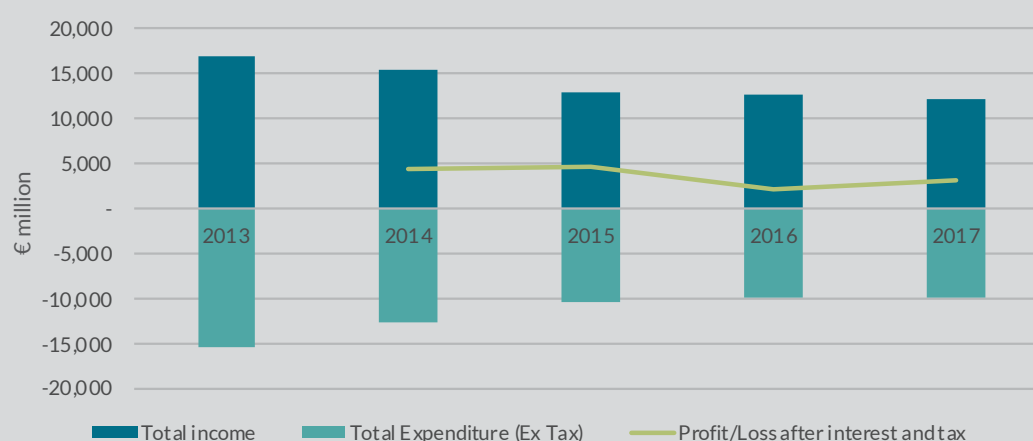
Source: Special Purpose Entities' Statistics, Central Bank of Ireland.

The total asset value of Irish-resident Insurance Corporations (ICs) increased by €2 billion to €311 billion in Q2 2018. Life ICs account for the majority of the sector, contributing 80 per cent to total assets, followed by reinsurance (11 per cent) and non-life ICs (8 per cent). The assets of ICs are spread across several investment categories with shares in IFs making up the single biggest asset holding at 46 per cent of total assets. These shares are concentrated in equity funds, bond funds and mixed funds. Box B examines the Irish reinsurance sector in more detail.

Insurance Technical Reserves (ITRs) account for 85 per cent of liabilities in the IC sector balance sheet. The majority of these ITRs represent amounts set aside to cover future estimated claims. The split of ITRs between life (90 per cent) and non-life (10 per cent) is consistent with the dominance of life insurance in the sector.

Box A: Income Statement Statistics and Ireland's Banking System*By Conor Kelly and Dermot Coates⁴*

The quarterly Locational Banking Statistics were expanded significantly after 2012 on foot of the recommendations of the Committee on the Global Financial System (CGFS). As part of these enhancements, income statement data was introduced into the series. The data provide useful metrics for tracking the recovery – and development – of the banking system in Ireland as it moves beyond the financial crisis. The data are based upon a statistical profit and loss account and are collected for domestic market retail banks and IFSC banks.⁵ The former are banks that have a significant level of retail business with Irish households and NFCs, and the latter are more internationally focused. The underlying data are also used in the compilation of the CSO's Structural Business Statistics for the banking sector, including value added and operating surplus.⁶

Box A Chart 1: Total Income and Expenditure, 2013-2017

Source: Table L.4 - Income Statement of Banking Offices Resident in Ireland and author's calculations.

Note: Total income excludes capital and exchange gains and losses. Total expenditure excludes corporation tax liabilities. Profit/Loss figure is after tax. Profit/Loss data were only collected from 2014 onwards.

These statistics provide an overview of the income and expenditure of the domestic market retail banks and the IFSC banks.⁷ The income statement data allows for a more in-depth view of the elements of bank income and expenditure and in a manner that facilitates analysis of trends as they develop. Over the five-year period 2013 to 2017, total income earned by the banking sector in Ireland fell by 27 per cent to €12.3 billion (Box A Chart 1). The scale of this reduction was greater for the domestic market retail banks (31 per cent) than for the IFSC banks (20 per cent). Over the same period, the reduction in expenditure by the banking sector was greater than the reduction in income. Expenditure fell by 35 per cent to €9.6 billion. Similar to banking sector income, the domestic market

⁴ Statistics Division, Central Bank of Ireland

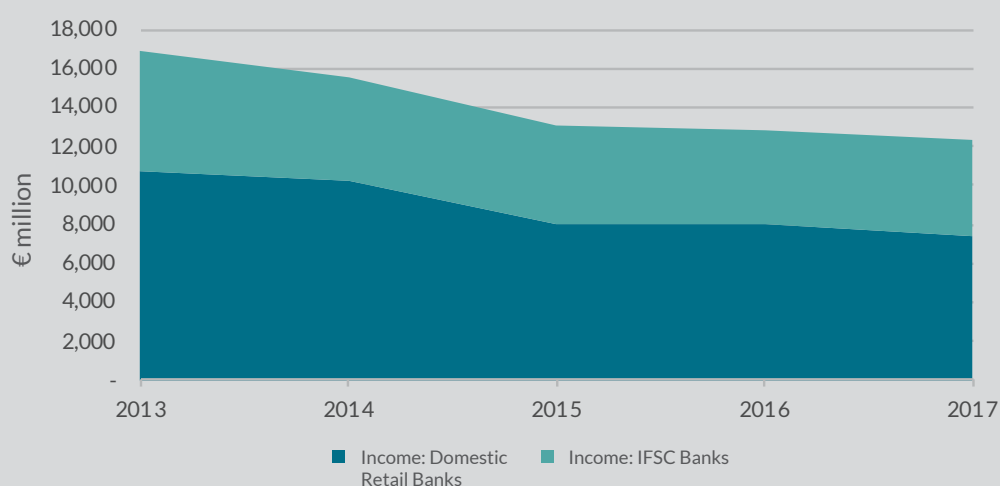
⁵ A full list of these institutions is available on the Central Bank of Ireland website. The data is collected at the level of Irish-resident entities (rather than group data). Credit Unions are excluded from this set of statistics.

⁶ *Business in Ireland* (Table 8.1: Production account and generation of income for all banks); <https://www.cso.ie/en/releasesandpublications/ep/p-bii/bii2015/fs/> There is a divergence between this production account and the Income Statement statistics in that the 'production value' presented in the former excludes value adjustments and profits from affiliates. The Central Bank of Ireland series, however, will include the share of profits receivable from associates/subsidiaries and dividends receivable from non-group companies. A further difference is that capital and exchange gains and losses are included in deriving the profit (after interest and tax) figure published by the Central Bank of Ireland.

⁷ This series was initially released as a quarterly publication. Due to seasonal volatility in the statistics, it has been migrated to an annual release.

retail banks recorded a significantly greater reduction in expenditure than the IFSC banks (Box A Charts 2 and 3). This reduction in both income and expenditure reflects multiple factors including, but not limited to, the exiting of several banks from the system, bank deleveraging, the low interest rate environment, and the introduction of greater efficiencies.

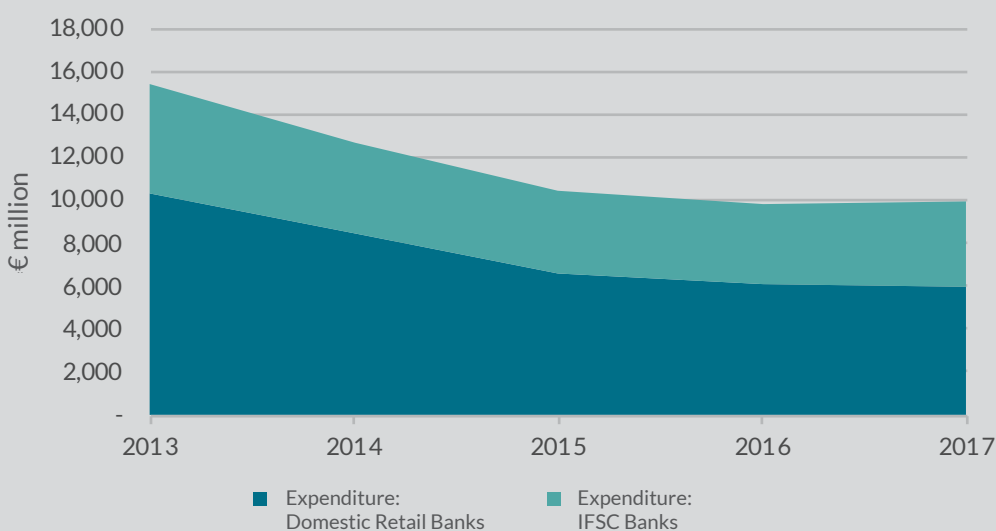
Box A Chart 2: Trends in total banking sector income by bank type, 2013-2017



Source: Table L.4 - Income Statement of Banking Offices Resident in Ireland and author's calculations.

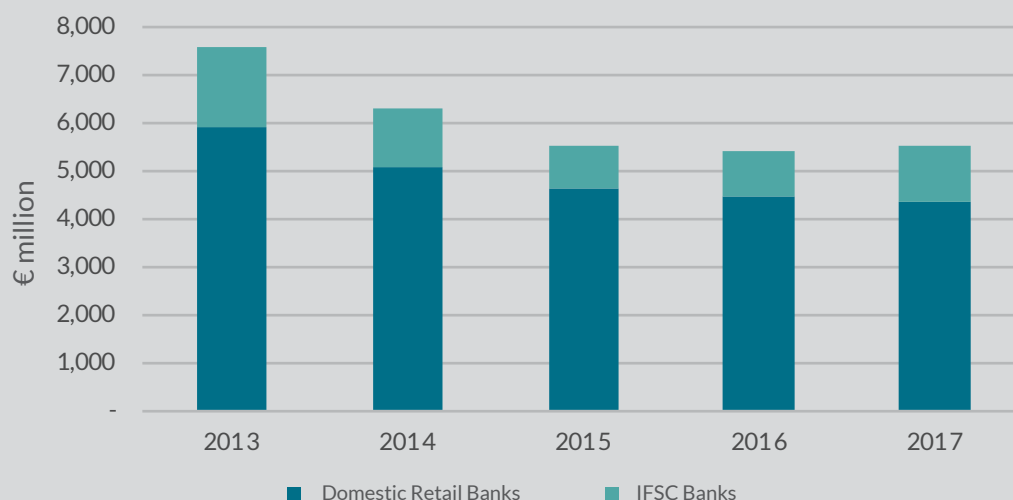
Note: This excludes Capital and Exchange gains and losses.

Box A Chart 3: Trends in total banking sector expenditure by bank type, 2013-2017



Source: Table L.4 - Income Statement of Banking Offices Resident in Ireland and author's calculations.

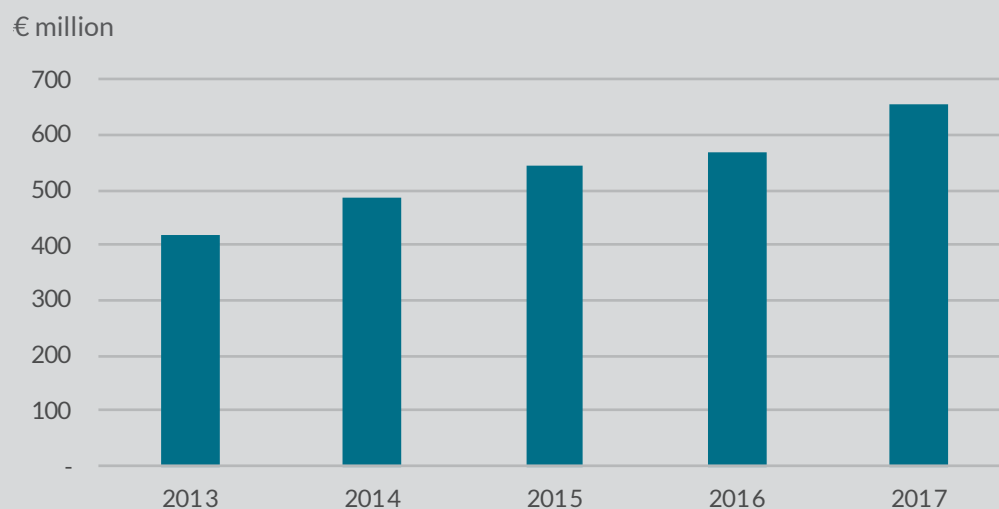
Note: This refers to expenditure (before Corporation Tax or Single Resolution Board contributions payable).

Box A Chart 4: Interest Income from Loans and Deposits by Bank Type, 2013-2017

Source: Table L.4 - Income Statement of Banking offices Resident in Ireland and author's calculations.

Note: This excludes interest income from group companies.

Interest income from loans and deposits has fallen (Box A Chart 4), and at the same time, interest income receivable on bonds⁸ has also fallen sharply. The latter amounted to €4.6 billion in 2013 but it had fallen by 61 per cent by 2017 to €1.8 billion. As a proportion of total income for the banking sector, this fell from 27 per cent to just 9 per cent. By contrast, income from account fees and charges⁹ has seen an increase over the same five-year period (albeit that it started from a low base). This increased by 57 per cent to €656 million in 2017 (Box A Chart 5).

Box A Chart 5: Income from Account Fees and Charges, 2013-2017

Source: Table L.4 - Income Statement of Banking Offices Resident in Ireland.

⁸ Including money market instruments.

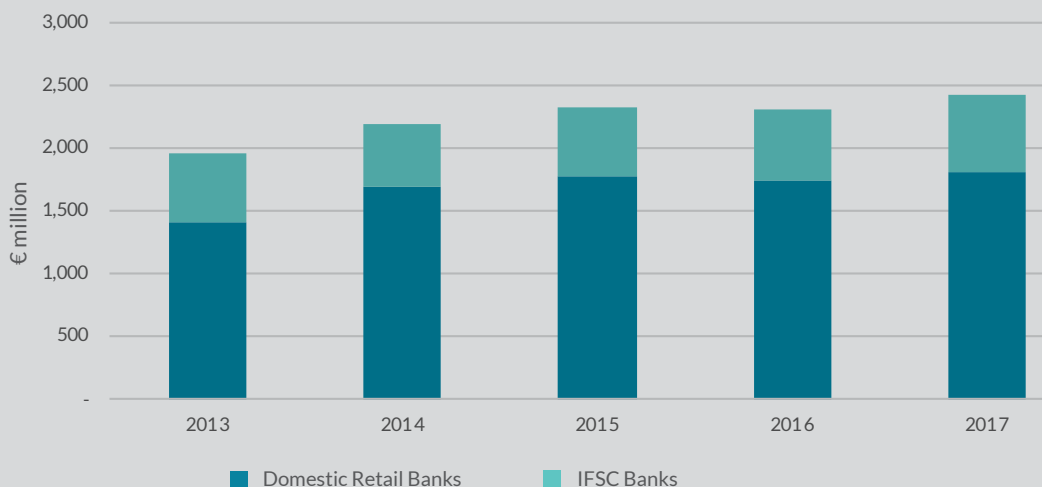
⁹ Maintenance charges and/or transaction fees on customer accounts.

In tandem to falling income, the cost to the banking sector of its bonds and other borrowings (i.e. loans and deposits) has also fallen since 2013. For instance, the interest payable on bonds has reduced by 71 per cent to €709 million.

Wages and salaries are another important cost centre for the banks. The overall cost of wages and salaries stood at €2,418 million in 2017 compared to €1,964 million in 2013. The domestic market retail banks saw a more substantial increase in this expenditure over the period (29 per cent) than did their peer IFSC banks (9 per cent) (Box A Chart 6). This movement is counter to the overall 35 per cent reduction in expenditure over this period. However, the data collected does not provide sufficient detail to allow analysis of the contributory elements of this growth.

Finally, the Income Statement statistics series was introduced over recent years by the Central Bank of Ireland and provide useful information on changes within Ireland's banking sector. The statistics indicate that both income and expenditure have fallen significantly since 2013 and that these reductions have been most pronounced in the case of the domestic market retail banks. The data also indicate that falls in interest income have been, in part at least, offset by rising income from account fees and charges.

Box A Chart 6: Expenditure on Wages and Salaries, 2013-2017



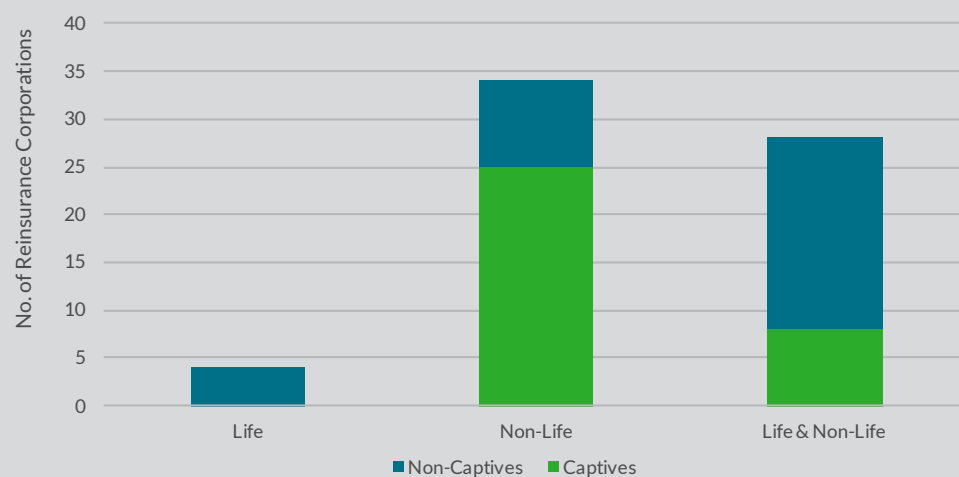
Source: Table L.4 - Income Statement of Banking Offices Resident in Ireland and author's calculations.

Note: Data includes payroll taxes.

Box B: Retrocession: Reinsuring the Reinsurer*By Roisin Flaherty and Anne-Marie Kelly¹⁰*

Reinsurance is purchased by insurance companies (ICs) to manage the underwriting risks on insurance policies. Retrocession is the activity of reinsurance companies subsequently reinsuring the risk they have assumed, and is practised by just under half of Irish reinsurers. This has the impact of spreading the downside risk and potential losses from the original reinsurance writer to another company, which may be located in a different jurisdiction. Very often the risk-transfer transaction is within the same insurance group, rather than with an unrelated party. As such, the practice of reinsurance and retrocession is used as a risk management strategy, diversifying risk widely and in a complex manner. In many instances, a reinsurer will transfer their risks to multiple reinsurers and use retrocessionaires located around the world.¹¹ This global risk transfer creates a degree of connectedness within the insurance system. Retrocession practice allows reinsurance companies manage their underwriting risks according to their own risk appetite, and transfer risk around the larger group. The effectiveness of many reinsurance companies is determined by how well they manage and diversify this risk. This box aims to provide a high-level overview of retrocession activity by Irish reinsurers. While reinsurance companies manage their overall risk profile using a variety of methods including retrocession, the practice is complex. Understanding the true nature of the risk transfer in retrocession requires a granular examination, which is outside the scope of this box.

Ireland has the second highest number of reinsurance companies in Europe.¹² There were 66 head office or subsidiary reinsurers of various size resident in Ireland at end-June 2018, with total assets of €34 billion. Reinsurers account for 11 per cent of the assets of the Irish insurance sector. The majority of Irish reinsurance companies are non-life reinsurers (Box B Chart 1), and account for 10 per cent of the total assets in the reinsurance sector.¹³ Non-life insurers can be exposed to a variety of risks depending on their business lines, and commonly use reinsurers as part of their risk management strategy. The top three reinsured lines of business of Irish non-life companies are general liability insurance (54 per cent), motor vehicle liability insurance (17 per cent), and fire and other damage to property insurance (16 per cent). 42 per cent of reinsurance companies are both life and non-life reinsurers, and the remaining reinsurance activity is in the life insurance market.

Box B Chart 1: Number of Reinsurance Companies in Ireland by Type, Q2 2018

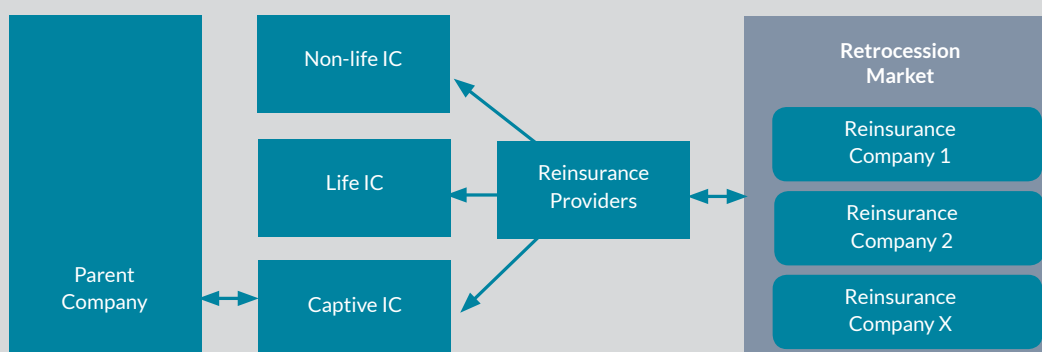
Source: Central Bank of Ireland Regulatory Statistics.

¹⁰ Statistics Division, Central Bank of Ireland.¹¹ Retrocessionaire refers to the reinsurance company that is reinsuring and assuming the risks of another reinsurance company. These retrocessionaires may be related to the original insurance and reinsurance company, meaning the risks are retained with the group.¹² Source: OECD Insurance Statistics¹³ For more information on the insurance sector breakdowns please see the following article: Kelly and Osborne-Kinch (2018), 'Insurance Corporations Statistics in Ireland: Introducing the New Quarterly Statistics', Central Bank of Ireland, QB 1, 2018.

Captive Activity in the Irish Insurance Market

Captive reinsurance companies account for 50 per cent of the Irish reinsurance market (Chart 1). A captive IC is primarily established by the parent company to insure its risks, and allows direct access to reinsurance providers and the retrocession market (Box B Figure 1).¹⁴ The captive IC is wholly-owned and controlled by the parent group, and writes insurance exclusively for that group. As the owners can control how they are insured, captives help the parent group manage the risks and costs of their insurance. Ireland has the fourth-highest number of captive ICs in Europe, with only Guernsey, Luxembourg and the Isle of Man with a higher number of captives.¹⁵ Captives locate in Ireland for various reasons including the competitive corporate tax regime, access to the EU market, and the plentiful supply of professional service providers.¹⁶

Box B Figure 1: Summary of Captive Access to the Retrocession Market



Reinsurance companies can transfer risks to other reinsurance companies via retrocession, as they seek to achieve their risk management/transfer objectives. In some instances there can be multiple retrocessionaires used by reinsurers. A severe natural catastrophe can trigger a series of events as losses cascade through the system.¹⁷ For example, if an IC writes policies to cover property risks, the occurrence of a catastrophe could mean the IC may be faced with a large volume of claims simultaneously as a result of concentration risk within the market. The IC may have reinsured some or all of this risk. In such instances, the reinsurance company will cover the proportion of risk it has assumed. If this reinsurance company has engaged in retrocession, the retrocessionaire will cover the original reinsurer, and so on. When a claim is made, the ultimate risk bearer is unknown to the policyholder. Retrocession reduces the risks facing single reinsurance companies by spreading the risk widely amongst reinsurers, which is particularly beneficial in events such as natural catastrophes, as losses can be large and unpredictable.

¹⁴ Single parent captives are the most popular structure for a captive arrangement.

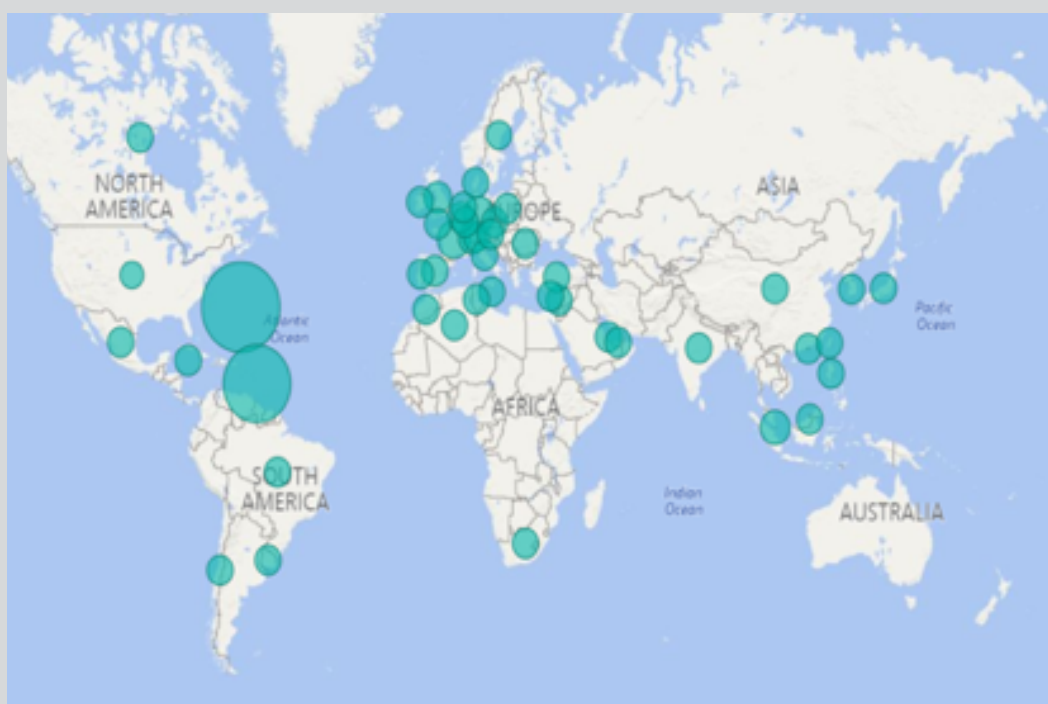
¹⁵ Source: Business Insurance, 2017 Statistics.

¹⁶ Kelly and O'Leary (2014), 'Reinsurance in Ireland; Developments and Issues', Central Bank of Ireland, QB 3, 2014.

¹⁷ Natural catastrophes include geophysical events (e.g. earthquakes) and meteorological events (e.g. storms).

Reinsurance recoverables were recorded by 42 per cent of Irish reinsurers in 2017.¹⁸ Recoverables are the proportion of the balance sheet that has been reinsured, and represent the best estimate of reinsurance companies' losses from past and future claims and expenses that can be recovered from their retrocessionaires. The remaining reinsurance companies (58 per cent) have not taken out reinsurance cover, and of these, two thirds are captives. 27 per cent of the Irish reinsurance sectors' liabilities are reinsured, amounting to €9.4 billion.¹⁹ This risk transfer is between both internal and external related companies. Box B Figure 2 below shows the countries in which Irish reinsurance companies have purchased retrocession cover.²⁰ The size of the dot is representative of the value of retrocession business being written into Ireland by reinsurance companies domiciled in that location. Bermuda and Barbados write the most retrocession cover for Irish reinsurance companies, accounting for 85 per cent of the total cover (Box B Table 1).²¹ In the case where the retrocession activity is to an unrelated third party, the retroceded risks are dispersed across the global insurance system, while the residual risk is retained by Irish reinsurance companies.

Box B Chart 2: Location of Retrocessionaires by size of Irish Reinsurance Recoverables



Source: Central Bank of Ireland Regulatory Statistics.

¹⁸ Reinsurance recoverables are also known as 'Insurance Technical Reserves and Related Claims'.

¹⁹ This instrument is volatile in nature, and represents an estimate of the reinsurance recoverables figure in 2017. Small reinsurance recoverable amounts (< €100,000) were removed from this calculation.

²⁰ Reinsurance recoverables that amount to less than €5 million were removed from Box B Figure 2.

²¹ The figures presented in Box B Table 1 represent reinsurance recoverables as a result of risk transfer between both internal and external related companies.

Box B Table 1: Top 10 domiciles for Retrocessionaires by size of Irish Reinsurance Recoverables

Country	Reinsurance Recoverables (€ million)
Bermuda	4,788
Barbados	3,528
France	561
Germany	471
Singapore	309
United Kingdom	113
Switzerland	65
United States	56
Spain	48
Ireland	32

It is evident that retrocession is a risk management strategy practiced by several Irish reinsurers. Unfortunately, we cannot infer whether reinsurance companies resident in Ireland are reinsuring direct business or engaging in retrocession activities. However, given the number of reinsurance companies located in Ireland, we can assume the risks are moving both into and out of Ireland; Irish reinsurance companies are transferring risks to other reinsurance companies in the system, while Irish reinsurance companies are assuming the risks of non-resident reinsurance companies seeking retrocession cover. In the event of a natural disaster, the losses are spread across the insurance network, as they cascade from policyholders via primary insurers to reinsurance companies. It is imperative that the interlinkages within the global retrocession market and risk transfer cascade continue to be monitored, given the global economy's increasing exposure to natural catastrophes.²²

²² Von-Dahlen and Von-Peter (2012), 'Natural catastrophes and global reinsurance – exploring the linkages', BIS Quarterly Review, December 2012.

Section 2

Signed Article

Assessing the Financial Risks and Buffers of the Central Bank

David Doran, Ruth Gleeson, Steve Kilkenny and Šarūnas Ramanauskas ¹

Abstract

The global financial crisis brought about significant changes in the size and composition of euro area national central banks' (NCBs) balance sheets, and led to substantially increased financial risks. Realised losses can have negative consequences for the independence, policy effectiveness and credibility of central banks and thus, in recent years, NCBs have been paying much closer attention to the measurement of risks on their balance sheet, and to the appropriateness of their financial buffers. This includes increasing the scope of risk measurements, enhancing risk measurement tools, and expanding the actions taken to mitigate risks. The Central Bank of Ireland (the Central Bank) has similarly developed its risk measurement tools and practices during this period. This includes the introduction of risk provisions, and the introduction of a broader framework to facilitate a more risk-based assessment of the Central Bank's financial buffers position. The framework's use of stress scenarios, as well as the application of a multi-year, dynamic balance sheet approach to estimating the Central Bank's risks, serves as an important guide to determining the adequacy of capital and reserves– thereby helping to preserve financial independence.

¹ The views expressed in this article are solely the views of the authors and are not necessarily those held by the Central Bank of Ireland or the European System of Central Banks. The authors are Head of Function for Financial Risk Management, Risk Analytics Manager, and Senior Risk Analysts, respectively. The authors would like to thank Glenn Calverley, Eimear Clerkin, Sharon Donnery, Fergal Power, Peter Sinnott and Helen Twomey for helpful comments. Any remaining errors or omissions are our own.

1. Introduction

While the structure and activities of central banks differ, in general they are exposed to similar financial risks to their commercial counterparts; including market and credit risk on securities, credit risk on lending to counterparties, interest rate mismatch risk, and exchange rate risk on currency exposures. The risk and return trade-offs are different for central banks, whereby the generation of large profits is usually not the primary objective in the management of public funds. Subject to preserving the value of funds invested and maintaining liquidity in its investment assets, central banks will generally aim to generate a profit. While central banks are typically conservative, they are also often exposed to further financial risks associated with implementing monetary policy; for example, risks arising from asset purchases. Given the typically conservative risk appetite, and policy mandate, NCBs pay close attention to their risk controls and risk management framework, and monitor the risks to their balance sheet. While such measures are broadly effective, central banks do take risks and therefore losses can and do arise. To mitigate against potential balance sheet losses, Eurosystem NCBs aim to hold a certain level of 'financial buffers', similar to commercial banks.²

Following the onset of the financial crisis, the risks facing many NCBs increased substantially, the scale and speed of which meant that financial risk buffers also needed to increase substantially to cover potential losses. Some observers may question why central banks actively manage or aim to mitigate such risks via financial buffers, when they could, in theory, operate with negative capital due to the long-term ability to create funds on their own account and generate seignorage income.³ Indeed, there are empirical examples of central banks that have effectively implemented policy whilst operating with negative capital.⁴

These examples do not however preclude potentially undesirable repercussions for central banks with consistently negative capital positions. While membership of a monetary union for central banks in the euro area may cloud the materiality of some of the potential policy disadvantages from operating with low or negative capital – given that policy is set by the Governing Council of the ECB – euro area NCBs would not be immune from the associated reputational and credibility risks. Furthermore, questions may arise as to the consequences for domestic financial stability and the (actual or perceived) fiscal strength of the country in question, depending on the length of time it took for the respective government to recapitalise the NCB.

Taking these considerations into account, many NCBs have enhanced their risk assessment methodologies and taken steps to increase their financial buffers, such as through enhanced levels of reserves and risk provisions. Similarly, the Central Bank has, since 2008, retained the maximum amount of annual profits permissible after distributions to the exchequer – 20 per cent – which has been transferred to its general reserve to build up financial buffers. In addition, the Central Bank has expanded its risk assessment methodologies and processes and has introduced suitable risk provisioning measures.

The remainder of the paper is structured as follows: Section 2 considers financial risk and buffers in the context of central bank balance sheets generally; Section 3 looks at how the Central Bank measures financial risks; Section 4 examines the framework and methodologies for modelling financial risks in the Central Bank, while Section 5 concludes.

² This paper uses the terms 'capital', and 'financial buffer' interchangeably to refer to any combination of capital, reserves (e.g. retained earnings) and provisions, all of which are considered to be effective in absorbing losses. While revaluation accounts can act as a financial buffer, they are not included as such in this paper as they cannot be controlled by a central bank and instead are created due to price movements.

³ Seignorage income can narrowly be defined as the difference between the income or value of currency issued, less the cost of issuing or minting the currency. More broadly, however, seignorage income can be extended to include the income that central banks make from investing the proceeds of currency issuance.

⁴ For instance, the Czech National Bank and the Central Bank of Chile (see Archer and Moser-Boehm, 2013).

2. Financial Risk and Buffers Assessments

2.1 Why should a central bank hold adequate financial buffers?

Starting with the counter argument, there are two well established arguments as to why central banks, generally, should not need to hold capital; (i) the absence of liquidity constraints due to the monopoly supply of currency, which (theoretically) ensures long run profitability, and (ii) the presumption of fiscal support due to the (general) State ownership of central banks.⁵ There are, however, some questions around the validity of these arguments. In particular, the conditionality and extent of government support varies across different institutions, and cannot be guaranteed in perpetuity due to the changing nature of governments and fiscal positions over time. The timeframe within which this recapitalisation should take place is also unclear. While there are nuanced considerations that apply to central banks in a monetary union, such as whether the policy effectiveness of a euro area NCB would be questioned to the same degree as non-monetary union central banks given the role of the ECB, the arguments presented here nonetheless apply to NCBs. In addition, the ECB has stated that NCBs must always be sufficiently capitalised (ECB, 2018a).

Aside from these uncertainties, there are three broader arguments that favour the maintenance of financial buffers by central banks:

(i) Independence

It is generally accepted that central banks should seek to be independent from their governments in order to maintain a clear distinction between the spending of money and money creation, and to maintain policy independence. Institutional and legal arrangements for a central bank are often constructed to support this distinction; however, as noted by Ivanović (2014), “Financial independence is the key element of central bank’s full independence”.

In the case of weak financial strength, a central bank may require fiscal support from the government. This raises the possibility of the government seeking to influence central bank policy, potentially in response to political pressure, thus introducing a short-term perspective to decision-making. Ivanović suggests that, in the case of a central bank requiring support from the fiscal authority, the political establishment could interfere in order to prevent the central bank from pursuing policies that may compound losses, thus curtailing its independence. In short, the necessary distinction between fiscal and monetary policy is made possible by central banks’ financial and operational independence from the prevailing political regime.

(ii) Effect on policy

Insufficient capital may also create a conflict between a central bank’s monetary policy objectives and efforts to avoid negative capital levels. While a central bank could create money with the intention of recapitalising through higher seignorage revenues, doing so could be at the expense of policy objectives, e.g. it could lead to undesirably high inflation. On this point, Stella (1997) concludes that “Central banks need not have capital or even positive net worth to function. However, seriously deteriorated balance sheets causing chronic losses will eventually interfere with price stability”. Specifically, he lists possible actions that a severely weakened balance sheet would demand: the abandonment of inflation control; the repression of the financial system; reliance on interventions from the treasury; or recapitalisation. All of these actions may result in a material diminution in the capacity for a central bank to perform its normal functions.

(iii) Credibility

The reputational impact of negative capital is another important consideration. As Bindseil, Manzanares and Weller (2004) argue, the central bank’s status as an unlimited source of money (and

⁵ Bindseil et. al. (2004) argue: ‘A government re-capitalisation rule would only be a full substitute for capital in this regard if it is unconditionally automatic.’

by extension, its theoretical ability to operate with negative capital) is dependent on public trust in the value of this money, and therefore on the reputation of the central bank itself. Archer and Moser-Boehm (2013) conclude that “Losses or negative capital may raise doubts – however erroneous – about the central bank’s ability to deliver on policy targets, and expose it to political pressure”. Buitert (2015) notes that counterparties may become reluctant to deal with a technically insolvent central bank, with such a scenario potentially affecting a central bank’s ability to implement monetary policy.

Some of these arguments may also apply in the situation of a central bank experiencing losses that do not completely deplete available buffers; in particular, the credibility of the central bank may be affected. This link between losses and credibility is referenced by Bunea *et. al.* (2016), who argue that ‘While they are not a measure of central bank performance, in the long run profits strengthen the credibility of central banks’.

Furthermore, Hall and Reis (2015) consider the use of non-standard monetary policy measures to be a ‘new style central banking’, where central banks borrow from commercial banks by expanding reserves, and use the proceeds to purchase risky assets. This has led to greater risks, including interest rate and default risk, which may result in negative income for the central bank. The authors note that negative central bank income may lead to payments from the government to the central bank or, if no fiscal support were in place, the issuance of endless amounts of reserves.

In summary, there are clear arguments for maintaining positive financial buffers: to preserve financial independence, to ensure effective monetary policy and to retain credibility. The next consideration, therefore, is what level of financial buffers is suitable?

2.2 Measuring the required level of financial buffers

As indicated by Milton and Sinclair (2011), if a central bank’s capital level is too low, the insurance against possible losses would be too small. However, if too much capital is held, there may be an opportunity cost as the funds retained could perhaps be put to better use by the State. They acknowledge that, in reality, the determination of this theoretical equilibrium is far from straightforward. On a similar note, Rule (2015) suggests that there is no straightforward, correct answer as to the ‘optimal’ level of capital for a central bank; instead, it is dependent on a number of factors including its institutional structure and the types of operations it undertakes.

Nonetheless, some central banks do attempt to define an appropriate level of buffers using approaches such as capital adequacy ratios, with Value-at-Risk (VaR) type analysis and more general frameworks also highlighted as possible methods (Archer and Moser-Boehm, 2013). More recently, the Bank of England (BoE) has announced a new financial risk framework, which sets out a number of parameters within which the BoE financial buffers are determined. This framework, agreed between the BoE and HM Treasury, sets out how BoE will be provided with the resources required to carry out the monetary and financial stability responsibilities it has been assigned. It includes a framework for determining the BoE’s required capital, any capital input required from HM Treasury, and how the BoE will distribute or retain profits in circumstances where its capital is above or below threshold levels. The central anchor of the framework is a target level for the BoE’s capital. The target is to be calculated using a forward-looking, scenario-based approach to assess potential losses in a set of severe but plausible events, for activities that are backed by the Bank’s capital (HM Treasury, 2018).

Overall, it is clear that there are several qualitative factors that influence a central bank's capital levels, as well as quantitative elements (e.g., size and risk profile of the asset base). Nonetheless, the Central Bank has taken further steps over recent years to help ensure a sufficient level of financial buffers are held. This includes the implementation of an enhanced capital assessment framework to help measure risks and identify an appropriate level of financial buffers.

3. Measuring the Central Bank of Ireland's Financial Risks

3.1. Central Bank of Ireland Exposures and Risks

As noted, the measurement of risks is central to assessing an appropriate level of buffers. The Central Bank is exposed to various degrees of market and credit risks through monetary policy operations, investment portfolio holdings, and through any holdings of securities purchased for monetary policy purposes.

During normal times, these exposures, and risks, are relatively small, but can increase rapidly in line with measures taken to meet price and financial stability policy objectives. For instance, the Central Bank's balance sheet increased substantially during the global financial crisis, primarily due to increased monetary policy-related lending to Irish counterparties, as well as the provision of emergency liquidity assistance (ELA). Any provision of ELA is at the own risk of the lending NCB. As set out in the ECB's Agreement on emergency liquidity assistance (ECB, 2017a), the main responsibility for the provision of ELA lies with the NCBs concerned. The Special Portfolio that remains on the Central Bank's balance sheet stems from that period of exceptional liquidity assistance to banks as it arose following the liquidation of IBRC.⁶

In addition, more recent large-scale asset purchases have resulted in further expansion of the balance sheet, and the emergence of a risk of a significant interest rate mismatch. This potential mismatch arises from the fact that securities purchased under the ECB's Asset Purchase Programme (APP) were at historically low, fixed rates, while increased liabilities associated with these purchases are linked to variable policy rates. Consequently, the Central Bank is at risk of experiencing decreases in its Net Interest Income (NII), in the event of a significant increase in euro area policy rates (Donnery *et al.*, 2017).

The stylised balance sheet in Figure 1, illustrates how risks change in line with changes in the balance sheet over time. Chart 1 shows that the Central Bank's balance sheet increased five-fold between 2006 and 2010, reaching over €200bn in 2010. A subsequent reduction, as the crisis abated, has since reversed following the purchase of large amounts of assets under the ECB's APP, with the balance sheet reaching approximately €90bn as at end-2017.

⁶ The Central Bank acquired a 'Special Portfolio', comprising Promissory notes, a fixed rate Irish Government Bond, Nama bonds, and a small amount of other assets. The Promissory Notes were exchanged for a portfolio of floating rate notes (FRNs). See CBI (2015) for more information.

Figure 1: Stylised Central Bank of Ireland Balance Sheet

NORMAL TIMES

	Assets	Liabilities
Credit risk/Market risk ▶	Investment portfolio	Banknotes Capital and reserves
Credit risk ▶	Monetary Policy Operations	Deposits
Limited interest rate mismatch		

FINANCIAL CRISIS
2008-2014

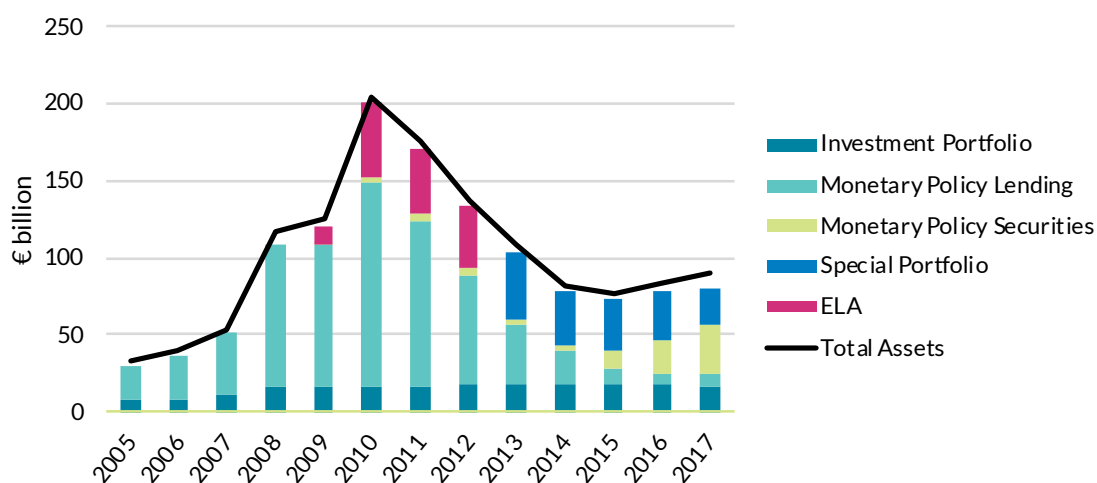
FINANCIAL CRISIS 2008-2014		Assets	Liabilities
Credit risk/Market risk	▶	Investment portfolios	Banknotes Capital and reserves
Credit risk	▶	Monetary Policy Operations	Deposits
Credit risk*	▶	ELA/Special Portfolio	Target 2
Credit risk	▶	Securities for mon. pol	
		Limited interest rate mismatch	

2015 to PRESENT

2015 to PRESENT		Assets	Liabilities
Credit risk/Market risk	▶	Investment portfolios	Banknotes Capital and reserves
Credit risk/Market risk	▶	Special Portfolio	Deposits
Credit risk	▶	Monetary Policy Operations	
Credit risk	▶	Securities for mon. pol	
		Moderate interest rate mismatch	

* Market risk also applied to the Special Portfolio

Chart 1: Central Bank of Ireland Key Financial Exposures 2005 - 2017



Source: Central Bank of Ireland Annual Reports

3.2. Central Bank of Ireland Measurement of Own Risks

As part of the framework for managing its risks, the Central Bank measures and models its financial risks through a number of different channels, using models and methodologies that are widely used within the financial industry to measure credit and market risks. Certain adjustments, however, are required to reflect the bespoke nature of central banking accounting rules. For instance, unrealised losses are recognised in the profit and loss account, while unrealised gains are instead written to revaluation accounts. As a result, the estimated risks are considered as residual losses after revaluation accounts have been considered, and the risk calculations reflect this.

The risk arising from the interest rate mismatch referenced earlier is measured using an internally developed Asset Liability Management (ALM) model. This model estimates the balance sheet over the next ten years, using assumptions based on historical trends, forward guidance and internal policies, with expert judgement also incorporated. A large number of interest rate path scenarios are inputted into the model, allowing the interest income and expense of the various elements of the balance sheet to be calculated for each scenario and risk measurements to be obtained.

3.3. Measuring Adjusted Risk Exposures – Shared Risks

A unique feature of central banks in the Eurosystem is the sharing of income and losses on certain monetary policy operations between the NCBs. While the Central Bank's balance sheet records the value of assets and liabilities held at a particular point in time, this does not fully reflect the risks to which the Central Bank is exposed. Instead, adjustments must be made to account for the loss sharing arrangements in the Eurosystem (see Table 1), whereby losses arising from decentralised monetary policy operations conducted by the Eurosystem are generally shared by the NCBs in proportion to their prevailing ECB capital key shares (the percentage of paid up capital provided by that NCB). The Central Bank's capital key share is 1.65 per cent⁷.

In particular, losses that may arise from certain outright purchase programmes (securities held for monetary policy purposes) are shared. These include the securities markets programme (SMP) (see Alvarez *et. al.*, 2017), the corporate sector purchase programme (CSPP) (ECB, 2018b), and the third covered bond purchase programme (CBPP3) (ECB, 2017b). In addition, any losses on a certain proportion of the public sector purchase programme (PSPP) are shared (ECB, 2018c). Losses arising on other portfolios of bonds held for monetary policy purposes are not shared, including losses on the first or second corporate bond programme (CBPP1/2)⁸ (see Alvarez *et. al.*, 2017) and purchases of domestic jurisdiction government bonds under the PSPP programme (ECB 2018c).

With regard to monetary policy lending, all standard monetary policy lending operations are loss shared, once the collateral used by the borrowing counterparties meets the required eligibility criteria (ECB, 2015a). Any losses arising from lending against collateral that does not meet these requirements are borne solely by the respective NCB (Nagel, 2012; Central Bank, 2018). For example, the Central Bank is one of a number of NCBs, which have Additional Credit Claims (ACC) frameworks in place (ECB, n.d.). This framework, which is temporary in nature, allows the Central Bank to accept as collateral certain credit claims that do not comply with the general Eurosystem eligibility rules and/or credit quality standards. Other assets on NCBs' balance sheets, including investment holdings, are held at the NCB's own risk.

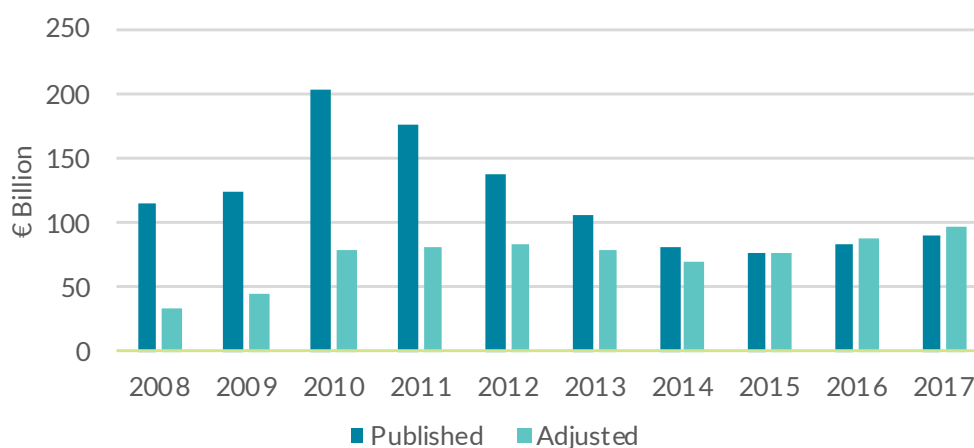
⁷ The capital of the ECB is provided by the central banks of all EU Member States and currently stands at €10.8bn. The amount contributed by each central bank is calculated based on the relevant country's population and GDP. Of this capital, only the portion attributable to the euro area NCBs is fully paid up, amounting to €7.6bn. See ECB (2015b).

⁸ CBPP 1 and 2 have ended and no balances remain outstanding on the Central Bank's balance sheet.

Table 1: Risk Shared Exposures for the Central Bank

Key Exposures (euro billion)	Risk Sharing
Lending to euro area credit institutions (related to monetary policy operations)	Yes
Securities held for monetary policy purposes	
Securities Markets Programme	Yes
Covered Bond Purchase Programme 3	Yes
Public Sector Purchase Programme	Mixed
Corporate Sector Purchase Programme	Yes

Chart 2, presents the historical differences between the published and adjusted risk exposures of the Central Bank. Currently, the difference between these is driven primarily by the CSPP, which is not held on the Central Bank balance sheet.

Chart 2: Central Bank of Ireland Published and Adjusted Risk Exposures

Source: Central Bank Annual Reports, ECB data, Central Bank of Ireland calculations

3.3.1 Sharing of ECB Profit and Losses

Another consideration with regard to loss sharing is potential losses experienced by the ECB. According to Article 33.2 of the ESCB Statute, "...in the event of a loss incurred by the ECB, the shortfall may be offset against the general reserve fund of the ECB and, if necessary, following a decision by the Governing Council, against the monetary income of the relevant financial year in proportion and up to the amounts allocated to the national central banks". This indicates that ECB losses could lower potential profits for the Central Bank during that fiscal year and, as such, can be construed as an indirect loss for the Central Bank.⁹ In recent years, the ECB has accumulated a significant amount of buffers to offset any potential losses.

⁹ For example, this mechanism was utilised in 2004, where the ECB made a net loss of €1.6bn. See ECB, (2005).

3.4 The Central Bank of Ireland's Financial Buffers

While the Central Bank employs active measures to mitigate risks, including rating thresholds, limits and implementation of Eurosystem risk management frameworks; it also seeks to maintain a level of financial risk buffers to absorb losses that may arise under certain circumstances. These buffers primarily consist of capital, reserves and any provisions set aside relating to certain financial risks. In addition, both revaluation accounts and profits in a given year can be used to offset losses.¹⁰ However, as both can deplete quickly due to market fluctuations, they are generally considered less useful as a financial buffer.

The issued and paid-up capital of the Central Bank is €30,474.00, which is held by the Minister for Finance. Reserves are created by the retention of a portion of the Central Bank's profit, the remainder of which is distributed to the Exchequer. This is governed by the Central Bank of Ireland (Surplus Income) Regulations (1943), which requires the Central Bank to transfer a minimum of 80 percent of its profits in any given year to the State - meaning a maximum of 20 percent can be transferred to the general reserve.

Following the recent increase in the balance sheet size and associated financial risk, the Central Bank sought to increase its financial buffers accordingly, to ensure it maintained appropriate levels of financial resilience (Chart 3). To this end, the maximum 20 per cent of profits were transferred to the general reserve between 2008 and 2017, resulting in capital and reserves of €4.2bn as of end-2017.¹¹ In addition, in 2016 the Central Bank established a general risk provision (GRP) to mitigate against the previously discussed potential interest rate mismatch on the balance sheet. A provision for securities has been maintained since 2012.

Chart 3: Central Bank of Ireland Financial Buffers



Source: Central Bank of Ireland Annual Reports

¹⁰ Revaluation accounts can only offset losses for the specific instrument they are held against; i.e., revaluation gains held against one instrument cannot be used to offset losses in another instrument.

¹¹ Over the same period, the Central Bank transferred over €12bn to the Exchequer in line with regulations.

4. A Framework for Assessing the Central Bank of Ireland's Financial Buffers

The Central Bank, in recent times, has enhanced its framework for the assessment of its financial buffers, to help preserve its financial independence. In determining the appropriate capital assessment framework, two key considerations presented themselves, namely whether to utilise the size of the nominal balance sheet as a basis for determining capital adequacy or whether to adopt a risk-based assessment and, secondly, whether to assess the balance sheet on a static or forward-looking basis.

(i) Nominal balance sheet size or risk-based assessment?

While there can be operational and communication benefits to simply setting capital and reserves based on the nominal size of the balance sheet, this does not ensure an adequate link between the level of buffers and the potential for losses. Therefore, a risk-based assessment was considered a more suitable approach.

The Central Bank's introduction of a GRP framework for the 2016 annual accounts helps in this regard, as it enables funds to be put aside for the purpose of building financial buffers against identified probable losses (See Box 8, Central Bank of Ireland, 2017). The Central Bank's internal policies on GRP, however, do not allow provisioning in excess of the specific conditions set out in the GRP policy. This means that the risk-based estimation of overall capital and reserves is a key component of the management of the Central Bank's buffers.

(ii) Static or forward-looking balance sheet assessment?

Risk measures, particularly when used to assess financial risks in an accounting context, tend to utilise a one-year horizon. This is a valid horizon for a number of reasons, including accounting convention and increased uncertainty beyond that point.

Over the medium- to long-term horizon, however, an NCB's risk profile can change substantially, and may increase, as it undertakes actions relating to its mandates (as has been the case with the introduction of the APP). At the same time, NCBs may be limited with regard to how quickly they can accumulate capital and reserves, meaning a sudden build-up of risks could leave a NCB unable to cover losses, should they materialise. Therefore, a forward-looking and dynamic risk assessment approach, using a medium- to long-term horizon, was considered appropriate when assessing the required capital and reserves.

4.1. Determination of recommended capital level

To incorporate these considerations, the Central Bank's enhanced capital assessment framework includes an annual exercise whereby one or more scenarios are calibrated over a five-year timeframe and the potential associated risks to the Central Bank's balance sheet are modelled. Where appropriate, the Central Bank's current risk provisions are added to the capital assessment results to identify the overall level of recommended buffers. Where the overall risk measures point towards potential capital requirements that are in excess of the Central Bank's existing levels of buffers, the Central Bank will seek to retain profits and/or record provisions (as per Section 3.4) in order to build up its buffers.

In determining what the appropriate level of capital should be, the Central Bank considers the scenarios modelled, their probability of occurrence, and the likely magnitude of losses. Additionally, a qualitative and professional judgemental overlay is also incorporated into the risk modelling process and overall profit retention decision. The framework allows for circumstances where, following a build-up of risks and associated buffers, conditions improve and a reduction of buffers may be warranted. Buffers in the form of provisions must be released in the event that the identified risk has

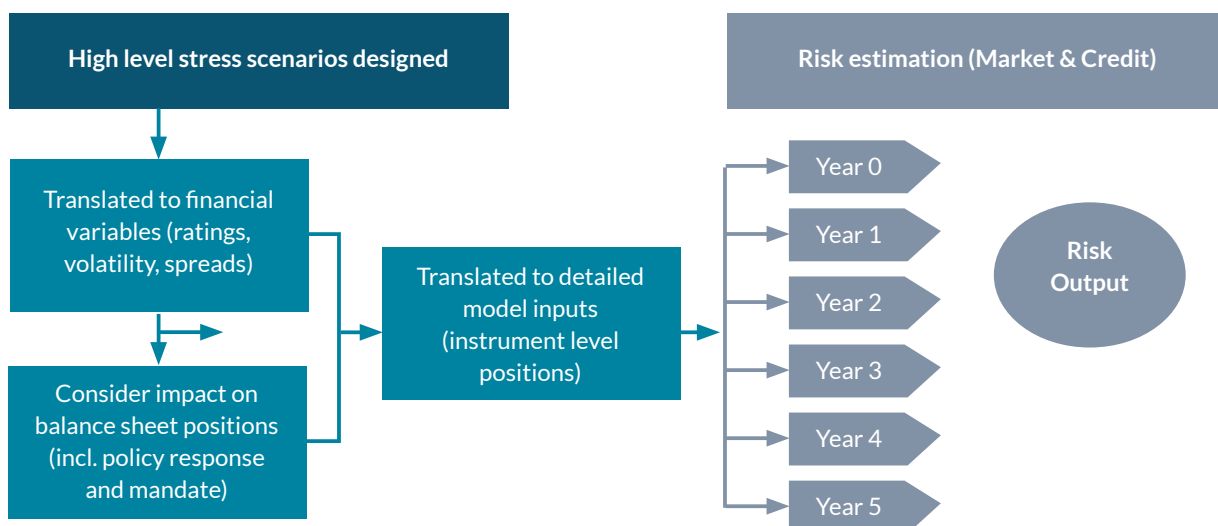
not been realised or the probability of the risk occurring has become negligible. Given that there may be uncertainty as to the future reduction in risks, however, greater discretion is provided for in the case of any risk-implied reduction in the general reserve, with expert judgement incorporated to avoid a reduction that may prove to be premature.

4.2. Modelling of Scenarios within the Capital Assessment Framework

As noted, the framework for assessing the adequacy of the Central Bank's capital and reserves uses stress scenarios to obtain the potential changes in the Central Bank's risk profile under extreme yet plausible stress events, over a five-year horizon. This process focuses on the market and credit risks associated with the Central Bank's exposures, whereas the interest rate mismatch risks and other provision calculations are modelled separately and then considered jointly in the overall assessment of risks and buffers.

A cross-Central Bank working group, coordinated by the Organisational Risk Division's Financial Risk Management Function and comprising experts from across the Central Bank, considers and calibrates appropriate risk scenarios that are then approved by the Central Bank's risk management governance structures. The scenarios assessed within the framework describe hypothetical risk events of varying magnitude and severity, which may occur over a five-year horizon. A baseline scenario is also constructed, which contains assumptions for both expected balance sheet exposures and market conditions. Figure 2 displays the structured process followed during the development and modelling of the stress scenarios.

Figure 2: Methodology for modelling risk under stress scenarios



In developing the stress scenarios, the following three principles are considered to be essential:

- (i) the scenarios should be plausible, but sufficiently adverse to provide useful information;
- (ii) the scenarios should be informed based on the current risk sensitivities of the Central Bank and available economic and market data;
- (iii) the scenarios should consider the evolution of the Central Bank's balance sheet and potential policy action linked to the Central Bank's mandate.

Following this, possible events that may result in adverse movements in key risk variables and exposures are considered (including contagion), along with the likelihood of these events. The scenarios are then mapped and translated to financial variables, such as credit rating migrations, volatility shocks and spread movements. To ensure plausibility, shocks to these variables are assessed with reference to historical time periods and expert judgemental overlay applied.

Future changes to the Central Bank's balance sheet are also included to more accurately measure the potential risk. These changes are based on current information (e.g. ECB forward guidance), but are also adjusted for consistency with the scenario under consideration, including any increases in exposure due to possible policy responses to the underlying stress scenario.

The dynamic nature of these scenarios allows for the examination of the possible evolution of the Central Bank's risk profile over a medium- to long-term horizon and provides a methodology by which risk associated with the Central Bank's off-balance sheet commitments (i.e. Eurosystem shared risks or risk relating to exposures, which are not currently on the balance sheet) can be measured. These off-balance sheet commitments may not always be apparent during benign periods, but may develop quickly in situations that are more adverse.

In order to model the risks associated with the proposed scenarios, these financial and balance sheet variables are parameterised and mapped to granular model inputs for risk estimation. Market and default risk are computed and these individual measures are aggregated to provide a total risk figure.¹² For each scenario, this risk estimation process is performed at discrete intervals over the five-year horizon and an evolution of the risk profile is generated for each scenario, based on the projected balance sheet for that scenario.

4.3 Summary of Capital Assessment Framework Risk Modelling

Table 2 provides a summary of the risk modelling approach employed within the capital assessment framework, to estimate the Central Bank's market and credit risks. The framework includes a bespoke approach towards the risk measurement of lending to counterparties, where an internally developed Credit Default Swap (CDS) based methodology is applied. Under this approach, instead of a specific collateral pool being linked to a loan, a hypothetical CDS contract is purchased from a notional third party, resulting in the modelling of a synthetic loan (see Christofides *et. al.*, 2015).

The underlying models used are calibrated using historical data and are complemented with expert judgement. While market and credit risk are calculated separately, the underlying inputs and settings are calibrated to provide consistency between the two models and this approach is under on-going refinement. As noted, interest rate mismatch risk is measured separately using an ALM model and is considered in conjunction with the market and credit risk methodologies to provide an overall risk assessment.

¹² Expected shortfall at a 99% confidence level (ES99) is the focal point of internal risk analysis for the Central Bank.

Table 2: Market and Credit Risk Modelling Summary

	Market Risk	Credit Risk
Portfolios Modelled	MTM portfolios (including investments, equity and the Special Portfolio)	All investment and monetary policy portfolios, all lending to counterparties and the Special Portfolio
Key Risk Driver	Volatility	Credit Rating
Risk Measure	1-year ES99	1-year ES99

5. Conclusion

Changes to NCBs' operating environments and policy approaches since the onset of the global financial crisis has had a significant effect on the size, composition and risks of their balance sheets. While central banks may theoretically be able to operate with negative capital, should risks be realised such that substantial losses occur, their independence, policy effectiveness and credibility may be compromised. In this context, NCBs have been paying much closer attention to the measurement of risks on their balance sheets in recent years.

The Central Bank has similarly developed its risk measurement tools during this period. The introduction of risk provisions has been a notable feature in recent years, and a broader framework has been introduced which facilitates a more risk-based assessment of the Central Bank's financial buffers position. The use of stress scenarios, as well as the application of a multi-year, dynamic balance sheet approach to estimating the Central Bank's risks, serves as an important guide to determining the adequacy of the Central Bank's capital and reserves.

The stress scenarios, underlying methodology and subsequent results serve as inputs into the Central Bank's profit appropriation decision, which is considered in the context of the Central Bank's current financial buffers and against its own risk appetite and internal policies, whilst also bearing in mind the distinction between avoidable and unavoidable risks.

It is also worth noting that the Central Bank's profits have been sizeable in recent years, but are expected to reduce significantly, following the full disposal of the Special Portfolio. After profits normalise, the Central Bank will be constrained in its ability to materially increase its capital and reserves to protect against potential risk exposures. Therefore, the recent practice of retention of the maximum allowable percentage of profits, which are transferred to the general reserve, serves as an important contributor to the Central Bank's overall financial buffers following the financial crisis. The introduction of a general risk provision in the 2016 Annual Accounts has also helped to improve the Central Bank's buffers. In combination, these measures will help provide the basis for the Central Bank's financial resilience and protect its continued independence in the years ahead.

References

- Alvarez, I., Casavecchia, F., De Luca, M., Duering, A., Eser, F., Helmus, C., Hemous, C., Herrala, N., Jakovicka, J., Lo Russo, M., Pasqualone, F., Rubens, M., Soares, R. and Zennaro, F., (2017). 'The use of the Eurosystem's monetary policy instruments and operational framework since 2012', Occasional Paper Series No. 188, European Central Bank.
- Archer, D. and Moser-Boehm, P. (2013) 'Central bank finances', BIS Papers No. 71, Bank for International Settlements.
- Bindseil, U., Manzanares, A. and Weller, B. (2004) 'The role of central bank capital revisited', Working Paper Series No. 392, European Central Bank.
- Buiter, W. (2015) 'The Euro Area: Monetary Union or System of Currency Boards?', Global Economics View, Citi Research.
- Bunea, D., Karakitsos, P., Merriman, N. and Studener, W. (2016) 'Profit distribution and loss coverage rules for central banks', Occasional Paper Series No. 169, European Central Bank.
- Central Bank of Ireland (2018). 'Annual Report 2017'.
- Central Bank of Ireland (2017). 'Annual Report 2016'.
- Christofides, C., Gleeson, R., Kearns, A. and Lynch, R. 2015. "Framework for enhanced modelling of collateralised lending". *Procedia economics and finance*, 29:183-194.
- Donnery, S., Doran, D., Gleeson, R. and Carroll, K. (2017). 'Non-standard Monetary Policy Measures and the Balance Sheets of Eurosystem Central Banks', Quarterly Bulletin 03, Central Bank of Ireland.
- ECB (2005). 'Annual Report 2004'.
- ECB (2015a). 'The financial risk management of the Eurosystem's monetary policy operations', ECB publication.
- ECB (2015b). 'Capital subscription', <https://www.ecb.europa.eu/ecb/orga/capital/html/index.en.html>.
- ECB (2017a). 'Agreement on emergency liquidity assistance', ECB publication, 17 May.
- ECB (2017b). 'Third covered bond purchase programme (CBPP3) - Questions & answers', <https://www.ecb.europa.eu/mopo/implement/omt/html/cbpp3-qa.en.html>.
- ECB (2018a). 'Convergence Report 2018', ECB Convergence Report, ECB publication.
- ECB (2018b). 'Corporate sector purchase programme (CSPP) – Questions & answers', <https://www.ecb.europa.eu/mopo/implement/omt/html/cspp-qa.en.html>.
- ECB (2018c). 'Public sector purchase programme (PSPP) - Questions & answers', <https://www.ecb.europa.eu/mopo/implement/omt/html/pspp-qa.en.html>.
- ECB (n.d.) 'Non-marketable assets', <https://www.ecb.europa.eu/mopo/assets/standards/nonmarketable/html/index.en.html>.
- Statute of the European System of Central Banks and of the ECB OJ C 202, 7.6.2016, p. 230.
- Guideline (EU) 2016/2249 of the ECB of 3 November 2016 on the legal framework for accounting and financial reporting in the European System of Central Banks (ECB/2016/34), OJ L 347, 20.12.2016, p. 3.
- Hall, R. and Reis, R. (2015). 'Maintaining Central-Bank Financial Stability under New-Style Central Banking', NBER Working Paper 21173.
- HM Treasury (2018), 'Financial relationship between HM Treasury and the Bank of England: memorandum of understanding', https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/718481/The_Financial_Relationship_between_the_Treasury_and_the_Bank_of_England_-_MoU_web.pdf.
- Ireland, Central Bank of Ireland (Surplus Income) Regulations 1943, S.I. No. 93/1943, Dublin.
- Ivanović, V. 2014. "Financial independence of central bank through the balance sheet prism", *Journal of Central Banking Theory and Practice*, 3(2): 37-59.
- Milton, S. and P. Sinclair (2011). 'Central banks' capital: an introduction', in (S. Milton and P. Sinclair, eds.), *The Capital Needs of Central Banks*, pp. 1-32, Oxon: Routledge.
- Nagel, J. 2012. "Understanding central bank balance sheets". *International Economy*, 26(3): 14-54.
- Rule, Garreth (2015). 'Understanding the central bank balance sheet', CCBS Handbook No. 32, Bank of England.
- Stella, P. (1997) 'Do Central Banks Need Capital?', Working Paper No. 83, International Monetary Fund.

Section 3

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, <https://www.centralbank.ie/statistics>

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 pages.

STATISTICAL TABLES: CENTRAL BANK WEBSITE LINKS

Money and Banking:

<https://www.centralbank.ie/statistics/data-and-analysis/credit-and-banking-statistics/bank-balance-sheets/bank-balance-sheets-data>

- 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

Retail Interest Rates:

<https://www.centralbank.ie/statistics/data-and-analysis/credit-and-banking-statistics/retail-interest-rates>

- 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

Locational Banking Statistics:

<https://www.centralbank.ie/statistics/data-and-analysis/credit-and-banking-statistics/locational-banking-statistics>

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

Income Statement Statistics:

<https://www.centralbank.ie/statistics/data-and-analysis/credit-and-banking-statistics/income-statement-statistics>

- Consistent and annualised data on the aggregate Profit & Loss account of all the reporting banks resident in Ireland including Account Fees & Charges, Wages & Salaries and other items of income and expenditure.

Consolidated Banking Statistics:

<https://www.centralbank.ie/statistics/data-and-analysis/credit-and-banking-statistics/consolidated-banking-statistics>

- Detailed quarterly developments in the exposure of Irish-headquartered credit institutions to non-residents, by counterpart country and sector on an ultimate risk basis.

Mortgage arrears:

<https://www.centralbank.ie/statistics/data-and-analysis/credit-and-banking-statistics/mortgage-arrears>

- Mortgage arrears and repossession statistics by property type
- Mortgage arrears and repossession statistics by entity type

Credit and Debit Card Statistics:

<https://www.centralbank.ie/statistics/data-and-analysis/credit-and-banking-statistics/credit-and-debit-card-statistics>

- Data in relation to credit and debit card transactions, including a sectoral breakdown of expenditure, E-commerce, spending outside Ireland
- Data on the number of debit and credit cards issued to Irish residents is also provided

Bank Lending Survey:

<https://www.centralbank.ie/statistics/data-and-analysis/credit-and-banking-statistics/bank-lending-survey>

- Quarterly data on changes in credit conditions over the past three months
- Data on changes in credit standards as well as loan demand for both enterprises and households

BIS Survey on Foreign Exchange and Derivative Markets:

<https://www.centralbank.ie/statistics/data-and-analysis/credit-and-banking-statistics/bis-survey-on-foreign-exchange-and-derivatives-markets>

- Data on the outstanding notional amounts and gross market values of foreign exchange, interest rate, equity, commodity, credit and other OTC derivatives contracts

Private Household Credit and Deposits:

<https://www.centralbank.ie/statistics/data-and-analysis/credit-and-banking-statistics/private-household-credit-and-deposits>

- Credit Advanced to and Deposits from Irish Private Households

Business Credit and Deposits:

<https://www.centralbank.ie/statistics/data-and-analysis/credit-and-banking-statistics/business-credit-and-deposits>

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

Money Market Funds:

<https://www.centralbank.ie/statistics/data-and-analysis/other-financial-sector-statistics/money-market-funds>

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

Securities Holdings and Issue Statistics:

<https://www.centralbank.ie/statistics/data-and-analysis/other-financial-sector-statistics/investment-funds>

- Ireland: Investment Funds Data

Securities Holdings and Issue Statistics:

<https://www.centralbank.ie/statistics/data-and-analysis/securities-statistics/securities-issues-and-holding-data>

- Securities Issue Statistics
- Holding Data

Special Purpose Entities:

<https://www.centralbank.ie/statistics/data-and-analysis/other-financial-sector-statistics/special-purpose-entities>

- Irish Special Purpose Entities

Quarterly Financial Accounts:

<https://www.centralbank.ie/statistics/data-and-analysis/financial-accounts>

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

Public Finances and Competitiveness Indicators:

<https://www.centralbank.ie/statistics/data-and-analysis/securities-statistics/holdings-of-long-term-irish-government-bonds>

- Holdings of Irish Government Long-Term Bonds

<https://www.centralbank.ie/statistics/data-and-analysis/competitiveness-reserves-and-national-debt>

- Harmonised Competitiveness Indicators for Ireland
- Gross National Debt

