Banc Ceannais na hÉireann
Central Bank of Ireland

Eurosystem

Quarterly Bulletin

QB4 – October 2017

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Notes

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

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

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

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

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

6. The following symbols are used:

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

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

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Forecast Summary Table

	2016	2017[f]	2018[f]
Real Economic Activity			
(% change)			
Personal consumer expenditure	3.3	2.8	2.7
Public consumption	5.3	2.0	1.5
Gross fixed capital formation	61.2	9.7	8.6
Modified Domestic Demand	4.8	4.2	3.9
Exports of goods and services	4.6	4.9	4.1
Imports of goods and services	16.4	5.4	5.0
Gross Domestic Product (GDP)	5.1	4.9	3.9
Gross National Product (GNP)	9.6	3.4	4.2
External Trade and Payments			
Balance-of-Payments Current Account (€ million)	9,196	8,611	5,776
Current Account (% of GNP)	3.3	2.9	1.8
Prices, Costs and Competitiveness			
(% change)			
Harmonised Index of Consumer Prices (HICP)	-0.2	0.3	0.7
of which: Goods	-3.1	-2.4	-1.8
Services	2.5	2.8	3.0
HICP excluding energy	0.4	0.1	0.4
Consumer Price Index (CPI)	0.0	0.7	1.3
Compensation per Employee	2.1	3.1	3.2
Labour Market			
(% change year-on-year)			
Total employment	2.9	2.6	1.8
Labour force	1.2	0.7	1.2
Unemployment rate (ILO)	7.9	6.2	5.6
Technical Assumptions[2]			
EUR/USD exchange rate	1.11	1.19	1.19
EUR/GBP exchange rate	0.82	0.90	0.90
Oil price ($ per barrel)	43.68	57.75	57.75
Interbank market – Euribor[3] (3-month fixed)	-0.26	-0.33	-0.33

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

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

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

Comment

The Irish economy continues to grow at a solid pace, supported by the strength of activity on the domestic side of the economy. Recovery continues to be underpinned by strong and broad-based growth in full-time employment, which has helped incomes to recover and supported the growth of consumer spending, while some key components of domestic investment are gradually gaining traction. Looking ahead, the outlook remains positive, with the economy projected to remain on a favourable growth path, though some risks and uncertainties persist.

Abstracting from some volatility in the headline national accounts data, a range of spending and activity indicators suggest that the underlying picture is that growth has continued at a relatively strong pace in the first half of 2017. In the main, expansion continues to be driven by the buoyancy of domestic economic activity, which is benefitting from sustained employment growth. In particular, gains in full-time employment have been particularly strong, outpacing the growth in overall employment, as part-time work has increasingly become converted into full-time jobs. This has supported the recovery in incomes and, in turn, growth in consumer spending. With regard to investment, while the headline measure remains volatile, the evidence suggests that the recovery in the domestic components, particularly construction, continues to gather pace, although from a relatively low base.

Looking ahead, the outlook remains broadly favourable. The main impetus to growth over the forecast horizon is expected to come from projected strength of domestic demand, reflected in solid growth in consumer spending and underlying investment. The main driver of growth is projected to be continuing gains in employment and incomes, though some moderation in employment growth from current rates is projected over the forecast horizon. Reflecting this, prospects for consumption and investment spending remain favourable and modified domestic demand is forecast to grow by 4.2 per cent this year and by 3.9 per cent next year. For 2017, this represents a small downward revision from the projection in the last Bulletin and reflects weaker growth in the national accounts measure of consumption in the first half of the year.

On the external side, a positive trend in underlying export performance has been dampened by pronounced weakness in contract manufacturing activity, while related factors have also restrained the growth in imports. This has led to downward revisions to the projections for growth in both exports and imports and, with the effect of the latter outweighing the former, the overall forecast for GDP growth has been raised slightly over the forecast horizon.

While the central forecast is for economic activity to continue to grow at a solid pace, risks to these forecasts remain to the downside. The outlook continues to be characterised by uncertainty about the external environment, both in relation to Brexit and broader risks, given the sensitivity of small, highly open economies to international shocks. In particular, the state of global economic and trading conditions and the configuration of major exchange rates are important determinants of Irish economic performance, given the dominant role of global firms in our tradeable sector.

To date, the impact of Brexit on the Irish economy has mainly been felt through the effect of the weaker sterling exchange rate. While indigenous sectors remain dependent on UK markets, on the output side, production, orders and exports data suggest a muted

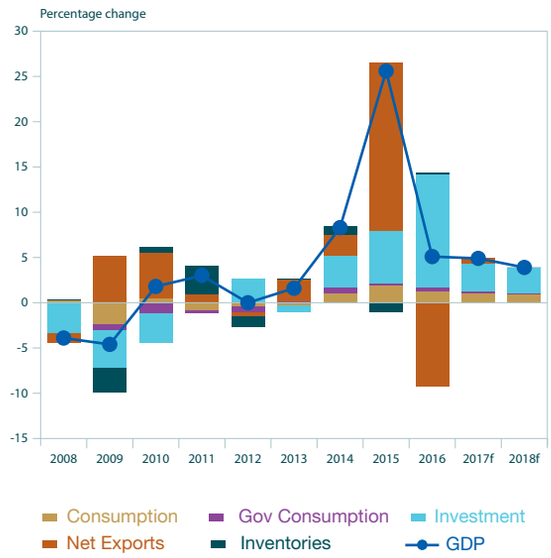
overall impact from Brexit related factors to date. On the demand side, sterling weakness has been cited as the factor behind the recent weakening in new car sales. However, the most notable impact of sterling weakness has been on inflation. Reflecting the relatively high proportion of goods imports which come from the UK, pass-through from sterling weakness has contributed to downward pressure on goods price inflation, which is persistently negative and is largely offsetting higher prices for services, keeping overall HICP inflation close to zero.

While overall price inflation remains very subdued and wage growth remains moderate, with domestic demand growing solidly and the labour market recovering rapidly, the question arises as to whether this can persist. In particular, the question of the extent to which there is still slack remaining in the labour market or whether the economy is now moving back close to capacity. Recent research in the Bank has focussed on some of these issues. A new measure of the potential additional labour supply from people not currently classified as unemployed suggests a lower level of labour utilisation currently than the standard unemployment rate (see Box C, page 21). While this also confirms that labour market conditions are tightening, it suggests that there is still scope for unemployment to fall further before wage pressures emerge. Further supporting evidence in this regard is contained in an article, 'The labour market and wage growth after a crisis', published in this Bulletin (pages 66-79). The paper finds that the subdued growth in wages in recent years can partly be attributed to temporary factors (including low inflation and changes in employment composition) as well as how slack is measured (unemployment versus non-employment). In addition, however, the paper also finds that the degree of sensitivity of wages is higher during periods of low or high unemployment outside of the 5-10 per cent range. With the qualification that inferences based on past behaviour must be used with caution, given the short-term outlook for unemployment contained in the latest forecasts, this suggests a further moderate pick-up in wage inflation over the forecast horizon, though overall wage pressures should remain contained.

The Irish Economy

Overview

Chart 1: Contributions to GDP



Source: CSO and Central Bank of Ireland.

- *The Irish economy has performed strongly this year although projected growth in headline GDP seems likely to overstate the strength of underlying developments. Modified domestic demand is projected to increase by 4.2 per cent in 2017, moderating to growth of 3.9 per cent in 2018. This represents a downward revision of 0.3 per cent for 2017 and 0.1 per cent for next year. It reflects both weaker growth in consumption in the first half of this year and a projected moderation in the growth of underlying investment. The forecast for Irish GDP growth is revised upwards by 0.4 per cent to 4.9 per cent this year and by 0.3 per cent to 3.9 per cent in 2018. This revision reflects both weaker than expected import growth and an upward revision to forecast investment in intangible assets this year.*

- *Strong growth in services exports and a positive underlying trend in goods exports was offset by pronounced weakness in contract manufacturing exports in the first half of 2017. Reflecting these divergent trends, we have made a small downward revision to overall export growth this year to 4.9 per cent, with a more pronounced revision to its composition. A larger contribution from services exports will offset weaker growth in goods exports that have been revised downwards to account for the decline in contract manufacturing. Export volumes are forecast to increase by 4.1 per cent next year, broadly in line with the growth in external demand. Imports of goods and services declined in year-on year terms in the first half of this year despite modest growth in both exports and final domestic demand. The positive impact on net exports of the downward revision to projected import growth accounts for much of the upward revision to headline GDP growth this year and in 2018.*

- *Moderate annual growth in modified domestic demand in the first half of this year mainly reflected a weaker than expected outturn for consumer spending. Consumer spending grew strongly in the first quarter but declined in seasonally adjusted terms in the second quarter. This is in part accounted for by a decline in new car sales as many consumers switched to second-hand imports, taking advantage of the decline in the value of sterling. The growth in consumer spending was lower than expected given the strength of high frequency indicators such as retail sales and consumer sentiment and the positive trend in disposable incomes. Taking account of these mixed signals, we have only made a small downward revision to projected consumption growth to 2.8 per cent this year while keeping the 2018 forecast unchanged at 2.7 per cent.*

- *Volatility in headline investment masked relatively strong underlying developments in the first half of the year. While growth in investment was strong overall, there was a marked weakness in investment in machinery and equipment excluding aircraft. Investment in building and construction continues to recover strongly. However, the number of house completions seems unlikely to reach our initial projections - we now expect completions to reach about 18,000 units this year, rising to just under 21,000 in 2018. This downward revision to projected housing output is offset by an upward revision to non-residential construction where output is increasing ahead of expectations.*

- *The labour market has performed strongly in 2017. Employment growth averaged 2.9 per cent in the first half of the year and unemployment remained on a strong downward trend. Growth in full-time employment was particularly robust, with numbers in work up 5.3 per cent in the first half of the year. For the year as a whole, employment growth of 2.6 per cent is anticipated, slowing to 1.8 per cent in 2018. On a cumulative basis, numbers at work should increase by over 90,000 persons over the forecast horizon, with employment exceeding 2.1 million in 2018. The unemployment rate is forecast to average 6.2 per cent this year and 5.6 per cent in 2018.*

- *Inflation in Ireland is subdued and remains the lowest in the Euro area. Average inflation reflects differences between goods and services prices, which have a roughly equal weighting in the Harmonised Index of Consumer Prices (HICP). Reflecting the impact of exchange rate appreciation, goods price inflation is persistently negative and it is largely offsetting higher prices for services. HICP inflation is expected to average 0.3 per cent in 2017. A modest pick-up in inflation to 0.7 per cent is likely in 2018 as the negative impetus from goods prices moderates while domestic demand pressures keep services inflation positive.*

Box A: The International Economic Outlook

By Monetary Policy Division

The expansion of economic activity in the euro area continues, with GDP growing by 0.6 per cent on a quarterly basis in the second quarter of 2017, and by 2.3 per cent on an annual basis. This represents the seventeenth consecutive quarter of growth in the euro area. The largest contributions to growth came from household consumption and gross fixed capital formation, at 0.3 and 0.2 percentage points, respectively. Net trade made a small positive contribution to overall growth. There have been positive surprises to GDP data over recent quarters, with upward revisions to quarterly growth rates of eight basis points on average since the third quarter of 2016. The ECB has increased its projected growth rate for 2017 to 2.2 per cent, from 1.9 per cent in the previous projections. Growth rates of 1.8 and 1.7 per cent are expected for 2018 and 2019, respectively.

Sentiment indicators for the euro area indicate that the economic recovery is to remain robust in the near term. The Composite Purchasing Manager's Index (PMI) for the euro area rose to 56.7 in September, from 55.7 in August. This represents a slight decrease from the six-year highs observed earlier in the year, but remains elevated compared with readings over those six years. The Manufacturing PMI rose to 58.1 in September, from 57.4 in August. This is the highest reading for the indicator in over six years. The European Commission's Economic Sentiment Indicator rose in September to 113, its highest level in over ten years, and exceeding its long run average of 100.

Annual HICP inflation in the euro area was 1.5 per cent in September, stable compared with August. Measures of underlying inflation have remained stable in recent months, with HICP excluding energy prices increasing by 1.3 per cent year-on-year. This represents a slight increase from 1.2 per cent in August, but an increase from 0.9 per cent in September 2016. The ECB forecasts headline HICP inflation to average 1.5 per cent in 2017, decreasing to 1.2 per cent in 2018 and rising to 1.5 per cent in 2019. The pattern reflects that base effects in energy prices imply a fall in the contribution of energy inflation between 2017 and 2018, to be followed by a moderate increase in energy prices in 2018 and 2019. HICP excluding energy is forecast to rise from 1.1 per cent in 2017 to 1.3 per cent in 2018 and 1.5 per cent in 2019, reflecting declining economic slack over the period.

In September, the Governing Council of the ECB decided to leave its key interest rates unchanged. Net asset purchases, currently at a pace of €60bn per month, are intended to run until the end of December 2017, or beyond if necessary. The ECB re-iterated its forward guidance that the Governing Council expects the key ECB interest rates to remain at their present levels for an extended period of time, and well past the horizon of the net asset purchases.

Box A: The International Economic Outlook

By Monetary Policy Division

The ECB assesses that risks to the economic recovery in the euro area are balanced for 2017, but are tilted to the downside for 2018 and 2019. The downside risks are seen mostly to arise from the external environment, including risks from geopolitical tensions and from further appreciation of the euro. Regarding inflation, risks are judged to be balanced for the 2017-19 period. Underestimation of the momentum in the economic recovery represents an upside risk, while downside risks include a prolonged period of low underlying inflation and low wage growth.

At its September meeting, the Bank of England's Monetary Policy Committee (MPC) voted to leave its policy rate unchanged at its historic low of 0.25 per cent. The MPC did signal, however, that a tightening of the monetary policy stance was likely to take place in the near term if the economy follows a path broadly consistent with the Bank's central projection. Inflation in the United Kingdom has exceeded the MPC's target of 2 per cent since February of this year, largely reflecting the passthrough to consumer prices of the depreciation of sterling since the second half of 2016. Annual inflation increased to 2.9 per cent in August from 2.6 per cent in July, and is forecast to remain elevated for the remainder of 2017. Thereafter, inflation is forecast to decrease in 2018 and 2019, but to remain above target.

The Office for National Statistics confirmed quarterly GDP growth in the United Kingdom of 0.3 per cent in the second quarter of 2017, following 0.2 per cent growth in the first quarter. This represents the weakest half of GDP growth since 2012. The approximately 18 per cent depreciation of sterling has raised import prices and weighed on real income growth. The resulting weakening in household consumption growth has largely driven the loss of momentum in growth in economic activity.

In the United States, GDP increased at an annualised rate of 3 per cent in the second quarter, following growth of 1.2 per cent in the first quarter. The second quarter increase reflected a large positive contribution from personal consumption expenditures (2.3 percentage points) and from investment (0.6 percentage points). There was a small positive contribution from net exports and a small negative contribution from government expenditures.

In September, the Federal Open Market Committee (FOMC) maintained its target range for the federal funds rate at between 1 per cent and 1.25 per cent, noting the continued strengthening in the labour market and moderate rise in economic activity. The FOMC expects annual inflation to remain somewhat below its 2 per cent objective in the near term, but to stabilise around the objective in the medium term. Annual inflation in the United States was 1.9 per cent in August.

In October, the FOMC will begin its program of normalisation of its balance sheet. It will gradually reduce its holdings of securities by decreasing the reinvestment of principal payments. The FOMC outlined its readiness to resume reinvestment of principal payments should this be deemed to be warranted by a deterioration in the economic outlook.

The recovery in global economic activity is continuing and is expected to accelerate moderately over the coming years. The IMF projects global GDP growth of 3.5 per cent in 2017 and 3.6 per cent in 2018, with the ECB projecting growth rates of 3.7 per cent and 3.8 per cent for the same years. Monetary and fiscal policy continue to support the cyclical retovery in advanced economies. Growth projections have been revised upward for Japan and the euro area, reflecting positive outturns for GDP growth in the first half of 2017. Projections of GDP growth in the United States have been revised downwards, however, due to the smaller expected contribution of fiscal policy to growth. A sustained increase in activity is expected within emerging market economies, with resilient growth in commodity-importers and a bottoming-out of the recessions in the commodity-exporters.

Table 1: Expenditure on Gross National Product 2016 and 2022[f]

	2016	% change in		2017[f]	% change in		2018[f]
	EUR millions	volume	price	EUR millions	volume	price	EUR millions
Personal Consumption Expenditure	96,613	2.8	0.6	99,865	2.7	0.9	103,485
Public Net Current Expenditure	28,354	2.0	3.0	29,780	1.5	2.0	30,828
Gross Domestic Fixed Capital Formation	87,662	9.7	2.2	98,279	8.6	2.2	109,064
Building and Construction	17,694	16.7	3.6	21,393	13.1	3.7	25,079
Machinery and Equipment	20,533	3.0	1.3	21,419	5.5	1.2	22,882
Intangibles	49,436	10.0	2.0	55,467	8.0	2.0	61,103
Value of Physical Changes in Stocks	2,383			2,383			2,283
TOTAL DOMESTIC DEMAND	215,012	5.5	1.6	230,308	5.0	1.6	245,660
of which: modified Domestic Demand	172,245	4.2	1.9	182,884	3.9	1.9	193,665
Exports of Goods & Services	335,042	4.9	2.6	360,650	4.1	1.1	379,580
FINAL DEMAND	550,054	5.1	2.2	590,958	4.5	1.3	625,240
Imports of Goods & Services	-274,398	5.4	1.1	-292,342	5.0	1.6	-311,838
Statistical Discrepancy	-89			-89			-89
GROSS DOMESTIC PRODUCT	275,567	4.9	3.3	298,527	3.9	1.0	313,314
Net Factor Income from Rest of the World	-48,818	11.6	2.6	-55,896	2.9	1.1	-58,166
GROSS NATIONAL PRODUCT	226,749	3.4	3.5	242,630	4.2	0.9	255,148
EU subsidies less taxes	993			1,915			2,014
GROSS NATIONAL INCOME	227,742	3.4	3.8	244,545	4.2	1.0	257,162

Demand

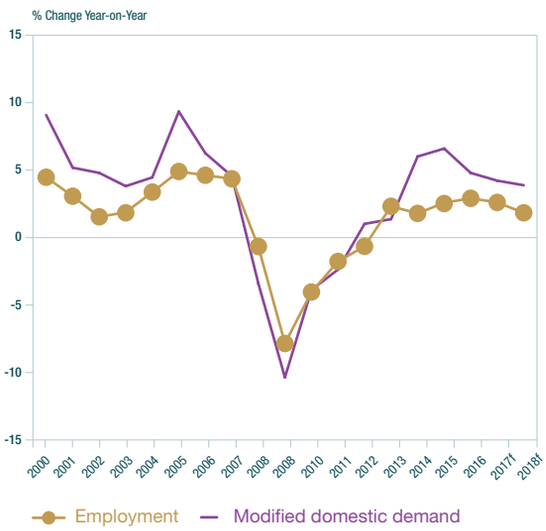
Domestic Demand Overview

Growth in domestic demand, principally consumption and investment expenditure will drive growth over the forecast horizon. Modified domestic demand is forecast to grow by 4.2 and 3.9 per cent in 2017 and 2018, respectively. This builds on robust growth of 4.8 per cent in 2016. The strength in domestic economic activity is underpinned by continued gains in employment over the period to 2018 (Chart 1).

Consumption

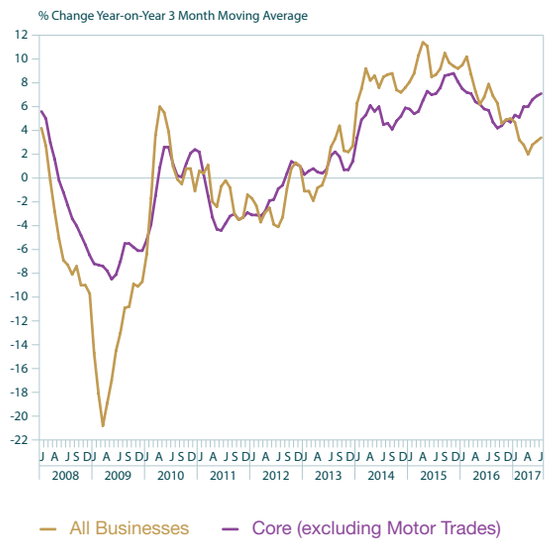
Personal consumption expenditure is forecast to increase by 2.8 and 2.7 per cent, respectively, in 2017 and 2018. Forecast consumption growth has been revised down by 0.3 per cent for 2017 compared to the previous Bulletin. This reflects a weaker than expected outturn in the first half of 2017 in the Quarterly National Accounts (QNA) measure of consumption that belied relative strength in high frequency indicators such as core retail sales, consumer sentiment and the strong labour market and income data

Chart 2: Domestic demand and employment growth



Source: CSO and Central Bank of Ireland.

Chart 3: Index of Volume of Retail Sales



Source: CSO.

(see below). The weaker than expected QNA figures appear to reflect both weak services consumption and a decline in new car sales as many consumers have switched to second-hand imports, taking advantage of the fall in the value of sterling.

The volume of personal consumption spending declined by 1.1 per cent in seasonally adjusted terms in the second quarter of the year following an increase of 0.9 per cent in the previous quarter. Despite this, for the first half of the year consumption spending was up 1.7 per cent in real terms relative to 2016. The volume of (core) retail sales (i.e. sales excluding motor trades) grew by 6.5 per cent in the first 7 months of the year, with the pace of growth accelerating over the summer months. Growth in purchases of household items (furniture, lighting and hardware) as well as electrical goods have also been firm in 2017.

Despite the ongoing uncertainties and risks associated with Brexit, there appears to be little appreciable impact so far on consumer sentiment. At the same time, the fall in the value of sterling is supporting real incomes and purchasing power through downward pressure on consumer prices (see Reddan and Rice (2017)).[1]

Investment

While headline investment fell by 8.8 per cent year-on-year in the second quarter of 2017 according to the latest QNAs, modified investment figures, which abstract some of the effects of multinational firms that have little impact on the domestic economy, point towards a more buoyant outturn, increasing by 11 per cent year-on-year. The growth in building and construction activity noted in previous Bulletins continued. Housing construction increased by 31.8 per cent, although this is coming from a very low base. Non-residential building and construction increased by 16.3 per cent year-on-year. Core machinery and equipment investment, on the other hand, has exhibited unexpected weakness this year, following a strong performance in 2016. Machinery and

1 See also Irish Central Bank Quarterly Bulletin 2017 Q2, Box C.

equipment investment excluding aircraft leasing declined by 13.5 per cent year-on-year in the second quarter, following a decline of 15.1 per cent in Q1 2017. Intangible investment excluding R&D related to intellectual patent imports increased by 32.6 per cent in Q2 2017.

For the remainder of 2017 and 2018, we expect that building and construction activity will continue to grow, underpinning domestic demand expansion. Reflecting the outturn for completions and housing starts in the first half of the year, completions are forecast to increase to approximately 18,000 units in 2017 with 21,000 completions forecast for 2018. This is a downward revision compared to the previous *Bulletin*. Non-residential construction is forecast to increase by 19.5 per cent and 15 per cent in 2017 and 2018, respectively. The robust pace of activity in the construction sector is reflected in survey data. Overall, building and construction investment is forecast to increase by 16.7 per cent and 13.1 per cent in 2017 and 2018, respectively.

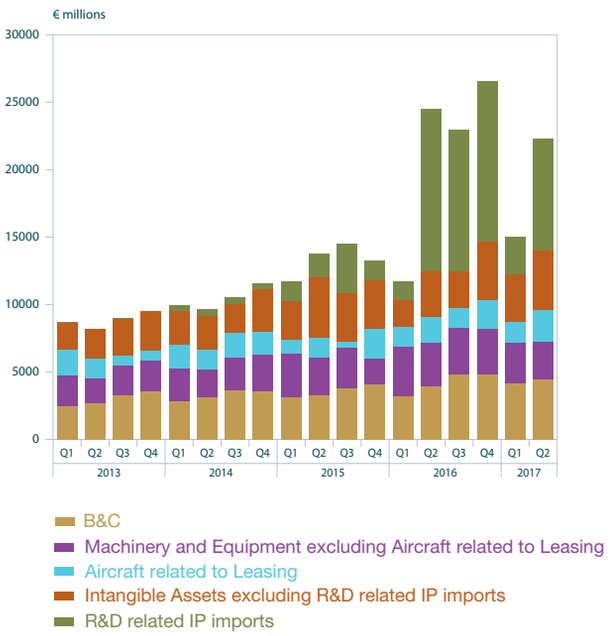
As indicated, core machinery and equipment investment softened considerably in the first half of 2017 according to the latest QNAs. The forecast for core machinery and equipment investment (excluding aircraft leasing) has been lowered in line with weakness in the QNA figures, which is now expected to remain flat in 2017 before increasing by 5 per cent in 2018.

Intangible assets excluding IP related imports registered a strong increase in the first half of 2017. These expenditures are forecast to grow by 8 per cent in 2017 and 12 per cent in 2018. Overall, modified investment is forecast to increase by 9 per cent and 9.1 per cent in 2017 and 2018 respectively.

Government Consumption

The volume of government consumption is expected to increase on average by 1.7 per cent per annum in 2017 and 2018. This outlook is guided by announced policy measures in *Budget 2017*.

Chart 4: Gross Fixed Capital Formation (Constant Prices)



Source: CSO.

External Demand and the Balance of Payments

Exports and Imports

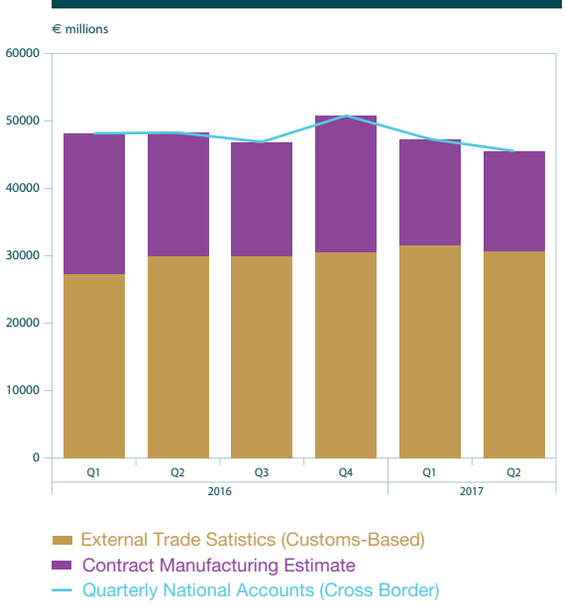
The second quarter outturn for exports was broadly in line with that of the previous quarter – exports of goods and services rose by 3.2 per cent annually in volume terms following 3.3 per cent growth on the same basis in the first quarter of 2017. The divergence between the performance of goods and services exports remained the most prominent feature of export growth during the second quarter, as services export growth dramatically outpaced that of goods, owing largely to the growth of computer services. Conversely, having weighed heavily throughout 2016 and into the first quarter of 2017, subdued contract manufacturing activity continued to contain goods export growth in the second quarter. The gap between the value of goods export values in the QNAs and the value of goods export in the External Trade Statistics[2], used as a proxy for contract manufacturing levels,

2 The inclusion of contract manufacturing is the main adjustment made in transforming goods export data from a cross border basis in the External Trade Statistics to an ownership basis in the QNAs.

Table 2: Goods and Services Trade 2016, 2017[f] and 2018[f]

	2016	% change in		2017[f]	% change in		2018[f]
	EUR millions	volume	price	EUR millions	volume	price	EUR millions
Exports	335,042	4.9	2.6	360,650	4.1	1.1	379,580
Goods	194,071	1.1	2.8	201,700	2.7	0.2	207,622
Services	140,971	10.5	2.0	158,951	6.0	2.1	171,959
Imports	274,398	5.4	1.1	292,342	5.0	1.6	311,838
Goods	88,219	5.4	0.5	93,408	5.2	-0.5	97,713
Services	186,179	5.4	1.4	198,935	4.9	2.6	214,125

Chart 5: Value of Goods Exports



Source: CSO.

narrowed by 28.3 per cent annually in the second quarter of 2017.

External demand indicators continue to signal positive prospects for 2017 and 2018. The outlook for demand in our main trading partners, based on the most up-to-date assumptions, points to a modest improvement in trading partner demand for 2017 relative to the previous Quarterly Bulletin. Moreover, the latest available sentiment indicators are consistent with continued growth in export orders over the short-term. However, while external demand is, on balance, improving, the recent appreciation of the euro vis-à-vis the dollar and sterling is likely to have some dampening influence on export growth. Furthermore, it is important to acknowledge that our projections assume a neutral contribution from contract manufacturing on growth in goods exports over the projection period.

Reflecting the above, the latest projection is for overall growth in export volumes of 4.9 per cent for 2017 and 4.1 per cent in 2018. While the projected profile for overall export growth is largely unchanged relative to the previous Quarterly Bulletin, the composition of export growth in terms of goods and services has changed somewhat. Most notable in this respect has been the significant upward revision to the services component in 2017 in line with recent stronger than anticipated outturns. Conversely, a sizable downward revision to the projected profile for goods exports has been incorporated, reflecting subdued levels of contract manufacturing during the first half of this year. Given the uncertainty surrounding the international outlook, and most notably Brexit, the risks to the export outlook remain largely to the downside.

Table 3: Balance of Payments 2016, 2017[f] and 2018[f]

€ million	2016	2017[f]	2018[f]
Trade Balance	60,644	68,308	67,743
Goods	105,852	108,292	109,909
Services	-45,208	-39,984	-42,166
Net Factor Income from the Rest of the World	-47,647	-55,896	-58,166
Current International Transfers	-3,801	-3,801	-3,801
Balance on Current Account	9,196	8,611	5,776
(% of GDP)	3.3	2.9	1.8

While imports of goods and services were broadly unchanged over the year to the first quarter of 2017, imports fell by 3.6 per cent in the second quarter due to a weakening of both goods and services imports. On the services side, the fall in import volumes reflected weaker business services sector imports, specifically research and development related imports, owing to a fall-off in the import of intellectual property assets. As a result of the decline in overall imports, net exports rose dramatically in the year to the second quarter, up by 47.6 per cent. Looking beyond the recent volatility, import growth is expected to be strong, albeit easing somewhat, during the second half of 2017 and further into 2018, as growth in both domestic demand and exports gradually slow. Accordingly, a 5.4 per cent rise in overall import volumes is projected in 2017 followed by 5.0 per cent in 2018. The forecasts for exports and imports imply a small positive contribution to growth this year from net trade of 0.6 percentage points, falling to 0.3 percentage points in 2018.

Net Trade, Factor Incomes and International Transfers

Following a sizable current account surplus of €8,570 million in the first quarter, a deficit of €872 million was recorded in the second quarter of 2017. This pattern of a strong surplus in the first quarter followed by a deficit in the second quarter was also observed in 2016 and, once again, can largely be attributed to developments in the imports of intellectual property. The single most noteworthy development in annual terms was the pronounced reduction in the services deficit in the second quarter of 2017 as a result of the buoyancy of services exports and, to a lesser extent, a falloff in services imports. The narrowing of the services deficit was, however, partly offset by a pickup in net factor income outflows as well as a fall in the merchandise trade surplus. See Box B for a discussion of new data on Ireland's current account balance with the UK.

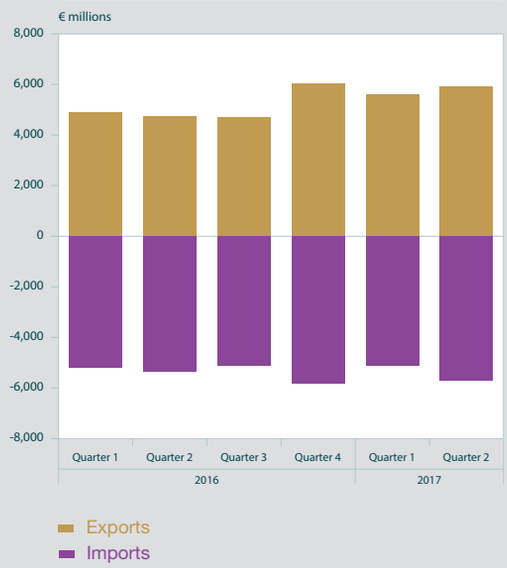
Taking account of the trade forecasts outlined above, the trade balance is forecast to rise to 22.9 per cent of GDP in 2017 followed by a falloff to 21.6 per cent in 2018. Net factor income outflows are expected to rise in both 2017 and 2018. Reflecting the prospective trends across these components, a current account surplus of around 2.9 per cent of GDP is projected for 2017 as a whole followed by a decline to 1.8 per cent in 2018.

Box B: Ireland's Current Account Balance with the UK

By Stephen Byrne and Thomas Conefrey[3]

In the latest Quarterly National Accounts and Balance of Payments publication for Q2 2017, the CSO released new data showing Ireland's trade in goods and services as well as income flows with the UK. Since the UK is Ireland's largest trading partner, and given the focus on that relationship arising from the UK's decision to leave the European Union, it is helpful to examine these data, which give greater access to data on services and income flows than were available previously. The new data are available from Q1 2016 and therefore provide a snapshot of trade and income flows between Ireland and the UK in the recent past.

Box B Figure 1: Merchandise Trade with UK



Source: CSO.

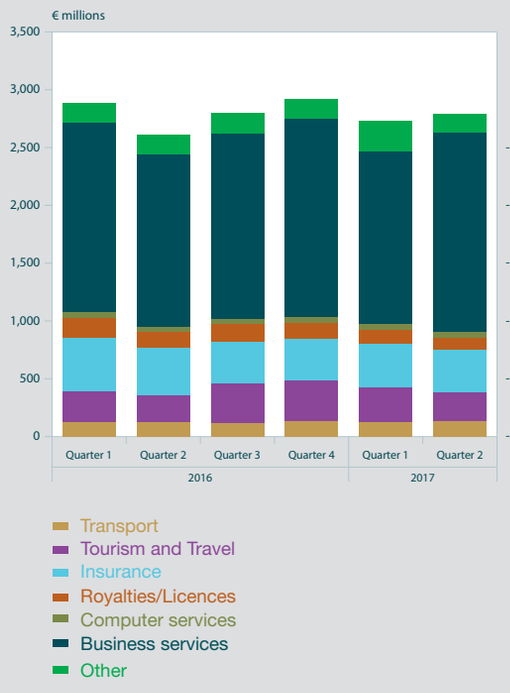
Figure 1 shows that for 2016 as a whole, Ireland maintained a merchandise trade deficit with the UK, meaning more goods were imported into the State from the UK than were exported. In the first half of 2017, this position has changed somewhat with exports of goods to the UK marginally exceeding imports. There is some volatility in the merchandise trade data and therefore it is not possible to discern a trend from the short timespan in the new data release. A notable aspect of the data shown in Figure 1 is the scale of Ireland's trade surplus in services with the UK. A breakdown of Ireland's services trade with the UK is shown in Figure 2. The chart shows that the surplus in services trade is driven by large exports in the computer services and financial services sectors. On the imports side, large business services imports are accounted for by significant inflows of operational leasing and research and development, i.e. the import of intellectual property.

3 Irish Economic Analysis Division.

Box B: Ireland's Current Account Balance with the UK

By Stephen Byrne and Thomas Conefrey

Box B Chart 2a: Services Exports to UK



Source: CSO.

Box B Chart 2b: Services Imports from UK

Source: CSO.

Figure 2 shows that Ireland is also an exporter of royalties/licenses to the UK. In the aggregate Balance of Payments statistics, Ireland has become a net exporter of royalties in recent quarters. The increase in royalty exports from Ireland is related to the recent activities by multinationals to move intellectual property assets to Ireland. As large stocks of IP and other R&D–related intangible assets are now located in Ireland following the recent relocations, the use of these assets in the production of goods and services by multinationals generate an export of royalty services, even though some of the related activity takes place outside of Ireland.

Table 1: Ireland UK Primary Income Flows

	€ Million	2016				2017	
		Quarter 1	Quarter 2	Quarter 3	Quarter 4	Quarter 1	Quarter 2
Primary Income	**Inflows**	**3,396**	**3,759**	**2,864**	**3,625**	**4,012**	**4,154**
	Outflows	**5,733**	**6,791**	**5,839**	**5,581**	**5,734**	**7,396**
(of which: Investment Income)	Inflows	3,335	3,698	2,803	3,564	3,951	4,093
	Outflows	5,649	6,708	5,755	5,503	5,648	7,312
Direct investment income	Inflows	439	512	-218	497	542	378
	Outflows	883	815	657	583	547	762
Portfolio investment income	Inflows	2,151	2,395	2,323	2,381	2,624	2,876
	Outflows	3,981	5,161	4,440	4,183	4,602	5,941
Other investment income	Inflows	745	791	698	686	785	838
	Outflows	784	732	658	736	499	609
Secondary Income	**Inflows**	**516**	**427**	**475**	**438**	**566**	**544**
	Outflows	**600**	**526**	**575**	**543**	**767**	**823**

Box B: Ireland's Current Account Balance with the UK
By Stephen Byrne and Thomas Conefrey

On the income side of the balance of payments, large primary income outflows derive mainly from the large outflows of portfolio investment income. Portfolio investment relates to cross border investments where the investor owns less than 10 per cent of the shares and does not influence the management of the company, as distinct from direct investment. The large outflows in this category relate to the profits of large investment funds located in Ireland. The new data do not allow for a breakdown of direct investment income flows, but in the aggregate current account the majority of direct investment outflows relate to income on equity (dividends and distributed branch profits). This is linked to the profits of UK owned firms located in Ireland being either repatriated or reinvested.

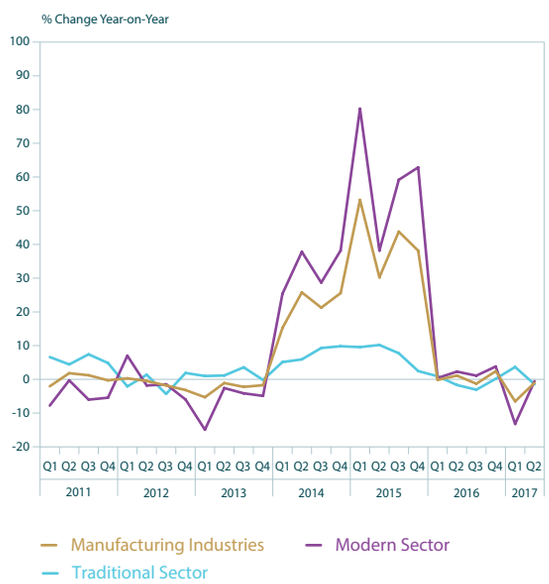
Supply

On the output side, the QNA show strong growth in the first half of 2017. On the services side, the information and communication sector grew by 24.5 per cent on average while the professional, administration and support services sector grew by 11.3 per cent. One notable exception was the financial and insurance activities sector, where output fell by 6.6 per cent. Agriculture, forestry and fishing grew by a robust 8.2 per cent in H1 2017 with construction growth also strong, up 20.8 per cent.

Industrial production data show that overall output in the manufacturing sector fell by 3.9 per cent from January to August in comparison to the same period last year. However, this series is volatile and heavily influenced by the activities of multinational corporations, with output in the modern sector falling by 4.3 per cent over this period, reflecting the weakness of contract manufacturing activity. In contrast, the output of the traditional sector grew by 0.5 per cent on average through the first eight months of the year.

The Investec manufacturing PMI suggests that growth was strong in recent months, with readings of 56.1 and 55.4 for August and September, respectively (values above 50 signifying expansion). The new exports order component had a positive reading of 54.8 with the employment indicator also signifying expansion with a value of 51.8. The CSO's monthly services index showed average growth of 3.1 per cent for the January to August period. All components of the Investec services PMI showed expansion for September with the overall index at 58.7.

Chart 6: Volume of Industrial Production



Source: CSO.

The Labour Market

Employment in the Irish economy continues to grow at a robust pace with 2.6 per cent growth anticipated for the year as a whole. This outlook has been revised down (from 3.0 per cent in the previous bulletin) reflecting more modest employment gains in the second quarter of the year. Looking to 2018, some further moderation in employment growth is expected with growth of close to 1.8 per cent anticipated. This outlook is partly driven by the strength in domestic demand spending (Chart 2) – see the article later in this Bulletin – *'The labour market and wage growth after*

Table 4: Employment, Labour Force and Unemployment 2016, 2017[f] and 2018[f]

	2016	2017[f]	2018[f]
Agriculture	113	108	109
Industry (including construction)	394	412	428
Services	1,513	1,552	1,574
Total Employment	**2,020**	**2,073**	**2,111**
Unemployment	173	136	124
Labour Force	2,193	2,208	2,235
Unemployment Rate (%)	7.9	6.2	5.6

Note: Figures may not sum due to rounding

a crisis'. Cumulatively, these forecasts point to an additional 91,000 persons at work over the forecast horizon with employment set to exceed the 2.1 million threshold in 2018. Job gains are set to remain broadly based, with an increasing contribution from the labour intensive construction sector.

According to the most recent *Quarterly National Household Survey* (QNHS), numbers in employment increased by 2.9 per cent (58,400 persons) in the first half of the year although the pace of employment growth slowed appreciably in the second quarter. In seasonally adjusted terms, employment levels rose by 0.2 per cent in the 2nd quarter relative to 0.7 per cent in the 1st quarter, due mainly to a sharp moderation in industrial employment. Overall, employment gains continue to be broadly-based with 11 of 14 sectors posting increases in the second quarter. The largest gains came in the Information and Communication (up 7,800 persons) and Construction (up 10,600 persons) sectors. In addition, there has been a shift from part- to full-time employment in recent quarters. Numbers in the latter were up 5.3 per cent in the first half of the year. This more than offset the 4.7 per cent decline in part-time employment. Box C presents an update to the Non-Employment Index for Ireland. This is a broader measure of utilisation in the labour force which includes individuals not captured in the standard unemployment rate.[4]

The labour force grew by 0.9 per cent (18,600 persons) in the first half of the year, although there was a notable slowdown in the second quarter (a 0.3 per cent contraction in seasonally adjusted terms). Following modest gains in participation in 2015 and 2016, the participation rate fell below the 60 per cent mark in the 2nd quarter to 59.8 per cent. Given the 2nd quarter numbers, we have revised our labour force growth rate down to 0.7 per cent this year and 1.2 per cent in 2018. This outlook coupled with the projections for employment should see a further fall in the unemployment rate to 6.2 per cent in 2017 and 5.6 per cent in 2018.

Pay

To date, wages have been slow to respond to the sharp pick-up in employment. According to the 2016 National Income and Expenditure Accounts (NIE), aggregate economy wide (employee) compensation levels increased by 5.4 per cent last year (up half a percentage point relative to 2015). Given employment developments, this translated into an estimated increase in compensation per employee of 2.1 per cent. For 2017 and 2018, with conditions in the labour market expected to improve, further growth in compensation per employee is projected with increases of 3.1 per cent on average in 2017 and 2018.

4 A Non-employment Index for Ireland, Central Bank Economic Letter Series 2017.9

Box C: Ireland's Non-Employment Index

By Stephen Byrne and Thomas Conefrey[5]

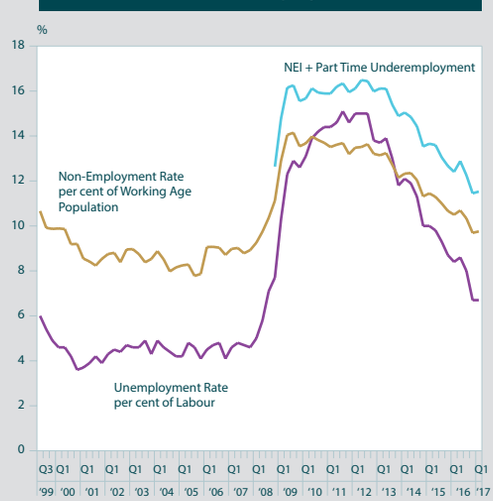
A recent Economic Letter introduced the methodology behind a Non-Employment Index (NEI) for Ireland. In this Box we give a brief overview of the NEI, and provide an update of the NEI up to the first quarter of 2017.

As the economic recovery has progressed in countries impacted by the global financial crisis, policymakers have increasingly begun to look beyond the unemployment rate at broader measures of utilisation in the labour market.[6] This is because, although the unemployment rate is a key measure of the state of the labour market, it captures only a subset of those who are not in employment but are part of the working-age population. The importance of considering broader measures of unemployment beyond the standard unemployment rate is heightened given the large increase in the number of individuals who dropped out of the labour force entirely during the economic downturn.

The NEI aims to account for individuals currently not included in the standard measure of unemployment, but who have some degree of attachment to the labour force. To construct the NEI, we calculate the transition rates into employment for various cohorts of non-employed individuals (discouraged workers, students, individuals who are not actively looking for work, etc.) over a long period from 1998-2016 using data from the Quarterly National Household Survey (QNHS). We then use these observed transition rates to weight all non-employed individuals by their relative likelihood of moving back into employment. In this way, our extended measure has an advantage over the standard unemployment rate in that it includes all non-employed individuals.

Figure 1 shows the latest estimate of the NEI for Ireland. The negative impact of the crisis on the labour market is clearly evident as the NEI increased sharply to 12.1 per cent at its peak in late 2009. It is notable that in the three years between 2009 and 2012, the NEI barely declined: in Q3 2012 it was just 0.1 of a percentage point lower than its value in the last quarter of 2009. Since late 2012, however, the NEI has been on a steadily declining path.[7] The most recent value of the NEI for Q1 2017 is 9.8 per cent, still higher than its average value in 2007. Including part-time underemployed individuals, the estimated NEI in Q1 2017 is 11.5 per cent. Both estimates of the NEI are on a declining path but are higher than the standard unemployment rate. This indicates that, while labour market conditions continue to improve, as of early 2017 there was a higher level of underutilisation than implied by the standard unemployment rate.

Box C Chart 1: Non-Employment Index



Source: CSO and Authors' Calculations.

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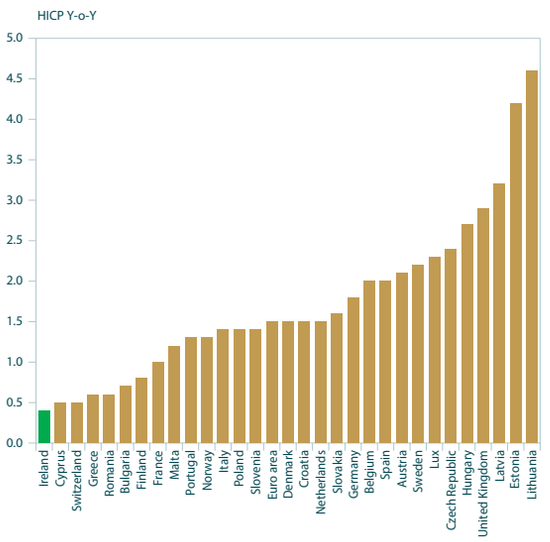
6 For example, see ECB (2017) - "Assessing labour market slack," in the ECB Economic Bulletin, Issue 3 / 2017.

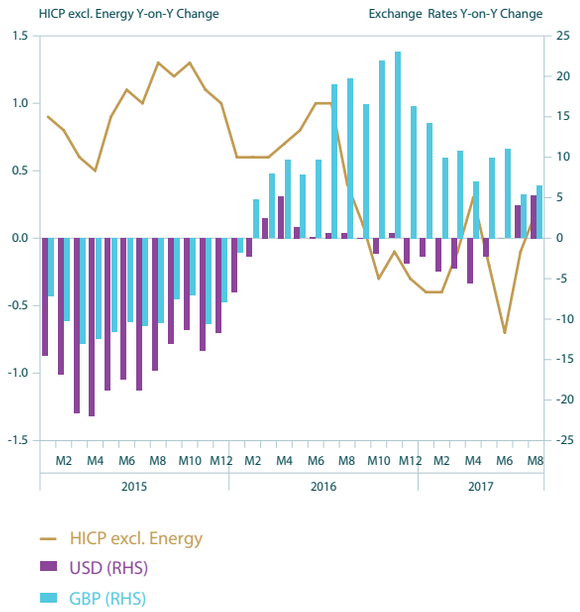
7 Box C, Figure 1 shows that for a period after 2010 the actual unemployment rate exceeds the NEI. There are two main reasons for this. Firstly, the denominator used to calculate the NEI is the working-age population which was more stable than the labour force during the crisis. The labour force – the denominator used to calculate the unemployment rate – is a narrower measure which fell sharply during the crisis. Secondly, the standard unemployment rate gives the same weight to short-term and long-term unemployed individuals. In contrast, the NEI significantly down weights the long-term unemployed relative to the short-term unemployed, reflecting the lower observed job-finding probabilities of long-term unemployed workers.

Chart 7: HICP - August 2017



Source: Eurostat.

Chart 8: Irish Inflation and Exchange Rate Changes



Source: Eurostat.

Inflation

Consumer Prices

Headline inflation remains muted as negative, generally imported, goods price inflation is offset by higher prices in the services sector. The Harmonised Index of Consumer Prices (HICP) increased by just 0.2 per cent over the January to August 2017 period compared to the previous year; goods prices declined by 2.4 per cent over this period while services prices increased by 2.7 per cent. Abstracting from energy price developments, core inflation remains in negative territory, down 0.2 per cent in the January to August period. Inflation in Ireland remains the lowest in the Euro area (see Chart 7).

The earlier weakening in sterling would appear to be contributing to downward pressure on consumer prices in Ireland as imports from the UK become cheaper. All else being equal, a rise in the value of the euro relative to sterling serves to decrease the euro price that foreign producers selling in Ireland need to charge to maintain profits in their own currency. Recent strength in the euro against the dollar, if maintained, may also exert some downward pressure on prices in Ireland.

Chart 9 reveals that in August 2017 prices increased for rent, petrol and diesel, restaurants and hotels and education, while prices declined for industrial goods, clothing, alcohol and food. In Chart 10 we show a decomposition of HICP inflation by commodity type. This highlights strong price pressures from rents and energy components balanced by negative contributions from industrial goods and clothing.

Over the coming year, the negative price impetus coming from the goods side of consumer prices is expected to continue, although the rate of decline is likely to moderate. Goods prices are forecast to decline by 2.5 per cent in 2017, followed by a decline of 1.8 per cent in 2018. In contrast, services prices, are expected to increase by 2.9 per cent and 3 per cent in 2017 and 2018, respectively.

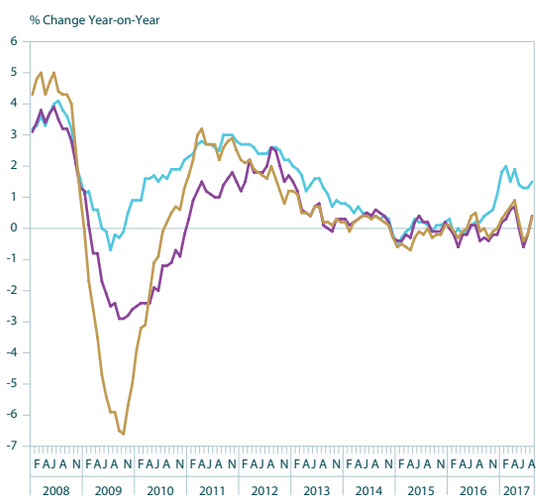
Overall, based on current assumptions for oil prices, exchange rates and international

Table 5: Inflation Measures - Annual Averages, Per Cent

Measure	HICP	HICP excluding Energy	Services[a]	Goods[a]	Euro Area HICP[b]
2012	1.9	0.9	1.9	1.9	2.5
2013	0.6	0.6	1.6	-0.4	1.4
2014	0.3	0.5	2.5	-1.7	0.4
2015	0.0	1.0	3.0	-3.1	0.0
2016	-0.2	0.4	2.5	-3.0	0.2
2017[f]	0.3	0.0	2.9	-2.5	1.5
2018[f]	0.7	0.8	3.0	-1.8	1.2

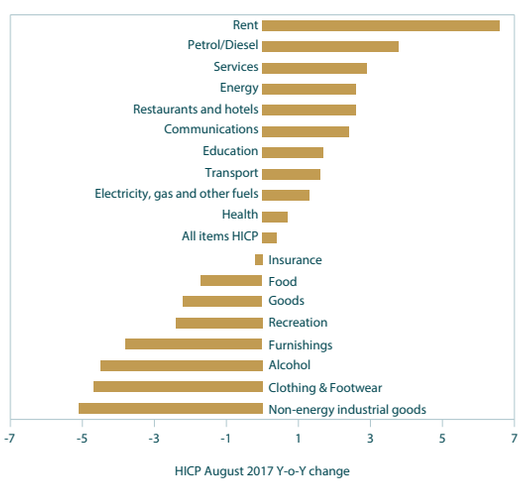
a Goods and services inflation refers to the HICP goods and services components
b ECB staff projections, September 2017

Chart 9: Consumer Prices



Source: CSO.

Chart 10: Consumer Prices by Commodity



Source: Eurostat.

commodity prices, the headline HICP rate is expected to increase by just 0.3 per cent in 2017 and 0.7 per cent in 2018. These forecasts are below projected inflation in the Euro Area (Table 5). HICP excluding energy is expected to remain flat in 2017 before increasing to 0.8 per cent in 2018.

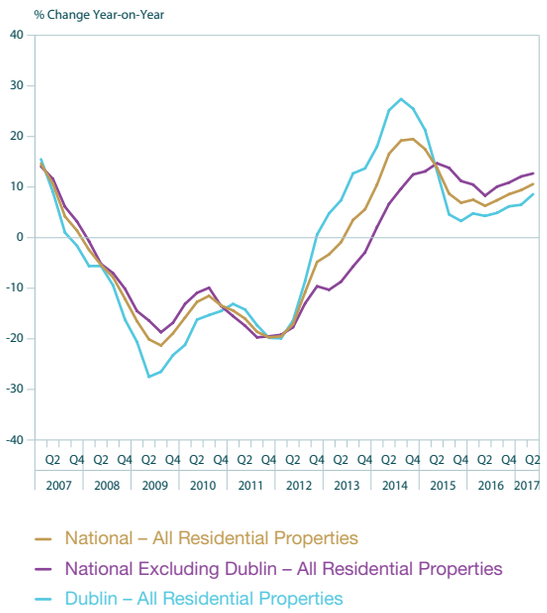
Residential Property

The latest CSO Residential Property Price Index (RPPI) showed that prices increased by 3 per cent month-on-month in July. These figures follow an increase of 1.5 per cent in June. In year-on-year terms, property prices increased by 12.3 per cent in July with prices in Dublin up 12.7 per cent. House prices outside Dublin recorded an annual increase of 11.7 per cent in July. Private rents as measured in the CPI basket grew by 7.3 per cent in the year to August.

Commercial Property

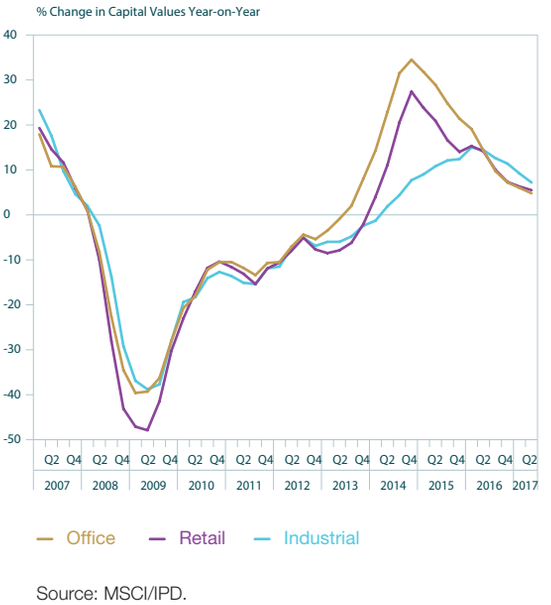
The latest data from the MSCI/IPD database show that the pace of growth in commercial property prices has moderated in recent quarters. Overall, commercial property prices

Chart 11: Residential Property Price Indices



Source: CSO.

Chart 12: MSCI/IPD Irish Commercial Property Index



Source: MSCI/IPD.

grew by 6.2 per cent year on year in the first quarter of 2017. On an annual basis, the office, retail and industrial sectors grew by 6.2, 6.3 and 9.2 per cent respectively. The Bank's *Macro Financial Review* conducts a detailed review of developments in the commercial property sector.

Competitiveness

Sterling has remained weak in relation to the euro through 2017 to date. The euro appreciated from £0.88 in late July to £0.93 in late August before moving back to €0.88 again in late September. Against the US dollar, the euro opened 2017 at $1.05 but has appreciated in recent months, averaging $1.19 from mid-August to mid-September.

The latest Harmonised Competitiveness Index (HCI) data for August 2017 show that the nominal HCI increased by 3.5 per cent on an annual basis. In real terms, the HCI rose by 2 per cent when deflated with consumer prices and by 2.8 per cent when deflated with producer prices. These developments suggest a decline in competitiveness in Ireland, linked to the exchange rate movements, although weakness in consumer price inflation is offsetting some of this fall.

The Public Finances

Overview

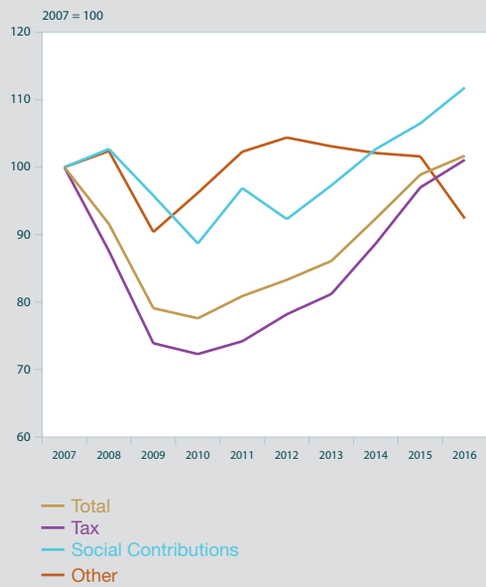
The latest fiscal data continue to be mostly positive. Government Finance Statistics reveal that the general government deficit declined in nominal terms once again in the first quarter of the year. Exchequer returns data indicate that taxes have been growing at a steady pace, and while current and capital spending have also been increasing in year-on-year terms, total expenditure remains below profile to date. Reflecting these developments, the Government appears on track to deliver an improvement in the general government balance in 2017 from the 0.6 per cent of GDP deficit recorded last year. Despite a decline in the general government debt ratio, total government debt actually increased in nominal terms in the first quarter of 2017 and remains at an elevated level.

Box D: Irish Government Revenue Developments in 2016

By Linda Kane and Rónán Hickey[8]

The recent release of annual Government Income and Expenditure data for 2016[9] confirmed that general government revenue reached a notable milestone last year as it surpassed its pre-crisis peak. Having declined by almost a quarter between 2007 and 2010, revenue has been steadily recovering, averaging growth of just under 5 per cent per annum in subsequent years. The three main sub components of revenue are (i) tax receipts, (ii) social contributions and (iii) other revenue[10]. Given tax receipts account for around 70 per cent of total revenue, it is no surprise that the two move closely together and tax revenue also surpassed it pre-crisis peak in 2016 (see Figure 1). We take a closer look at developments in tax revenue below. Social contributions experienced a smaller contraction during the crisis and have been quicker to recover, supported by the improving labour market and a number of fiscal measures. The evolution of other revenue, meanwhile, has primarily reflected developments in the receipts generated from government intervention in the financial sector.

Box D Chart 1: Developments in general government revenue (2007 = 100)



Source: CSO.

These include guarantee fees, Central Bank surplus income and investment income, and have been moderating in recent years following the ending of the bank guarantee scheme and divestment of banking related assets.

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9 http://www.cso.ie/en/releasesandpublications/er/giea/governmentincomeexpenditurejuly2017

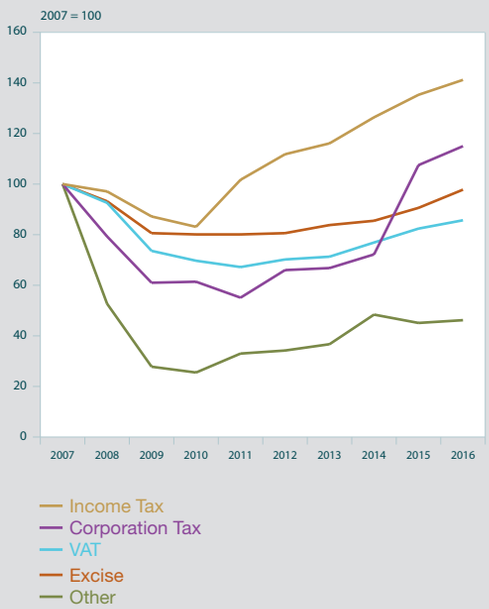
10 Other revenue is composed of (i) other current revenue, (ii) sales and (iii) non-tax capital revenue.

Box D: Irish Government Revenue Developments in 2016

By Linda Kane and Rónán Hickey

Figure 2[11] takes a closer look at the developments of individual tax heads and the role that they have played in the revenue recovery[12]. Three particular developments are worth highlighting. The first is the recovery and growth of income tax, which was a very significant 40 per cent above its pre-crisis peak in 2016. This is due in no small part to the introduction of the Universal Social Charge (USC), discussed in more detail below. The second is the role that corporation tax has played in driving tax revenue in recent years, despite its relatively small base, with this tax responsible for 40 per cent of the increase in total tax revenue over the period 2014 to 2016. Apart from income tax, it is the only other major tax head to have increased above its pre-crisis level, mainly due to its rapid growth in 2015. The third development is that 'other' tax revenue has stabilised in recent years at around half of its 2007 level. The collapse of 'other' tax revenue during the crisis was driven by sharp declines in its biggest two components, capital gains tax and stamp duty, in the wake of the housing crash.

Box D Chart 2: Developments in tax heads (2007 = 100)



Source: Department of Finance.

While policies such as the pension fund levy and an increase in capital tax rates, alongside the economic recovery, have led to a gradual improvement, the level of transitory income generated by the housing market boom is now very evident. Reflecting all of the above, income tax is now playing a much bigger role in supporting the tax base; it represented 40 per cent of total tax revenue in 2016, up from just a quarter in 2006. The proportion of revenue coming from 'other' taxes has declined by 10 per cent over the same period, to just 7 per cent last year.

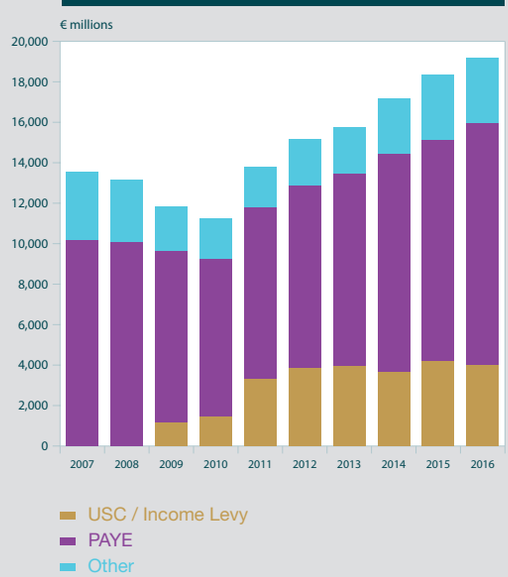
11 We use Exchequer data as Government Income and Expenditure data doesn't outline individual tax heads.

12 This updates a Chart by Hickey and Smyth from 'The Financial Crisis in Ireland and Government Revenues', Central Bank of Ireland Quarterly Bulletin, October 2015.

Box D: Irish Government Revenue Developments in 2016
By Linda Kane and Rónán Hickey

Figure 3 takes a closer look at the components that have driven the recovery in income tax using data from the Revenue Commissioners. It shows that PAYE is still the most important component of income tax, accounting for two-thirds of receipts. PAYE revenue has recovered alongside the labour market and broader economy in recent years, and having fallen by around one-quarter by 2010 had rebounded to 18 per cent above its pre-crisis level in 2016. What is even more evident from the Chart, however, is the important role that the USC (and its predecessor the Income Levy) has played in supporting income tax receipts in recent years. Given its broad based nature - it is applicable to a wider set of employees than traditional income tax and has fewer exemptions – the USC has proven to be a very stable revenue source. Last year it generated €4 billion of revenue, accounting for almost 21 per cent of total income taxes and more than 8 per cent of total tax receipts.

Box D Chart 3: Components of income tax



Source: Revenue Commissioners.

An assessment of government revenues over the past decade highlights both the magnitude of the contraction that took place following the housing market adjustment and the recovery that has subsequently occurred. Revenues declined by almost one-quarter between 2007 and 2010, but are now back above their pre-crisis peak. The composition of total revenue has not changed significantly over this period, with the proportions from tax, social contributions and 'other' revenue broadly unchanged from their 2007 levels. The underlying tax components have changed, however, with income tax contributing a much larger share.

Government Finance Statistics

First quarter Government Finance Statistics show a decline in the general government deficit ratio at the start of the year. The deficit ratio improved to 2.0 per cent of GDP from 2.8 per cent one year earlier, supported by a solid increase in tax revenues and investment income, and lower current transfers and interest payments. The general government gross debt ratio declined from 74.3 per cent of GDP in the first quarter of 2016 to stand at 72.8 per cent of GDP in the first three months of this year. However, this decrease was entirely driven by developments in GDP, with the level of gross general government debt increasing by €7.6 billion in nominal terms in the first quarter of 2017 compared to the same period last year. General government net debt, which includes certain financial assets of government, also increased in nominal terms in the first quarter of this year. Once again, the general government net debt ratio declined over this period, but reflected the effect of the increase in GDP.

Table 6: Analytical Exchequer Statement January - September 2017

	Jan-Sep 2017 €m	Jan-Sep 2016 €m	Annual Change (%)	Outturn vs Profile (%)
Revenue	**45,245**	**43,535**	**3.9**	**-171**
– Tax revenue	35,217	33,408	5.4	-212
– Appropriations-in-aid	8,567	8,359	2.5	-4
– Other Revenue	1,460	1,768	-17.4	4.5
Expenditure	**47,539**	**45,938**	**3.5**	**-677**
– Current Primary Expenditure	40,955	39,200	4.5	-371
– Capital Expenditure	2,517	2,122	18.6	-155
– Interest on National Debt	4,067	4,616	-11.9	-151
Balance	**-2,294**	**-2,403**	**4.5**	**506**

Source: Department of Finance

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

Exchequer Returns

Exchequer data is currently available for the first three quarters of the year. Tax revenues continued to grow at a steady pace up to end-September. This improvement was not enough to outpace total expenditure, which also increased, with the overall deficit marginally better than in the same period last year (see Table 6). Meanwhile the Exchequer Balance was positive and significantly ahead of profile so far this year, driven by once-off AIB share sale receipts.

Exchequer tax revenue grew by 5.4 per cent on an annual basis in the year to September, with strong gains across the majority of tax categories. Income taxes were up 5 per cent year-on-year, as the labour market continues to recover. Of the other 'big four' tax heads - VAT, corporation tax and excise duties - the former two were up significantly by 8.1 per cent and 12.3 per cent, respectively, relative to the same period in 2016. Meanwhile excise duties declined 3.9 per cent in the year to September. Corporation tax alone performed ahead of expectations in the first nine months of the year, with the outturn €169 million above profile. This over-performance was more than offset by the below profile returns for income tax, excise duties and VAT up to end-September. Total tax revenues were €212 million below profile in cumulative terms in the first nine months of the year, and were marginally below target on a monthly basis in September. Non-tax revenues were lower in year-on-year terms, although this was mostly anticipated, and primarily reflects lower Central Bank surplus income compared to 2016.

On the expenditure side, developments in current primary spending largely drove the overall rise in total spending, with capital spending also contributing to the year-on-year increase. There were broad based increases in current spending across almost all departments, most notably in Health, Education and Housing. Despite these increases, current spending still came in below profile in the year to September. Larger EU Budget contributions in the first nine months of the year also contributed to higher spending. Capital expenditure increased significantly in annual terms, primarily reflecting developments in Housing and Transport. Meanwhile, interest spending declined by a sizeable 11.9 per cent year-on-year. Overall, total spending was €677 million below profile in the year to end-September.

Funding and Other Developments

The National Treasury Management Agency (NTMA) raised a further €1.75 billion through bond sales in the third quarter of this year, with auctions continuing to be oversubscribed. This brought the total raised to date in 2017 to €10.5 billion, and as a result the NTMA is comfortably on target to achieve its range of €9-13 billion for the year as a whole. This funding is more than adequate to cover bonds set to mature in 2017 and the forecast Exchequer deficit, resulting in an increase in the NTMA's cash balances. The NTMA cancelled a total of €3 billion in outstanding bonds linked to the liquidation of IBRC during the first three quarters of this year. As a result, €8.5 billion of these long dated bonds have now been cancelled, with €16.5 billion still outstanding. In September, Moody's further upgraded Ireland's sovereign credit rating to A2 citing "continued strong economic growth and improved public finances, with the budget deficit approaching balance and public debt on a downward trend". Ireland holds an A rating from all major credit rating agencies, with a stable or positive outlook.

An Timpeallacht Gheilleagrach

Leanann geilleagar na hÉireann de bheith ag fás ar luas maith agus tá neart na gníomhaíochta ar an taobh intíre den gheilleagar ag tacú leis an bhfás sin. Tá an téarnamh bunaithe i gcónaí ar fhás láidir, leathan ar fhostaíocht lánaimseartha, rud a chuireann leis an téarnamh ar ioncam agus a thacaíonn le caiteachas tomhaltóirí, fad atá fuinneamh ag teacht de réir a chéile faoi phríomhghnéithe áirithe den infheistíocht intíre. Ag féachaint romhainn, tá an t-ionchas dearfach, agus meastar go leanfaidh an geilleagar ar chonair fhabhrach fáis, cé go bhfuil roinnt rioscaí agus éiginnteachtaí ann i gcónaí.

Cé is moite de luaineacht áirithe i sonraí príomha na gcuntas náisiúnta, tugann raon táscairí caiteachais agus gníomhaíochta le tuiscint gur lean an fás ar luas measartha láidir sa chéad leath de 2017. Tríd is tríd, tá an leathnú á spreagadh i gcónaí ag buacacht na gníomhaíochta eacnamaíche intíre atá ag tairbhiú d'fhás marthanach ar fhostaíocht. Go deimhin, bhí na méaduithe ar fhostaíocht lánaimseartha an-láidir, sa mhéid gur sháraíodar an fás ar an bhfostaíocht fhoriomlán, de réir mar a tiontaíodh obair pháirtaimseartha ina postanna lánaimseartha. Thacaigh sé sin leis an téarnamh ar ioncam agus, dá réir sin, leis an méadú ar chaiteachas tomhaltóirí. Ó thaobh na hinfheistíochta de, cé go bhfuil luaineacht ag baint i gcónaí leis an tomhas príomha, tugann an fhianaise le tuiscint go bhfuil luathú ag teacht ar an téarnamh ar na gnéithe intíre, go háirithe ar fhoirgníocht, cé go bhfuil bonn an téarnaimh sin sách íseal.

Ag féachaint romhainn, tá cuma dhearfach ar chúrsaí tríd is tríd. Meastar go dtiocfaidh príomhspreagadh an fháis thar thréimhse na réamhaisnéise ó neart réamh-mheasta an éilimh intíre, rud a léirítear sa dlúthfhás ar chaiteachas tomhaltóirí agus ar bhunfheistíocht. Tuartar go mbeidh méaduithe leanúnacha ar fhostaíocht agus ar ioncam mar phríomhspreagadh an fháis, ach meastar go maolóidh an fás ar fhostaíocht anuas ó na rátaí reatha thar thréimhse na réamhaisnéise. Dá réir sin, tá na hionchais maidir le tomhaltas agus caiteachas infheistíochta fabhrach i gcónaí agus meastar go dtiocfaidh méadú 4.2 faoin gcéad ar an éileamh modhnaithe intíre i mbliana agus méadú 3.9 faoin gcéad air an bhliain seo chugainn. Don bhliain 2017, is ionann é seo agus athbhreithniú beag anuas ar an réamh-mheastachán san Fhaisnéis Ráithiúil dheireanach agus freagraíonn sé d'fhás níos laige i dtomhas na gcuntas náisiúnta ar thomhaltas sa chéad leath den bhliain.

Maidir leis an taobh seachtrach den gheilleagar, maolaíodh treocht dhearfach i mbunfheidhmíocht onnmhairiúcháin de thoradh laige shuntasach i ngníomhaíocht na monaraíochta ar conradh, fad a chuir imthosca gaolmhara srian leis an bhfás ar allmhairí. Dá thoradh seo, rinneadh athbhreithnithe anuas ar na réamh-mheastacháin don fhás ar onnmhairí agus ar allmhairí araon agus, i bhfianaise gur mó éifeacht an dara ceann ná an chéad cheann acu, rinneadh an réamhaisnéis fhoriomlán maidir le fás OTI a ardú beagán thar thréimhse na réamhaisnéise.

Cé gurb é an réamhaisnéis lárnach go leanfaidh gníomhaíocht eacnamaíoch de bheith ag fás ar luas measartha maith, tá rioscaí ar an taobh thíos ag baint leis na réamhaisnéisí seo. Tá éiginnteacht ann ó thaobh na timpeallachta seachtraí de, idir Brexit agus rioscaí níos leithne, ó tharla go bhfuil geilleagair bheaga, oscailte leochaileach do thurraingí idirnáisiúnta. Bíonn tionchar tábhachtach ag dálaí eacnamaíocha agus trádála domhanda agus ag cumraíocht na bpríomhrátaí malairte ar fheidhmíocht eacnamaíoch na hÉireann, i bhfianaise an róil cheannasaigh a bhíonn ag gnólachtaí domhanda inár n-earnáil intrádála.

Go dtí seo, bhí iarmhairt Brexit le brath go mórmhór trí éifeacht ráta malairte níos laige don phunt steirling. Cé go bhfuil earnálacha dúchasacha spleách i gcónaí ar mhargaí RA, ó thaobh aschuir de, tugann sonraí maidir le táirgeadh, maidir le horduithe agus maidir le honnmhairiú le tuiscint go raibh tionchar foriomlán maolaithe ag dálaí a bhain le Brexit go dtí seo. Ó thaobh éilimh de, luadh laige steirling mar chúis leis an lagú a chonacthas le déanaí ar dhíolacháin carranna nua. Ar a shon sin, is ar bhoilsciú don chuid is mó atá iarmhairt laige steirling le brath. I bhfianaise go dtagann cion sách ard d'allmhairí earraí ón Ríocht Aontaithe, cuireann traschur ó laige

steirling le brú anuas ar bhoilsciú praghsanna earraí, ar boilsciú é a bhíonn diúltach ar bhonn leanúnach agus a fhritháiríonn praghsanna níos airde ar sheirbhísí, sa chaoi go gcoinnítear boilsciú TCPT gar do nialas.

Cé go bhfuil boilsciú foriomlán praghsanna maolaithe i gcónaí agus go bhfuil fás pá measartha i gcónaí, leis an méadú láidir ar an éileamh intíre agus leis an téarnamh gasta atá ag teacht ar an margadh saothair, níor mhór ceist a chur faoi inbhuanaitheacht na staide seo. Tá ceist ann go háirithe i dtaobh an bhfuil scóip fágtha sa mhargadh saothair nó an bhfuil an geilleagar ag druidim i dtreo na lánacmhainneachta arís. Díríodh ar roinnt de na saincheisteanna sin i dtaighde a rinne an Banc le déanaí. Le tomhas nua ar sholáthar ionchasach saothair bhreise ó dhaoine nach n-aicmítear faoi láthair mar dhaoine dífhostaithe, tugtar le fios go bhfuil leibhéal úsáide saothair níos ísle ann faoi láthair ná mar a thugtar le fios ón ráta caighdeánach dífhostaíochta (féach Bosca C, leathanach 21). Cé go ndeimhnítear leis an méid sin freisin go bhfuil dálaí sa mhargadh saothair ag éirí níos géire, tugtar le tuiscint go bhfuil scóip ann go fóill le haghaidh laghdú breise ar dhífhostaíocht sula dtiocfaidh brúnna maidir le pá chun cinn. Tá fianaise thacaíochta bhreise maidir leis sin in alt dar teideal 'The labour market and wage growth after a crisis', atá foilsithe san Fhaisnéis Ráithiúil seo (leathanaigh 66-79). Is é tátal an ailt sin go bhfuil an fás maolaithe ar phánna le blianta beaga anuas inchurtha go páirteach do thosca sealadacha (lena n-áirítear boilsciú íseal agus athruithe ar chomhdhéanamh fostaíochta) agus don chaoi ina ndéantar an scóip a thomhas (dífhostaíocht in aghaidh neamhfhostaíochta). Chomh maith leis sin, áfach, fuarthas amach go mbíonn an leibhéal íogaireachta maidir le pánna níos airde le linn tréimhsí dífhostaíochta ísle nó le linn tréimhsí dífhostaíochta airde lasmuigh den raon 5-10 faoin gcéad. Á chur san áireamh go gcaithfear a bheith faichilleach le haon tátail a bhíonn bunaithe ar iompar roimhe seo, tugtar le tuiscint leis an ionchas gearrthéarmach don dífhostaíocht sna réamhaisnéisí is déanaí go mbeidh méadú measartha ar bhoilsciú pánna thar thréimhse na réamhaisnéise, ach ba cheart go gcoinneofaí srian ar bhrúnna foriomlána pá.

Financing Developments in the Irish Economy

Overview

Private sector debt as a proportion of GDP decreased by 17.4 percentage points between Q4 2016 and Q1 2017, and by 34.2 percentage points year-on-year, reaching 281.3 per cent, its lowest level since the beginning of the financial crisis. The quarter-on-quarter fall in private sector debt reflected reductions in the stock of debt owed by both households and non-financial corporations (NFCs), as well as an increase in annualised GDP. Household debt fell by €1.1 billion in Q1 2017. NFC debt decreased by €34 billion during Q1 2017. Developments in Irish private sector debt are significantly influenced by activities of large multinational corporations (MNCs), and the restructuring of these entities has resulted in considerable movements in Irish private sector debt, particularly from 2014 onwards.

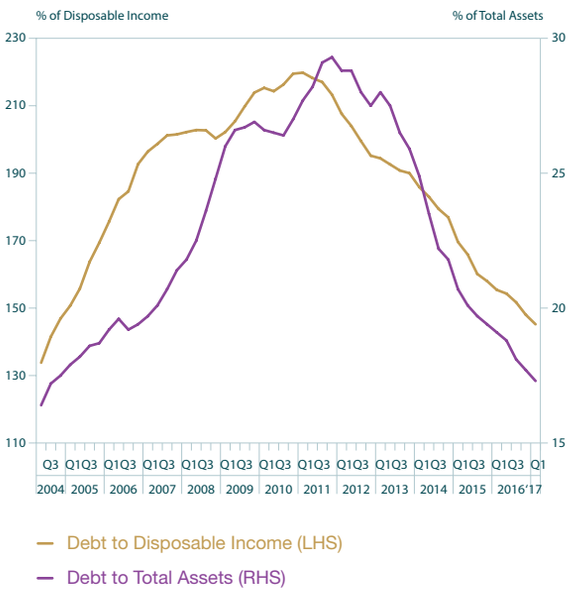
There were positive developments in lending in Q2 2017, with net mortgage lending for principal dwelling house (PDH) mortgages increasing by €182 million. Gross new lending to non-financial, non-property related SMEs totalled €966 million in Q2 2017, an increase of €108 million compared to the same quarter in 2016.

Household sector financing costs decreased for new PDH mortgages year-on-year in Q2 2017. Variable and fixed rates for new PDH mortgages fell. Interest rates on new non-financial, non-property SME loans saw a reduction in Q2 2017, although they are still higher than rates on outstanding loans. SMEs also saw significant differences in interest rates charged to property-related lending. Lower rates were agreed on new SME lending for real estate acquisitions while higher rates were charged for construction-related new loans.

In terms of government financing, the cost of insuring Irish sovereign debt against default has declined by 50 per cent in the past year from 79 to 37 basis points. Financing developments in the banking sector were favourable as captured by a lower year-on-year cost of stable funding. Interest rates on new household term deposits remained low in July 2017, at 0.08 per cent. Deposits from all Irish private-sector enterprises held at banks increased by €2.9 billion over the year, with the outstanding deposit book standing at €89.1 billion by Q2 2017, reflecting an annual growth rate of 3.4 per cent.

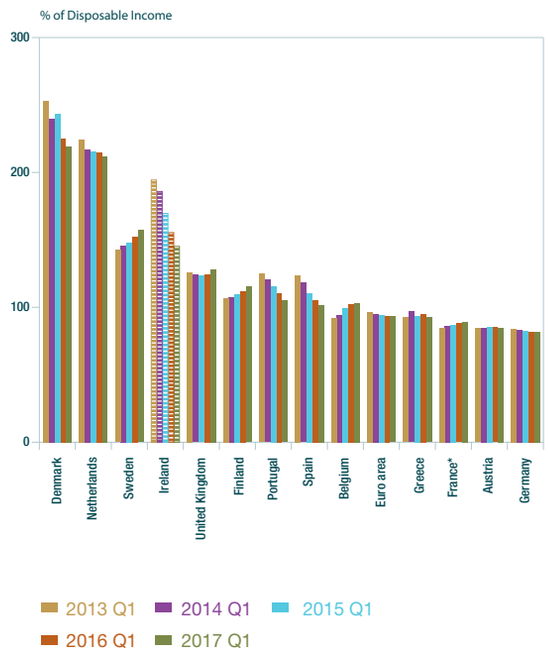
The growth of the non-bank financial industry continued with the number of financial vehicles registered in Ireland reaching the highest level on record by Q2 2017. The net asset value (NAV) of investment funds (IFs) resident in Ireland increased by 2.6 per cent (€44.3 billion) over Q2 2017, reaching €1,765.8 billion, while the NAV of Irish money market funds (MMFs) fell to €472.4 billion in Q2 2017, from €482.6 billion in Q1 2017.

Chart 1: Household Debt Sustainability Indicators



Sources: Quarterly Financial Accounts, Central Bank of Ireland; Quarterly National Accounts, CSO.

Chart 2: Evolution in the Ratio of Debt to Disposable Income by Country



Sources: Quarterly Financial Accounts, Central Bank of Ireland; Quarterly National Accounts, CSO; Statistical Data Warehouse, ECB.

Note: * Latest data Q4 2016.

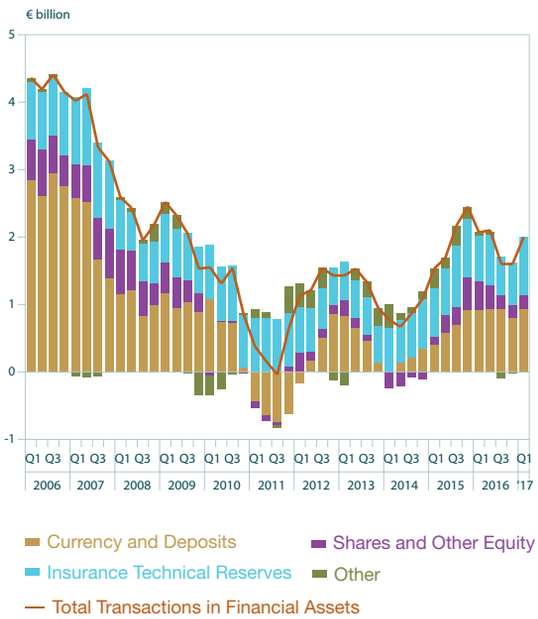
Household Sector

The Irish household sector saw the largest deleveraging amongst European Union (EU) countries over the year, with the ratio of debt to disposable income decreasing by 10.2 percentage points between Q1 2016 and Q1 2017 (Charts 1 and 2). Despite this, Irish households remain the fourth most leveraged in the EU. From a longer-term perspective, Irish household debt to disposable income fell by 49.2 percentage points between Q1 2013 and Q1 2017, compared to the average 3.3 percentage point reduction seen for the euro area during the same period. Comparing with individual EU countries, the household debt to disposable income ratio in Ireland has moved down from third to fourth highest in the EU.

Irish household sector net worth stood at €670.3 billion in Q1 2017 (or the equivalent of €142,914 per capita), representing a €12.1 billion increase from the previous quarter. This reflected increases in housing assets (€6 billion), financial assets (€5.5 billion) and, to a lesser extent, decreasing liabilities (€0.5 billion) over the quarter. Household sector debt fell to €142.7 billion (€30,421 per capita) between Q4 2016 and Q1 2017, representing a decline of 0.8 per cent over the quarter. From a longer-term perspective, household sector debt has decreased by 30 per cent from its peak of €203.7 billion in Q3 2008.

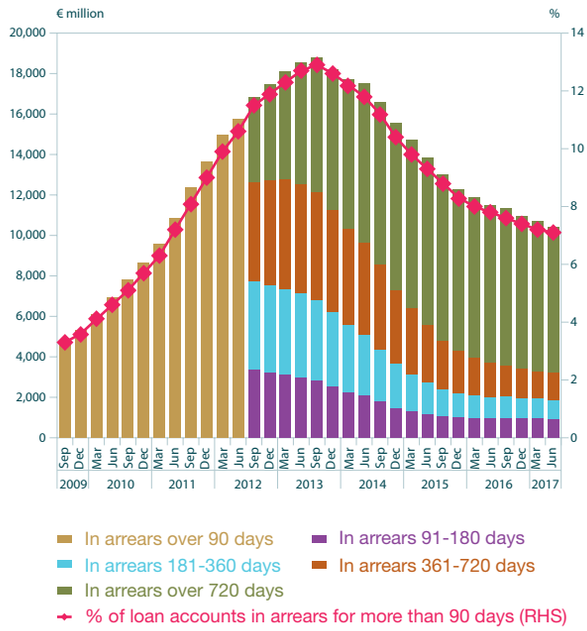
On the asset side, total household transactions in financial assets reached €2 billion in Q1 2017, representing an increase of €0.4 billion compared to the previous quarter. Household investments in deposits rebounded by €174 million between Q4 2016 and Q1 2017. Households continued to lodge the majority of their deposits with monetary financial institutions (€725 million — four-quarter moving average); deposits transactions with general government totalled €128 million (Chart 3).

Chart 3: Household Transactions in Financial Assets - Four Quarter Moving Average



Sources: Quarterly Financial Accounts, Central Bank of Ireland; Quarterly National Accounts, CSO.

Chart 4: PDH Mortgage Accounts in Arrears over 90 Days



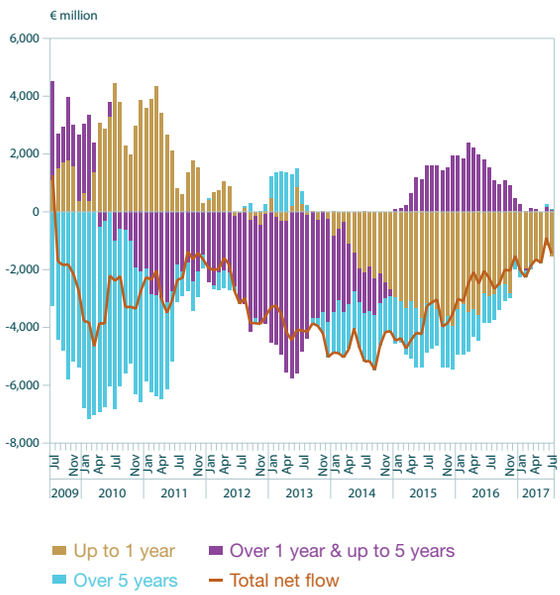
Source: Residential Mortgage Arrears and Repossessions Statistics, Central Bank of Ireland.

On the liability side, loans to households (adjusted for loans sales and securitisations) declined by 1.8 per cent in annual terms in July 2017, the lowest rate of decline since December 2009. Mortgage loans, which account for 83 per cent of total on-balance sheet loans of Irish resident banks, decreased in net terms by €38 million in July 2017 after a net increase of €166 million in the previous month. In year-on-year terms, net mortgage lending declined by €377 million, or 0.5 per cent, representing the lowest rate of decline since August 2010. Non-housing loans increased by 3.2 per cent in annual terms to July 2017, marking nine consecutive months of annual growth. The volume of new mortgage agreements (excluding renegotiations) amounted to €631 million in July 2017, bringing new agreements to €5.8 billion over the past year. This compares with new mortgage agreements of €4.5 billion over the year to July 2016.

Principal dwelling house (PDH) mortgages recorded net new lending of €182 million in Q2 2017, representing the fifth consecutive quarter of growth. PDH fixed-rate loans recorded a net increase of €794 million over the quarter, in contrast to floating rate loans, which recorded a fall of €612 million. This continues to reflect an increasing number of borrowers entering into fixed-rate contracts in the current lower interest rate environment.

The number of PDH mortgage accounts in arrears fell further in Q2 2017, representing the sixteenth consecutive quarter of decline. A total of 73,706 accounts (10 per cent) were in arrears as of Q2 2017, a decline of 3.6 per cent relative to Q1 2017. Some 51,750 accounts (7 per cent) were in arrears of more than 90 days at the end of Q2 2017 (Chart 4). All maturity categories of arrears, including those over 720 days, declined in Q2 2017. This category recorded an eighth consecutive decline, having declined for the first time in Q3

Chart 5: Loans to NFCs: Net Flows (12-month sum) by Original Maturity Category



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

2015. The decline of 2.4 per cent in Q2 2017 contributed to an annual decrease of 8 per cent.

The weighted average interest rate on new variable rate mortgage agreements (excluding renegotiations) stood at 3.38 per cent in July 2017. The rate on all new agreements, fixed and variable, stood at 3.32 per cent. Standard variable rates for new PDH mortgages fell by 23 basis points to 3.34 per cent in Q2 2017, since the same period in 2016. Fixed-rate PDH mortgage rates also recorded a decline, with rates fixed for 1-3 years falling by 30 basis points over the same period.

Non-Financial Corporation Sector

Net lending to NFCs declined by €1.4 billion, or 3.3 per cent, in annual terms to end-July. There was a €624 million decrease in net NFC lending in July, following an increase of €423 million in June. Long-term lending grew on an annual basis for the second consecutive month, rising by 0.3 per cent in the year to end-July. Medium-term lending also increased on an annual basis for the second consecutive month, growing by 0.4 per cent. In contrast, short-term lending decreased by 13.3 per cent annually (Chart 5).

NFC debt as a percentage of GDP fell during Q1 2017, decreasing from 246.6 per cent to 230.4 per cent. This was due to a decrease in NFC debt by 5 per cent and an increase in annualised GDP by 1.7 per cent. NFC debt to GDP has fallen by 100 percentage points since its peak of 330 per cent in Q1 2015. This decline largely reflected the substantial increases in GDP during 2015.

NFC debt decreased by €34 billion between Q4 2016 and Q1 2017. This largely reflected a reduction in the value of loans owed by Irish resident NFCs to foreign counterparts (€25.7 billion). NFCs also reduced debt with Irish resident sectors by €11.6 billion. Most of this reduction was with other financial intermediaries. Despite these developments, Irish NFC debt remains high when viewed in an international context. The debt to GDP ratio of Irish NFCs was 126.2 percentage points above the euro area average of 104.2 per cent in Q1 2017. This ranks Ireland as the second most indebted amongst EU countries. However, the Irish data is distorted by the important role of MNCs. Luxembourg and Cyprus, both of which also have very large MNCs relative to the size of their economies, were the most indebted and third most indebted, with NFC debt to GDP ratios of 345.3 per cent and 225.5 per cent, respectively.

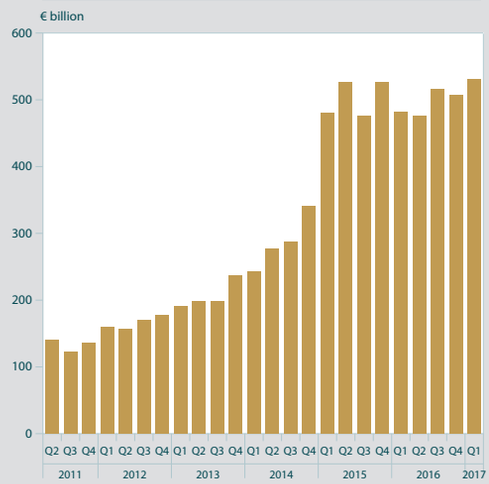
Regarding developments in multinational NFCs, investment by foreign-owned MNCs in their Irish operations (FDI inflows) increased from €8.6 billion in Q1 2017 to €26 billion in Q2 2017. This reflected an increase across all components of direct investment transactions (i.e. equity, reinvested earnings and other capital). Investment by Irish-owned MNCs abroad (FDI outflows) increased by €18 billion during the quarter, to stand at €22.6 billion in Q2 2017. Despite this increase, direct investment income earned abroad by this sector remained stable at €4.4 billion in the quarter. Box A assesses the

Box A: Revisiting the Impact of Redomiciling Entities on the Market Capitalisation of Irish Non-Financial Corporations

by Conor Kelly, Dermot Coates and Breda McLoughlin[1]

Securities Issues Statistics (SIS) is a statistical dataset published by the Central Bank of Ireland, which covers the issuance of debt securities and quoted (or listed) shares by euro area residents.[2] They are used to monitor direct borrowing and lending, the depth of capital markets, and the role of the euro in international financial markets. In the case of Ireland, the SIS series has seen a pronounced upward trend over recent years in the market capitalisation – or the value of the quoted shares – of Irish resident non-financial corporations (NFCs). In part, this has reflected new share issuance (also referred to as transactions in SIS) and share price movements, but undoubtedly a key factor has been the incidence of redomiciled NFCs. The latter phenomenon has become increasingly common over recent years with a succession of NFCs, primarily in the pharma and medical devices sector, relocating their headquarters from countries such as the United States to Ireland, by means of incorporating a new entity in this country (sometimes referred to as a tax inversion).

Box A Chart 1: Market Capitalisation of Irish Resident NFCs, 2011 – 2017



Source: Securities Issues Statistics, Central Bank of Ireland.

A previous examination found that the cumulative market capitalisation of all Irish resident NFCs increased by €100 billion – to more than €240 billion – over the five-year period to Q1 2014[3]. A small number of redomiciled NFCs accounted for €115 billion (or approximately 46 per cent) of the total by 2014. The objective of this Box is to revisit the prior analysis and shed further light on the impact on SIS statistics of the relocation (or redomiciling) of NFC headquarters to Ireland since 2011. Given that a substantial portion of the quoted shares of these redomiciled NFCs are listed on a US stock exchange and denominated in US dollars (USD), the impact of the foreign exchange developments upon Ireland's SIS series is also addressed below.

1 Statistics Division, Central Bank of Ireland.

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

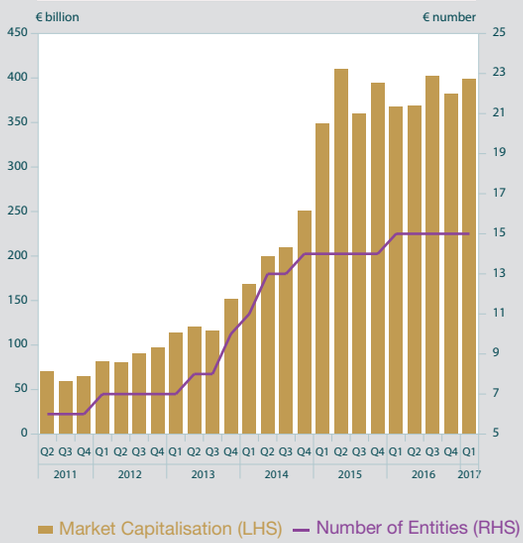
3 Coates, D. and McHugh, A. (2014), 'The Impact of Redomiciled NFCs on Irish Securities Issues Statistics', Central Bank of Ireland, Quarterly Bulletin (Q3), pp. 43-45.

Box A: Revisiting the Impact of Redomiciling Entities on the Market Capitalisation of Irish Non-Financial Corporations

by Conor Kelly, Dermot Coates and Breda McLoughlin[1]

Under the applicable guidelines, the ECB and national central banks (NCBs) publish monthly SIS data on the outstanding amounts (stocks) and transactions (gross issuance, redemptions and net issuance). In the case of transactions, these only relate to developments involving a cash payment (i.e. a 'true flow')[4]. Further changes in end-period stocks, which are not attributable to transactions, are recorded as '*reclassifications and other changes*'. These include price and exchange rate valuation changes, in addition to factors such as redomiciling activity. The published data indicates that the cumulative market capitalisation (stock) of all NFCs stood at some €140 billion in early 2011, effectively unchanged since 2009. During the period 2011 to 2015, however, it increased substantially, by over 243 per cent, to stand at €480 billion. Over the following two years, this upward trend continued, albeit at a more modest pace, and the equivalent figure stood at €530 billion in Q1 2017 (Box A Chart 1). In part, this reflected a marked increase in the underlying number of redomiciled NFCs which increased to 15 in 2016 from six in 2011.

Box A Chart 2: Market Capitalisation and Count of Redomiciled Entities only, 2011 – 2017



Source: Securities Issues Statistics, Central Bank of Ireland.

A related factor is that the scale of the redomiciling activity has grown with firms merging with entities that were formed on foot of earlier mergers. One example of this phenomenon is the relocation of Medtronic to Ireland following its acquisition of Covidien in January 2015, where the latter had itself relocated to Ireland a number of years earlier[5]. In this case, Medtronic was simply substituted for Covidien in our underlying SIS dataset, resulting in a static number of redomiciled entities, albeit that the market capitalisation figure increased by over €60 billion when compared to the previous quarter. This illustrates some of the complexity of tracking these entities over time.

4 Where securities are created (or redeemed) against cash. The Handbook of Securities Statistics (HSS) (BIS-ECB-IMF), however, prescribes a different approach whereby all transactions in securities are covered.

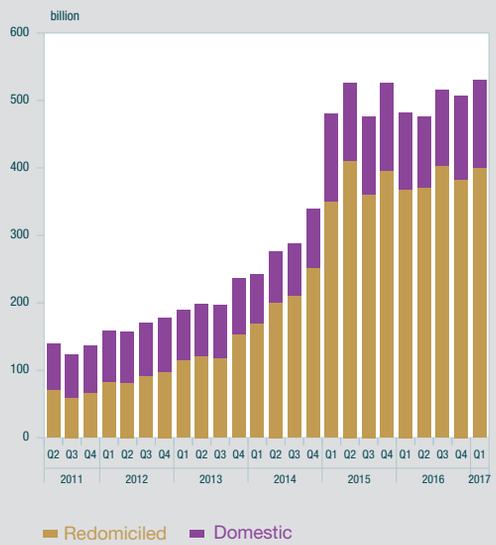
5 http://newsroom.medtronic.com/phoenix.zhtml?c=251324&p=irol-newsArticle&ID=2010595.

Box A: Revisiting the Impact of Redomiciling Entities on the Market Capitalisation of Irish Non-Financial Corporations

by Conor Kelly, Dermot Coates and Breda McLoughlin[1]

Over the review period, the volume of shares issued has remained broadly unchanged. Initial Public Offerings (IPOs) have been on a very small scale. By contrast, redomiciling activity has had a significant impact. For instance, redomiciled NFCs accounted for 50 per cent (or €70 billion) of the total in early 2011. This underlying composition changed quite significantly over the subsequent years (Box A Chart 3). In Q1 2017, redomiciled entities accounted for over 75 per cent of the total market capitalisation, with 47 per cent of the total market capitalisation of Irish NFCs accounted for by the three largest redomiciled NFCs. In 2011, the average market capitalisation of all NFCs was €965 million; the average for domestic entities was then €513 million compared to €7.8 billion for their redomiciled peers. By Q1 2017, the average for domestic entities was €1.9 billion compared to €25 billion for those that had redomiciled.

Box A Chart 3: Composition of Cumulative Market Capitalisation of all Irish Resident NFCs, 2011 – 2017



Source: Securities Issues Statistics, Central Bank of Ireland.

Note: Cumulative refers to the aggregate market capitalisation of all Irish resident NFCs.

Finally, the redomiciled entities are largely denominated in USD and listed on a US stock exchange. Given the magnitude of these firms, this provides large-scale exposure to foreign exchange movements. For instance, the market capitalisation of those firms with quoted shares denominated in euro accounted for approximately 50 per cent of the total in early 2011. By 2017, however, this had fallen to less than 23 per cent, as USD-denominated shares had become predominant (Box A Chart 4). As the SIS series are reported in euro-equivalent terms, exchange rate movements can further distort the scale of transactions and complicate analysis of the data. When we look at the developments in the euro/dollar exchange rate over the period of our data, we see wide variance[6]. To put this in context, when we take the single largest redomiciled entity in the dataset and apply both the high and the low valuation of the dollar to its position in Q1 2017, this would provide us with valuations that are €30 billion apart: from €75 billion to €105 billion. This means that the variance of the euro/dollar exchange rate during this period, when applied to a single entity in Q1 2017, would provide a difference of over 5 per cent of total market capitalisation.

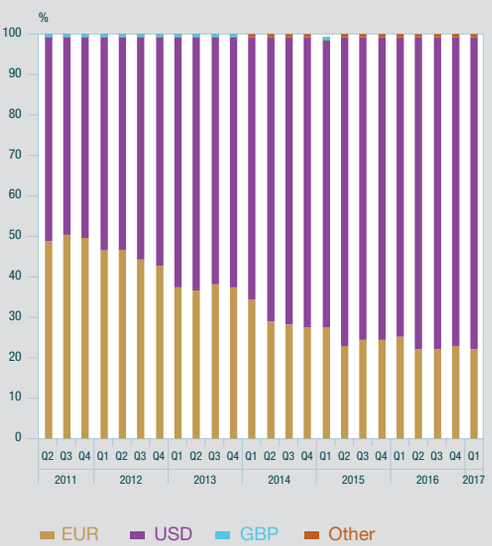
6 The exchange rate has had a high of 1.48 in May 2011, and a low of 1.05 in April 2015.

Box A: Revisiting the Impact of Redomiciling Entities on the Market Capitalisation of Irish Non-Financial Corporations

by Conor Kelly, Dermot Coates and Breda McLoughlin[1]

Applying the same analysis to all USD-denominated entities in Q1 2017, would mean a variance of over €121 billion – a difference of almost 23 per cent of total market capitalisation. This clearly illustrates how redomiciled entities, and changes in the euro/dollar exchange rate, can greatly influence the market capitalisation of NFCs in the SIS series. Whilst an analysis of volume and value movements would traditionally have provided insight into this sector, this research highlights that other movements, such as reclassifications and foreign exchange movements, are key to understanding movements in the debt and equity markets of Irish resident NFCs.

Box A Chart 4: Currency Composition of Cumulative Market Capitalisation of Irish Resident NFCs, 2011 – 2017

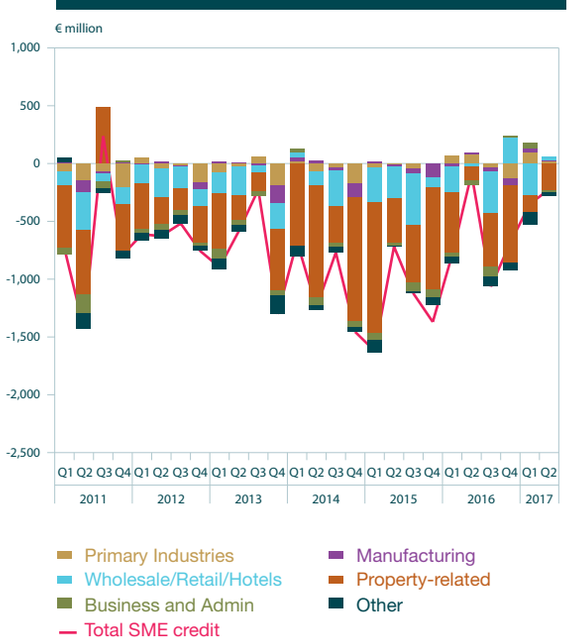


Source: Securities Issues Statistics, Central Bank of Ireland.

impact of redomiciling entities on the market capitalisation of Irish NFCs.

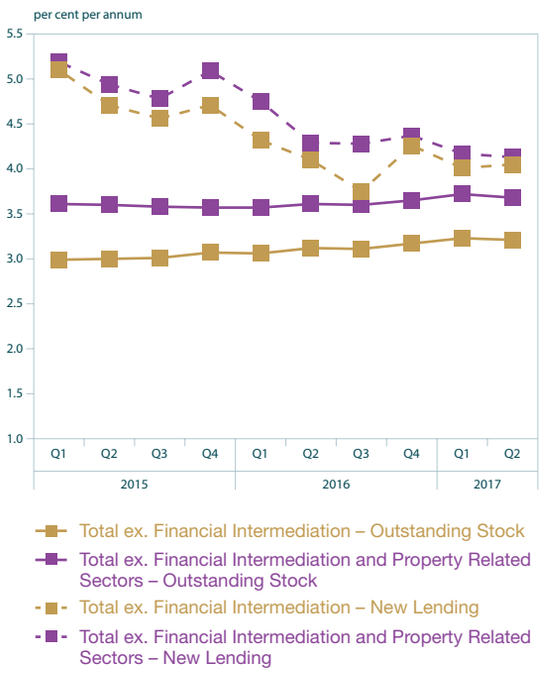
Gross new lending to Irish SMEs amounted to €1.2 billion in Q2 2017. Repayments continued to exceed new loan drawdowns resulting in outstanding credit declining by 7.5 per cent over the year. Gross new lending to non-financial, non-property related SMEs totalled €966 million in Q2 2017, an increase of €108 million in comparison to the same quarter in 2016. Annually, these new drawdowns totalled €3.6 billion, representing a 28.6 per cent year-on-year increase. Drawdowns for wholesale/retail trade and repairs, and agricultural purposes dominated in Q2 2017, despite attracting higher than average interest rates. Six economic sectors registered increases in net SME lending (drawdowns exceeding repayments) during Q2 2017, although this was offset by continuing new repayments on property-related lending (Chart 6). Property-related lending constituted 41 per cent of outstanding credit to SMEs and 19 per cent of new drawdowns in Q2 2017. In Q1 2017, property-related lending constituted 24

Chart 6: Net Lending/Repayment Position of Non-Financial SMEs



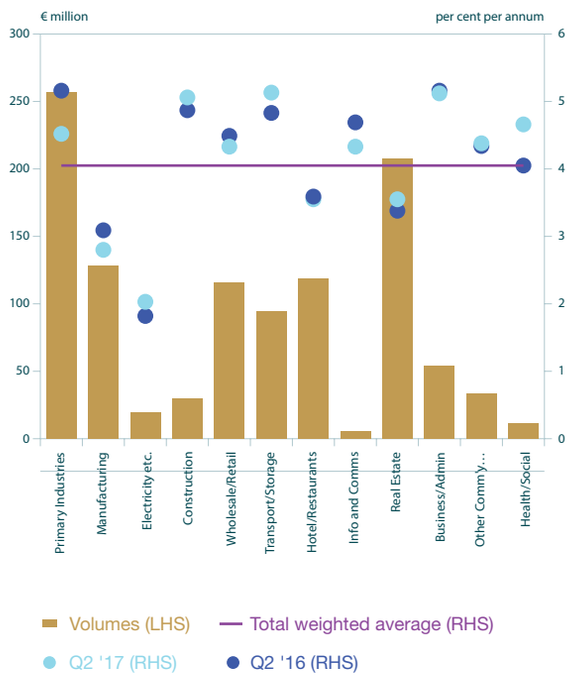
Source: Business Credit and Deposits Statistics, Central Bank of Ireland.

Chart 7: Interest Rates on New and Outstanding SME Loans



Source: Business Credit and Deposits Statistics, Central Bank of Ireland.

Chart 8: SME New Lending Interest Rates and Corresponding New Lending Drawdowns (Q2 2017)



Source: Business Credit and Deposits Statistics, Central Bank of Ireland.

per cent of new SME lending. Overall, SME credit declined €231 million in the second quarter.

In terms of prices, there remain significant differences in interest rates charged to property-related lending, with lower rates agreed on new SME lending for real estate, and higher rates for construction lending. The weighted average interest rate on new non-financial SME loan drawdowns was 4.05 per cent in Q2 2017, representing a decrease of 5 basis points over the year (Chart 7). Rates on new lending are higher than the rates applied to the existing stock of non-financial SME loans, which was 3.20 per cent as of Q2 2017. New lending rates declined in six economic sectors over the past year (Chart 8). Of note were declines in interest rates charged to SMEs engaged in primary industries (64 basis points) and manufacturing (29 basis points). Construction SMEs experienced a weighted average increase of 19 basis points over the same period, and continued to attract one of the highest interest rates on new drawdowns.

Government Sector

Government debt rose by €5.1 billion to €235.4 billion in Q1 2017, 2.2 per cent up on the last quarter of 2016. This increase was driven by a net issuance of debt securities of €6.9 billion, while redemptions amounted to €2.2 billion. Quarterly government debt, which is based on the Excessive Deficit Procedure (EDP) measure of debt, increased by €7.6 billion in Q1 2017. Government net financial wealth decreased slightly from -€157.8 billion in Q4 2016 to -€158 billion in Q1 2017, as the increase in government debt was largely offset by an increase of €4.7 billion in the stock of financial assets held by government. The rise in government asset holdings was mainly accounted for by increased government holdings of deposits.

The cost of insuring Irish sovereign debt against default has declined from 79 to 37 basis points, pointing to more favourable financing conditions for the Government. Such developments tally with the narrowing

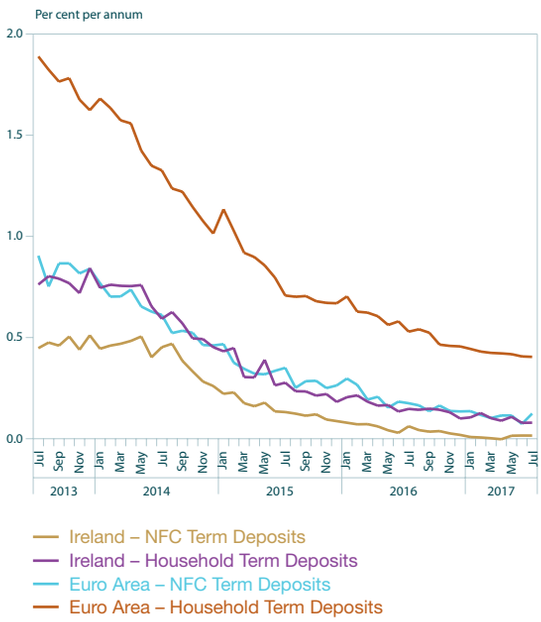
spread of Ireland's 10-year government bond yields over the German equivalent, which has continued to fall from an average of 69 basis points in Q1 2017 and 54 basis points in Q2 2017, to stand at 39 basis points on average during Q3 2017 to date. The proposal by the NTMA in early-September 2017 to seek early repayment of IMF loans and facilities with other counterparties such as Sweden and Denmark, could potentially further improve financing costs.

Financial Sector

Deposits from Irish private-sector enterprises held at banks increased by €2.9 billion over the year, with the outstanding deposit book standing at €89.1 billion by Q2 2017. This amounts to an annual growth rate of 3.4 per cent. Excluding financial intermediation, deposits from private-sector enterprises increased by 7.8 per cent year-on-year, to stand at €53.2 billion. Some 21 per cent of the annual growth can be attributed to business and administrative services. On a quarterly basis, deposits from all non-financial sectors increased by 3.5 per cent, or €1.8 billion.

In annual terms, household deposit lodgements were €3.1 billion higher than withdrawals, growing by 3.2 per cent. Household deposits stood at €99.5 billion at the end of July 2017. This represents an increase in net terms of €27 million in July 2017 following a rise of over €1 billion in June. Developments in loans and deposits mean that Irish households continued to be net funders of the Irish banking system. Banks held €8 billion more household deposits than loans by July 2017. In contrast, household loans exceeded deposits by €72.6 billion in May 2008. Interest rates on new household term deposits remained low in July 2017, at 0.08 per cent. This represented a 7 basis points decline over the last twelve months. Equivalent euro area rates had a somewhat larger decline of 13 basis points over the same period, and remain significantly higher at 0.40 per cent (Chart 9).

Chart 9: New Business Interest Rates on Household and NFC Term Deposits



Source: Retail Interest Rates, Central Bank of Ireland; Statistical Data Warehouse, ECB.

NFC deposits increased by €732 million in net terms in July 2017, following a decrease of €87 million in June. The increase was predominantly driven by a rise of €644 million in overnight deposits. Total NFC deposits grew by 7.6 per cent annually to end-July, continuing the trend in corporate deposits observed since 2012. The interest rate on new business NFC term deposits fell by 5 basis points over the last twelve months to stand at 0.02 per cent in July. The corresponding rate for the euro area fell by 5 basis points over the same period, recording a rate of 0.12 per cent.

Irish banks' borrowings from the Central Bank as part of Eurosystem monetary policy operations were unchanged in July 2017. The outstanding stock of Central Bank borrowings was €7.8 billion, with the domestic market banks accounting for 95 per cent of this.

The growth of the non-bank financial industry continued with the number of financial vehicles

Chart 10: Percentage Growth in Total Assets by Fund Type since Q1 2017 - with breakdown of revaluations and net purchases

Source: Investment Funds Statistics, Central Bank of Ireland.

registered in Ireland reaching the highest level on record in Q2 2017. The number of reporting financial vehicle corporations (FVCs), or securitisation vehicles, reached 906 in Q2 2017, representing an addition of 26 vehicles in the quarter. The number of other Special Purpose Entities (SPEs), non-securitisation vehicles, grew at a faster pace, reaching 1,033 vehicles in Q2 2017, representing an addition of 37 vehicles in the quarter. The total asset value of Irish resident securitisation vehicles, or FVCs, declined by 5 per cent to €391.3 billion in Q2 2017, largely due to euro appreciation. The total assets of non-securitisation vehicles, or other SPEs, declined by 3 per cent to €345.2 billion in Q2 2017. Mortgage-backed securitisation (MBS) and resolution vehicles continued to decline in line with longer-term trends in Q2 2017. Cash Collateralised Debt Obligations (CDO) was the only securitisation type to record an increase in total assets. Within other SPEs, all activity types recorded decreases in total assets, except for loan origination and operational leasing.

The net asset value (NAV) of Irish money market funds (MMFs) fell to €472.4 billion in Q2 2017, from €482.6 billion in Q1 2017. The decrease was driven by negative revaluations of €19.1 billion largely due to euro appreciation. Total debt securities held by MMFs in Q2 2017 amounted to €350 billion, down from €383 billion in the previous quarter. Of this €33 billion decrease, €22 billion relates to holdings of US debt securities. Across sectors, central government and bank debt saw the largest quarter-on-quarter reductions in their holdings: €11.2 billion and €13.9 billion, respectively. Central government debt security holdings have decreased by 35 per cent since end-December 2016.

The NAV of investment funds (IFs) resident in Ireland increased by 2.6 per cent (€44.3 billion) over Q2 2017, reaching €1,765.8 billion. Total assets held by Irish IFs increased by €43.1 billion from Q1 2017, amounting to €2,138.8 billion at end-June. Total assets experienced a negative revaluation for the first time since Q2 2016, amounting to €39.7 billion. Much of this is accounted for by dollar depreciation of 6.6 per cent relative to euro over the quarter, as €905.4 billion of total assets, or 42 per cent, are denominated in dollars.

Growth over Q2 2017 in total assets was generally low and positive across fund types, with the exception of real estate and other funds (Chart 10). Real estate funds saw 11.3 per cent growth in total assets, due to €2.4 billion in net purchases of property. Their negative revaluation is also attributable to movements of the euro against the foreign currency composition of their assets over the quarter. The other funds category saw negative revaluations that slightly exceeded net purchases of assets, leading to a 0.6 per cent reduction in their total assets. All fund types saw net purchases of assets, but only mixed funds experienced a positive revaluation. Hedge and other funds saw the largest

negative revaluations in percentage terms (8.5 and 5 per cent, respectively).

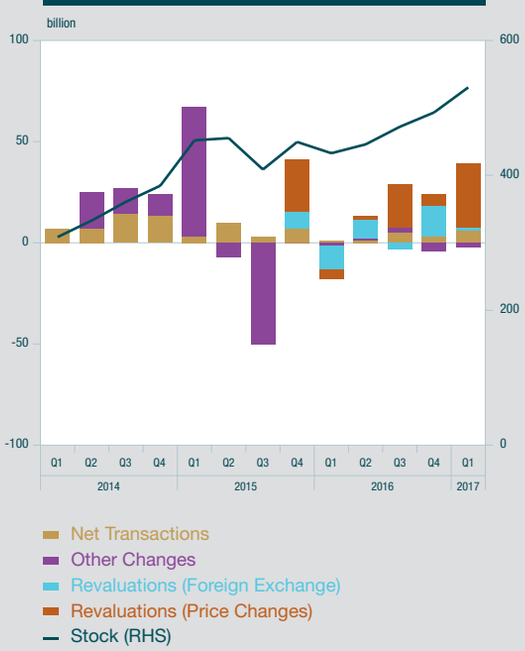
Total equity holdings of all funds amounted to €926.5 billion in Q2 2017, increasing by €19.4 billion from Q1 2017. Equities experienced negative revaluations of €14.4 billion: this was concentrated in bank (€2.2 billion), investment fund (€4.6 billion) and corporate equity (€9.7 billion). The negative revaluations were mostly concentrated in US equities (€8 billion), which is partially explained by the weakening of the dollar against the euro. Box B analyses portfolio holdings of Irish resident IFs with a focus on exposures to the NFC sector.

Box B: Portfolio Holdings of Irish Resident Investment Funds: an in-depth analysis of exposures to the global non-financial corporations sector

by Dermot Coates and Siobhán O'Connell[7]

The Central Bank of Ireland's recently launched series on Securities Holdings Statistics (SHS) serves to illustrate the asset-holding exposures of the various economic sectors in Ireland to a variety of issuing countries and sectors. A key theme from this dataset is the scale of the aggregate portfolio held by Irish resident investment funds (IFs). This sector currently accounts for 73 per cent of all securities held by Irish residents.[8] The market value of these IF holdings stood at €1,721 billion by Q1 2017, an increase of some 50 per cent over a three-year period. Holdings by asset class, however, have tended to be heavily concentrated around a limited array of issuers.[9] For instance, IFs held debt securities valued at almost €800 billion by Q1 2017 with more than 50 per cent of these issued by governments. Similarly, quoted shares (or equity) accounted for €670 billion of total holdings and 80 per cent of this was issued by non-financial corporations (NFCs).

Box B Chart 1: Irish Resident IFs – Change in Holdings of NFC Equities, 2014 – 2017



Source: Securities Holdings Statistics, Central Bank of Ireland.

This, however, is not the full picture as the NFC sector encompasses a wide array of firms engaged in the production of goods and non-financial services across many industries globally. The objective of this Box is to shed light on the exposure of Irish resident IFs to a diverse range of industries and countries through these underlying equity holdings.

7 Statistics Division, Central Bank of Ireland.

8 Coates, Osborne-Kinch and Power (2017) outlines the relevant caveats with regard to coverage.

9 This refers to the European System of Accounts (ESA) which provides an internationally compatible framework for the description of an economy. This framework presents the economy by sector including households, government, corporations (financial and non-financial), non-profit institutions serving households and the rest of the world.

Box B: Portfolio Holdings of Irish Resident Investment Funds: an in-depth analysis of exposures to the global non-financial corporations sector
by Dermot Coates and Siobhán O'Connell

Box B Table 1: IFs Equity Holdings Exposures to NFCs by Issuer Country (Top 10)

€ billion	Q1-2014		Q1-2017
Total	**308**	**Total**	**530**
United States	101	*United States*	208
Japan	30	*Japan*	45
United Kingdom	29	*United Kingdom*	37
Germany	16	*Germany*	30
France	14	*France*	22
Switzerland	10	*Cayman Islands*	19
South Korea	8	*South Korea*	14
Cayman Islands	8	*Switzerland*	14
Netherlands	8	*Netherlands*	12
Taiwan, Province of China	6	*Taiwan, Province of China*	11

Source: Central Bank of Ireland.

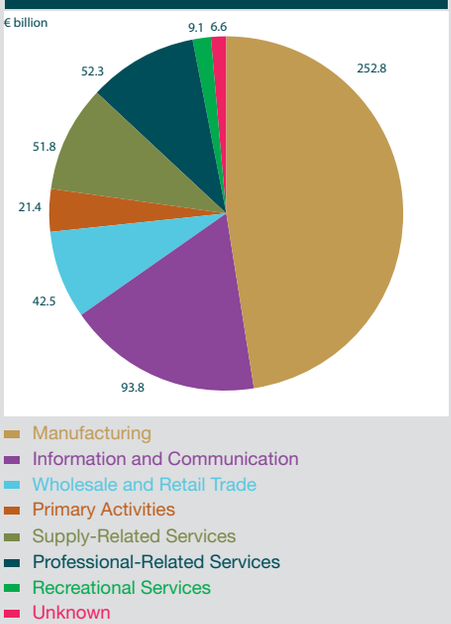
Quoted shares are one of the main asset classes held by Irish resident IFs. The value of these shares has increased by €240 billion since Q1 2014, thereby contributing substantially to the marked increase in the value of total holdings. The rising value of these holdings is primarily attributable to movements in the value of NFC-issued shares which rose by almost 60 per cent over this period. This reflects a combination of new purchases (positive net transactions) alongside market price and exchange-related movements (revaluations) over time (Box B Chart 1). Whereas price changes have had a large and positive effect across a number of quarters, exchange-related movements have also figured prominently. In part, this reflects the strengthening of the US dollar alongside the prevalence of equity holdings issued by US NFCs. Indeed, the data presented in Box B Table 1 indicates that, with regard to quoted shares, the US is the principal geographic counterparty for Irish resident IFs. The value of these exposures increased by more than 100 per cent between the first quarters of 2014 and 2017 (Box B Table 1). When examined on a country-by-country basis, the composition of these exposures remains broadly consistent over time albeit that the Cayman Islands have grown in relative importance having overtaken both Switzerland and South Korea. This phenomenon reflects the incorporation of an increasing number of Chinese-listed (or operated) firms in these islands.

Box B: Portfolio Holdings of Irish Resident Investment Funds: an in-depth analysis of exposures to the global non-financial corporations sector

by Dermot Coates and Siobhán O'Connell

Examining the NFC breakdown in greater depth is possible using NACE sector codes.[10] The NACE sector breakdown indicates that almost 50 per cent (€252 billion) of the NFC equity held by Irish resident IFs relates to the quoted shares of manufacturing firms (Box B Chart 2). The next largest exposures relate to firms in the Information & Communication Technology, and Professional Services space (at 18 per cent and 10 per cent, respectively). Manufacturing firms dominate across each of the primary issuer countries. For instance, US resident manufacturers accounted for 34 per cent of total manufacturing holdings. In the case of Information & Communication Technology firms, an important component of this category relates to the 'internet' industry group where the latter includes a number of household names such as Alphabet, Facebook and Netflix. The US was the principal issuer country for these firms. Indeed, the value of securities held in such firms has experienced significant growth because of both positive share price movements and the purchase of additional shares.

Box B Chart 2: Disaggregating IF Holdings of NFC Equities by Industry Classification, Q1 2017



Source: Securities Holdings Statistics, Central Bank of Ireland.

The term 'manufacturing', however, is very broad and so we have endeavoured to look beyond this in order to better understand the composition of the securities held (Box B Table 2). An important industry group within this sector was pharmaceuticals. The latter accounted for more than 12 per cent (€31 billion) of these holdings. It also includes a number of firms recently redomiciled to Ireland, such as Allergan and Perrigo. Other important industry groups include semiconductors, chemicals, and oil & gas.

Box B Table 2: Underlying Composition of Manufacturing Industry Holdings, Q1 2017 (€ billion)

Total	**252.8**
Pharmaceuticals	30.8
Semiconductors	23.6
Chemicals	17.7
Oil & Gas	15.8
Healthcare Products	13.6
Beverages	12.2
Food	11.3
Auto Manufacturers	11.2
Electronics	10.9
Cosmetics & Personal Care	10.5
Residual Manufacturers	95.0

Sources: Central Bank of Ireland; Bloomberg.

10 NACE ('Nomenclature générale des Activités économiques dans les Communautés Européennes') is a statistical classification of economic activities. In some cases, we have merged categories for presentational purposes. For instance, Professional Services here includes the following: financial & insurance; real estate; and administrative & support service activities.

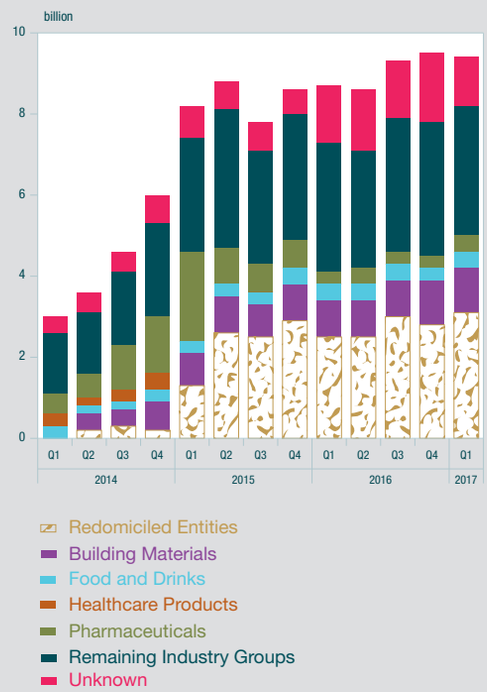
Box B: Portfolio Holdings of Irish Resident Investment Funds: an in-depth analysis of exposures to the global non-financial corporations sector

by Dermot Coates and Siobhán O'Connell

At the end of Q1 2017, Irish resident holdings of Irish IFs stood at €142 billion or 8 per cent of the total. Looking at Irish NFC issuance (Box B Chart 3) and subsequent holdings by Irish IFs, total holdings increased to €9.3 billion at end Q1 2017 from €3.4 billion at end Q1 2014. This increase was largely due to five companies redomiciling through inversions during the period, accounting for €3 billion of the total at end-Q1 2017, and through general market revaluations (see Box A).

Finally, we turn to Irish resident IFs and their exposure to NFC equity issued in the UK. With regard to NFC quoted shares, the UK is the third largest counterparty (issuer) country for Irish resident IFs (Box B Table 1). The market value of these equity holdings increased by approximately 23 per cent over the three years to Q1 2017. While this represents a clear uplift over the period, it noticeably lags the rise in the value of NFC shares held overall (60 per cent) and the rise in the value of both euro area and US holdings (58 and 84 per cent, respectively).

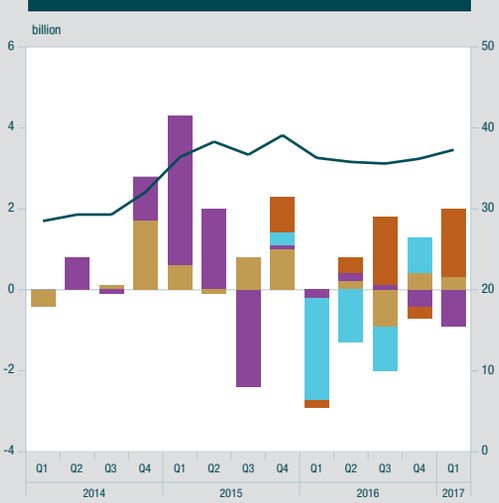
Box B Chart 3: Irish Resident IFs — Equity Holdings Issued by Irish Resident NFCs, 2014 — 2017



Source: Central Bank of Ireland; and Bloomberg.

In the case of the value of IF holdings of UK issuance, the rate of growth has been relatively slow since Q2 2016 (or coinciding with the Brexit referendum). Indeed, the data presented here indicates that there were significant negative net transactions (or sales) in the immediate aftermath of the vote (Box B Chart 4). Over the course of much of 2016, the impact of the falling value of the British pound is evident in the data presented here. These falls have served to constrain the value of this portfolio as positive share price developments were offset by negative exchange-related movements[11]. Nonetheless, it is important to bear in mind that although these are UK resident (and listed) NFCs, many of these are also global brands and will be large-scale exporters[12].

Box B Chart 4: Irish Resident IFs – Equity Holdings of NFC Issuance (UK only), 2014 – 2017



Source: Securities Holdings Statistics, Central Bank of Ireland.

11 Exchange rate movements are reflective of sterling to euro movements and therefore only impact holders of these investments funds whose primary currency is euro.

12 Top Ten companies: British American Tobacco, Glaxo Smith Kline, BP, Diageo, Reckitt Benck, Unilever, Astra Zeneca, Vodafone, Imperial Brands and Rio Tinto.

Box C: Trends in Market Volatility

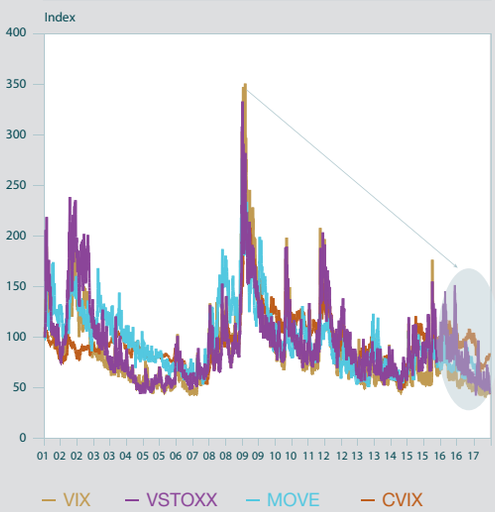
by Ross Collins[13]

Volatility (in a financial market context) can be described as a statistical measure of the dispersion of returns for a given security or market index. It is calculated as the standard deviation of returns of the security or market index.

On 8 May 2017, the Chicago Board Options Exchange Volatility Index (VIX) (which measures the one-month implied volatility from options on the S&P 500 equity index) dropped under 10. This gained much market attention as the VIX had previously only dropped below this level for fewer than 10 days since 1990. In July, the index dropped even further to reach a level of 9.36, close to the all-time low of 9.31 recorded in July 1993 and remains significantly below its historical average (since 1990) of 19. The current low volatility environment is further notable as it is set against a backdrop of perceived heightened geopolitical uncertainty.

The VIX is not the only measure of volatility on financial markets, although it is the most commonly referenced. Some of the other indices frequently used to gauge the dimensions of recent volatility include: the VSTOXX index which measures the volatility of the Eurostoxx 50; the MOVE index which shows the volatility of US Treasury yields; and the CVIX index which is computed by Deutsche Bank to show the volatility of currency markets.[14] Most asset classes are experiencing low levels of volatility to varying degrees as illustrated in Box C Chart 1 below.

Box C Chart 1: Comparing Current Volatility Levels to Historical Values (Period 2001 – Present)



Source: Bloomberg; each series was normalised as at 29 August 2001, each value thereafter is relative to that date.

13 Financial Markets Division, Central Bank of Ireland.

14 CVIX is calculated based on the 3-month implied volatilities of 9 major currency pairs. The currency pairs and their weights are as follows: EUR/USD: 37.84%, USD/JPY: 18.92%, GBP/USD: 12.16%, AUD/USD: 8.11%, USD/CAD: 6.76%, USD/CHF: 5.41%, EUR/JPY: 4.05%, EUR/GBP: 4.05%, and EUR/CHF: 2.70%.

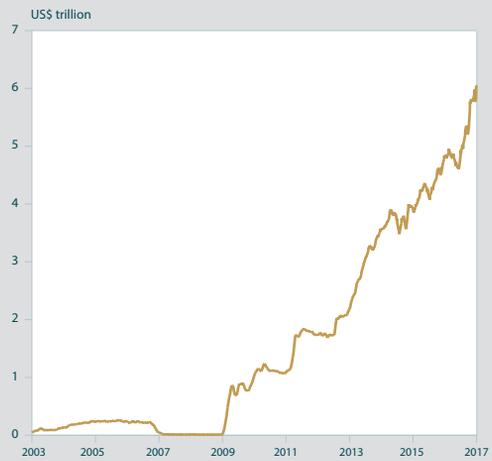
Box C: Trends in Market Volatility

by Ross Collins

Possible Causes of the Current Low Volatility Environment

Market volatility has generally trended lower from 2016 through to the present. This is despite certain political events, such as the outcome of the 'Brexit' referendum, as well as heightened geopolitical tensions on the Korean Peninsula. This trend may be attributed to a number of factors according to market participants:

Box C Chart 2: G3 Central Bank Aggregate Excess Reserves



Source: Bloomberg.

i) Accommodative and Communicative Central Bank Policies

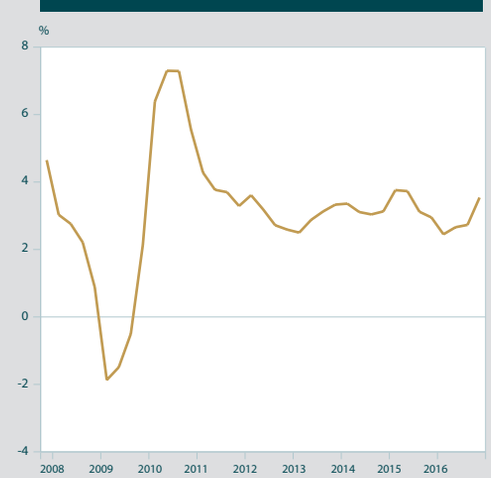
Since the global financial crisis, major central banks [such as the G3, comprising the Federal Reserve (Fed), the ECB and the Bank of Japan (BoJ)] have pursued highly accommodative monetary policies and sign-posted future monetary policy decisions with clear and credible forward guidance. The excess reserves of these central banks, being a measure of excess liquidity in the financial system, now totals US$6.1 trillion, as illustrated in Box C Chart 2.

Portfolio rebalancing has been cited as a dominant effect of global central bank asset purchase programmes. The impact of this effect has been to lower yields on relatively safer assets owing to the expansionary monetary policies of global central banks, which in turn has caused investors to move out of such assets and into relatively riskier, higher yielding assets. This may have compressed market volatility and led to more stable returns on equity markets.

ii) Positive and Stable Global Economy

Since the resolution of the sovereign debt crisis in the euro area, global growth has remained in a remarkably stable range of around 2.25 per cent to 3.25 per cent (see Box C Chart 3). Unemployment rates in the US have trended steadily lower, while US corporate profits have been above their 2006 peak. Bloomberg recounts that more than 80 per cent of US firms reported stronger than expected earnings in their Q1 2017 reports.[15]

Box C Chart 3: World Real GDP Growth



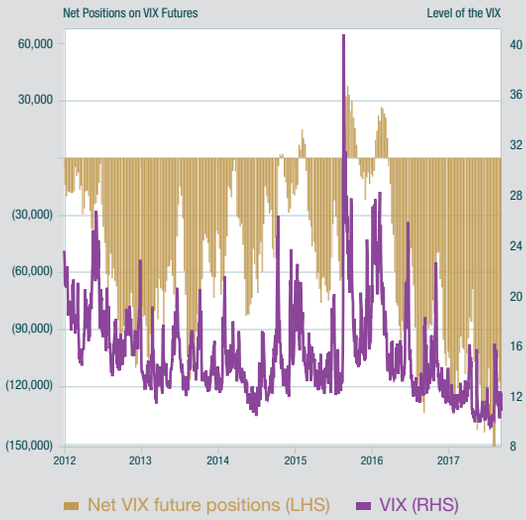
Source: Bloomberg.

Box C: Trends in Market Volatility
by Ross Collins

iii) Possible Distortions due to Exchange-Traded Products Linked to the VIX

Exchange-traded products (ETPs) that allow investors to speculate on the level of the VIX have grown in popularity as the VIX is becoming an asset class in its own right. These products mainly invest in VIX futures contracts.[16] Between 2005 and 2009, the average daily volume of VIX futures contracts was 1,050. By comparison, the daily average volume for VIX futures contracts this year up to May was nearly 96,000.[17] Although it is agreed that ETPs have had a big influence on the volume of VIX futures, market analysts are split on whether they influence prices. Box C Chart 4 shows that the level of the VIX has been closely related to the net positioning on the VIX in recent years.

Box C Chart 4: The Level of the VIX versus Net Positions on VIX Futures



Source: Bloomberg.

iv) Asset Management Styles

Retail investors have been switching from actively managed to passively managed funds due to perceived better cost/return characteristics. Bank of America Merrill Lynch note that almost 70 per cent of all assets under management (AUM) in Japan are passively managed.[18] Some estimates suggest around 40 per cent of equity AUM in the US are now passively managed. The more passive approach is generally viewed by market participants as helping to further reduce volatility.

This box has reviewed the current trend of low market volatility, particularly for equity markets and the possible contributory factors that have been cited by market participants. However, some commentators stress that over-confidence and complacency are responsible for the benign volatility readings, and that volatility measures could be vulnerable to a sharp move higher particularly in the event of an escalation in geopolitical tensions or the occurrence of macro-economic shocks.

15 See Bloomberg Market Wrap (25 July 2017) which outlines that strong earnings have boosted optimism on the global economy and is pushing volatility towards record lows.

16 VIX futures contracts are standard futures contracts on the level of the VIX index itself. They are cash settled as physical delivery is not possible.

17 See Bloomberg article on low market volatility (3 May 2017) which highlights the trend in volumes of VIX futures contracts.

18 See "The ETF-ization of the S&P 500, Part 1", Bank of America Merrill Lynch (July 2017).

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.

Strategic Stimulus: Analysis of Eurosystem Monetary Operations

by John Graham, Anthony Nolan, and Paul Kane, Financial Markets Division[1]

Abstract

Throughout 2016 and during the first half of 2017, the Eurosystem continued to provide substantial monetary policy stimulus, against an environment of shifting political headwinds and gradually rising inflation both in the euro area and globally. In this article, we review the Eurosystem's experience over this period outlining the main changes to the Eurosystem's operational framework, in particular the expansion of the asset purchase programmes and introduction of TLTRO-II, and analyse the impact of these measures on Eurosystem liquidity provision and on liquidity conditions. In this context, the article discusses the measures introduced by other major central banks, while also providing a brief summary of the debt capital market activity of both the Irish government and the main domestic banks.[2]

1 The authors would like to acknowledge, with thanks, the input of Sean Furlong and Patrick Haran, and the helpful comments and suggestions of John Nash, Neil Lawton, Ken Egan and other colleagues in the Financial Markets Division of the Central Bank of Ireland.

2 A glossary of terms used throughout this article is available after section 6.

1. Introduction to monetary policy developments (2016 & H1 2017)

Over the course of 2016 and the first half of 2017, the ECB's Governing Council expanded and augmented a number of non-standard measures in order to achieve its monetary policy mandate of maintaining euro area inflation rates of below, but close to, two per cent over the medium term. These measures included an increase in the volume of purchases under the Asset Purchase Programme (APP), the expansion of the purchasable asset classes to include corporate debt, the acceptance of cash collateral under the securities lending facilities put in place for the Public Sector Purchase Programme (PSPP), reductions to the key policy rates and continued liquidity provision via the Targeted Longer Term Refinancing Operations (TLTROs).

This article briefly reviews the evolving monetary policies of the main central banks, but goes on to focus on the euro area and the actions of the ECB. It is structured as follows; Section 2 reviews developments at other major central banks, while Section 3 gives an overview of the ECB's monetary policy decisions over 2016 and H1 2017. Section 4 looks at overall trends in Eurosystem open market operations, while Section 5 discusses developments in Ireland with regard to Eurosystem liquidity provision, as well as the sovereign and domestic banks' debt market activity. Section 6 concludes the paper.

2. Global monetary policy developments in the review period

During the review period, a number of the main global central banks continued on a path of non-standard stimulus measures in an effort to address a low inflation environment, with some choosing to introduce more unconventional measures over further reductions in negative rates.

The Bank of Japan (BoJ), having expanded its asset purchases to ¥80 trillion (€713 billion)[3] per year, announced the introduction of a tiered reserves system in January 2016, in which a portion of financial institutions' reserves held with the central bank attract a negative interest rate of -0.1 per cent. Further to this, the BoJ announced a departure from more conventional measures in September 2016. Referred to as quantitative and qualitative monetary easing[4] with yield curve control, the BoJ adjusted the volume of long-term bond purchases in an effort to keep 10-year Japanese government bond yields close to 0 per cent. This measure was coupled with a commitment from the BoJ to overshoot its inflation target of 2 per cent.

Moreover, central banks with a traditionally strong alignment to the euro, maintained negative policy rates. In Sweden, the Riksbank cut its repo rate a number of times, eventually moving it to -0.50 per cent in February 2016[5], while Danmarks Nationalbank cut its certificate of deposit rate to -0.65 per cent by the end of H1 2016.[6]

Elsewhere in Europe, the main political focus of this period was that of the UK's referendum on European Union membership, as the UK electorate voted in favour of leaving the EU. In anticipation of uncertainty around the time of the UK's vote on EU membership, the Bank of England (BoE) announced in early March 2016 that additional Indexed Long-Term Repo operations would be offered in the weeks around the referendum. Following the outcome of the UK vote on 23 June 2016, the BoE announced that it stood ready to provide £250 billion of additional funds through its normal facilities, to act as a backstop and to support the functioning of markets. In an effort to manage a trade-off between the BoE's goal of meeting its inflation target and anticipated

3 Reference rate as of 21 September 2016.
4 Bank of Japan announcement 21 September 2016.
5 Riksbank repo rate decision 10 February 2016
6 Danmarks Nationalbank Official interest rates.

economic weakness, the BoE introduced a number of monetary stimulus measures in August of 2016[7]. The BoE reduced its official Bank Rate to 0.25 per cent from 0.50 per cent, a level at which it had stood since March 2009. It also introduced a term funding scheme to reinforce the pass-through of the rate cut, under which the BoE would lend £100 billion to banks at a rate close to the new Bank Rate. The BoE's Monetary Policy committee also voted unanimously in favour of introducing the purchase of up to £10 billion in UK corporate bonds and the expansion of its asset purchases in UK government bonds by £60 billion, taking the total stock of asset purchases to £435 billion, all of which were to be funded by the issuance of central bank reserves.

Further afield, and under a contrasting economic cycle, the Peoples' Bank of China (PBoC) left its 1-year benchmark lending and deposit rates unchanged during 2016 and H1 2017, instead increasing its 7-day, 14-day and 28-day reverse repo rates in Q1 2017. Prior to this, the PBoC had been on a path of monetary policy easing during 2015. Having conducted a series of currency devaluations in 2015, the PBoC introduced a further policy change in January 2016, in the form of a "referenced" rate (which represented a departure from a more closely managed exchange rate) for the renminbi against a basket of currencies, as well as making a number of reductions to banks' reserve requirement ratios during this period. Further to this, the PBoC introduced a change in the way it calculates the renminbi's daily reference rate against the dollar in May 2017, by using a 'counter-cyclical adjustment factor' aimed at reducing the impact of big market movements. While China introduced measures to address capital outflows to reduce downward pressure on the renminbi, it further opened its bond markets[8] and foreign exchange market[9] to international investors, aiming to attract flows into the country.

In December 2015, the US Federal Reserve was the first major central bank to tighten its monetary policy, and following the US presidential election in November 2016, it continued on a path of tightening as a result of continued improvement in US economic performance, declining unemployment, and an expectation that inflation would rise towards its 2 per cent target over the medium term[10]. Having increased the Federal Funds rate from a range where it had been since January 2009, from 0–0.25 to 0.25-0.50 per cent at its meeting in December 2015, the Federal Open Markets Committee (FOMC) went on to make three further rate increase decisions during 2016 and H1 2017, raising rates to 0.50-0.75; 0.75-1.00 ; and 1.00-1.25 per cent, in December 2016, March 2017, and June 2017 respectively. In addition, the Fed has announced a reduction of its balance sheet[11] before the end of 2017.

3. ECB's key policy decisions in the review period

The Eurosystem provided substantial monetary stimulus in H1 2016 to counteract heightened risks to the ECB's price stability mandate, while further adjustments and additional measures were introduced to ensure normalised market activity over the remainder of the review period. These measures were against a backdrop of very low or even negative inflation in the euro area experienced prior to 2016, and had an objective of securing the return of inflation to levels below, but close to, 2 per cent over the medium term. The measures introduced included the expansion of the APP (with subsequent modifications during the period in terms of volumes and asset composition), the expansion of securities lending facilities under the PSPP to also accept cash as collateral, further key policy rate cuts and the announcement of a new series of TLTROs. Box 1 below summarises the main decisions of the ECB throughout the review period..

7 Bank of England monetary stimulus measures 04 August 2016

8 Announcement of Bond Connect settlement service by the Hong Kong Monetary Authority 19 May 2017

9 Announcement by State Administration of Foreign Exchange - 27 February 2017

10 FOMC Minutes of the Board's discount rate meetings 14 November 2016 to 14 December 2016

11 The Fed currently holds $4.24 trillion in outright purchases on its balance sheet, as of Q2 2017, and reinvests in new securities as holdings mature, see Quarterly balance sheet developments report 2017-05 (page 12)

Box 1: Summary of ECB Decisions

On 10 March 2016, the Governing Council decreased the Main Refinancing Operation (MRO) interest rate by five basis points to 0.00 per cent; the Marginal Lending Facility (MLF) rate by five basis points to 0.25 per cent and the rate on the Deposit Facility by 10 basis points to -0.40 per cent, starting from the operation settled on 16 March 2016.

The following measures were also announced on 10 March 2016:

- The launch of a Corporate Sector Purchase Programme (CSPP) as an additional component of the ECB's APP. This added investment-grade euro-denominated bonds issued by non-bank corporations established in the euro area to the list of assets that are eligible for regular purchases. This was to further strengthen the pass-through of asset purchases to the financing conditions of the real economy (commencement details announced on 2 June 2016);
- The increase of combined monthly purchases under the APP to €80 billion, starting in April 2016;
- A new series of four Targeted Longer-Term Refinancing Operations (TLTRO-II) starting in June 2016.

This package of monetary policy decisions aimed to provide substantial monetary stimulus to counteract the heightened risks to the ECB's price stability objective.

On 3 May 2016, the ECB published an amending decision introducing an additional early repayment option for TLTRO-I borrowings in June 2016.

On 2 June 2016, the Governing Council announced that on 8 June the Eurosystem would start making purchases under its already announced CSPP (see 10 March 2016 announcement).

Moreover, starting on 22 June, the Eurosystem would conduct the first operation in its new series of TLTRO-II.

On 22 June 2016, the Governing Council reinstated a waiver of minimum credit rating requirements for marketable instruments issued or guaranteed by the Greek government, subject to special haircuts and eligible for use in Eurosystem operations, starting on 29 June 2016. The Governing Council acknowledged the commitment of the Greek government in implementing the ESM programme and expected continued compliance with its conditionality, and said that it will examine possible purchases of Greek government bonds under the PSPP at a later stage.

On 27 September 2016, the ECB and People's Bank of China (PBoC) extended for a further three years the bilateral currency swap arrangement established in 2013. The swap arrangement has a maximum size of CNY 350 billion and €45 billion.

On 8 December 2016, the Governing Council decided to continue its purchases under the APP at the monthly pace of €80 billion until the end of March 2017. However, from April 2017, the net asset purchases were to continue at a lower monthly pace of €60 billion, but with purchases extended until the end of December 2017, or beyond, if necessary, and in any case until the Governing Council sees a sustained adjustment in the path of inflation consistent with its inflation target. If, in the meantime, the outlook becomes less favourable or if financial conditions become inconsistent with further progress towards a sustained adjustment of the path of inflation, the Governing Council intends to increase the programme in terms of size and/or duration.

Box 1: Summary of ECB Decisions

In addition to the extension of the programme, the following parameters were announced, for implementation on 2 January 2017:

- the maturity range of the PSPP was broadened by decreasing the minimum remaining maturity for eligible securities from two years to one year.
- purchases of securities under the APP with a yield to maturity below the interest rate on the ECB's deposit facility were permitted to the extent necessary.

Moreover, the Governing Council decided that Eurosystem national central banks would have the possibility to also accept cash as collateral in their PSPP securities lending facilities (discussed further in Box 3).

On 19 January 2017, the Governing Council provided further details on the purchase of assets with yields below the Deposit Facility Rate (DFR):

- No purchases below the DFR would be conducted under the third covered bond purchase programme (CBPP3), the asset-backed securities purchase programme (ABSPP), or the CSPP
- With regard to the PSPP, for each jurisdiction, priority would be given to purchases of assets with yields above the DFR. This meant that the amount of purchases that have to be made at yields below the DFR would vary among jurisdictions. This amount could also change over time, reflecting changes in market interest rates relative to the DFR.

On 19 June 2017, in pursuit of further transparency, the ECB published the 'Emergency Liquidity Assistance (ELA) agreement'. ELA aims to provide central bank money to solvent financial institutions that are facing temporary liquidity problems, outside of normal Eurosystem monetary policy operations.

4. Developments in Eurosystem Liquidity Provision

Throughout 2016 and into the first half of 2017, excess liquidity[12] continued to rise across the euro area, primarily driven by purchases under the APP and continued participation in the final rounds of TLTROs.

In addition, the Eurosystem maintained its provision of liquidity via fixed rate, full allotment refinancing operations including the MROs, the three-month Long Term Refinancing Operations (LTROs) and 7-day US dollar operations. However, as pre-announced, the final round of the TLTRO programme took place in March 2017. Box 2 below provides further details of the history of the TLTROs.

12 Excess liquidity exists in the Eurosystem when the liquidity supply provided through the ECB's monetary policy instruments exceeds the liquidity needs (autonomous factors plus reserve requirements) of the banking system.

Box 2: History of Targeted-Longer-Term Refinancing Operations

The first series of eight operations (TLTRO-I) was announced in June 2014. TLTROs aimed to provide financing at attractive conditions to euro area credit institutions with a maturity of up to four years.

This was followed by a second series of four quarterly operations (TLTRO-II), announced in March 2016. Under TLTRO-II, banks could borrow up to 30 per cent of the amount of their existing stock of loans to non-financial corporations and households (excluding loans to households for house purchases). Moreover, banks were given the opportunity to repay funds borrowed under TLTRO-I early and switch to TLTRO-II funding.

Such a shift of funding was deemed attractive for two reasons:

- First, it lengthened the term of bank funding and removed the requirement for mandatory repayment where lending thresholds were not met.
- Second, it lowered the average cost of TLTRO-I funding which stood at 0.10 per cent over the MRO rate at the time of the operation for the first two operations, while this cost was reduced to the MRO rate for the remaining six operations[13]. The maximum rate banks would have to pay for TLTRO-II funding was 0.00 per cent, as this was the MRO rate at the time of the operations and the higher bound in respect of TLTRO-II lending.

The TLTROs provide incentives for bank lending to the real economy. In the case of TLTRO-I, the incentives for lending were two-fold:

- First, banks whose net lending over a reference period exceeded a bank-specific benchmark could borrow more in the final six TLTRO-I operations and the maximum additional amount was set at three times the amount by which their net lending had exceeded their benchmark.
- Second, banks that did not meet their lending benchmarks were required to repay their TLTRO-I borrowings early.

Incentives for lending are provided in a different form under TLTRO-II. Rather than penalising banks that fail to meet their benchmarks, TLTRO-II provides incentives, in the form of lower interest rates, for banks which outperform their benchmarks. Banks whose eligible net lending in the period between 1 February 2016 and 31 January 2018 exceeds their lending benchmarks will benefit from a rate reduction. The TLTRO-II rate can be as low as –0.40 per cent.

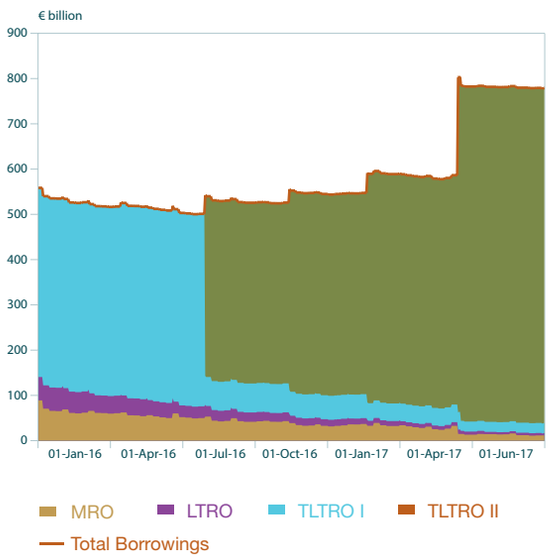
Euro area banks' total TLTRO-II borrowings currently stand at €740.2 billion. The first TLTRO-II operation (TLTRO-II.1, settled in June 2016) attracted bids amounting to €399.3 billion, which largely reflected a shift out of TLTRO-I funding and into TLTRO-II funding. The second and third TLTRO-II operations (TLTRO-II.2 and TLTRO-II.3) allotted €45.3 billion and €62.2 billion respectively.

Take-up in the final operation in March 2017 (TLTRO-II.4) was substantially higher at €233.5 billion, of which a significant share (€216.7 billion) constituted a net increase in TLTRO borrowings. The significant take-up in the final operation reflects the overall attractive pricing of TLTRO-II compared with banks' alternative market-based funding, and, to some degree, additional incentives for take-up in the final operation.

Overall, outstanding TLTRO credit (including outstanding TLTRO-I credit) stood at €760.6 billion as at end-March 2017 and was concentrated in the first and final TLTRO-II operations.

13 TLTRO-I first two operations incurred a rate of 0.15 per cent, operations three through six a rate of 0.05 per cent and the remaining operations seven and eight carry a 0.00 per cent rate.

Chart 1: Eurosystem Borrowings



Source: CBI calculations.

4.1 Eurosystem Refinancing Operations

Participation in Eurosystem refinancing operations across the euro area increased by €40.8 billion over 2016, from €559.4 billion on 30 December 2015 to €600.2 billion on 28 December 2016. As at 30 June 2017, total Eurosystem lending stood at circa €782.1 billion.

Chart 1 above illustrates this evolution with the increase in lending driven by the take up in TLTRO-II.

Eurosystem lending increased over the period largely due to the take up in the TLTRO-II operations. Conversely, the total amount borrowed through the MRO declined by €77.4 billion, from €89.0 billion on 31 December 2015 to €11.6 billion on 30 June 2017.

As can be seen in chart 1, throughout 2016, the composition of the total amount of liquidity provided through Eurosystem refinancing operations has continued to be in favour of TLTRO lending. TLTRO lending accounted for 75 per cent of total Eurosystem lending as at 31 December 2015, increasing to 91 per cent as at 31 December 2016 and rose to 97 per cent at 30 June 2017 as counterparties availed of the longer term funding.

The volume of participation in the Eurosystem's weekly 7-day US dollar operation increased during 2016, with total allotments throughout the year averaging $734.4 million, compared to an average allotment amount of $115.8 million in 2015. However, the increase during 2016 is generally reflective of higher market demand for dollar funding over end quarter periods, reflected in the median participation for 2016, which stood at $111.0 million. From 1 January to 30 June 2017 this trend has continued, as participation in the US dollar operation averaged $615.4 million, while the median was $185.5 million.

4.2 Overview of the ECB's Purchase Programmes

Liquidity injections by means of non-standard monetary policy measures were the main drivers of rising excess liquidity over 2016 and the first quarter of 2017. The APP has remained a key instrument in providing further monetary policy stimulus with policy rates at a historically low level. Box 3 below provides a summary of developments in relation to the APP over the course of 2016 and H1 2017.

Box 3: December 2016 Governing Council Meeting; decisions relating to the Asset Purchase Programme.

A number of changes to the APP have been made since inception, in terms of size, duration, composition, and the programme parameters, reflecting the evolving outlook for inflation and the need to ensure a smooth implementation of the programme. A number of adjustments were made over the review period, with the most important decisions being made at the Governing Council meeting on 8 December 2016. This box discusses those decisions.

First, the Governing Council decided to extend APP purchases beyond the previously signalled end date of March 2017. ECB President Draghi announced that purchases would continue until at least December 2017, at an average monthly pace of €60 billion from April 2017, reduced from €80 billion. The extension of the programme was deemed necessary amid an absence of a sustained adjustment in inflation towards the ECB's inflation target, of below but close to 2 per cent. At the same time, the reduction in the pace was deemed appropriate as deflationary risks had dissipated since the decision to increase the pace of purchases from €60 billion to €80 billion in March 2016. In order to ensure the continued smooth implementation of the programme, it was also decided that the minimum eligible maturity for bonds purchasable under the PSPP be reduced from two years to one year, and that purchases below the DFR be allowed to the extent necessary. Significantly, the decision to reduce the pace of purchases was accompanied by a commitment to increase the pace again if necessary.

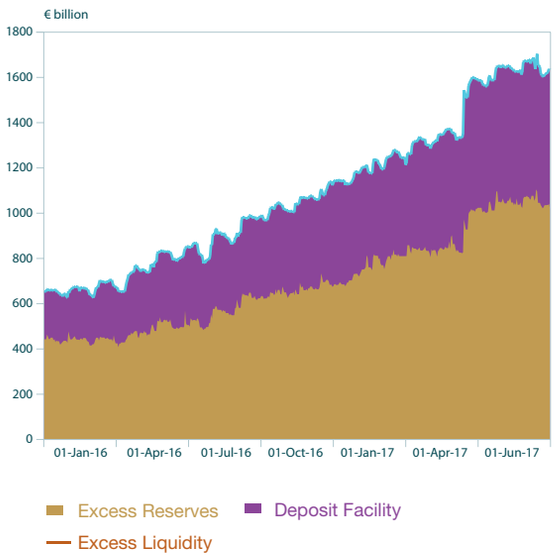
Second, the Governing Council also reconfirmed the previous announcement that the net purchase pace would be supplemented by the reinvestment of maturing APP holdings. While redemptions have been a feature of the Covered Bond Purchase Programme 3 (CBPP3) and the Asset Backed Securities Purchase Programme (ABSPP) since their inception, as there is no lower bound on the residual maturity for eligible purchases in these programmes, redemptions were a new feature in the PSPP. When the PSPP became operational in March 2015, the minimum eligible maturity for purchases was two years. Therefore, the first redemptions from the PSPP portfolio were due to begin in March 2017.

The monthly purchase pace set by the Governing Council represents the net monthly target for the APP. The gross purchase target equals the monthly target plus the volume of nominal redemptions in a given month, while the net figure excludes redemptions. The reinvestment of redemptions ensures that the Eurosystem balance sheet continues to grow at the pace set by the Governing Council. While the Eurosystem endeavours to fulfil the required reinvestments in the month they fall due, in certain cases this will not be possible, and reinvestments will be fulfilled in subsequent months. This will potentially cause some variation in the monthly purchase volumes published by the ECB.

Also in December 2016, the Governing Council decided to enhance the effectiveness of the PSPP Securities Lending facilities by allowing NCBs, on a voluntary basis, to lend bonds held under the PSPP against cash collateral. While the PSPP securities lending facilities had been in existence since the inception of PSPP, holdings could only be lent against collateral in the form of bonds, i.e. on a "cash neutral" basis. The decision to accept cash collateral was intended to support repo market liquidity and functioning by making the facility more accessible to market counterparties, and by facilitating the lending of PSPP holdings in greater volumes. Eight NCBs, plus the ECB, currently accept cash as collateral in their PSPP securities lending facilities, including the Central Bank of Ireland. A total limit of €50 billion has been set for the Eurosystem for lending against cash-only collateral. To avoid unduly curtailing normal repo market activity, securities are lent against cash collateral at a rate equal to the lower of the DFR minus 30 basis points (i.e. currently equal to minus 70 basis points), and the prevailing market repo rate.

The changes above contributed to the smooth implementation of the APP throughout 2017 to date. As of end June 2017, total Eurosystem holdings under the four constituent programmes amounted to €1.95 trillion. The PSPP accounted for over €1.6 trillion of this. As for the PSPP securities lending facilities, the average daily on-loan amount for June was €50.5 billion (against both securities and cash).

Chart 2: Composition of Excess Liquidity (2016 - end June 2017)



Source: CBI calculations.

4.3 Overview of liquidity conditions in the euro area and impact on money market rates

During the period, excess liquidity continued to rise across the euro area, driven mainly by purchases under the APP and TLTRO-II. Excess liquidity is comprised of counterparty deposits on the overnight Deposit Facility and/or left on current accounts as excess reserves. A counterparty's current account holdings are comprised of its minimum reserve requirement in addition to 'excess reserves' held above this requirement. A counterparty's average minimum reserve requirements are remunerated at the MRO rate, while excess reserves bear the rate on the Deposit Facility (-0.40 per cent as at end-June 2017). Therefore, both excess reserves and funds placed on the Deposit Facility bear a rate of interest below that of the MRO.

Chart 2 illustrates the evolution and composition of excess liquidity (as at 1 January 2016) to end June 2017, the overall level of which has risen substantially over the period as stimulus measures such as the APP and TLTRO-II have continued to drive overall excess liquidity levels higher, from €654.5 billion in January 2016 to €1,633.1 billion at the end of June 2017.

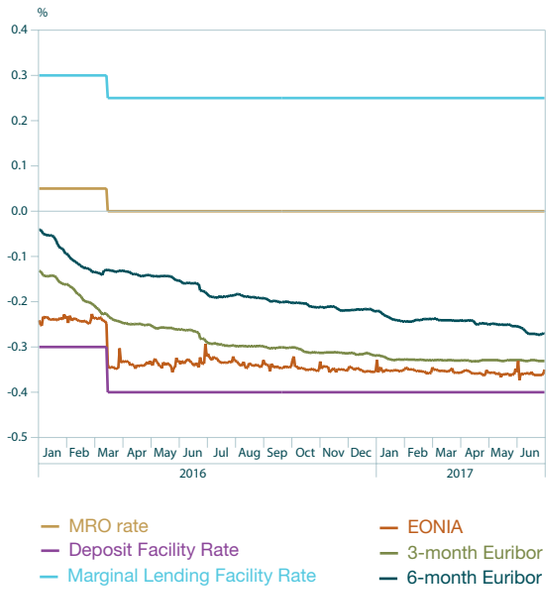
Current account holdings in excess of minimum reserve requirements averaged €567.3 billion for 2016, more than twice the level in 2015, which was €259.1 billion. The path of rising excess reserves has continued into 2017, with the average level of current account holdings held in excess of minimum reserve requirements standing at €937.1 billion for the year to 30 June 2017. Reserve requirements across the Eurosystem increased only slightly over the year, from €113.3 billion at end 2015 to €118.8 billion at end 2016, and by 30 June 2017 stood at €122.6 billion.

Excess liquidity across the euro area throughout 2016 was also reflected in an increased recourse to the Deposit Facility. Usage of the Deposit Facility averaged €326.1 billion per day in 2016, compared to a daily average of just €114.2 billion in 2015. So far in 2017, usage of the facility has remained elevated, averaging €530.7 billion per day during H1 2017, thus representing an important component of overall excess liquidity.

Against a backdrop of high levels of excess liquidity in the euro area, daily recourse to the MLF remained low throughout 2016, averaging just €0.1 billion, down from €0.3 billion in 2015. However, the average during H1 2017 has increased to €0.3 billion. Furthermore, the rate on the MLF was reduced by five basis points to 0.25 per cent in March 2016 and has remained at this level since.

Due to the increased liquidity, euro area money market rates remained at low levels in 2016 and in the first half of 2017. Moreover, following the Governing Council's decision to lower the rate on the Deposit Facility by 10 basis points to -40 basis points on 10 March 2016, the

Chart 3: The Eurosystem's Interest Rate Corridor & Selected Money Market Rates



Source: Bloomberg.

EONIA rate (a market measure of weighted average overnight unsecured lending) fell accordingly, and has remained at levels only a few basis points above the Deposit Facility. Chart 3 below illustrates that in an environment of high excess liquidity, money market rates closely track the rate on the Deposit Facility, rather than the rate of the MRO.

EONIA rates continue to be driven towards the rate on the Deposit Facility, reflecting an environment of high excess liquidity, as the DFR acts as the main policy anchor of money market rates. The increase in excess liquidity has also driven EURIBOR (Euro Interbank Offered Rate) fixings lower into negative territory during this period following further Governing Council announcements on the expansion of the purchase programmes and the introduction of TLTRO-II

5. Summary of Irish Developments

5.1 Eurosystem Borrowings & TARGET2[14] Balance

Eurosystem lending to Irish domiciled counterparties decreased from €10.7 billion at 2015 year-end to €7.4 billion at the end of 2016. However, it had moved up to €7.8 billion - consisting solely of long-term funding - by 30 June 2017[15].

During 2016 and the first half of 2017, and as seen in the preceding year, Irish domestic banks continued to reduce their level of central bank funding mainly due to increased access to debt capital markets in areas such as covered bond issuance and a balance sheet deleveraging process.

Moreover, in an environment of excess liquidity, lower levels of recourse to Eurosystem lending was, *inter alia*, a contributing factor in Ireland's TARGET2 balance switching from a liability of €3.0 billion at the end of 2015 to an asset of €8.2 billion by 30 June 2017. The change in balances reflects a net inflow of €11.2 billion of funds into Ireland across the TARGET2 system over the period.

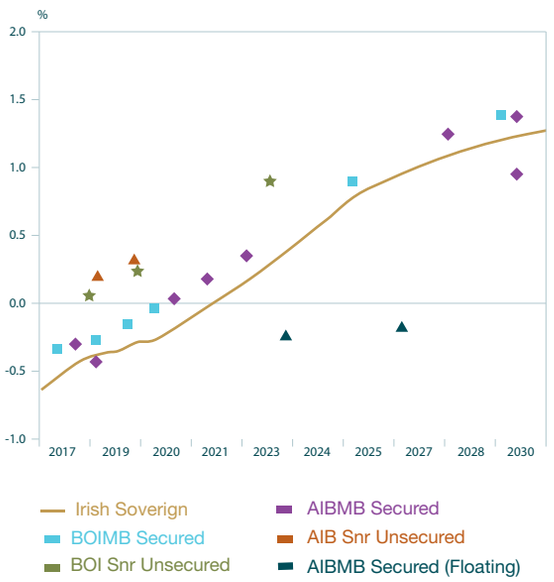
5.2 Irish sovereign and bank debt market activity in 2016 and to end of June 2017

Against a backdrop of record low interest rates and the continued support of the ECB's accommodative policies, Irish government bonds performed strongly, with spreads narrowing against German and French benchmark bonds in 2016. In 2017, the 10-year bond traded at a spread below 0.50 per cent for most of June against its German 10-year equivalent, and at one stage trading below seven basis points to the French 10-year equivalent bond, prior to the first round of the French presidential elections in April. For the period 1 Jan 2016 to 30 Jun 2017, the 10-year benchmark Irish government bond traded at a high of 1.215 per cent in Feb 2017 and

14 Trans-European Automated Real-Time Gross Settlement Express Transfer System

15 Latest publicly available data.

Chart 4: Irish Banks' Bond Yields as at 30/06/2017



Source: Bloomberg.

a low of 0.318 per cent in September 2016, with an average yield of 0.79 per cent. Notable moves for Irish yields took place alongside movements in other securities and bonds yields, reacting to political events, from the UK referendum to French and US presidential elections.

While the National Treasury Management Agency's (NTMA) 2016 planned market issuance was relatively low in the range of €6 billion to €10 billion, their first auction of the year was for €3 billion. A 10-year benchmark 2026 bond was issued via syndication in January, yielding 1.156 per cent, with international investors accounting for 88 per cent of the allocation. This bond was also tapped for a further €2.75 billion during 2016 at yields below 1.00 per cent. Also of note in 2016 was the State's first issuance of €100 million of a 100-year note, by private placement at a yield of 2.35 per cent.

Meanwhile, the NTMA funding plan announced for 2017 was for issuance of between €9 billion and €13 billion in long-term bonds, €9.36 billion of which had been issued by the end of June. Notable issuances included a new 20-year benchmark bond of €4.0 billion in January yielding 1.734 per cent, and the NTMA's first inflation-linked bond issuance of €609.5 million in April for a 23-year tenor, with a floating coupon of 0.25 per cent plus Irish HICP (excluding tobacco).

As a result of large retail inflows, all three Irish banks have much improved loan-to-deposit ratios and liquidity ratios during the review period, resulting in a low level of debt issuance over this term. AIB Mortgage Bank issued €1 billion in a 7-year covered bond in January 2016 and €750 million in both 7-year and 10-year floating rate covered bonds in February 2017. Meanwhile, Bank of Ireland's only issuance during this period was a €10 million unsecured 3-year bond in January of 2016. Chart 4 illustrates the banks secured fixed yield levels relative to the sovereign yield curve and AIB Mortgage Bank's two floating rate covered bonds mentioned previously.

6. Conclusion

Continued supportive central bank monetary policies remained necessary in light of below-target inflation during the period, as the ECB expanded its APP in March 2016 and offered incentivised funding to the banking sector through the TLTRO-II. The euro area economy saw an increase in inflation in Q4 2016 in line with rising global trends, and following the ECB Governing Council's announcement of further policy measures in early 2016, notably successive reductions in the rate on the Deposit Facility to -0.40 per cent and an expansion of the APP in terms of both volume and asset classes purchased. Purchases under the APP are intended to run until the end of December 2017, or beyond, if necessary.

Against the backdrop of these measures, excess liquidity in the Eurosystem has continued to rise over the review period, reaching €1.6 trillion by the end of H1 2017, keeping both secured and unsecured money

markets rates anchored to the DFR. Looking ahead, markets will continue to monitor the ECB's monetary policy stance, as other major central banks address possible tapering of their respective quantitative easing programs. Meanwhile, the ECB's Governing Council will continue to monitor progress towards achieving its objective, of maintaining euro area inflation rates of below, but close to, 2 per cent over the medium term.

Annex 1: Glossary of Terms

Autonomous Factors: Autonomous factors are normally outside the control of the Eurosystem and are defined as the items in the consolidated balance sheet of the Eurosystem, apart from monetary policy operations, that provide or withdraw liquidity from the system. The most notable autonomous factors are banknotes in circulation; government deposits with the Eurosystem; and net foreign assets.

EONIA (Euro Overnight Index Average) is a market index computed as the weighted average of overnight unsecured lending transactions undertaken by a representative panel of banks.

EURIBOR (Euro Interbank Offered Rate) is the rate at which interbank term deposits are offered by one prime bank to another prime bank. This is often the reference rate for maturities of one, two and three weeks, and for maturities of one to twelve months.

Excess liquidity arises when the supply of liquidity (as provided via the Eurosystem's monetary policy instruments), exceeds the demand for liquidity (as dictated by minimum reserve requirements and autonomous factors outside the direct control of individual NCBs), there is said to be **excess liquidity** in the banking system. In this situation, the excess will likely end up being deposited with the Eurosystem via Deposit Facility usage or banks' current account balances.

Excess Reserves: Current account holdings in excess of the average minimum reserve requirements.

General Collateral rates (GC) are the rates on a range of assets that are accepted, at any particular moment, as collateral in the repo market by the majority of market intermediaries and at a very similar repo rate.

Liquidity Provided: The net amount of liquidity provided by the Eurosystem through its monetary policy instruments.

Maintenance period (MP): The period over which compliance with reserve requirements is calculated. The MP begins on the settlement day of the first MRO following the policy meeting of the Governing Council.

Minimum reserves are determined on the basis of the institutions' average daily reserve holdings (calculated on the basis of certain balance sheet liabilities) over a maintenance period. Each bank in the Eurosystem is required to maintain a balance with their respective NCB. The required reserve holdings are remunerated at a level corresponding to the average interest rate over the maintenance period of the MROs of the Eurosystem.

Open Market Operations (OMOs) include Main Refinancing Operations, and Longer-Term Refinancing Operations, as defined below:

(i) Main Refinancing Operations (MRO) are regular liquidity-providing reverse transactions with a frequency and maturity of one week. The MRO rate is currently 0 per cent.

(ii) Longer-Term Refinancing Operations (LTRO) are liquidity-providing reverse transactions that are regularly conducted with a monthly frequency and a maturity of three months. Longer-Term Refinancing Operations are conducted at irregular intervals or with other maturities, such as with the length of one maintenance period, six months, twelve months or up to four years (as with the TLTROs).

Standing facilities aim to provide and absorb overnight liquidity, signal the general monetary policy stance and bound overnight market interest rates. Two standing facilities, which are administered in a decentralised manner by the NCBs, are available to eligible counterparties on their own initiative:

(i) Marginal Lending Facility (MLF): Counterparties can use the MLF to obtain overnight liquidity from the NCBs against eligible assets. The interest rate on the

MLF is currently 0.25 per cent and normally provides a ceiling for the overnight market interest rate.

(ii) **Deposit Facility (DF):** Counterparties can use the Deposit Facility to make overnight deposits with the NCBs. The interest rate on the Deposit Facility is currently -0.40 per cent and normally provides a floor for the overnight market interest rate.

TARGET2 is the payment system of the euro that is operated by the central banks of the Eurosystem. All payments are settled in central bank money (that is to say they are booked on the accounts that banks hold with their central bank) and are settled in real time. The payments are primarily between banks and ancillary systems (e.g. security settlement systems, central bank counterparties, retail payment systems) as well as payments forming part of Eurosystem operations such as Open Market Operations.

Variable rate allotment: In normal circumstances, the Eurosystem, when conducting its OMOs, assesses the total liquidity need of the banking sector and, in competitive tenders, allots this amount. Usually these tenders are conducted as variable rate tenders, meaning that banks pay the interest rate that they offer when they make their bids.

The Eurosystem may also execute its tenders in the form of fixed rate tenders, where the interest rate is specified in advance and banks bid the amount of money they wish to transact at the fixed interest rate.

In some circumstances, the ECB may decide in advance to allot the full amount of liquidity that banks request, i.e. to accommodate all bids, at a fixed interest rate (known as **fixed rate full allotment**). This is the method currently in use.

The Labour Market and Wage Growth after a Crisis

Suzanne Linehan, Reamonn Lydon, Tara McIndoe-Calder, Paul Reddan and Diarmaid Smyth

Abstract

The substantial improvement in labour market conditions since 2013 has been one of the most noteworthy aspects of Ireland's economic recovery. An important exception in this turnaround is, however, wage growth, which remains subdued relative to pre-recession trends. This article uses a number of metrics to fully assess underlying labour market conditions, before considering the reasons behind recent muted wage growth and the potential path of future wage developments. The evidence suggests that some of the post-crisis weakness in wages may be attributed to temporary factors including low inflation, employment composition effects and the estimation of labour market slack. Furthermore, our analysis points to a non-linear relationship between wage growth and unemployment, whereby the degree of sensitivity of wages is greater during periods of low or high unemployment. We also note a number of reasons as to why historical trends may not represent a reliable guide to future wage developments including changes in institutional wage setting, a shift in the natural rate of unemployment, recession-related scarring effects and productivity developments.

1. Introduction

The turnaround in the labour market since 2013 is one of the most remarkable aspects of Ireland's economic recovery. Having shed over 300,000 jobs between 2007 and 2012, by the second quarter of 2017 the numbers in employment were just 80,000 below the pre-recession peak. At the same time, the recovery in employment has been accompanied, until recently, by little or no growth in nominal hourly wage rates at the aggregate level. As a result, the main driver of increases in household incomes in recent years has been the growth in employment and the increase in average hours worked.

With labour market indicators pointing to ever-tightening conditions in the near-term, questions arise as to whether the degree of slack in the labour market is falling, and the potential consequences for wage developments. This article looks at these issues, using a range of metrics to assess underlying conditions in the labour market and the factors which have driven wage growth, before attempting to assess some of the potential influences on future wage developments.

In Section 2, we assess how close the economy is to full employment, presenting a dashboard of key labour market indicators, covering employment flows, job vacancies, hours worked and labour force participation. We show that whilst there has been substantial improvements in recent years, wage growth has lagged behind. In Section 3, we examine the determinants of wage growth, relating changes in nominal wages to unemployment, inflation, productivity and other factors. We show that the relationship between wage growth and unemployment in Ireland is non-linear, with a far greater degree of sensitivity at low or high levels of unemployment. We also explore the extent to which past patterns are a reliable guide to the future and the extent to which some changing labour market features could have a bearing on future wage developments.

2. Labour market developments

The growth of the economy in recent years has been supported by strong and broad-based growth in employment, which is currently growing at its fastest rate in a decade, thereby facilitating a sharp fall in unemployment (see Box 1 on Okun's Law, linking unemployment to output, and Figure 1(a)). As Figure 1(b) shows, the composition of employment has shifted away from construction towards services sectors such as education, health, professional services, information and communications, and accommodation and food services. The number and share of workers working in industry has also declined since 2007, by around 1.5 per cent or 40,000 workers. This, however, reflects a long-term decline stretching back to the early 2000s.

Turning to the supply-side, labour force participation – that is, the proportion of the 15-64 year old population in either work or unemployed – declined sharply during the recession (Figure 1(c)). The fall-off for men, from a peak of 82 per cent to just over 76 per cent is particularly stark. As Byrne and O'Brien (2017) point out, the rise and fall in participation reflects both cyclical and structural factors. They show that the rapid rise in labour force participation before the recession was "almost entirely due to the enlargement of the labour force through immigration from new EU member states". The paper also shows that the recovery in female participation in recent years has been driven by a cyclical response to an improving labour market. Figure 1(d) highlights the significant role played by inward migration in Irish employment since the early-2000s. It is noteworthy that by early 2017, non-Irish employment was already approaching pre-recession levels, at 15.8 per cent of total employment (versus a peak share of 16.2 per cent) and 327,000 workers (peak 350,000).

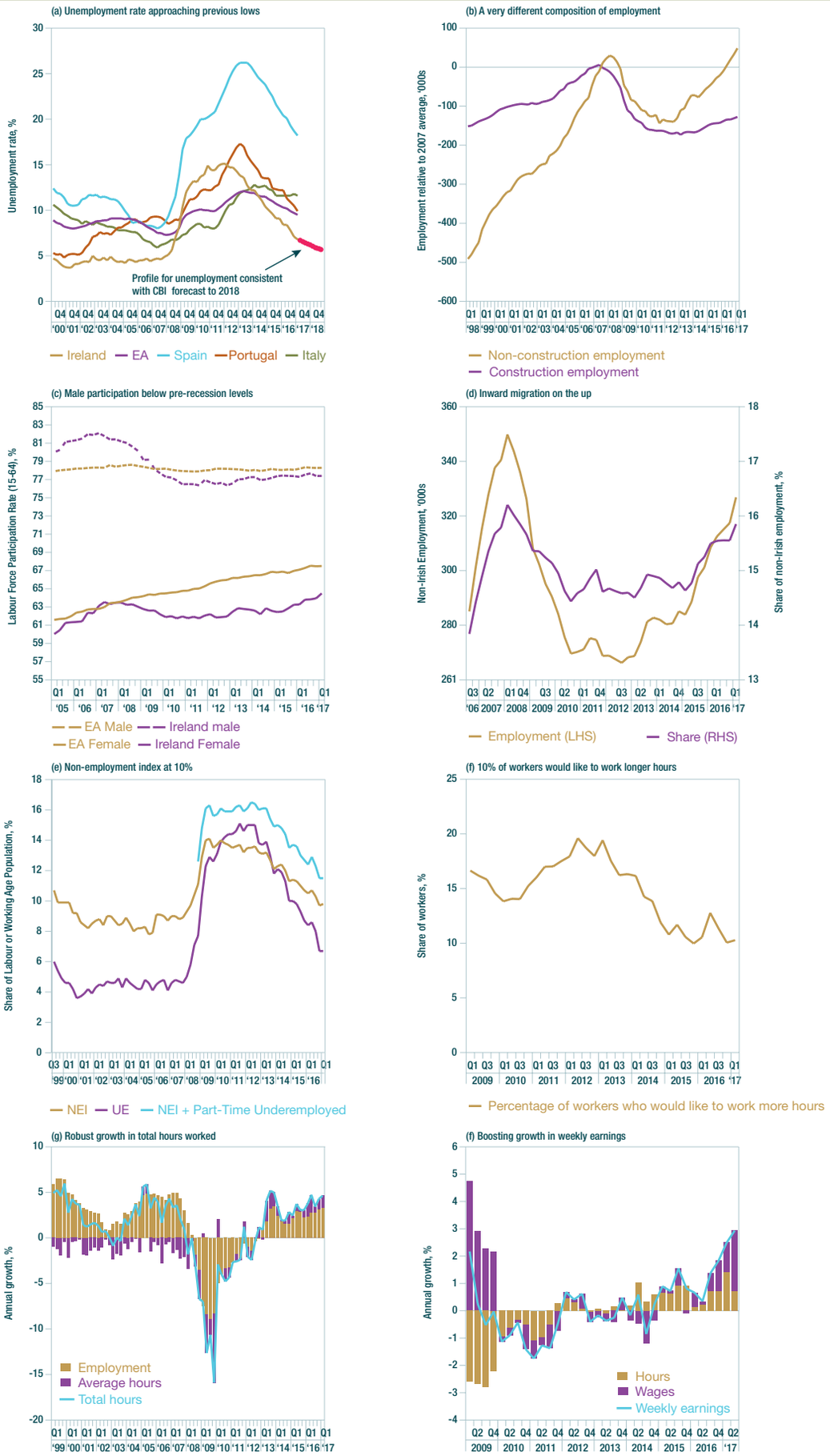
Separately, recent evidence suggests that there may be a greater degree of slack in the labour market than that indicated by the unemployment rate, which may also drag on wage growth. Both ECB (2017) and Yellen (2014) highlight the usefulness of broader measures of slack when analysing wage growth in the recent recovery in Europe and the US. Underemployment, whereby workers are unable to work up to their desired hours, is one factor omitted from the standard (ILO) headline measure of the unemployment rate. As Figure 1(f) shows, in the first quarter of 2017 around one-in-ten Irish workers were willing to work up to 16 hours more per week on average – down from one-in-five at its peak (2013). Moreover, subdued labour force growth has also kept the unemployment rate down without necessarily reflecting a tightening labour market.

For Ireland, a useful alternative measure of slack in the labour market is the non-employment index (NEI) developed by Byrne and Conefrey (2017). In contrast to the narrower ILO definition of the unemployment rate, the NEI measure of labour utilisation includes individuals that are not in the labour force, such as discouraged workers and passive job seekers, and weights them by their probability of finding employment. As well as pointing to a somewhat greater amount of labour market slack than that suggested by the headline unemployment rate (see Figure 1(e)), Byrne and Conefrey (op. cit.) also highlight the comparatively smaller decline in broader measures (including underemployed alongside non-employed) of slack over the course of the recovery.

The final two charts in Figure 1 look at the contribution of average hours worked to total hours worked (i.e. numbers employed multiplied by average hours) and weekly pay. Prior to the recession, average hours worked were in trend decline, reflecting both compositional changes – notably the rise in female participation, which tends to be concentrated in jobs involving irregular work hours – and income effects from higher wages. However, at the onset of the recession, there was a cyclical decline in hours as firms cut back on labour demand. The recovery has seen the steady growth in average hours make a significant contribution to overall total hours, alongside employment growth (see Figure 1(g)). The final chart in Figure 1 shows the contribution of increases in average weekly hours to growth in average weekly pay (nominal). It shows that around half of the growth in average weekly earnings since the second half of 2016 was from increases in average weekly hours of work. We return to the subject of hourly wage growth in the next section.

As regards unemployment and unemployment dynamics, Box 1 re-examines the historical relationship between output growth and changes in unemployment using a new indicator for domestic economic activity, i.e. modified domestic demand (MDD). Having broken down in the recent past, when using GDP as the measure of economic activity, Box 1 re-establishes Okun's Law in an Irish context and forecasts unemployment going forward. This points to a further decline in unemployment to below 6 per cent in 2018.

Figure 1: Labour Market Indicators



Source: CSO, QNHS & EHECS, Eurostat.

Box 1: Unemployment and output – Okun's law with modified domestic demand

In 2017, the CSO published new indicators of the level of economic activity, designed to exclude globalisation effects that affect traditional measures, such as GDP. One of the new measures – Modified Total Domestic Demand, or MDD – is specifically designed to provide greater insight into activity within the domestic economy and is more closely related to employment growth as it focuses on the physical capital used to produce domestic output (see CSO, 2017). This box tests how successfully it achieves this aim by estimating the historical relationship between unemployment and output fluctuations using both GDP and MDD (Okun, 1962).

Figures B1.1 and B1.2 plot the quarterly change in unemployment against changes in GDP or MDD, for the 1998 to 2017 period. There is a negative correlation between unemployment and output, with some notable outliers particularly for the sub-period 2008-2010 and 2015. The latter relates to the exceptional (GDP) growth rates recorded in that year while the former relates to the rapid rise in unemployment during the crisis.

Figure B1.1: Okun's Law with GDP

Source: CSO and authors' calculations.

Figure B1.2: Okun's Law with MDD

Source: CSO and authors' calculations.

We now model the Okun's Law relationship using both GDP and MDD as a measure of output. Our specification is in first differences (quarterly changes) with output entering the equation in log form. We include three lags of differenced output to capture the dynamics of the relationship. We also include a lag of the change in the unemployment rate to deal with stationarity issues. See Equation 1 below, which is estimated from 1998Q2 to 2017Q2.

$$(1)\ \Delta U_t = \alpha + \beta(\Delta Y_t) + \beta(\Delta Y_{t-1}) + \beta(\Delta Y_{t-2}) + \beta(\Delta Y_{t-3}) + \delta(\Delta U_{t-1}) + \omega_t$$

We find that the MDD model explains more of the variation in the unemployment rate than the alternative model using GDP.[1] We find that the sum of the coefficients on lagged MDD (-0.25) is close to previous estimates of the Okun coefficient for Ireland (see Conefrey et al., 2014). We then use our forecasts for MDD to 2018 to forecast the unemployment rate.[2] Results are shown in the table below, with the model predicting an average unemployment rate of 6.2 per cent in 2017 (the monthly average in the year to August is 6.4 per cent) and a fall to 5.6 per cent in 2018.

1 Our GDP specification includes a dummy for 2015.

2 We smooth the annual forecasts for the remainder of 2017 and 2018.

Table B1.1: Forecasting Unemployment with MDD

	2016 (actual)	2017f	2018f
Unemployment Rate	7.9%	6.2%	5.6%

Figure 2: Labour Market Heat Map 2004Q1 to 2017Q1

Source: Authors' calculations based on: QNHS, EHECS, QNA.
Note: Heat map shadings are determined by the number of standard deviations from the mean. A growth rate two standard deviations below the mean is assigned the darkest red, a growth rate two standard deviations above the mean is shaded the darkest green.

Taking another approach to examine overall labour market conditions, we build on the methodology employed in Byrne and Smyth (2016) and construct a labour market heat map covering employment, unemployment, mobility, labour force, and hours (Figure 2). For each variable, we take the longest time series available and standardise the year on year growth rate for each quarter, which abstracts from seasonality concerns.[3] We then assign colour bands from red to green, to depict whether a series is below or above average, respectively, or at its long-run average (neutral). Although the series span a relatively short sample period – quarterly labour market data only starts in 1998 – there are a number of cyclical peaks and troughs over the past 19 years. This is a rich period of analysis encompassing the Celtic Tiger years, the housing bubble, the financial crisis and the subsequent recovery.

For many variables, the heatmap tells a similar story to the charts in Figure 1, that of a labour

3 An alternative approach might be to exclude periods when clear imbalances existed – for example, the years in the lead up to the financial crisis. However, we felt it was more appropriate to include the longest possible data sets whenever possible.

market experiencing a robust recovery. The pick-up in employment and the decline in unemployment (inverted for the purposes of the heat map) are clearly visible. Aside from wages (discussed below), three variables, stand out: flows into and out of employment (hires and exits)[4] and job vacancies. We discuss each in turn.

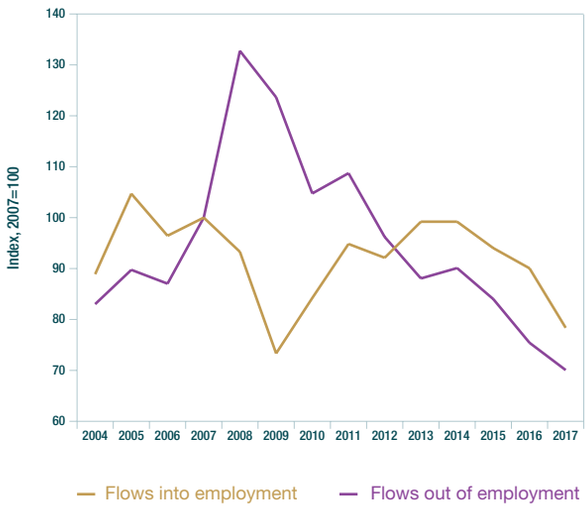
2.1 Flows into and out of employment

Flows into and out of employment provide a useful insight into the supply-demand balance in the labour market, a key factor when it comes to thinking about the influence of 'slack' on wage growth. As the heatmap suggests, the exit rate from employment has declined steadily since the start of the turnaround in the labour market. However, in recent quarters the hires rate has slowed somewhat, having peaked earlier on in the recovery. Figure 3 shows this by plotting the number of workers flowing into and out of employment. Given that output growth has showed little sign of weakening in the last two years, the slowdown in the flow into employment could point to an increase in labour productivity. It could also be early evidence of a declining pool of potential labour supply, and therfore less slack in the economy. Given the potential for both of these factors to impact on wage growth, we return to this issue in Section 3 below.

2.2 Job Vacancies

The number of job vacancies posted by firms, as published by the CSO since 2008, is indicative of the number of job openings, and is therefore an important part of aggregate labour demand.[5] The number of vacant jobs is linked to the unemployment rate via the job-matching process – if this process is functioning properly, vacancies will be filled and a higher availbility of work will lead to a lower unemployment rate. We plot the relationship between the vacancy rate and the unemployment rate, known as a

Figure 3: Flows into and out of employment (2007=100)



Source: CSO.

Note: Flows into employment consist of all those moving from unemployment or inactivity into employment in the past year. Flows out of employment consist of all those moving from employment to non-employment in the past year.

Beveridge Curve, in Figure 4.[6] Typically, cyclical fluctuations in the business cycle generate movements along the curve. For example, an environment of low vacancies and high unemployment sees a move down and to the right along the curve. Shifts in the curve can signal structural changes in the economy. The curve appeared to shift outwards after the onset of recession, signalling a breakdown in the job-matching process from 2009 onwards. In recent quarters, momentum in the falling unemployment rate and increasing vacancy rate has seen a move along the curve, up and to the left, consistent with a cyclical upturn in the Irish economy.

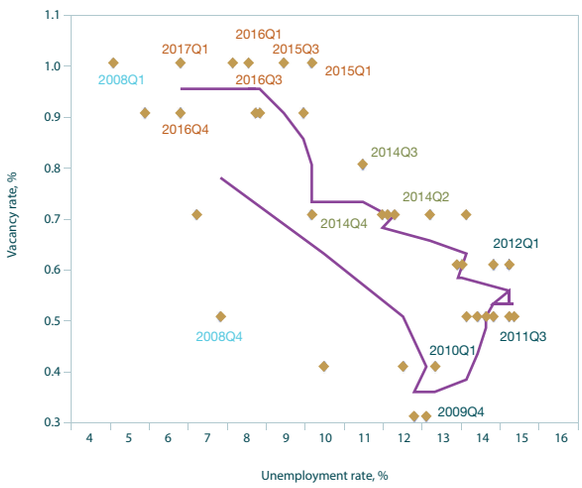
In summary, a range of indicators show that the labour market has recovered strongly from the recession, while overall compensation and hourly earnings growth remain subdued when compared to the pre-crisis period. However,

4 Exits are also inverted for the purposes of the heat map.

5 A job vacancy is defined as a newly created, unoccupied, or about to become vacant post on a specific reference date. A post open to internal candidates is not considered a job vacancy. It is important to point out that not all job openings appear as posted job vacancies, and vacancies are therefore likely to understate the level of aggregate demand; see Davis, Faberman and Haltiwanger (2013).

6 The vacancy rate is defined as the ratio of job vacancies to vacancies and occupied positions.

Figure 4: Beveridge Curve



Source: CSO and authors' calculations.

Figure 5: Growth in Real Wages and Vacancies (2017)

Source: CSO (EHECS).

*IT is the average growth from 2014-2016. All other sectors is 2016 to 2017 growth.

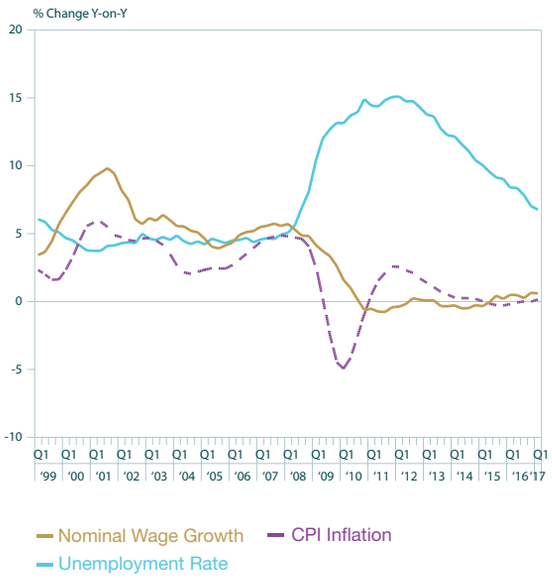
it is useful to extend this analysis to look at sectoral dynamics, as aggregate measures can mask variation across sectors in the labour market. Figure 5 shows that some sectors are experiencing stronger wage growth than others and the vacancy rate seems to be positively linked with this growth. High skill sectors such as finance, professional activities and IT have both relatively high vacancy rates and higher wage growth, suggesting that labour tightness in those particular sectors may be leading to stronger wage growth. This emphasises the importance of a careful examination of the factors driving wages before any conclusions are drawn. We undertake this in the next section.

3. Wage growth

The behaviour of nominal wages, at least in the short to medium term, is determined by demand and supply factors in the labour market and inflation. In the longer term wage movements are also affected by trends in productivity and the labour share of income. As an economy and aggregate demand expand, this creates an environment in which firms require additional labour to satisfy increased demand. This additional labour can vary in terms of its composition, as extra workers are hired or existing employees work longer hours. As new workers are hired, the pool of available additional labour shrinks, leading to a tighter labour market. This creates the conditions for wage increases as firms compete to hire the available additional labour and to retain their incumbent workforce. Inflation expectations also play an important role in wage determination as employees will seek to increase their wages to maintain their standard of living as prices rise.

The previous analysis suggests that several key indicators are signalling a tighter labour market going forward. Figure 6 shows that, after a decade of strong nominal (5.7 per cent) and real (2.7 per cent) growth up to 2008, nominal wages have been broadly flat over the last seven years. Nevertheless, it is important

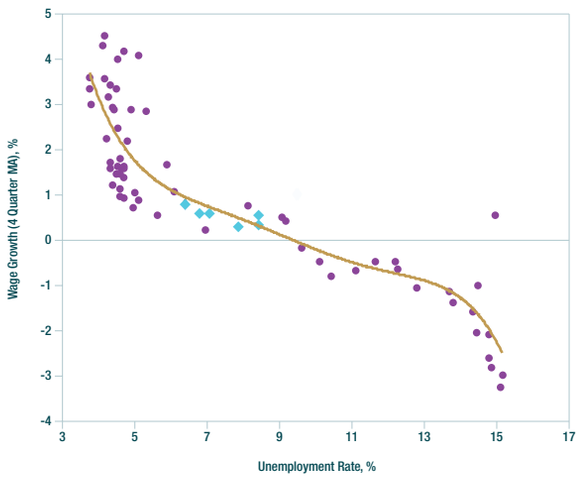
Figure 6: Nominal Wage Growth, Inflation and Unemployment



Source: CSO.

Notes: Wage growth figures are a four-quarter moving average. Wage growth is defined as the annual change in hourly earnings. Data from 2008 is from EHECs (Table EHQ03). For earlier years, we use historical weekly earnings data for Services (QEQ01), Industry (QIJQ1/QIPQ1), Financial Services (BIQ01), Construction (BDQ01). Weekly earnings are then divided by usual hours of work (QNHS) to get hourly earnings. The growth rates from the pre- and post-2008 sources are merged.

Figure 7: Real Wage Growth and Unemployment



Source: CSO and authors' calculations.

Notes: Blue points indicate the period from 2016q1-2017q2. Wages are defined as average hourly earnings.

to highlight that weak nominal wage growth, against a backdrop of strong employment growth, is not unique to post-crisis Ireland. Indeed the UK and the US have had similar experiences over recent years, which is often termed the 'wage puzzle' (see Saunders (2017) and Yellen (op. cit.)). In fact, and unlike the case in Ireland, the US and the UK have had low unemployment rates for much of the past decade, indicating a low degree of slack in the labour market, yet aggregate wage growth has remained weak in these economies. The second half of 2016 saw a return to low levels of nominal wage growth, in Ireland, which appears to have continued into 2017 and picked-up pace in the last quarter (although, as the CSO points out, quarterly data is subject to revision). The focus in this section is average wage or earnings growth.

It should be emphasised, however, that there are differences across sectors and types of workers that give rise to these average trends as is evident in the earlier chart on vacancies and wage growth (Figure 5).[7]

3.1 Wages and Unemployment

While the rapid fall in unemployment from its peak in 2012 may lead to expectations of wage increases, the historical relationship between wage growth and the unemployment rate does not necessarily suggest that this will be the case. Figure 7 plots real wage growth against the unemployment rate from 1999Q1 to 2017Q2.[8] The relationship is non-linear, with real wage growth broadly flat in the 5 per cent to 10 per cent unemployment

7 See Walsh (2012) and Bergin, Kelly and McGuninness (2012) for an in-depth analysis of compositional factors and earnings trends in the recession. Explanations for the missing wage growth 'puzzle' in the US and UK – i.e. weak wage growth during a prolonged period of low unemployment – have also examined the role of compositional factors; see, for example, Daly and Hobijn (2016).

8 Note that 2009Q1-2010Q2 is excluded as exceptional real wage growth over this period was driven by a collapse in consumer price inflation.

Table 1: Phillips curve 2000-2017

Annual percentage change in nominal wages	Coefficient	Standard error
Inflation (CPI)[a]	0.93***	(0.34)
Unemployment	-5.75***	(1.68)
Unemployment^2	0.62***	(0.18)
Unemployment^3	-0.022***	(0.006)
Change in unemployment	0.13	(0.25)
Output per worker[b]	0.34***	(0.11)
Migration (% growth in non-Irish employment)	-0.045***	(0.015)
Nominal effective exchange rate (change)	-0.045*	(0.023)
Constant	17.60***	(5.51)
Observations	64	
Time	2000q1-2017q2	
R-squared	0.931	

Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

(a) Inflation is instrumented with the lag of the oil price; (b) Output per worker is a three-year moving average and is from the OECD productivity database, except for 2015 where we use growth in modified domestic demand to smooth out exceptional increases in GDP due to the activities of multinationals in Ireland which are largely unrelated to domestic economic output (see Box 1). The sample period (2000Q1-2017Q2) is determined by the availability of quarterly migration data from the QNHS (the percentage of non-Irish workers in total employment). Coefficients from a model using data back to 1995 (excluding migration) are very similar.

range.[9] Outside of this range, real wages tend to be more responsive to changes in the unemployment rate. For example, the period from 2000 to 2007, when unemployment was under 5 per cent, saw real wage growth averaging 2.2 per cent per year. Conversely, when unemployment was above 10 per cent from 2010 to 2015, annual real wage growth averaged -0.3 per cent. The blue-coloured points on the chart show the most recent data points, from 2016Q1 to 2017Q2. It is important to point out that the relationship between wage growth and unemployment may be contingent on the sample period available for estimation. The quarterly dataset we have constructed captures three distinct phases of the cycle: a prolonged period of low unemployment (1999-2007), followed by a period of rising and high unemployment (2008-2012), followed again by a period of falling and, more recently, low unemployment (2013 onwards).

To more formally examine the determinants of wage growth, we estimate a wage Phillips curve relating changes in nominal wages to unemployment (level and changes), inflation, productivity, migration and changes in the nominal effective exchange rate. The analysis and results are very similar to Leddin (2010).[10] The regression results are shown in Table 1. The results indicate that both slack (unemployment) and inflation are important factors for nominal wage growth.[11] Trend productivity growth, measured here as a 3-year moving average, is, as expected, positively correlated with nominal wage growth. The last two terms – migration and the effective exchange rate – are included to capture the impact of potential labour supply and margin pressures that could affect firms' ability to award pay increases. Both factors are negatively correlated with nominal wage growth, as expected.

9 Bermingham et al. (2012) also find evidence of threshold effects in the Irish Phillips curve. Phillips, in his original work on wages and unemployment, also explicitly considered the possibility of non-linearities in the relationship, Phillips (1958).

10 With one significant difference: to approximate the shape of the wage growth-unemployment relationship in Figure 7, the unemployment level is included as a cubic polynomial.

11 Although, the inclusion of the cubic terms for unemployment means that its influence is greater at higher or lower levels of unemployment. The rate of change in unemployment matters also, but only when unemployment is falling, i.e. accelerating wage growth when unemployment is falling.

Given the results in Table 1, the obvious question is what does the path forecast for unemployment (to end-2018) imply for nominal wage growth. To make this prediction, we make the following assumptions about the path for the other variables: inflation, 0.7 per cent in 2017, 1.3 per cent in 2018 (from the forecasts in Central Bank Quarterly Bulletin Q3 2017); output per worker, 3 per cent (three-year average); migration, 6 per cent growth in non-Irish employment (2017 year-to-date mean value); no change in the nominal effective exchange rate. Putting all of this together gives a prediction for nominal hourly wage growth in 2018 of just under 2.8 per cent, and 1.5 per cent in real terms (the value for 2017Q2 was 2.2 per cent[12]). Allowing for an increase in average hours broadly in line with that of 2016 (of around 0.4 per cent) implies an overall nominal increase in compensation per employee of 3.2 per cent in 2018.

3.2 The past as a reliable guide to the future?

As pointed out earlier, the regression results are really only useful to the extent that the past is a reliable guide to the future. On this issue, two related questions arise. First, has the natural rate of unemployment – i.e. the point at which full employment is reached and nominal wage pressures build – shifted during the recession/recovery? Second, have changes to the institutional wage bargaining framework affected the rate at which wages might be expected to grow?

Changes in structural unemployment can shift the natural rate of unemployment. Looking at the latest unemployment trends, particularly the continued fall in long-term unemployment, does not suggest that there has been a significant increase in the natural rate, although it may be some time before a clear picture emerges. Whilst the share of long-term unemployed is higher than pre-recession levels – for example, 55 per cent in 2017Q1 compared with 32 per cent for the 2000-2007 period – it has been falling steadily since the start of the recovery. Wider measures of slack, such the Non-Employment Index in Figure 1(e), are also close to, or approaching, pre-recession levels.

Institutional changes in the wage-setting process also have implications for future wage growth. As Leddin (2010) shows, previous bargaining agreements with benchmarking had a strong influence on wage setting across the entire economy, and not just those sectors formally signed up to the agreements. Changes in the institutional framework, could therefore lead to quite different wage growth-employment outcomes. For example, there is some evidence of the emergence of other forms of collectivised wage setting, such as pattern bargaining, whereby an agreement between employees and (a leader) firm within a sector are mirrored by other firms. As Calmfors and Seim (2013) point out, pattern bargaining can promote wage-moderation if the 'leader' firm is in the tradables sector and exposed to international competition.[13]

An extended period of low inflation may have implications for wage setting behaviour and the natural rate of unemployment (see Holden, 2003). These include a slower rate of downward real wage adjustment than would have been the case with a higher inflation rate, due to downward nominal wage rigidity. For instance, results from the ESCB Wage Dynamics Research Network indicates the presence of downward wage rigidities in a number of European countries.[14] In addition, as prices, including wages, are denominated in nominal terms, inflation dynamics affect the frequency of wage adjustment and the forward-looking component of the wage setting process. In Ireland, the effect of

12 This is the annual growth rate in Q2 2017 of seasonally adjusted hourly earnings in EHECS. We use this series because it is the closest match to the pre-2008 data we use to construct a longer time series. An alternative is the annual growth rate for the series *excluding* irregular earnings, which, in Q2 2017, is slightly lower at 1.5 per cent. However, the trend movement in the two series is very similar.

13 Although the main point of the Calmfors and Seim (2013) paper is to question this 'conventional wisdom'. They show that in a small, open economy pattern bargaining does not always result in wage restraint and high employment in equilibrium, in particular as the relative size of the 'tradables' sector declines.

14 See Keeney and Lawless (2010) and Linehan, Lydon and Scally (2015).

downward nominal wage rigidity on the optimal adjustment of real wages, in the presence of low inflation since 2009, may have been mitigated by two factors. The high number of exits from employment between 2008 and 2012, and the lower wages of new entrants to employment during the recession and early recovery periods (see Conefrey and Smith (2013) and Lydon and Lozej (2016)). However, the prevailing low inflation environment has likely contributed to subdued wage growth over recent years as one possibility is that gains in real terms may have moderated demands for wage increases.

A perception of increased job insecurity versus the pre-recession years could also contribute to wage restraint on the part of workers. For instance, there is some evidence that the costs of losing a job increased significantly during the recession and remained high during the early years of the recovery. Using data from 2005-14, Lydon and Lozej (2016) find that the wages of new hires fell by almost 20 per cent during the recession, and have remained at that level up to 2014. To the extent that individuals' wages are path dependent, this could interpreted as evidence of 'wage scarring', whereby unemployment experiences in the recession continue to weigh on wages long after the recovery has started.[15]

4. Conclusions

The improvement across a range of Irish labour market indicators provides clear evidence of a well-established labour market recovery from the recession. One noteworthy exception in terms of this recovery has, however, been wage growth – both overall compensation and hourly earnings growth have proven modest relative to the pre-crisis period. Even now, when several key indicators are signalling a tighter labour market going forward, Irish wage growth remains subdued.

There are a number of potential reasons behind this weakness. The evidence presented here suggests that some of the post-crisis weakness may be attributed to temporary factors (including low inflation and changes in employment composition) as well as how slack is measured (unemployment versus non-employment). In addition, our examination of the determinants of wage growth points to a non-linear relationship between wage growth and unemployment, whereby the degree of sensitivity of wages is higher during periods of low or high unemployment. In view of this and given the short-term outlook for unemployment, nominal hourly wage growth below but close to 3 per cent is envisaged for 2018.

It is nevertheless important to note that historical trends, from a wage perspective, may not necessarily prove to be a reliable guide to future developments for a variety of reasons. First, the natural rate of unemployment may have shifted, for example due to changes in the structural unemployment rate. Much will also depend on the effects of productivity and competitiveness trends, wage bargaining processes and crisis memory or scarring effects, all of which are very difficult to predict in the short to medium term.

15 See Saunders (2017) for UK evidence on wage scarring.

References

Bergin, Adele, Elish Kelly, and Seamus McGuinness. 2012. “Explaining changes in earnings and labour costs during the recession.” Renewal Series Paper, No. EC9, Economic and Social Research Institute, Dublin.

Bermingham, Colin, Dermot Coates, John Larkin, Derry O’ Brien and Gerard O’Reilly. 2012. “Explaining Irish Inflation During the Financial Crisis.” Research Technical Paper, 9/RT/12, Central Bank of Ireland, Dublin.

Byrne, Stephen, and Thomas Conefrey. 2017. “A Non-Employment Index for Ireland.” Economic Letter No. 09/EL/17. Central Bank of Ireland, Dublin.

Byrne, Stephen, and Martin D. O’Brien. 2017. "Understanding Irish Labour Force Participation." *The Economic and Social Review* 48.1, Spring 2017: 27-60.

Byrne, Stephen, and Diarmaid Smyth. 2016. “A Macroeconomic Heatmap for Ireland.” Quarterly Bulletin No.2 2016. Central Bank of Ireland, Dublin.

Calmfors, Lars, and Anna Larsson Seim. 2013. "Pattern bargaining and wage leadership in a small open economy." *The Scandinavian Journal of Economics* 115.1: 109-140.

Central Statistics Office. 2017. “Macroeconomic releases Year 2016 and Quarter 1 2017.” Press Statement, Central Statistics Office, Dublin.

Conefrey, Thomas, and Richard Smith. 2014. "On the slide? Salary scales for new graduates 2004-2012." Economic Letters 1, Central bank of Ireland, Dublin.

Conefrey, Thomas, Martina Lawless, and Suzanne Linehan. 2014. "Developments in the Irish labour market during the crisis: what lessons for policy?" *Journal of the Statistical & Social Inquiry Society of Ireland,* No. 44.

Daly, Mary C., and Bart Hobijn. 2016. "The intensive and extensive margins of real wage adjustment." Federal Reserve Bank of San Francisco Working Paper: 2016/4, Federal Reserve Bank of San Francisco, San Francisco.

Davis, Steven J., R. Jason Faberman, and John C. Haltiwanger. 2013. "The establishment-level behavior of vacancies and hiring." *The Quarterly Journal of Economics* 128.2: 581-622.

European Central Bank. 2017. “Assessing Labour Market Slack.” Economic Bulletin Issue 3, 2017: 31-35, European Central Bank, Frankfurt.

Holden, Steinar. 2005. “Wage Formation under Low Inflation.” In (Hannu Piekkola and Kenneth Snellman, eds.) *Collective Bargaining and Wage Formation*. Physica-Verlag, Heidelberg, Germany.

Keeney, Mary, and Martina Lawless. 2010. "Wage setting and wage flexibility in Ireland: Results from a firm-level survey." Working Paper Series, No 1181/April 2010, European Central Bank, Frankfurt.

Leddin, Anthony 2010. “The Philips Curve and the Wage-Inflation Process in Ireland”, in (S. Kinsella and A. J. Leddin, eds.), *Understanding Ireland's Economic Crisis: Prospects for Recovery,* pp. 159–77, Blackhall Publishing, Dublin.

Linehan, Suzanne, Reamonn Lydon, and John Scally. 2015. "Labour Cost Adjustment during the Crisis: Firm-level Evidence." Quarterly Bulletin Articles 2015: 73-92, Central bank of Ireland, Dublin.

Lydon, Reamonn, and Matija Lozej. 2016. “Flexibility of new hires' earnings in Ireland.” Research Technical Paper, No. 06/RT/16. Central Bank of Ireland, Dublin.

Okun, Arthur M. 1962. “Potential GNP: Its Measurement and Significance,” *American Statistical Association, Proceedings of the Business and Economics Statistics Section,* pp. 98–104.

Phillips, A.W. 1958. “The relation between unemployment and the rate of change of money wage rates in the United Kingdom, 1861-1957.” E*conomica, 25*(100), pp 283-299.

Saunders, Michael. 2017. “The Labour Market.” Bank of England Speech given at the Resolution Foundation, 13 January 2017, London.

Yellen Janet L. 2014. “Labor Market Dynamics and Monetary Policy.” Speech at the Federal Reserve Bank of Kansas City Economic Symposium, 22 August 2014, Jackson Hole, Wyoming.

Walsh, Kieran. 2012. "Wage bill change in Ireland during recession-how have employers reacted to the downturn?" *Statistical and Social Inquiry Society of Ireland,* Vol.41, 2011-2012, pp 39-70.

Statistical Appendix

Statistical Appendix

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

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

STATISTICAL TABLES: CENTRAL BANK WEBSITE LINKS

Money and Banking:
https://www.centralbank.ie/statistics/data-and-analysis/credit-and-banking-statistics/bank-balance-sheets
- Summary Irish Private Sector Credit and Deposits
- Financial Statement of the Central Bank of Ireland
- Credit Institutions – Aggregate Balance Sheet
- Credit Institutions (Domestic Market Group) – Aggregate Balance Sheet

Business Credit and Deposits:
https://www.centralbank.ie/statistics/data-and-analysis/credit-and-banking-statistics/business-credit-and-deposits
- Credit Advanced to Irish Resident Private-Sector Enterprises
- Deposits from Irish Resident Private-Sector Enterprises

Private Household Credit and Deposits:
https://www.centralbank.ie/statistics/data-and-analysis/credit-and-banking-statistics/private-household-credit-and-deposits
- Credit Advanced to and Deposits from Irish Private Households

Money Market Funds:
https://www.centralbank.ie/statistics/data-and-analysis/other-financial-sector-statistics/money-market-funds
- Money Market Funds Aggregate Balance Sheet
- Money Market Funds Currency Breakdown of Assets

Retail Interest Rates:
https://www.centralbank.ie/statistics/data-and-analysis/credit-and-banking-statistics/retail-interest-rates
- Retail Interest Rates - Deposits, Outstanding Amounts
- Retail Interest Rates - Loans, Outstanding Amounts
- Retail Interest Rates and Volumes - Loans and Deposits, New Business
- Official and Selected Interest Rates

Investment Funds:
https://www.centralbank.ie/statistics/data-and-analysis/other-financial-sector-statistics/investment-funds
- Ireland: Investment Funds Data

Securities Holdings and Issue Statistics:
https://www.centralbank.ie/statistics/data-and-analysis/securities-statistics/securities-issues-and-holding-data
- Securities Issues Statistics
- Holding Data

Financial Vehicle Corporations:
https://www.centralbank.ie/statistics/data-and-analysis/other-financial-sector-statistics/financial-vehicle-corporations
- Irish Financial Vehicle Corporations

Locational Banking Statistics:
https://www.centralbank.ie/statistics/data-and-analysis/credit-and-banking-statistics/locational-banking-statistics
- Total Positions of Banking Offices Resident in Ireland vis-a-vis Residents and Non-Residents

Quarterly Financial Accounts:
https://www.centralbank.ie/statistics/data-and-analysis/financial-accounts

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

Public Finances and Competitiveness Indicators:
https://www.centralbank.ie/statistics/data-and-analysis/securities-statistics/holdings-of-long-term-irish-government-bonds

- Holdings of Irish Government Long-term Bonds

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

- Gross National Debt
- Nominal and Real HCIs

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