



Banc Ceannais na hÉireann
Central Bank of Ireland

Eurosystem



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Section 1



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-12 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.

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Forecast Summary Table

	2017	2018e	2019f	2020f
Real Economic Activity				
(% change)				
Personal consumer expenditure	1.6	3.0	2.1	2.0
Public consumption	3.9	6.4	5.5	2.9
Gross fixed capital formation	-31.0	9.8	7.2	6.1
Exports of goods and services	7.8	8.9	4.1	3.8
Imports of goods and services	-9.4	7.0	4.1	3.9
Gross Domestic Product (GDP)¹	7.2	6.7	4.2	3.6
Gross National Product (GNP)	4.4	6.0	4.0	2.2
Modified Gross National Income (Nominal)	3.0			
External Trade and Payments				
Balance-of-Payments Current Account (€ million)	24,920	28,992	29,224	28,221
Current Account (% of GDP)	8.5	9.1	8.6	7.9
Prices, Costs and Competitiveness				
(% change)				
Harmonised Index of Consumer Prices (HICP)	0.3	0.7	0.7	1.1
<i>of which:</i> Goods	-2.1	-0.2	-1.3	-0.9
Services	2.5	1.6	2.4	2.8
HICP excluding energy	-0.1	0.1	0.8	1.2
Consumer Price Index (CPI)	0.3	0.5	0.7	1.1
Compensation per Employee	0.8	2.8	3.6	3.7
Labour Market				
(% change year-on-year)				
Total employment	2.9	3.0	2.1	1.7
Labour force	1.1	1.9	1.8	1.3
Unemployment rate (ILO)	6.7	5.7	5.4	5.0
Technical Assumptions²				
EUR/USD exchange rate	1.13	1.19	1.13	1.13
EUR/GBP exchange rate	0.88	0.88	0.88	0.88
Oil price (\$ per barrel)	54.40	65.73	64.12	62.50

¹ GNI* and adjusted presentations of the BOP/IIP provide more reliable estimates of the resources available to domestic residents.

² 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.

Comment

Following a strong performance last year, the growth of the Irish economy is projected to moderate somewhat in 2019 and 2020, reflecting both the impact of a less favourable and more uncertain international environment and also the limits imposed by domestic capacity constraints as labour market conditions tighten. Looking ahead, the Central Bank's central forecast is that the outlook for the economy remains broadly positive, with growth set to be supported by a still solid pace of expansion in domestic economic activity, underpinned by continued growth in employment and real incomes, the ongoing recovery of the construction sector and growth in domestic government spending.

While the underlying outlook for growth in the Irish economy remains positive, it is subject to heightened levels of risk and uncertainty related to the future path of the Brexit process. The central projection continues to assume that a disorderly, no deal Brexit scenario can be avoided and that trading relationships between Ireland and the UK remain unchanged over the forecast horizon.

The Central Bank's central forecast is that underlying economic activity is projected to continue to grow at a relatively solid pace in coming years, though some moderation in growth is in prospect in 2019 and 2020. The pace of global and euro area economic activity has weakened since last Autumn and prospects for growth in Ireland's main trading partners have been lowered further in recent months, with risks to the international economic outlook seen as tilted to the downside. The forecast slowdown in external demand is projected to lead to some further moderation in export growth over the forecast horizon.

The main impetus to Irish economic growth over 2019 and 2020 is expected to continue to come from domestic demand, driven by further growth in employment and incomes, though some moderation in employment growth is projected. Recent labour market data suggest that employment growth has slowed a little and that this moderation may already be underway. In light of this, a further small reduction to the forecast for jobs growth has been made in the latest projections. Reflecting the moderation in employment growth, and with some

uncertainty about economic prospects weighing on sentiment, the growth of consumer spending is projected to ease towards 2 per cent over this year and next. Allied to some easing in underlying investment spending, the growth of underlying domestic demand is projected to moderate to 4.0 per cent in 2019 and 3.2 per cent in 2020, marginally lower than the projections set out in the last Quarterly Bulletin. With regard to GDP, following estimated growth of 6.7 per cent last year, growth is projected to moderate to 4.2 per cent in 2019 and 3.6 per cent in 2020. This is a downward revision of 0.2 per cent to the forecast for 2019 compared to that published in the last Quarterly Bulletin.

With regard to Brexit, in previous analysis, the Bank has published work examining the potential medium-term impact on the Irish economy of an orderly WTO scenario, a Free Trade Area-like agreement and, most recently, a disorderly, no deal Brexit. In the first two scenarios it is assumed, as per the proposed Withdrawal Agreement, that a transition period would apply until end-2020, allowing preparations to be made for the transition to the new arrangements and during which time the UK would continue to participate in the EU Customs Union and the Single Market. In both of these cases, immediate disruption would be avoided and the impact of Brexit on the Irish economy would only be felt over the medium- to long-term, beyond the forecast horizon for the current projections. Therefore, neither of these outcomes would have a material bearing on the central forecasts outlined in this Bulletin.

This would not be the case for a disorderly, no deal Brexit, however. A disorderly, no deal scenario would have very severe and immediate disruptive effects, with consequences for almost all areas of economic activity. Certain sectors and regions would be disproportionately affected, especially those which are more reliant on trade with the UK or which are more vulnerable to the imposition of tariff and non-tariff barriers, particularly sectors such as agriculture, food and smaller scale manufacturing, and rural regions and those near the Border. The Central Bank's estimate, as published in the January 2019 Quarterly Bulletin, is that a disorderly Brexit could reduce the growth rate of the Irish economy by up to four percentage points in the first year. Given the current favourable forecasts for the economy as a result of domestic demand and the strong non-UK multinational sector, our assessment is that there would still be some positive growth in output this year and next even under a no-deal scenario, but materially lower than in the central forecast - closer to one per cent growth in both years. Over a decade, the estimates suggest that a disorderly, no deal Brexit could reduce the overall level of Irish output by 6.1 per cent, as compared to 1.7 per cent, for example, in the case of a transition to a Free Trade Area-like arrangement.

However, Brexit is not the only risk to the Irish economic outlook. On the external side, there continue to be other downside risks facing the Irish economy. The international economic outlook has weakened since the publication of the last Bulletin. Given the position of Ireland as a small, highly open economy and the important role of multinational firms within the economy, the evolution of global economic and trading conditions and movements in major exchange rates will have an important bearing on Irish economic performance. On the domestic side, while overall price inflation remains very subdued, wage growth has continued to pick up against a background where the remaining slack in the labour market, in terms of potential additional labour supply, is diminishing (Box D, page 39) and there is increasing reliance on inward migration as an additional source of labour supply (Box C, page 35).

An Timpeallacht Gheilleagrach

I ndiaidh feidhmíocht láidir a bheith ann an bhliain seo caite, tuartar go dtiocfaidh maolú éigin ar fhás gheilleagar na hÉireann in 2019 agus in 2020, rud a léiríonn tionchar na timpeallachta idirnáisiúnta atá níos lú fabhraí agus níos éiginnte, agus na teorainneacha atá ann de bharr constaicí acmhainne intíre fad is atá dálaí an mhargaidh saothair á ndaingniú. Ag féachaint romhainn, is é príomh-réamhaisnéis an Bhainc Ceannais go bhfuil an t-ionchas do gheilleagar na hÉireann fós dearfach ar an iomlán, agus go mbeidh leathnú ar luas seasmhach sa ghníomhaíocht eacnamaíoch intíre ag tacú le fás. Mar bhunús leis sin, beidh fás leanúnach i bhfostaíocht agus i bhfíorioncaim, an téarnamh atá ar siúl san earnáil tógála agus an fás ar chaiteachas intíre rialtais.

Cé go bhfuil an bunionchas d'fhás i ngeilleagar na hÉireann fós dearfach, tá sé faoi réir leibhéil ardaithe riosca agus éiginnteachta a bhaineann le todhchaí phróiseas Brexit. Glactar leis fós sa phríomh-réamhfhaisnéis gur féidir Brexit mí-ordúil, gan chomhaontú, a sheachaint agus go mbeidh an caidreamh trádála idir Éirinn agus an Ríocht Aontaithe gan athrú le linn thréimhse intomhaiste na réamhaisnéise.

Is é réamhaisnéis lárnach an Bhainc Ceannais go dtiocfaidh fás ar luas sách seasmhach ar an mbunghníomhaíocht eacnamaíoch in 2018, cé go bhfuil ionchas ann go dtiocfaidh maolú áirithe ar an bhfás sin in 2019 agus in 2020. Tá lagú tagtha ar luas na gníomhaíochta eacnamaíche domhanda agus luas ghníomhaíocht eacnamaíoch an limistéir euro ó bhí fómhar na bliana seo caite ann, agus laghdaíodh ionchais fáis do phríomhpháirtithe trádála na hÉireann tuilleadh le roinnt míonna anuas, leis sin, dealraíonn sé go bhfuil rioscaí don ionchas eacnamaíoch domhanda ar an taobh thíos. Maidir leis an moilliú tuartha san éileamh seachtrach, tuartar go gcuirfidh sé sin tuilleadh maolaithe ar fhás onnmhairí le linn thréimhse intomhaiste na réamhaisnéise.

Meastar go dtiocfaidh príomhspreagadh d'fhás eacnamaíoch na hÉireann in 2019 agus in 2020 ón éileamh intíre, arna spreagadh ag fás breise ar fhostaíocht agus ar ioncaim, cé go dtuartar go dtiocfaidh maolú éigin ar an bhfás fostaíochta. Tugann sonraí maidir leis an margadh saothair, a glacadh go gairid, le tuiscint go bhfuil moilliú beag tagtha ar fhás

fostaíochta agus go bhféadfadh an maolú sin a bheith ar siúl cheana féin. I ngeall air sin, rinneadh laghdú beag eile ar an ionchas d'fhás post sna réamhaisnéisí is déanaí. Tuairtear go maolóidh an fás ar chaiteachas tomhaltóirí i dtreo 2 faoin gcéad i mbliana agus an bhliain seo chugainn, rud a léiríonn an maolú ar fhás fostaíochta. Tá roinnt éiginnteachta ann freisin maidir leis an tionchar atá ag ionchais eacnamaíocha ar sheintimint. I dteannta maolú áirithe ar bhunchaiteachas infheistíochta, tuairtear go maolófar an fás ar bhunéileamh intíre go 4.0 faoin gcéad in 2019 agus go 3.2 faoin gcéad in 2020, fás atá beagán níos lú ná mar a bhí sa réamhaisnéis a leagadh amach san Fhaisnéis Ráithiúil dheireanach. Maidir le OTI, tar éis fás measta 6.7 faoin gcéad an bhliain seo caite, tuairtear go mbeidh maolú ar fhás go 4.2 faoin gcéad in 2019 agus go 3.6 faoin gcéad in 2020. Is athbhreithniú anuas de 0.2 faoin gcéad é sin ar an réamhaisnéis do 2019 i gcomparáid leis an réamhaisnéis a foilsíodh san Fhaisnéis Ráithiúil dheireanach.

Maidir le Brexit, tá saothar foilsithe ag an mBanc Ceannais in anailís a rinneadh roimhe seo inar scrúdaíodh an tionchar féideartha meántéarmach a bheadh ag cás EDT ordúil, ag comhaontú amhail comhaontú Limistéir Saorthrádála agus, le déanaí, ag Brexit mí-ordúil, gan chomhaontú, ar gheilleagar na hÉireann. Glactar leis sa chéad dá chás go mbeadh feidhm ag idirthréimhse go dtí deireadh 2020, de réir an Chomhaontaithe um Tharraingt Siar beartaithe, rud a cheadódh ullmhúchán a dhéanamh don aistriú chuig socruithe nua. Leanfadh an Ríocht Aontaithe de pháirt a ghlacadh in Aontas Custaim agus i Margadh Aonair an Aontais Eorpaigh le linn na hidirthréimhse sin. Sa dá chás sin, sheachnófaí cur isteach láithreach agus ní bhraithfí tionchar Brexit ar gheilleagar na hÉireann ach sa mheántéarma agus san fhadtéarma, tréimhsí atá taobh amuigh de thréimhse intomhaiste na réamhaisnéisí atá ann faoi láthair. Dá bhrí sin, ní bheadh tionchar ábhartha ag aon cheann de na torthaí sin ar na príomh-réamhaisnéisí a shonraítear san Fhaisnéis seo.

Ní hamhlaidh an cás maidir le Brexit mí-ordúil, gan chomhaontú, áfach. Bheadh éifeachtaí suaiteacha diana agus láithreacha ag cás mí-ordúil, gan chomhaontú, agus bheadh iarmhairtí aige sin do nach mór gach réimse den ghníomhaíocht eacnamaíoch. Maidir le hearnálacha agus réigiúin a bhraitheann níos mó ar thrádáil leis an Ríocht Aontaithe nó atá níos leochailí i dtaca le forchur taraifí agus forchur constaicí neamhtharaife, bheadh tionchar díréireach ar na hearnálacha agus ar na réigiúin áirithe sin, go háirithe earnálacha amhail talmhaíocht, bia agus déantúsaíocht ar scála níos lú, agus réigiúin tuaithe agus réigiúin gar don Teorainn. Is é meastachán an Bhainc Ceannais, mar a foilsíodh i bhFaisnéis Ráithiúil Eanáir 2019, go bhféadfadh Brexit mí-ordúil ráta fáis gheilleagar na hÉireann a laghdú oiread agus 4 phointe faoin gcéad sa chéad bhliain. I bhfianaise na réamhaisnéisí dearfacha atá anois ann don

gheilleagar de bharr éileamh intíre agus de bharr na hearnála láidre ilnáisiúnta neamh-RA, is é ár meastachán go mbeadh roinnt fás dearfach ann ar aschur i mbliana agus an bhliain seo chugainn fiú má bhíonn Brexit gan chomhaontú ann, ach bheadh an fás sin níos lú ná mar atá sa phríomh-réamhfhaisnéis - ní ba ghaire d'fhás aon faoin gcéad sa dá bhliain. Thar tréimhse deich mbliana, tugann na meastacháin le tuiscint go bhféadfadh Brexit mí-ordúil, gan chomhaontú, leibhéal an aschuir Éireannaigh a laghdú 6.1 faoin gcéad, i gcomparáid le 1.7 faoin gcéad i gcás go n-aistreofaí chuig socrú amhail socrú Limistéir Saorthrádála.

Ní hé Brexit an t-aon riosca d'ionchas eacnamaíoch na hÉireann, áfach. Ar an taobh seachtrach, tá rioscaí eile ar an taobh thíos fós ann do gheilleagar na hÉireann. Tá lagú tagtha ar an ionchas eacnamaíoch idirnáisiúnta ó foilsíodh an Fhaisnéis Ráithiúil dheireanach. I bhfianaise go bhfuil geilleagar beag, rí-oscailte ag Éirinn agus i bhfianaise an ról thábhachtaigh atá ag gnólachtaí ilnáisiúnta sa gheilleagar, bíonn tionchar tábhachtach ar fheidhmíocht eacnamaíoch na hÉireann ag forbairt dálaí trádála agus dálaí eacnamaíocha domhanda agus ag gluaiseachtaí sna mór-rátaí malairte. Ar an taobh intíre, cé go bhfuil boilsciú praghsanna foriomlán fós maolaithe, tá fás pá fós ag ardú i gcomhthéacs ina bhfuil laghdú ag teacht ar an scóip sa mhargadh saothair, i dtéarmaí soláthar breise saothair féideartha (Bosca D, lch. 39) agus táthar ag brath níos mó ar inimirce mar fhoinse bhreise soláthair saothair (Bosca C, lch. 35).

The Irish Economy

Overview

- While the underlying outlook for growth in the Irish economy remains positive, it is subject to heightened levels of risk and uncertainty related to the future path of the Brexit process. The central projection continues to assume that a disorderly, no deal Brexit scenario can be avoided and that trading relationships between Ireland and the UK remain unchanged over the forecast horizon. However, the risk of a disorderly, no deal Brexit cannot be fully ruled out. As noted in the previous Quarterly Bulletin, published in January, a disorderly Brexit would have immediate and material economic implications, permeating all areas of economic activity. In the event of such an outcome, the economic outlook for coming years would be revised down significantly.
- If a disorderly, no deal Brexit is avoided and a transition agreement is in place, the outlook for growth in the Irish economy remains positive, albeit subject to some uncertainty given a less favourable international economic environment. The latest forecasts set out in this Bulletin contain a small downward revision to the projection for growth this year. This primarily reflects incoming data suggesting that the outlook for demand in Ireland's trading partners has weakened since the last projection. Underlying domestic demand is projected to grow by 4 per cent this year and by 3.2 per cent in 2020, broadly unchanged from the projections published in January. Reflecting the weaker external environment, the forecast GDP growth has been revised down slightly to 4.2 per cent for this year, while remaining at 3.6 per cent for next year.
- Turning to the external outlook, incoming data suggest that the global expansion has weakened. The main international economic institutions have lowered their forecasts for global GDP growth this year and next, while the ECB's latest staff projections for euro-area GDP have also been revised down. As a small and highly open economy, Ireland is particularly exposed to these developments. Reflecting this and allowing for some offset from accelerating pharmaceuticals exports, overall exports are forecast to grow by 4.1 per cent this year and 3.8 per cent in 2020, 0.2 per cent and 0.1 percentage points lower than at the time of the last Bulletin.
- The strong growth in employment seen in 2017 and 2018 is projected to moderate slightly this year and next as the economy

approaches full employment. However, with employment growth still projected to outstrip growth in the labour force, the unemployment rate is forecast to fall to an average rate of 5.4 per cent this year and 5 per cent in 2020. As spare capacity in the labour market diminishes, wage growth is projected to pick up slightly, with wages forecast to increase by 3.6 per cent this year and 3.7 per cent next year.

- The favourable outlook for the labour market will continue to support consumer spending over the forecast horizon. However, with increasing uncertainty about economic prospects weighing on sentiment, the growth in consumer spending is projected to lag the growth in disposable incomes. This view is supported by the continuing build-up of deposits in the domestic banking system (see Box F), which may be the result of households and firms increasing precautionary savings in the face of uncertainty about the outlook. Growth in private consumption is forecast to slow from 3 per cent last year to 2.1 per cent this year and 2.0 per cent in 2020.
- Growth in underlying investment (investment excluding intangible assets and aircraft) is expected to continue to grow solidly, albeit at a slower pace than in 2018 as uncertainty about Brexit and conditions in the external environment weigh on firms' investment decisions. Growth in some of the key domestic components of investment is projected to remain strong. Housing investment is expected to grow by 19.6 per cent this year and 11.9 per cent next year, driven primarily by the continued pickup in new house building. In 2018, preliminary estimates suggest that approximately 18,000 new housing units were completed, and forward-looking indicators point towards 24,000 and 28,000 completions this year and next.
- Despite the tightening labour market, inflation remains subdued. While higher energy prices pushed up headline inflation during the course of last year, core inflation (excluding energy prices) hovered around zero. Average headline inflation last year of 0.7 per cent reflected a 0.2 per cent decline in goods prices, offset by a 1.6 per cent increase in services prices, which was mainly driven by growth in housing rents. Headline HICP inflation is projected to average 0.7 in 2019 as lower energy prices offset a gradual pick up in services inflation. Conditional on the market implied path of oil prices and exchange rates, headline HICP is expected to increase by 1.1 per cent in 2020.
- With regard to Brexit, in previous analysis, the Bank has published work examining the potential medium-term impact on the Irish

economy of an orderly WTO scenario, a Free Trade Area-like agreement and, most recently, a disorderly, no deal Brexit. In the first two scenarios it is assumed, as per the proposed Withdrawal Agreement, that a transition period would apply until end-2020, allowing preparations to be made for the transition to the new arrangements and during which time the UK would continue to participate in the EU Customs Union and the Single Market. In both of these cases, the impact of Brexit on the Irish economy would only be felt over the medium- to long-term, beyond the forecast horizon for the current projections and, therefore, neither of these outturns would have a material bearing on the central forecasts outlined in this Bulletin.

- This would not be the case for a disorderly, no deal Brexit, however. A disorderly, no deal scenario would have very severe and immediate disruptive effects, which would permeate almost all areas of economic activity. Certain sectors and regions would be disproportionately affected, particularly agriculture and food sectors as well as Border regions and other rural regions with a heavy reliance on agriculture and a particular reliance on the UK as an export market. The Central Bank's estimate, as published in the January 2019 Quarterly Bulletin, is that a disorderly Brexit could reduce the growth rate of the Irish economy by up to four percentage points in the first year. Given the current favourable forecasts for the economy as a result of domestic demand and the strong non-UK multinational sector, our assessment is that there would still be some positive growth in output this year and next even under a no-deal scenario, but materially lower than in the central forecast - closer to one per cent growth in both years. Over a decade, the estimates suggest that a disorderly, no deal Brexit could reduce the overall level of Irish output by 6.1 per cent, as compared to 1.7 per cent, for example, in the case of a transition to a Free Trade Area-like arrangement.

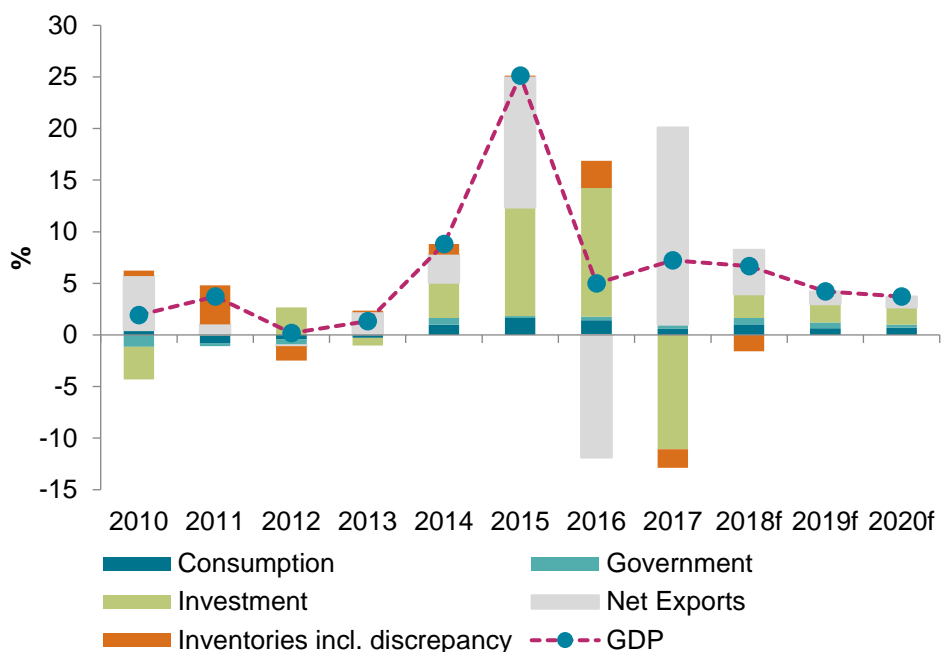
Table 1: Summary of Brexit Estimates

Scenario	Long Run Effect on Output (% deviation from baseline)
FTA like	-1.7
WTO with transition	-3.2
Disorderly WTO	-6.1

Source: Central Bank of Ireland.

Note: Table 1 shows the estimated long-run effect on output of different Brexit scenarios. The results are presented as per cent deviations from a no-Brexit baseline.

Figure 1: Contributions to GDP Growth



Source: CSO and Central Bank of Ireland.

Box A: The International Economic Outlook
By Monetary Policy Division

Global economic activity has weakened and the growth outlook is less favourable than previously anticipated. Vulnerabilities stemming from emerging market economies and the weakening European economy, combined with a slowdown in trade and global manufacturing, Brexit uncertainty and risks in financial markets, may adversely affect confidence and investment, undermining global economic activity. In light of this assessment, the OECD revised down its projections in March, projecting global GDP to grow by 3.3 per cent in 2019 and 3.4 per cent in 2020.

Euro area economic activity has remained weak, reflecting the slowdown in external demand and a number of country and sector-specific adverse factors, which seem to have more persistent effects than previously anticipated. Real GDP increased by 0.2 per cent on a quarterly basis in the fourth quarter of 2018, following 0.1 per cent growth in the third quarter. On the other hand, unemployment is still on a downward trajectory and reached 7.8 per cent in January, stable compared with December 2018 and down from 8.6 per cent in January 2018. This remains the lowest rate seen since October 2008. Monetary policy remains accommodative, thereby underpinning domestic

demand and supporting favourable financing conditions. This, coupled with rising wages, is expected to support consumption and economic activity over the medium term.

The ECB staff macroeconomic projections released in March reflect a weaker outlook than previously projected, notably in the near term. Euro area GDP is foreseen to increase by 1.1 per cent in 2019, 1.6 per cent in 2020, and 1.5 per cent in 2021 (substantially revised down for 2019, slightly revised down for 2020 and unchanged for 2021 compared with the December 2018 projections). The balance of risks is still tilted to the downside, mainly reflecting external geopolitical factors, as well as uncertainties stemming from the risk of rising protectionism and vulnerabilities in emerging markets.

Turning to euro area sentiment indicators, the Markit composite PMI posted 51.9 in February 2019 (up from 51.0 in January). While slightly higher than in January, the reading signals that the rate of expansion remains modest. The European Commission's economic sentiment indicator and the business climate indicator remained broadly flat in February, while the consumer confidence indicator increased slightly.

Euro area annual HICP inflation was 1.5 per cent in February, up from 1.4 per cent in January. While moderating from the very high rates observed in 2018, energy remains the component with the highest annual rate. Measures of underlying inflation have remained broadly stable, but subdued, with HICP excluding energy and unprocessed food increasing by 1.2 per cent. Looking ahead, energy price inflation is expected to decline further over the forecast horizon, partly offset by gradually rising underlying inflation. The March projections forecast annual HICP inflation at 1.2 per cent in 2019, 1.5 per cent in 2020 and 1.6 per cent in 2021 (revised down for the whole projection horizon compared with the December 2018 projections).

In light of these developments, at its March meeting the Governing Council (GC) of the ECB announced measures aimed at providing additional monetary stimulus. The GC launched a new series of quarterly targeted longer-term refinancing operations (TLTRO-III), starting in September 2019 and ending in March 2021, each with a maturity of two years, with built-in incentives for credit conditions to remain favourable. An extension to the horizon in which the GC will not raise rates was also outlined, with the key ECB rates now expected to remain at their present levels at least through the end of 2019.

Turning to the United States, the labour market remains robust, with strong job gains and low unemployment, but growth of economic activity has slowed from its solid rate in the fourth quarter of 2018. Growth of household spending and business investment has slowed

down somewhat in the first quarter of 2019. While headline inflation has declined due to lower energy prices, inflation excluding energy and food have remained near 2 per cent.

The US Federal Open Market Committee (FOMC) maintained the target range for the federal funds rate unchanged at 2.25 to 2.5 per cent at its March meeting. The FOMC confirmed that, in light of global economic and financial developments and muted inflationary pressures, it will be patient in determining future adjustments to the target range for the federal funds rate. Moreover, the FOMC announced that, if the economy evolves as expected, the unwinding of the Federal Reserve balance sheet will stop at the end of September 2019.

In the United Kingdom, economic growth slowed in late 2018 and appears to have weakened further in early 2019. The slowdown mainly reflects a weaker external demand and the fall in household spending and business investment, as Brexit uncertainties continue to weigh on confidence. Heightened uncertainty and elevated bank funding costs are expected to subside over time and, together with looser fiscal policy, to support the growth recovery in the medium term.

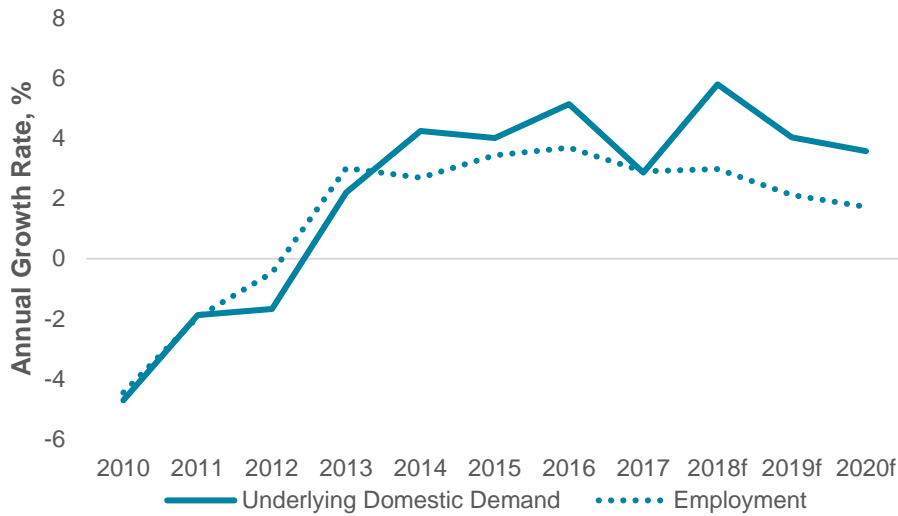
The Bank of England's Monetary Policy Committee maintained the Bank Rate and the stock of bond purchases unchanged in March, at 0.75 per cent and at 445 billion GBP respectively. Looking ahead, the appropriate monetary policy stance will reflect the broader economic outlook. This, in turn, will continue to depend significantly on the type of transition to new trading arrangements between the EU and the UK.

Demand

Domestic Demand Overview

Consumer and investment spending are expected to grow at a more moderate pace in 2019 and 2020. Underlying domestic demand is forecast to grow by 4 per cent this year and by 3.2 per cent in 2020, forecasts which are broadly unchanged from those published in the last Quarterly Bulletin. The projected moderation in the pace of growth in the domestic economy over this year and next reflects both the advanced stage of the business cycle and the negative impact of heightened uncertainty on consumer and investor confidence.

Figure 2: Underlying Domestic Demand and Employment



Source: CSO and Central Bank of Ireland.

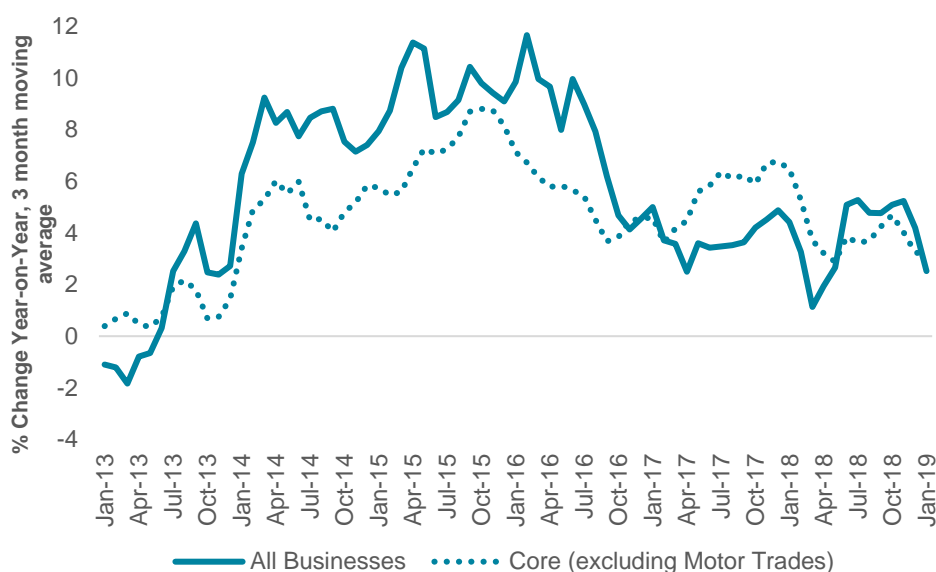
Consumption

Consumer spending increased by an estimated 3 per cent last year according to the preliminary National Accounts estimates for 2018, supported by strong growth in employment and incomes. While consumption was particularly strong in the second and third quarters of 2018, growth slowed to 2.6 per cent year-on-year in the fourth quarter, consistent with the weakening of consumer sentiment towards the end of last year.

Looking ahead, the outlook is for growth in consumption to continue to moderate, reflecting some slowing in the growth of employment over the forecast horizon and with heightened uncertainty regarding international prospects and, in particular, the risk of a disruptive UK departure from the European Union weighing on consumer confidence. As a result, growth in personal consumption expenditure is projected to average 2.1 per cent this year and 2 per cent in 2020.

Table 2: Expenditure on Gross National Product 2018 to 2020f

	2018	% change in		2019f	% change in		2020f
	€millions	vol	price	€millions	vol	price	€millions
Personal Consumption Expenditure	104,254	2.1	1.8	108,306	2.0	2.2	112,903
Public Net Current Expenditure	31,968	5.5	1.9	34,368	2.9	2.0	36,072
Gross Domestic Fixed Capital Formation	79,438	7.2	2.8	87,512	6.1	2.4	95,091
<i>Building and Construction</i>	27,077	10.5	5.9	31,669	7.5	3.8	35,368
<i>Machinery and Equipment</i>	24,370	2.6	0.3	25,008	4.3	1.2	26,385
<i>Intangibles</i>	27,991	8.0	2.0	30,835	6.0	2.0	33,339
Value of Physical Changes in Stocks	1,593			1,593			1,593
TOTAL DOMESTIC DEMAND	217,253	4.4	2.2	231,779	3.7	2.3	245,659
<i>of which: Underlying Domestic Demand</i>	172,321	4.0	2.3	183,384	3.2	2.4	193,794
Exports of Goods & Services	383,808	4.1	1.1	403,631	3.8	1.5	425,413
FINAL DEMAND	601,061	4.2	1.5	635,410	3.8	1.8	671,072
Imports of Goods & Services	-284,355	4.1	0.8	-298,498	3.9	1.2	-313,787
<i>Statistical Discrepancy</i>	1,754			1,754			1,754
GROSS DOMESTIC PRODUCT	318,460	4.2	2.0	338,666	3.6	2.3	359,039
Net Factor Income from Rest of the World	-66,634	5.2	1.1	-70,824	8.9	1.5	-78,320
GROSS NATIONAL PRODUCT	251,826	4.0	2.3	267,841	2.2	2.5	280,719
EU subsidies less taxes	1,157			1,230			1,290
GROSS NATIONAL INCOME	252,983	4.0	2.3	269,072	2.2	2.5	282,008

Figure 3: Index of Volume of Retail Sales

Source: CSO and Central Bank of Ireland.

Investment

Preliminary National Accounts data indicate that headline investment increased by 49.1 per cent, on a year-on-year basis, in the fourth quarter of 2018. As noted in previous *Bulletins*, this figure includes some activities of the multinational sector, namely aircraft leasing and intellectual property-related transfers, which have limited impact on domestic economic activity. Excluding these components, underlying investment increased by 4.5 per cent year-on-year in the fourth quarter of 2018.

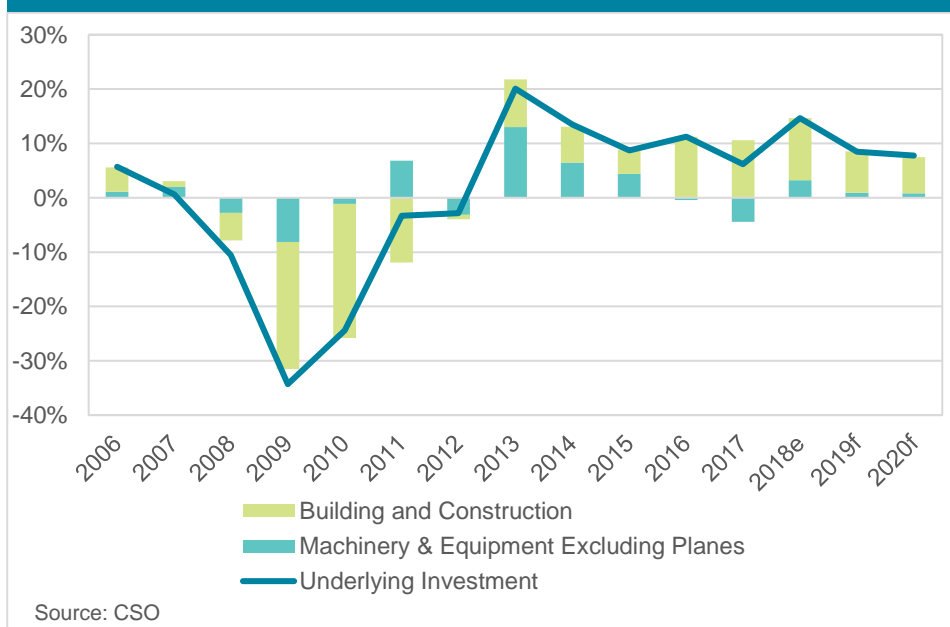
For 2018 as a whole, headline investment increased by 9.8 per cent. Within that aggregate, overall building and construction investment continued to increase strongly, up 16 per cent for the year. Housing investment increased by 24.1 per cent in 2018, with strong increases in new dwellings and spending on home improvements, while other building and construction, mainly commercial and civil construction, increased by 12.1 per cent. Machinery and equipment investment, excluding the Other Transport component (mainly the aircraft sector) increased by 11.5 per cent in the year. Turning to the more volatile components, investment in aircraft increased by 60.1 per cent in 2018, while investment in intangible assets declined by 10.9 per cent.

With regard to residential investment, available indicators point to a continued increase in housing output, albeit from a low base. Based on estimates from the CSO, there were approximately 18,000 new dwellings completed in 2018. Forward-looking indicators suggest that this is expected to increase to approximately 24,000 and 28,000 new housing units in 2019 and 2020, respectively. Overall, residential investment is expected to increase by 19.6 and 11.9 per cent in 2019 and 2020,

respectively. For the non-residential sector, activity is forecast to increase by 7 per cent and 6 per cent, respectively, in 2019 and 2020 compared with the 12 per cent rate of growth seen in 2018. There are upside as well as downside risks associated with this forecast, as firms relocating to Ireland after Brexit may result in an increased demand for commercial property. On the other hand, an adverse Brexit scenario may result in a more generalised slowdown in construction investment.

The solid pace of expansion in the construction sector is corroborated by survey data from the Ulster Bank Construction PMI, which is signalling continued growth in the overall, new orders and expectations indices. Overall, building and construction investment is forecast to increase by 10.5 and 7.5 per cent in 2019 and 2020.

Figure 4: Growth in Underlying Investment



With regard to the other components of investment, underlying machinery and equipment investment increased by 11.5 per cent in 2018. While the fourth quarter was particularly weak, this component of investment is particularly volatile under normal economic conditions. As such, more data will be required to determine whether the slowdown is related to Brexit. Underlying machinery and equipment investment is projected to increase by 2 and 3 per cent this year and next. However, these forecasts are subject to greater uncertainty than usual.

Given the outlook for its various components, underlying investment is forecast to increase by 8.4 and 6.6 per cent in 2019 and 2020, respectively.

Government Consumption

Reflecting measures announced in Budget 2019, government consumption is projected to grow by 5.5 percent this year, moderating to

growth of 2.9 percent in 2020 contributing 0.5 and 0.3 percentage points to GDP in 2019 and 2020, respectively. This follows estimated growth of 6.4 per cent in 2018.

External Demand and Balance of Payments

Exports and Imports

Net exports were a key driver of GDP growth in 2018, with preliminary estimates indicating a contribution of 4.3 percentage points, as strong year-on-year growth in total exports of 8.9 per cent was only partially offset by the 7 per cent increase in overall imports.

Rapid year-on-year growth in goods exports of 12 per cent in 2018 was primarily attributable to pharmaceutical products.³ As such, the strength of pharmaceutical exports has masked the somewhat tepid export performance of the majority of other merchandise export categories. While the share of total merchandise exports accounted for by contract manufacturing remains large at almost 30 per cent in 2018, this represents a decline of 3.5 percentage points since 2017.

Merchandise exports to the United Kingdom declined by approximately 2.7 per cent in value (0.8 per cent in volume) in 2018, such that the share of the United Kingdom in the total value of merchandise exports continued to decline, standing at approximately 11 per cent in 2018, down from over 13 per cent in 2017.⁴ In contrast, the share in the total value of other EU Member States increased from less than 38 per cent in 2017, to almost 39 per cent in 2018. While the value of merchandise exports to the United Kingdom fell in absolute terms, it remains a critically important export destination for domestically oriented sectors including agriculture, and SMEs more generally.

Services exports grew rapidly, almost entirely driven by the robust growth in computer services, which increased by approximately 18 per cent year-on-year. Business services exports, which had been a key contributor to services exports in recent years, declined in 2018, primarily due to a fall in research and development services of almost EUR 2.3 billion.

The contribution of exports to overall GDP growth is forecast to decline in 2019, as demand from Ireland's main trading partners is set to weaken. This will only be partially offset by the associated fall in imports of intermediate goods. While the recent high growth rates largely reflect developments in the pharmaceuticals sector, the forecast figures are based on the assumption that future export growth will grow broadly in line with demand for imports from Ireland's main trading partners. Overall

³ See [Box C: Strong Pharmaceutical Exports Boost Overall Export Growth](#), Quarterly Bulletin 1, 2019.

⁴ Note that the share of the United Kingdom in total exports increased in volume terms, from approximately 53 per cent in 2017, to over 54 per cent in 2018.

export of goods and services are expected to rise by 4.1 per cent this year and by 3.8 per cent in 2020.

There was a broad based recovery in the growth in imports, which increased by 7 per cent in 2018 according to preliminary estimates, having declined by 9.4 per cent in 2017. Most broad categories of both merchandise and services recorded increases on an annual basis. Machinery and transport equipment (largely reflecting aircraft leasing), and chemicals and related products (much of which are used as inputs for pharmaceuticals exports) were two merchandise import categories that recorded substantial increases. In contrast, the import of research and development services declined by EUR 3.3 billion.

Import growth is forecast to decline considerably compared to 2018, to 4.1 per cent in 2019 and 3.9 per cent in 2020. This reflects the projected weakening of both domestic demand and export growth.

The above forecast assumes that current trading arrangements between the United Kingdom and the European Union will apply during a transition period until the end of 2020. Any increase in barriers to trade between Ireland and the United Kingdom arising from Brexit would result in a more severe decline in exports, for two reasons: first, the United Kingdom is one of Ireland's most important trading partners, so any shock to import demand from the United Kingdom would have pronounced adverse consequences for Irish exporters. Second, Ireland relies on UK road networks as a "land-bridge" to access markets on the European mainland. Thus, any increase in barriers to trade between the United Kingdom and the EU could result in delays for goods that transit through the United Kingdom on their way to Ireland.

Table 3: Goods and Services Trade 2017 to 2020f

	2017	% change in		2018e	% change in		2019f	% change in		2020f
	€millions	vol	price	€millions	vol	price	€millions	vol	price	€millions
Exports	352,556	8.9	0	383,808	4.1	1.1	403,631	3.8	1.5	425,413
Goods	192,854	11.8	-3.4	208,237	4.2	0.1	217,200	3.9	0.7	227,250
Services	159,701	5.2	4.5	175,571	3.9	2.2	186,431	3.7	2.5	198,163
Imports	263,268	7	0.9	284,355	4.1	0.8	298,498	3.9	1.2	313,787
Goods	85,214	14.3	1.1	98,542	4	0.5	103,041	3.9	0.6	107,688
Services	178,054	3.7	0.7	185,813	4.1	1	195,457	3.9	1.5	206,099

Box B: US profit repatriations and Ireland's Balance of Payments statistics

By Lorenz Emter, Bernard Kennedy and Peter McQuade

Over the past decade a small number of very large “superstar” US multinational enterprises (MNEs) have accumulated considerable savings (Chart 1).⁵ Retained offshore earnings, in particular, amounted to over USD 2 trillion by the end of 2017 and reflect profits earned by US MNEs’ foreign subsidiaries from previous years.⁶ Up until recently, US MNEs had been reluctant to repatriate these foreign profits because of the relatively high corporate tax rate maintained by the US.⁷ In this box, we document how the process of profit repatriation affected the external statistics of the United States and Ireland. Although the magnitude of the financial flows was sizeable, the extent to which they affected real economic activity is likely to be very limited.

⁵ See: Avdjiev, Stefan and Everett, Mary and Lane, Philip R. and Shin, Hyun Song, (2018), “Tracking the International Footprints of Global Firms.” BIS Quarterly Review, March 2018; Ayyagari, Meghana, Demircuc-Kunt, Asli, and Maksimovic, Vojislav (2018), “Who are America's star firms?” World Bank Policy Research Working Paper WPS8534.

⁶ See: Zoltan Pozsar (2018), “Repatriation, the Echo-Taper and the €/€ Basis,” Credit Suisse, Global Money Notes No. 11.

⁷ See: Smolyansky, Michael, Gustavo Suarez, and Alexandra Tabova (2018) “U.S. Corporations’ Repatriation of Offshore Profits,” FEDS Notes. Washington: Board of Governors of the Federal Reserve System, September 4, 2018.

US MNEs reduced their foreign retained earnings in 2018. The legislation of the Tax Cuts and Jobs Act (TCJA) by the US Federal Government in December 2017 substantially reduced the headline corporate tax rate from 35 percent to 21 percent. Combined with a one-time charge on profits currently held offshore of 15.5 per cent for cash and 8 per cent for investments in illiquid assets, this reduced the tax rate that US MNEs are required to pay when repatriating their foreign retained earnings (IMF 2018). As a consequence, many US MNEs repatriated some of their foreign retained earnings and then undertook substantial share buybacks, primarily in the first half of 2018 (Chart 2).⁸

These transactions had a substantial effect on the US balance of payments, namely the components of direct investment earnings and receipts (Charts 3). In the international transactions accounts, income on equity (or earnings) of foreign affiliates consists of two components: 1) Dividends that are repatriated to the parent company; and 2) Reinvested earnings that remain with foreign affiliates. According to the US Bureau of Economic Analysis (BEA), following the US corporate tax reform, reinvested earnings turned negative in the first quarter of 2018 reflecting the withdrawal of foreign retained earnings by U.S. parent companies from their foreign affiliates.⁹ The decline in reinvested earnings also translated into a partially offsetting decline in net acquisition of direct investment assets in the financial account (by USD 139 billion in Q1 2018) which only started to recover during Q3 2018.

The transactions of US MNEs were so sizeable that they had a material impact on global foreign direct investment (FDI) flows in 2018. According to UN (2018), global FDI fell by 19% in 2018, to an estimated USD 1.2 trillion from USD 1.47 trillion in 2017 (Chart 4).¹⁰ The decline was concentrated in developed countries where FDI inflows fell by an estimated USD 451 billion with flows to Europe declining by USD 272 billion. Furthermore, the OECD (2018) assert that the primary factor behind the decline in FDI was the repatriation of accumulated foreign earnings by US MNEs following the US tax reforms.¹¹

⁸ Data on the volume of funds repatriated on an institution-by-institution basis is not directly available. However, JP Morgan estimate that USD 225 billion was repatriated during Q1 2018 and this slowed to USD 115 billion in Q2 2018 and USD 44 billion in Q3 and Q4. The research also suggests that, in addition to share buyback schemes, firms used the repatriated funds to retire corporate debt and, to a lesser extent, increase capital expenditure. See: JP Morgan (2019). Flows and Liquidity, Global Markets Strategy 08 March 2019.

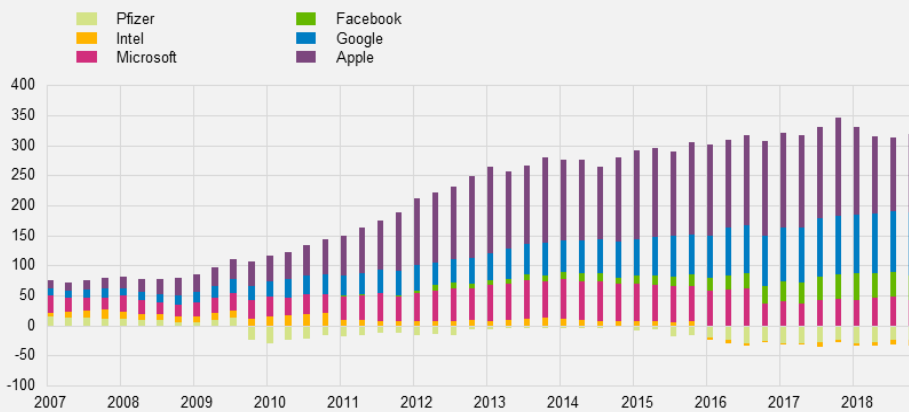
⁹ See: Bureau of Economic Analysis (2018) "U.S. International Transactions, Third Quarter 2018," 19 December 2018.

¹⁰ See: United Nations (2018) "Global Investment Trends Monitor", October 2019.

¹¹ See: OECD (2018) "FDI in Figures," October 2018.

Some of the profits repatriated by US MNEs involved their Irish subsidiaries. While the list of “Superstar” firms is very limited, many of them (including some of the technology firms included in Charts 1 and 2) maintain a presence in Ireland.¹² This partly explains why on a country basis, Ireland, despite its small size, remains the third largest foreign holder of US Treasury securities, as US MNEs and their subsidiaries have purchased these, and other safe assets, as a store of value for their retained earnings.¹³ Since the introduction of the US tax reform, Ireland’s reported holdings of US treasuries have declined by approximately EUR 50 billion (Chart 5). This is consistent with the repatriation of retained earnings by US MNEs’ subsidiaries, as the firms may have sold US treasuries in order to repatriate funds to the US before paying dividends or engaging in share buybacks.

Chart 1: Cash holdings of selected US MNEs

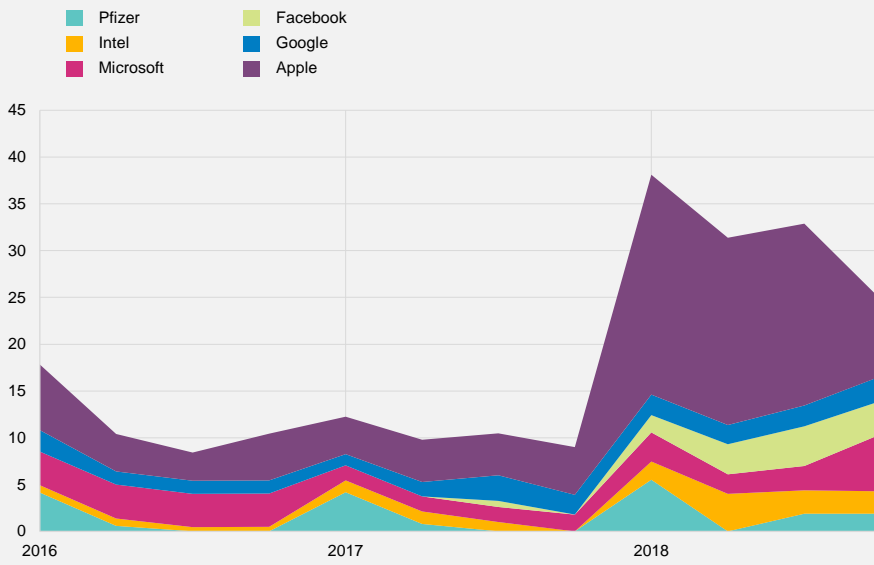


Source: Bloomberg
 Unit: Billions of USD, cash and cash equivalents net of debt

¹² Firm level data on the amount of funds repatriated is not available. However, the total amount of offshore earnings up to end 2017 was concentrated in a small number of entities particularly in the IT and healthcare sectors and many of these companies have operations in Ireland (Pozsar 2018).

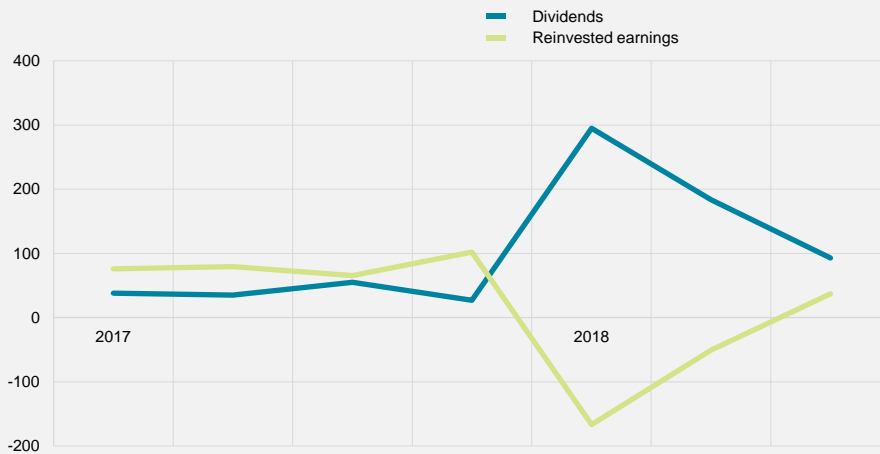
¹³ The sizeable fund industry located in Ireland is another important factor contributing to the very large holdings US Treasuries by Irish residents. See: Daly, Pierce and Moloney, Kitty (2017) “Liquidity & Risk Management: Results of a Survey of Large Irish-Domiciled Funds,” Central Bank of Ireland, Quarterly Bulletin 03/2017.

Chart 2: Share buybacks by selected US MNEs



Unit: Billions of USD
Source: Bloomberg

Chart 3: US Direct Investment Earnings and Receipts



Unit: Billions of USD, seasonally adjusted
Source: US Bureau of Economic Analysis

Chart 4: FDI Inflows by Region, 2017-2018

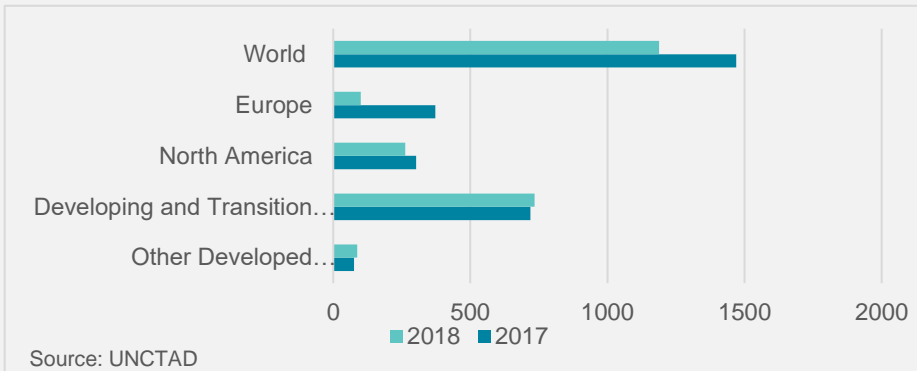
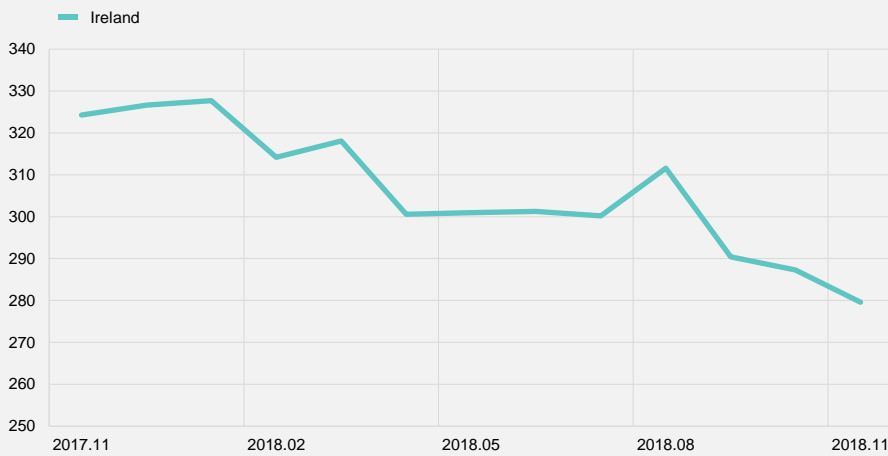


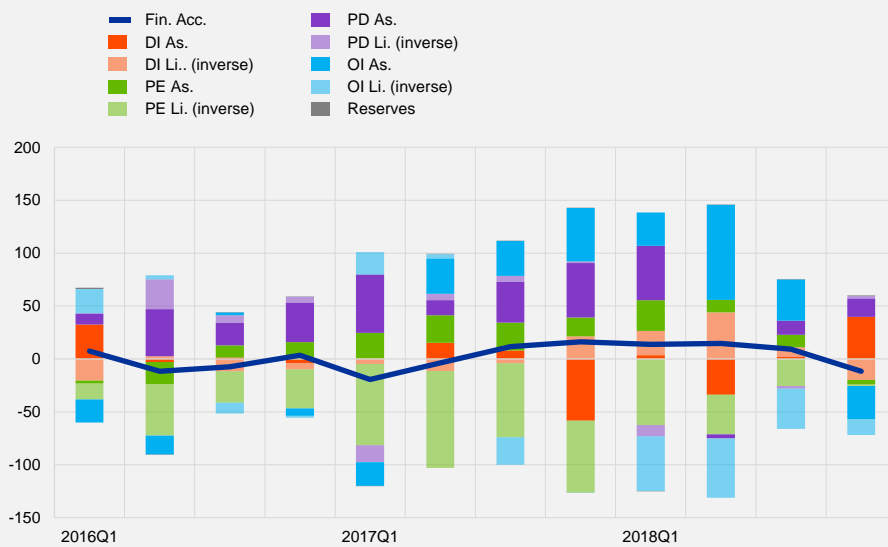
Chart 5: Irish holdings of US Treasuries



Note: Billions of USD

Source: US Department of Treasury, Treasury International Capital (TIC) system.

Chart 6: Irish Financial Account - Standard Components



Note: Euro Billions. Positive values denote outflows, negative values denote inflows. Inverse indicates that signs on liabilities have been reversed.

Source CSO, Balance of Payments Tables BPQ16 and BPQ17

The repatriation of profits by US MNEs also affected portfolio and direct investment in the Irish BoP.¹⁴ Prior to the second quarter of 2018, Irish resident investors (including Irish resident subsidiaries of US MNEs) consistently purchased substantial portfolio debt securities, which likely include perceived safe assets such as US Treasuries (Chart 6). Up to Q1 2018, these flows frequently reached EUR 50 billion per quarter, but turned negative in the second quarter of 2018 and remained low in the third and fourth quarters of 2018. At the same time, between Q4 2017 and Q3 2018, direct investment into Ireland declined by EUR 97 billion, while direct investment out of Ireland declined by EUR 86 billion.¹⁵ These transactions primarily took place vis-a-vis euro area countries, rather than the US (Chart 7). This reflects the fact that US MNEs are often organised in a very complex way involving European and other financial centres whereby the location of profits and sales do not always fully overlap. Consequently, Ireland might have served as one intermediary in the process of profit repatriation back to the US.¹⁶

Finally, it is important to emphasise that, while the accounting values involved are very large, adverse real economic effects on domestic Irish economic activity are likely to be very limited. In fact, Clancy (2019) finds that past US tax cuts have typically had a small, positive, effect on Irish economic activity.¹⁷ Moreover, the effects of the TCJA legislation might be even more limited insofar as they are primarily linked to US MNEs' tax optimisation activities, much of which focus on the movement of intellectual property assets rather than physical capital and underlying economic activities.

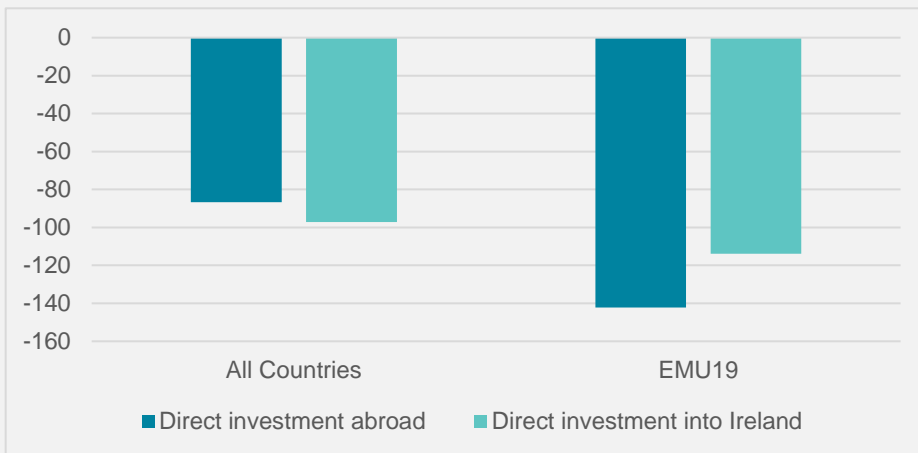
¹⁴ According to the UN (2018), repatriations by US MNEs had a major effect on a few important host countries, particularly Ireland, which registered outflows of USD 121 billion.

¹⁵ It should be noted in Q4 2018 increases in direct investment both into and out of Ireland were recorded for the first time since Q3 2017.

¹⁶ A similar decline in FDI assets and liabilities is also observable in the balance of payments statistics of Luxembourg. It should also be noted that the effects on the balance of payments of the US and Ireland are unlikely to be entirely symmetric. See: Flaherty and Sibley (2016) "Explaining Ireland's FDI Asymmetry with the United States," Central Statistics Office.

¹⁷ Clancy, Daragh (2019) "US corporate tax rate cuts: Spillovers to the Irish economy," Journal of Statistical & Social Inquiry Society of Ireland, forthcoming.

Chart 7: Direct Investment into and out of Ireland by Region (2017Q4 - 2018Q4)



Source: CSO

Net Trade, Factor Incomes and International Transfers

The headline current account balance showed a surplus of almost €30 billion, over 9 per cent of GDP, in 2018. However, much of this surplus reflects the distorting effect of globalisation on Ireland's balance of payments, and indicative estimates suggest that the modified current account balance, which better reflects the domestic economy, was much smaller standing at approximately €10 billion. The trade balance, which measures exports minus imports, exceeded €99 billion, or 30.9 per cent of GDP in 2018, having increased by over €10 billion compared to 2017.

The deficit on net investment income exceeded -€66 billion, as investment income payable to foreign investors (€147 billion) greatly exceeded that payable to Irish resident investors (€80 billion). In net terms, this represented an increase in outflows on investment income of almost €6 billion.

The surplus on the financial account balance increased markedly, reaching almost €26 billion in 2018, compared to less than €5 billion in 2017. However, recent developments in the financial account, including both direct and portfolio investment, may have been affected by recent changes in US tax legislation (see Box C).

The trade balance is forecast to stay relatively constant at just under 31 per cent of GDP in 2019 and 2020, while net factor income outflows are expected to continue to increase markedly over the next two years. Overall, the headline current account surplus is forecast to decline from 9.0 per cent of GDP recorded in 2018, to 8.6 percent of GDP in 2019, and 7.8 per cent of GDP in 2020.

Table 4: Balance of Payments 2017 to 2020f

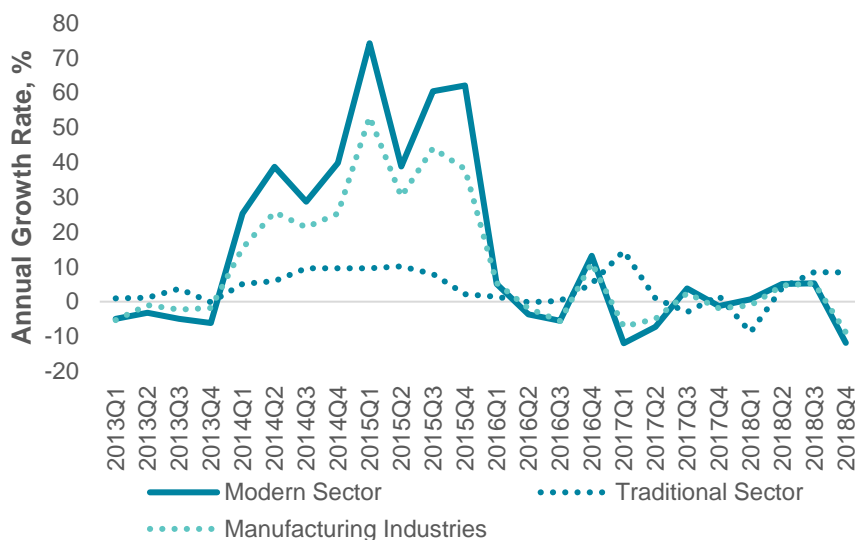
	2017	2018	2019f	2020f
Trade Balance	89,287	99,453	105,133	111,626
<i>Goods</i>	107,640	109,695	112,990	117,072
<i>Services</i>	-18,353	-10,242	-7,857	-5,446
Net Factor Income from the Rest of The World	-59,777	-65,376	-70,824	-78,320
Current International Transfers	-4,590	-5,085	-5,085	-5,085
Balance on Current Account	24,920	28,992	29,224	28,221
(% of GDP)	8.5	9.1	8.6	7.9

Supply

The Quarterly National Accounts for the fourth quarter of 2018 provide preliminary output figures for the year, showing 6.7 per cent growth in GDP. The growth in output is spread across most sectors of the economy, but two sectors, Information and Communication and Professional, Admin and Support Services, recorded double-digit growth, expanding by 26.9 per cent and 11.2 per cent respectively. It is worth noting that these sectors are distorted by the activities of MNEs. The Information and Communication category contains multinational technology companies while Professional, Admin and Support Services includes aircraft leasing activities. The largest decline in output is again seen in Agriculture, Forestry and Fishing which declined by 17.5 per cent in 2018. It is the only sector that had a negative annual growth rate in every quarter of the year.

Industrial production data for 2018 show that total output in the industrial sector of the economy declined by 0.1 per cent over the year as a whole. Given the effect that some large exporters have on the industrial production data, it is useful to consider the output of the modern and traditional sectors separately. Production in the modern sector, which contains high value manufacturing such as pharmaceuticals and computer components, declined by 0.9 per cent, while output in the traditional sector grew by 2.8 per cent in 2018 (Figure 5). While forward-looking data such as the Investec Manufacturing PMI has weakened in recent months, survey indicators still signal continued expansion in the industrial sector in the period ahead, albeit a slower one than before.

Figure 5: Volume of Industrial Production



Source: CSO

The Labour Market

The latest labour market data point to some moderation in the growth of employment towards the end of last year. Labour Force Survey (LFS) data for the fourth quarter of 2018 indicate that employment was 2.3 per cent higher on a year-on-year basis in the final quarter, which represents a slowdown from the 3 per cent pace of annual growth recorded in the third quarter of 2018. The recent LFS data indicate that there were an additional 50,000 persons at work in the final quarter of last year compared to the same period in 2017, bringing the total number of persons at work to 2.28 million, a new peak for the Irish economy. While moderating somewhat, employment growth has continued to be broad-based, increasing in ten of the fourteen economic sectors over the year, with the largest sectoral increases recorded in administration and support service activities and in construction. The pace of expansion in employment is projected to moderate further in coming years, with employment growth of 2.1 per cent and 1.7 per cent projected for 2019 and 2020, respectively.

The latest LFS data also showed continued strong growth in the labour force, which increased by 1.9 per cent over 2018 on an annual basis. The growth of the labour force was primarily driven by stronger contributions from demographics, with net inward migration accounting for around three-quarters of the addition to the labour force in 2018. The main sources of migration to Ireland have altered over the previous decade and Box C provides a detailed analysis of the changing patterns of migration by nationality and sectors of employment in Ireland in recent years.

The labour force participation rate remained at 62.2 per cent in the fourth quarter. Developments in the participation rate during 2018 show a notable increase in female participation, which was offset by a decrease in male participation. Looking ahead, the labour force is projected to increase by a further 1.8 per cent in 2019 and 1.3 per cent 2020.

Considering these developments, unemployment is expected to continue to fall over the projection horizon, albeit at a slower pace than during the last number of quarters. The seasonally adjusted unemployment rate in the final quarter of 2018 was 5.7 per cent, unchanged from the previous quarter, and down from 6.4 per cent in the fourth quarter of 2017. In terms of levels, the fourth quarter data indicate a year-on-year decrease of 15,200 persons in unemployment to 128,800. The long-term unemployment rate (i.e. those unemployed for longer than one year) fell to 2.1 per cent in the final quarter of last year compared with 2.5 per cent a year earlier. In light of the above projections for growth in employment and the labour force, the unemployment rate is projected to decline further to an average rate of 5.4 per cent this year and 5.0 per cent in 2020.

This outlook is subject to considerable risk. Under a no-deal Brexit scenario, the outlook for the labour market would be considerably weaker. While the labour market would be affected by weaker growth in the economy, certain sectors and regions would be more exposed to a disruptive Brexit. In particular, employment in agri-food is particularly exposed, as the sector is reliant on the UK as an export market, and also relatively more sensitive to both tariff and non-tariff barriers.

As the economy approaches full employment, employers looking to grow their workforce face a dwindling supply of potential workers. The latest Non-Employment Index for the fourth quarter of 2018 showed a further decline in the potential labour supply from those outside of the labour force (see Box D). As a result, the Non-Employment Index has fallen to below the levels seen before the last crisis, suggesting that the potential additional labour supply of workers coming from outside the labour force has reduced significantly in recent years. This implies an increasingly important role for inward migration in easing domestic labour supply pressures (Box C).

While employment growth is set to moderate somewhat, the employment outlook still remains relatively favourable and wage growth is projected to pick up further over the forecast horizon. Compensation per employee rose by 2.8 per cent in 2018, and is forecast to rise to 3.6 per cent in 2019 and 3.7 per cent in 2020. With consumer price inflation projected to remain relatively subdued, there is the prospect of further significant gains in terms of the real purchasing power of workers along with an anticipated rise in consumer spending.

The most recent earnings data from the CSO Earnings Hours and Employment Survey (EHECS) reported a strong pickup in wages in the fourth quarter of 2018, with a 3.8 per cent rise in average hourly earnings compared with Q4 2017. For the year as a whole, the data point to a 3 per cent rise in average hourly earnings in 2018, compared to 1.9 per cent in 2017. In terms of sectoral outcomes, the largest gains were recorded in the mining and quarrying (7.8 per cent), information and communication (7.5 per cent), and construction (4.4 per cent) sectors. Wage growth as measured in the EHECS Survey was stronger in the private sector throughout 2018, with a 3 per cent increase compared to 2.5 per cent in public sector.

Vacancy rates appear to be highest in the multinational-dominated service sectors of professional, scientific and technical activities, and financial, insurance and real estate activities. The same sectors display the highest average weekly earnings for employees while also employing the highest share of non-Irish workers. These trends may suggest some shortages of domestic skills in key business areas, with companies seeking to recruit workers with relevant skillsets from abroad.

Box C: Inward migration and the Irish labour market

By David Staunton¹⁸ and Diarmaid Smyth¹⁹

The marked improvement in the Irish labour market since 2012 offers the clearest evidence of the recovery and growth in the economy since the financial crisis. Projections in this Bulletin forecast average annual employment growth of 1.9 per cent to 2020 with the macroeconomic projections underlying Budget 2019 forecasting annual growth rates of 1.6 per cent from 2021 to 2023. With unemployment already very low, this pace of employment growth requires a readily available supply of labour if the risk of overheating is to be contained. This Box looks at one aspect of labour supply, inward migration, and examines the extent to which it has boosted labour force growth, as well as its impact on the labour market.

The long-term trend in Irish migration is shown in Figure 1. There has been a notable return to net inward migration in recent years, averaging 23,300 persons annually since 2016. Furthermore, it would appear that the bulk of these inflows (mainly aged 25-44 years) have entered the labour force, with the vast majority finding employment.²⁰ In terms of

¹⁸ Irish Economic Analysis Division

¹⁹ Department of Finance

²⁰ For example, a decomposition of labour force growth by participation and demographics shows marked growth in the latter component in recent quarters, with a much more modest contribution from participation.

Irish nationals, there was a large net outflow during the financial crisis, amounting to a cumulative 113,000 persons between 2008 and 2015. In recent years however, this trend slowed before reversing last year with a marginal net inflow of Irish nationals – the first time this has occurred since the crisis (Figure 2). Evidence from previous experience of returning emigrants shows that they are attracted home by a wage premium.²¹

Figure 1: Total migration flows

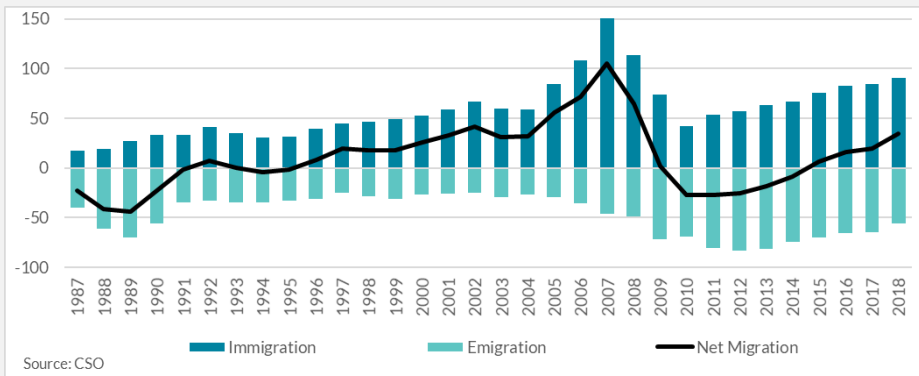
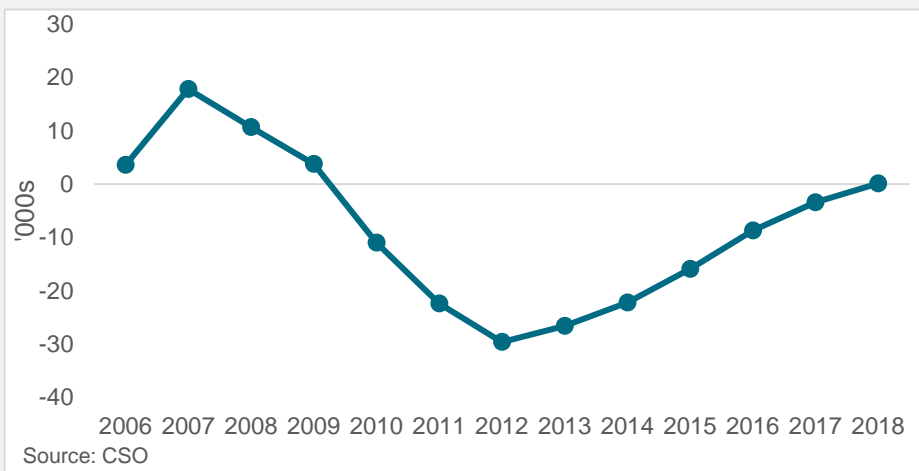


Figure 2: Net migration of Irish people



Another recent feature of migration trends has been the changing nationality of migrants. Figure 3 shows the total number of PPS numbers issued to adults from key countries in 2007 and 2018.²² There has been a notable fall in inward migration from 2004 accession states, particularly Poland and Lithuania. However, even as the Irish labour market strengthens and wage growth picks up, there is no indication that inward migration from these countries will approach its 2007 peak over the medium term. This is for two reasons – firstly, the growth in inward migration up to 2007 occurred against the background of the

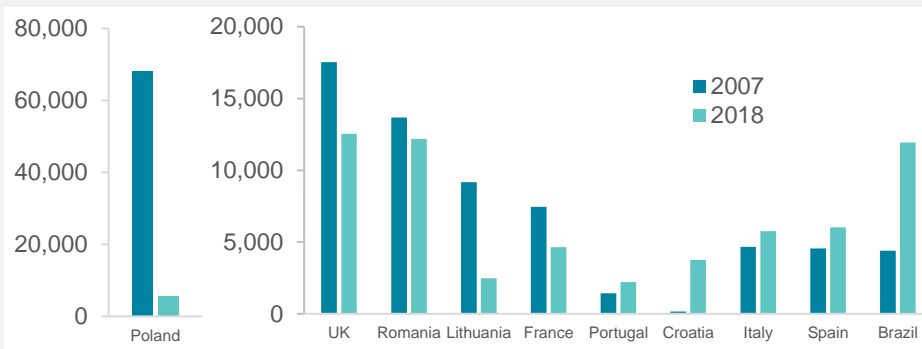
²¹ See for example, Barrett and O’Connell (2001), ‘Is There a Wage Premium for Returning Irish Migrants?’, *The Economic and Social Review*, Vol. 32, No. 1.

²² A PPS number is a unique ID number necessary for individuals to interact with Government departments, employers etc. New migrants are issued one soon after arrival.

2004 EU enlargement and the extension by Ireland (and some other EU countries) of free movement rights to the accession countries. No similar structural change is currently on the horizon. Secondly, the Eastern European labour market is far stronger than it was a decade ago, and while wage levels in these countries are still lower than in Ireland, they are rising much more quickly. Ireland’s real wage premium relative to Lithuania, for example, fell by 34 per cent between 2007 and 2017; in Poland, it fell by 23 per cent.²³

The current level of inward migration is far lower than in 2007, but inflows from some countries have increased. Croatia gained free movement rights after its 2013 accession, and has shown the most dramatic increase in percentage terms. Inward migration from Southern European countries has also risen, likely driven by elevated unemployment (youth unemployment, in particular) in the region. In absolute terms, the biggest increase is from Brazil.

Figure 3: PPSNs issued to adults (15+) from key migration countries²⁴



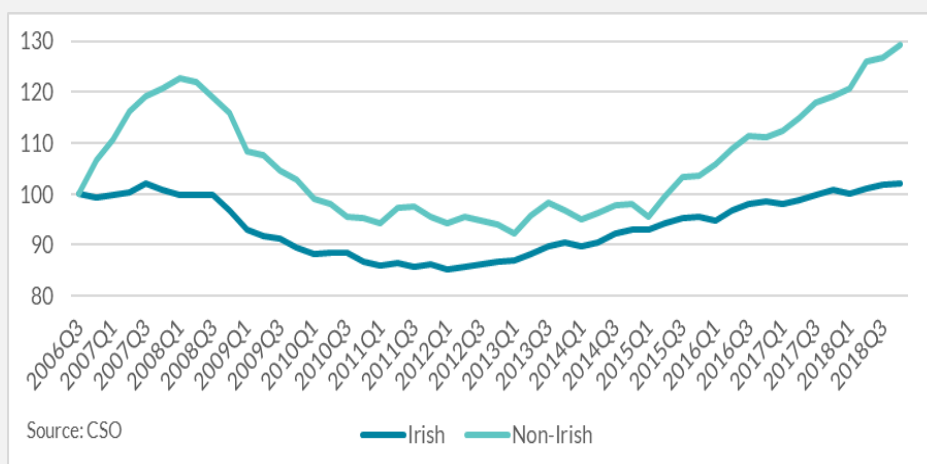
Source: CSO, Department of Social Protection

Given recent employment growth, it is useful to look at the increase in Irish and non-Irish employment separately. Figure 4 shows that while the level of Irish employment has grown steadily in recent years, non-Irish employment has increased much more quickly. Since 2015Q3, the level of non-Irish employment has grown faster than Irish employment. The average annual growth rate of non-Irish employment since 2015 is 7 per cent; the equivalent figure for Irish employment is 3 per cent.

²³ These are OECD figures, PPP adjusted in 2017 USD, and reflect both wage levels and costs of living in the respective countries.

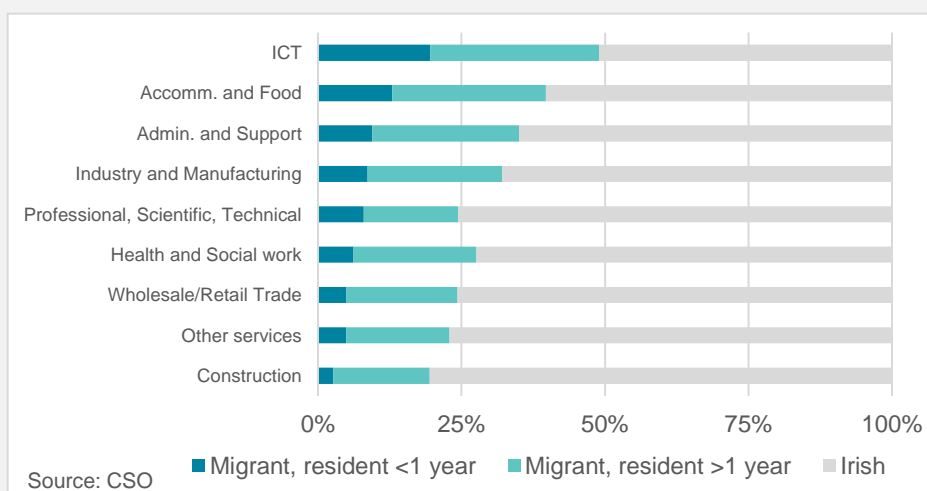
²⁴ Note that the 2018 (15+) figure for each country is calculated from its total 2018 PPSN figure multiplied by the proportion of PPSNs in 2017 issued to adults.

Figure 4: Index of Irish and non-Irish employment, 2006Q3 = 100



It is also possible to look at the impact of inward migration across sectors. If immigration is now an important source of labour supply, it is useful to examine whether these workers are alleviating shortages in the tightest sectors of the labour market. For each sector, figure 5 breaks down workers hired within the last year into three categories - Irish, recent migrants (resident less than one year), and other migrants (resident more than one year). The extent to which migration is supporting hiring in sectors with elevated vacancy rates, such as ICT, becomes clear. In 2018, almost half of the new hires in ICT were migrants, 40% of whom arrived in Ireland within the last year. The chart also shows how the construction sector now hires predominantly from the domestically available stock of labour. In 2018, just 3% of new hires in construction were recent migrants.

Figure 5: Nationality of new hires, 2018²⁵



While significant variation exists across sectors, the importance of migration in the labour market has risen considerably since 2015. Given

²⁵ Migrant here is defined as those classified as “non-Irish” in the LFS. A recent migrant is a non-Irish worker who has been resident in the country for less than one year.

the outlook for employment growth, inward migration will continue to be an important source of additional labour supply in a tightening labour market.

Box D: An Update on Non-Employment and Labour Market Slack

By Stephen Byrne and Thomas Conefrey²⁶

The Irish economy has been in a sustained growth phase for a number of years. The unemployment rate has fallen from 16 per cent in 2012Q1 to 5.7 per cent in the fourth quarter of 2018. Due to the highly open nature of the Irish labour market and the mobility of labour supply, there is uncertainty over what constitutes full employment in an Irish context. Nevertheless, at the current level of unemployment it is clear that the labour market is now closer to a position of full employment than at any stage since 2009. Despite this and considering the rapid growth in output since 2013, wages have been relatively slow to pick up until recently.

One reason for this slow pickup in wages could be that the standard unemployment rate is not adequately capturing the degree of spare capacity in the labour market. To be counted as unemployed, an individual must be actively seeking work and available to start in the next two weeks. In previous analysis published in 2017, we developed a new indicator of utilisation in the labour market called the Non-Employment Index^{27 28} which distinguishes between groups like short and long-term unemployed, discouraged workers and passive job seekers, factoring in how likely individuals in each group are to transition into employment in the next quarter.

These non-employed individuals are not recorded as unemployed in the official measure of unemployment, but instead are classed as outside of the labour force. In some cases, these individuals may never transition back into employment, for instance those who have retired or those who are too ill to work. However, some other individuals who are without work and are not seeking employment may still transition into the labour market if their circumstances change. This is borne out in the

²⁶ Irish Economic Analysis Division

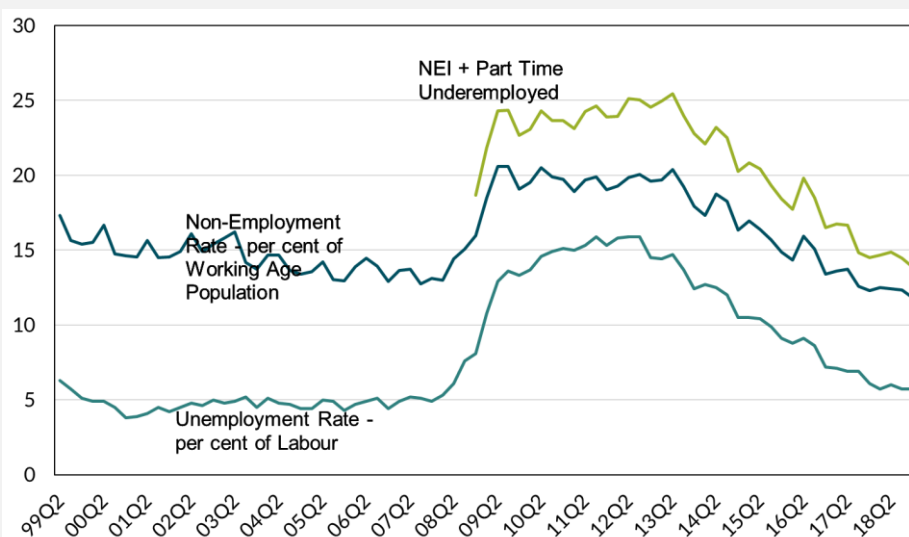
²⁷ This analysis is based on the work from the USA by Hornstein, Kudlyak and Lange (2014).

²⁸ [Byrne, S and T. Conefrey. A Non Employment Index for Ireland. Central Bank of Ireland Economic Letter Series, 2017.9.](#)

data. In our analysis, we showed that individuals who classified themselves as “seeking but not immediately available” had a higher probability on average of gaining employment in the next quarter than those who were classed as long-term unemployed. This is despite fact that the latter are included in the unemployment rate while the former are not.

In 2017, when the original analysis was published, wage growth remained particularly muted. A potential explanation for the subdued nature of wage growth lay in the fact that while the unemployment rate had fallen very quickly since the beginning of 2012, the Non-Employment Index had fallen more slowly and was above the level seen before the onset of the financial crisis. An update to the Non-Employment Index using the most recently available microdata from the Quarterly Labour Force Survey show that this is no longer the case (Figure 1).

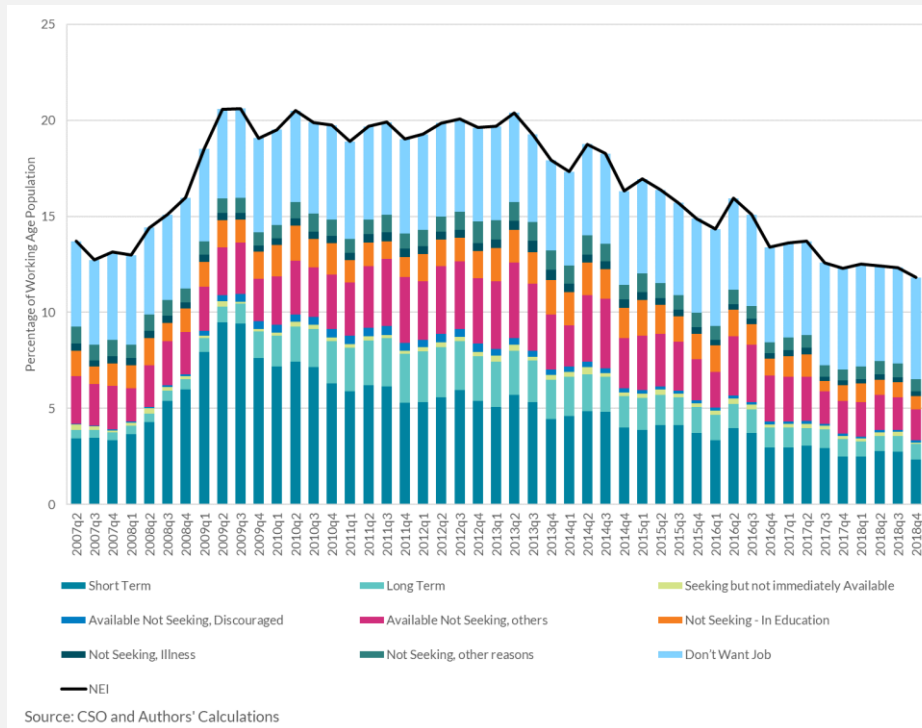
Box D Figure 1: Non-Employment Index



As shown in figure 1, the Non-Employment Index has now fallen to below the levels seen before the crisis, and now stands at 11.9 per cent, compared with 13.1 per cent in late 2007. In recent quarters, the Non-Employment Index has continued to decline, suggesting that the level of underutilisation in the labour market is reducing.

A decomposition of the non-employment index shows that the largest contributions to the decline in the non-employment index recently, outside of the officially unemployed, has come from those who say they are available but not seeking, others. According to Eurostat, these may be individuals who are currently not seeking a job for personal or family reasons.

Box D Figure 2: Decomposition of Non-Employment Index



During the period from 2013 to 2017, there were large numbers in categories such as the available not seeking and not seeking, in education. As can be seen from the chart above, the numbers in these groups are now much smaller and any additional falls in the non-employment index would need to come from outside these groups, for example, from those who report that they do not want a job. However, the absolute number in this category has actually increased since the beginning of 2012. Moreover, individuals who report that they do not want a job have the lowest probability of transitioning into employment in the next quarter. These developments suggest that the potential additional supply of workers coming from those outside of the labour force has been reduced significantly in recent years. On balance, this implies an increasingly important role for inward migration in easing domestic labour supply pressures – a topic explored further in Box C.

Table 5: Employment, Labour Force and Unemployment 2017 to 2020f

	2017	2018	2019f	2020f
Agriculture	110	105	104	102
Industry (including construction)	412	425	432	438
Services	1,672	1,730	1,772	1,807
Total Employment	2,194	2,260	2,307	2,347
Employment Growth (%)	2.9	3.0	2.1	1.7
Labour Force	2,352	2,396	2,439	2,470
Labour Force (%)	1.1	1.9	1.8	1.3
Unemployment	158	136	131	123
Unemployment Rate (%)	6.7	5.7	5.4	5.0

Inflation

Prices

HICP inflation registered a year-on-year increase of 0.7 per cent in February 2019. Having turned positive in late 2018, goods price inflation decreased by 0.6 per cent year-on-year in February, returning to the negative trend of previous years as increases in energy prices moderated. The energy component of the HICP increased by 1.7 per cent in February 2019, compared to an increase of 7.2 per cent in 2018. Food prices increased by 0.5 per cent registering their first year-on-year increase in over 5 years, largely driven by increases in processed food prices. The most recent data confirm that the negative trend in non-energy industrial goods prices has continued, with prices declining by 2.5 per cent year-on-year in February 2019. As noted before, these declines may partly reflect the impact of quality adjustment methods.²⁹ The latest data indicate that services price increases picked up in the opening months of 2019, increasing by 1.9 per cent in February 2019 year-on-year, in line with favourable growth in domestic demand. In a change from recent trends, core inflation – HICP excluding the energy component – has picked up slightly, registering a year-on-year increase of 0.6 per cent in February 2019.

Until recently, lower import costs have been a major factor behind the weakness in goods prices, as the euro's strength against sterling and the dollar weighed on the price of goods with a high import content (Figure 6). The euro/dollar and euro/sterling exchange rate, however, were 8 per

²⁹ See Box E *Why Are Prices For Some Consumer Prices Falling In Ireland*, QB 3 2018

cent and 1.3 per cent lower year-on-year in February 2019 and, if sustained, this could exert some upward pressure on import prices in 2019, though the outcome of the Brexit process is potentially a more important determinant.

While oil prices declined in the final quarter of 2018, they increased from a low of \$50 per barrel at end-December 2018 to \$65 per barrel by March 2019. Financial market expectations of future prices are slightly higher than those of the last Bulletin. The pass-through to energy prices means that the projected increase in the energy component is higher for 2019 compared to the previous Bulletin. Domestically generated inflation is, in turn, conditional on the pace of wage growth. With wage growth projected to pick up over the forecast horizon, it is expected that services inflation will continue to rise.

Conditional on the market implied path for oil prices, exchange rates and the latest projections for growth in economic activity, inflation is forecast to remain relatively subdued this year and next. Current assumptions point to a forecast of 0.7 and 1.1 per cent for HICP inflation in 2019 and 2020. (see Table 6). Goods prices are projected to decline by 1.3 and 0.9 per cent in 2019 and 2020, respectively; the more moderate decline in 2020 is due to higher food price inflation and lower assumed declines in energy prices. Services prices, meanwhile, are projected to rise by 2.4 and 2.8 per cent over the same period.

Uncertainty surrounding the forecast primarily relates to external factors. Most importantly, 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, and a higher tariff environment would have knock on effects for consumer prices.

Figure 6: Consumer Prices by Commodity

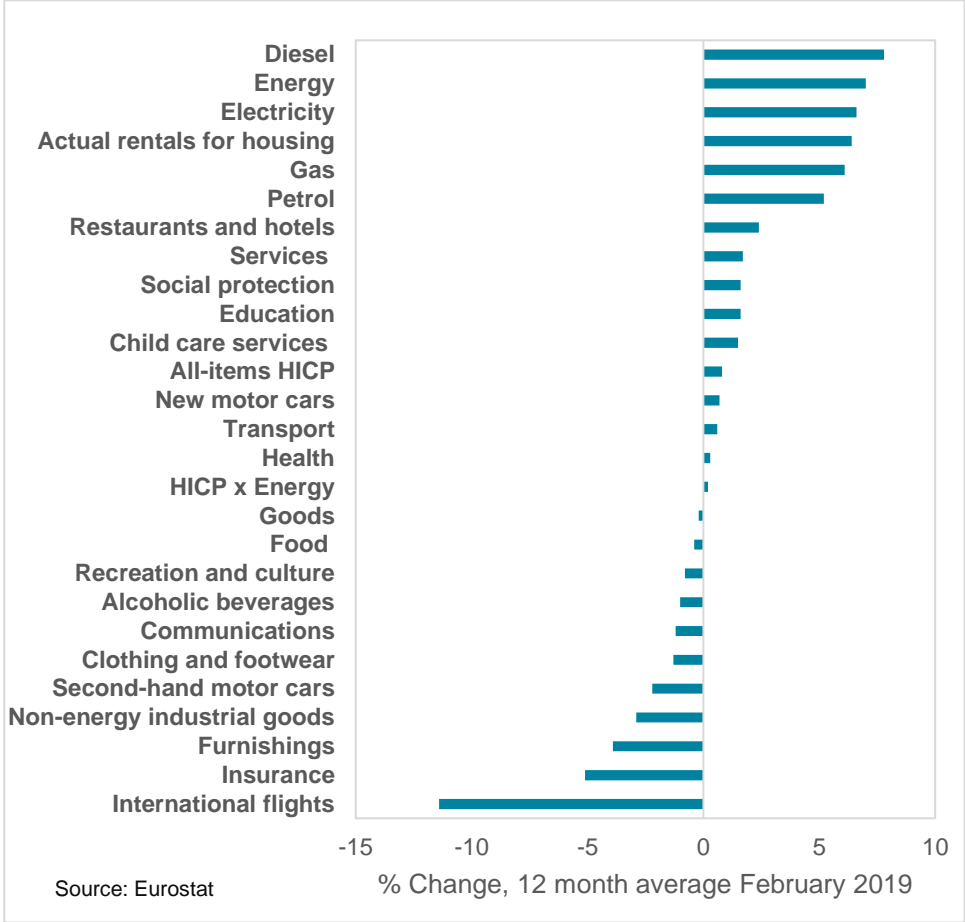


Figure 7: Irish Inflation and Exchange Rate Changes



Table 6: Inflation Measures – Annual Averages, 2017 to 2020f

Measure	HICP	HICP excluding Energy	Services ^a	Goods ^a	CPI
2017	0.3	-0.1	2.5	-2.1	0.3
2018	0.7	0.1	1.6	-0.2	0.5
2019f	0.7	0.8	2.4	-1.3	0.7
2020f	1.1	1.2	2.8	-0.9	1.1

Residential Property³⁰

The latest CSO data show that residential property prices increased by 5.6 per cent in the year to January 2019, down considerably from the 11.8 per cent increase seen in the year to January 2018. The divergence between Dublin and non-Dublin inflation has continued. Residential prices in Dublin rose by 1.9 per cent and non-Dublin prices rose by 9.5 per cent. This disparity has widened significantly since 2017, when Dublin and non-Dublin prices increased by 12.1 per cent and 13 per cent respectively.

In terms of supply, the fourth quarter 2018 Myhome.ie report shows that as of year-end 2018, there were 21,700 homes listed for sale on their site, up 15 per cent from 2017. Property Price Register data show the total volume of residential sales in 2018 was €17.2 billion – a 15.3 per cent increase from 2017. The number of sales listed on the register has risen every year since 2011, with 2018 up 3.6 per cent from the previous year. 2019 has gotten off to a slow start however, with January and February transaction figures 15.1 per cent below the same period in 2018. Most housing transactions complete in the second half of the year, so the weak opening months should not prevent total transactions from increasing again this year.

Turning to the rental market, the Daft.ie report for Q4 2018 provides further indication of a moderate slowdown in the residential sector. Average rents rose by 9.2 per cent in 2018, down from 10.9 per cent in 2017 and 13.6 per cent in 2016. Increasing supply has likely played a part in reducing rent inflation, with available units listed on Daft.ie up 11 per cent in January 2018 compared with January 2017. This breaks a seven-year trend of declining availability. Residential completions have also increased, the details of which are outlined in the Investment section of this Bulletin. While the weakening in rent inflation is a positive sign, it must be put in the context of the rapid price growth since 2013. Average rent nationally stands at an all-time high of €1,347 per month, 31 per cent above the pre-crisis peak and 82 per cent above the low seen in November 2011. HICP data broadly support these figures, showing the

³⁰ The Bank's [Macro Financial Review for H2 2018](#) provides a more detailed review of residential and commercial property prices.

price of *Actual Rentals for Housing* has risen by 26 per cent from the pre-crisis peak, and is 62 per cent above the low of December 2010.

Commercial Property

Annual growth in Commercial Property values stood at 5% at year-end 2018. After double-digit growth at the beginning of the recovery in 2014 and 2015, price growth has weakened each year. It is now at its lowest level since growth first turned positive in Q4 2013. The MSCI/IPD index remains almost 40% below its pre-crisis peak.

The Public Finances

Overview

Government Finance Statistics and Exchequer data point to continued improvement in the fiscal position in the second half of last year. As a result, while final general government data for 2018 has yet to be released, it appears possible that a small fiscal surplus was achieved for the year as a whole: the first such surplus since 2007. The general government debt position also appears to have improved in the second half of 2018. Using GDP as the denominator understates the debt burden, however, and debt as a percentage of GNI* - though still improving - is substantially higher. The government estimates it remained above 100 per cent last year, amongst the highest in the European Union. This high level of public debt is one of a number of fiscal vulnerabilities that still exist. On the expenditure side, government current voted primary spending was once again higher than targeted in 2018, the fifth successive year that this has occurred. On the revenue side, corporation taxes - part of which may be volatile - continue to play a significant role in driving tax growth. While it is not clear whether these flows are sustainable in the future, developments in the previous decade highlight the importance of not overly relying on potentially volatile sources of tax revenue (see Box D).

Exchequer Returns

There have been limited fiscal data releases for 2019 to date. Exchequer returns were broadly in line with expectations in the first two months of the year, recording an Exchequer surplus of €138 million. When transactions with no general government impact are excluded, however - most notably capital revenue linked to FEOGA payments and loan repayments - the position was a deficit of €1,059 million (see Table 7). This outturn was broadly in line with expectations, although both revenue and expenditure were slightly below profile. The former still recorded solid growth of 4.8 per cent from the same period the year before, led by notable gains in income taxes and VAT. Growth in spending was even stronger, expanding by 8.0 per cent in annual terms. This was despite a contraction in interest payments, as both current and capital spending

accelerated. This increase was not as strong as had been anticipated, however.

Table 7: Analytical Exchequer Statement, January to February 2019 (€millions)

	2019 Jan to Feb €m	2018 Jan to Feb €m	Annual Change (%)	Outturn vs Profile (€m)
Revenue	10,097	9,631	4.8%	-24
Tax Revenue	8,106	7,814	3.7%	-50
Appropriations-in-Aid	1,831	1,700	7.7%	26
Other Revenue	160	117	36.6	0
Expenditure	11,156	10,333	8.0%	-155
Current Primary Expenditure	10,240	9,429	8.6%	-60
Capital Expenditure	501	435	15.2%	-81
Interest on National Debt	415	469	-11.5%	-14
Balance	-1,059	-701	-51.0%	131

Source: Department of Finance

Note: The figures in the Table exclude transactions with no general government impact, to try and give a closer approximation to the General Government balance.

Box E: The role of Corporation Tax in driving Irish Tax Growth, 2015-2018

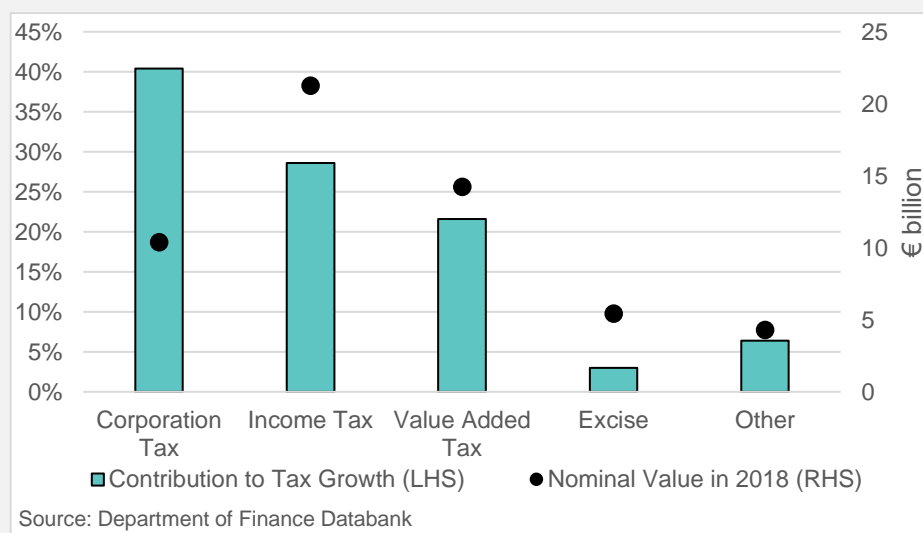
By Rónán Hickey and Linda Kane

The significant role that corporation tax (CT) inflows have played in supporting Irish revenue growth in recent years - and the risks associated with this reliance - are well documented³¹. The tax head has more than doubled since end-2014, with receipts surpassing €10 billion last year, and has consistently performed ahead of expectations. As Chart 1 shows, it has driven 40 per cent of total tax revenue growth over the four-year period from 2015 to 2018, despite it being a considerably smaller tax base in nominal terms than both income tax and VAT. In 2018, meanwhile, CT represented 19 per cent of total tax

³¹ See for example 'Box C: Risks related to corporation tax flows', Central Bank Quarterly Bulletin 4, October 2018; 'Annual Tax Report', Department of Finance, January 2018; 'Fiscal Assessment Report', Irish Fiscal Advisory Council, November 2018.

revenue, up from 16 per cent a year earlier and just 11 per cent five years earlier. This followed significantly higher than expected annual inflows – receipts were 22 per cent ahead of profile last year – albeit some of which has been identified as reflecting timing factors³². Even excluding this temporary component, however, CT receipts as a percentage of tax revenue would still have reached its highest level in two decades, 17 per cent.

Chart 1: Contribution of Tax Heads to Tax Growth, 2015-2018



Against this background, and with uncertainty over how stable some of the CT flows received in recent years are³³, this Box compares developments since end-2014 with revenue linked to residential construction in the early to mid 2000's - the last time a large transitory revenue stream played a key role in driving tax growth. To identify the direct impact that residential construction had on tax revenue over this period we use data constructed by McQuinn and Smyth (2010)³⁴. They estimate the direct impact of residential construction on the three tax components heavily influenced by activity in the sector - stamp duty, capital gains tax (CGT) and VAT – with their results replicated in Table 1. We focus on the five years to 2006 as this is the year when direct housing related revenues peaked. As the Table shows, by the end of this period, value added tax on new housing accounted for around a quarter of total VAT receipts, with one-third of CGT and 80 per cent of stamp duty driven by the sector. As a result, residential construction was generating around 16 per cent of total tax revenue in 2006. The

³² The Department of Finance notes that €700m of the €1.9bn higher than expected receipts is temporary and is not expected to recur in 2019.

³³ See, for example 'Box 3.1: How much of the corporate tax surges should be prudently set aside?', Irish Post Programme Surveillance Report, European Commission, Autumn 2016.

³⁴ Kieran McQuinn and Diarmaid Smyth, 'Quantifying revenue windfalls from the Irish housing market', Economic and Social Review, Volume 41 No 2, Summer 2010.

Table also outlines the data in nominal terms, showing the total impact increased from €2.3bn in 2002 to €7.2bn in 2006.

Table 1a – Individual Tax Components Residential Contribution (€m)

	2002	2003	2004	2005	2006
Stamp Duty	666.1	1075.50	1461.90	2003.00	2988.10
VAT	1439.40	1876.10	2331.10	2840.90	3241.00
CGT	199.1	464.7	436.5	584	964.1
Total	2304.60	3416.30	4229.50	5427.90	7193.10

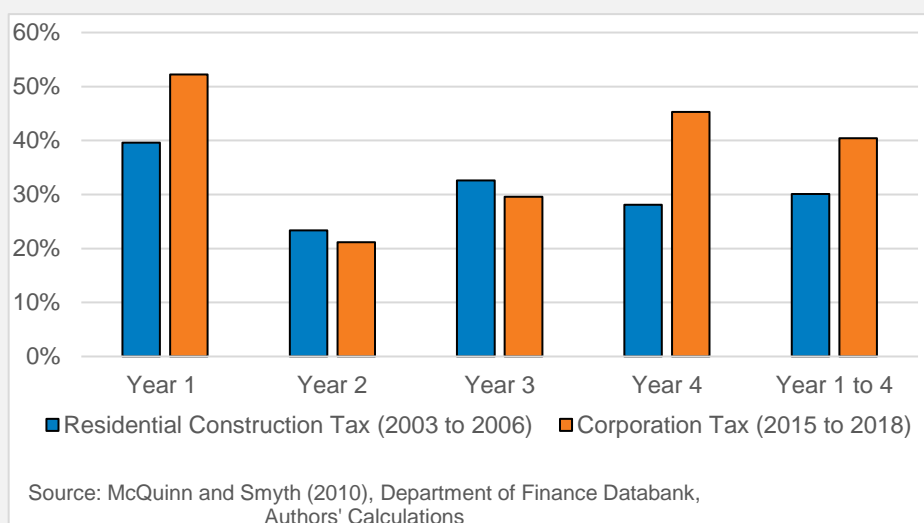
Source: McQuinn and Smyth (2010)

Table 1b – Individual Tax Components Residential Contribution (per cent of tax head)

	2002	2003	2004	2005	2006
Stamp Duty	57.1	63.7	70	73.5	80.4
VAT	16.2	19.3	21.8	23.5	24.1
CGT	31.7	32.2	28.8	29.8	31.1
Total	7.9	10.6	11.9	13.8	15.8

Source: McQuinn and Smyth (2010)

How do the two periods compare? As Chart 2 shows, while CT has driven 40 per cent of growth in total tax revenue in recent years, residential construction taxes drove a lower 30 per cent of growth in tax receipts between 2002 and 2006. Direct residential construction taxes peaked at 16 per cent of total tax revenue in 2006, below last year's adjusted figure of 17 per cent. From a broader perspective, it is important to note that the residential construction boom had a wider impact on the overall economy, from an employment, output and fiscal point of view. The data above excludes indirect revenues linked to residential construction - such as VAT receipts from purchases of furniture, household goods etc. - while employment in the construction sector accounted for 11 per cent of total employment in 2006 and played an important role in driving income tax receipts. On the other hand, recent developments in CT appear more exogenous, and with around 40 per cent of CT revenues coming from just 10 companies it is clear that exposure risks are high.

Chart 2: Contribution of Tax Component to Tax Growth

The high degree of reliance on construction revenues in the early to mid-2000s proved to be unsustainable given underlying dynamics in the sector. With regard to CT, on the other hand, it is not yet clear whether the flows we have seen in recent years are unsustainable in the future. From a public finances perspective, it is important not to become overly reliant on any tax head in driving total revenue growth.

Funding and Other Developments

The NTMA has been very active in the first quarter of 2019, raising €5.25 billion through bond sales. This included €4 billion through the syndicated sale of a 10-year bond in January. For the year as a whole, the Agency plans to issue between €14 billion and €18 billion of bonds, the mid-point of which is broadly consistent with funds raised last year. The NTMA began the year with strong cash balances in excess of €15 billion and are well placed to fund maturities totalling €13 billion that will arise during the remainder of 2019. The first quarter of this year also saw a further €500 million of the floating rate Treasury bonds linked to the liquidation of Irish Bank Resolution Corporation purchased from the Central Bank of Ireland and subsequently cancelled. To date, a total of €14 billion of these bonds have been cancelled, leaving around €11 billion outstanding.

Box F: Credit Developments in the Irish Economy

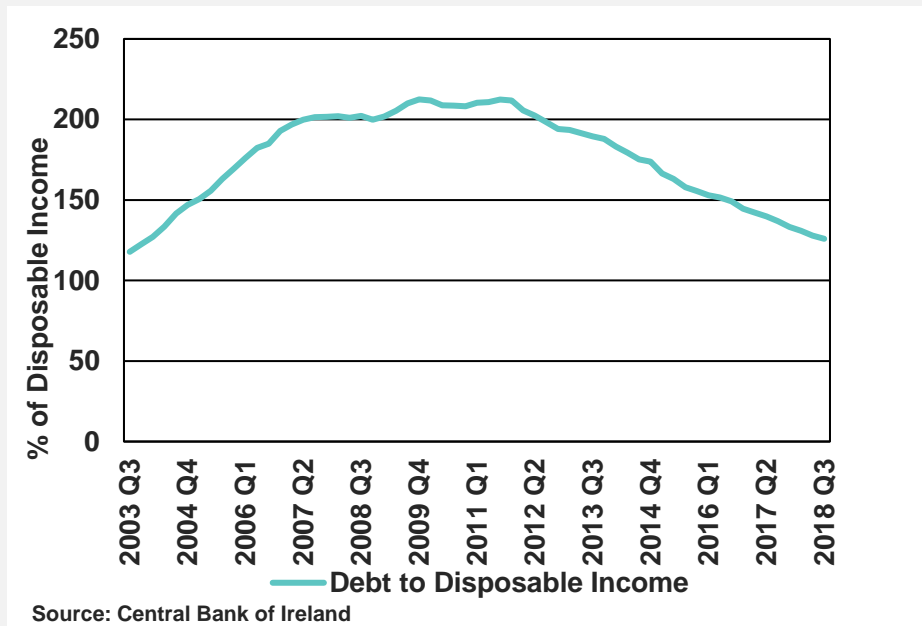
By Statistics Division

There are signs that wider economic developments are leading to a recovery in credit flows and a slowdown in the deleveraging seen in recent years. Credit from the Irish banking sector has become broadly

positive for both mortgage and consumer lending. New lending to SMEs continues to grow primarily due to increased lending for real estate activities, which now account for one-third of all new SME lending. The most recent data indicate that mortgage-lending growth may be stabilising but lending for consumer purposes continues to increase.

Developments in household consumption and investment activity continue to strengthen, notwithstanding the slower pace of recovery in credit to the household sector. The Quarterly Financial Accounts gives a comprehensive overview of credit to the household sector, and shows that households are still, on aggregate, paying down debt. However, the rate at which this is occurring has declined significantly, as bank credit begins to grow, while loans held by non-banks are repaid. Declining household debt combined with rising household incomes has led to substantial deleveraging. The ratio of household debt to income fell to 125.8 per cent in Q3 2018. Irish households are relatively highly indebted, ranking fourth highest amongst European countries in terms of debt to income.

Box F Figure 1: Household Debt as a Percentage of Disposable Income



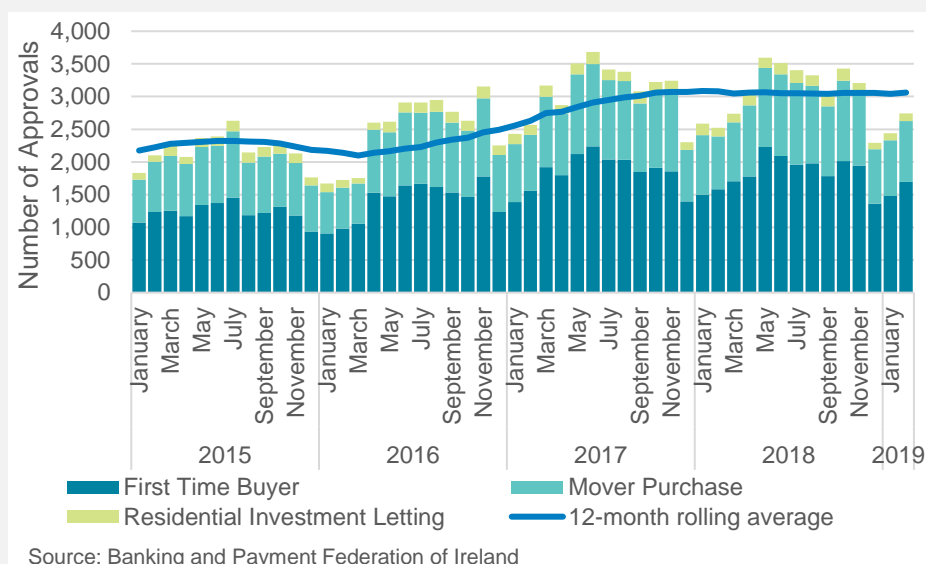
Loans to Households

While overall credit of households continues to decline, new mortgage agreements increased 18.3 per cent in the year to end-January 2019. In net terms, new mortgage lending was consistently higher than repayments by households throughout the second half of 2018, and while net lending for the beginning of 2019 has turned negative, it is reflective of seasonal effects. The return to broadly positive net

mortgage lending reverses a trend of prolonged deleveraging which had taken place since the onset of the financial crisis.

Turning to mortgage refinancing, the value of mortgages renegotiated with an existing bank amounted to €5,090 million in the twelve-months to end-January; a 7 per cent decline on the previous twelve-months. The majority of these mortgages were renegotiated with an over 1 year fixation term. In contrast, mortgage switching between banks increased by 75 per cent in annual terms over 2018, albeit involving lower volumes with €1,242 million re-mortgaged during 2018.³⁵ Central Bank data from the first half of 2018 indicate that the average LTV of re-mortgage loans was 58 per cent, in contrast to new mortgage LTVs of 75 per cent.³⁶

Box F Figure 2: Monthly Mortgage Approvals for House Purchase



There are signals that mortgage credit growth may be easing. Recent data indicate a stabilisation of the annual growth rate in mortgage lending at around 1.4 per cent per month. One potential forward-looking indicator for mortgage credit is the number of mortgage approvals for house purchase, which declined by 0.7 per cent in the year to February 2019 (Figure 2).³⁷ Additionally, demand for credit for house purchase, as measured in the Central Bank of Ireland Bank Lending Survey, decreased slightly in Q4 2018³⁸. The BLS respondent indicated that the decline in demand is due to the perceived impact of the regulatory and fiscal regime governing the housing market.

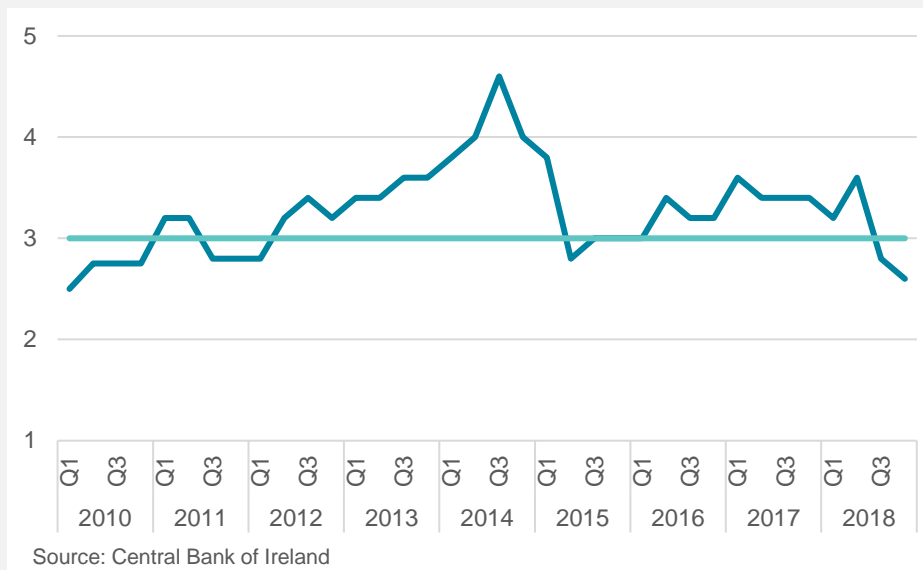
³⁵ Source: Banking and Payments Federation of Ireland Mortgage Drawdowns Report Q4 2018

³⁶ Source: Central Bank of Ireland Household Credit Market Report 2018

³⁷ Source: Banking and Payments Federation of Ireland Mortgage Approvals Report February 2019

³⁸ Source: Central Bank of Ireland Bank Lending Survey

Box F Figure 3: Change in Demand for Loans for House Purchase

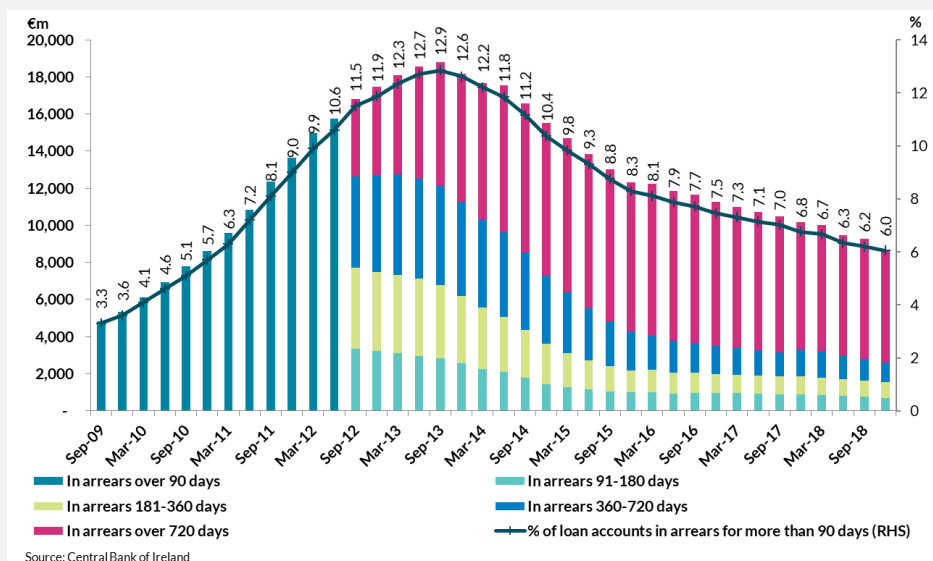


Key: 1 = decreased considerably,
 2 = decreased somewhat,
 3 = remained basically unchanged,
 4 = increased somewhat,
 5 = increased considerably.

Levels of mortgage arrears continue to fall. Having peaked at 12.9 per cent in 2013, the percentage of principal dwelling home (PDH) mortgage accounts in arrears of over 90 days has more than halved to 6 per cent (Figure 2). The figure has now fallen for 21 consecutive quarters. A large arrears reduction has also been seen in the buy-to-let (BTL) market segment, though the over 90 days in arrears levels remain elevated at 14 per cent. The majority of the remaining arrears in both market segments are now concentrated in the greater than 720 days category, suggesting that the remaining arrears cases may be more difficult to resolve than was previously the case. A large number of these cases have also been shown to be in arrears of significantly more than the 720 days threshold.³⁹

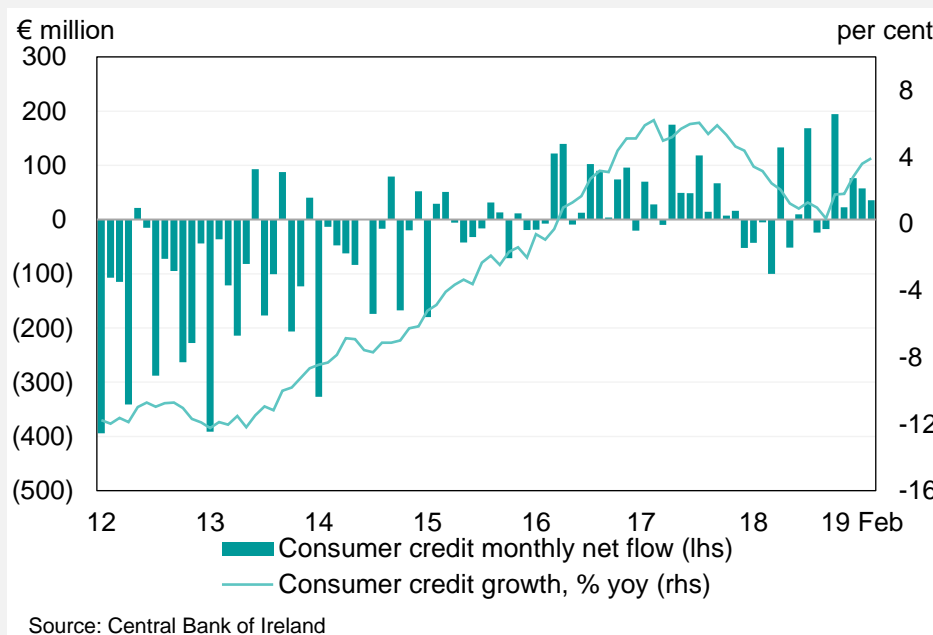
³⁹ Source: Central Bank of Ireland: <https://www.centralbank.ie/docs/default-source/publications/research-technical-papers/10rt17---resolving-a-non-performing-loan-crisis-the-ongoing-case-of-the-irish-mortgage-market.pdf>

Box F Figure 4: PDH Mortgage Accounts in Arrears over 90 Days



Levels of consumer credit advanced by Irish banks continued to increase. The rate of growth has picked up in recent months following declines in mid-2018; however, it is still below the high growth rates experienced in 2017. Car finance loans account for a sizeable proportion of consumer credit and seasonality in the purchase of vehicles likely drove the increases in net lending in early-2019. The Q4 2018 Bank Lending Survey indicates that demand for consumer credit remained unchanged on earlier quarters, reflecting solid consumer confidence and spending on durable goods.

Box F Figure 5: Bank Lending to Households for Consumption; Developments in Net Flows, Annual Rate of Change



Source: Central Bank of Ireland

Lending to SMEs

New bank lending to Irish SMEs continues to grow, with loan drawdowns in 2018 at the highest level since the start of the data series in 2010. The 6.2 per cent increase in new lending in 2018 is primarily due to increased lending for real estate activities, which now account for one-third of all new SME lending. Although the level of loan repayments by SMEs has held broadly steady when compared to the previous year, the increase in gross new lending is not yet sufficient to halt the overall decline in outstanding SME loans. However, the rate of decrease has slowed significantly in recent quarters when compared to earlier years.

Data from the Department of Finance SME Credit Demand Survey indicate a slowdown in the number of SMEs applying for bank credit in recent years, with only 20 per cent of firms having applied the six months to September 2018.⁴⁰ The survey also indicated the lack of credit requirement as the reason for the low application rate.

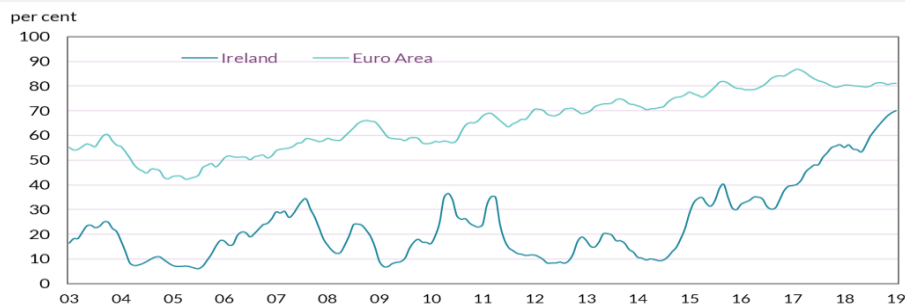
Interest Rates

The cost of new mortgage credit remains high relative to European peers. The average rate recorded for new mortgage lending in January was 3.01 per cent, higher than the average for any other euro area country other than Greece. A significant change is ongoing in the interest rate fixation behaviour of households in recent years. Fixed rate mortgages now comprise 70 per cent of all new agreements⁴¹. This proportion of fixed rate drawdowns is the highest recorded in the series' history and brings Ireland closer to the high fixation rates seen elsewhere in the euro area. Fixation period can vary significantly however, and the typical historical fixation period in Ireland is less than 3 years. Recent months have seen a shift to longer interest fixation products, with the increase in lending in PDH mortgages in Q4 2018 driven by mortgages with fixed rate of over 3 years. This is reflective of the wider range of 5, 7 and 10 year fixed rates mortgages available on the market.

⁴⁰ Source: SME Credit Demand Survey – April 2018 – September 2018

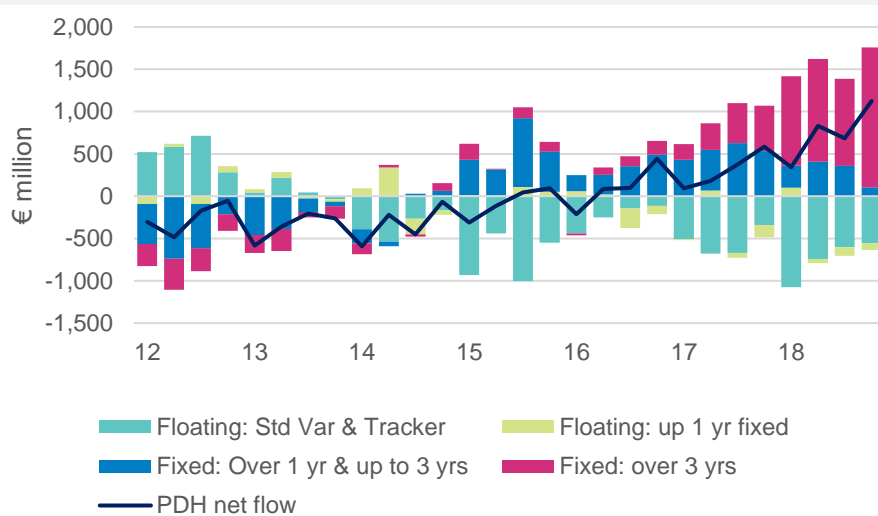
⁴¹ As measured by loan amount on a three-month rolling basis

Box F Figure 6: New mortgage agreements: Share of fixed rate mortgages (3-month rolling average)



Source: Central Bank of Ireland

Box F Figure 7: PDH fixed and floating rate loans (Net Flows)



Source: Central Bank of Ireland

SME interest rates continue to decline, albeit at a slower rate than mortgage rates. The average interest rate on new SME drawdowns at the end of 2018 was 3.97 per cent, a marginal twelve basis lower than end-2017. Interest rates on SME loans vary significantly between sectors, with collateralised real estate lending securing rates of 3.22 per cent, and SMEs engaged in the market driven agriculture sector agreeing rates of 4.64 per cent as the end of 2018.

Overview of Financial Developments in the Irish Economy

The Overview of Financial Developments Chapter presents a summary of the latest financial trends in Ireland. The Financial Statistics Summary Table and accompanying graphs provide key insights for understanding important trends, utilising the latest data for the household sector, small and medium sized enterprises, the financial sector and the public finances. Links to the relevant source data are provided below each chart.



Financial Statistics Summary Table

	2016	2017	2018	2019
Lending - Outstanding, € billion				
Irish Households for House purchase	73.5	74.8	76.1	74.6**
	-1.3%	0.0%	1.4%	1.4%**
Irish Households for Consumer and Other credit	14.7	15.1	15.3	15.3**
	0.4%	2.1%	1.5%	2.5%**
Irish Non-Financial Corporates	42.3	41.3	40.9	40.9**
	-3.3%	-0.6%	1.7%	2.9%**
Irish resident Small and Medium Sized Enterprises	28.3	26.4	23.5	-
	-8.2%	-4.0%	-3.8%	-
Irish Private Sector ¹	147.5	148.4	150.0	148.4**
	-2.5%	0.7%	1.0%	1.4%**
Deposits - Outstanding, € billion				
Irish Households	97.1	99.5	104.0	104.8**
	2.3%	3.4%	4.5%	4.8%**
Irish Non-Financial Corporates	45.6	50.5	52.4	52.7**
	9.0%	9.8%	3.4%	3.1%**
Irish Resident Private-Sector Enterprises	89.3	93.2	95.7	-
	0.7%	6.3%	2.1%	-
New Business Interest Rates, %				
Lending for House purchase ²	3.5	3.3	3.1	-
Non-Financial Corporate Lending	2.6	2.6	2.6	-
Irish Small and Medium Sized Enterprises Lending	4.1	4.0	4.1	-
Household Term Deposits	0.2	0.1	0.1	-
Households - € billion				
Household Debt to Disposable Income	144.7%	133.2%	125.8%***	-
Household Net Worth	653.9	726.3	768.8***	-
Financial Sector Assets - Outstanding, € billion				
Credit Institutions	590.3	552.1	599.8	606.8**
Investment Funds	1,938.4	2,241.8	2,327.8	-
Money Market Funds	485.2	500.6	502.1	489.8**
Special Purpose Entities	740.1	731.8	726.8	-
Insurance Corporations ³	301.1	311.8	304.9	-
Securities - € billion				
Securities Held by Irish Residents ⁴	2,496.6	2,768.2	2930.2***	-
Government Bond Debt	121.6	126.9	131.2	135.4*
Debt Securities Issued by Irish Residents ⁵	731.9	719.7	687.9	693.8*

¹ Includes lending to households, Non-Financial Corporates, Insurance Corporations and Pension Funds, and Other Financial Intermediaries

⁵Debt Securities: all currencies

*Ref. Jan 2019

²Ex. Renegotiations

**Ref. Feb 2019

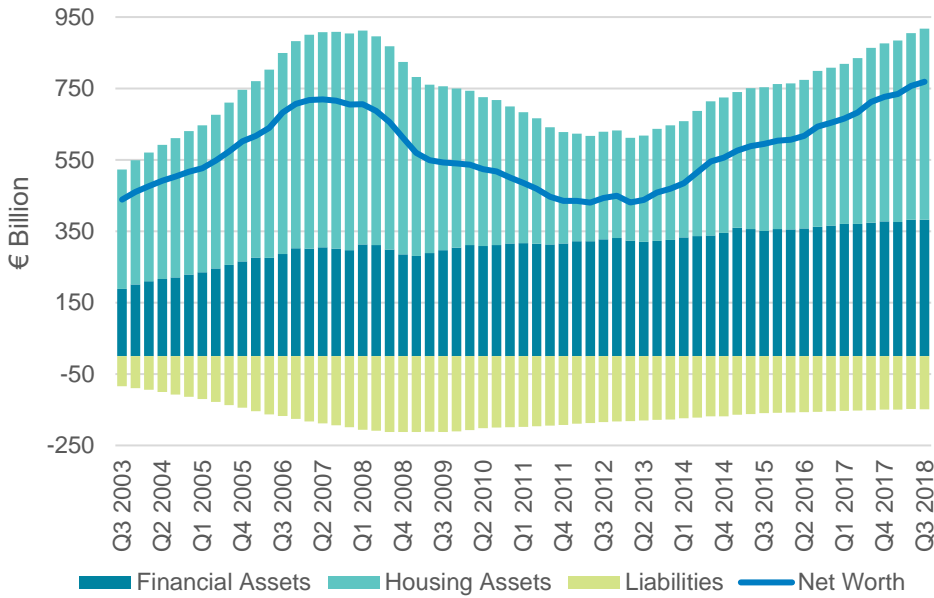
³First reporting commenced in 2016

⁴Direct Insurance Corporations Securities holdings not included in 2015

***Ref. Q3 2018

Household Sector

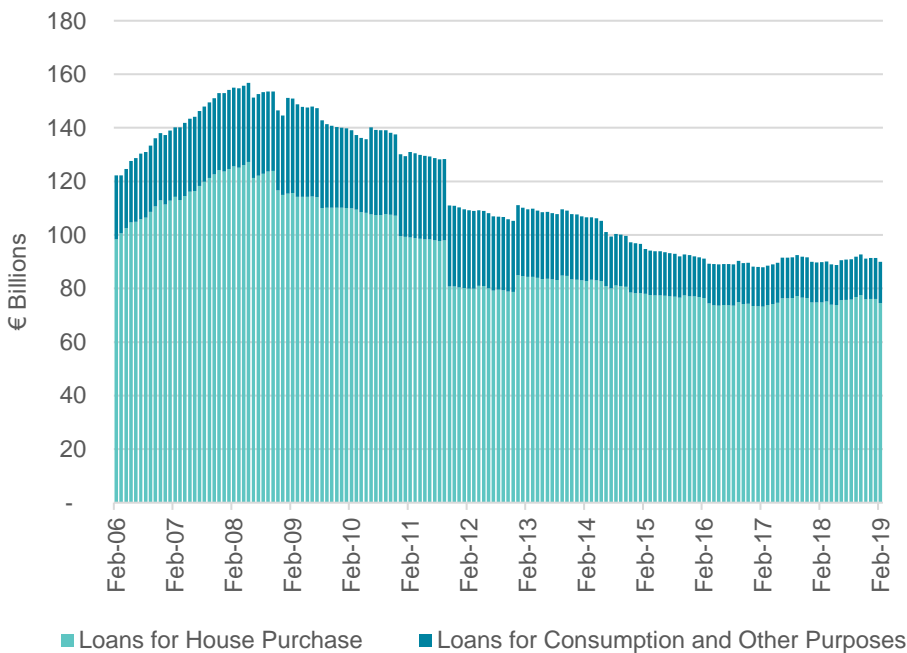
Chart 1: Household Net Worth



Household net worth has now exceeded its pre-crisis peak.

Source: [Quarterly Financial Accounts](#), Central Bank of Ireland

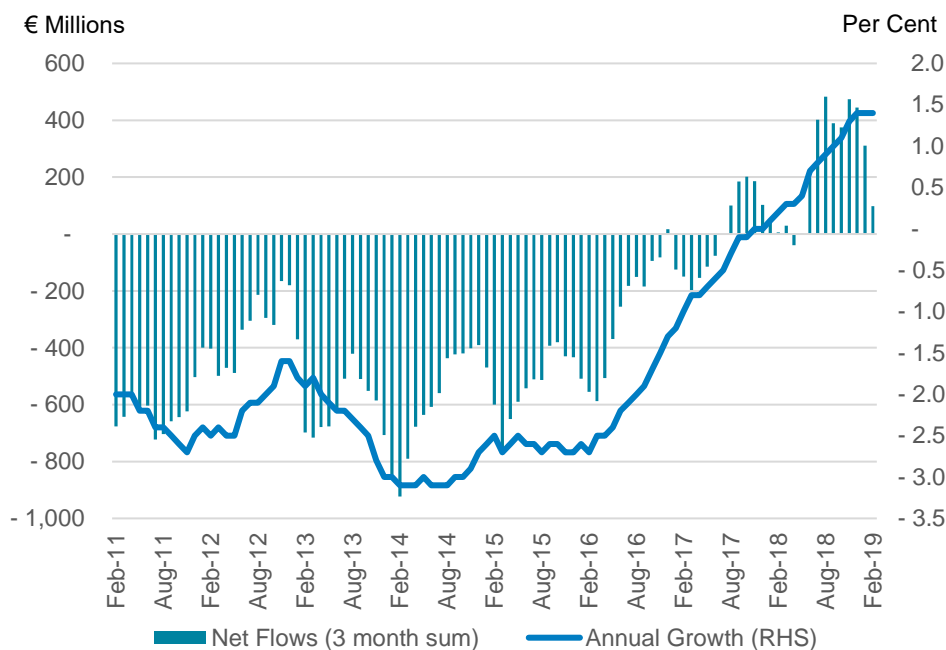
Chart 2: Outstanding Loans to Irish Households from Irish Banks



Outstanding amounts of Irish bank loans to households remains at a subdued level relative to its historical highs.

Source: [Bank Balance Sheet Statistics](#), Central Bank of Ireland

Chart 3: Net flows for Loans for House Purchase

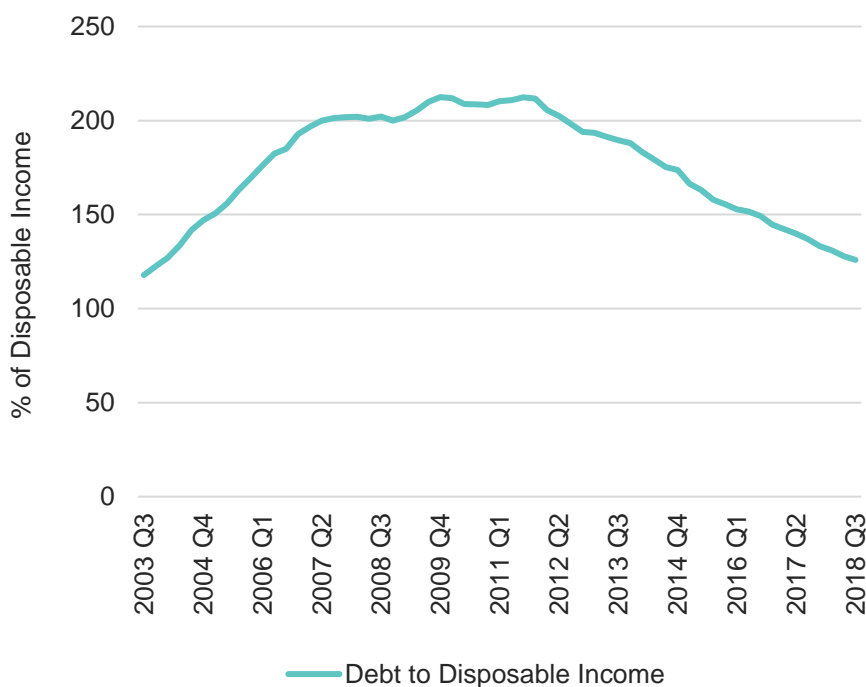


Loans for house purchase growing at fastest annual rate since 2009.

Source: [Bank Balance Sheet Statistics](#), Central bank of Ireland

Note: Data encompass Irish resident bank on balance sheet net lending for the purpose of house purchase.

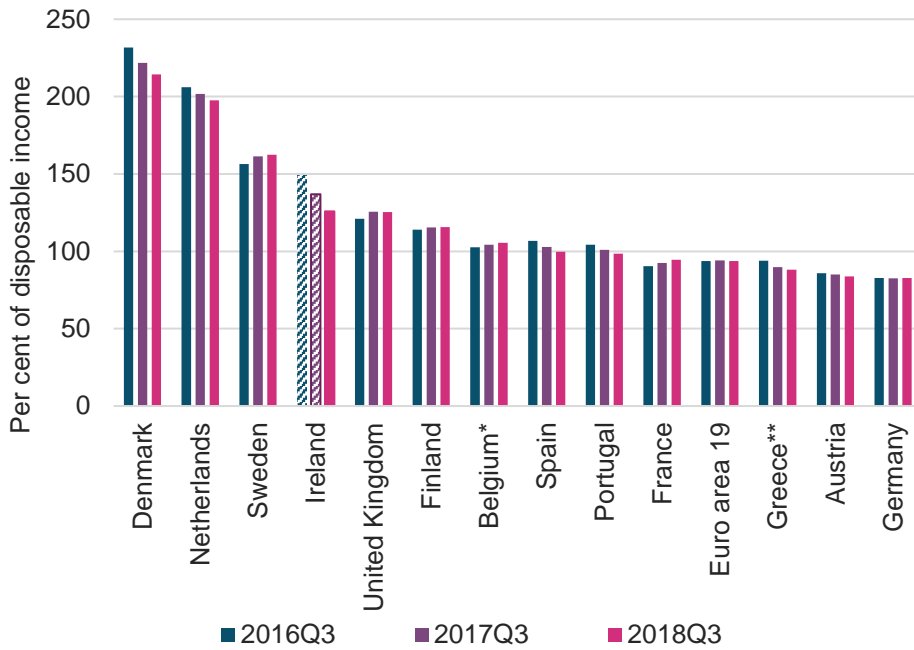
Chart 4: Household Debt to Disposable Income



Households are continuing to deleverage – debt to disposable income is at its lowest point since Q1 2004.

Source: [Quarterly Financial Accounts](#), Central Bank of Ireland

Chart 5: EU Cross Country Comparison of Household Indebtedness

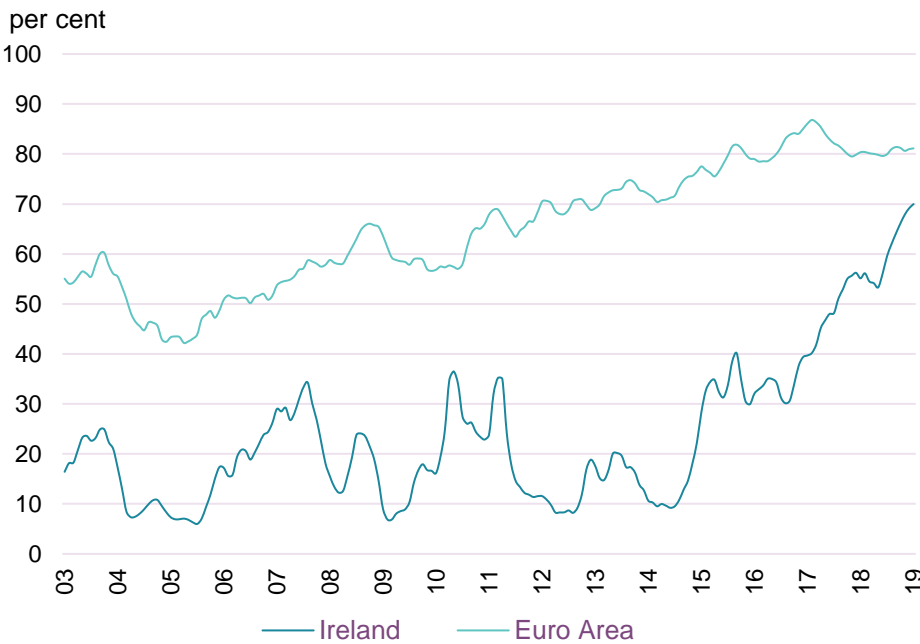


Ireland ranks fourth among European countries when comparing ratios of household debt to disposable income.

Source: [Quarterly Financial Accounts](#), Central Bank of Ireland

Note: *Data are from Q2 2018. **Data are from Q4 2017

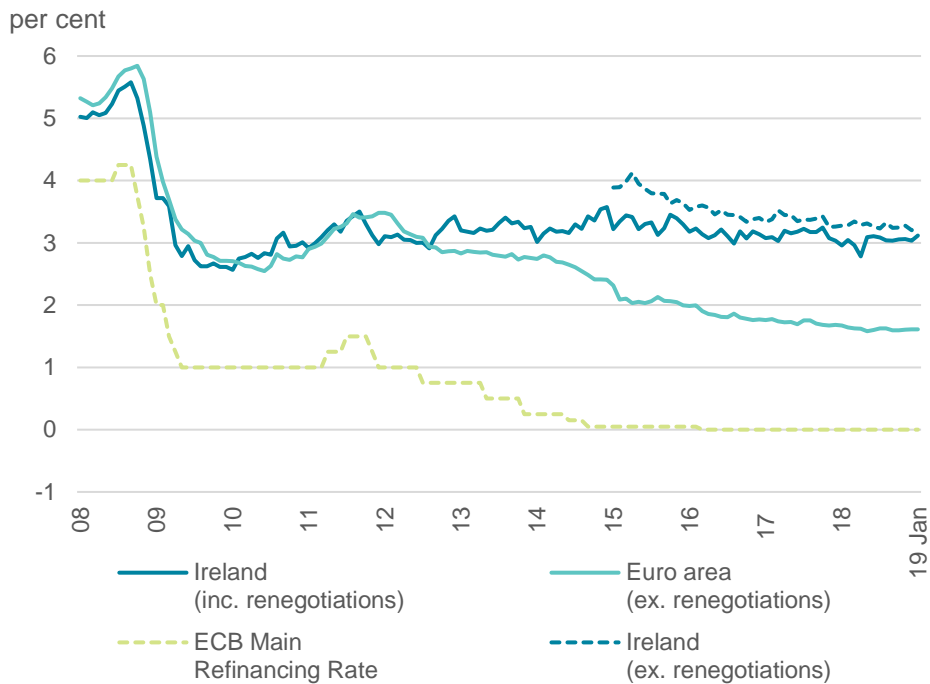
Chart 6: New Mortgage Agreements: Share of Fixed Rate Mortgages (3 Month Rolling Average)



Highest proportion of new fixed rate mortgage agreements in series history.

Source: [Interest Rate Statistics](#), Central Bank of Ireland, [ECB Statistical Data Warehouse](#)

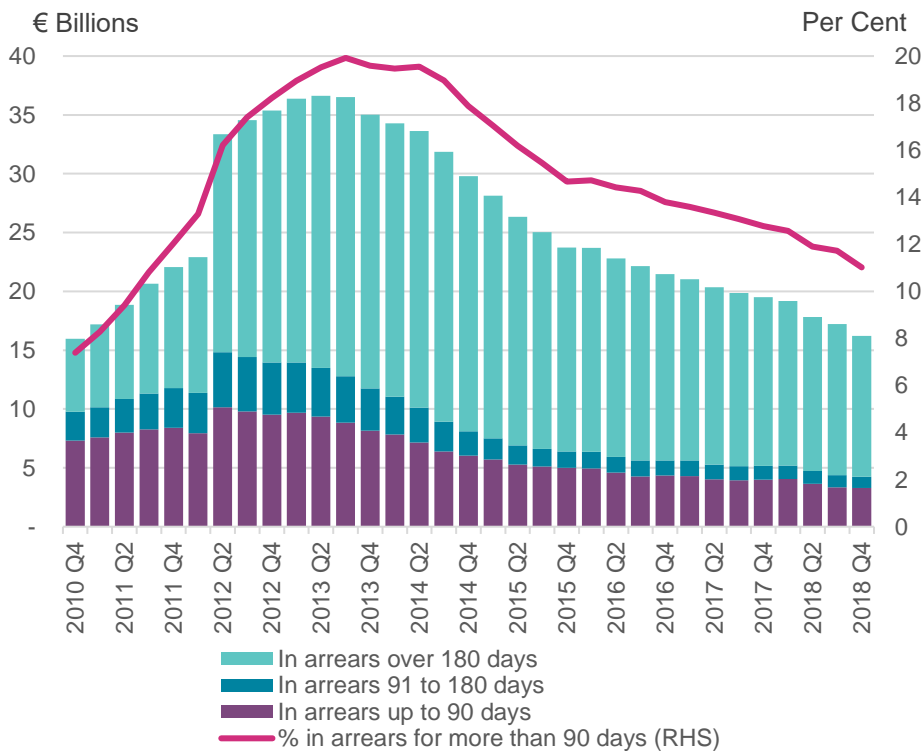
Chart 7: Interest Rates on New Variable Rate Loan Agreements to Households for House Purchase



New variable rate mortgage agreements (excluding renegotiations) had a weighted average of 3.29 per cent in January 2019.

Source: [Interest Rate Statistics](#), Central Bank of Ireland

Chart 8: Mortgage Arrears (Primary Dwelling House and Buy-to-Let)

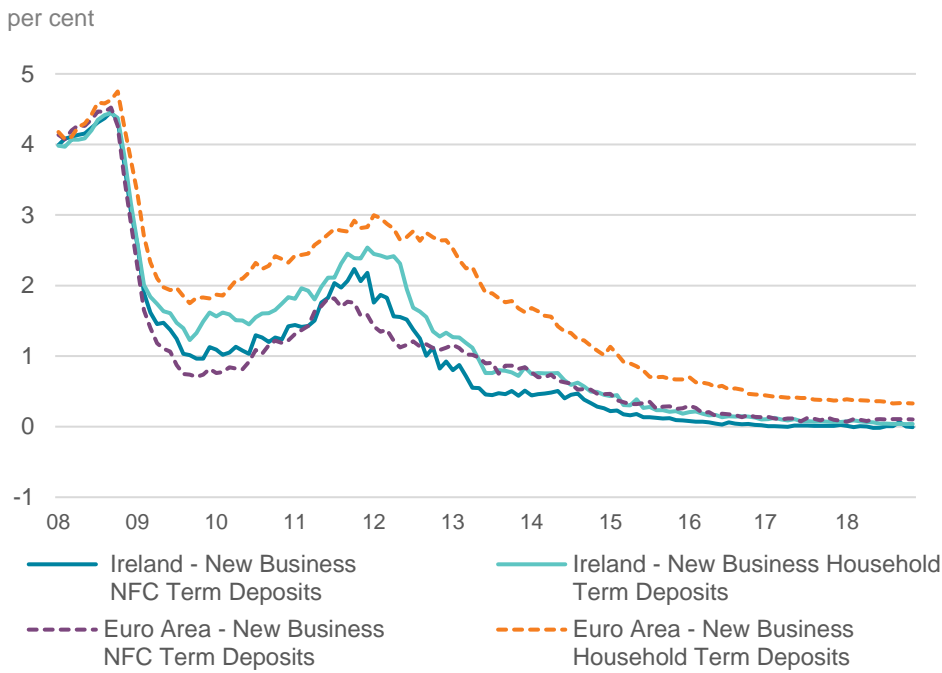


The amount of mortgages in arrears continue to decline.

Source: [Mortgage Arrears Statistics](#), Central Bank of Ireland

Note: Buy to let mortgages enter statistical population in Q2 2012

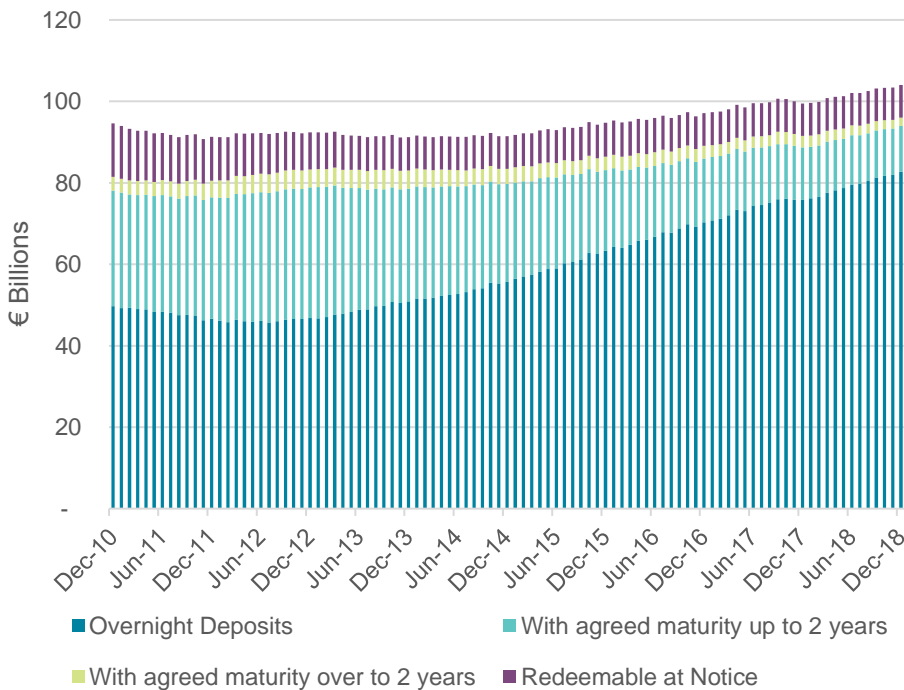
Chart 9: Interest Rates on Household & NFC Term Deposits



Interest rates on Irish new household term deposits were 0.04 in January 2019.

Source: [Interest Rate Statistics](#), Central bank of Ireland

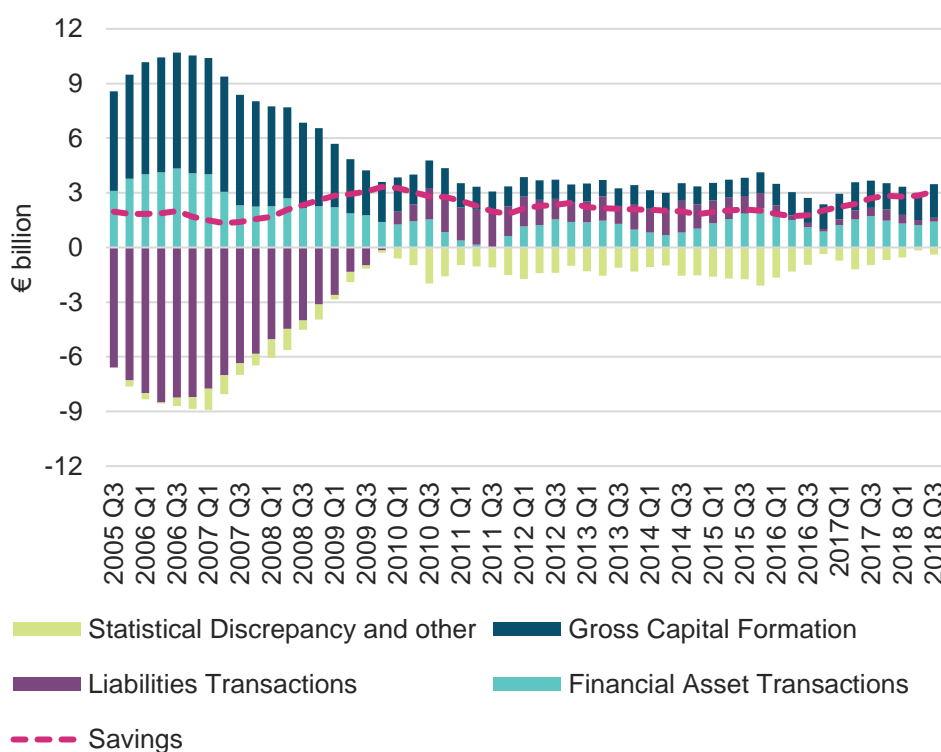
Chart 10: Deposits of Irish households by Category of Deposit



Total household deposits continue to increase, but overnight deposits continue to increase their share of the total.

Source: [Bank Balance Sheet Statistics](#), Central Bank of Ireland

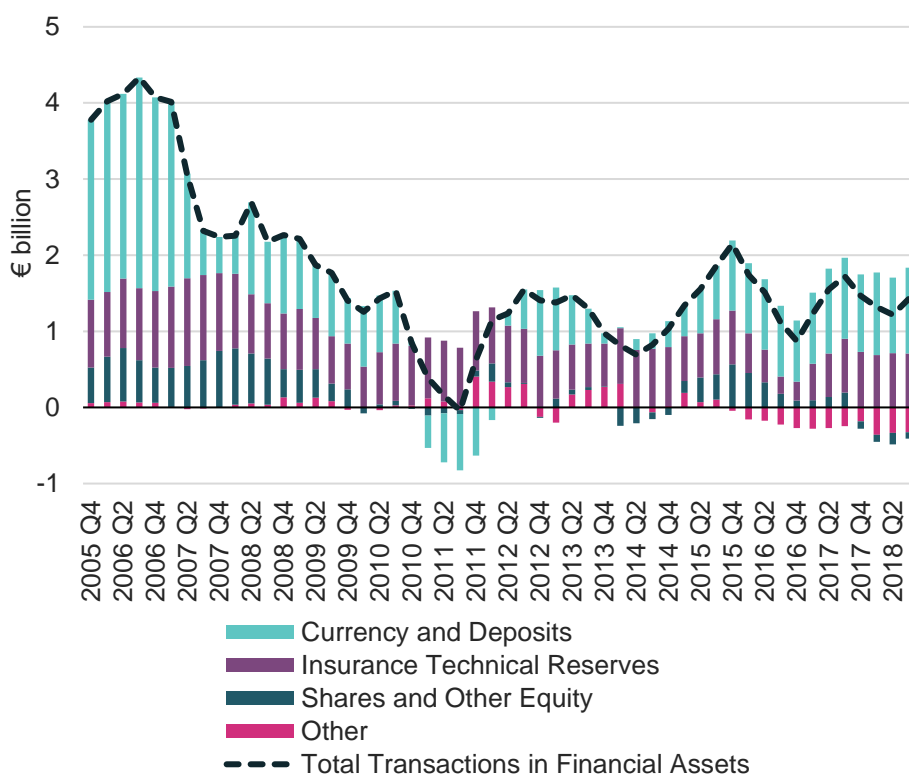
Chart 11: Household Savings by Use (4-Quarter Moving Average)



Households saved €3.1 billion in Q3 2018. This saving consisted of €1.8 billion of gross capital formation and €1.4 billion of financial asset accumulation.

Source: [Quarterly Financial Accounts](#), Central Bank of Ireland

Chart 12: Household Transactions in Financial Assets (4-Quarter Moving Average)

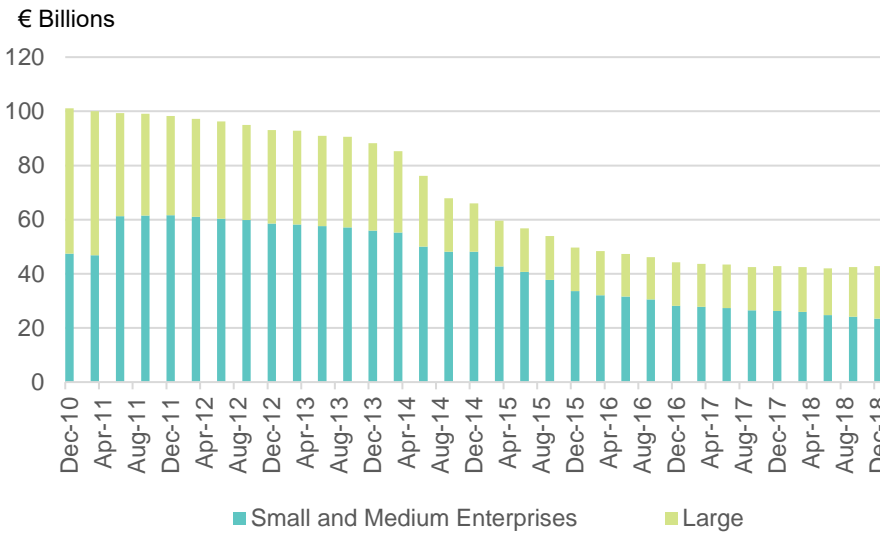


Households are investing primarily in currency and deposits and in insurance and pension policies.

Source: [Quarterly Financial Accounts](#), Central Bank of Ireland

Non-Financial Corporate Sector

Chart 13: Credit Extended to Large and Small and Medium (SME) Non-financial Enterprises

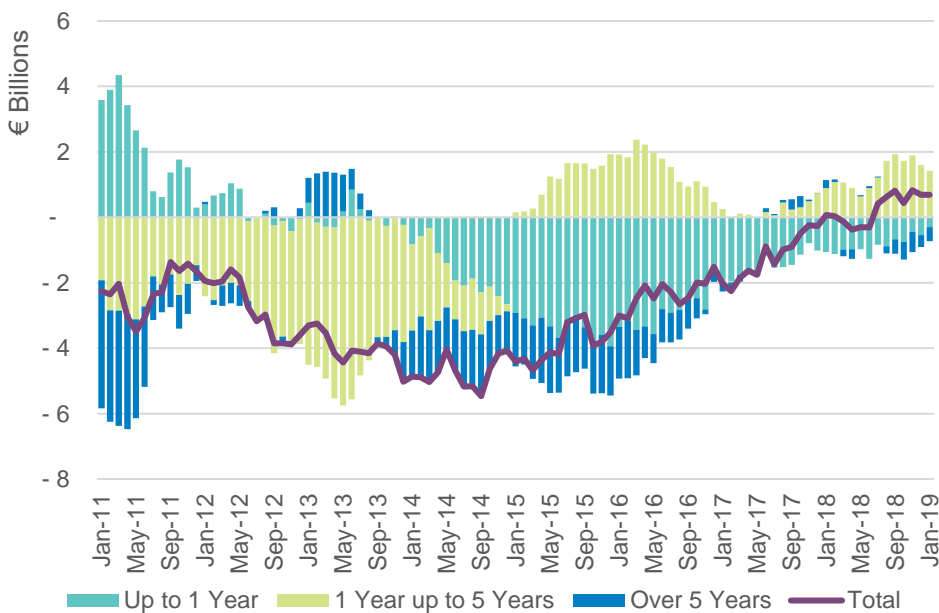


Bank lending to large enterprises has begun to recover, while lending to SMEs continues to decline slowly.

Source: [SME and Large Enterprise Credit and Deposits](#); Author's Calculations, Central Bank of Ireland

Note: SMEs are defined as enterprises with fewer than 250 employees and whose annual turnover does not exceed €50 million and/or whose annual balance sheet does not exceed €43 million. This is the standard EU definition of an SME.

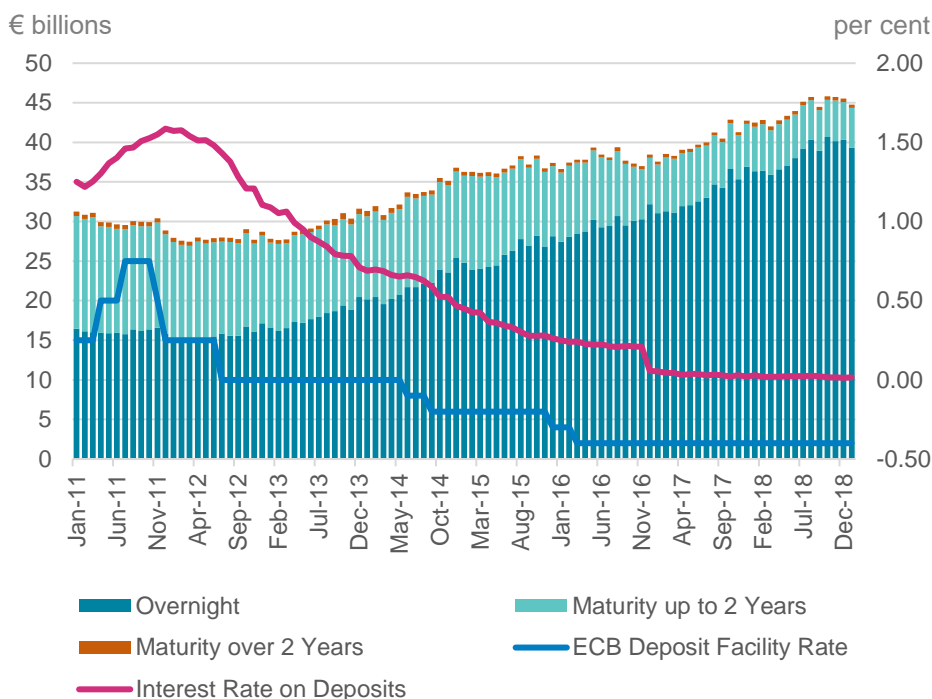
Chart 14: Loans to NFCs; Net Flows (12-Month Sum) by Original Maturity Category



NFC lending growth is driven by loans in the 1-5 years maturity category.

Source: [Loans to Irish Private Sector Statistics](#), Central Bank of Ireland

Chart 15: Deposits of Irish NFCs by Category of Deposits

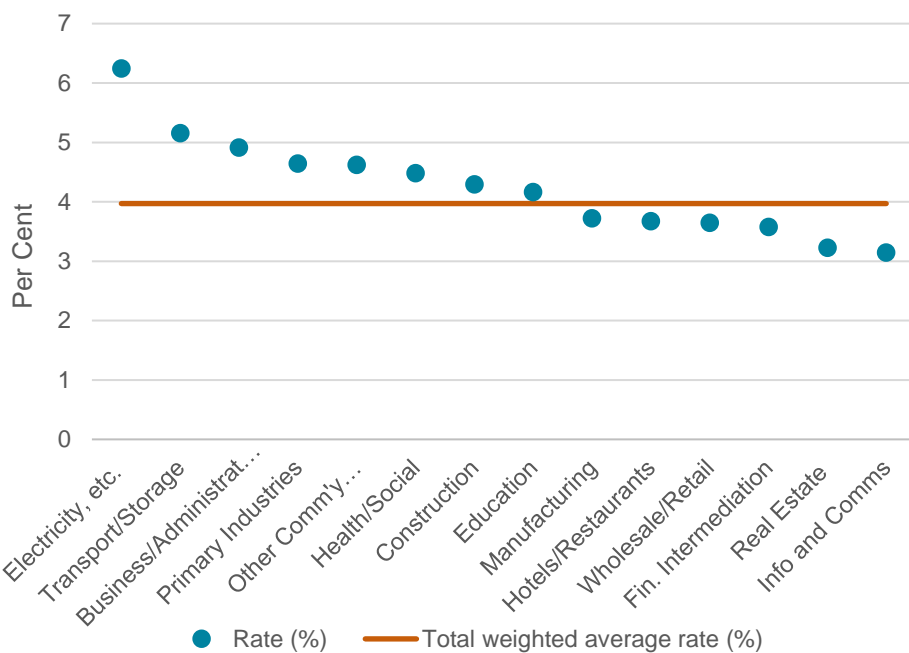


Deposits from NFCs are increasing, growth is coming from deposits of overnight maturity.

Source: [Bank Balance Sheet Statistics](#), Central Bank of Ireland

Note: Interest rate on deposits is a weighted average across maturity categories.

Chart 16: SME New Lending Interest Rates and New Lending Drawdowns, Q4 2018



Electricity SMEs saw the largest net new lending in Q4 2018.

Source: [SME and Large Enterprise Credit and Deposits](#), Central Bank of Ireland

Chart 17: Gross New Lending to SMEs, Q4 2018

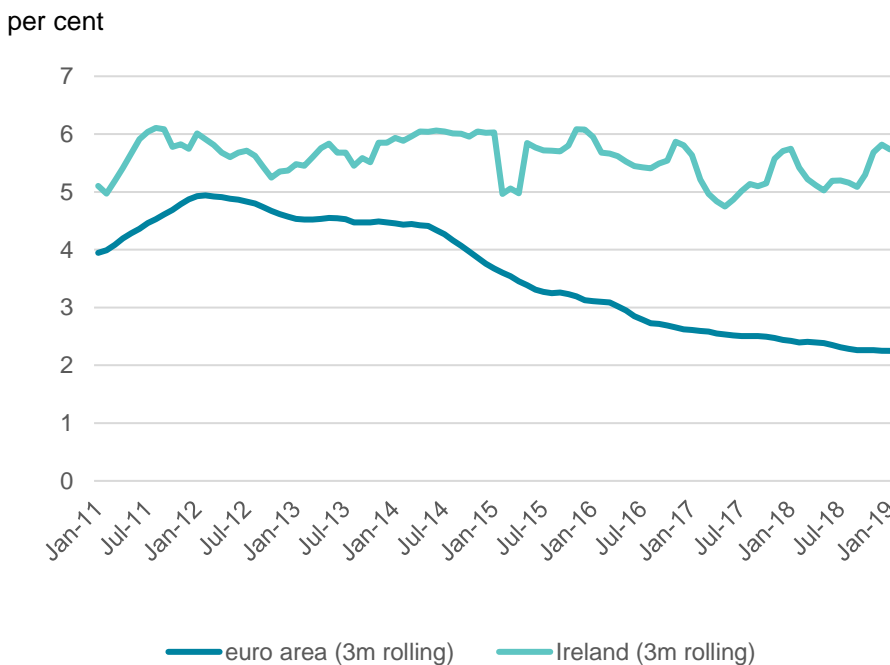
Real estate has consistently been



Source: [SME and Large Enterprise Credit and Deposits](#), Central Bank of Ireland

Note: Other includes Education, Information & Communications, Electricity, Gas, Steam and Air Conditioning Supply

Chart 18: Interest Rates on Small Loans to Non-financial Corporations



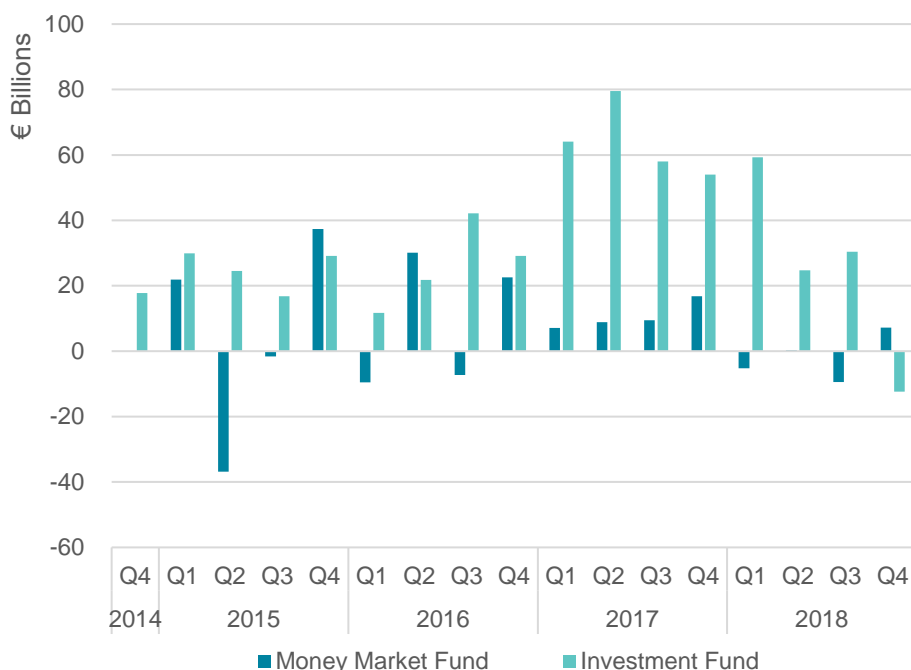
Irish NFCs face higher funding costs than the euro area average for bank loans.

Source: Bank Interest Rate Statistics, ECB Statistical Data Warehouse

Note: Only includes interest rates charged on new bank lending to NFCs of amount <250k

Non-Bank Financial Sector

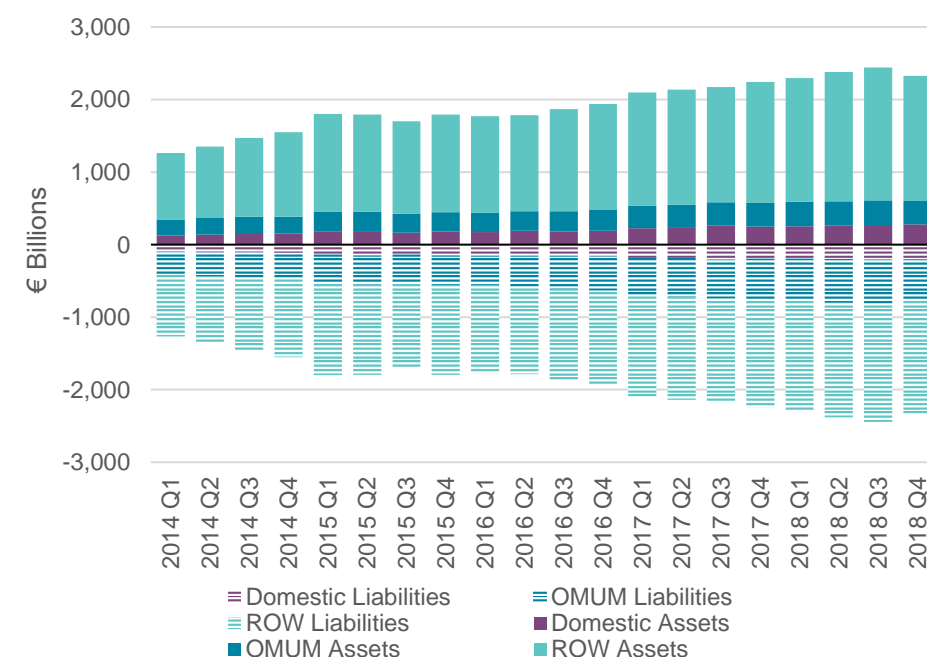
Chart 19: Net Subscriptions of Money Market and Investment Funds



Investment Funds saw their first quarter of net redemption in the history of the series in Q4 2018.

Source: [Investment Funds Dataset](#), Money Market Funds Dataset, Central Bank of Ireland

Chart 20: Total Assets and Liabilities of Investment Funds - by Region

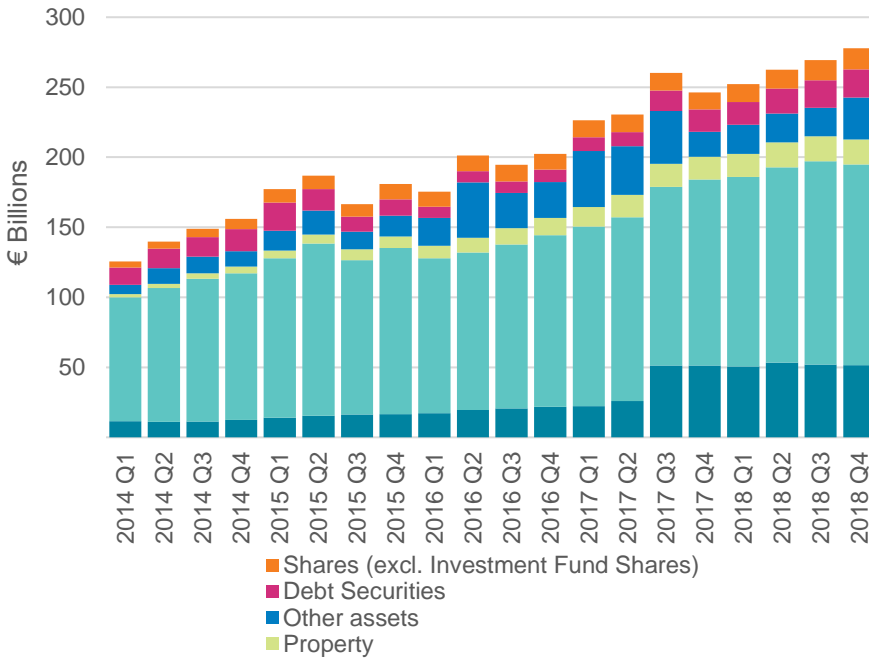


Investment funds are mainly used by foreign investors to invest in foreign assets.

Source: [Investment Funds Dataset](#), Central Bank of Ireland

Note: OMUM= Other Monetary Union Member, ROW=Rest of World.

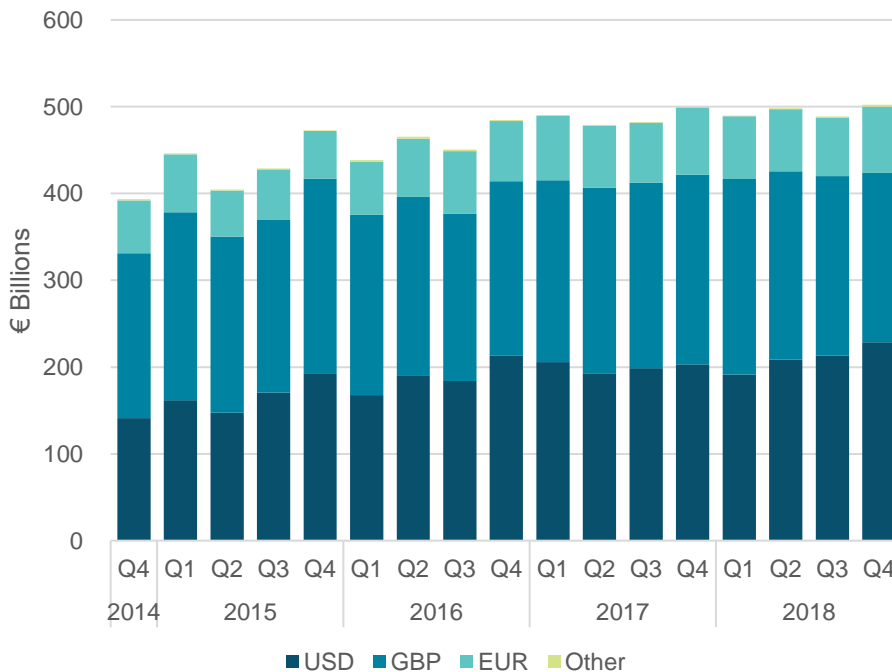
Chart 21: Total Irish Assets of Irish Resident Investment Funds, by Asset Class



Investment in other Irish funds constitutes the majority of Irish assets held by Irish resident investment funds.

Source: [Investment Funds Dataset](#), Central Bank of Ireland

Chart 21: Total Assets of Money Market Funds, by Currency

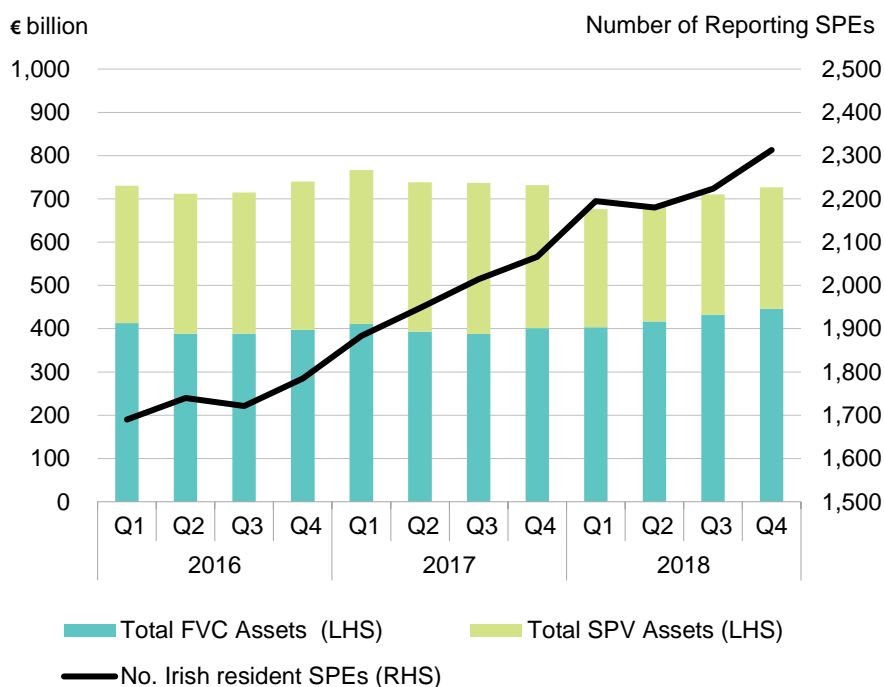


Money Market Funds mainly satisfy demand from GBP and USD investors.

Source: [Money Market Funds Dataset](#), Central Bank of Ireland

Note: Source excludes other assets and equity held by money market funds, and thus does not exactly match chart.

Chart 23: Total Assets and Number of Irish Resident SPEs

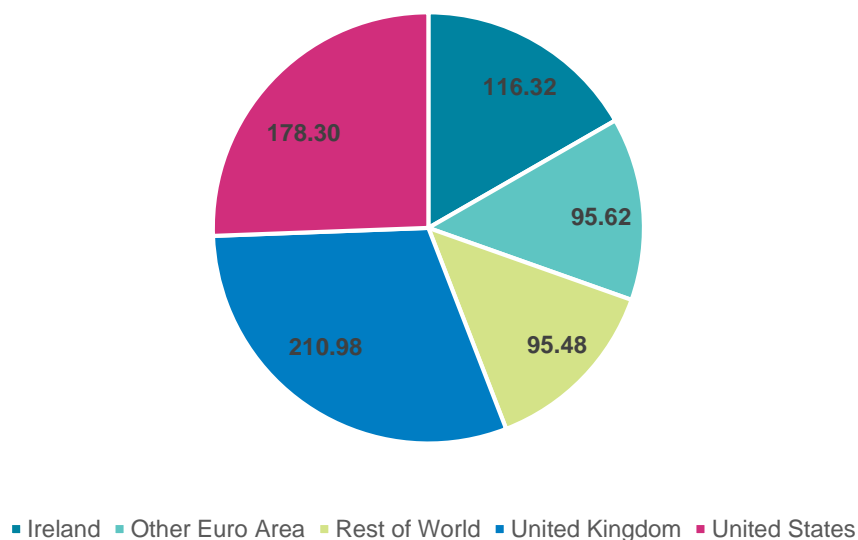


The growth in the number of special purpose entities continues to outpace the growth in their total assets.

Source: [Special Purpose Entities Dataset](#), Central Bank of Ireland

Note: FVC= Financial Vehicle Corporation, SPV= Special Purpose Vehicle.

Chart 24: Total SPE assets by sponsor region in Q4 2018, € billions

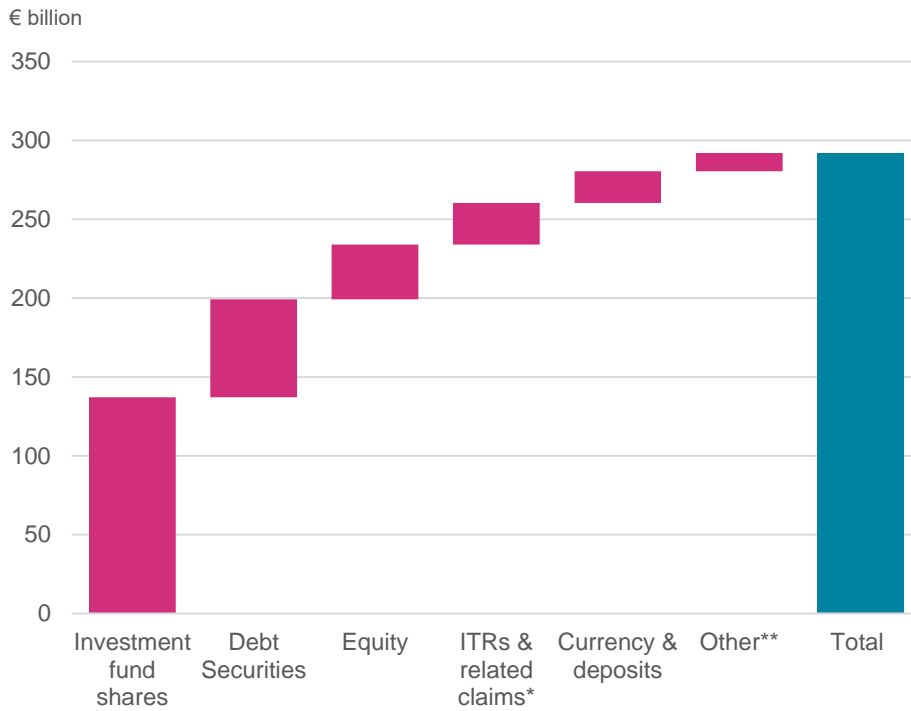


United Kingdom and United States sponsors have set up the majority of SPEs (by assets).

Source: [Special Purpose Entities Dataset](#), Central Bank of Ireland; Authors own calculations

Note: The sponsor of an SPE is the institution that has set it up.

Chart 25: Irish Insurance Corporations (ICs) Financial Instrument breakdown, Q4 2018



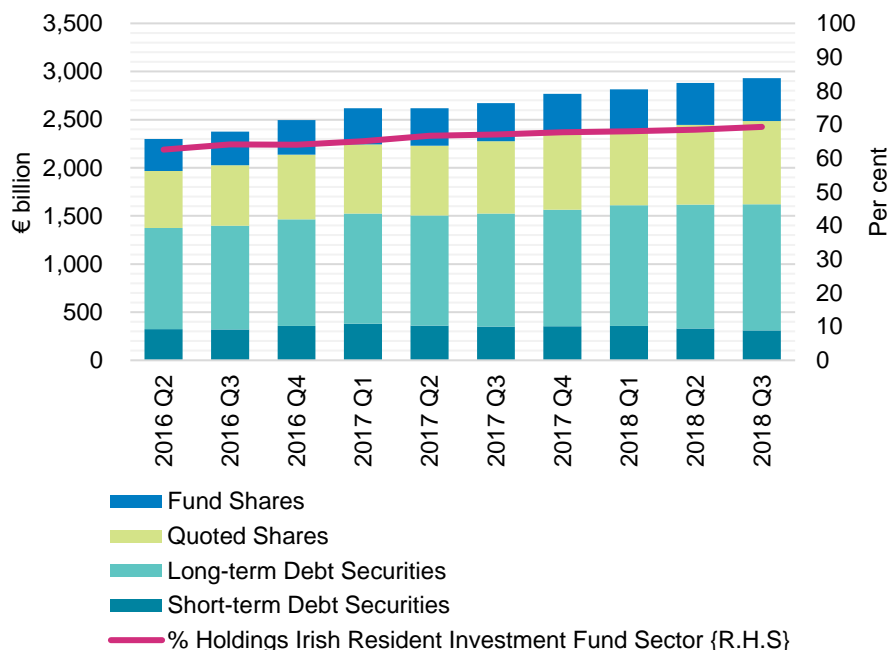
Insurance Corporations predominantly hold Investment Fund Shares.

Source: [Insurance Corporation Statistics](#), Central Bank of Ireland.

Note: *Insurance Technical Reserves and Related Claims. **Other includes Loans and Financial Derivatives.

Other Statistics

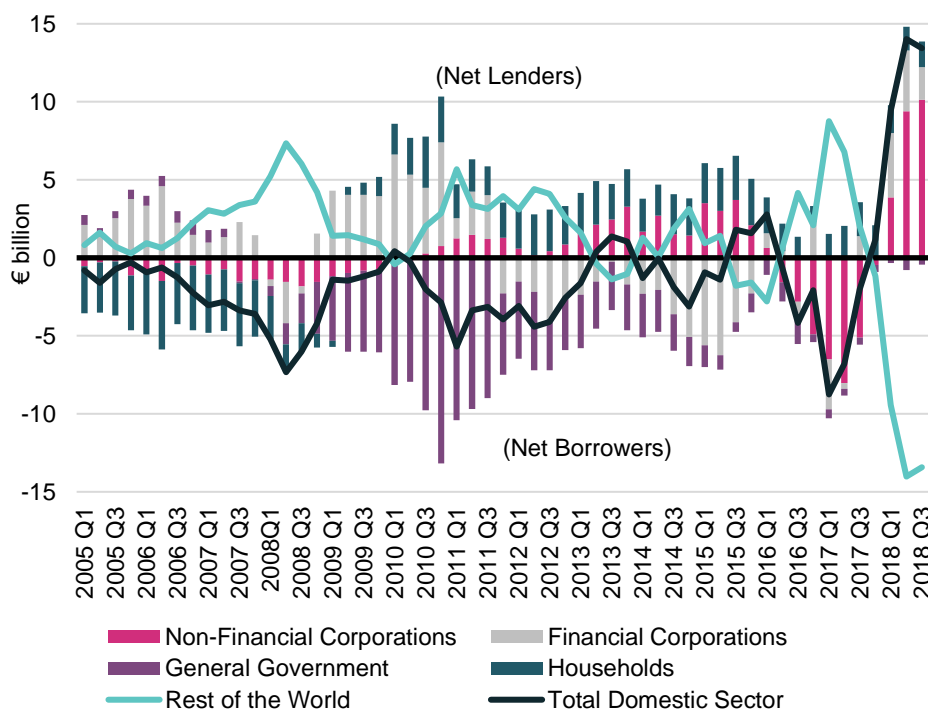
Chart 26: Total Securities holdings of Irish residents



Investment Funds hold the majority of debt and equity held by Irish residents

Source: [Securities Holdings Statistics](#), Central Bank of Ireland, Author's calculations

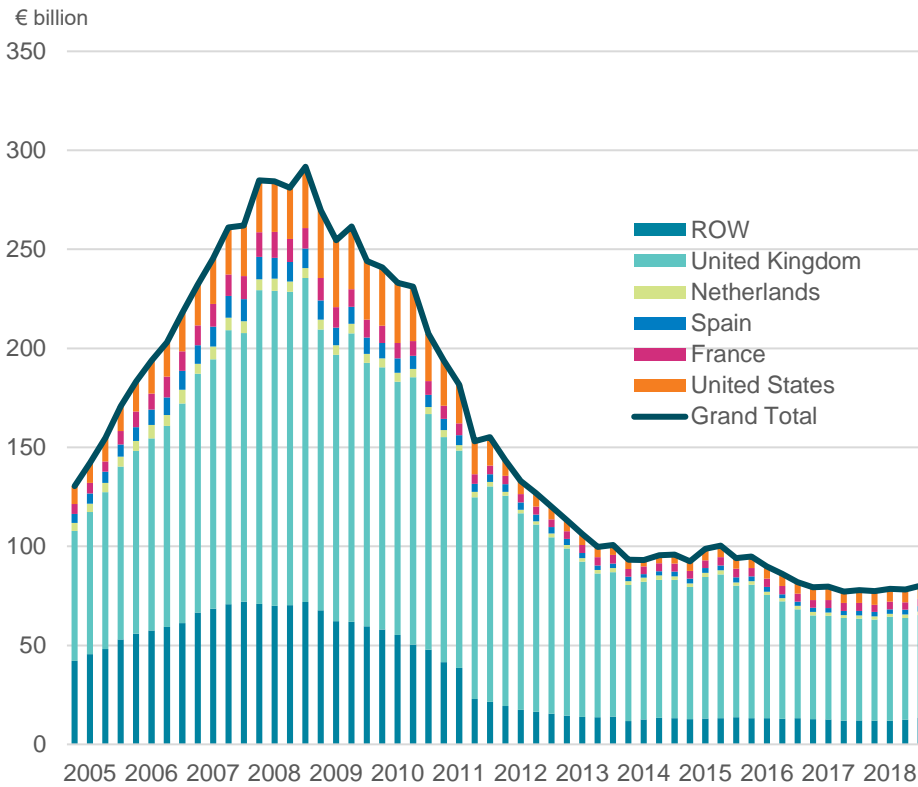
Chart 27: Net lending/borrowing of Irish residents (4 quarter moving average)



Net lending by the domestic economy fell by €1 billion to €13 billion in Q3 2018

Source: [Quarterly Financial Accounts](#), Central Bank of Ireland

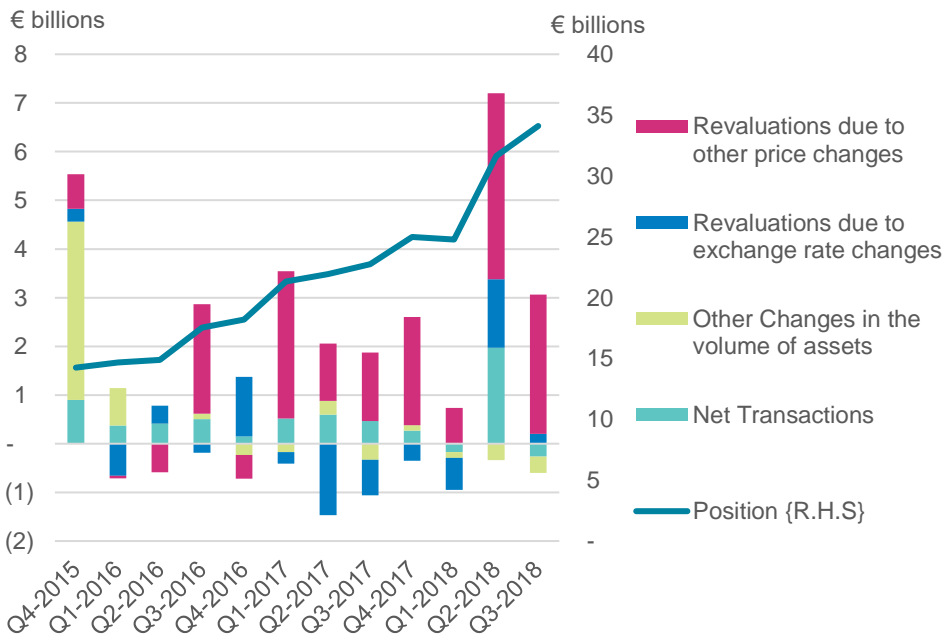
Chart 28: Location of Irish Foreign Claims



Domestic banks' largest foreign claims continue to be on the United Kingdom.

Source: [Consolidated Banking Statistics](#), Central Bank of Ireland

Chart 29: Irish Resident Holdings of 'FAANG' Listed Shares



New granular datasets permit detailed analysis on the holdings of Irish resident investors.

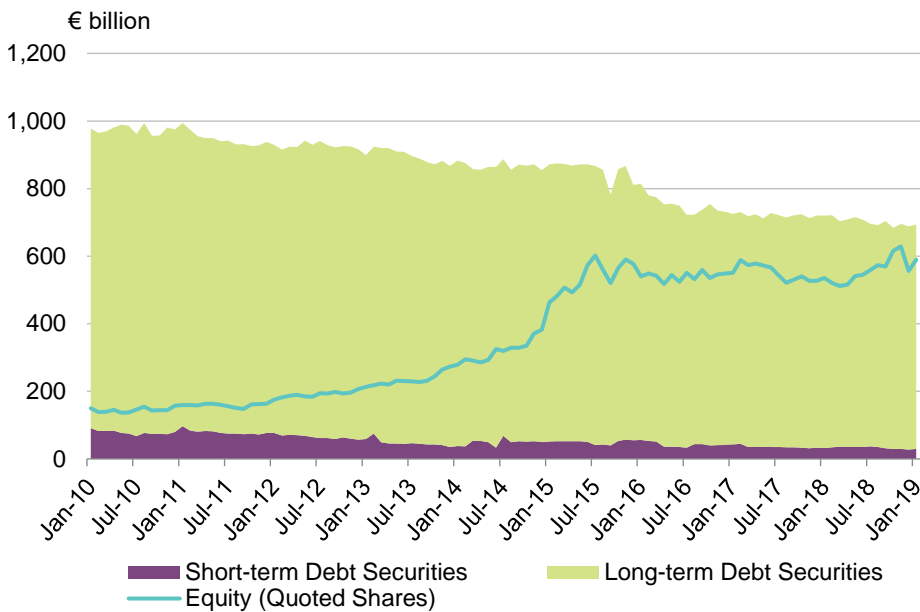
Irish resident investors held € 34 billion worth of FAANG stock as at end-September 2018.

94 per cent of this €34 billion is held by Irish resident investment funds.

Source: Authors calculations, Central bank of Ireland

Note: 'FAANG' = Facebook, Apple, Amazon, Netflix and Google (Alphabet).

Chart 30: Issuance of Debt and Equity by Irish Financial and Non-Financial Corporations

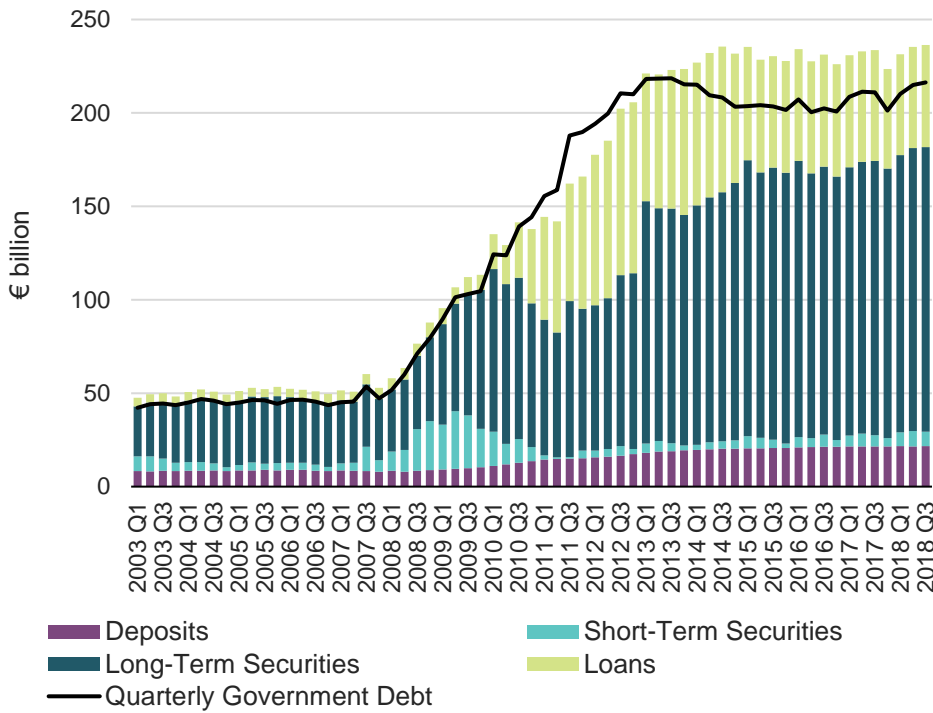


The gap between the total equity and total debt issued by Irish financial and non-financial corporations continues to narrow.

Source: [Securities Issue Statistics](#), Central bank of Ireland

Government Sector

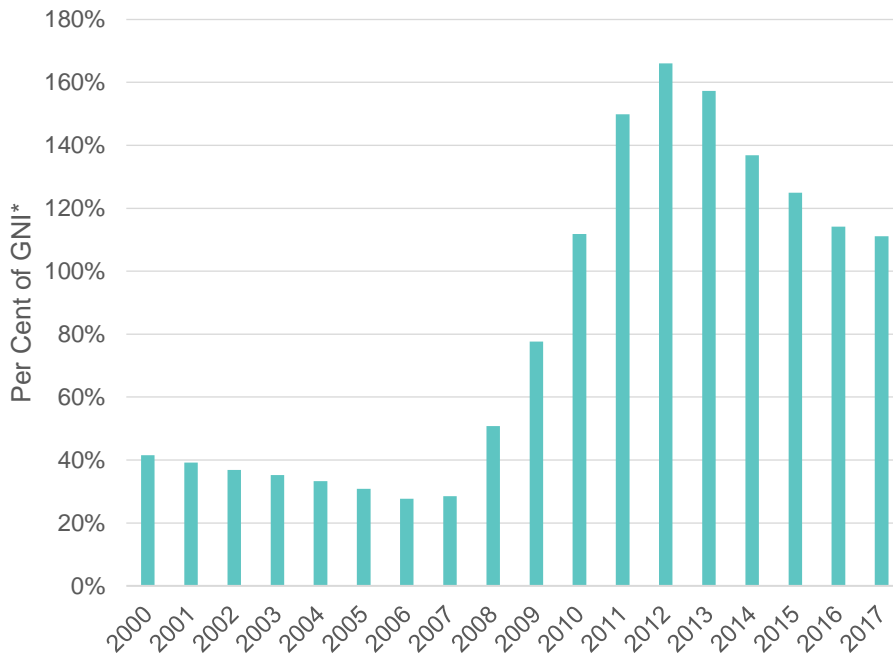
Chart 31: Irish Government Debt - by Category



Quarterly Government Debt rose by €1 billion to €216 billion in Q3 2018

Source: [Quarterly Financial Accounts](#), Central Bank of Ireland

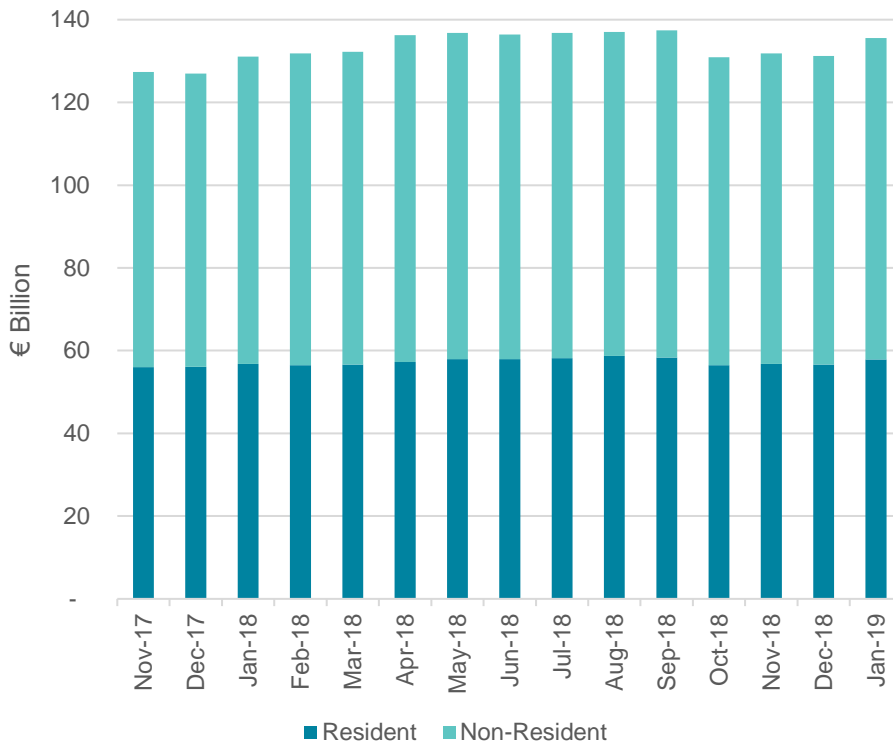
Chart 32: Irish Government Debt-to-GNI*



The ratio of General Government Debt to GNI* was 111 per cent in 2017.

Source: [Annual Government Financial Statistics](#) and [National Income and Expenditure Results](#), Central Statistics Office

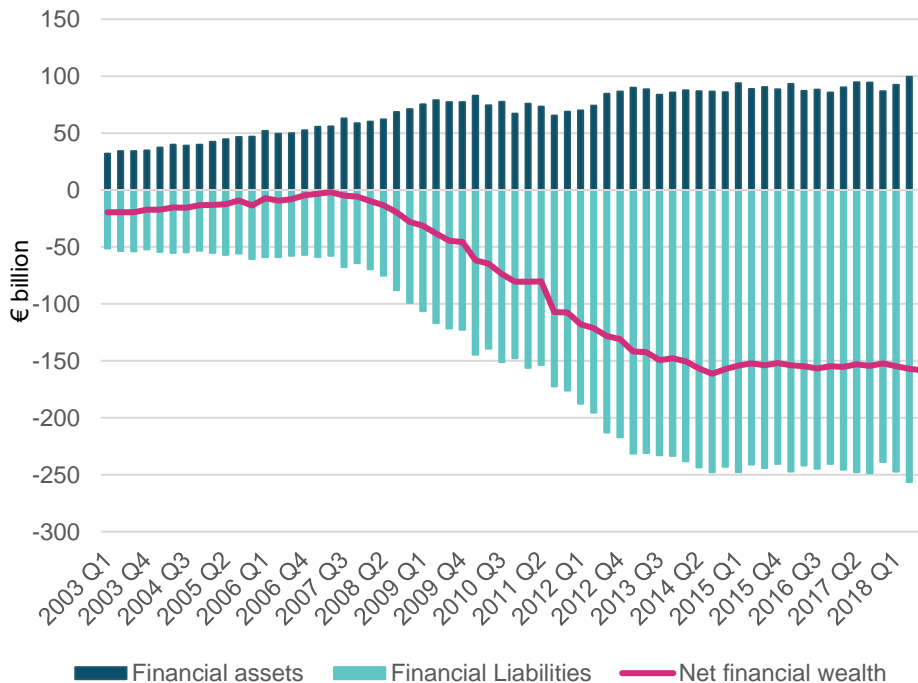
Chart 33: Breakdown of Holders of Government Bonds



Non-resident investors' holdings of Irish government bonds increased by €3bn to €78bn in January 2019.

Source: [Holdings of Long Term Government Bonds](#), Central Bank of Ireland

Chart 34: Government Net Financial Wealth



Government net financial wealth fell by €1 billion during Q3 2018 as the increase in liabilities outstripped the increase in financial assets

Source: [Quarterly Financial Accounts](#), Central Bank of Ireland

Section 2

Signed Articles

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

The Irish Government Bond Market and Quantitative Easing

John Larkin, PJ Anderson and Sean Furlong⁴²

Abstract

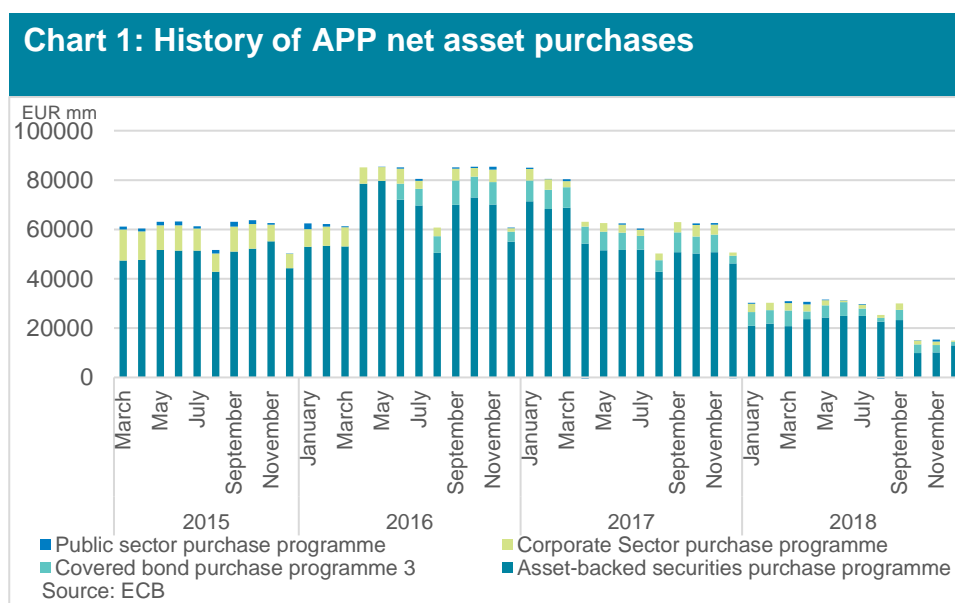
Between September 2014 and the end of 2018, under the ECB's Asset Purchase Programme (APP), the Eurosystem purchased over €2.5 trillion worth of securities. By the end of December 2018, over €30bn of Irish government bonds, a significant portion of the Irish government bond market, had been purchased under the programme. As might be expected after such an event, the bond market has undergone a number of changes. We examine these changes under three key themes. Firstly, we look at the impact on yields. Secondly, we look at the market structure in terms of the duration, the cost of Irish government debt and the change in the structure of the investor base. Finally, we examine the impact on the liquidity of Irish government bonds over the period. We present strong evidence that announcement effect of the APP caused a compression of Irish bond yields. This has contributed to financing conditions that indirectly support increased issuance of Irish sovereign debt at lower interest rates, which in turn has reduced Ireland's debt servicing costs. The maturity profile of Irish government debt has also been extended. Finally, we find little evidence that liquidity conditions deteriorated over the period, contrary to expectations when the programme was announced.

⁴² The authors work in the Financial Markets Division. The views expressed in this article are those of the authors only, and do not necessarily reflect the views of the Central Bank of Ireland. The authors would like to thank Peter Sinnott, Daragh Cronin, Elizabeth Frayne, Robert Goodhead, John Nash, Patrick Haran, as well as Rossa White and David Purdue of the NTMA for their helpful comments and suggestions.

1. Introduction

In January 2015, the ECB's Governing Council decided to introduce the Public Sector Purchase Programme (PSPP), commonly known as quantitative easing (QE), to its suite of existing private sector asset purchase programmes. Under the PSPP, the Eurosystem purchased euro area bonds, issued by central governments, on a large scale in pursuit of its price stability objective⁴³. This built on the existing private sector purchase programmes, the Third Covered Bond Purchase Programme (CBPP3) and the Asset-Backed Securities Purchase Programme (ABSPP), which were initiated in October and November 2014 respectively. The Corporate Sector Purchase Programme (CSPP) was added later, in June 2016.

While the ECB had purchased government bonds in the past under the Securities Markets Programme (SMP), the scale and objectives of the PSPP represented uncharted territory for the ECB⁴⁴. The first purchases under the PSPP were conducted on 9 March 2015. Following the end of net purchases in December 2018, the cumulative net purchases under the PSPP across the euro area amount to €2.17tn. Chart 1 shows the evolution of APP purchases over time across its four component purchase programmes. The monthly APP net purchase pace was adjusted a number of times in response to an evolving inflation outlook.



⁴³ The securities purchasable under the PSPP also included bonds issued by recognised agencies, regional and local governments, international organisations and multilateral development banks located in the euro area.

⁴⁴ The SMP was an asset purchase programme introduced in 2010, with the aim of alleviating market tensions in particular sovereign bond markets, which were hampering the transmission of monetary policy. In contrast to the PSPP, the SMP was designed to be neutral with respect to the supply of central bank liquidity as purchases under SMP were sterilised.

Purchasing bonds on a large scale reduces the supply of those securities in the secondary market, which puts upward pressure on the price and downward pressure on yields. The compression of yields on government bonds is among the primary channels through which central bank bond buying affects inflation.⁴⁵ Sovereign bond yields are used in the pricing of a broad range of interest rates relevant to the real economy. Given that the ECB had reached the effective lower bound on interest rates, the purchase programme has been a powerful non-standard tool to lower financing conditions more generally in order to stimulate economic activity and put upward pressure on inflation. Purchases also affect inflation through other transmission channels such as the portfolio-rebalancing channel, the signalling channel and the exchange rate channel.

From the outset, the ECB acknowledged the “potential distortive effects of central bank action on the formation of market prices”, and set out a strategy for minimising such unintended consequences, including on bond market liquidity.⁴⁶ This strategy included a number of safeguards that would aim to protect both market functioning and market liquidity. The measures imposed included limits⁴⁷ on the proportion of each issuer’s outstanding PSPP-eligible debt that could be held by the ECB and the prohibition of purchases of public sector debt in the primary market. Purchases were conducted in the secondary market at the prevailing market price and in a market neutral manner, while the PSPP holdings were made available to the market for securities lending, with the aim of supporting market liquidity by alleviating bond scarcity borrowing.⁴⁸

This article investigates the evolution of the Irish government bond market since the beginning of the PSPP. The analysis captures some of the effects of PSPP on the market. Section 2 examines the background of the PSPP from an Irish implementation perspective. Section 3 examines the impact of APP on Irish sovereign bond yields. Section 4 looks at the developments in the Irish bond market over time, in terms of the duration and cost of Irish government debt and the change in the structure of the investor base. Section 5 assesses what impact the PSPP has had over

⁴⁵ For a description of the channels through which the APP affects inflation, see Box 1 ‘The Governing Council’s Expanded Asset Purchase Programme.’ ECB Economic Bulletin Issue 1, 2015.

⁴⁶ “*Embarking on public sector asset purchases*”, speech by Benoît Cœuré, Member of the Executive Board of the ECB, at the Second International Conference on Sovereign Bond Markets, Frankfurt, 10 March 2015.

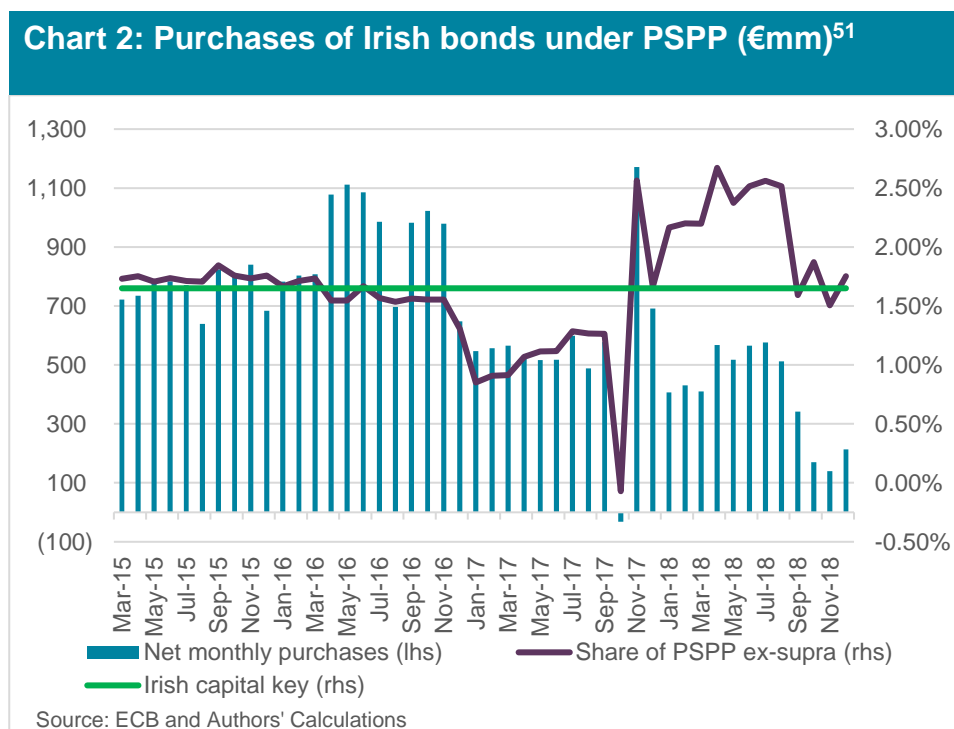
⁴⁷ Eurosystem holdings of PSPP-eligible bonds such as Securities Markets Programme (SMP) and any other portfolios owned by NCBs are included in the calculation for the issuer limit and issue limit.

⁴⁸ For an overview of the initial modalities around the programme see “Box 1: The euro area expanded asset purchase programme”, Central Bank of Ireland Annual Report 2015.

the period on the liquidity of the Irish government bond market. Section 6 concludes.

2. Implementation of QE in Ireland

As with other Eurosystem monetary policy operations, while the ECB coordinates operations on a system wide basis, the PSPP is implemented on a decentralised basis. Thus, one significant difference between the ECB's QE programme and that of other major global central banks is that it is implemented in nineteen sovereign states and thus multiple sovereign bond markets. In order to provide an appropriate guide for the implementation of purchases across euro area countries, the ECB's capital key was considered the most appropriate metric since it is based on the population and the size of the economy in each country. For Ireland, this meant that the capital key of 1.65 per cent would guide the allocation of PSPP purchases of Irish government bonds.⁴⁹ Chart 2 presents the evolution of Irish purchases under PSPP.⁵⁰



⁴⁹ While each NCB is responsible for purchasing domestic bonds in its own jurisdiction, the ECB also purchases in each jurisdiction in order to maintain the risk-sharing profile of the PSPP.

⁵⁰ The sharp decrease in October 2017 is due to the redemption of PSPP holdings of the Irish government bond that matured in this month. Due to the size of the redemption, the Bank opted to reinvest the maturing principal over two months rather than one, in accordance with the flexibility granted by the Governing Council.

⁵¹ The share of PSPP ex-supra refers to PSPP purchases excluding the 10% allocation for marketable debt instruments issued by international or supranational institutions located in the euro area (from March 2015 until March 2016 this figure was 12%).

The volume of monthly purchases of Irish government bonds under the PSPP fluctuated over time for two reasons: firstly, volumes were adjusted in accordance with the total PSPP target, and secondly, the Irish purchase share was adjusted due to issuer limit constraints. In order to preserve market functioning the Central Bank, similar to other National Central Banks (NCBs), is restricted to a maximum holding of 33 per cent of the nominal amount of the total outstanding PSPP-eligible bonds, and 33 per cent of any individual government bond. Due to the Eurosystem's legacy holdings of Irish government bonds related to the SMP, as well as the size of the Central Bank's so-called "Special Portfolio"⁵² holdings, the issuer limit was a binding constraint to Irish purchases throughout much of the implementation period.⁵³ As a result, after purchasing Irish government bonds at close to the capital key share for the first two years of the programme, this share dropped sharply in early 2017 following the extension of the programme to the end of that year.

However, the ability to purchase Irish bonds under the Programme improved during late 2017 due to: (i) higher than expected National Treasury Management Agency (NTMA) issuance, (ii) accelerated disposals of Floating Rate Notes (FRNs) from the Special Portfolio by the Central Bank, and (iii) lower projected APP purchase pace in 2018, the share of Irish government bond purchases increased. For many months of 2018, Irish monthly purchases were above the capital key share (1.65 per cent), with the objective of reducing the negative deviation from capital key on a stock basis. As of 31 December 2018, cumulative net purchases of Irish government bonds by the Eurosystem (purchases by both the CBI and the ECB) amounted to €30.1bn, which represents a 1.55 per cent share of total PSPP purchases (excluding supranational bonds).

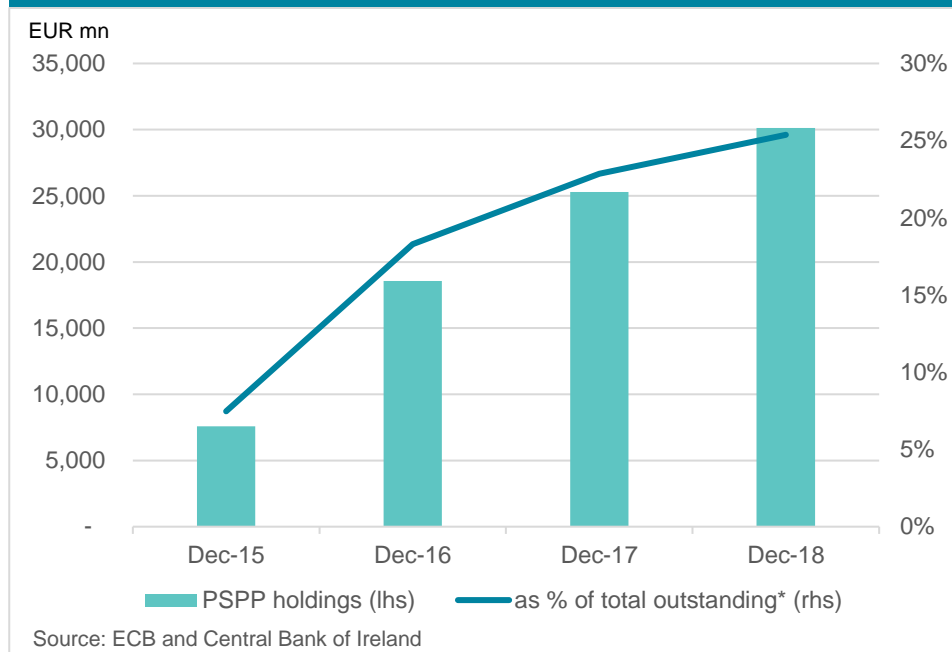
Net PSPP purchases ended in December 2018 and the Governing Council announced that the full reinvestment of maturing principal amounts in PSPP (and private sector purchase programmes) would continue "for an extended period of time past the date when it starts raising the key ECB interest rates". Accordingly, the period from January 2019 onwards can be referred to as the APP "reinvestment phase". The Governing Council also announced that during the PSPP reinvestment phase, the capital key would continue to guide purchases on a stock basis. This means that in principle redemptions are reinvested in the jurisdiction in which principal repayments are made. Furthermore,

⁵² Special Portfolio refers to the Central Bank's holdings of Irish government bonds (floating rate notes (FRNs)) acquired as part of the liquidation of Irish Bank Resolution Corporation (IBRC).

⁵³ The lack of Irish government bond issuance during the years preceding the programme also limited the supply available for purchase under PSPP.

adjustments will be made to bring individual NCBs' shares of PSPP holdings into closer alignment with ECB capital key.

Chart 3: Evolution of PSPP holdings in terms of percentage of outstanding amount⁵⁴

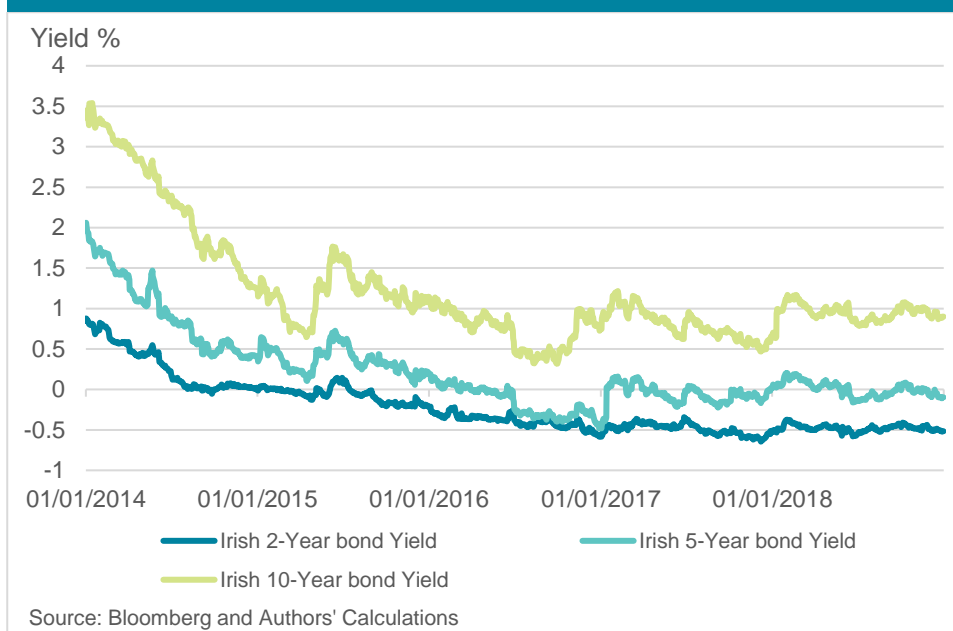


3. The impact of APP on yields

This section quantifies the impact of the APP on Irish sovereign bond yields. Irish yields declined sharply across the curve in the years preceding the introduction of the APP in the euro area. This was primarily due to the improving economic and fiscal position of the sovereign, coupled with associated upgrades from credit ratings agencies, in the aftermath of the sovereign debt crisis in the euro area. Chart 4 graphs the evolution of Irish yields since 2014. Yields declined over the course of 2014 and generally remained at suppressed levels since. Since the beginning of 2015, the 'generic' 10-year yield has traded between a high of 1.78 per cent, reached in June 2015 and low of 0.33 per cent, reached in September 2016.⁵⁵

⁵⁴ The outstanding amount of fixed rate Irish government bonds. This amount differs from the PSPP eligible universe that is utilised in the calculation of issuer limit.

⁵⁵ Bloomberg compile generic bond prices by creating a time series that links consecutive on-the-run government bonds. For the time-period used in this paper, there are periods where there were no available on-the-run 2-year, 5-year and 10-year Irish government bonds, resulting in data gaps. For those periods of missing data, we substitute in the closest bond available by maturity.

Chart 4: Irish sovereign bond yields 2014-2018

We apply an event study methodology to quantify the immediate effects of the announcement of the APP on Irish sovereign bond yields. Event studies are popular in the literature and focus on changes in asset prices over certain dates. They are based on the assumption that new information is incorporated into the prices of the bond yields very quickly. With an event study approach, the choice of events can be subjective. There have been various different approaches taken in the literature. We follow the approach of Gagnon et al. (2011) where the events focus on a narrow set of official communications. A key assumption in this approach is that the chosen announcements are the only thing to affect the markets expectations of APP decisions. More specifically, we focus on APP announcements at ECB press conferences that contained new information concerning the size, composition and duration of various elements of the APP. There is one exception to this, where we use one event that is not an official Governing Council meeting, a dovish speech given by President Draghi in October 2015. Details of the chosen events are outlined in Table 1.

We analyse the change in Irish sovereign 2-year, 5-year and 10-year bond yields over a one-day and two-day window. The one-day window is measured as the difference between the relevant bond yield at the end of the trading day previous to the announcement and its value at the end of the trading day of the announcement, while the two-day window uses the day following the announcement. The choice of window length is important as it involves a trade-off between it being small enough to avoid contamination of prices by developments elsewhere in the markets (such as economic data releases) and it being wide enough to allow sufficient time for revised expectations to become fully incorporated into bond

prices. Even within a short window, there is still the potential for contamination. For example, the US Employment report is sometimes released the day after the ECB policy decision. We attempt to alleviate this problem by controlling for macroeconomic news surprises in our econometric specification. It should also be noted that during some of these events, the APP announcements formed a part of a broader monetary policy package such as changes to forward guidance on interest rates. While we concentrate on dates with changes to the APP, it is not possible to disentangle the effects of other policy measures that may have been announced at the same time.

Table 1: Key announcement dates used in event study and the two-day change in Irish government bond yields over event set

Date	GC Meeting	Details	2-day change		
			IE 2Y	IE 5Y	IE 10Y
04/09/2014	Yes	Decision to launch ABSPP and the CBPP3.	-0.05***	-0.18***	-0.16***
02/10/2014	Yes	ABSPP and the CBPP3 modalities published.	0.007	0.04*	0.04***
06/11/2014	Yes	President Draghi's dovish comments suggesting further unconventional policy tools	-0.01	-0.06***	-0.08***
22/01/2015	Yes	APP announced	0.00	-0.12***	-0.17***
05/03/2015	Yes	Details of PSPP purchases provided	0.01	-0.06**	-0.05*
22/10/2015	Yes	President Draghi indicates he is prepared to expand PSPP.	-0.04	-0.08	-0.09
03/12/2015	Yes	APP extended	0.11	0.18	0.20
10/03/2016	Yes	APP extended, purchases increased from EUR 60 bn to EUR 80 bn. CSPP announced	-0.01	0.03	-0.03
02/06/2016	Yes	The Eurosystem began purchasing CSPP	-0.01	-0.02	-0.06**
08/12/2016	Yes	APP extended, purchases reduced to EUR 60bn	-0.04	0.00	0.15***
26/10/2017	Yes	APP extended, purchases reduced to EUR 30bn from Jan 2018	-0.07***	-0.09***	-0.09***
14/06/2018	Yes	End-date announced and final taper to EUR 15bn between Oct and Dec 2018	-0.03	-0.09**	-0.11***
13/12/2018	Yes	Confirmation of end net asset purchases and details on reinvestment phase provided	0.00	-0.05***	-0.02***
Cumulative change over events			-0.14	-0.51	-0.49
Actual change Sept 2014 - Dec 2018			-0.50	-0.56	-0.78

* 10% significance level, ** 5% significance level, *** 1% significance level, no asterisks – effect is not significant

Our analysis focuses on the period from September 2014 to December 2018. Following Gagnon et al (2011) and Ambler and Rumler (2017), we

begin with some descriptive analysis over the event dates by analysing the change in yields in the two-day window over the announcement dates. This is illustrated in Table 1. Overall, the Irish sovereign yield curve flattened considerably over the events, with the 2-year, 5-year and 10-year yields declining by a cumulative 14, 51 and 49 basis points respectively in the two-day window over the event set. The statistical significance of each change is estimated by means of a t-test.⁵⁶ The magnitude of the change over the event set, particularly at the longer end of the curve, is quite large when compared with the overall change in yields during the period. This illustrates the importance of these events for overall yield movements over the period.

Focussing on the impact of the individual announcements, the largest downward movements occurred at the initial announcements of the ABSPP and CBPP3 and again the announcement of the APP to include the PSPP in January 2015. It is notable that sovereign bonds reacted positively to the news of purchases in another asset class. This could be attributable to market anticipation that the ECB would eventually purchase sovereign bonds, once an asset purchase programme commenced. A notable upward movement occurred following the December 2015 Governing Council meeting, when the programme horizon was extended but the monthly purchase pace remained unchanged. This disappointed markets, which had expected the Governing Council to both extend the horizon and increase the pace of purchases. Two months previously, in October of that year, President Draghi had indicated that he was prepared to expand the programme. This led to a significant fall in yields at the time but perhaps prepared the ground for the market to be disappointed in December. The final three events are associated with a tapering of the programme, firstly the announcement in October 2017 of a reduction in monthly purchases to €30bn, then in June 2018 the announcement of a further reduction to €15bn and finally confirmation of the end of the net purchase phase and details of the reinvestment phase in December 2018. These three events led to a significant fall in yields. The favourable reaction in terms of yield movements could be attributed to dovish communication during the press conferences. For instance, the programme was extended at two of the meetings and in June 2018, there was an unexpected change in the forward guidance on interest rates.

On relative value basis, Irish sovereign bond yields outperformed core bond yields over the event dates in the study. This is illustrated in Table 2. The largest tightening was witnessed at the longer end of the curve. In 2014, there was a sizable credit risk premium built into peripheral bond

⁵⁶ Our t-test assesses whether the change in bond yields is significantly different from the 'normal' change as calculated as the average of the preceding 30 days. A similar approach is taken by Pereira (2016) and Ambler and Rumler (2017).

yields. At that time, Ireland was trading in line with peripheral countries, whereas in recent times it has been trading closer to the semi-core. Over the announcement days in relation to the purchase programmes, the 5-year and 10-year spreads tightened considerably, with the expectation of a guaranteed purchaser of peripheral debt. This finding is consistent with other studies such as Urbschat and Watzka (2017) that show a stronger downward impact in the periphery than in the core, which suggests a reduction in the credit risk premium in peripheral countries.

Table 2: Two-day change in the spread over Germany over event set (basis points)

	IE 2-year	IE 5-year	IE 10-year
Cumulative change over event set	-0.01	-0.24	-0.26

We extend the above descriptive analysis by adopting an econometric framework frequently used in event study literature. At this point, we broaden the analysis by examining the change in the one-day and two-day window. Using daily data, we regress Δy_t , the one-day or two-day change in Irish sovereign bond yields on D_t , which represents a dummy variable that takes a value of 1 for each of the events and zero for all other dates. As discussed above, there are many factors that can cause yields to increase or decrease over the window in question. The risk of this contamination increases with a wider window. We control for macroeconomic surprises by including the one-day and two-day change in Global Citi Economic Surprise Index. This is represented by z_t in the equation below.⁵⁷

$$\Delta y_t = \alpha + \beta D_t + \lambda \Delta z_t + \varepsilon_t$$

The regressions are estimated using ordinary least squares⁵⁸, in the first instance over the entire period of the APP from September 2014 to December 2018. The results indicate a downward impact on yields that is statistically significant for 5-year and 10-year yields for the one-day change but not statistically significant for the two-day change. Given the results of our descriptive analysis above and the body of empirical studies that show that QE policies have the largest effect at the announcement of the policy, we split our sample into three. The first sample could be described as the ‘announcement phase’ from June 2014 to March 2015. The second could be described as the ‘implementation and recalibration

⁵⁷ As a robustness check, we also included a measure of volatility. When the one and two-day change in the VIX index is included in the specification, our results are unchanged.

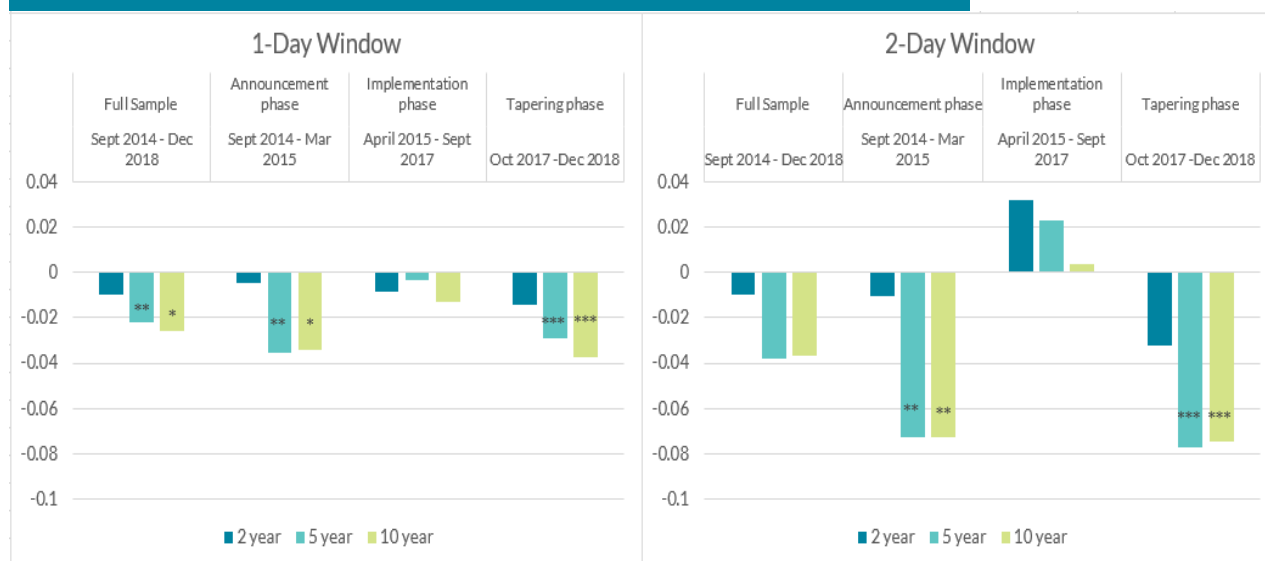
⁵⁸ Newey West HAC standard errors are used for robustness.

phase' from April 2015 to September 2017. The third sample could be described as the 'tapering phase' from October 2017 to December 2018.

The coefficients on the dummy variable in our regressions are illustrated in Chart 5. We see a strong and statistically significant downward impact in the 'announcement phase' in the 5-year and 10-year bonds for both the one-day and two-day changes. However, in the 'implementation and recalibration phase', the impact is not statistically significant from zero in both cases. In the tapering phase, we see a similar impact as during the announcement phase for both one-day change and the two-day change.

The result that QE has a large downward impact on yields at the initial announcements of the programme is consistent with findings elsewhere.⁵⁹ Subsequent purchases, policy announcements and the build-up of the stock of assets likely helped maintain yields at relatively low levels over the course of the programme.⁶⁰ The decline in yields during the tapering phase is interesting as it is perhaps counter-intuitive. It illustrates the strong impact that communication can have during the press conference.

Chart 5: Coefficient (β) on the event dummy over different phases – one-day and two-day window



* 10% significance level, ** 5% significance level, *** 1% significance level

4. Structural developments

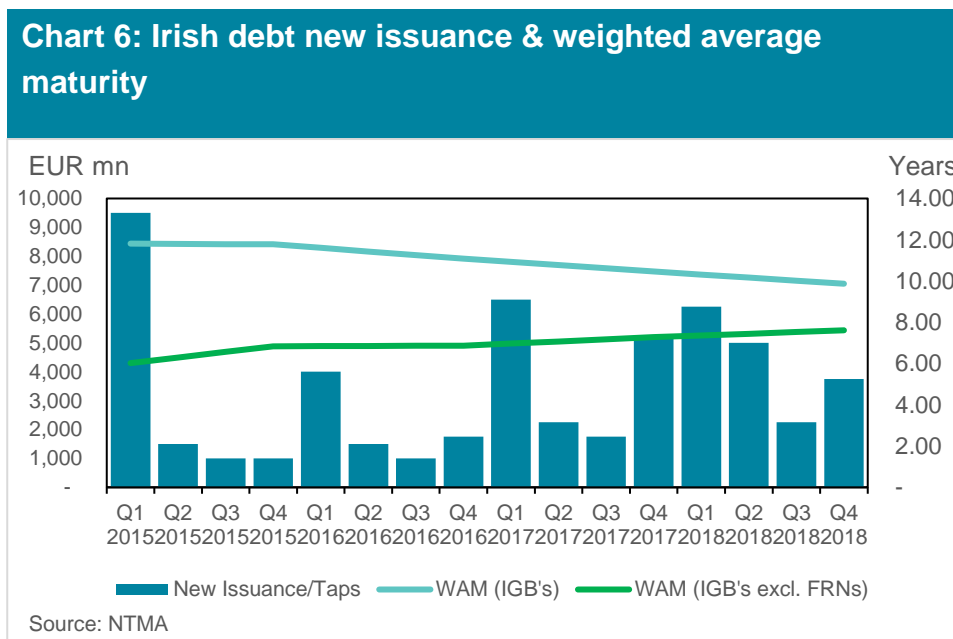
Since the start of the PSPP in March 2015, the Eurosystem has made significant purchases of euro area sovereign debt in the secondary markets. This likely had an impact on the structure of the Irish government bond market in terms of the duration, the cost of Irish

⁵⁹ See for instance Haldane et al (2016).

⁶⁰ Praet, P. (2017), "Maintaining price stability with unconventional monetary policy measures", speech at the MMF Monetary and Financial Policy Conference, London, 2 October.

government debt and the change in the structure of the investor base. As the previous section outlines the PSPP has had the effect of reducing Irish sovereign bond yields significantly and contributed to a flattening of the yield curve. Consequently, while the objective of the PSPP is not to support debt issuance by sovereigns, the PSPP has contributed to conditions that have supported increased issuance of Irish sovereign debt at lower interest rates and for longer maturities.

From 2015 to the end of 2018, Ireland’s NTMA issued approximately €54bn of benchmark Irish government long-term bonds, equating to a net additional supply of €28bn over the period. During this period, the Central Bank also disposed of €13bn of long-term floating rate notes (FRNs) from the Special Portfolio, which were subsequently cancelled by the NTMA⁶¹. The NTMA extended the maturity profile of outstanding Irish government debt, over the horizon of the PSPP, through its issuance of long-term fixed rate bonds. The weighted average maturity (WAM)⁶² of the universe of Irish government bonds (IGBs), as illustrated in Chart 6, now stands at approximately 10 years, which is above the euro area average of approximately 8 years. Excluding the FRNs, the NTMA’s issuance of longer maturity benchmark fixed rate Irish government bonds has steadily increased the WAM for these securities, from about 6 years in Q1 2015 to almost 8 years in Q4 2018.



Looking at Table 3 it is clear that this longer maturity issuance achieved weighted average yields that were much lower over the course of the

⁶¹ On 8 February 2013, the NTMA issued €25.034 billion nominal of Floating Rate Notes, with original maturities ranging from 25 to 40 years, which were exchanged for the Promissory Notes held by the Central Bank, on foot of the liquidation of IBRC.

⁶² This WAM includes the FRNs and at the beginning of 2015, the WAM for these bonds stood at approximately 33 years.

PSPP than pre-PSPP. The lower average yields, which were attained despite the increased supply and maturity profile of outstanding Irish sovereign debt, demonstrates that the PSPP indirectly led to a favourable impact on the cost of servicing Irish debt.

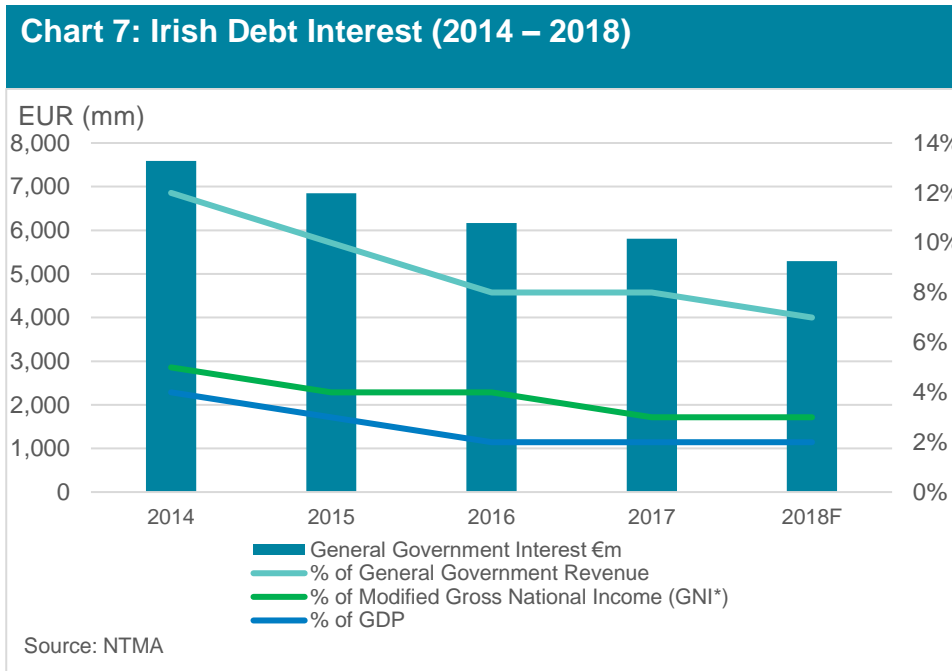
Table 3: Irish Government Bond Issuance (2014 – 2018)

Year	Amount Issued (EUR bn)	WAM (yrs)	Weighted Avg. Yield
2014	11.75	12	2.84%
2015	13	18	1.51%
2016	8.25	10	0.82%
2017	15.75	12	0.89%
2018	17.25	12	1.07%

Source: NTMA

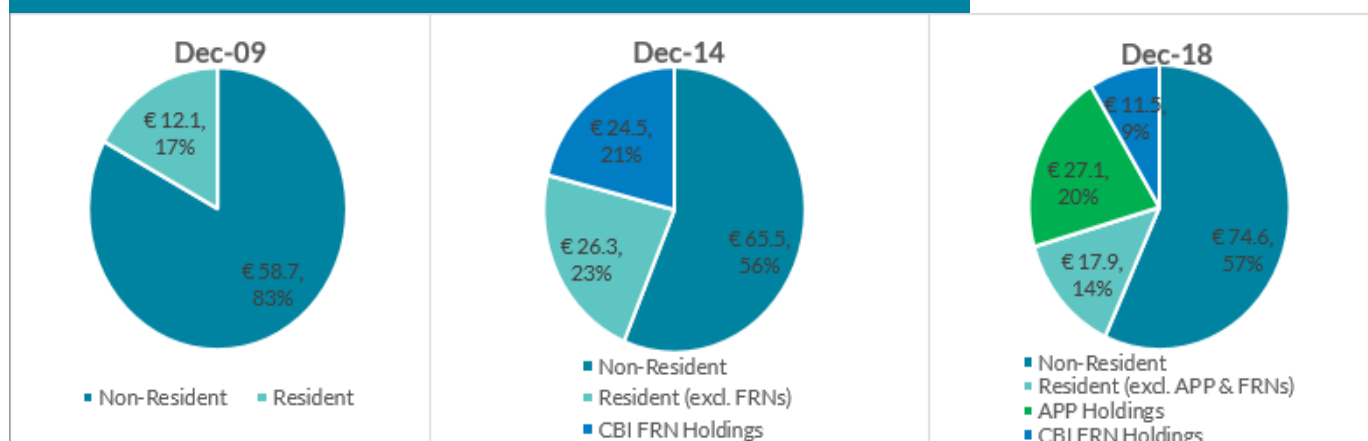
Delving deeper, it is clear in Chart 7 below that the interest cost of servicing general Irish government debt has declined considerably over the horizon of the PSPP. Given the favourable low interest rate environment, the NTMA actively replaced higher cost debt with cheaper new issuance (i.e. early repayment of loans from the IMF, Sweden and Denmark). In absolute terms, the amount paid on interest fell from €7.6bn in 2014 to a projected €5.3bn as at the end of 2018, a reduction of 30 per cent. Given Ireland's robust economic growth throughout this period the fall as a percentage of GNI*⁶³ is even greater.

⁶³ GNI* refers to "modified gross national income" and is designed to filter out the statistical noise associated with multinationals or, as Ireland's Central Statistics Office (CSO) notes, remove the effects of globalisation.



The composition of holders of Irish sovereign debt has changed over the course of the last decade, as illustrated in Chart 8. In 2009, prior to the sovereign debt crisis, non-resident investors accounted for greater than 80 per cent of holdings. Some argue that non-residents represent a less stable source of demand for sovereign debt (Arslanalp and Tsuda 2012). This could be due to their sensitivity to factors such as the fiscal position and the business cycle position (Jalles 2018). The NTMA has historically maintained a sizable investor base outside Ireland, reflecting Ireland's position as a small open economy with a relatively small domestic financial system. Chart 8 shows a marked reduction in the share of debt held by non-residents between 2009 and 2018, however, this is distorted by the issuance of the FRNs in February 2013 that would form part of the Central Bank's "Special Portfolio", thus inflating the share of resident holdings. In absolute terms non-resident holdings actually increased during the sovereign debt crisis and non-residents remained net buyers of Irish debt during the APP. This suggests that non-resident investors have been a resilient source of financing for the NTMA, even during times of stress.

Chart 8: Holders of Irish Government Long-Term Bonds (€mm)



Although the overall share of resident and non-resident holdings are relatively unchanged between Q4 2014 and Q4 2018, the composition of resident holdings has changed considerably throughout the lifetime of the PSPP. The NTMA cancelled a considerable amount of long term FRNs on foot of disposals by the Central Bank during this period, while also issuing a substantial amount of Irish sovereign debt. Through its purchases of Irish government bonds in the secondary markets (€30bn in total), the PSPP indirectly absorbed a portion of the increased NTMA bond issuance. The composition of Irish sovereign debt holders as at Q4 2018 indicates that the PSPP led to a reduction in the share of debt held by Irish residents (excluding CBI).

Table 4: Change of sovereign bond holdings by institutional sector (Q4 2014 – Q2 2018)

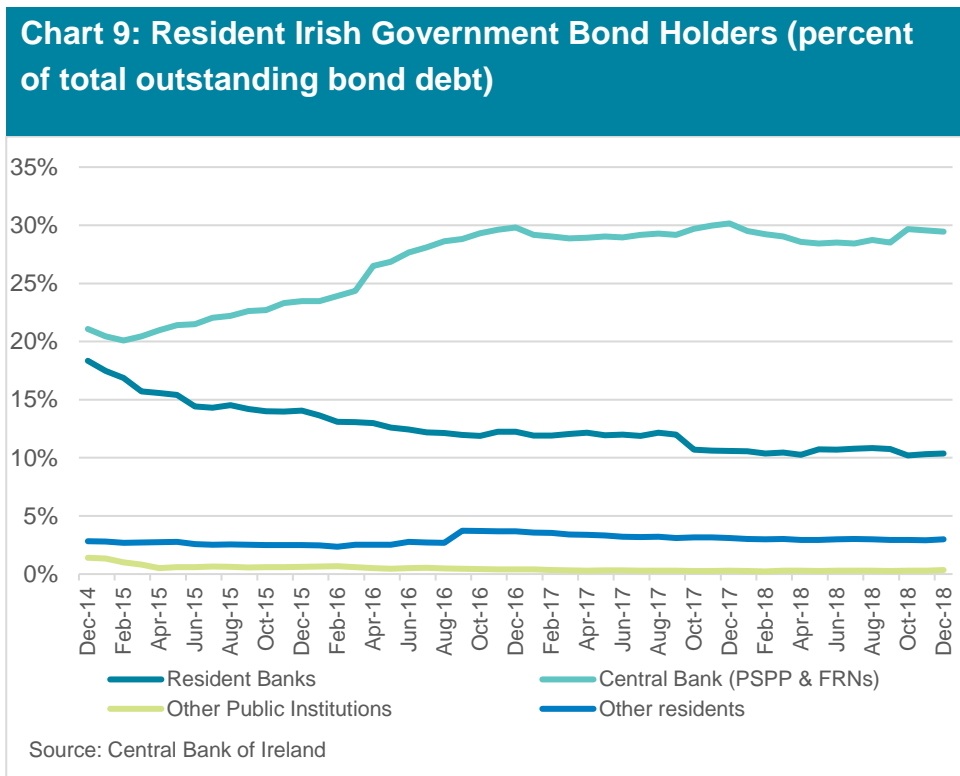
Country	Resident banks	Central bank	Other public institutions	Other residents	Non-residents
France	-3.20%	15.90%		-1.70%	-11.00%
Germany	-4.10%	16.20%		-0.20%	-11.90%
Ireland	-7.70%	7.40%	-1.10%	0.20%	1.20%
Italy	-2.70%	13.60%		-7.10%	-3.80%
Netherlands	-1.80%	18.00%		1.10%	-17.30%
Portugal	-2.80%	17.10%		-0.90%	-13.40%
Spain	-13.30%	17.60%	-4.30%	-3.40%	3.40%

Source: Bruegel & Central Bank of Ireland

With sovereigns exposed to bank risk and banks exposed to sovereign risk, the resulting two-way exposure creates a link between the default risk of governments and banks⁶⁴ (the so-called bank-sovereign 'doom loop'), which became one of the major challenges to stabilising the euro

⁶⁴ Arslanalp and Tsuda (2012), Working Paper WP/12/284, IMF.

area financial system during the crisis period. Against this background, a reduction in holdings of Irish government bonds by resident banks could potentially be seen as a positive for financial stability. In comparison to most of its euro area peers, Ireland (together with Spain) is an outlier in terms of the decline in the resident banks’ holdings of sovereign debt and in terms of the increase in non-resident holdings. This is illustrated in Table 4. Looking deeper into the investor profile in Chart 9 we can see that this decline in Irish resident holdings (ex CBI) is mostly accounted for by resident banks, whose share of outstanding Irish government bond debt has declined from about 18 per cent at the start of 2015 to approximately 10 per cent at the end of 2018.



5. Market Liquidity

Market liquidity is generally defined as the ability to rapidly execute sizable securities transactions at a low cost and with limited price impact. As set out by the IMF (2015), QE can have both positive and negative effects on market liquidity.⁶⁵ While the introduction of a large committed buyer to the market should be supportive of market liquidity, the central bank as a buy-to-hold investor simultaneously reduces the net supply of bonds to private investors, thus increasing scarcity. At the time of the introduction of the PSPP in March 2015, the ECB was cognisant of the potential implications of large-scale asset purchases by the central bank

⁶⁵ Global Financial Stability Report, October 2015, IMF.

on bond market liquidity.⁶⁶ In order to avoid exacerbating any existing market frictions, and limit distortions within sovereign bond markets, the Eurosystem would avoid the cheapest-to-deliver bonds for futures contracts, and purchasing bonds trading ‘special’ in repo markets. Large-scale purchases would also increase scarcity for private market participants and potentially impact broader market liquidity. Further measures, such as the imposition of issue and issuer limits, and the Eurosystem’s securities lending programmes aimed to mitigate this possible adverse impact on smooth market functioning.

Since the launch of QE by the world’s main central banks, a number of studies have looked at the impact of QE on sovereign bond markets. The findings have been mixed. Kandrak and Schlusche (2013) found no significant liquidity effects of the Federal Reserve’s QE programme on the US Treasury markets, while Christensen and Gillan (2013) found that the Fed’s purchases of US Treasury Inflation-Protected Securities (TIPS) had a positive impact on liquidity in this market. With respect to the ECB’s APP, Schlepper (2017) found a negative impact on German bond market liquidity.

This section looks at a number of liquidity indicators in order to examine the evolution of liquidity in the Irish government bond market throughout the PSPP: i) turnover data; ii) real trade data; and iii) indicative price data.⁶⁷

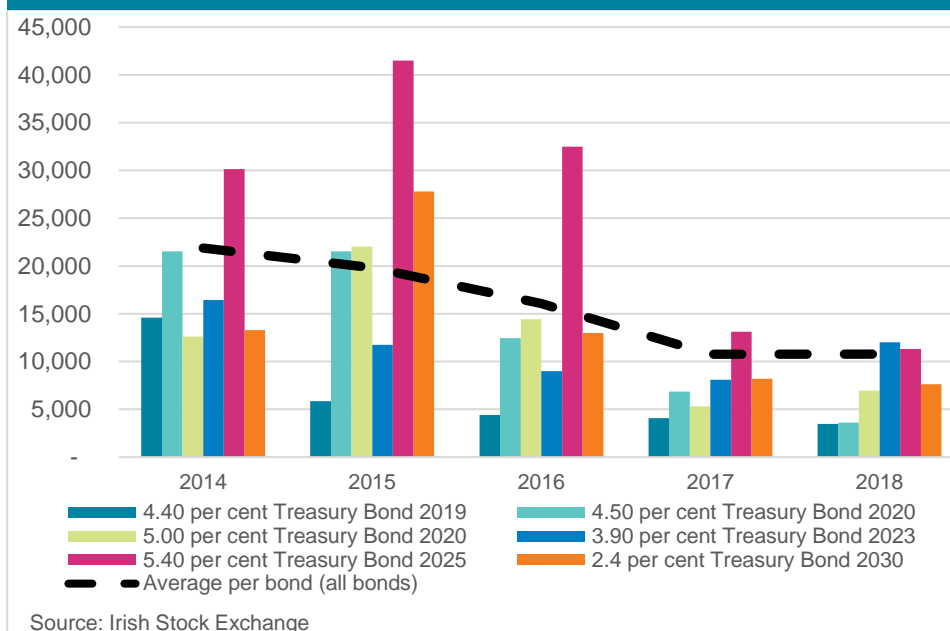
(i) Turnover data

The turnover, or volume traded, in a securities market, while not necessarily a measure of liquidity, can be an indicator of liquidity conditions in a market, with higher turnover pointing to higher liquidity. Chart 10 sets out total annual turnover for a selection of Irish government bonds. In order to capture the evolution of traded volumes over the period of PSPP, the selected bonds are those that were issued pre-PSPP and remain outstanding. This turnover data displays a downward trend since 2015, the year of the PSPP’s introduction. This trend reflects a logical intuition; with the Eurosystem entering the market as a significant new buy-to-hold investor, the market of remaining “free float” bonds for private investors to transact in diminishes.

⁶⁶ “*Embarking on public sector asset purchases*”, speech by Benoît Cœuré, Member of the Executive Board of the ECB, at the Second International Conference on Sovereign Bond Markets, Frankfurt, 10 March 2015. https://www.ecb.europa.eu/press/key/date/2015/html/sp150310_1.en.html

⁶⁷ A comparison of before and during the APP would in theory be useful in this section, however, it is not utilised given the large distortions in the Irish market before the APP due to the sovereign debt crisis.

Chart 10: Annual turnover for selected Irish government bonds

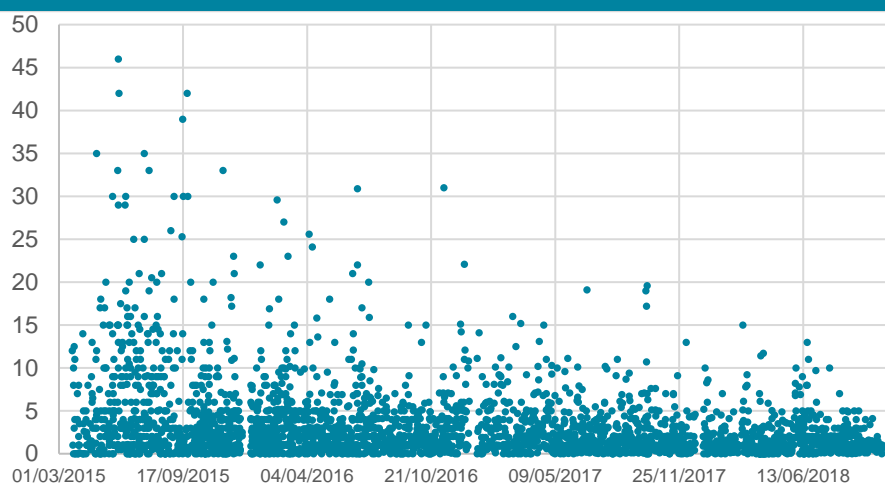


In order to assess whether the reduction in turnover has led to a decrease in liquidity, we can look at other metrics of market liquidity.

(ii) Real trade data

The Central Bank has conducted over 3,000 trades in the Irish government bond market under PSPP since March 2015. Data gathered on these trades include the competitive quotes received for each executed trade. A more liquid market should facilitate greater price transparency and discovery, meaning that competitive quotes are less widely dispersed than in a less liquid market. Chart 11 shows that through time, the cover (i.e. distance between second best price and best price in an executed trade) on PSPP trades has tightened, and become more clustered closer to zero. This trend is also visible in Table 5, which presents the standard deviation of the distance between traded price and second best price on all trades, for each year that PSPP has been active. This suggests improving liquidity between early 2015 and today. A similar yet less obvious trend is also visible if we consider the distance between the third best quote, and the best price.

Chart 11: Distance between traded price and second best price (trade level data, in cents)



Source: Central Bank of Ireland and Authors' Calculations

Table 5: Standard deviation between traded price and second best price

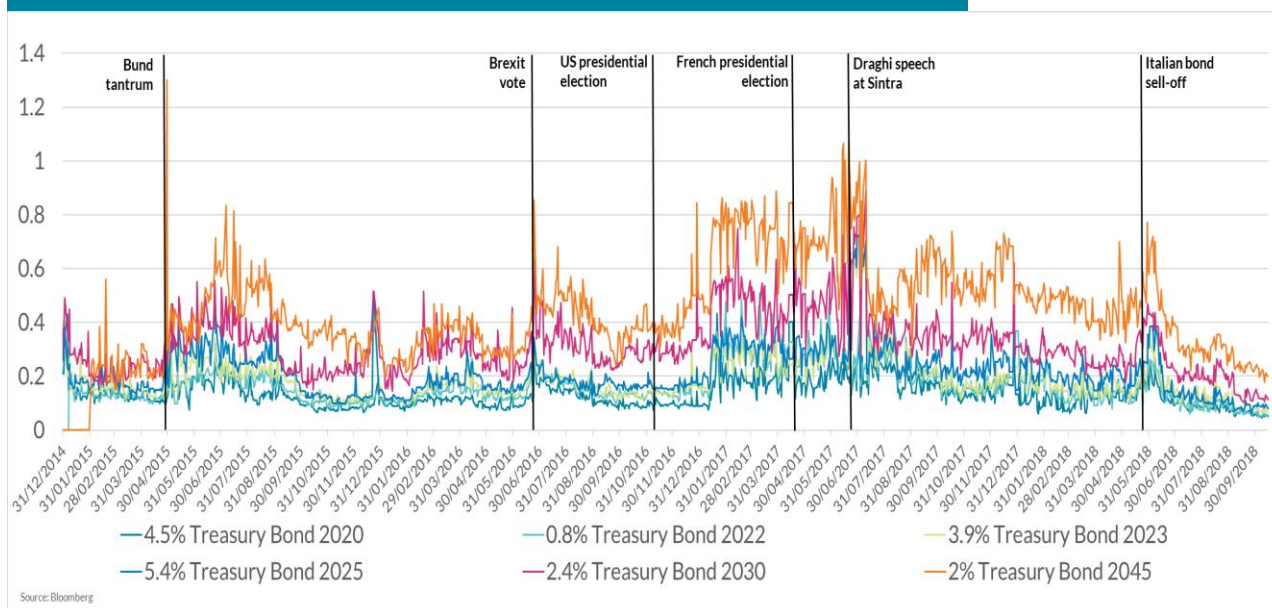
Year	Volatility of Second Price Cover
2015	6.8
2016	3.8
2017	2.9
2018	2.0

(iii) Indicative bid-ask spread data

Market makers present inventory and indicative prices at which they are willing to trade securities on platforms such as Bloomberg and Tradeweb. These platforms also calculate a single generic “bid” and “offer” price for each security, which is derived from the indicative prices quoted by dealers. We can use these indicative prices to calculate a bid-offer spread for each trading day. Charting the evolution of this measure over time, this indicator can provide information on how the liquidity of a bond has changed. Chart 12 illustrates the evolution of the bid-offer spreads for a selected number of Irish government bonds that were issued prior to PSPP and are still outstanding today. While the day-to-day data is somewhat volatile, we can observe some trends. Bid-offer spreads did not display an obvious widening or tightening through much of the first two years of PSPP implementation. Thereafter, a clear widening can be observed from the end of 2016 through most of 2017. This widening is most likely explained by a number of events affecting global uncertainty during this period, such as the Brexit referendum in June 2016 and the

US presidential election outcome in November 2016. The tightening of bid-offer spreads in late 2017 and into 2018 suggests that the underlying impact of QE was not significant. It is particularly notable that spreads have continued to tighten throughout 2018, during a period of gradual wind-down of QE coupled with Brexit uncertainty.

Chart 12: Bid-Offer spreads for selected Irish government bonds



6. Conclusions

The scale of bond purchases under the APP was always likely to have a significant impact on the markets in which they were active. Now that the net asset purchase phase of the APP has ended, it is an appropriate time to examine this impact in greater detail. This article specifically focuses on the Irish government bond market.

Based on an event study approach, we estimate that the announcement effect related to the programme reduced Irish sovereign bond yields significantly and contributed to a flattening of the yield curve. This result is consistent with findings elsewhere. We find that the largest and most significant downward impact on yields occurred over the initial announcements of the programme, but also, somewhat surprisingly, over the final announcements during the tapering phase. Irish sovereign bonds have also performed well over the period, relative to German bunds.

The PSPP has contributed to conditions that support increased issuance of Irish sovereign debt at lower interest rates. As a result, this reduced the State's interest burden. The NTMA have also extended the maturity profile of Ireland's debt. The composition of holdings of Irish debt has also changed over the period. While the share of non-resident holdings has remained resilient, the share of domestic banks' holdings has declined.

With regard to liquidity, the evidence based on a number of metrics, although somewhat mixed, does not show a significant deterioration in conditions. Certainly, liquidity in Irish bonds proved sufficient in order to facilitate a smooth implementation of the PSPP in Ireland without resulting in major market distortions.

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Foreign Exchange and External Sector Developments in China

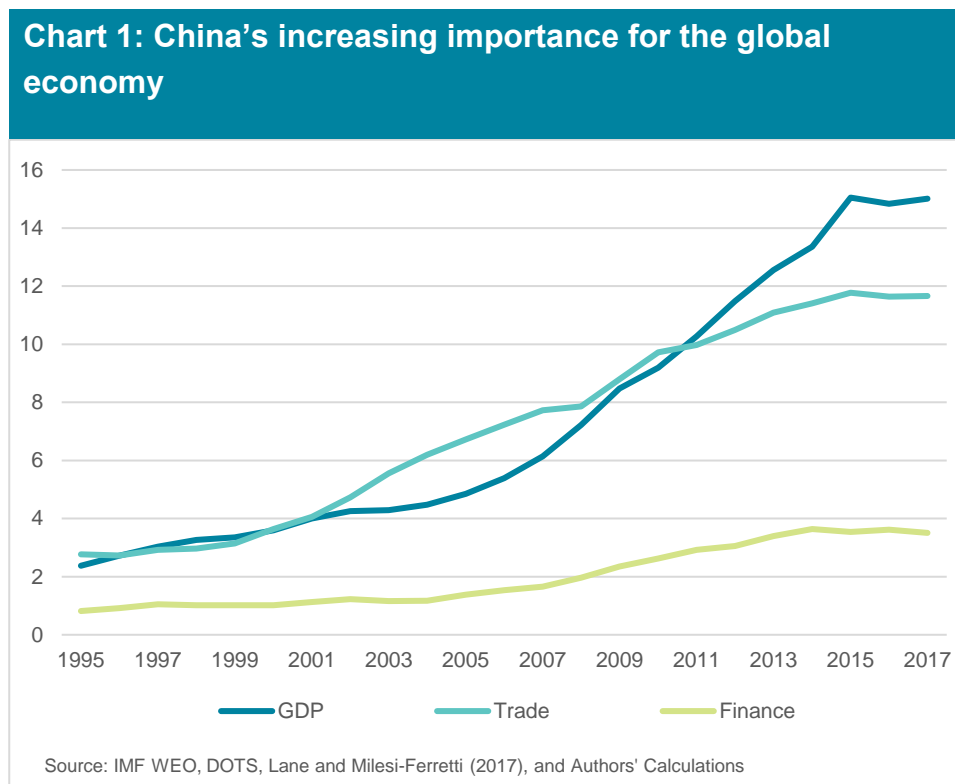
Lorenz Emter and Peter McQuade (IR)

Abstract

China has experienced a number of episodes of capital flow and exchange rate volatility over the past 3 years. Meanwhile, the current account surplus has declined markedly together with net saving, while the real effective exchange rate appreciated. This note describes some aspects of these developments and explains how they relate to key features of the Chinese external sector and exchange rate arrangements. Despite market restrictions, periods of financial stress are typically associated with exchange market pressure on the Renminbi (RMB) and sudden stops in private capital inflows. In the second half of 2018, the RMB experienced a decline of 8 per cent against the U.S. Dollar (USD), raising fears that the period of financial market instability experienced in 2015 could be repeated. In our assessment, while current indicators provide little indication of further rapid RMB depreciation in the very short run, there are several risk factors that could trigger currency instability in the future. These risk factors include: i) an escalating trade war undermining Chinese growth; ii) internal and external pressure to liberalise financial markets jeopardising successful exchange rate management; iii) domestic financial market vulnerabilities undermining investor sentiment. Regarding potential international spillovers, although direct trade and financial linkages between China and Ireland are substantial relative to the latter's linkages to other emerging market economies, Ireland is more heavily exposed to advanced economies. Finally, Hong Kong plays a critical role as a financial intermediary, such that a close examination of Hong Kong-China linkages is essential to understand China's place in the global financial system.

Introduction

China's rapid economic growth implies that development there can have important implications for the global economy. The share of global GDP accounted for by China now makes up 15% of global GDP, up from just 2% of global GDP in 1995. This trend appears likely to continue as the latest IMF Article IV report on China concludes that the near-term economic outlook remains positive, although the probability of a downturn has increased.⁶⁸ Risks to the Chinese economy stem from three main sources: 1. The domestic financial sector; 2. A trade dispute with the US; 3. A destabilising capital outflow episode.



Note: China's share of global GDP, asset and liability flows (finance), and export and import flows (trade).

China's rapid economic development has entailed a substantial increase in trade and financial integration with the rest of the world. Following its accession to the World Trade Organisation (WTO) in 2001, China has become the world's largest exporter of goods and China's share in global trade increased from around 3 to 12 per cent (Chart 1). While China's financial integration is still limited in comparison, the Chinese authorities have gradually eased existing capital account restrictions. While this gradual liberalisation lead to an increase in financial integration, it has

⁶⁸ IMF (2018) Article IV Consultation: People's Republic of China.

<https://www.imf.org/en/Publications/CR/Issues/2018/07/25/Peoples-Republic-of-China-2018-Article-IV-Consultation-Press-Release-Staff-Report-Staff-46121>

also been associated with a number of episodes of capital flow and exchange rate volatility over the past 3 years.

The increasing size and integration of the Chinese economy, imply that a hard landing in China could entail adverse spillovers to the global economy. This is also the case for Ireland, albeit primarily through indirect channels, including through its effects on Ireland’s trading partners. For instance, recent research by the Bank of England finds that a hard landing scenario that sees Chinese GDP fall by 10% below the IMF baseline forecast could reduce the level of UK GDP by up to 1.4%.⁶⁹ This hit to UK GDP could be increased twofold by amplification mechanisms, depending on the size of exchange rate and asset price moves. The extent to which these amplification mechanisms unfold depend, in turn, on how the Chinese authorities manage the exchange rate and the financial account. This is why we examine recent developments in the exchange rate and external accounts of China in this article.

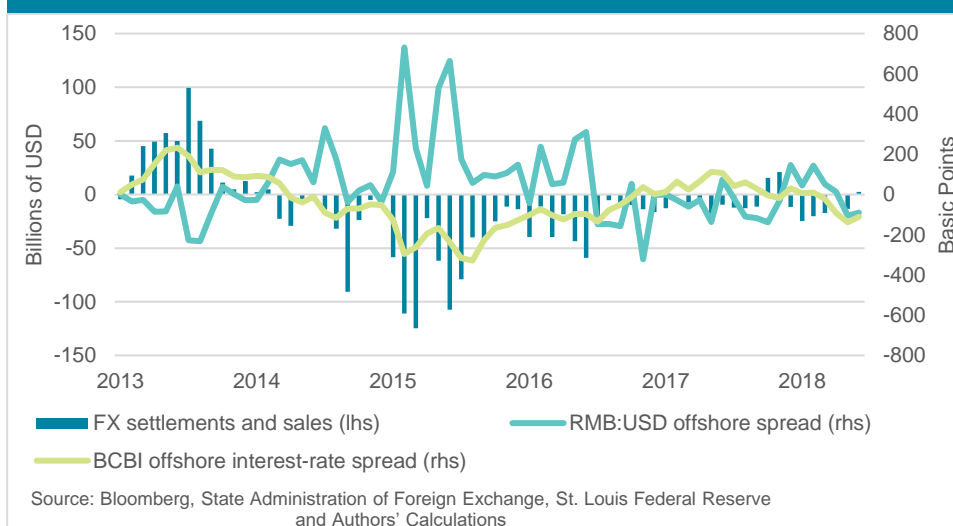


Note: The five shaded areas highlight selected recent policy changes to the Chinese exchange rate regime: 1) March 2014, when the volatility range of RMB interbank spot exchange rate against US dollar was enlarged from one per cent to two per cent; 2) August 2015, the PBoC reformed the exchange rate regime to liberalise RMB exchange rate through improving the mechanism for determining the central parity of RMB exchange rate. This was also the month when the IMF took the decision to add the RMB to the SDR basket; 3) May 2017, the PBoC announced that the countercyclical adjustment factor would be introduced; 4) January 2018, when the PBOC announced that it was suspending the use of the countercyclical adjustment factor; 5) August 2018, the PBoC reintroduced the countercyclical adjustment factor.

⁶⁹ Gilhooly et al. (2018). “From the Middle Kingdom to the United Kingdom: spillovers from China.” Topical article. *Bank of England Quarterly Bulletin*, 2018 Q2. <https://www.bankofengland.co.uk/-/media/boe/files/quarterly-bulletin/2018/from-the-middle-kingdom-to-the-united-kingdom-spillovers-from-china>

China operates a managed-floating exchange rate regime. The floating band of the RMB's trading prices is 2 per cent against a basket of currencies (heavily weighted toward USD) in the interbank foreign exchange market. Although the Chinese authorities intervene in the foreign exchange market to stabilise the RMB's value within the band, this arrangement allows substantial exchange rate flexibility, particularly at frequencies lower than one day.⁷⁰ In addition to direct reserve purchases and sales, some commentators assert that the authorities can influence the exchange rate by exerting pressure on state run banks to increase or decrease foreign lending, or by changing the stringency of restrictions on citizens wishing to move funds in and out of China.⁷¹

Chart 3: FX settlements and sales, and onshore-offshore spreads (2013-2018)



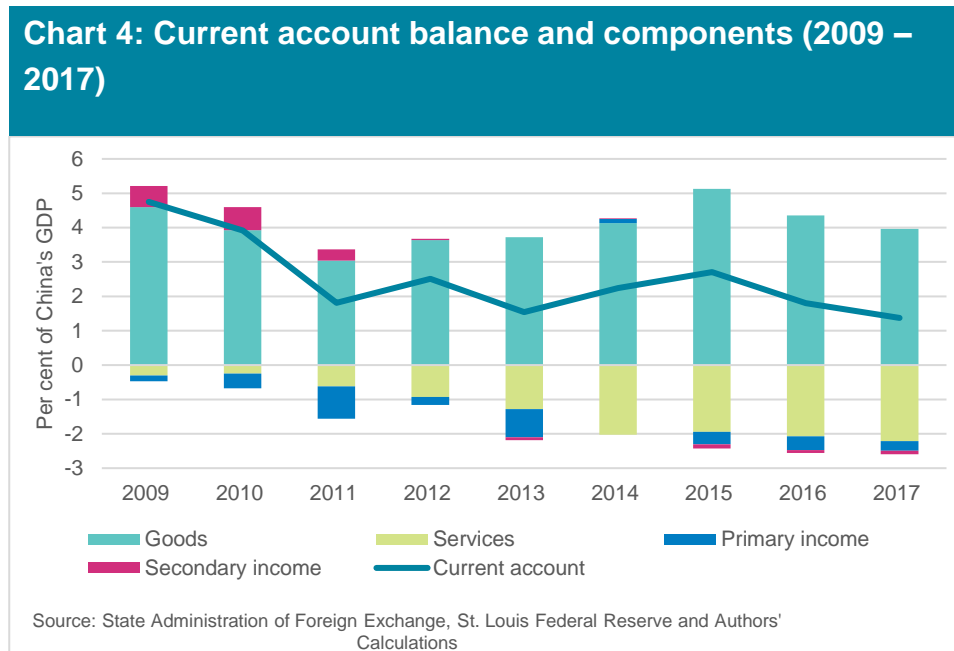
Note: Currency spread measured in non-standard units (Fen/100) for ease of comparison with interest rate spreads.

Periods of financial stress are typically associated with exchange market pressure on the RMB. Such pressures are observable in a number of higher-frequency indicators, including the spread between the offshore and onshore foreign exchange rates between the RMB and the USD (Chart 3). At times of weak investor sentiment regarding the RMB, the number of Yuan per USD tends to increase in offshore relative to onshore markets. In addition, weaker sentiment is also observable in official foreign exchange settlement and sales data, where lower values denote

⁷⁰ According to the IMF, China officially maintains “a de jure managed floating exchange rate arrangement with a view to keeping the RMB exchange rate stable at an adaptive and equilibrium level based on market supply and demand with reference to a basket of currencies to preserve the stability of the Chinese economy and financial markets.” https://www.elibrary-areaer.imf.org/Documents/YearlyReport/AREAER_2017.pdf

⁷¹ Brad Setser, Follow the Money, July 10, 2018 <https://www.cfr.org/blog/my-latest-take-chinas-foreign-exchange-intervention-proxies>

greater RMB net sales.⁷² These exchange market pressures can be managed through intervention by the People’s Bank of China (PBoC), which are reflected in the reserve assets item of the financial account. China held a stock of foreign exchange reserves of almost USD 3.1 trillion in August 2018.



Note: Positive values denote a surplus.

The Chinese authorities may also intervene in offshore debt markets. According to market commentators, the ability to manage offshore rates in isolation from onshore markets also means that the Chinese authorities can intervene internationally without introducing major changes in domestic financial conditions. However, this facility is dependent on the existence of stringent capital controls such that future liberalisation efforts could undermine the ability of the authorities to stabilise the currency.

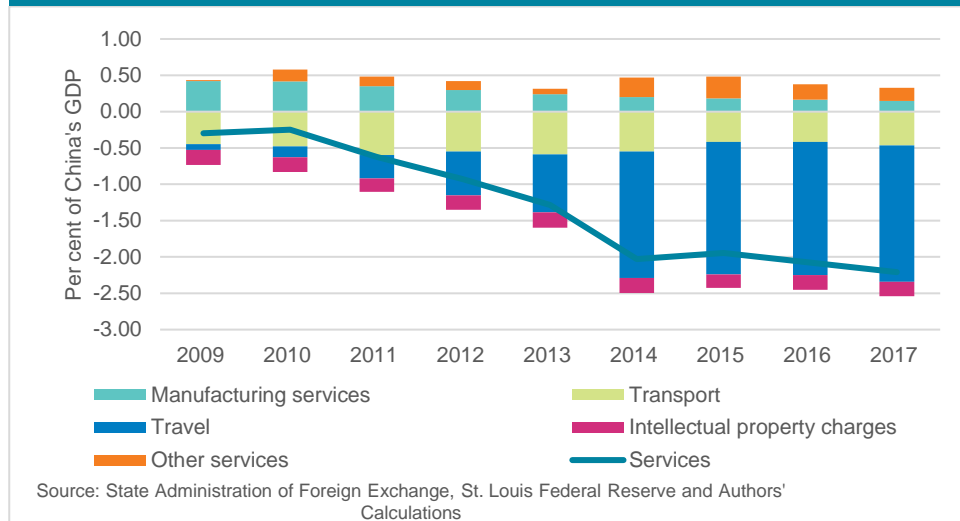
The 2015 episode interrupted China’s progress toward financial liberalisation and a less tightly managed exchange rate. The authorities curtailed previous liberalisation efforts to contain the fall in the RMB. According to Eichengreen and Xia (2018), in January 2016 foreign banks became subject to the normal required reserves policy when making RMB deposits at their domestic agent banks, which increased required reserves. This policy aimed to suppress the shorting of the RMB, and reverse the expectation of RMB devaluation.⁷³ In future, greater exchange

⁷² See also Goldman Sachs, Asia Economic Analyst, July 04, 2016 <https://research.gs.com/content/research/en/reports/2016/07/03/d1a4c1f9-0d37-4edc-bda0-04ab337b735a.html>

⁷³ See: Eichengreen, B., and Xia, G. (2018) “China and the SDR: Financial liberalisation through the back door.” Center for International Governance Innovation, No. 170. https://www.cigionline.org/sites/default/files/documents/Paper%20no.170_0.pdf

rate flexibility could facilitate even the introduction of an inflation targeting monetary policy regime, towards which the PBoC appeared to have been moving gradually.⁷⁴

Chart 5: Services balance, selected components (2008 – 2017)



Note: Positive values denote a surplus.

Chart 6: Saving Investment balance in China (2008 – 2015)

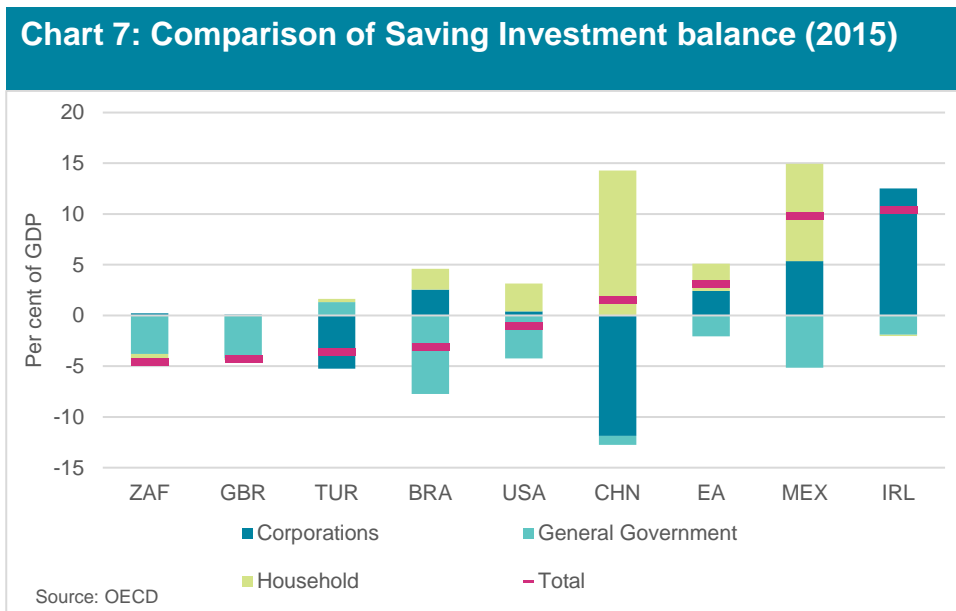


Note: Positive values denote a surplus of saving over investment.

⁷⁴ See Girardin, E., Sandrine Lunven, and Guonan Ma (2018). China's evolving monetary policy rule: from inflation-accommodating to anti-inflation policy. *BIS Working Papers*, No. 641.

Exchange rates and offshore markets

High frequency indicators of offshore exchange and interest rate market pressures remained subdued in recent months (Chart 3).⁷⁵ The RMB experienced a sharp depreciation of close to 8 per cent versus the USD in the second half of 2018.⁷⁶ However, on-shore off-shore spreads remained relatively narrow compared to previous episodes. The impact on the real effective exchange rate (REER) was also muted (Chart 2). The People’s Bank of China has taken a number of actions to ease pressure on the currency, including through the reintroduction of the *counter-cyclical adjustment factor* in August, in order to offset market expectations of further depreciation.⁷⁷ At the same time, official statistics on Chinese FX reserve holdings suggest that they remained broadly stable over the course of summer 2018.



Note: Positive values denote a surplus of saving over investment.

⁷⁵ It may be the case that the most recent depreciation was somewhat less managed by the Chinese authorities than the 2015 episode as the depreciation observed in 2015/16 occurred much more gradually. See also: Brad Setser, Follow the Money, September 24, 2018. <https://www.cfr.org/blog/how-did-china-manage-its-currency-over-summer>

⁷⁶ Note that, while being significant, this depreciation vis-à-vis the USD pales in comparison to those the Turkish Lira (25%) and the Argentine Peso (45%) witnessed over the same period.

⁷⁷ First introduced in May 2017, the counter-cyclical adjustment factor was added to the RMB:USD Central Parity rate quotation model used by the Peoples Bank of China. This model contains three factors: 1) closing price; 2) exchange rate movements of a basket of currencies; and 3) the counter-cyclical factor, with the latter signalling the willingness of the authorities to act to disrupt market expectations of future depreciation. See press release from Secretariat of FX Market Self-Disciplinary Mechanism, Peoples Bank of China, August 24, 2018. <http://www.pbc.gov.cn/english/130721/3610729/index.html>

The RMB was close to fundamentals according to the most recent IMF Article IV report on China (although it was drafted in June 2018 prior to the recent depreciation), while the external position was considered to be moderately stronger than was justified. Taking a longer term perspective, while the nominal RMB:USD exchange rate now stands at levels similar to those observed in 2008, it is important to note that the REER has appreciated substantially since the pre-crisis period (Chart 2).⁷⁸

Current and financial account balances

The decline in the REER has also been paralleled by a gradual decline in the current account surplus. 2018Q1 figures show a current account deficit on a quarterly basis. This has been associated with persistent trends in the trade balance over a number of years, specifically a decline in the goods surplus, combined with an increase in the services deficit (Chart 4). While the decline in the goods balance also relates to rising oil prices, the deterioration of the services balance is primarily attributable to the travel balance (Chart 5). To some extent this is because China liberalised outbound travel after the global financial crisis. In addition, a significant portion of the travel deficit may actually consist of misclassified, sometimes illicit, capital outflows.⁷⁹ China has a deficit on charges for the use of intellectual property, while running a manufacturing services surplus (related to contract manufacturing), mirroring some characteristics of the Irish current account. Finally, although the aggregate trade balance has declined in recent years, the bilateral balance with the US has continued to increase, contributing to tensions with the US administration.

The decline in the current account surplus has been mirrored by a deterioration in the financial balance of the corporate sector (Chart 6). This is a consequence of measures taken by the Chinese Government to maintain economic growth during the global financial crisis, whereby credit was extended by state owned banks to corporations in order to stimulate investment. In contrast, the household saving rate has remained stable at around 15 per cent of GDP. Although the aggregate net saving

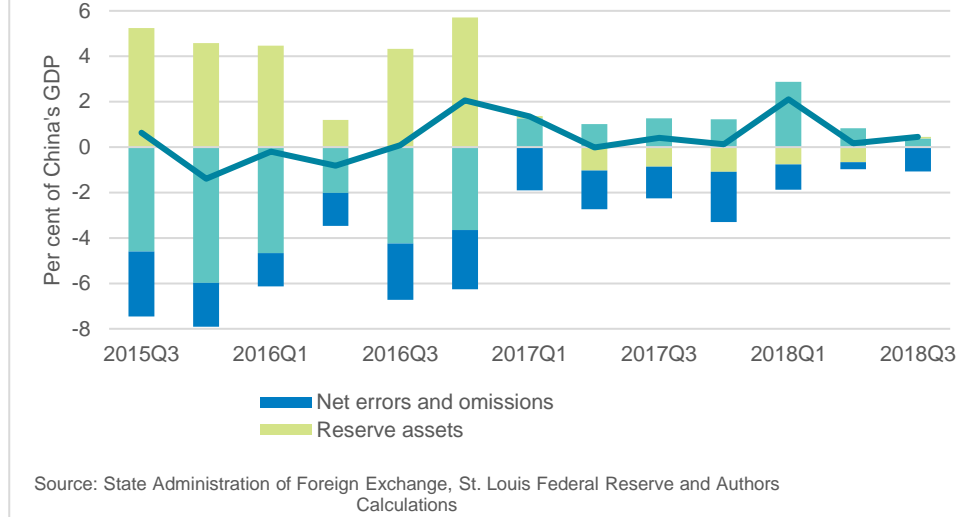
⁷⁸ Paul Krugman, August 13, 2015

<https://krugman.blogs.nytimes.com/2015/08/13/china-2015-is-not-china-2010/>

⁷⁹ Changes in the methods used to compile the balance of payment statistics by the State Administration of Foreign Exchange are believed to have resulted in a reduction of 1% of GDP in the current account surplus in 2015 and 2016. Essentially, some remittances reported as travel, and some overseas purchase transactions executed using bank cards are recorded as imports actually represent investment abroad. Some commentators have suggested that the timing of changes in the classification of travel were taken strategically in order to keep the current account surplus below the threshold level necessary to be categorised as a currency manipulator by US authorities. For more see: Wong, A. (2017) China's Current Account: External Rebalancing or Capital Flight, Federal Reserve Board of Governors, International Finance Discussion Papers No. 1208 <https://www.federalreserve.gov/econres/ifdp/files/ifdp1208.pdf>

rate in China no longer appears exceptional, the large scale of household net saving and corporate borrowing stand out internationally (Chart 7).⁸⁰

Chart 8: Net Financial account, reserves and error and omissions (2015Q3 – 2018Q1)



Note: Positive values denote net inflows.

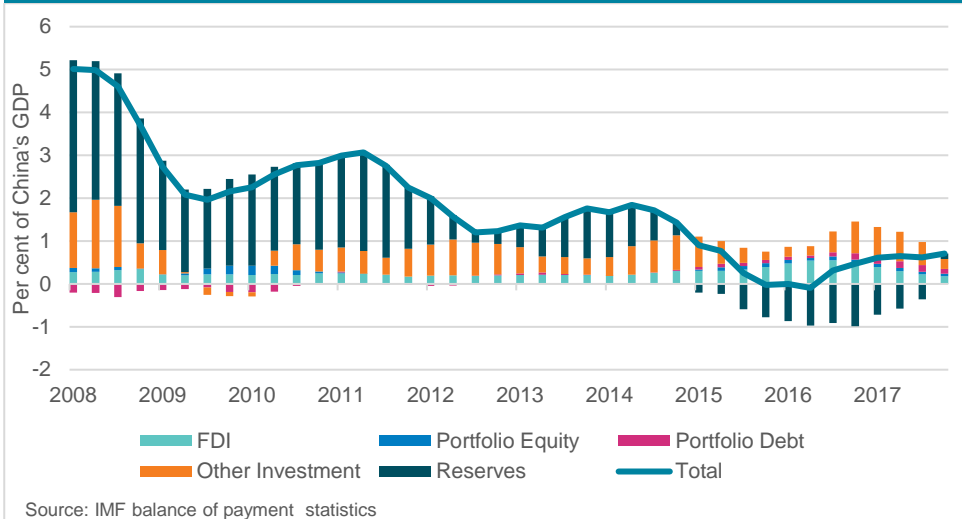
It is possible that outflows by Chinese citizens may be somewhat understated. The ‘net errors and omissions’ category has been negative for some time (Chart 8) and could capture the influence of illicit private capital outflows that occur in contravention of official capital flow management measures and financial restrictions.⁸¹ These may partly reflect the desire of domestic Chinese firms and households to invest overseas, motivated by a desire to achieve higher risk adjusted returns or international portfolio diversification. Abstracting from the influence of official reserves flows, the combined capital and financial account was positive in 2018Q1. Higher frequency data suggest that the sharp RMB depreciation after June coincided with very moderate net capital outflows compared to the 2015 episode. This might reflect the fact that markets and Chinese residents have become somewhat desensitised to exchange rate fluctuations.⁸²

⁸⁰ Note that the very high savings rate of corporations reported in Ireland is due to the substantial activities of multinational enterprises and associated profit shifting.

⁸¹ For opposing views see: Brad Setser, July 23, 2018, <https://www.cfr.org/blog/chinas-currency-back-play>
Hatzvi, E., Meredith, J., and Nixon, W. (2015) Chinese Capital Flows and Capital Account Liberalisation, Reserve Bank of Australia, Quarterly Bulletin, December 2015. <https://www.rba.gov.au/publications/bulletin/2015/dec/pdf/bu-1215-5.pdf>

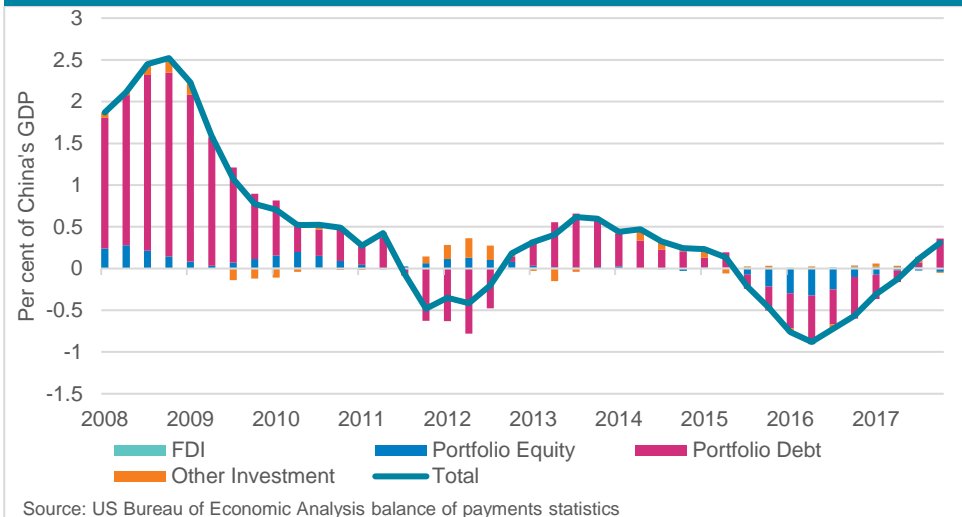
⁸² See Brooks, R., Ma, G., and Khan, T. (2018) “What is competitive devaluation for the RMB?”, *IIF Global Macro Views*, October 18, 2018.

Chart 9: Gross international asset flows (2007 – 17)



Notes: Gross liability flows. Rolling 4-quarter sums. Positive values denote net purchases of foreign assets by Chinese residents (i.e. outflows).

Chart 10: Gross US liability flows vis-à-vis China (2007 – 17)



Notes: Gross US liability flows. Rolling 4-quarter sums. Positive values denote net purchases of US assets by Chinese residents (i.e. outflows from China to the US).

Trade and financial links to China

Advanced economy trade and financial links to China are typically large relative to other emerging market economies. Tables 1 and 2 illustrate the relative importance of bilateral international linkages of selected advanced economies with China and other EMEs. As a result, RMB movements against the US dollar are often highly correlated with the movements of other EMEs. While EME exposures generally account for a small fraction of overall external exposures, China represents by far the most important EME exposure for all of the advanced economies in the

comparison. This is not surprising given the relatively large size of the Chinese economy in absolute terms.

Table 1: Average bilateral trade exposures

	Trade links					
	EMU	IRL	USA	GBR	CHN	HKG
TUR	1.5	0.5	0.5	1.7	0.5	0.1
ZAF	0.4	0.1	0.3	1.1	1.0	0.5
ARG	0.2	0.2	0.4	0.1	0.3	0.1
BRA	0.7	0.3	1.6	0.6	1.9	0.4
MEX	0.6	0.8	14.7	0.4	1.1	0.5
SAU	0.6	0.4	1.0	0.8	1.2	0.2
IND	0.8	0.4	1.8	1.2	1.8	2.7
IDN	0.3	0.1	0.6	0.2	1.4	0.5
RUS	2.0	0.3	0.5	0.9	1.9	0.3
CHN	5.4	3.2	14.6	6.8		50.0
HKG	0.5	0.3	1.4	1.7	7.4	

Source: IMF direction of trade statistics.

Note: The value shown is the average share of exports and imports in total exports and imports of selected economies (the euro area, Ireland, the US, the UK, China and Hong Kong) to and from selected large emerging market economies (Turkey, South Africa, Argentina, Brazil, Mexico, Saudi Arabia, India, Indonesia, Russia, China and Hong Kong). For example, 1.5% of all external trade of euro area countries was with Turkey. In each column, green, orange, and red indicate low, medium, and high exposures relative to other EMEs, respectively.

Table 2: Average private financial asset and liability exposures

	Private financial links					
	EMU	IRL	USA	GBR	CHN	HKG
TUR	0.3	0.1	0.1	0.3	0.1	0.0
ZAF	0.5	0.3	0.3	0.9	1.3	0.0
ARG	0.1	0.0	0.4	0.1	0.0	0.0
BRA	0.6	0.2	1.1	0.6	0.3	0.0
MEX	0.4	0.2	1.6	0.3	0.1	0.0
SAU	0.3	0.1	0.5	0.5	0.4	0.3
IND	0.2	0.1	0.5	0.5	0.2	0.4
IDN	0.1	0.1	0.3	0.2	0.5	0.2
RUS	1.1	0.6	0.2	0.3	0.4	0.1
CHN	0.7	0.3	1.7	1.0		30.6
HKG	1.3	0.5	1.4	1.7	44.5	

Source: IMF coordinated portfolio investment survey, BIS locational banking statistics.

Note: The value shown is the average share of FDI, portfolio equity, debt, and bank assets (excluding official reserves) and liabilities in total assets and liabilities of selected advanced economies (the euro area, Ireland, the US, the UK, China and Hong Kong) vis-à-vis selected large emerging market economies (Turkey, South Africa, Argentina, Brazil, Mexico, Saudi Arabia, India, Indonesia, Russia, China and Hong Kong). For example, 0.3% of all external financial exposures of euro area countries were vis a vis Turkey. In each column, green, orange, and red indicate low, medium, and high exposures relative to other EMEs, respectively.

Table 2 highlights the important role of Hong Kong as a financial hub for the Chinese economy. While advanced economies show substantial trade linkages with China, their direct financial links with Hong Kong are far more pronounced which, in turn, is the dominant source of private external financing for the Chinese economy. For example, only 0.7 per cent of the total external financial exposures of the euro area are to China, but when Hong Kong is added, this number grows to approximately 2 per cent. The role of Hong Kong as a financial hub for the Chinese economy can be further illustrated by an analysis of the sudden stop in capital inflows which China experienced in 2015 and 2016.

Financial account during capital flow volatility in 2016

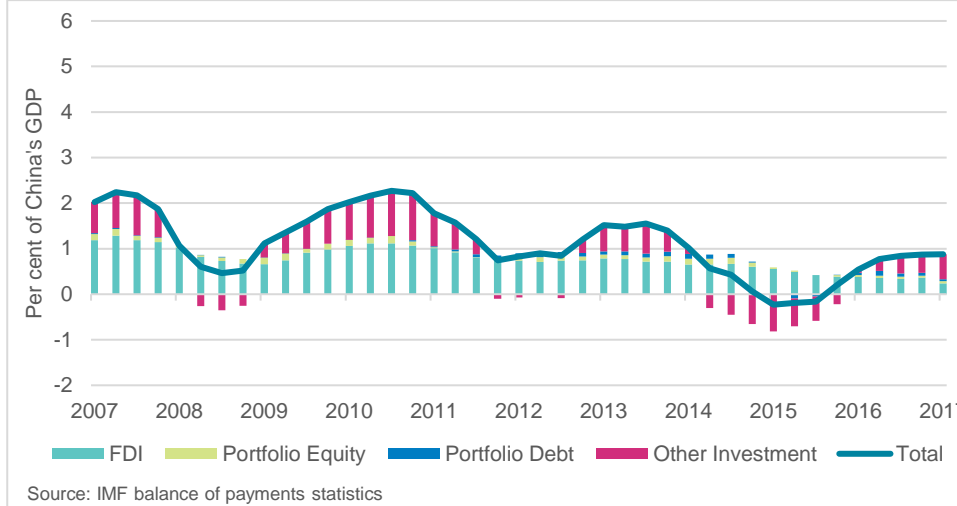
China experienced a bout of financial market turbulence in 2015 and 2016.⁸³ The severity of the 2015/16 episode is apparent from the scale of reserve outflows, which peaked at almost 1 per cent of GDP in 2016Q4 (Chart 9). In absolute terms, Chinese reserves declined by almost USD 1 trillion between the peak in June 2014 and the local minimum in January 2017, as the PBoC was forced to intervene to stabilise the RMB which nevertheless depreciated by 10 per cent against the USD between June 2015 and December 2016. It is also worth noting that these reserves, and the associated transactions, are heavily concentrated in the US (Chart 10). It has been speculated that official intervention in the offshore debt markets was also critical to the resolution of the 2015/16 episode as speculators were squeezed out of the market by official purchases. This intervention led to a substantial spike in the offshore interest rate spread vis-à-vis onshore debt markets demonstrating the usefulness of capital controls (Chart 3). As a result, offshore interest rates rose substantially above onshore rates for a time.⁸⁴ When exchange market pressures (EMP) flared up again at the end of 2016 the Chinese authorities, who had already run down official reserves by 20 per cent since June 2015, substantially tightened existing capital flow management measures,

⁸³ According to Eichengreen and Xia the initial triggers for the market volatility were primarily domestic factors. In the aftermath of the global financial crisis, the authorities had extended considerable liquidity to support GDP growth, but some of which was perceived to be fuelling property and financial market speculation. Efforts to clamp down on some of these practices in 2014 and 2015 contributed to financial market volatility. However, it should also be noted that the exchange rate setting mechanism was modified on August 11, 2015, whereby instead of using midpoint for the daily trading band of plus or minus two per cent, it changed to a system where the midpoint of the next day's exchange rate trading band was based on the previous day's closing price.

⁸⁴ The PBoC also uses bank reserve requirements to manage pressure of the RMB. For instance, in January 2016 the PBoC introduced measures to make foreign banks making deposits and domestic agent banks subject to the normal required reserves policy. According to Eichengreen and Xia, this policy was intended to inhibit shorting the RMB and reverse the expectation of future RMB devaluation.

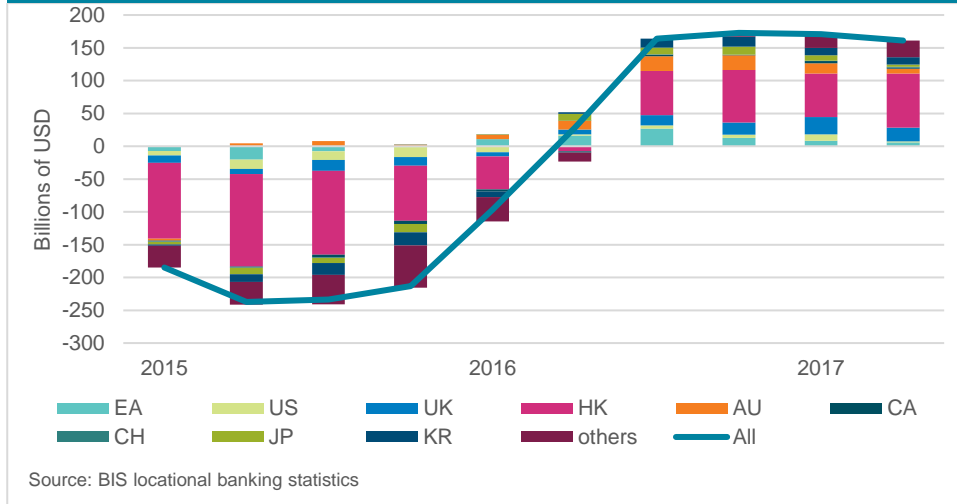
including on offshore RMB lending.⁸⁵ This coincided with significant spike in the Hong Kong inter-bank offered rate (Hibor) and easing exchange market pressures (Chart 13).

Chart 11: Gross international liability flows (2007 – 17)



Notes: Gross assets flows. Rolling 4-quarter sums. Positive values denote net purchases of Chinese assets by foreign residents (i.e. inflows).

Chart 12: International Bank Claims on China by country of origin (2015Q2 – 2017Q4)



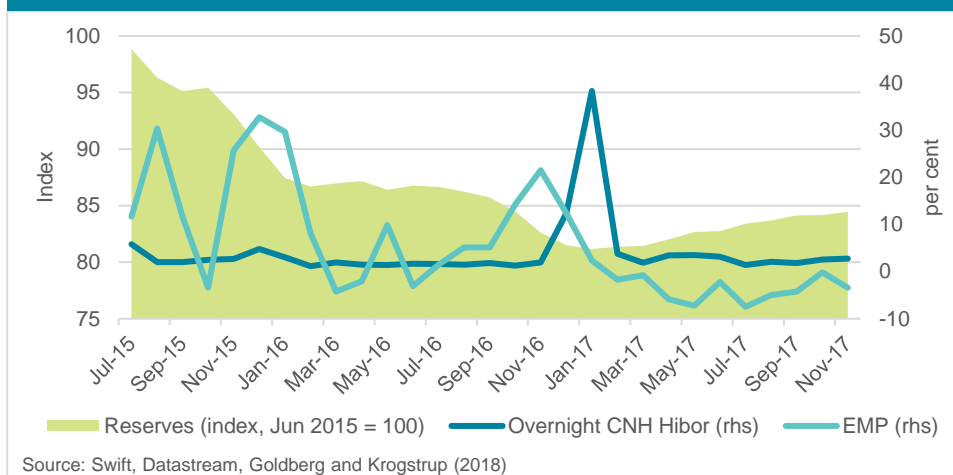
Notes: 4-quarter moving sums of fx and break adjusted change in stocks. Country based on residence of reporting bank.

Bank flows are the most volatile component of China’s international financial linkages. Chart 11 displays international liability flows and illustrates the large reversal of other investment inflows during the

⁸⁵ See IMF (2017) Article IV Consultation: People’s Republic of China. <https://www.imf.org/~media/Files/Publications/CR/2017/cr17247.ashx>

2015/16 episode.⁸⁶ The decline in FDI inflows during that time was more muted, while portfolio investment inflows to China generally remain negligible due to investment restrictions, irrespective of financial conditions more generally. Taken together, Charts 10 and 11 suggest that the 2015 episode was driven primarily by a withdrawal by foreign investors, specifically banks, from existing positions in China. However, a more nuanced picture emerges when BIS banking statistics are examined.

Chart 13: Exchange market pressure, reserves, and offshore inter-bank rate



Note: The overnight Hong Kong Inter-bank Offered Rate (Hibor) is the annualized rate charged for inter-bank lending on RMB denominated instruments. EMP is the exchange market pressure index for China developed by Goldberg and Krogstrup (2018). Last observation is for November 2017.

Identifying the role of Hong Kong is critical to understanding financial flows to and from China. Chart 12 provides a geographic breakdown of the decline in bank claims on China, and highlights the central role of Hong Kong in intermediating international bank flows in and out of the mainland.

Chinese banks were primarily responsible for the withdrawal of funding from China via Hong Kong during the 2015 episode. There is evidence suggesting that the role of foreign banks in the 2015 episode was limited in comparison to institutions from the mainland. So while many of the loans appeared to be *foreign* in origin, many were actually *vis-à-vis* Chinese banks, although the latter may have used international capital to fund the loans. This highlights the role of negative feedback loops during which depreciation undermined the sustainability of offshore borrowing, which lead Chinese residents to repay foreign loans in anticipation of

⁸⁶ Note also that gross liability flows (Chart 10) have been substantially smaller than gross asset flows (Chart 8), such that there have been net financial outflows over most of the past decade.

potential future depreciation, i.e. capital outflows in the form of a reduction in the foreign liabilities of domestic borrowers. The Chinese authorities reacted to this by introducing the countercyclical adjustment factor in order to offset market expectations of further depreciation.

Conclusion

The Chinese current account surplus has declined substantially in the last decade. Although part of this decline is a consequence of deliberate policy actions, there has also been a substantial appreciation in the real effective exchange rate. This loss of competitiveness may undermine the sustainability of an export oriented economic development strategy. In the aftermath of the global financial crisis, China used financial restrictions to sustain economic growth by stimulating corporate borrowing and investment. Many Chinese citizens appear to want to invest capital overseas, creating pressure on the authorities to liberalise the financial system and capital controls. However, dramatic reforms risk unintentionally destabilising the RMB.

Despite the sharp RMB depreciation against the USD after June 2018, short-term indicators do not currently exhibit signs of foreign exchange market tension. Yet there are many near-term risks that could materialise, particularly against a background of underlying pressure for citizens to take money out of China. Furthermore, while previous episodes were primarily associated with sudden stops in capital inflows, much of this actually took the form of a retrenchment of foreign investors/Chinese banks existing positions out of Hong Kong.⁸⁷ Specifically, depreciation undermined the sustainability of offshore borrowing, which lead Chinese firms to repay foreign loans in anticipation of potential future depreciation, i.e. capital outflows in the form of a reduction in the foreign liabilities of domestic borrowers.⁸⁸

Such a tendency towards negative feedback loops is all the more worrying in the context of deteriorating political and trade relations with the US. An escalation of the current tension with the US into a full-scale trade war could undermine Chinese growth. Indeed, given the rapid economic growth and convergence achieved in the last decade, the likelihood of a growth slowdown seems high, which could also lead to

⁸⁷ For more a closer examination of whether the 2015 episode was a sudden stop or a capital flight episode see: Herzberg, V. (2016) "Composition and Dynamics of Chinese Capital Flows: What has been the Role of Capital Controls?" Central Bank of Ireland, Quarterly Bulletin 2016, no. 3, Box B. <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>

⁸⁸ For contemporaneous media coverage, see also: China capital outflows: bank loans dwarf foreign deals, Financial Times, December 18, 2016. <https://www.ft.com/content/7567f612-c2bf-11e6-9bca-2b93a6856354>

pressures on the currency. Tensions with the US could also lead to pressure on China to liberalise their financial markets, which could make it harder to manage the exchange rate. The 2015 episode demonstrated the potential for the now large Chinese banking sector to affect global financial conditions.⁸⁹ In this context, it is important to note the considerable domestic financial market vulnerabilities that exist in China, not least because of the relatively high level of credit to GDP (156 per cent of GDP in 2017) for an emerging market economy.

The Chinese authorities have successfully used the available policy levers and buffers to manage growth over the past decade. Yet this continues to be a difficult balancing act. While China holds a large stock of foreign exchange reserves, the 2015 episode demonstrated how rapidly this stock can decline. Nonetheless, the comparatively muted reaction in net capital flows in recent months compared to the 2015 episode might reflect the fact that markets and Chinese residents may have become less sensitive to short-term exchange rate volatility, such that depreciations in line with fundamentals are now possible without causing financial havoc. This could eventually help to pave the way for the introduction of an inflation-targeting regime. However, a number of reforms were reversed after the 2015 episode, demonstrating the tension between progress toward financial development and liberalisation, and short-term financial stability.

It will be important to continue to monitor the Chinese economy. In the short term, spillovers to Ireland are likely to come primarily through indirect channels as direct linkages to China remain limited. Yet continued economic growth and financial reforms are likely to see China become ever more important for international trade and finance, as the financial system becomes more open to international capital flows and the international role of the Renminbi increases. Hence, economic and financial developments in China will increasingly have global implications.

⁸⁹ Cerutti, E. and Zhou, H. (2018) The Chinese banking system: Much more than a domestic giant, VoxEU, February 09, 2018. <https://voxeu.org/article/chinese-banking-system>

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