Banc Ceannais na hÉireann
Central Bank of Ireland

Eurosystem

Financial Stability Review 2019: II

Contents

Notes

1. Unless otherwise stated, this document refers to data available on 15 November 2019.

2. Irish retail banks refer to the five banks offering retail-banking services withinthe Irish State: Allied Irish Banks plc, The Governor and Company of the Bank of Ireland, Permanent TSB, KBC Bank Ireland plc and Ulster Bank Ireland Designated Activity Company.

3. The following symbols are used:

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

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Preface

The Central Bank serves the public interest by safeguarding monetary and financial stability and by working to ensure that the financial system operates in the best interests of consumers and the wider economy.

The *Financial Stability Review* evaluates the main risks facing the financial system and assesses the resilience of the financial system to those risks. A resilient financial system is one that is able to provide services to Irish households and businesses, both in good times and in bad. The Central Bank's policy actions seek to ensure that the financial system is able to absorb, rather than amplify, adverse shocks.

The structure of this publication mirrors the overall approach the Central Bank takes in reaching a judgement around its macroprudential policy stance.

- The first section outlines the Central Bank's assessment of the main risks facing the Irish financial system over the short to medium term.
- The second section outlines the Central Bank's assessment of the resilience of the domestic financial system to adverse shocks and its ability to absorb, rather than amplify, shocks of this nature.
- The third section explains the Central Bank's policy actions to safeguard financial stability and ensure that the resilience of the financial system is proportionate to the risks it faces.

Ireland is host to a large and diverse financial sector. A growing part of that financial sector serves international clients, with limited direct implications for the domestic economy. This publication focuses on the segments of the financial sector that provide services to Irish households and businesses.

The *Review* reflects, and is informed by, the deliberations of the Central Bank's Financial Stability Committee and Macroprudential Measures Committee. The aim of the *Review* is not to provide an economic forecast, but instead focuses on the potential for negative outcomes to materialise. The Central Bank is committed to transparency over its judgements around financial stability and plans to use this publication as a key vehicle to explain the policy actions taken, within its mandate, to safeguard financial stability.

Réamhrá

Freastalaíonn an Banc Ceannais ar leas an phobail trí chobhsaíocht airgeadaíochta agus airgeadais a choimirciú agus trína áirithiú go bhfuil an córas airgeadais ag feidhmiú ar mhaithe le leas na dtomhaltóirí agus leas an gheilleagair níos leithne.

San Athbhreithniú ar Chobhsaíocht Airgeadais, déanaimid measúnú ar na príomhrioscaí atá os comhair an chórais airgeadais agus ar athléimneacht an chórais airgeadais in aghaidh na rioscaí sin. Is córas airgeadais athléimneach é córas inar féidir seirbhísí a chur ar fáil do theaghlaigh agus do ghnólachtaí Éireannacha le linn tréimhsí maithe agus drochthréimhsí araon. Le gníomhaíochtaí beartais an Bhainc Ceannais, féachtar lena áirithiú go bhfuil an córas airgeadais in ann turraingí dochracha a sheasamh seachas iad a mhéadú.

Tagann struchtúr an fhoilseacháin seo leis an gcur chuige a ghlacann an Banc Ceannais chun teacht ar a thuairim faoina sheasamh maidir le beartas macrastuamachta.

- Sa chéad mhír, déantar cur síos ar mheasúnú an Bhainc Ceannais ar na príomhrioscaí atá roimh an gcóras airgeadais Éireannach sa ghearrthéarma agus sa mheántéarma.
- Sa dara mír, déantar cur síos ar mheasúnú an Bhainc Ceannais ar athléimneacht an chórais airgeadais intíre in aghaidh turraingí dochracha agus ar a chumas chun risocaí den sórt sin a sheasamh seachas iad a mhéadú.
- Sa tríú mír, déantar cur síos ar ghníomhaíochtaí beartais an Bhainc Ceannais chun cobhsaíocht airgeadais a chosaint agus chun a chinntiú go bhfuil athléimneacht an chórais airgeadais ar comhréir leis na rioscaí atá roimhe.

Is earnáil airgeadais mhór agus ilchineálach í earnáil airgeadais na hÉireann. Tá fás ag teacht ar an gcuid sin den earnáil airgeadais a fhreastalaíonn ar chliaint idirnáisiúnta, agus tá impleachtaí díreacha teoranta ann don gheilleagar intíre. Dírítear san fhoilseachán seo ar na codanna sin den earnáil airgeadais a chuireann seirbhísí ar fáil do theaghlaigh agus do ghnólachtaí Éireannacha.

San *Athbhreithniú*, léirítear breithnithe ón gCoiste um Chobhsaíocht Airgeadais agus ón gCoiste um Bearta Macrastuamachta de chuid an Bhainc Ceannais agus tá na breithnithe sin mar bhonn faisnéise leis an athbhreithniú. Ní hé is aidhm don *Athbhreithniú* réamhaisnéis eacnamaíoch a chur ar fáil. Ina ionad sin, dírítear ar an bhféidearthacht go dtiocfadh torthaí diúltacha chun cinn. Tá an Banc Ceannais tiomnaithe do thrédhearcacht a chuid breithnithe maidir le cobhsaíocht airgeadais agus tá sé beartaithe aige an foilseachán seo a úsáid mar bhealach chun míniú a thabhairt ar na gníomhaíochtaí beartais a ghlactar laistigh dá shainordú chun cobhsaíocht airgeadais a chosaint.

Overview

The small and open nature of the Irish economy means that it is always particularly vulnerable to shocks arising abroad. The Central Bank judges that the main risks to domestic financial stability continue to stem from external developments and that these external risks are elevated at the moment. Structural risks include the ongoing possibility of a disorderly Brexit and the risk of sudden changes in the international trading and tax environment. Cyclical risks stem mainly from the possibility of an abrupt tightening in global financial conditions. The fall in global interest rates since the last *Review* mitigates near-term debt sustainability concerns, but can also build vulnerabilities in the medium term, by underpinning further increases in already high asset valuations and a continued search for yield in global financial markets. Domestically, an economy close to capacity and continued lending growth point to a gradual build-up of cyclical risk, with the potential for pro-cyclical risk taking in the absence of a disorderly Brexit.

The main sources of risk to domestic financial stability are:

Continuing risk of a disorderly Brexit: The path ahead for the United Kingdom's planned exit from the European Union remains uncertain. The Central Bank – working with relevant authorities – has taken action to mitigate the most material and immediate risks to the provision of cross-border financial services between the UK and the EU in the event of a disorderly Brexit. Nonetheless, a disorderly Brexit is expected to lead to a material macroeconomic disruption and its impact would differ by region, sector and firm size. Firms in the agriculture and retail sectors are more reliant on the UK market and are a source of high lending exposure for the domestic banking system. The impact of a disorderly Brexit could be amplified in the near term by heightened uncertainty and market volatility, which could result in a greater-than-expected deterioration in macro-financial conditions.

A sharp repricing of global risk premia after an extended period of search for yield: Global financial conditions have been accommodative for a number of years, and have eased further since the last *Review*. This has resulted in a prolonged period of easing credit standards in parts of the global corporate debt market and increased risk taking by the non-bank financial sector. A sudden reversal in global risk appetite could lead to sharp falls in asset prices and either cause or amplify adverse shocks to global – including Irish – economic activity. The domestic banking system could be affected directly, through exposures to the global leveraged loan market, as well as indirectly, through a generalised cyclical downturn.

Changes in the international trading and tax environment: Ireland is one of the most open economies in the world. The economy is highly integrated in global supply chains and relies significantly on investment by foreign multinational enterprises. As a result, it is particularly exposed to abrupt shifts in international trading and tax arrangements. The probability of such structural shocks has increased recently. US effective tariffs on imports, for example, have increased to levels last seen several decades ago. A further escalation in global trade disputes, combined with shifts in the international tax environment, could have a particularly adverse impact on Ireland, potentially amplified by an increase in the risk premium that foreign investors would attach to Ireland in the face of such shocks.

A re-emergence of sovereign debt sustainability concerns in the euro area: Government debt-to-GDP ratios remain elevated across parts of the euro area, although interest burdens are currently aided by accommodative monetary policy. Euro area banks continue to have significant, and in some cases growing, exposure to their domestic sovereigns and the financial architecture in the euro area remains incomplete. Further downward revisions to growth expectations, higher political uncertainty or a general reappraisal of risk could lead to a re-emergence of European sovereign debt sustainability concerns. Ireland remains vulnerable given the elevated debt position of the government.

Overheating and potential for elevated risk taking: The domestic economy is approaching full capacity and – in the absence of a disorderly Brexit – the outlook for growth is solid. Domestic banks have expanded their large enterprise lending, while new household credit is growing at the highest level in a decade. In such an environment, banks and other financial intermediaries may not fully internalise the collective impact of their individual risk-taking behaviour, especially when profitability remains below market expectations. Any pro-cyclical credit supply response to an overly buoyant economy risks retrenchment when sentiment turns or risks materialise.

Overall, the risk environment is broadly similar to that prevailing in the last *Review*. Domestically, the gradual build-up of cyclical risk has continued since the last *Review*. The high degree of uncertainty around the way in which the UK leaves the EU continues to pose significant challenges to the Irish macro-financial environment. While the further fall in global interest rates since the last *Review* mitigates near-term debt sustainability concerns, this interest rate environment also underpins the potential for further increases in already high asset valuations. There is significant interdependence between risks, which could lead to multiple shocks occurring simultaneously.

With reference to the above risks, the Central Bank assesses the resilience of the financial system and the economy – the ability of the system to absorb, rather than amplify, shocks.

The resilience of the domestic banking system has remained broadly stable over the past six months, at a considerably higher level than five years ago, but profitability challenges have become more acute. Since 2014, Non-Performing Loans (NPLs) on domestic retail banks' balance sheets have fallen by around 85 per cent; capital levels have substantially improved, with the system-wide "fully-loaded" CET1 ratio standing at around 17 per cent; and funding costs, which are primarily deposit-based, are among the lowest in Europe. Overall, the banking system is now better able to absorb shocks, rather than amplify them. Since the last *Review*, however, profitability challenges over the short to medium term have become more acute. High costs, which are above the European average and 25 per cent higher than in 2015, continue to contribute to weaker profits. In addition, there is downward pressure on banks' interest margins from the continued low interest rate environment, while softening house price expectations could increase loan provisions. The level of NPLs is still above international averages and a sustainable reduction in NPLs remains a supervisory priority. Substantial investment is also required to strengthen operational resilience and more progress is needed to enhance resolvability.

The resilience of domestic households and firms continues to improve. The trend of falling household sector indebtedness has persisted since the last *Review*. Debt service ratios continue to decline relative to incomes with the household sector interest burden now lower than at any time over the past 15 years. Nevertheless, vulnerabilities remain, as the households that have defaulted

in the past or have had their loans restructured, are particularly susceptible to shocks. In the corporate sector, the resilience of Irish firms is broadly unchanged since the last *Review*. The largest Irish owned corporates have had stable leverage since 2013. SME deleveraging has continued in aggregate, although there has been some increase in indebtedness among agricultural firms.

Sovereign resilience has strengthened in recent years, but vulnerabilities remain, including the possible reversal of recent increases in corporate tax receipts. At over one hundred per cent of GNI*, the Irish government's debt level remains high, but resilience has improved, as the debt to GNI* ratio has fallen by 35 percentage points since 2013. This decline has been supported by both very strong nominal GNI* growth and below-average interest rates. Public finances are particularly vulnerable to a disorderly Brexit and the potential unwinding of recent corporate tax windfalls, which have driven recent increases in tax revenue.

Non-bank finance has become increasingly important for the domestic property market, but its resilience remains untested. The size of the non-bank financial sector relative to the domestic economy is among the largest globally. While they have a predominantly international focus, Irish-resident investment funds have become increasingly exposed to the domestic real estate market – accounting for one-third of the estimated stock of investable commercial real estate. These Irish real estate funds have higher leverage compared to their European peers, implying greater potential vulnerability to a sharp repricing in global risk premia. At the same time, these funds allow investors to redeem their funds relatively infrequently, suggesting that the risk of forced sales driven by widespread redemptions is mitigated to some extent. The resilience of these non-bank financial entities to a widespread turnaround in market sentiment remains untested. The Central Bank will be conducting a deep dive on property funds to assess the resilience of this growing form of market-based finance to the domestic economy.

The Central Bank uses its macroprudential policies to promote financial stability in Ireland and considers the balance between the risks facing the economy and financial system and their resilience.

The Central Bank has completed the annual review of the mortgage measures, with no change to the LTV and LTI limits or the allowances. The objective of the mortgage measures is to strengthen borrower and lender resilience and to reduce the likelihood that an adverse credit-house price spiral emerges. The Central Bank's annual review of the mortgage measures is based on extensive analysis on the effectiveness of the measures and on broader developments in the mortgage and housing markets. As part of the annual review, the Central Bank engages with key stakeholders to gain broader insights and perspectives into the functioning of both the measures and the wider market.

Key findings of this year's review informing the Central Bank's decision include the following:

- Growth in new mortgage lending, housing market activity and in house prices has continued, but at a slower pace. The share of mortgage-financed purchases by households continues to rise.
- The measures have been effective in maintaining prudent underwriting standards in the mortgage market in recent years, despite the upward pressure on house prices relative to incomes due to supply constraints.

- The measures have become more binding as prices have grown faster than incomes: more households are borrowing at, or close to, the maximum available implied by the limits. This is consistent with the measures being more binding at some points in the cycle and being effective in maintaining prudent lending standards, even in a market which has been supply-constrained.
- Over the course of the year, the supply of new housing has also continued to grow. The supply response to date has been strongest in areas where house prices are higher and it is these areas where the measures are also more binding.
- Central Bank analysis suggests that, in the absence of the mortgage measures, both the proportion of highly-indebted mortgage borrowers and the level of house prices would likely have been significantly higher in 2019 than their current observed levels.
- This implies that the mortgage measures have been effective in strengthening borrower and lender resilience. It also implies that the mortgage measures have been effective in limiting the potential for an adverse credit-house price spiral to emerge.
- While the objective of the mortgage measures is not to target house prices, this analysis also suggests that – in the absence of the mortgage measures – affordability pressures for mortgage borrowers would have been even more acute.

Overall, the Central Bank has judged that the measures – as currently designed and calibrated – continue to meet their objectives.

The Central Bank has kept the Countercyclical Capital Buffer (CCyB) rate at 1 per cent. The CCyB aims to strengthen the resilience of the banking sector to a future downturn. The 1 per cent rate is consistent with the Central Bank's framework, reflecting the continued gradual build-up of cyclical systemic risk, both domestically and globally – although excessive credit growth is not currently apparent in Ireland. The macro-financial outlook in Ireland is subject to significant uncertainty and the Central Bank remains ready to adjust the CCyB rate in either direction as appropriate.

The Central Bank has completed the annual review of the O-SII framework, identifying six institutions as systemically important with buffer rates between 0.5 and 1.5 per cent. The objective of the O-SII buffer is to reduce the probability of failure of systemically important financial institutions, given the potentially greater impact of failure of those institutions on the domestic economy. Two institutions (Barclays Bank Ireland plc and Bank of America Merrill Lynch International DAC) have been designated as O-SIIs for the first time, both with a buffer rate of 0.75 per cent. Two institutions (Unicredit Bank Ireland plc and Depfa Bank plc) are no longer designated as O-SIIs. The 2019 review has resulted in no policy change for the four other existing O-SIIs (AIB Group plc, Bank of Ireland Group plc, Citibank Holdings Ireland Ltd and Ulster Bank Ireland DAC).

The Central Bank aims to complete the macroprudential framework for bank capital. The Irish economy is small and highly globalised. As a result, it is both more sensitive to developments in the global financial cycle and more prone to structural macroeconomic shocks. A resilient banking system requires sufficient capital buffers to absorb these structural shocks. In July 2019, the Minister for Finance agreed to transpose the systemic risk buffer (SyRB) into Irish law and to designate its implementation and calibration to the Central Bank. The Central Bank will announce the buffer rate and any phase-in period after legislation has been provided. The SyRB completes the macroprudential framework for bank capital, but it is only one element of the overall bank

capital framework that is appropriate for a small, highly-globalised economy, such as Ireland. The Central Bank will continue to develop this broader capital framework and consider the mix and interactions between instruments and buffers, including in the context of forthcoming changes stemming from the implementation of relevant European legislation as well as future changes to the Basel framework.

Forbhreathnú

Toisc gur geilleagar beag, oscailte é geilleagar na hÉireann, tá sé leochaileach do thurraingí ó thar lear. Measann an Banc Ceannais go n-eascraíonn na príomhrioscaí don chobhsaíocht airgeadais intíre as forbairtí seachtracha agus go bhfuil na rioscaí seachtracha sin ardaithe faoi láthair. Ar na rioscaí struchtúracha, áirítear an fhéidearthacht leanúnach go mbeidh Brexit mí-ordúil ann agus an riosca go mbeidh athruithe ar an timpeallacht idirnáisiúnta trádála agus cánach. Eascraíonn rioscaí timthriallacha as an bhféidearthacht go mbeidh daingniú tobann ar dhálaí airgeadais domhanda. Leis an titim ar rátaí domhanda úis ó foilsíodh an t*Athbhreithniú* deireanach, maolaítear an imní a bhaineann le hinbhuanaitheacht fiachais sa ghearrthéarma ach cruthaítear leochaileachtaí sa mheántéarma trí thaca a chur faoi mhéaduithe breise ar luachálacha sócmhainní atá ard cheana féin agus faoi chuardach leanúnach torthaí. Sa chríoch baile, tá an geilleagar ag druidim i dreo na lánacmhainneachta agus tá fás leanúnach ar iasachtú, rud a thugann le fios go bhfuil carnadh céimseach riosca thimthriallaigh ann, agus tá an fhéidearthacht ann go nglacfar rioscaí comhthimthriallacha in éagmais Brexit mí-ordúil.

Is iad seo a leanas na príomhfhoinsí riosca don chobhsaíocht airgeadais intíre:

Riosca leanúnach maidir le Brexit mí-ordúil: Tá éiginnteacht ag baint i gcónaí leis an gconair a leanfaidh an Ríocht Aontaithe chun imeacht as an Aontas Eorpach. Tá gníomh glactha ag an mBanc Ceannais, agus é ag obair le húdaráis ábhartha, chun maolú a dhéanamh ar na rioscaí ábhartha agus láithreacha is mó do sholáthar seirbhísí airgeadais trasteorann idir an Ríocht Aontaithe agus an AE i gcás Brexit mí-ordúil. Ar a shon sin, meastar go mbeadh saobhadh maicreacnamaíoch ábhartha ann i gcás Brexit mí-ordúil agus go mbeadh tionchar éagsúil aige ag brath ar an réigiún, ar an earnáil agus ar mhéid an ghnólachta atá i gceist. Bíonn gnólachtaí sna hearnálacha talmhaíochta agus miondíola ag brath níos mó ar mhargadh na Ríochta Aontaithe agus is foinse risíochta iad don chóras baincéireachta intíre ó thaobh iasachtú ard. D'fhéadfaí go méadófaí an tionchar a bheadh ag Brexit mí-ordúil sa ghearrthéarma le héiginnteacht ardaithe agus luaineacht margaí, rud a d'fhéadfadh meathlú níos measa ná mar a bheifí ag súil leis ar dhálaí macra-airgeadais a chruthú.

Athphraghsáil ghéar ar phréimheanna riosca domhanda i ndiaidh tréimhse fhada de chuardach torthaí: Tá dálaí in-comhfhoirmeacha airgeadais domhanda i réim le roinnt blianta anuas agus tá maolú tagtha orthu tuilleadh ó foilsíodh an *tAthbhreithniú* deireanach. De thoradh an méid seo, bhí tréimhse fhada ann inar maolaíodh caighdeáin chreidmheasa i gcodanna den mhargadh fiachais chorparáidigh domhanda agus inar glacadh níos mó rioscaí san earnáil airgeadais neamhbhainc. D'fhéadfadh titim ghéar ar phraghsanna sócmhainní bheith ann de bharr aisiompú tobann ar fhonn riosca ar fud an domhain, rud a d'fhéadfadh turraingí diúltacha do ghníomhaíocht eacnamaíoch dhomhanda - lena n-áirítear in Éirinn - a chruthú nó a mhéadú. D'fhéadfaí go ndéanfaí difear díreach don chóras baincéireachta intíre trí bhíthin neamhchosaintí ar an margadh iasachtaí giaráilte domhanda, mar aon leis an ionchas d'éifeachtaí indíreacha trí chor chun donais timthriallach ginearálaithe.

Athruithe ar an timpeallacht idirnáisiúnta trádála agus cánach: Tá geilleagar na hÉireann ar cheann de na geilleagair is oscailte ar domhan. Tá an geilleagar thar a bheith comhtháite i slabhraí soláthair domhanda agus bíonn sé ag brath go mór ar fhiontair ilnáisiúnta. Dá bhrí sin, tá sé neamhchosanta ar athruithe tobanna ar shocruithe idirnáisiúnta trádála agus cánach. Tá méadú tagtha le déanaí ar an dóchúlacht go mbeidh turraingí struchtúracha seachtracha den sórt sin ann. Mar shampla, tá méadú tagtha ar tharaifí éifeachtacha SA ar allmhairí go dtí leibhéil nach bhfuil feicthe leis na scórtha bliain. D'fhéadfadh go mbeadh tionchar díobhálach ag aon leathnú breise ar dhíospóidí trádála domhanda, i dteannta le hathruithe ar an timpeallacht cánach idirnáisiúnta, ar Éirinn, agus d'fhéadfaí go dtreiseofaí an tionchar sin dá méadódh infheisteoirí seachtracha an biseach riosca a bheadh ag gabháil le hÉirinn i gcás turraingí den sórt sin.

Imní an athuair faoi inbhuanaitheacht fiachais cheannasaigh sa limistéar euro: Tá cóimheasa fiachais rialtais le OTI fós ard i gcodanna den limistéar euro ach tá beartas in-chomhfhoirmeach airgeadaíochta ag cuidiú le hualaigh úis faoi láthair. Tá neamhchosaint shuntasach, agus i gcásanna áirithe, neamhchosaint atá ag dul i méid, ag bainc sa limistéar euro ar a gceannasaigh intíre agus tá an bonneagar airgeadais sa limistéar euro fós easnamhach. Má bhíonn tuilleadh athbhreithnithe anuas ar ionchais fáis, éiginnteacht pholaitiúil níos mó nó athmheasúnú ginearálta ar riosca ann, d'fhéadfadh imní teacht chun cinn arís maidir le hinbhuanaitheacht fiachais cheannasaigh Eorpaigh. Tá Éire fós leochaileach i bhfianaise staid fiachais ard an rialtais.

Róthéamh agus ionchas go nglacfar níos mó rioscaí: Tá an geilleagar intíre ag druidim i dtreo na lánacmhainneachta agus - mura mbíonn Brexit mí-ordúil ann - tá ionchas d'fhás láidir ann. Tá bainc intíre tar éis a gcuid iasachtaithe le fiontair mhóra a leathnú, fad atá méadú ag teacht ar chreidmheas teaghlaigh de réir an ráta is airde le deich mbliana anuas. I dtimpeallacht den sórt sin, tá seans ann nach ndéanfaidh bainc nó idirghabhálacha airgeadais eile inmheánú ar thionchar comhchoiteann a n-iompair rioscúil, go háirithe nuair a bhíonn brabúsacht faoi bhun ionchais an mhargaidh. Tá an baol ann go n-eascróidh athdhaingniú trí ghearradh siar as aon fhreagairt chomhthimthriallach soláthair creidmheasa ar gheilleagar róbhuacach nuair a thiocfaidh athrú ar sheintimint nó nuair a thiocfaidh rioscaí chun cinn.

Ar an iomlán, tá an timpeallacht riosca mórán mar an gcéanna leis an timpeallacht a bhí i réim nuair a foilsíodh an t*Athbhreithniú* deireanach. Sa chríoch baile, lean an carnadh céimseach riosca thimthriallaigh ó foilsíodh an t*Athbhreithniú* deireanach. Tá éiginnteacht mhór ann maidir leis an gcaoi ina bhfágfaidh an Ríocht Aontaithe an tAontas Eorpach, rud a chruthaíonn dúshláin shuntasacha don timpeallacht mhacra-airgeadais in Éirinn. Cé go bhfuil ábhair imní maidir le hinbhuanaitheacht fiachais sa ghearrthéarma maolaithe ag titim bhreise ar rátaí úis domhanda ó foilsíodh an t*Athbhreithniú* deireanach, cuireann an timpeallacht rátaí úis seo taca faoin bhféidearthacht go mbeidh méaduithe breise ar luacháilacha sócmhainní atá ard cheana féin. Tá idirspleáchas ard ann idir rioscaí agus d'fhéadfadh turraingí iolracha comhuaineacha teacht chun cinn dá bharr sin.

I ngeall ar na rioscaí thuasluaite sin, déanann an Banc Ceannais measúnú ar athléimneacht an chórais airgeadais agus an gheilleagair - is é sin, measúnú ar chumas an chórais turraingí a sheasamh seachas iad a mhéadú.

Tá athléimneacht an chórais baincéireachta intíre cobhsaí don chuid is mó le sé mhí anuas, agus ag leibhéal i bhfad níos airde ná mar a bhí ann cúig bliana ó shin, ach tá géarú tagtha ar na dúshláin a bhaineann le brabúsacht. Ó 2014 i leith, tá laghdú tuairim is 85 faoin gcéad tagtha ar iasachtaí neamhthuillmheacha atá ar chláir chomhardaithe na mbanc miondíola intíre; tá leibhéil chaipitil feabhsaithe go mór sa mhéid gurb ionann cóimheas CET1 "lánluchtaithe" ar fud an chórais agus tuairim is 17 faoin gcéad; agus tá costais maoiniúcháin, atá bunaithe ar thaiscí, i measc na gcostas maoiniúcháin is ísle san Eoraip. Ar an iomlán, tá cumas níos fearr ag an gcóras baincéireachta anois turraingí a sheasamh seachas iad a mhéadú. Ó foilsíodh an t*Athbhreithniú* deireanach, áfach, tá dúshláin maidir le brabúsacht sa ghearrthéarma agus sa mheántéarma imithe i méid. Leanann costais arda - atá níos airde ná na meánchostais Eorpacha agus 25 faoin gcéad níos airde ná mar a bhí in 2015 - de bheith ag cur le brabúis níos laige. Ina theannta sin, tá brú anuas ar chorrlaigh úis na mbanc ón timpeallacht leanúnach rátaí ísle úis, fad a d'fhéadfadh maolú ar ionchais do phraghsanna tithe soláthairtí d'iasachtaí a mhéadú. Tá leibhéal na n-iasachtaí neamhthuillmheacha fós níos airde ná na meáin idirnáisiúnta agus is tosaíocht mhaoirseachta i gcónaí é laghdú inbhuanaithe ar iasachtaí neamhthuillmheacha. Tá gá le hinfheistíocht shuntasach chun athléimneacht oibríochtúil a neartú agus is gá dul chun cinn breise a dhéanamh chun inréiteacht a fheabhsú.

Tá athléimneacht teaghlach agus gnólachtaí intíre ag feabhsú i gcónaí. Lean an treocht den laghdú ar fhéichiúnas na hearnála teaghlaigh ó foilsíodh an t*Athbhreithniú* deireanach. Leanann cóimheasa fiach-sheirbhíse de bheith ag dul i laghad i gcomparáid le hioncaim agus tá ualach úis na hearnála teaghlaigh níos ísle anois ná mar a bhí tráth ar bith le 15 bliana déag anuas. Mar sin féin, tá leochaileachtaí ann i gcónaí sa mhéid go bhfuil na teaghlaigh ar theip orthu a gcuid íocaíochtaí a dhéanamh san am atá thart, nó ar athstruchtúraíodh a gcuid iasachtaí, soghonta i leith turraingí. San earnáil chorparáideach, tá athléimneacht gnólachtaí Éireannacha gan athrú, a bheag nó a mhór, ó foilsíodh an t*Athbhreithniú* deireanach. Tá díghiaráil na gcorparáidí Éireannacha is mó cobhsaí ó 2013 i leith. Leanann díghiaráil FBM ar bhonn comhiomláin ach tá méadú éigin tagtha ar fhéichiúnas i measc gnólachtaí talmhaíochta.

Tháinig neartú ar an athléimneacht cheannasach le blianta beaga anuas ach tá leochaileachtaí ann i gcónaí, lena n-áirítear freaschur féideartha na méaduithe atá feicthe le déanaí ar fháltais ó cháin chorparáide. Tá leibhéal fiachais rialtas na hÉireann ard i gcónaí agus é os cionn céad faoin gcéad den OIN*, ach tá feabhas tagtha ar athléimneacht ó tharla go bhfuil laghdú 35 faoin gcéad tagtha ar an gcóimheas fiachais le OIN ó 2013 i leith. Tá OIN* ainmniúil an-láidir mar aon le rátaí úis faoi bhun an mheáin mar thaca leis an laghdú seo. Tá an t-airgeadas poiblí leochaileach do Brexit mí-ordúil agus do fhreaschur amhantar atá feicthe le déanaí ó cháin chorparáide, ar amhantair iad a spreag méaduithe le déanaí ar ioncam cánach.

Tá maoiniú neamhbhainc tar éis éirí níos tábhachtaí don mhargadh maoine intíre, ach tá a athléimneacht fós gan tástáil. Tá méid na hearnála airgeadais neamhbhainc i gcomparáid leis an ngeilleagar intíre ar cheann de na cinn is mó ar domhan. Cé go bhfuil béim idirnáisiúnta acu go

príomha, tá neamhchosaint cistí infheistíochta Éireannacha ar an margadh eastáit réadaigh intíre ag dul i méid - is ionann iad agus aon trian de stoc measta an eastáit réadaigh tráchtála sho-infheistithe. Tá giaráil níos airde ag baint leis na cistí eastáit réadaigh Éireannacha seo i gcomparáid lena bpiaraí Eorpacha, rud a thugann le tuiscint go bhfuil siad níos leochailí d'athphraghsáil préimheanna riosca domhanda. Ag an am céanna, is féidir le hinfheisteoirí a gcistí a fhuascailt sách annamh leis na cistí seo rud a thugann le tuiscint go maolaítear go pointe an riosca maidir le díolacháin éigeantacha arna spreagadh ag fuascailtí forleathana. Tá athléimneacht na n-eintiteas airgeadais neamhbhainc seo in aghaidh aisiompú forleathan ar mheon an mhargaidh gan tástáil. Déanfaidh an Banc Ceannais iniúchadh mionsonraithe ar chistí maoine chun measúnú a dhéanamh ar athléimneacht an mhaoinithe mhargadhbhunaithe seo don gheilleagar intíre, ar maoiniú é atá ag dul i méid.

Baineann an Banc Ceannais leas as a chuid beartas macrastuamachta chun cobhsaíocht airgeadais in Éirinn a chur chun cinn agus breathnaíonn sé ar an gcothromaíocht idir na rioscaí atá ag bagairt ar an ngeilleagar agus ar an gcóras airgeadais agus athléimneacht an gheilleagair agus an chórais airgeadais in aghaidh na rioscaí sin.

Chuir an Banc Ceannais an t-athbhreithniú bliantúil ar na bearta morgáiste i gcrích agus beartaíodh nach mbeadh aon athrú ar theorainneacha CIL nó CII ná ar na liúntais. Is é is cuspóir do na bearta morgáiste athléimneacht iasachtaithe agus iasachtóirí a neartú agus an dóchúlacht go dtiocfaidh bíseanna creidmheasa - praghsanna tithe chun cinn a laghdú. Tá athbhreithniú bliantúil an Bhainc Ceannais ar na bearta morgáiste bunaithe ar anailís fhairsing ar éifeachtacht na mbeart agus ar fhorbairtí níos leithne sna margaí morgáiste agus tithíochta. Mar chuid den athbhreithniú bliantúil, bíonn rannpháirtíocht ag an mBanc Ceannais le páirtithe leasmhara chun léargas agus tuairimí níos leithne a shealbhú maidir le feidhmiú na mbeart morgáiste agus an mhargaidh níos leithne.

Bhí na príomhthorthaí seo a leanas ó athbhreithniú na bliana seo mar bhonn eolais le cinneadh an Bhainc Ceannais:

- Lean an fás ar iasachtú nua morgáiste, ar ghníomhaíocht an mhargaidh tithíochta agus ar phraghsanna tithe ach tá an fás sin ar luas níos moille. Tá an cion de cheannacháin tithe ag teaghlaigh atá á maoiniú ag morgáiste ag dul i méid.
- Bhí na bearta éifeachtach maidir le caighdeáin stuamachta fhrithgheallta a choimeád ar bun sa mhargadh morgáiste le blianta beaga anuas in ainneoin go raibh brú aníos ar phraghsanna tithe i gcomparáid le hioncaim mar gheall ar shrianta soláthair.
- Tá na bearta ag éirí níos ceangailtí de réir mar a bhíonn praghsanna ag méadú níos tapúla ná ioncaim: tá níos mó teaghlach ag fáil iasachtaí atá ag an uasmhéid is intuigthe leis na teorainneacha, nó gar dóibh. Tá sé seo i gcomhréir leis an tuiscint go mbeadh na bearta níos ceangailtí ag tráthanna áirithe sa timthriall agus go mbeidís éifeachtach chun caighdeáin stuamachta iasachtaithe a choimeád ar bun fiú i margadh ina bhfuil srian ar sholáthar.
- Le linn na bliana, tháinig méadú ar sholáthar tithe nua freisin. Go dtí seo, bhí an fhreagairt soláthair is treise le feiceáil i gceantair ina bhfuil praghsanna tithe níos airde agus bíonn na bearta níos ceangailtí sna ceantair sin.

- Le hanailís an Bhainc Ceannais, tugtar le fios gurb amhlaidh go mbeadh cion na n-iasachtaithe morgáiste a bhfuil fiachas ard acu agus leibhéal na bpraghsanna tithe i bhfad ní b'airde in 2019 ná mar atá d'uireasa na mbeart morgáiste.
- Tugann sé seo le tuiscint go bhfuil na bearta morgáiste éifeachtach maidir le hathléimneacht iasachtaithe agus iasachtóirí a neartú. Tugann sé le tuiscint freisin go bhfuil na bearta éifeachtach chun an fhéidearthacht go dtiocfaidh bíseanna creidmheasa - praghsanna tithe chun cinn a laghdú.
- Cé nach bhfuil sé mar chuspóir ag na bearta morgáiste díriú ar phraghsanna tithe, tugann an anailís seo le tuiscint go mbeadh brúnna inacmhainneachta d'iasachtaithe morgáiste níos measa d'uireasa na mbeart morgáiste.

Ar an iomlán, measann an Banc Ceannais go bhfuil a gcuid cuspóirí á mbaint amach ag na bearta mar atá siad ceaptha agus calabraithe faoi láthair.

Tá ráta an Chúlchiste Friththimriallaigh (CCyB) coimeádta ag 1 faoin gcéad ag an mBanc Ceannais. Is é is aidhm don Chúlchiste Friththimthriallach (CCyB) athléimneacht na hearnála baincéireachta a neartú i gcás cor chun donais amach anseo. Tá ráta 1 faoin gcéad i gcomhréir le creat an Bhainc Ceannais agus léiríonn sé an carnadh céimseach leanúnach riosca shistéamaigh thimthriallaigh, sa chríoch baile agus ar fud an domhain - cé nach léir go bhfuil fás creidmheasa iomarcach ann faoi láthair in Éirinn. Tá an t-ionchas macra-airgeadais in Éirinn faoi réir éiginnteacht shuntasach agus tá an Banc Ceannais réidh chun ráta CCyB a choigeartú i dtreo ar bith de réir mar is cuí.

Tá an t-athbhreithniú bliantúil ar chreat O-SII tugtha chun críche ag an mBanc Ceannais agus aithníodh sé institiúid ann mar institiúidí a bhfuil tábhacht shistéamach leo agus rátaí maoláin idir 0.5 agus 1.5 faoin gcéad acu. Is é is cuspóir do mhaolán O-SII an dóchúlacht go dteipfidh ar institiúidí airgeadais a bhfuil tábhacht shistéamach leo a laghdú i bhfianaise na féidearthachta go mbeadh tionchar níos mó ar an ngeilleagar intíre dá dteipfeadh orthu. Ainmníodh dhá institiúid mar O-SIIanna don chéad uair (Barclays Bank Ireland plc agus Bank of America Merrill Lynch International DAC) agus tá ráta maoláin 0.75 faoin gcéad acu. Níl dhá institiúid ainmnithe mar O-SIIanna a thuilleadh (Unicredit Bank Ireland plc agus Depfa Bank plc). Ní raibh aon athrú beartais i gceist in athbhreithniú 2019 do na ceithre institiúid O-SII eile (AIB Group plc, Bank of Ireland Group plc, Citibank Holdings Ireland Ltd agus Ulster Bank Ireland DAC).

Tá an Banc Ceannais ag iarraidh an creat macrastuamachta do chaipiteal bainc a chur i gcrích. Is geilleagar beag rí-dhomhandaithe é geilleagar na hÉireann. Dá thoradh sin, tá sé níos leochailí d'fhorbairtí sa timthriall airgeadais domhanda agus tá sé níos tugtha do thurraingí maicreacnamaíocha struchtúracha. Ionas go mbeidh córas baincéireachta athléimneach ann, tá cúlchistí leordhóthanacha caipitil de dhíth chun na turraingí struchtúracha sin a sheasamh. I mí Iúil 2019, chomhaontaigh an tAire Airgeadais go ndéanfaí an cúlchiste riosca shistéamaigh (SyRB) a thrasuí i ndlí na hÉireann agus go ndéanfaí feidhmiú agus calabrú an chéanna a shannadh don Bhanc Ceannais. Fógróidh an Banc Ceannais an ráta maoláin agus aon tréimhse do chéimniú isteach nuair a bheidh an reachtaíocht curtha ar fáil. Leis an SyRB, cuirtear an dlaoi mhullaigh ar an gcreat macrastuamachta do chaipiteal bainc ach níl ann ach gné amháin den chreat foriomlán

caipitil bainc atá iomchuí do gheilleagar beag rí-dhomhandaithe mar atá ag Éirinn. Leanfaidh an Banc Ceannais den chreat caipitil níos leithne seo a fhorbairt agus de staidéar a dhéanamh ar an meascán agus na hidirghníomhaíochtaí idir ionstraimí agus maoláin, lena n-áirítear i gcomhthéacs na n-athruithe a eascróidh as feidhmiú na reachtaíochta Eorpaí ábhartha mar aon le hathruithe amach anseo ar chreat Basel.

Risks

Continuing risk of a disorderly Brexit

The path forward for the United Kingdom's planned exit from the European Union remains uncertain. Significant efforts have been made to mitigate any immediate disruption to the provision of cross-border financial services between the UK and the EU in the case of a disorderly Brexit. However, the macroeconomic shock of a disorderly Brexit would be sizable, with more severe effects in certain regions and sectors. Economic shocks could present difficulties for businesses and households in servicing existing debt, especially in those regions most exposed to Brexit, which also tend to have lower average levels of income. Losses on loans to Irish borrowers would compound the negative effect of losses on Irish banks' sizable direct UK lending exposures. Any such shock could be amplified in the near-term by heightened uncertainty and market volatility, which could result in a greater-than-expected deterioration in macro-financial conditions.

The continued uncertainty surrounding the future relationship between the UK and EU remains a risk to the domestic macro-financial environment. Despite renegotiations to the original Brexit agreement, the failure of UK Parliament to formally adopt the agreement has resulted in a further extension of the Brexit deadline to 31st January 2020. The UK general election on 12th December adds further uncertainty to the UK's planned exit from the EU.

A disruptive no-deal Brexit presents a number of 'cliff-edge' risks to the provision of cross-border financial services between the UK and the EU, which authorities and firms have taken steps to mitigate.[1] The Irish financial system and economy have close links to the UK financial system. The Central Bank, working with other authorities domestically and internationally, has taken action to ensure that the most material and immediate risks to the provision of cross-border financial services from a disorderly exit of the UK from the EU's Single Market have been mitigated. However, the possibility remains that pockets of disruption may emerge. The delay in ratifying the Withdrawal Agreement has shortened the current transitional period for the negotiation of a future trade relationship. This could present further 'cliff edge' risks through 2020. In principle, similar concerns exist for the time-limited extended equivalence treatment of UK central counterparties (CCPs) by the EU authorities. However, the EU Commission have recently proposed extending this equivalence further beyond March 2020.[2]

While the underlying outlook for growth in the economy remains positive, there is significant uncertainty surrounding Brexit. Under the new Withdrawal Agreement, Northern Ireland will remain aligned to the EU Customs Union and Single Market while remaining in the UK customs territory, whereas Britain will not be aligned to the EU after the transition period.[3] This may result in a worse "deal" scenario for east-west trade between Britain and Ireland than the previous Withdrawal Agreement rejected by the House of Commons. Notwithstanding this, a no-deal scenario would pose immediate challenges to the Irish economy (Chart 1). According to the latest published projections by the Central Bank, the unemployment rate would rise to almost 7 per cent in 2021 in the event of a no-deal Brexit. While this would be a material disruption to economic

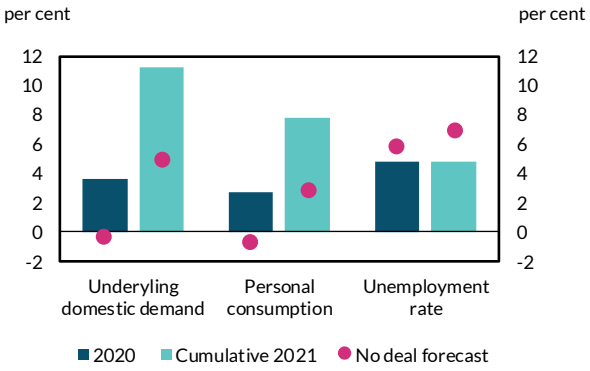
[1] See Box 1 *Brexit Contingency: Mitigation of 'Cliff Edge' Risks* in FSR 2019:1.
[2] https://ec.europa.eu/commission/presscorner/detail/en/SPEECH_19_6285.
[3] This would be reviewed approximately 4 years after the withdrawal becomes effective, when the Northern Ireland Assembly can choose to continue the arrangement or revert to WTO rules.

activity, it would be less severe than the macroeconomic shock incorporated in the adverse scenario of the 2018 EBA stress test (see: *Resilience: Banks)*.

Given the unprecedented nature of a disorderly Brexit, it is very difficult to assess with accuracy its macroeconomic implications. A more disruptive no-deal Brexit, driven by a sharper increase in uncertainty or fall in confidence could result in significant and persistent financial market dislocation in the near-term. If such market distress were to persist, it could contribute to a worse-than-expected macroeconomic shock (see Box 1). This could be amplified by the sensitivity of Irish asset prices to Brexit developments (Chart 2).

Chart 1: A no deal Brexit will have significant consequences for economic activity

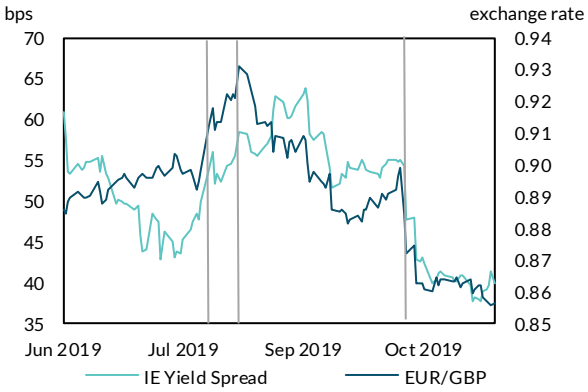
Central Bank's economic forecasts



Source: Central Bank of Ireland.
Note: Forecast as presented in the 2019 Q4 Quarterly Bulletin.

Chart 2: Irish bond yields have responded to Brexit news in recent months

Irish sovereign bond yields and the EUR/GBP exchange rate



Source: Bloomberg
Note: Irish yield spreads are calculated as the difference between Irish and German 10-year bonds. Vertical lines mark significant Brexit events. 28 July: Boris Johnson vows to deliver Brexit by31 October 'by any means necessary'. 9 August: In a letter to civil servants, Boris Johnson says no-deal Brexit preparations should be 'top priority'. 10 October: After crunch talks with Boris Johnson, Leo Varadkar says a Brexit deal can be achieved by 31 October. Last observation 8 November 2019.

Direct exposure to Brexit through the trade channel is larger for smaller exporters and importers, and differs across sectors. Smaller exporting firms are twice as reliant on the UK as larger firms (Chart 3). However, for some sectors, such as the Agri/food and the Wholesale & Retail sectors, it is medium-sized firms that are most exposed to the UK. Agriculture, in particular the beef and dairy sector, is especially exposed to high trade tariffs in the event of a disorderly Brexit. Concerns over the viability of beef farming in particular (Chart 4), and high leverage ratios in the agriculture sector present significant vulnerabilities (see also *Resilience: NFC*). In terms of regional vulnerabilities, almost 70 per cent of all farms in the West, Midlands and Mid-West are beef farms.[4]

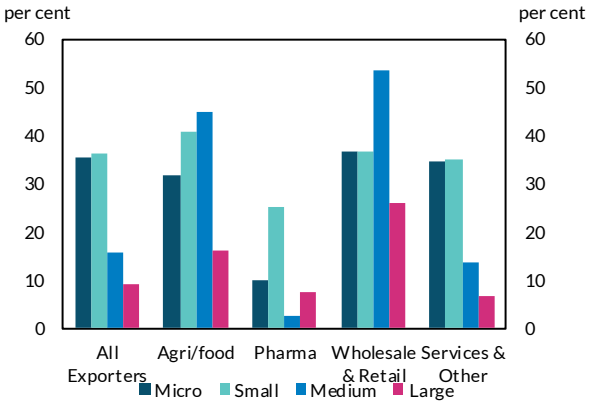
Banks have exposure to a disorderly Brexit through their domestic SME lending, particularly to the agricultural and retail sectors. Sectors relatively more exposed to Brexit with the largest employment and bank SME lending concentration include Agriculture and Retail. The agriculture

[4] See Conefrey, T. (2019), "New Risks and Old Problems: The Uncertain Outlook for Irish Agriculture", Economic Letter, Vol. 2019 No. 10, and references therein for a wider discussion on the challenges facing the agriculture sector in the context of Brexit.

sector has a high bank lending exposure but a smaller employment exposure (Chart 5). The retail sector has a similarly high bank lending exposure but also a high employment exposure.

Chart 3: Brexit exposure though direct export values is substantially larger for smaller exporters

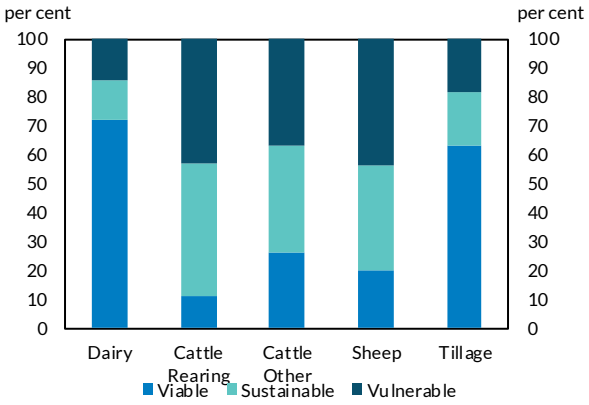
The UK share of export value by sector and firm size class



Source: CSO.
Note: Size classes are defined according to number of persons engaged at the enterprise; Micro (0-9), Small (10-49), Medium (50-250) and Large (250+). Data refer to 2017.

Chart 4: Cattle and sheep farms are most vulnerable

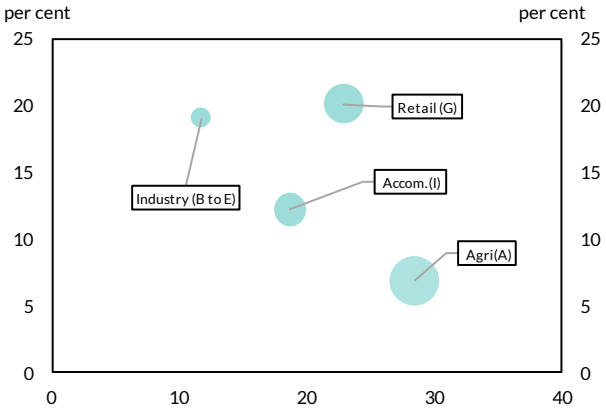
Viability by Farm System 2018



Source: Teagasc National Farm Survey 2018
Notes: Teagasc defines economically viable farms as those farms where farm income is sufficient to remunerate family labour at the minimum agricultural wage (assumed to be €19,616), and provide a 5 per cent return on the capital invested in non-land assets such as machinery and livestock. Farms below this income but with an off-farm income source of either the farmer or their spouse are defined as economically sustainable. Farms with incomes below the sustainable threshold and without an off-farm income source are categorised as vulnerable.

Chart 5: Brexit exposure to SMEs is greatest in the agriculture and retail sectors

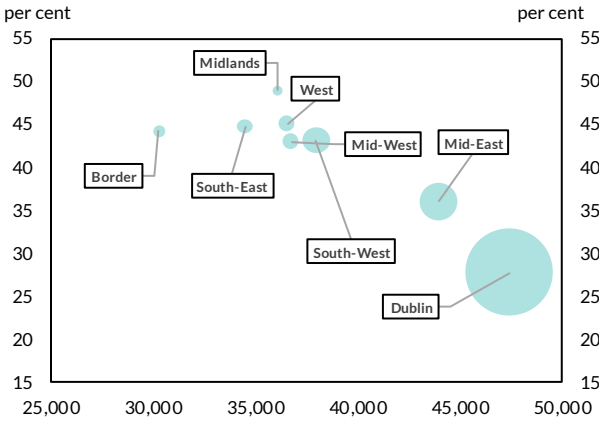
Share of total employment for Brexit exposed sectors (y-axis), outstanding SME lending shares for retail banks (x-axis) and the share of total bank assets (size of the bubble), 2018



Source: CSO and Central Bank of Ireland.
Notes: Brexit-exposed sectors include; Agriculture, forestry and fishing (NACE rev. 2 sector A), Industry (B to E), Wholesale and retail, repair of motor vehicles and motorcycles (G) and Accommodation and food service activities (I). The total outstanding SME lending values and total employment are restricted to market service sectors and excludes financial and real estate lending in NACE rev. 2 sectors K, L, and O – U. Bank lending data are for five retail banks.

Chart 6: Bank mortgage exposure is greatest for those regions with the lowest sector exposure to Brexit and the highest incomes

Regional share of Brexit exposed employment (2018, y-axis), nominal median income (2017, x-axis) and the regional share of bank mortgage lending (2018, size of bubble).



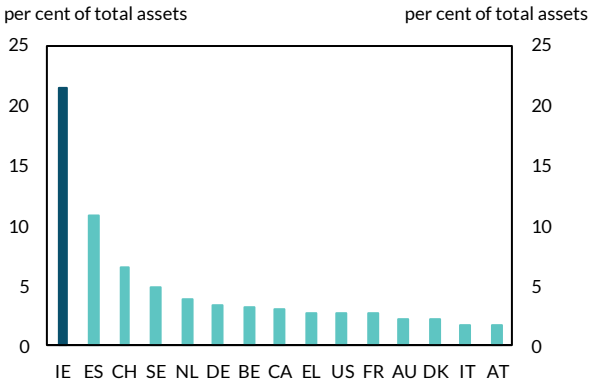
Source: CSO and Central Bank of Ireland.
Notes: Regions are classified according to Eurostat NUTS 3 classification. Brexit-exposed sectors include; Agriculture, forestry and fishing (NACE rev. 2 sector A), Industry (B to E), Wholesale and retail, repair of motor vehicles and motorcycles (G) and Accommodation and food service activities (I). Bank mortgage lending data are for primary dwellings and buy to let properties for five retail banks.

Regions with more employment exposure to Brexit also tend to have lower median household incomes – but domestic banks have smaller mortgage portfolios in these regions. The regions with a high share of employment in Brexit-exposed sectors and lower household incomes are more at risk in the event of an adverse shock with negative consequences for the ability of mortgage holders to meet repayments (Chart 6). Dublin and the Mid-East have the largest share of mortgage lending but the lowest exposure to Brexit-exposed employment and the highest median household incomes. The remaining regions are clustered on a range of 40-50 per cent share of employment exposed to Brexit and a median household income in the range of 30,000-40,000 euro.

The Irish retail banking sector is relatively heavily exposed to the performance of the UK. A disorderly Brexit will negatively affect the UK economy, and by extension the performance of Irish banks' exposures in the UK. The UK is the second largest market for Irish retail banks. The Irish banks' direct UK exposure is high compared with other countries' banking systems (Chart 7). Approximately 26 per cent of total loans are held vis-à-vis UK counterparts. This figure has remained broadly unchanged over the period for which data are available. UK households account for over 50 per cent of UK lending, almost all of which is in the form of residential mortgages. Corporate lending accounted for a further 28 per cent – half of which related to UK SMEs. Despite the continued uncertainty, impaired UK assets remain low at 2.7 per cent. However, it is likely that this would deteriorate in the event of a disorderly Brexit.

Chart 7: UK exposures remain significant for Irish banks, more so than banks from other countries

Claims on UK counterparties as a share of total assets



Source: BIS and Central Bank of Ireland calculations
Notes: Claims are calculated on an immediate counterparty basis for a sample of domestic banks across a number of countries. Data as at 2019Q2.

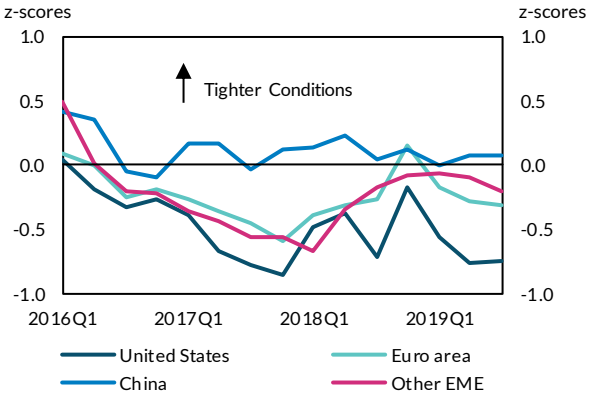
A sharp repricing of global risk premia after an extended period of search for yield

Compressed risk premia create the potential for a sharp and destabilising reversal of financial market sentiment. Financial conditions in advanced and emerging economies have been accommodative for a number of years, facilitating a continued build-up of global debt. There is evidence that the search for yield has led to a deterioration in credit standards in some market segments, especially parts of the global corporate debt market, while it has also increased risk taking by the non-bank financial sector internationally. Irish financial firms have direct exposures to global financial markets, including the global leveraged loan market. Domestic asset prices and economic activity may also be indirectly affected by abrupt changes in global sentiment. As a consequence, a sudden drop in global risk appetite could have adverse repercussions for the Irish economy and its financial system.

Global financial conditions remain accommodative. Financial crises often follow long periods of accommodative financial conditions and growth in indebtedness. Upturns in the financial cycle can lead to ample financial market liquidity, a mispricing of risk, the build-up of debt, and the emergence of financial mismatches (e.g. currency, maturity or liquidity mismatches) on lenders' and borrowers' balance sheets. The IMF Global Financial Conditions Index suggests that accommodative conditions in advanced economies have eased further since the last *Review* (Chart 8). Credit risk premia remain compressed relative to historical benchmarks (Chart 9), particularly for lower-rated issuance.[5] Sovereign bond yields have fallen to record lows in many countries, in some cases turning negative even at maturities of 20 years (Chart 10), while term premia have also become increasingly compressed (Chart 11).

Chart 8: Accomodative financial conditions continue to prevail in many parts of the world

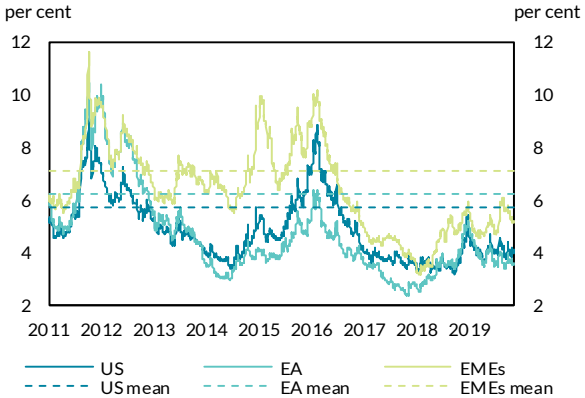
IMF global financial conditions index



Source: IMF.
Notes: The z-score indicates an observation's distance from the population mean in units of standard deviation. An increase in Z scores signifies a tightening of financial conditions, while a decrease in Z scores signifies a loosening of financial conditions. The standard deviations and means are calculated over the period 1996–2019. Other EMEs denotes IMF-defined systemically Important Emerging Market Economies other than China. Last observation 2019Q3.

Chart 9: Credit risk-premia are well below long-run averages

Corporate bond spreads

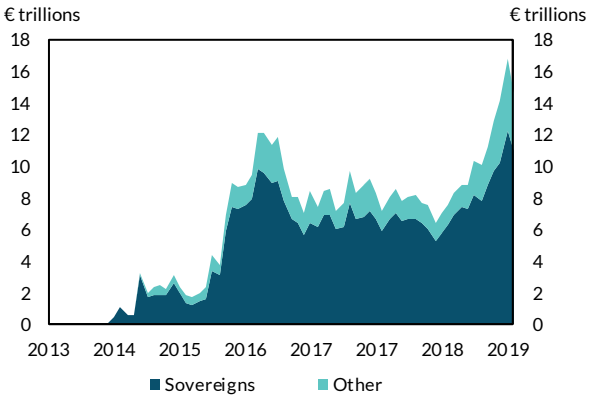


Source: St Louis Fed, BIS, and Central Bank of Ireland calculations.
Notes: ICE BofAML Option-Adjusted Spreads on below investment grade corporate bonds. Dashed lines indicate historic averages since 1998 for US and EA and 1999 for EMEs. Last observation 15 November 2019.

[5] See IMF Global Financial Stability Review, October 2019.

Chart 10: Yields on many bonds have turned negative

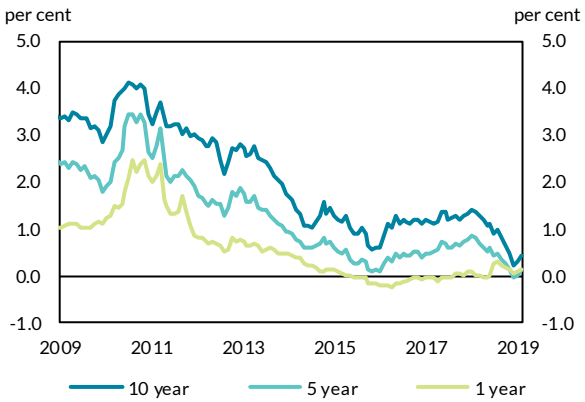
Market value of negative yielding debt



Source: BIS.
Notes: Last observation September 2019.

Chart 11: Term premia have become increasingly compressed

Government bond yields at different maturities



Source: Bloomberg and Central Bank of Ireland calculations.
Notes: Notes: Monthly government 10, 5 and 1-year bond yields contain the average bond spread for 12 countries; Belgium, China, France, Germany, Ireland, Italy, Japan, Netherlands, Spain, Switzerland, UK and the US. Bloomberg does not provide several observations for the selected countries for 1-year government bonds. The Netherlands has no observations while Belgium, Spain, Switzerland and the US also have missing data. Last observation 31 October 2019.

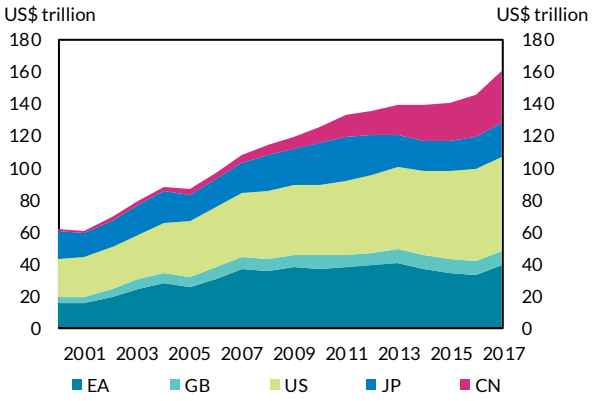
Amid accommodative financial conditions the build-up of debt has continued. Globally, debt stood at around USD 240 trillion or over 300 per cent of global GDP in early 2019 – high by historical standards in many countries (Chart 12).[6] Global debt growth has been driven by a significant build-up of government debt in the US and of corporate and household debt in China.[7] Leverage in many other EMEs has also expanded, facilitated by substantial cross-border portfolio debt flows. The low interest rate environment has also encouraged investment funds, pension funds and insurers in advanced economies to take on more risk to generate returns, moving into higher-yielding and less liquid investments such as lower-rated corporate bonds (e.g. BBB).[8]

Growing indebtedness in the corporate sector in advanced economies, often facilitated by market-based sources of finance, is a particular pocket of vulnerability. Corporate sector debt has increased relative to GDP in some advanced economies (Chart 13). The expansion in corporate leverage in the US has been facilitated by the growth in riskier forms of market-based sources of debt, such as lower-rated bonds and leveraged loans. This has been accompanied by weakened underwriting standards in corporate lending. There has been a marked deterioration in the distribution ratings in the US corporate debt market in recent years, with an increase in the share of BBB-rated securities in the total investment grade issuance.[9]

[6] Global Debt Monitor, Institute for International Finance, April 2019.
[7] The US sovereign however benefits from the extraordinary privilege of being issuer of the dominant currency.
[8] Source: ECB Financial Stability Review, May 2019.
[9] European Central Bank – Banking Supervision (2019) "Keeping an eye on banks' leveraged lending", Newsletter Article, 15 May 2019.

Chart 12: Debt levels are elevated in many regions

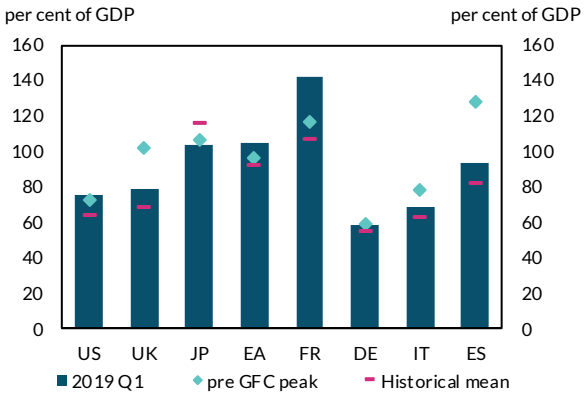
Total debt in selected countries, all sectors, (2000-2017)



Source: IMF Global Debt Database.
Notes: Chart shows sum of general government debt and private sector debt (all instruments), or where the latter is unavailable, private sector debt (debt securities).

Chart 13: Corporate debt has exceeded its pre-crisis peak in some countries

Corporate debt as a share of GDP



Source: BIS and Central Bank of Ireland calculations.
Notes: pre GFC peak denotes maximum between 2007Q1 and 2008Q4, historical mean is the average from 1980Q1 (or later depending on data availability).

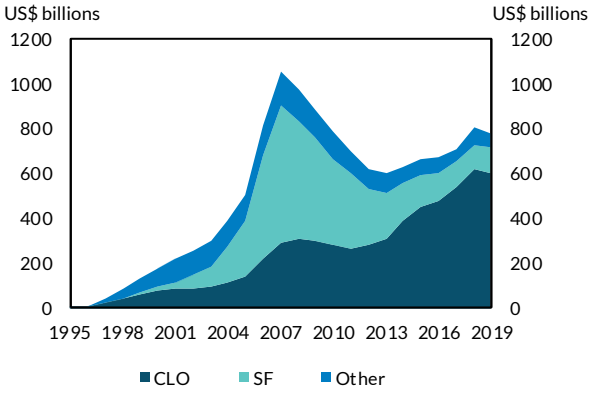
Leveraged finance has been an increasingly important source of funding. The rapid growth of leveraged loans, often repackaged into collateralised loan obligations (CLOs) has some parallels with developments in the US subprime mortgage market in the run-up to the last global financial crisis (Chart 14). For example, there has been a marked deterioration in underwriting standards in the leveraged loan market in recent years. Leveraged loans without maintenance covenants increased from 20 per cent in 2012 to 80 per cent in 2018.[10] The share of newly issued leveraged loans to large corporates with high leverage has exceeded previous peak levels observed in 2007.[11] That said, CLOs are less complex than the collateralised debt obligations (CDOs) and structured finance products of the pre-crisis period. There is also better information about the direct exposures of banks to these structures, though uncertainty remains around the nature of broader investors in CLOs. Overall, the resilience of this form of finance, given the significant structural changes in the market, is untested in an episode of generalised repricing of risk.[12]

A sudden drop in global risk appetite could be triggered by events such as a global growth slowdown, monetary policy surprises or the escalation of trade or currency disputes. Global economic growth has been losing momentum, as global manufacturing, trade and investment have slowed (Chart 15). The IMF projects a pronounced slowdown in advanced economies in 2020, with euro area GDP forecasted to grow just 1.2 per cent. In response, monetary policy tightening in advanced economies has been delayed, and in some cases reversed. This has supported risk appetite, even as policy uncertainty has remained high (Chart 16). However, increased monetary policy uncertainty could leave markets vulnerable to mispricing future interest rate moves. Trade tensions have also had a material effect on financial markets. Corporate bond spreads have risen as a response to news of escalating trade tensions and narrowing on news of monetary easing in the US.

[10] Aramonte S. and Avalos F. (2019) "Structured finance then and now: a comparison of CDOs and CLOs", BIS Quarterly Review, September 2019, Box B.
[11] See Federal Reserve Board Financial Stability Report, November 2019.
[12] BIS Quarterly Review, International banking and financial market developments, September 2019.

Chart 14: While the growth in the global CLO market has slowed, the stock remains high

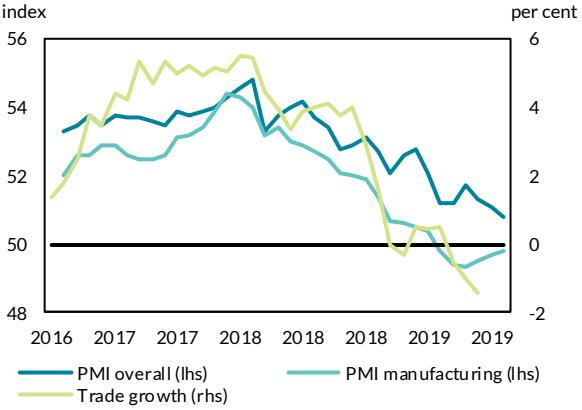
US CDO/CLO Outstanding



Source: SIFMA, BIS and Central Bank of Ireland calculations.
Note: CLO - Collateralised Loan Obligation, SF - Structured Finance.
All observations are for Q4 for each year. Last observation 2019Q1.

Chart 15: Global economic growth is losing momentum

Global PMI and year on year trade growth



Source: IHS Markit, CPB, via Datastream.
Notes: Last observation 15 October 2019.

A generalised flight to safety could be amplified by the behaviour of investors or financial institutions. 'Rating cliffs' could amplify any repricing shock as demand by institutional investors for assets beyond certain thresholds could fall sharply. This is a particular concern given the growth in the share of the BBB segment of the corporate bond market, which could be particularly vulnerable to the risk of downgrades to below investment grade.[13] Bank and insurer capital requirements would also be more likely to become binding in the face of falling asset values.

Ireland could be affected by a sudden repricing of risk through direct exposures of financial institutions. While Irish retail banks exposure to CLOs is very limited (see Box 2), their exposure to leveraged finance has increased, including to covenant-light loans. As supervisory focus has increased in this area, improved estimates show that Irish retail banks hold approximately €15 billion of leveraged loans. The Irish insurance industry has also engaged in a search for yield in order to maintain profitability amid the low interest rate environment that has prevailed in recent years. Irish-oriented non-life insurance corporations have shifted somewhat toward riskier asset allocations, increasing the share of corporate bonds in their portfolios (over half of which are rated A and BBB) while reducing the share of sovereign bonds (see *Resilience: Insurance*).[14]

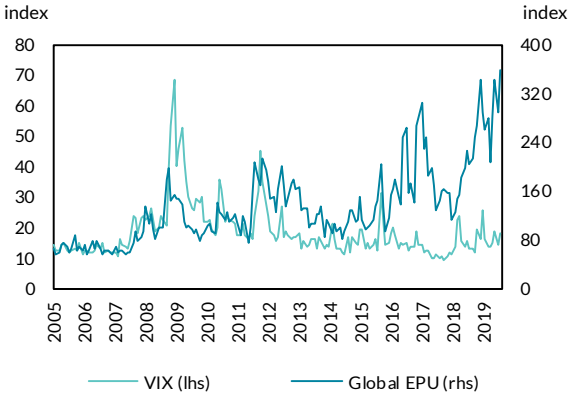
Ireland could also be affected through indirect channels if risks in systemically important economies crystallise. The last crisis demonstrated that financial shocks originating in the US can have implications globally, with Ireland affected due to strong trade and financial interlinkages.[15] Research also suggests that Ireland is highly sensitive to US macroeconomic developments, with a 1 per cent increase in US GDP growth estimated to lead to an increase of up to 1.3 per cent in Irish output growth.[16] More generally, as a highly open and financially developed economy, Ireland is

[13] According to the IMF, such cliff effects occurs when there is a downgrade, in particular below the investment-grade threshold, which in turn has an additional liquidity effect due to the need to meet regulatory requirements. See: IMF (2010) The uses and abuses of sovereign credit ratings, Global Financial Stability Report, Chapter 3, September 2010.
[14] Central Bank of Ireland (2019), Insurance Quarterly, June 2019; Cardelle, M. (2019) Investment behaviour of Irish Insurance Companies under the Solvency II regime: pro-cyclical or counter-cyclical?, *Mimeo.*
[15] McQuade, P. and Mehigan. C. (2019) Trade Tensions and the composition of Ireland's exports, *mimeo*.
[16] Bermingham C. and Conefrey T. (2011) "The Irish Macroeconomic Response to an External Shock with an Application to Stress Testing," Research Technical Papers 10/RT/11, Central Bank of Ireland. Purdue, D. (2018) "Impacts of the US economy on Ireland: a quantitative and qualitative analysis" National Treasury Management Agency Report.

particularly susceptible to spillovers from shocks originating abroad, particularly from other systemically important countries.

Chart 16: Economic policy uncertainty remains elevated while implied volatility has stayed low

VIX and Global Economic Policy Uncertainty



Source: Chicago Board Options Exchange (CBOE), Baker, Bloom, Davies; via Datastream.
Notes: Last observation 1 September 2019.

Changes in the international trading and tax environment

Ireland is one of the most open economies in the world, with high levels of integration into global supply chains and a significant reliance on foreign MNEs. As a result, it is particularly exposed to abrupt shifts in international trading and tax arrangements. The probability of such structural shocks has increased in recent years. US effective tariffs on imports, for example, have increased to levels last seen several decades ago. A further escalation in global trade disputes, combined with shifts in the international tax environment, could have a particularly adverse impact on Ireland through a structural reduction in global trade, permanent adverse shocks to corporate tax revenues, and the location decisions of foreign MNEs. These shocks could have a significant macroeconomic impact, potentially amplified by an increase in the risk premium that foreign investors would attach to Ireland in the face of such shocks, challenging domestic borrowers, including the sovereign.

Ireland is exposed to disruptions to the international trading environment through its participation in global value chains. Exports plus imports of goods and services from Ireland were equivalent to 212 per cent of GDP in 2018. Similarly, 63 per cent of Irish value added was produced for foreign final demand in 2016, equating to the second highest reliance on foreign demand in the OECD.[17] Firms operating in Ireland use imported intermediate inputs heavily for the production of exports. In 2016, 41 per cent of the value added embedded in gross Irish exports was from abroad.

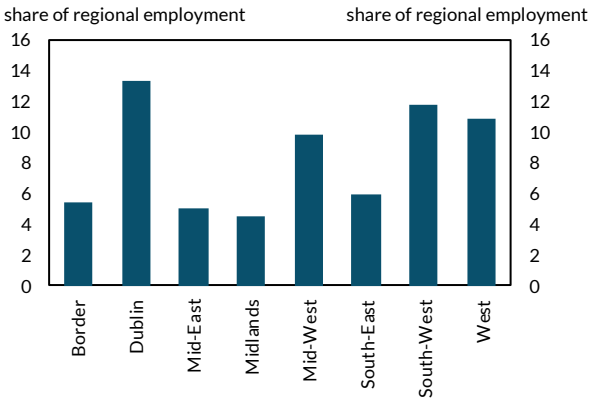
Ireland is also highly reliant on foreign MNEs. While the direct exposures of the domestic financial system are limited, MNEs make a substantial contribution to the real Irish economy: as significant employers, they support economic growth and living standards. In 2018, almost 220,000 people (approximately 10 per cent of total employment) were employed by agency-assisted foreign owned companies.[18] This employment is not evenly distributed across regions, with the share of MNEs in total regional employment highest in Dublin (Chart 17). MNEs are also linked to the domestic economy through their expenditure on domestically sourced goods and services (Chart 18). They are also important exporters, and contribute heavily to tax receipts (Chart 19). The MNE contribution to the non-financial economy stood at 58.7 per cent of gross value added in Ireland in 2015, far above the EU28 average of 24.5 per cent.

International trade tensions have already had an impact on the global economy. The level of US effective tariffs on imports has increased to levels last seen several decades ago. At present, Sino-US trade tensions are a major driver of economic policy uncertainty in both countries. The direct and indirect consequences of trade disputes have accentuated the recent cyclical slowdown in global economic growth. Given the composition of Ireland's exports, the trade tensions seen to date have not had a material impact on Ireland. However, global supply chains are inherently vulnerable to increases in trade barriers and tariffs, since price increases in intermediate inputs can be amplified further downstream in the production process. Non-tariff measures such as cross-border or cross-firm operating restrictions could be particularly damaging to MNEs.

[17] In other words, this reflects the domestic value added part of exports (excluding the import component of Irish exports) that is consumed abroad as a share of the total value produced in the economy.
[18] Figures refer to full-time, permanent employment in foreign-owned agency-based companies come from the 2018 Department of Business, Enterprise and Innovation (DBEI) Annual Employment Survey.

Chart 17: MNEs are significant employers, especially in Dublin and western regions

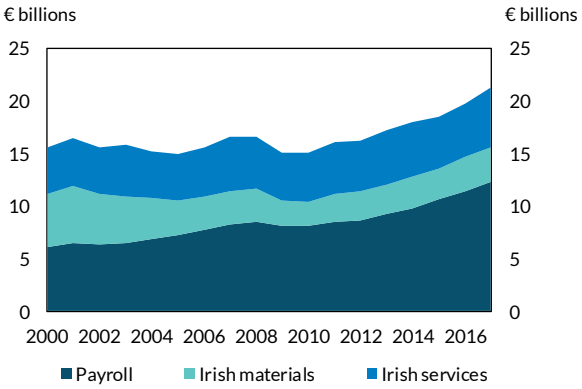
MNEs' employment by region



Source: 2018 Department of Business, Enterprise and Innovation (DBEI) Annual Employment Survey, CSO and Central Bank of Ireland calculations.
Notes: Full-time, permanent employment by agency-assisted foreign-owned companies over total regional employment for 2018.

Chart 18: As well as employee pay, MNEs are linked to the domestic economy through their suppliers

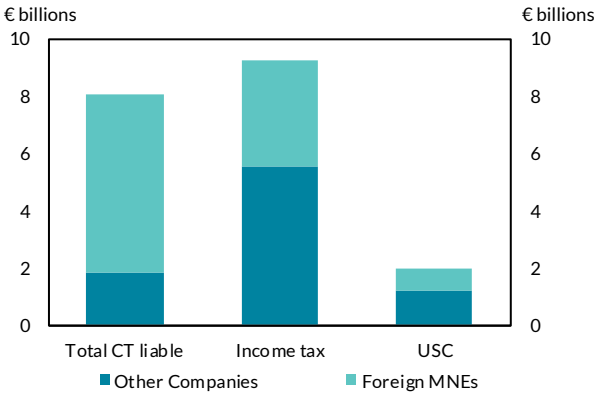
MNEs' direct expenditure on the Irish economy



Source: Department of Business, Enterprise and Innovation.
Note: Last observation 2017.

Chart 19: MNEs are an important contributor to Irish tax revenue across different tax heads

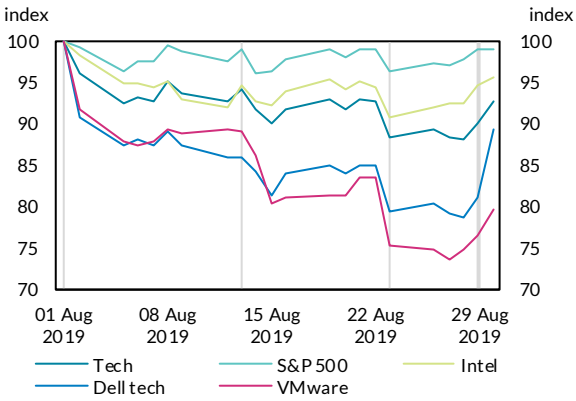
MNEs' contribution to corporation, income tax and USC



Source: Corporation Tax Payments & Returns 2018, Revenue, May 2019.
Notes: Last observation May 2019.

Chart 20: Tech share prices have dropped around announcements of new tariffs

Share prices of tech firms and trade dispute events



Source: Bloomberg and Central Bank of Ireland calculations.
Note: Vertical grey lines indicate trade war developments: 1) August 1, US announces 10 per cent tariffs on $300bn Chinese goods; 2) August 13, yield curve inverts; 3) August 23, China announces USD 75bn in tariffs on US goods; 4) August 29, Chinese Department of Commerce indicates desire to reach a deal in trade war.

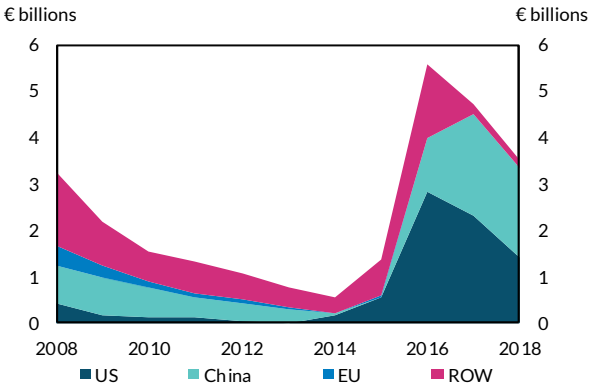
Some US high-tech firms with a large presence in Ireland could be affected by an escalation of trade disputes given their extensive global value chains, which include strong connections to China. This is highlighted by recent equity market developments around trade dispute news (Chart 20). Relatedly, Irish exports of *electronic integrated circuits* amounted to EUR 3.5 billion in 2018, or 2.5 per cent to total merchandise exports in 2018, of which EUR 1.9 billion (or 55 per cent of total *electronic integrated circuits* exports) went to China, with the remainder largely destined for the US (Chart 21).

The probability of structural shifts in the international tax landscape has also risen. At the EU level, pressure is rising to move away from unanimity voting on taxation to qualified majority voting. In addition, the OECD Base Erosion and Profit Shifting (BEPS) report in 2015 was the first

multilateral attempt to address aggressive tax planning. Agreement of BEPS 2.0 in 2020 will likely result in further changes to the international corporate tax landscape. BEPS 2.0 consists of two pillars. Pillar 1 addresses taxing rights and nexus rules, while Pillar 2 outlines a global minimum tax and a tax on base-eroding payments.

Chart 21: Irish technology exports include intermediate inputs used in global value chains

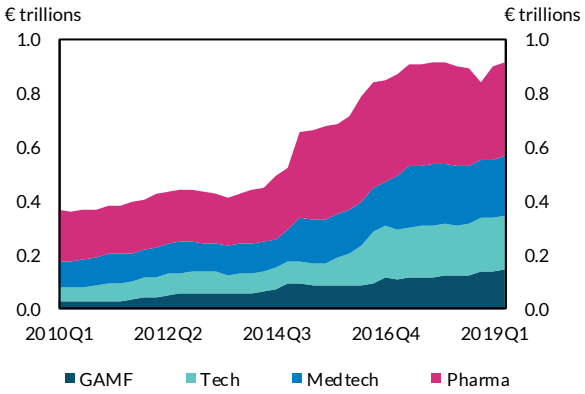
Exports of electronic integrated circuits



Source: Eurostat.
Notes: Last observation 2018.

Chart 22: Many MNEs active in Ireland have valuable intangible assets

Value of MNEs' intangibles



Source: Bloomberg and Central Bank of Ireland calculations.
Note: Billions of USD, based on 23 large MNEs operating in Ireland. GAMF refers to Google, Apple, Microsoft and Facebook. Tech refers to Adobe, Dell, Intel, Oracle, VMware, and WesternDigital. Medtech refers to Abbott Laboratories, Baxter, Boston Scientific, Johnson & Johnson, and Medtronic. Pharma refer to Alexion, Allergan, Gilead, Mallinckrodt, Merck, Perrigo, Pfizer, and Takeda. Last observation 2019Q2.

Structural shifts in the international tax landscape could have implications for both the corporation tax base and, possibly, the future locational choices of firms in Ireland. Implementation of the latest OECD proposals under Pillar 1 could see a reduction in the Irish corporation tax base.[19] This could have implications for Ireland's corporate tax revenue, with the risk of substantial reductions relative to recent windfall revenues. MNEs have been largely responsible for the rapid increase in corporate tax receipts, which rose from 10.3 per cent of total revenue in 2011, to 18.7 per cent in 2018. An effective minimum global tax rate, as proposed under OECD BEPS Pillar 2, could also have implications for future locational choices for FDI into Ireland. This risk is a particular concern for industries using intellectual property and internationally mobile intangible assets, such as the pharmaceuticals, and information and communications technology sectors (Chart 22).

An escalation of global trade disputes combined with shifts in the international tax landscape could be disruptive for the Irish economy. Direct and indirect job losses could undermine the debt servicing capacity of domestic households and suppliers, while reduced economic growth prospects could cause asset prices to fall. This could create financial stability risks, for instance by eroding the ability of exposed firms and households to service their debt. A negative shock to government revenue could also increase in the cost of funding for the sovereign (see also *Risks: Sovereign debt*).

[19] OECD (2019) "Secretariat Proposal for a "Unified Approach" under Pillar One", OECD Public Consultation, 09 October – 12 November 2019.

Re-emergence of sovereign debt sustainability concerns in the euro area

Near-term pressures on sovereign bond yields in Europe have eased recently, in the context of the further easing of monetary policy in the euro area. However, despite significant progress since the crisis, the euro area's financial architecture remains incomplete and hence vulnerable to a re-emergence of the sovereign-bank doom loop. High legacy debt in the public sector and anaemic economic growth weigh on debt sustainability. Higher yields in the face of adverse shocks would increase the cost of debt financing in already indebted countries, reducing fiscal space when most needed. Notwithstanding the recent decoupling of Irish sovereign bond yields from those of other highly-indebted euro area countries, a generalised repricing of sovereign risk would be challenging for Ireland as the debt-to-GNI ratio remains elevated.*

During the euro area sovereign debt crisis, market sentiment turned against both banks and sovereigns. This created a negative feedback loop as banks typically maintained substantial holdings of domestic sovereign debt, such that falls in the value of these assets reduced their implicit valuation. At the same time, governments of countries with weakly capitalised banks often bore substantial fiscal costs arising from the need to provide bailouts. During the crisis, liquidity contractions across sovereign markets was amplified by market segmentation and the lack of a common safe asset.[20]

Despite significant progress in recent years, the financial architecture of the euro area remains incomplete. Reforms such as the establishment of the SSM, the SRB, and the adoption of the bank recovery and resolution directive have improved bank supervision, capitalisation, resilience, and resolvability. The establishment of the ESM and ECB policy measures have also eased market perceptions regarding fragmentation risk. Some key elements of the financial architecture, however, remain incomplete. Additional measures to further shield banks and governments from periods of contagion, such as the creation of a euro area-wide integrated deposit insurance scheme and a common safe asset, remain a work in progress.

As a consequence, in the face of significant adverse shocks, highly-indebted euro area countries could be vulnerable to a re-emergence of the sovereign-bank doom loop. Government debt-to-GDP ratios remain elevated, while fiscal consolidation during the upward phase of the cycle has been limited in many euro area countries (Chart 23). At the same time, the muted recovery in economic growth (Chart 24) in the euro area since the crisis has dampened another channel for debt reduction, while inflation rates have persistently fallen short of expectations. Moreover, forecasts for euro area economic growth have repeatedly been revised down (Chart 25). Further adverse shocks to growth could lead to a re-emergence of sovereign debt sustainability concerns.

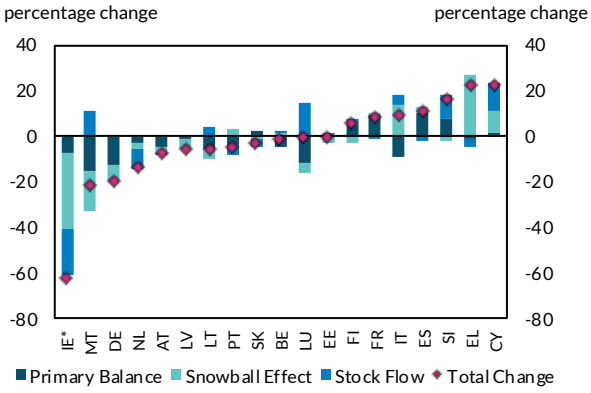
In 2018, when government debt yields were under pressure in Italy, its banking system responded by increasing its exposure to domestic sovereign debt (Chart 26). This episode, during which yields were temporarily pushed upwards by increasing political uncertainty, highlights the potential for a

[20] For a discussion of these amplification effects, see Clancy, D., Dunne, P. and Filiani, P. (2019) "Liquidity and tail risk interdependencies in the euro area sovereign bond market", Central Bank of Ireland, Research Technical Papers, Vol. 2019, No. 11.

re-emergence of the doom loop between the banking sector and sovereign debt, particularly in the context of a more general repricing of risk (see *Risks: Global repricing*).

Chart 23: Sovereign debt has continued to increase in some euro area countries

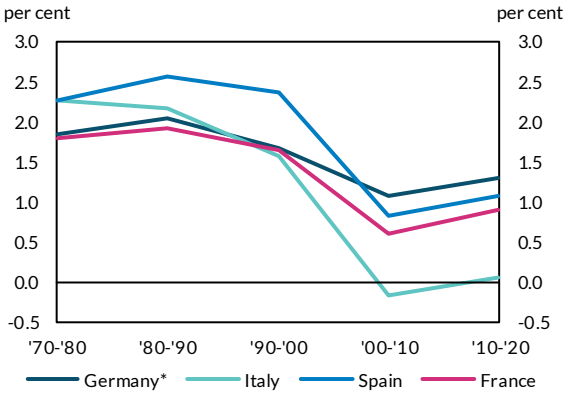
Change in government debt ratios in euro area countries, 2012 to 2018



Source: Conefrey, Hickey and Walsh (2019).
Notes: The chart decomposes changes in the debt-to-GNI (debt-to-GNI* for Ireland) ratio into its key drivers: the primary budget balance, snowball effect (or interest-growth differential) and the stock-flow adjustment. The stock-flow adjustment reflects factors affecting debt but not included in the budget balance, such as the sale of financial assets.

Chart 24: GDP growth in the largest euro area countries has slowed in recent decades

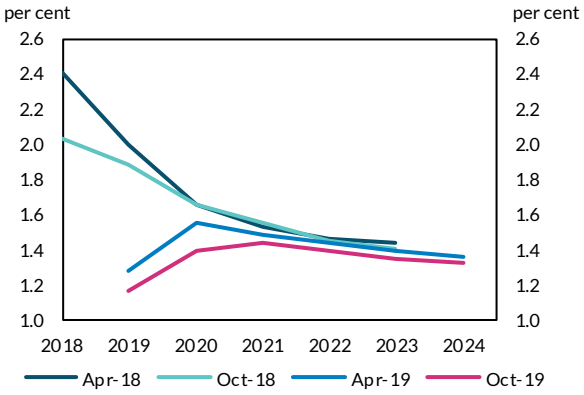
Ten-year average GDP per capita growth rates (constant prices)



Source: AMECO.
Notes: GDP at 2010 reference levels per head of population. For Germany, data before 1991 refer to West Germany only.

Chart 25: Euro area GDP growth has slowed, while forecasts have been revised down repeatedly

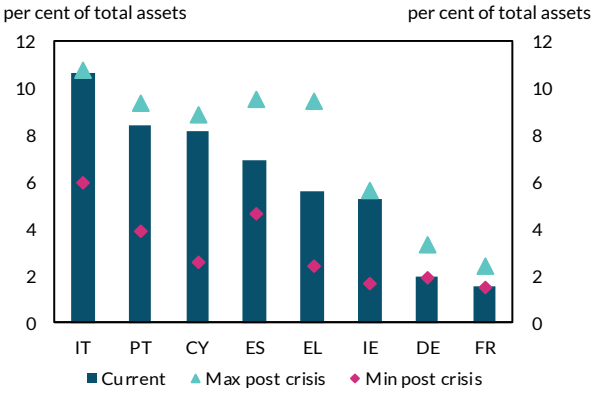
Euro area GDP growth forecasts



Source: IMF WEO
Notes: Euro area GDP forecasts are from the World Economic Outlook in April 2018, October 2018, April 2019 and October 2019.

Chart 26: Banks increased their holdings of domestic sovereign debt in some euro area countries

Domestic sovereign exposures of MFIs



Source: ECB and Central Bank of Ireland calculations.
Notes: Series for Ireland refer to Irish retail banks

A re-emergence of sovereign debt sustainability concerns could limit the scope for countercyclical fiscal policies in countries with elevated debt positions, by increasing the cost of servicing debt. An increase in the cost of financing would erode fiscal space during a downturn, which would hamper the capacity of governments to provide fiscal stimuli when they are most needed. This would be particularly damaging if the economies were simultaneously hit by a persistent shock to growth that could put government debt on a different path.

A re-emergence of sovereign debt sustainability concerns might erode bank capital buffers across some euro area banks. Markets expect low euro area bank profitability to persist, leaving them more vulnerable to potential increases in funding costs or losses on sovereign exposures (see

Resilience: Banks). Market-based indicators of euro area bank and sovereign risk remain highly correlated (Chart 27), suggesting that in an adverse scenario, the potential for an adverse feedback loop between bank and sovereign distress remains.

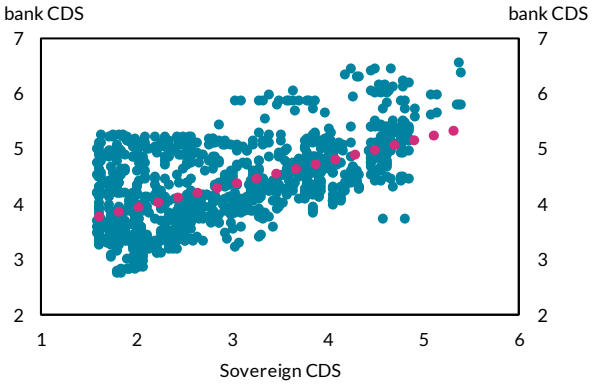
Irish banks and insurers are exposed to the domestic sovereign. While the degree of exposure to the domestic sovereign is not as a high as in some highly-indebted euro area countries, Irish resident banks (excluding IFSC banks) hold Irish sovereign debt equivalent to 5.3 per cent of their total assets. Exposure to Irish and euro area periphery sovereign bonds also remains substantial for some Irish-market oriented non-life insurers.

Irish sovereign debt remains high, making it more vulnerable to changes in market perceptions. Irish government debt was 104 per cent of GNI* in 2018 (see *Resilience: Sovereign*), the highest stock of government debt per capita in the euro area. Much of the debt is held by foreign investors (see Box 3). Since the crisis, reductions in the sovereign debt ratio in Ireland have primarily been driven by growth in national income and stock-flow adjustments, and less so by debt reductions.[21]

Market sentiment toward Ireland is benign at present. Irish sovereign yields remain at historical lows, while the Irish sovereign is currently more closely correlated with euro area countries with lower debt levels (Chart 28). Nevertheless, a general repricing of euro area sovereign debt could increase the cost of borrowing for the Irish Government. The magnitude of such spillovers could be amplified if market perceptions of country-specific risk were reassessed, for example in the event of a disorderly Brexit (Chart 2).

Chart 27: Market based indicators of euro area bank and sovereign risk remain highly correlated

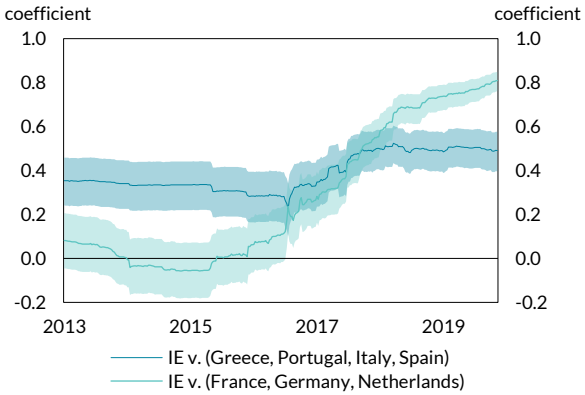
Bank and sovereign credit default swaps



Source: Datastream and Central Bank of Ireland calculations.
Notes: Based on 43 euro area banks from 9 euro area countries. The vertical axis reports the log of the price of bank CDS. Log of price of sovereign CDS is reported on the horizontal axis. Monthly observations range from January 2017 to October 2019.

Chart 28: Irish bond yields are increasingly correlated with less indebted countries

Correlation between Irish bond yields and other countries



Source: Datastream and Central Bank of Ireland calculations.
Notes: Time-varying average pairwise cross-country correlations (solid lines) between changes in the Irish 10-year sovereign bonds yields and those of two groups of euro area countries, observed at a weekly frequency, January 2013-November 2019. The correlation is computed using a window size of 240; calculations start in January 2002. Shaded areas indicate 95 per cent confidence intervals. Last observation 15 November 2019.

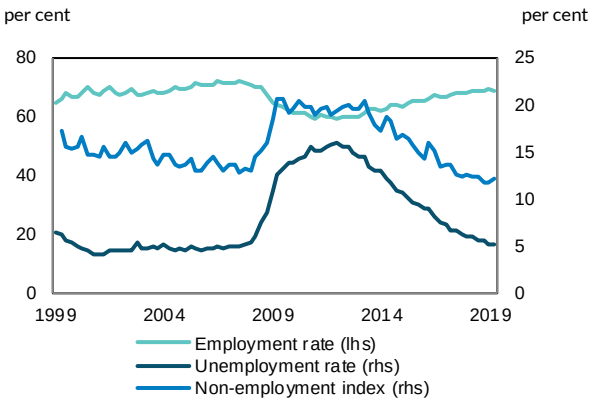
[21] The stock-flow adjustment reflects factors affecting debt but not included in the budget balance, e.g. sales of financial assets.

Overheating and potential for elevated risk-taking

If a disorderly Brexit does not arise, prospects for the Irish economy remain favourable. The economy is, broadly speaking, already operating around potential. Asset prices, especially real estate, are stabilising at levels suggestive of a mature phase of the cycle. Credit growth is strengthening, especially for mortgages, consumer lending and lending to large enterprises, with some evidence of increased risk appetite. In such an environment, banks and other financial intermediaries may not fully internalise the collective impact of their individual risk-taking behaviour, especially when the outlook for profitability remains below market expectations. Any pro-cyclical credit supply response to an overly-buoyant economy can precipitate a pro-cyclical retrenchment when sentiment turns or risks materialise.

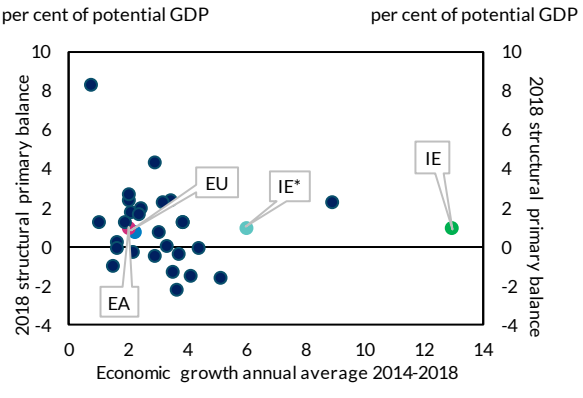
In the absence of a disorderly Brexit (see *Risks: Brexit*), projections for the economy remain favourable, raising the risk that strong cyclical conditions could give rise to overheating dynamics. The Irish economy continued to perform strongly in the first half of 2019, while already being in an advanced phase of the economic cycle. Labour market conditions are broadly consistent with full capacity (Chart 29). As the economy has approached full employment, fiscal policy may have had the capacity to be more countercyclical, with Ireland experiencing amongst the highest rates of economic growth in the EU over the five years up to 2018 (Chart 30). The latest Central Bank projections for the economy, on the basis of a Brexit deal occurring, are for underlying domestic demand growth of 3.8 per cent this year with the unemployment rate to average 5 per cent.[22] Despite some moderation in 2020/21, forecasts are for continued expansion in domestic demand at approximately 3.5 per cent with further declines in the unemployment rate also expected. Declining labour market slack could add to wage pressures, which in turn could damage competitiveness and make the economy more sensitive to correction.

Chart 29: Labour market conditions are consistent with full employment
Labour market indicators



Source: CSO and Central Bank of Ireland calculations
Notes: Employment refers to persons aged over 15 and in employment. The NEI is a measure of labour utilisation that takes account of the degree of attachment to the labour force of various non-employed groups - for background see Economic Letter, No. 9 2017. Last observation 2019Q2.

Chart 30: Fiscal policy may not have been sufficiently countercyclical given the pace of economic growth
Structural primary balance in EU Member States (2018) and average annual growth (2013-2018)



Source: Ameco Database, CSO and Central Bank of Ireland calculations
Note: IE refers to the annual average growth in real GDP in Ireland. IE* refers to the annual average growth in real GNI* in Ireland.

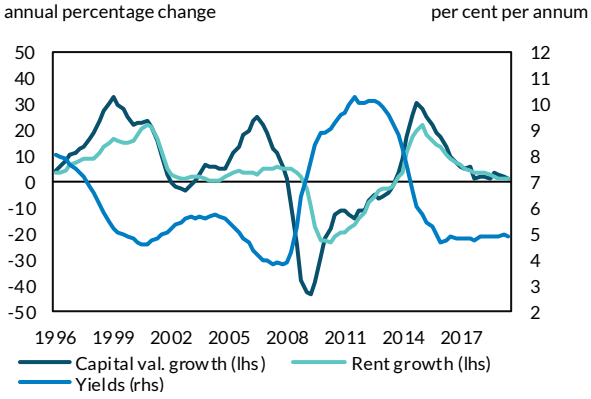
[22] Central Bank of Ireland Quarterly Bulletin No. 4 2019.

Emerging domestic imbalances, be it in the wider economy or in real estate or other asset markets, presents incentives for elevated risk taking, as it can mask underlying fragility in the system. It has been noted in the last *Review* that banks face significant challenges to their profitability, while market expectations of return on equity (ROE) do not appear to have adjusted downward in response to higher levels of capitalisation (see also *Resilience: Banks*). In an environment of easy global financing conditions (see *Risks: Global repricing*) and an economy operating close to full capacity, banks and other financial intermediaries may seek to improve profitability through a relaxation of lending standards and increased volumes of activity in riskier market segments. In doing so, individual banks and investment funds may fail to take account of the system-wide consequences of their actions, further inflating domestic demand and asset prices. This collective action can make the system more susceptible to cyclical risk materialising.

Irish asset prices, especially real estate, are in many cases stabilising at relatively high levels consistent with a more advanced stage of the cycle. While growth in house prices has been moderating, they remain high relative to incomes and, to a lesser extent rents, on a historic basis. Rental growth remains robust, reflecting the underlying supply constraints in that sector and continuing favourable factors supporting demand for housing services (see *Risk Assessment – Mortgage measures*). Meanwhile, against a backdrop of more modest price and rental growth (Chart 31), commercial real estate (CRE) continues to attract significant volumes of investment, largely from abroad.[23] The stabilisation of CRE yields at a level lower than their long-run average may be suggestive of stretched valuations in the domestic CRE market. The spread of CRE yields over that of the sovereign in Ireland nonetheless remains high, and further deviated from long-run averages than other European countries (Chart 32). This differential in Ireland, in a historical and cross-country sense, may explain the on-going attractiveness of Irish CRE to international investors.

Chart 31: CRE yields remain relatively steady while capital value and rental growth has moderated

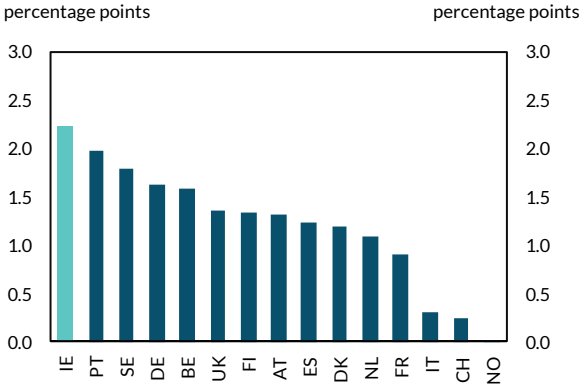
CRE yields and annual growth in capital values and rents



Source: MSCI and Central Bank of Ireland calculations
Note: Last observation 2019Q3.

Chart 32: Spreads on Irish CRE above long-run average, with that excess amongst the highest in Europe

Deviation of current CRE/government bond yield spread from long run average



Source: MSCI, Datastream and Central Bank of Ireland calculations
Note: CRE yield is the gross rent passing yield. DK, SE, UK and FI, use net operating income yields. Data available varies by country, from 14 years to 25 years. Last observation end-2018.

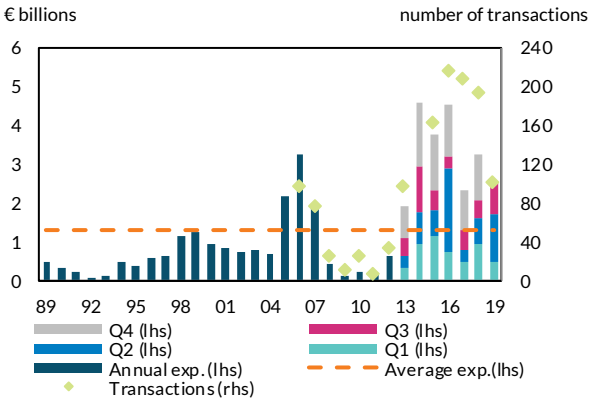
Strong underlying demand for CRE has been met by a supply response, primarily financed through foreign sources. Irish CRE has attracted investment expenditure of approximately €2.5bn in the

[23] According to both Cushman & Wakefield and CBRE data for the first 9 months of 2019, of the CRE investment for which a source can be identified, approximately 60 per cent originates overseas.

first 9 months of the year, higher than the equivalent 2018 figure, and almost twice the level of real long-run average annual expenditure (Chart 33). The overall Dublin office vacancy rate (5.3 per cent) remains at a historically low level (Chart 34), reflecting broader buoyant demand conditions. According to recent CBRE estimates, about 950,000m^2 of new office accommodation, is due to come on-stream in Dublin over the next five years (2020-24)[24], to service a market where the average annual take up since 2003 has been almost 200,000m^2 per annum (Chart 34). The delivery of such a substantial quantity of space at a time of heightened uncertainty emphasises the importance of prudent management and financing of the supply pipeline in the period ahead.

Chart 33: Investment in Irish CRE remains strong and above real long-run average

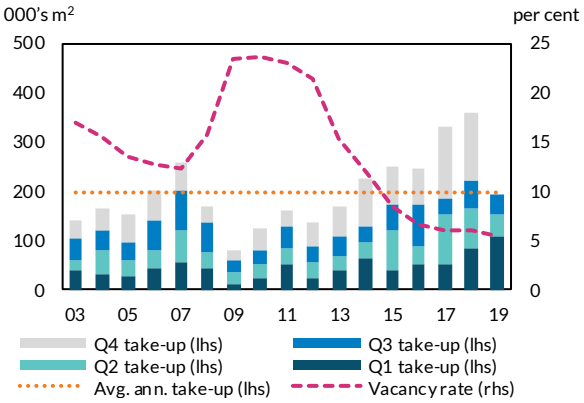
Real investment expenditure in Irish CRE



Source: Cushman & Wakefield and Central Bank of Ireland calculations
Notes: Quarterly breakdown was not available pre 2013. Data are real, with the last observations relating to 2019Q3. Average annual CRE investment expenditure calculated 1989 to 2018.

Chart 34: Strong take-up has seen office vacancy rate in Dublin fall to one of the lowest across major European cities, even with strong supply pipeline

Dublin office take-up and vacancy rate



Source: CBRE and Central Bank of Ireland calculations.
Notes: Last observations 2019Q3.

Despite current demand levels appearing to support activity, developments in the CRE market may be more sensitive to European and global risk appetite than domestic conditions. Irish resident investment funds are estimated to hold approximately 35 per cent of the invested CRE market in Ireland, and are significant intermediaries of foreign investor flows into the market.[25] While greater involvement of non-bank financial entities in the sector facilitates liquidity and risk-sharing, it opens up the market to a new transmission channel for risk. A decline in risk appetite could result in a sharp fall in the availability of funding, dampening Irish property prices, reducing collateral values, depressing construction activity, and reducing the value of Irish households' investments via pension or investment funds.

Recent increases in lending, particularly for mortgages, consumer credit and lending to large enterprises, are reflective of current benign conditions. Aggregate non-financial private sector credit growth has been on an upward trend for five years, and is currently growing at around 3 per cent per annum. This is mainly driven by strong growth in PDH mortgage lending and, increasingly, by credit to large enterprises which has seen strong increases over 2019. Consumer (i.e. non-mortgage personal) credit too has seen a stronger rate of growth over the year. Negative rates of

[24] Consisting of more than 430,000m^2 under construction and 520,000m^2 with planning permission granted.
[25] See Coates et al., *"Who invests in the Irish commercial real estate market? An overview of non-bank institutional ownership of Irish CRE"*, Central Bank of Ireland, Financial Stability Note, Vol. 2019, No. 6.

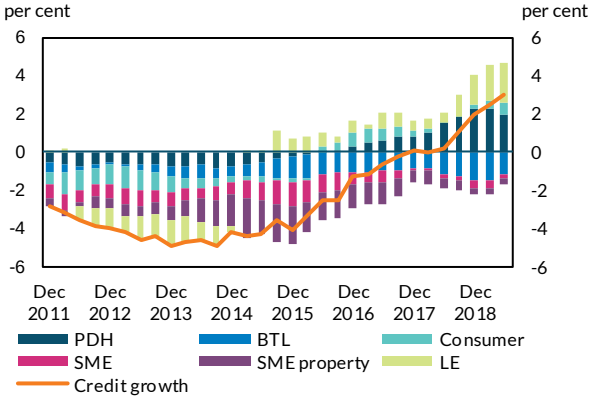
growth persist however in BTL mortgage lending and lending to SMEs, in particular for property purposes, which continue to slow the aggregate rate of credit growth (Chart 35).

Bank lending to large enterprises has seen particularly strong rates of growth at approximately 15 per cent in the first half of 2019. This is dominated by lending to firms in the manufacturing sector, specifically those in the food and beverage industry (Chart 36), which itself is a sector that would be relatively more exposed to a disorderly Brexit (See *Risks: Brexit*). By mid-2019, the outstanding amount of large non-financial enterprise lending had reached €20 billion, just €2 billion lower than lending to non-financial SMEs.[26] An analysis of new lending to Irish large enterprises by the largest retail banks during 2018 shows some marginal shift away from lower risk lending as the year progressed, but the proportion of the highest risk lending remains relatively low (Chart 37).

Any pro-cyclical credit supply response to an overly-buoyant economy can precipitate a pro-cyclical retrenchment when sentiment turns or risks materialise. Even if growth in key asset markets, such as real estate, is broadly in line with economic fundamentals, those fundamentals are subject to a high degree of volatility and uncertainty in the Irish market. Similarly, the trading performance of firms, and their ability to service their debt can be negatively affected if the business cycle turns aggressively, which it may be more likely to do the faster the pace of economic growth is above potential. Misplaced enthusiasm and expectations about future economic activity or asset markets, leading to higher risk lending could result in future unexpected losses for banks. These could limit their capacity for future lending, and further dampen economic activity when the cycle turns. This pro-cyclicality between credit growth and economic activity is clearly evident across many countries through time, including Ireland. Indeed, this relationship has been stronger in Ireland than in many advanced economies (Chart 38).

Chart 35: PDH mortgages and lending to large enterprises key drivers of overall credit growth

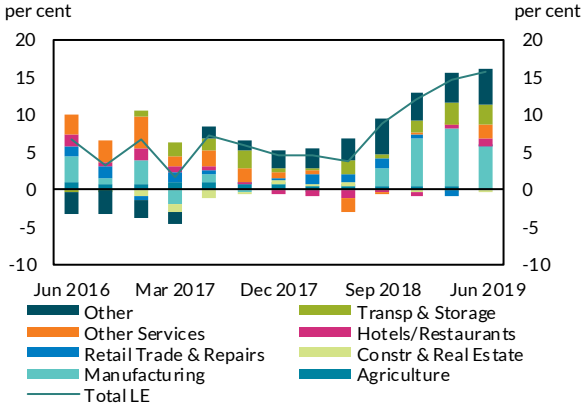
Non-financial private sector credit growth and contributions by lending type



Source: Central Bank of Ireland.
Notes: BTL includes holiday home. Consumer relates to non-mortgage household credit. LE stands for large enterprises and is a derived series.
Last observation 2019Q2.

Chart 36: Banks' lending to large firms has been particularly strong to the manufacturing sector

Growth in credit to large enterprises

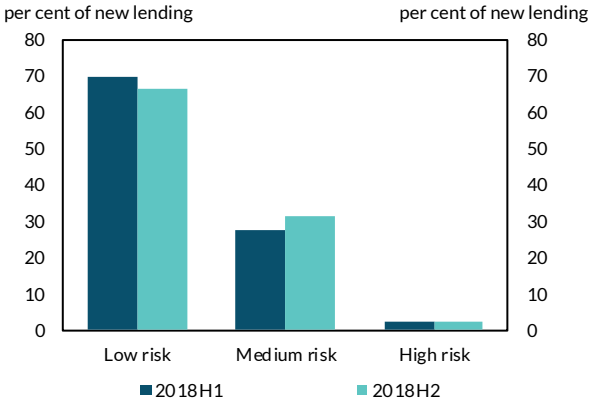


Source: Central Bank of Ireland.
Last observation 2019Q2.

[26] See Table A14 and A14.1, Central Bank of Ireland, Money & Banking Statistics.

Chart 37: Most recent bank lending to large enterprises has a marginally higher risk profile

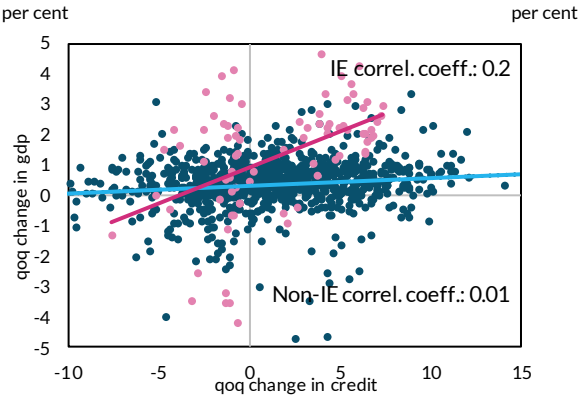
Proportion of new lending to large enterprises by risk category



Source: Central Bank of Ireland
Notes: New lending data for loans and participating loans only. New lending data are for large non-financial, non-real estate corporate enterprises and excluding government sectors (NACE Rev. sectors O, P, Q, R, S, T, U, K and L). Internal bank ratings of performing balances are from three Irish retail banks harmonised to a common rating scale. Loans are assigned to risk categories based on an analysis of internal bank ratings and historical default transition rates.

Chart 38: Pro-cyclicality between credit and economic activity more pronounced in Ireland than other countries

Positive correlation between credit growth and economic growth



Source: ECB Statistical Data Warehouse, Bank for International Settlements, Bank of England and Central Bank of Ireland.
Note: Countries included are Ireland, Austria, Belgium Denmark, Finland, France, Germany, UK, Greece, Italy, Portugal, Spain, US. Credit and economic growth expressed in quarterly terms. Economic growth in Ireland taken as GNI*. Irish observations are in pink.

Box 1: Financial market distress and the macro-financial environment in Ireland

By Gordon Barham, Fabio Parla and Martin O'Brien (Macro-Financial Division)

Understanding how macroeconomic variables react to financial market turbulence can help policymakers judge the appropriate macroprudential policy stance. In and of itself, financial market volatility does not necessarily mean financial stability risks are materialising. However, a prolonged period of financial market turbulence can eventually affect macro-financial outcomes.

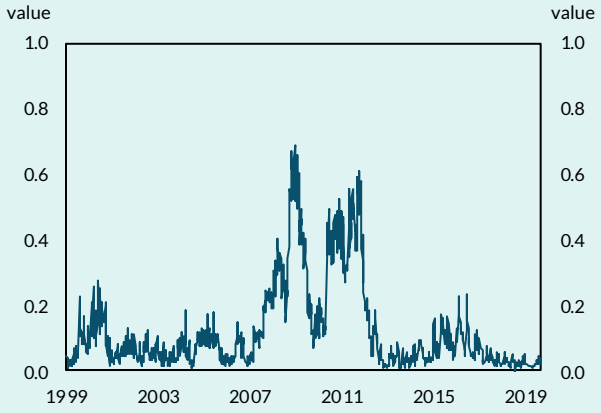
A key challenge is mapping the high frequency developments in financial market distress to slower evolving macroeconomic and credit indicators. Financial market risk is monitored by the Central Bank at a high frequency through, among other indicators, developments in the Irish composite stress index (ICSI) (Chart A)[1] while macroeconomic variables, such as unemployment, house prices and loans to the private sector are observed monthly and with a lag.

The response of the macroeconomic aggregates to financial distress is analysed here through the estimation of a mixed-frequency Vector Autoregression (MF-VAR).[2] Compared to standard VAR, the MF-VAR allows for the modelling of the co-movements of high and lower frequency variables jointly, which allows for inference of developments in the ICSI on the credit and macroeconomic variables of interest from a macroprudential policy perspective.

Chart B shows the impact of increased financial market distress on the unemployment rate, house prices and loans to the private sector. Financial distress is proxied by a 5 basis points increase in the ICSI.[3] Over a one-year horizon (3 year horizon) this shock leads to an increase in the unemployment rate of 0.2 (0.3) percentage point, while the corresponding responses of house prices and of private loans are -1.2 (-2.0) and -1.1 (-1.6) per cent, respectively.

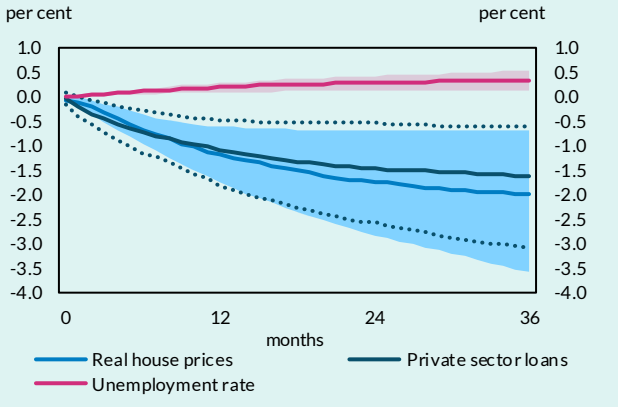
In practice, a wider range of information are considered in motivating any particular macroprudential policy decision in times of financial distress. The approach outlined in this Box can assist policy makers reach a timely interpretation of the impact of financial market turbulence on the macro-financial environment.

Chart A: Irish composite stress index (ICSI).



Source: Central Bank of Ireland
Notes: Last observation 15 November 2019.

Chart B: Response of the macro variables.



Source: CSO and Central Bank of Ireland.
Notes: The chart shows the median bootstrap estimates and the corresponding 90 percent confidence intervals (CIs) of the impulse responses (dashed lines refer to CI of private sector loans).

[1] It tracks volatility in financial markets and bank-related asset prices (see Box 5, Central Bank of Ireland (2016), Macro-Financial Review).
[2] For more see Ghysels, E. (2016) "Macroeconomics and the reality of mixed frequency data", Journal of Econometrics, 193(2), 294-314. Three MF-VARs are estimated, each of them fitted to the ICSI and to one of the three macroeconomic variables, using different time spans: January 1999-September 2019 (unemployment rate), January 2005-August 2019 (house prices), January 2003-August 2019 (loans). The macroeconomic variables entering the VAR are (month-on-month) changes in the unemployment rate and (month-on-month) real house prices and loans to private sector growth rates.
[3] There have been six instances since 1999 when the ICSI experienced four consecutive weeks of changes greater than or equal to 5bps.

Box 2: Collateralised loan obligations (CLOs) market domiciled in Ireland

By Simone Cima and Pierce Daly (Market-Based Finance Function)

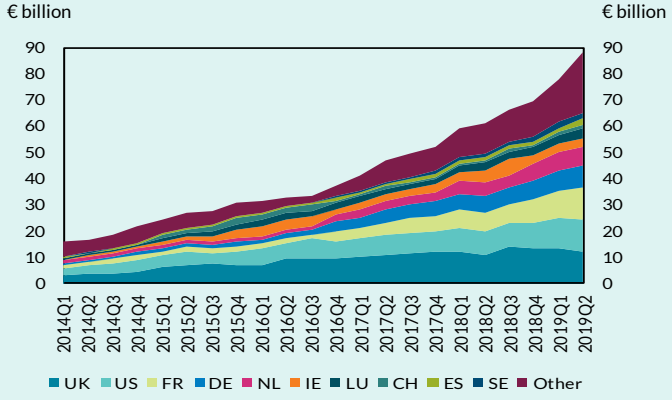
The size of the US and, to a lesser extent, European leveraged loans markets has grown substantially in recent years. A key driver of this growth has been the securitisation of leveraged loans through collateralised loan obligations (CLOs). CLO vehicles purchase assets (principally leveraged loans originated by banks), bundle them together, and then issue debt securities with these assets as collateral.[1] CLO securities typically consist of different tranches of debt, each with different credit ratings, where the higher-rated tranches have seniority of payment over the lower-rated ones.

Ireland is the principal location within Europe for the domicile of CLO entities. CLO securities issued by Irish domiciled CLO vehicles amounted to €74bn at Q2 2019, around two-thirds of the total estimated outstanding value of the European CLO market (which itself is much smaller than the US CLO market). Total assets of Irish domiciled CLO vehicles have grown rapidly in recent years, from €16bn at Q1 2014 to €88bn at Q2 2019 (Chart A). Irish domiciled CLO vehicles' assets mainly consist of leveraged loans (€59bn in Q2 2019). These loans are mainly to corporate borrowers in the UK, US, and euro area countries such as France, Germany and the Netherlands. The exposure of Irish resident CLO vehicles to domestic corporate borrowers is relatively small at €0.9bn. In comparison, Irish banks had approximately €41bn in loans outstanding with Irish NFCs in the same period.

Investors in CLOs issued by Irish vehicles are also mainly located abroad, including in the euro area, the US, the UK and Japan. Within euro area investors, holdings are concentrated amongst non-bank investors – investment funds and, to a lesser extent, insurance corporations. From the perspective of Irish-resident investors, CLO securities are mainly held by Irish domiciled investment funds (€2.2bn). These holdings are spread across approximately 160 funds and represent less than 1 per cent of Irish funds' total assets at Q2 2019. Investment in CLOs by Irish retail banks is also very limited, accounting for less than 0.1 per cent of the total assets of the domestic banking system.

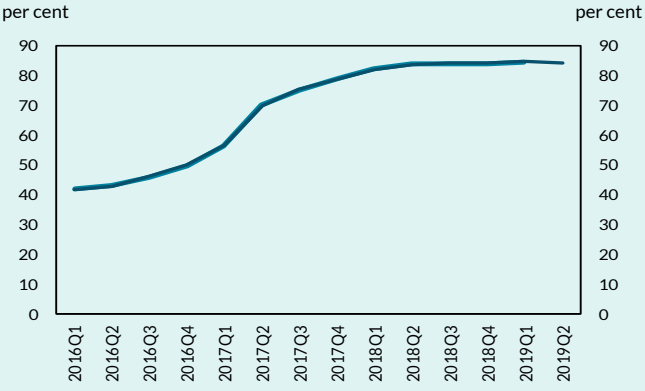
In a low interest rate environment, the search for yield has contributed to investor appetite for CLOs. However, this market has also seen growing risk-taking behaviour and declining credit standards, which may contribute to a potential mispricing of risk. Leveraged loans that are used as collateral for CLOs have seen reduced covenant protections, both globally as well as in Ireland (Chart B). This is coupled with rising leverage ratios of corporate borrowers, which reduce their ability to repay debts in the event of a downturn.[2] Any stress in the leveraged loan market may potentially spread to other parts of the financial system due to its interconnectedness with several types of investors and entities. Given Ireland's role as a hub for European CLO activity, the Central Bank has been active in seeking to shed light in this segment of the market-based finance sector, adding to international efforts to understand vulnerabilities in this market.[3]

Chart A: Total Assets of Irish CLO vehicles, by origin of exposure, Q1 2014 – Q2 2019



Source: Central Bank of Ireland.

Chart B: Cov-lite loans as a fraction of outstanding leveraged loans in Irish CLOs, Q1 2016 – Q2 2019



Source: Central Bank of Ireland, IHS market and authors' calculations.

[1] CLO vehicles are required to report data to the Central Bank of Ireland on a quarterly basis under the FVC returns, however, are not prudentially regulated entities.
[2] See, for example, Bank of England, Financial Stability Report, Issue No. 44, November 2018.
[3] See McCarthy et al. (2019), The Who's Who of Irish Collateralised Loan Obligations, Central Bank of Ireland, November 2019.

Box 3: Who invests in Irish sovereign debt securities?

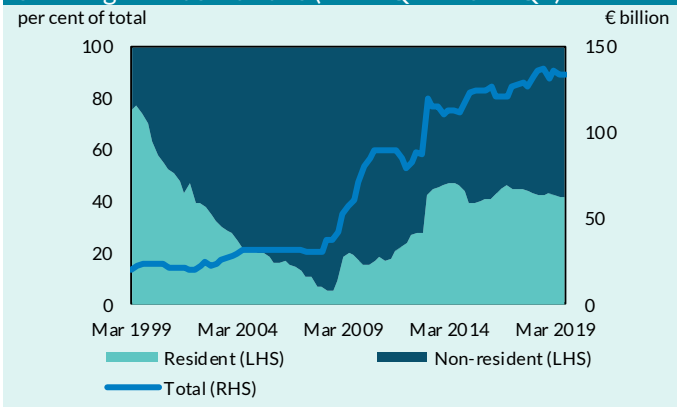
By Mary Everett, Vahagn Galstyan and Peter McQuade[1]

Smooth functioning of the sovereign debt market critically important for financial stability. In that context, it is important to understand the share of sovereign debt held by non-resident investors as their holdings may be less sticky than domestic investors.[2] Close geographical proximity and institutional linkages such as common membership of the euro and the EU are additional factors that mitigated retrenchment from cross-border portfolio investment during the global financial crisis.[3] This Box provides an overview of the geographic distribution of investors in Irish sovereign debt securities.

Irish Government consolidated gross debt stood at €215bn in 2019Q1, of which 66 per cent was debt securities according to Eurostat. Central Bank statistics indicate that the nominal value of outstanding Irish sovereign debt securities was €134bn at end-August 2019. Of this, €56bn (42 per cent of total sovereign debt securities holdings) were held by residents and €78bn were held by non-residents. The share of non-resident investors declined during the global financial crisis, with further falls observed during the European sovereign debt crisis (Chart A). The share of non-resident investors stabilised following the implementation of the ECB's asset purchase programme, which coincided with improving economic conditions.[4] This pattern is similar to that observed in other countries that experienced severe financial stress during the sovereign debt crisis (e.g. Spain).

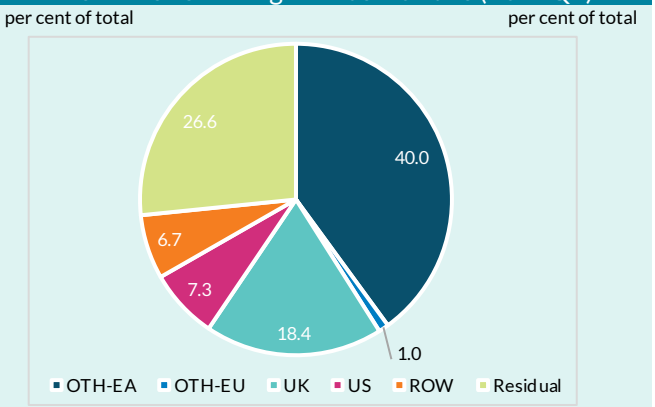
A more detailed geographic breakdown of the non-resident investors in Irish government debt securities is available from the ECB's Securities Holding Statistics Database (Chart B). Investors resident in other euro area countries held approximately 40 per cent of total non-resident holdings, with the remaining 60 per cent held by non-euro area investors. There are, however, a number of caveats associated with these data. Notably, the reported shares of the UK (18 per cent) and US (7 per cent), the primary non-euro area investors, may be exaggerated because of the presence of custodian investors in London and New York.[5] The National Treasury Management Agency also provide the average geographic breakdown of immediate investors over the past 5 syndications (as opposed to the total outstanding stock).[6] The share of non-residents was 92 per cent. The US and Canada combined accounted for 6.7 per cent, while the UK share was 30 per cent.

Chart A: Resident and non-resident holdings of Irish sovereign debt securities (1999 Q1 – 2019 Q1)



Source: Central Bank of Ireland
Notes: Total refers to nominal value of outstanding debt securities. The increase in resident holdings in 2013 reflects the exchange of promissory notes for govt. bonds issued to the CBI by Anglo Irish Bank.

Chart B: Geographic breakdown of non-resident holders of Irish sovereign debt securities (2019Q1)



Source: Eurosystem Securities Holding Statistics Database
Notes: Per cent of total outstanding debt securities

[1] Monetary Policy, International Analysis and Relations, International Analysis and Relations and Irish Economic Analysis.
[2] Reinhart, C. & Rogoff, K. (2011) "The Forgotten History of Domestic Debt," *Economic Journal*, vol. 121(552).
[3] Galstyan, V. & Lane, P.R. (2013) "Bilateral portfolio dynamics during the global financial crisis," *European Economic Review*, vol. 57.
[4] The PSPP increased resident holdings via the Central Bank of Ireland. Larkin, L., Anderson, P.J., & Furlong, S. 2019. "The Irish Government Bond Market and Quantitative Easing," Central Bank of Ireland, Quarterly Bulletin 02.
[5] This database does not yet comprehensively cover insurance companies and pension funds. Firm-level Bloomberg data indicate that insurers held approximately €11bn in June 2019, which represents a lower bound as firms are not obliged to disclose this information.
[6] NTMA August 2019 investor presentation.

Overall risk environment

The overall risk environment is broadly similar to the previous Review. The gradual build-up of cyclical systemic risk continues. While the fall in global interest rates since the last Review mitigates near-term debt sustainability concerns, it could also lead to further increases in already high asset valuations. With regard to mortgage lending, developments in lending volumes, lending standards, and house prices do not point to excesses that would present immediate threats to financial stability. The high degree of uncertainty around Brexit continues to pose significant challenges to the Irish macro-financial environment. Persistent structural risks for the economy and financial system, apart from Brexit, remain at moderately high levels. There is significant interdependence between risks creating the possibility for different risks to crystallise at the same time or to act as triggers to one another.

Cyclical risk

Cyclical risks relate to the developments in credit, asset markets (including real estate), risk-taking behaviour, the broader economic cycle and external imbalances, which are reflective of the gradual build-up of vulnerabilities in the macro-financial environment. In assessing the risk environment to inform policy decisions such as the Countercyclical Capital Buffer (CCyB), the Central Bank assesses these risks (See *Policy: CCyB*). The most important contributors to cyclical systemic risk in Ireland currently are developments in global financial conditions (see *Risks: Global repricing*) and the incentives for elevated risk-taking related to the potential emergence of domestic imbalances (see *Risks: Domestic imbalances*).

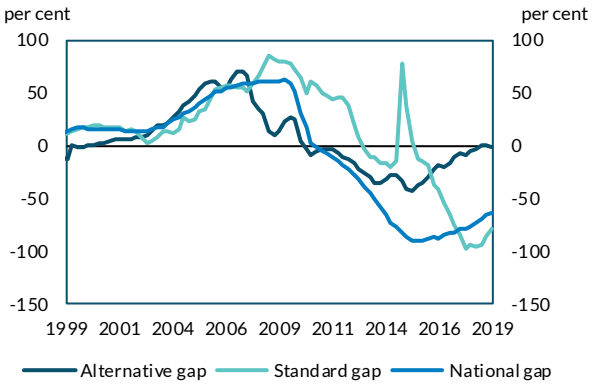
The further strengthening of credit growth is now more important in driving the gradual build-up of cyclical risk domestically. Overall measures of cyclical systemic risk, such as the preferred measure of the "credit gap" used by the Central Bank, have moved close to positive territory, with growth in credit being the main contributory factor over the past year (Chart 39). As referred to in *Risks: Domestic imbalances*, while aggregate credit growth is still relatively modest, certain pockets have strengthened considerably over 2019. Both the employment and unemployment rate are reflective of relatively tight labour market conditions. House prices are high compared to incomes and rents, although price growth has recently slowed (see *Risks: Mortgage measures*). Broader asset market developments, especially in terms of compressed risk premia, remains a significant element in the build-up of broader cyclical risk.

Measures of more immediate systemic distress or crisis likelihood do not point to an imminent crystallisation of risks. Estimates of the probability of a systemic banking crisis over the next two years remain relatively low (Chart 40).[27] However, these estimates are subject to a degree of uncertainty, especially given the particular circumstances of the extended low interest rate environment. While near-term debt sustainability concerns are mitigated, the extended period of search-for-yield supports already high asset prices in many markets, and the nominal levels of debt themselves remain relatively high. It also may contribute to challenges for the profitability of banks and insurance companies, limiting their capacity to build resilience to shocks (See Box 6). Consequently, relatively minor shocks compared to those in the past could have more significant impacts as a result of the prolonged low interest rate environment. With the cyclical build-up of

[27] See O'Brien, M. and Wosser, M. (2018), "An early-warning system for systemic banking crises: A robust model specification", Central Bank of Ireland Research Technical Paper Vol. 2018, No. 9.

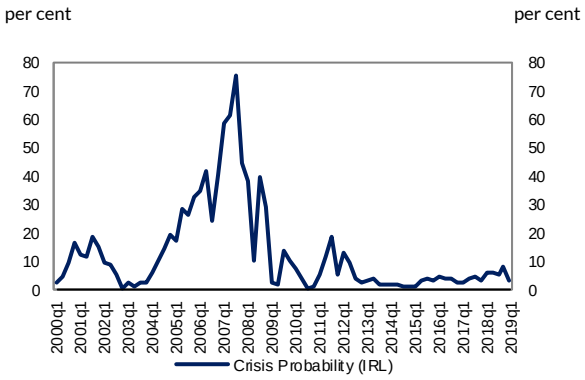
potential vulnerabilities in certain asset markets (See *Risks: Global repricing*), shocks of a more structural nature, such as a disorderly Brexit (See *Risks: Brexit*), could give rise to more immediate market turbulence. If such market turbulence were to persist, it could lead to a more general materialisation of cyclical systemic risk. The measures of stress in Irish financial markets (ICSI), has been relatively higher through 2019 than in previous periods, but remains below levels consistent with significant financial market distress (See Box 1).

Chart 39: Standard credit gaps remain substantially below zero but the nationally preferred alternative credit gap is now around zero
Various measures of the credit gap



Source: CSO, ECB and Central Bank of Ireland calculations.
Notes: Last observation 2019Q2.

Chart 40: Estimates of the probability of a banking crisis over the next two years remain low, but are subject to uncertainty
Systemic Banking Crisis Likelihood - Ireland



Source: Central Bank of Ireland.
Note: Last observation 2019Q1.

Mortgage measures – risk assessment

The potential that risks to financial stability might emerge from developments in the mortgage and housing market is a key motivation for the Central Bank's mortgage measures. As part of the regular annual review that informs the calibration of the measures, the Central Bank assesses developments in mortgage lending and the housing market in light of the measures' objectives (See *Policy: Mortgage measures*). In doing so, the mortgage measures risk assessment considers:

- the extent to which credit is a key driver in recent house price growth, and vice versa (pro-cyclicality), and;
- whether the loan-to-value and loan-to-income characteristics of new mortgage lending have shifted in a way resulting in a significant deterioriation in bank or borrower resilience.

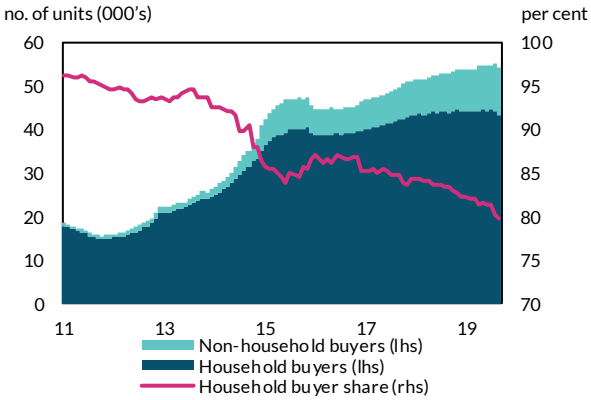
Overall, developments in lending volumes, lending standards, and house prices do not point to excesses that would present immediate threats to financial stability. The overall housing market has witnessed more moderate increases in activity levels and prices over the past year. New mortgage lending has also been expanding at a slower pace. Both the volume and the risk characteristics of that lending are not indicative of a significant deterioration in lending standards.

While significant challenges remain in the functioning of the market, housing market activity and prices continue to rise, with the pace of growth easing. Housing market activity continues to expand, but at a slower pace. The annual number of housing transactions on the open market rose by an average of 4 per cent to about 55,000 in the third quarter of 2019 (Chart 41), but the pace

of increase is 3 percentage points lower than that seen in 2018Q3. Current transactions levels are low compared to estimates of average activity from the start of the century. [28] These transaction levels have contributed to the turnover rate in the market remaining relatively static around 3 per cent, roughly comparable with many European markets, but below that of the UK.[29] Supply has increased recently, in terms of both the available stock for sale (Chart 42) and the delivery of new units (Chart 43). The supply of new units has been concentrated in the areas of highest demand, such as the Greater Dublin Area. Forecasted completions in the low 20,000s nationally for 2019 suggest that current supply levels are not adequate to meet medium term demand.[30]

Chart 41: Housing transactions are growing, but at a slower pace, with an increased share of non-household buyers

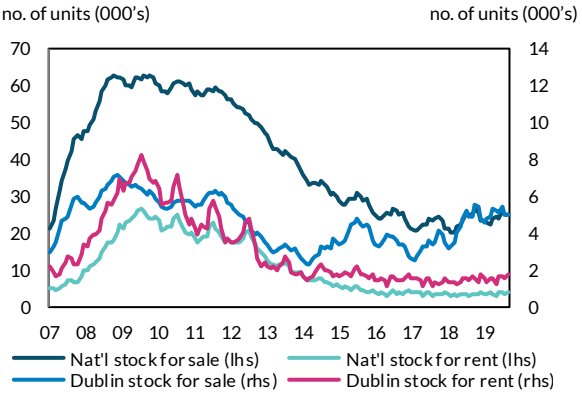
Market-based transactions of residential property (rolling annual total)



Source: CSO
Note: Last observation September 2019.

Chart 42: The stock of housing units for sale has risen, especially in Dublin

Number of second-hand units listed for sale or rent on Daft.ie website



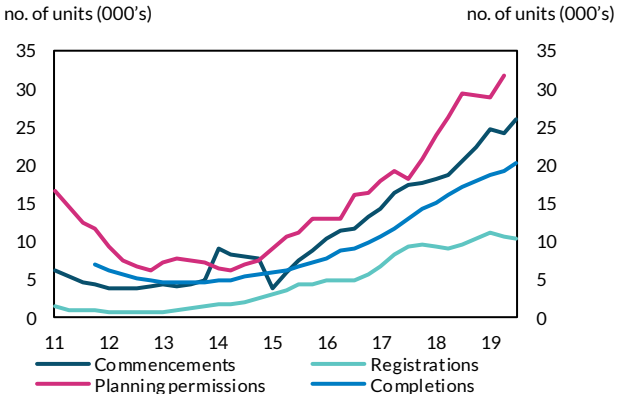
Source: Daft.ie
Notes: Observations are recorded from the Daft.ie website at the end of each month. Last observation September 2019.

The moderation in house price growth, which began in the first half of last year, has continued into 2019. According to the CSO, national residential property prices grew by 1.1 per cent annually in September 2019, down from 8.5 per cent a year earlier (Chart 44). Average house prices across the country are at their highest level since early 2009. The slowdown is particularly apparent in Dublin, where annual price growth was marginally negative in August and September. While the pattern is similar outside Dublin (Chart 44), the overall figure masks a substantial degree of regional divergence. House price growth is still quite robust in the Border and West regions, where prices were up 11.8 and 5 per cent respectively, year-on-year. In contrast, the Mid-East, home to a large portion of the Dublin commuter belt, saw prices grow by 0.2 per cent over the last 12 months.

[28] The estimated annual average number of housing transactions from 2000-2018 is approximately 80,000 units. Data from 2000-2010 are obtained from Coates et al., "*Estimating Cash Buyers and Transaction Volumes in the Residential Property Sector in Ireland, 2000-2014*", Central Bank of Ireland, Quarterly Bulletin 3, 2016.
[29] The turnover rate is the number of annual market-based transactions as a share of the total housing stock. Comparable European data from the European Mortgage Federation's, Hypostat Report 2019.
[30] See Conefrey, T. and Staunton, D. (2019) "Population Change and Housing Demand in Ireland" Central Bank of Ireland, Economic Letter Series, Vol.2019, No.14, *forthcoming*.

Chart 43: Supply of new housing units increasing, but remains below medium term estimates of demand

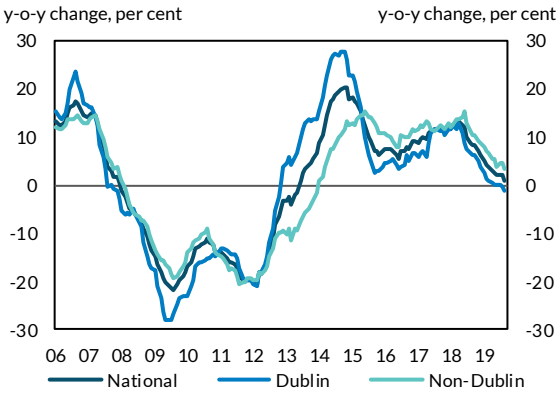
Housing market construction activity – rolling annual total



Source: CSO and Department of Housing, Community and Local Government.
Notes: rolling 4-quarter total. Last observations 2019Q3, except for planning permissions which are 2019Q2

Chart 44: House prices continue to moderate

CSO RPPI annual change: National, Dublin & non-Dublin



Source: CSO
Notes: Last observation September 2019

A number of factors have contributed to the slowdown in house price growth. Recent commentary on the decline in house price growth points to weaker effective demand due to:

- economic uncertainty associated with Brexit,
- a lack of clarity on certain policy areas earlier this year (for example, the future of the help-to-buy scheme) and
- the extent to which house price levels have stretched above income levels in certain market segments, in conjunction with the prevailing LTI limit.

Stronger increases in the supply of housing units coming on-stream in some localities is also a feature. These factors were also cited most often by participants in a range of events hosted by the Central Bank with property industry professionals during October 2019 (see Annex A for a summary of those proceedings). Differences in price dynamics and sales activity levels across the price distribution were also noted. At the upper-end of the price distribution, prices have fallen, with fewer units being sold. Demand in the "sub €400,000" category, however, remains strong. Such market intelligence appears to correspond with evidence from the Property Price Register, with the lower pace of growth being particularly noticeable at the upper-end of the market (Chart 45).

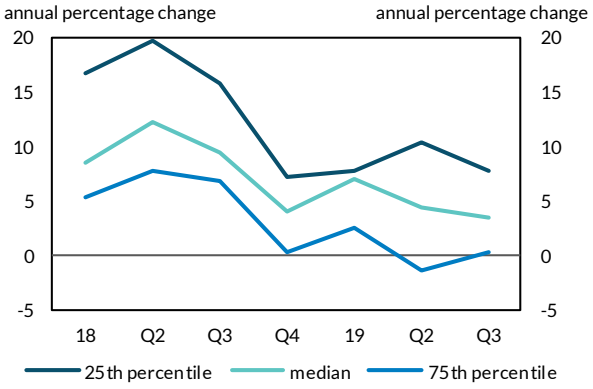
House prices are somewhat below long-run estimates of fundamental levels, but they remain high compared to income or rent on a historical basis. The suite of model-based approaches used by the Central Bank to assess misalignment in house prices continue to show that actual prices are somewhat below what would be expected given economic fundamentals (Chart 46).[31] Statistical indicators of house price valuations, such as house price-to-rent and house price-to-income ratios, however, exceed historical averages (Chart 46). Higher positive deviations from long-run averages of price-to-income are typically associated with higher probabilities of house price declines in the

[31] For more information see Kennedy G., O'Brien, E. and Woods M. (2016), "Assessing the sustainability of Irish residential property prices: 1980Q1-2016Q2", Central Bank of Ireland, Economic Letter Series, Vol. 2016, No. 11.

future.[32] Low levels of supply relative to medium-run estimates of demand can in part explain the model-based and statistical indicator valuation measures.

Chart 45: The moderation in house prices is more evident at the upper end of the price distribution

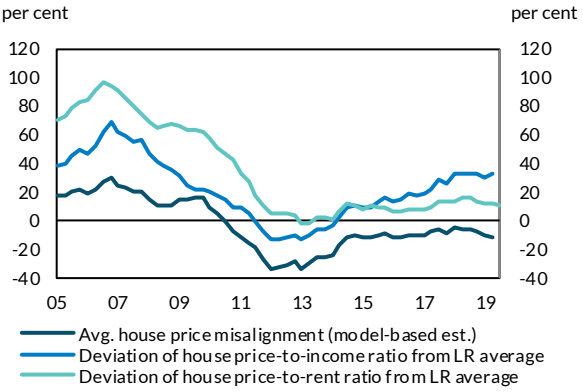
Average change in median, 25th and 75th per centile national house prices



Source: PRSA & Central Bank of Ireland calculations
Note: Full market price observations only, those below €20,000 and above €2,000,000 are excluded. Last observation 2019Q3.

Chart 46: Statistical indicators of house price valuations are above long-run averages

Estimates of residential property price misalignment



Source: CSO & Central Bank of Ireland calculations
Note: Model-based series is the average of 2 of the reduced form house price models in Kennedy, O'Brien and Woods (2016). Last observation 2019Q3 for hp-to-r ratio, 2019Q2 for other indicators.

The gap between supply and demand of properties is particularly evident in the rental market. Residential rents have continued to grow steadily throughout 2019 (Chart 47), due to insufficient supply occurring alongside strong demand.[33] Persistent rental growth since 2012 means that current rent levels are more than 30 per cent above their previous peak in 2008 (Chart 47). The comparative strength of residential rental yields has attracted more residential investment into the private rental sector (PRS).[34] In 2018, over €1 billion, or 30 per cent of total Irish property investment, was aimed at the domestic PRS, up from about €200 million in 2017. Moreover, CBRE estimate that a further €6 billion may be available to invest in the sector here. However, the stock of rental properties available does not seem to be increasing with this level of additional investment. A reduction in the number of smaller private landlords in the market has been cited as one reason why, despite the rise of institutional PRS investment, the stock of rental properties remains relatively flat (See Annex A). Properties sold by exiting private landlords that do not remain in the rental stock increase the supply available for owner-occupation.

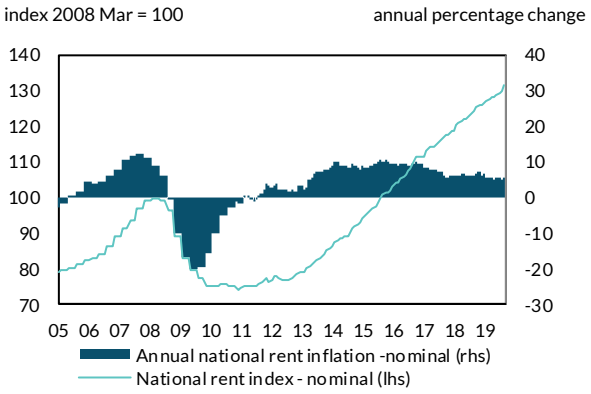
Survey evidence suggests a softening of house price expectations. While most participants in the Central Bank/SCSI survey of property market professionals expect prices to rise over a three-year time horizon, there has been a shift in responses towards price stagnation or even a price decrease for both national and Dublin markets over the next 12 months. Nationally, 29 per cent of respondents to the 2019Q3 Survey said they expect house prices to grow over the coming year, down from 59 per cent of those that answered a year earlier. The percentage anticipating lower

[32] See Box A1 in the Central Bank of Ireland's "Review of residential mortgage lending requirements. Mortgage Measures 2018". Instances where price-to-income ratios are 20 per cent above long-run averages are associated with a 20 per cent probability of house price declines of between 0-5 per cent over the following 12-month period.
[33] Residential rent data are also available from the RTB, whose national rent index grew 7 per cent annually in 2019Q2, down from 8.2 per cent in 2018Q2.
[34] According to Davy, even though net prime residential yields in Dublin have fallen to 3.85 per cent, from 5 per cent two years ago, they are still higher than the 3 per cent (or lower) available to investors in many other European cities. For more see: "Institutional investment to help unlock housing supply", Davy Economic Research, July 2019.

house prices in a year's time rose to 35 per cent in 2019Q3, up from 8 per cent in the 2018Q3 Survey. The median growth expectation over the medium-term (1-to-3 years) has declined since the 2018 review (Chart 48). In the latest survey, the median anticipated cumulative change over the medium term both nationally and in Dublin was 3 per cent.

Chart 47: Rents are now significantly above their previous peak, with strong growth continuing

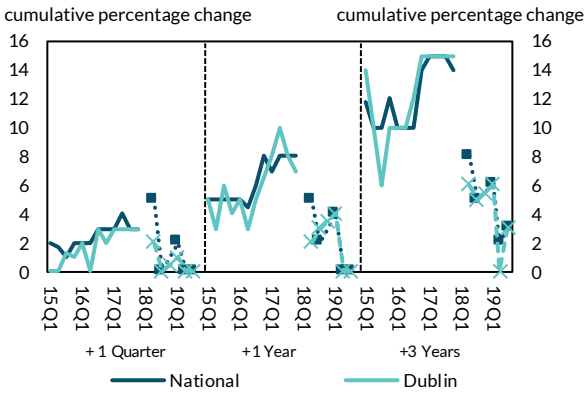
CSO residential rent inflation - nominal



Source: CSO
Notes: Last observation October 2019.

Chart 48: House prices are expected to moderate further

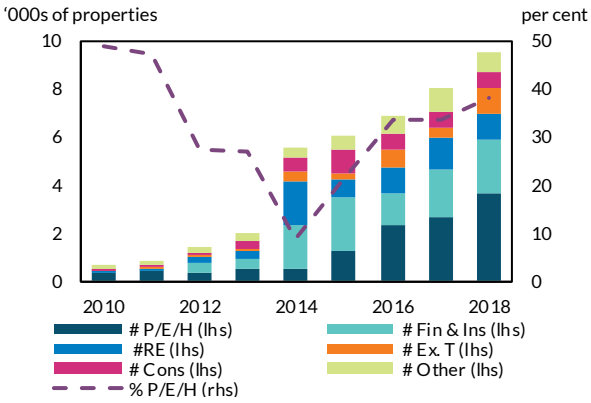
Median expected change in residential property prices



Source: CBI/SCSI Property Price Survey
Notes: Chart provides details of the results from the past 17 surveys (2015Q1 to 2019Q3). Due to unforeseen circumstances, no survey took place in 2018Q1 and 2018Q4. Number of observations vary from survey to survey.

Chart 49: The public sector is a significant driver of non-household participation in the housing market

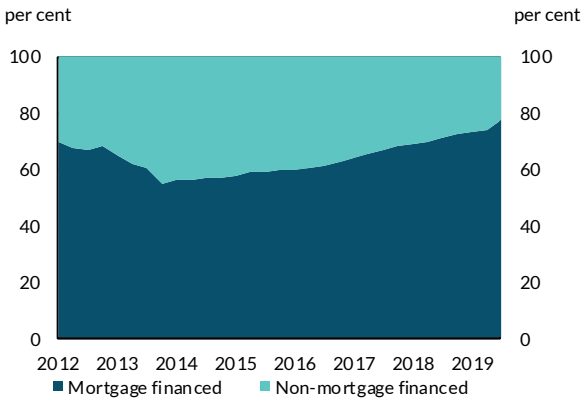
Non-household acquisition of residential properties by NACE breakdown



Source: CSO.
Notes: P/E/H = Public/Education/Health; Fin & Ins = Financial & Insurance; RE = Real Estate; Ex. T = Extra-Territorial; Cons = Construction.

Chart 50: Households are increasingly financing their property purchase with a mortgage

Estimated breakdown of households' residential property transactions by method of finance



Source: CSO and BPFI.
Note: Non-mortgage financed portion is calculated as the difference between the total number of RRE transactions and the number of mortgages drawn down by households for the purchase of RRE expressed as a percentage of the total number of RRE transactions. Last observation 2019Q3.

Non-household buyers' importance in the overall market has continued to rise, while at the same time more households are financing their purchase with a mortgage. The rise of non-household buyers of recent years has not eased, and they are currently accounting for approximately 20 per cent of market activity (Chart 41). Underlying this increase is a more substantial participation in the market by the non-profit or healthcare sectors (local authorities, approved housing bodies,

residential care institutions), which accounted for almost 40 per cent of the volume of non-household transactions in 2018, and over 60 per cent of the growth in those transactions during that year (Chart 49).[35] Within the household sector, an increased share of purchases has been financed by a mortgage from an Irish bank. Estimates for the 12 months to June 2019, suggest that about three-quarters of the homes bought by households were mortgage-financed, up from 70 per cent in 2018Q2 and a trough of 55 per cent at the end of 2013 (Chart 50).

The rising share of mortgage-financed purchases by households is consistent with the increase in new mortgage lending that has continued through 2019. New mortgage lending continues to expand steadily (Table 1).[36] Relative to 2018 H1, both the value and the volume of new mortgage lending for house purchase has risen for both FTBs and SSBs, with FTBs accounting for almost 55 per cent of all drawdown activity. Average loan values have also risen over the year for PDH loans (2.7 per cent), but proportionately less so for SSBs (1 per cent). More recent data to 2019 Q3 from the Banking and Payments Federation Ireland (BPFI) are broadly consistent with these developments, but do show a moderation in the pace of growth for average loan values through 2019 compared with 2018.[37] At the same time, the proportion of new loans that are issued at longer-term fixed interest rates has been rising, with approximately one-third of mortgages being issued with fixation periods of 5 years or more.[38]

Table 1| Overview of New Mortgage Lending 2019 H1

	Total Value (€m)	No. of Loans	Average Loan (€)
Total in-scope	3,789	16,574	228,611
% change 2018 H1	*10.3*	*7.6*	*2.7*
PDH Lending	3,709	16,001	231,798
% change 2018 H1	*12.1*	*9.7*	*2.2*
- **of which FTB**	2,065	9,041	224,404
% change 2018 H1	*12.8*	*9.3*	*3.1*
- **of which SSB**	1,644	6,960	236,207
% change 2018 H1	*11.4*	*10.2*	*1.0*
BTL Lending	80	573	139,616
% change 2018 H1	*-37.5*	*-33.3*	*-6.2*

Notes: Central Bank of Ireland Monitoring Template Data. Data refers to mortgage lending within scope of the mortgage measures. Exemptions from the measures, specifically loans for re-financing, negative equity loans and other exemptions are not included.

Growth in aggregate new mortgage lending is not at a level that would signal elevated risks. Having declined towards the end of 2018, the number of annual mortgage approvals has been growing during 2019. Almost 40,000 borrowers had their mortgage applications approved in the year ending September 2019, a 7.5 per cent increase on the same figure last year, and an indication that the current demand for housing finance is supportive of further growth in actual mortgage drawdowns. In addition, the ratio of new mortgage lending to economy-wide household

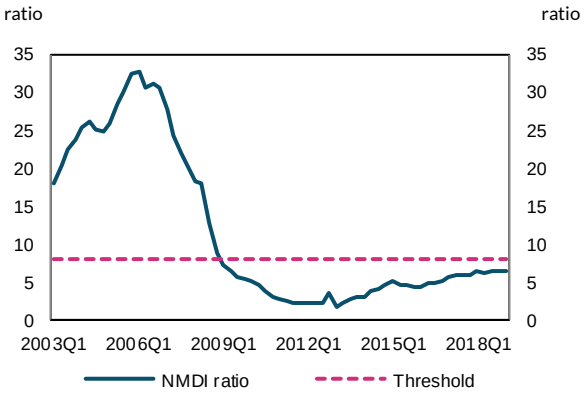
[35] Residential Property Price Index, April 2019, CSO.
[36] See the latest Central Bank data on characteristics of new mortgage lending.
[37] See BPFI (2019) Mortgage Drawdowns Report 2019Q3.
[38] See Central Bank of Ireland Household Credit Market Report (2019)

disposable income remains below 8 per cent, which is the estimated current threshold for that indicator above which cyclical systemic risk in the mortgage market would be of more immediate concern (Chart 51).

The slowdown in house price growth does not appear to be driven by developments in new mortgage lending. House price growth has been lower through the year to mid-2019 than some empirical models of the housing market would have suggested given the information available in mid-2018 (Chart 52).[39] However, the "unexpected" decline in house price growth is not related to "unexpected" developments in new mortgage lending growth. Instead, much of the shocks to house price growth are not explained by shocks to the main explanatory factors in the model, such as new lending, disposable incomes, housing supply per capita and interest rates, but rather to factors outside the model. This would suggest that confidence and sentiment in the market, which are not separately identified in the current model, may be important drivers in slower house price growth through 2019 – a finding consistent with some recent market commentary (See Annex A).

Chart 51: The volume of new mortgage lending remains consistent with broader economic developments

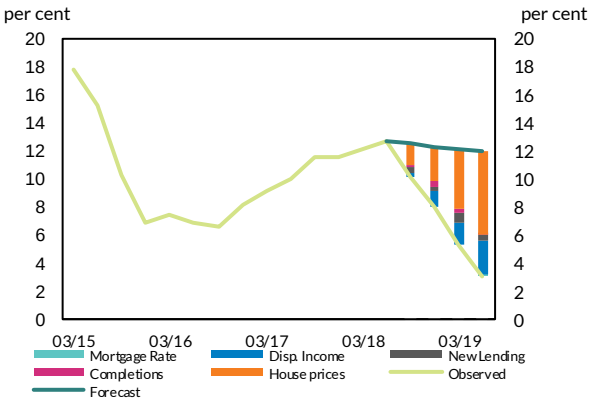
New mortgage lending to disposable income (NMDI) ratio



Source: Central Bank of Ireland calculations.
Note: For more information, see Keenan and O'Brien (2018). Last observation 2019Q2.

Chart 52: New mortgage lending has not been driving "unexpected" house price dynamics

Forecast error variance decomposition – house price growth



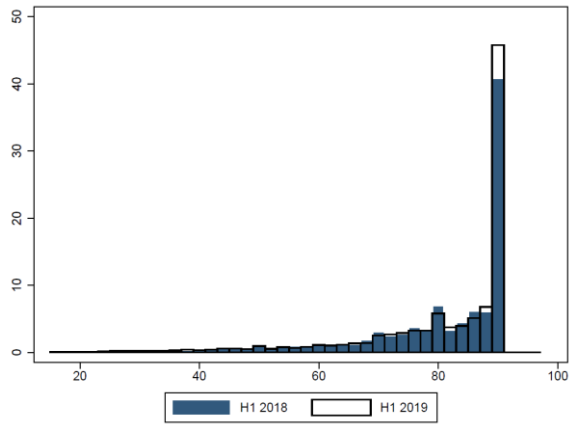
Source: Central Bank of Ireland calculations.

There has been more clustering of lending at the limits set by the mortgage measures. The mortgage measures have become more binding in H1 2019, with a larger share of lending clustered around the LTV and LTI limits compared to H1 2018. Given the growth in house prices over that period, these increased shares of lending around the limits are to be expected. For FTBs in H1 2019, 46 per cent of borrowers had an LTV between 89 – 90 per cent (Chart 53). This figure was 41 per cent in H1 2018. For SSBs, there has been an increase in the share of loans with an LTV of 79-80 and 89-90 per cent of 1 – 2 per cent respectively between H1 2018 and H1 2019 (Chart 54). For LTI, there has been an increase in the share of loans with an LTI between 3.25 – 3.5 and a decrease in the share of loans with an LTI above the limit of 3.5 in H1 2019, compared to H1 2018. This is consistent across both borrower types (Chart 55 and Chart 56). Approximately 38 per cent of FTBs had an LTI between 3.25 -3.5 in H1 2019. For SSBs this figure was 21 per cent.

[39] See Box 6 for a description of the modelling technique used to analyse housing market developments for the mortgage measures review.

Chart 53: LTV for FTBs in H1 2019 compared to H1 2018

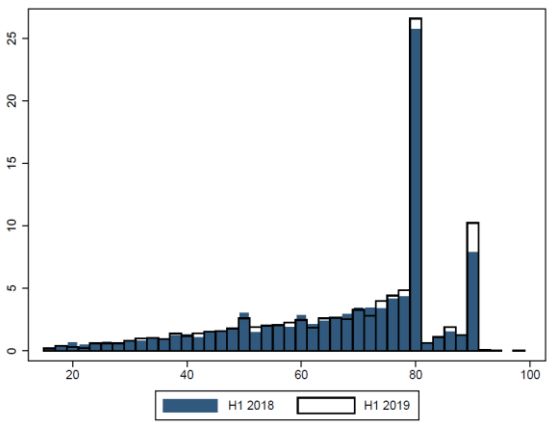
per cent



Source: Central Bank of Ireland calculations using MT Data.
Notes: In-Scope New Property Purchase and Self-Build loans only.

Chart 54: LTV for SSBs in H1 2019 compared to H1 2018

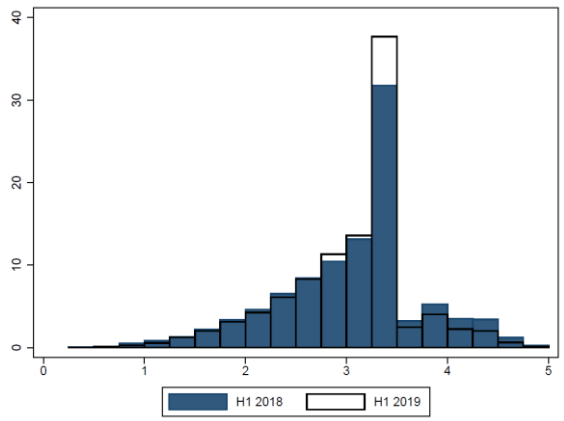
per cent



Source: Central Bank of Ireland calculations using MT Data.
Note: In-Scope New Property Purchase and Self-Build loans only.

Chart 55: LTI for FTBs in H1 2019 compared to H1 2018

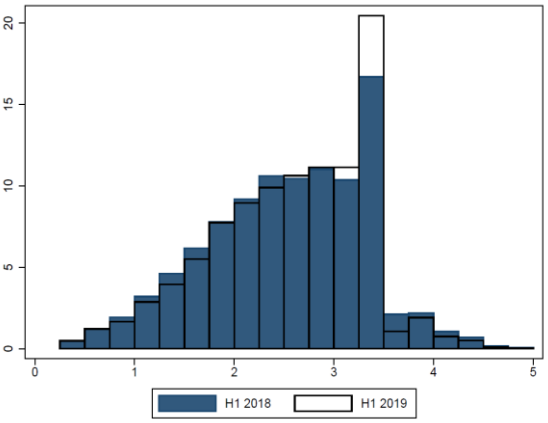
per cent



Source: Central Bank of Ireland calculations using MT Data.
Notes: In-Scope New Property Purchase and Self-Build loans only.

Chart 56: LTI for SSBs in H1 2019 compared to H1 2018

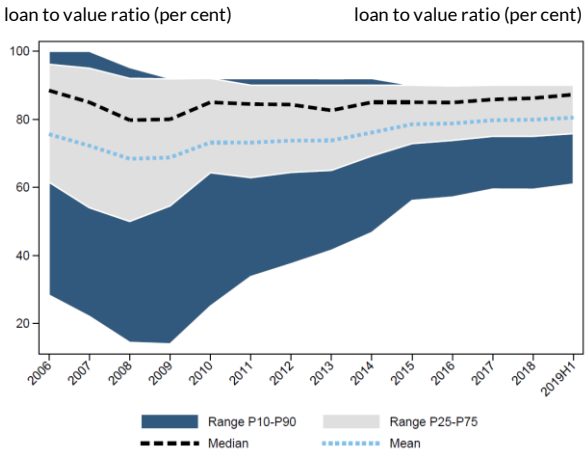
per cent



Source: Central Bank of Ireland calculations using MT Data.
Note: In-Scope New Property Purchase and Self-Build loans only.

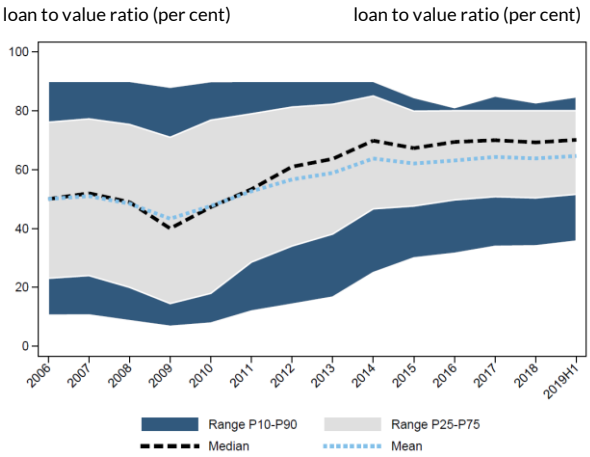
Despite the increased bindingness of the measures, there has not been a generalised deterioration in lending standards that would be damaging to system-wide bank and borrower resilience. The evolution of LTV for each borrower type over time illustrates that the distribution has narrowed considerably since 2006, and remained relatively static in the past year (Chart 57 and Chart 58). The mean and median LTVs for both FTBs and SSBs have remained relatively stable since the introduction of the mortgage measures in 2015. Similarly, for LTIs, the distribution has narrowed over time, with the 90th percentile of LTI at approximately 6 times gross income for FTBs in 2008, falling to around 4 times gross income in H1 2019. The mean and median LTIs for both groups have increased slightly since the introduction of the mortgage measures (Chart 59 and Chart 60).

Chart 57: FTB LTV over time, 2006 – H1 2019



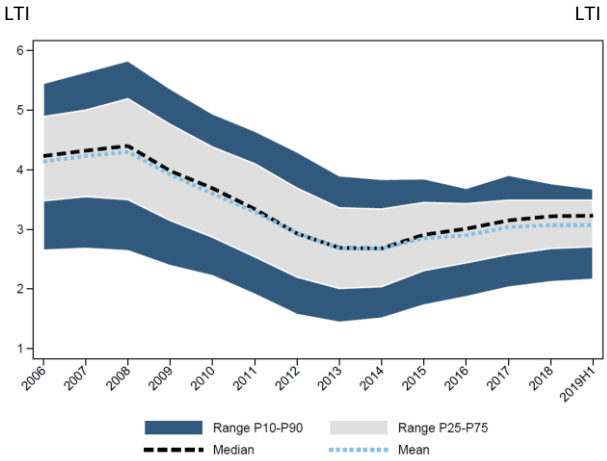
Source: Central Bank of Ireland calculations using MT and LL Data.
Notes: All loan types, In-scope loans only from 2015 to H1 2019

Chart 58: SSB LTV over time, 2006 – H1 2019



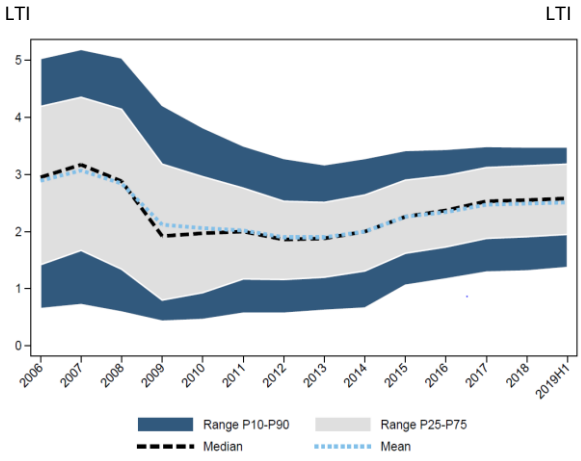
Source: Central Bank of Ireland calculations using MT and LL Data.
Note: All loan types, In-scope loans only from 2015 to H1 2019.

Chart 59: FTB LTI over time, 2006 – H1 2019



Source: Central Bank of Ireland calculations using MT and LL Data.
Notes: All loan types, In-scope loans only from 2015 to H1 2019. 4 bank view from 2006 – 2014.

Chart 60: SSB LTI over time, 2006 – H1 2019



Source: Central Bank of Ireland calculations using MT and LL Data.
Note: All loan types, In-scope loans only from 2015 to H1 2019. 4 bank view from 2006 – 2014.

Structural risk

Structural risks exist within the financial system independent of the financial and economic cycles. They stem from slow-moving features of the financial system or economy, such as market or exposure concentration, the degree of financial system interconnectedness and systemic importance, and the scope for structural macroeconomic shocks.[40] A disorderly Brexit and changes in the international trade and tax environment are significant potential structural macroeconomic shocks at present (see *Risks: Brexit* and *Risks: Tax and Trade*). Furthermore, the small, open, highly globalised nature of the Irish economy and financial system presents a general source of structural macroeconomic risk, with potential implications for financial stability (see

[40] Given their slow moving nature, the structural systemic risk assessment will be included on an annual basis in the H2 *Financial Stability Review*.

Policy: SyRB). Overall, with respect to market and exposure concentration, as well as the scope for structural macroeconomic shocks, the Central Bank judges the level of structural risk in Ireland to remain relatively high (Table 2).

Table 2| Market and exposure concentration remains relatively high

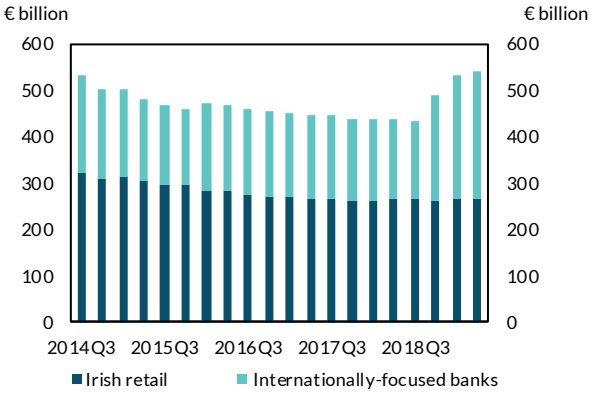
Snapshot of selected structural risk indicators

Indicators	Threshold	Risk level	Last observation	Latest observation date	Annual change
Market share top 5 inst: priv sector lending	Post-crisis average		87.7%	Sep-19	-0.5 pps
Market share top 5 inst: priv sector deposits	Post-crisis average		81.7%	Sep-19	-2.3 pps
Market share top 5 inst: NFC lending	Post-crisis average		90.6%	Sep-19	0.1 pps
Market share top 5 inst: SME lending	Post-crisis average		97.7%	Jun-19	1.0 pps
Market share top 5 inst: HH lending	Post-crisis average		93.3%	Sep-19	-0.5 pps
Property-related lending (% share of total)	Historical average		66.1%	Jun-19	-1.4 pps

Source: Systemic Risk Pack FSR Annex, Central Bank of Ireland
Note: See the Systemic Risk Pack annex. For explanatory notes, definitions of indicators, thresholds and determinants of risk level please see the Systemic Risk Pack .

Chart 61: Banking assets have increased as a result of Brexit

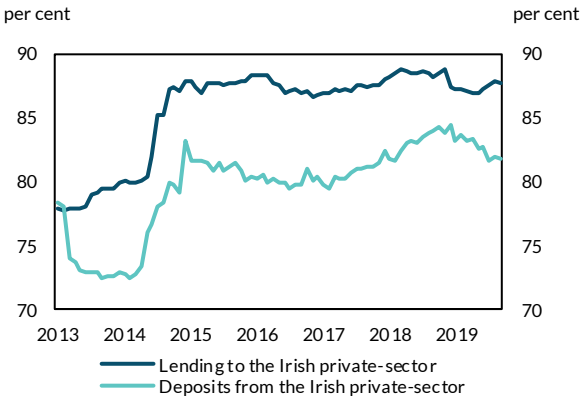
Total banking assets



Source: Central Bank of Ireland.
Note: Total assets of all supervised credit institutions. Last observation 2019Q2.

Chart 62: Domestic financial intermediation remains heavily concentrated within a small number of banks

Share of lending and deposit taking activities accounted for by the 5 largest banking groups



Source: Central Bank of Ireland.
Note: Adjusted for group structure and relate to assets held with Irish counterparts only. Credit unions are treated as a single entity. Last observation September 2019.

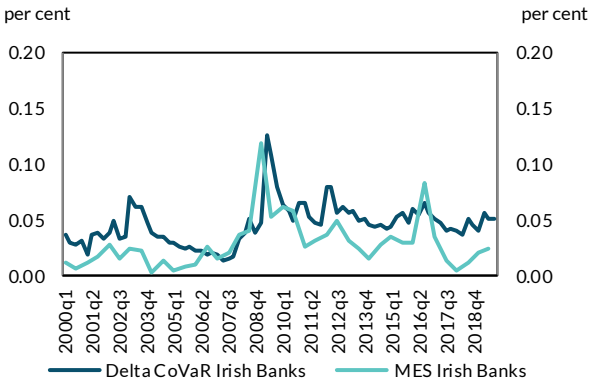
Despite significant changes to the structure of the overall banking system during 2019, the domestically relevant system remains relatively concentrated in terms of number of banks and the non-financial sectors to which they are exposed. The size of the banking system in Ireland has increased by 24 per cent in the year to 2019Q2 (Chart 61). Almost all of this increase relates to those banks that have relocated their EU activities to Ireland as a result of Brexit. By way of comparison, the size of the Irish retail banking sector increased by 1.3 per cent over the same time frame. Irish households and businesses rely heavily on a small number of banks to provide financial intermediation services in the form of loans and deposits, with almost 90 per cent of non-financial private sector credit being sourced from five banking groups (Chart 62). This reliance on a limited number of banks means that a deterioration in their financial performance could permeate more widely through to the real economy than might arise elsewhere. At the same time, lending by resident banks to the domestic economy remains heavily concentrated in property-related lending

(in particular residential mortgages). These exposures account for approximately 66 per cent of outstanding bank lending is to Irish residents. Such concentrated loan books leave banks susceptible to shocks in the Irish residential property market.

This reliance on a limited number of retail banks for domestic financial intermediation is reflected in their degree of systemic importance. Market based indicators of their systemic risk contribution (Delta CoVaR) have been relatively stable in recent quarters, but have been above long-run averages, suggesting that the scope for the Irish banking system to transmit financial market shocks has risen marginally (Chart 63). The systemic vulnerability (MES) of the Irish banking system to a large external financial shock has also risen in recent quarters, suggesting a slightly higher degree of systemic fragility given recent global developments affecting European equity markets. The systemic importance of banks to the Irish economy and financial system is the primary factor considered when setting the OSII buffer (see *Policy: OSII*).

Chart 63: The Irish retail banks continue to have significant degree of systemic importance

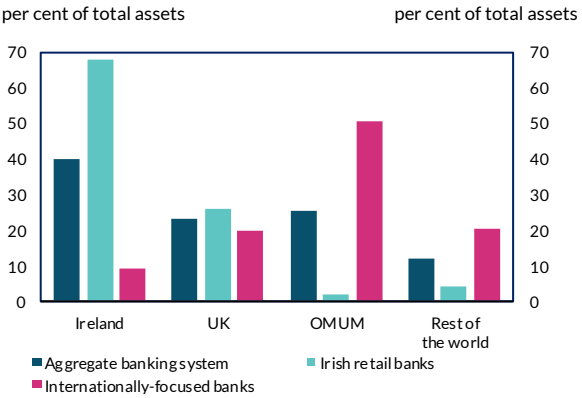
Delta CoVAR and domestic banks' marginal expected shortfall



Source: Datastream and Central Bank of Ireland calculations
Notes: Last observation 2019Q3.

Chart 64: The Irish banking system is internationally exposed

Geographical breakdown of exposures by residence of the counterparty



Source: Central Bank of Ireland.
Note: Data are consolidated and relate to a sample of banks that provide a geographical breakdown. Exposures are the sum of derivatives, equity instruments, debt securities, loans and advances. Data as at 2019Q2

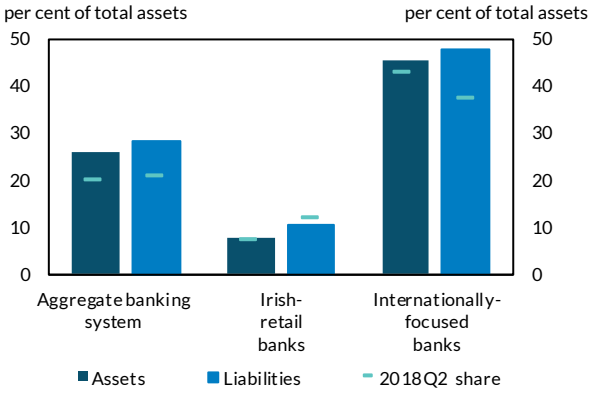
The degree of Irish financial sector interconnectedness globally, and within the financial system, has been increasing. However it is important to understand the implications of the choice of Ireland as a hub for international banks and investment funds when considering the domestic financial stability implications of this interconnectedness. In general, cross-border and intra-financial system interconnectedness are seen as key mechanisms for transmitting and amplifying external shocks to domestic financial stability. Across the various segments of the banking system, UK exposures are prominent, but especially so for domestically relevant retail banks (Chart 64). Meanwhile, over 25 per cent of assets and 28 per cent of liabilities of the Irish banking system assets are held vis-à-vis other financial institutions, an increase over the past year primarily due to internationally-focused banks and the impact of Brexit (Chart 65). In contrast, the five institutions that make up the Irish retail banking sector have limited exposures to other financial institutions, but have provided 50 per cent of the bank debt funding of Irish real estate investment funds (approx. €2 billion at end 2018).

Interconnectedness between the Irish State and Irish banks persists with the State remaining a shareholder in a number of banks. The Irish government holdings of Irish bank shares has

remained broadly unchanged in recent years with ownership stakes in three of the five main retail banks. Conversely, 12 per cent of Irish government debt is held by resident banks with these exposures particular concentrated in the five retail banks (Chart 66). This represents just over 5 per cent of these banks' total resident assets. At the same time Irish funds hold less than 1 per cent of Irish government debt (Chart 67). Domestic insurance firms also have limited direct exposures to the Irish State.

Chart 65: Exposure of the Irish banking system to other financial entities

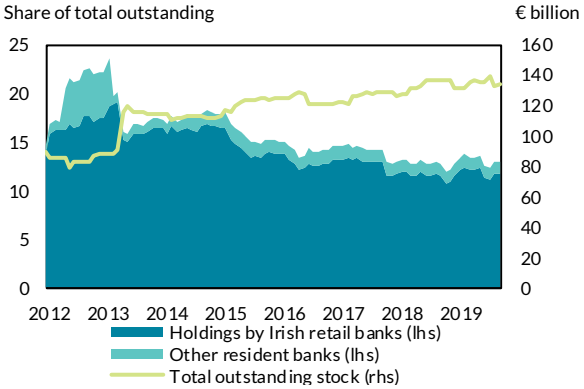
Financial assets and liabilities held vis-à-vis other financial institutions



Source: Central Bank of Ireland.
Notes: Data are consolidated. Assets include debt instruments, loans and advances to other financial institutions. Liabilities include derivatives, short positions and deposits held by other financial institutions. Data as at 2019Q2.

Chart 66: Banks' holdings of Irish Government debt are concentrated among the retail banks

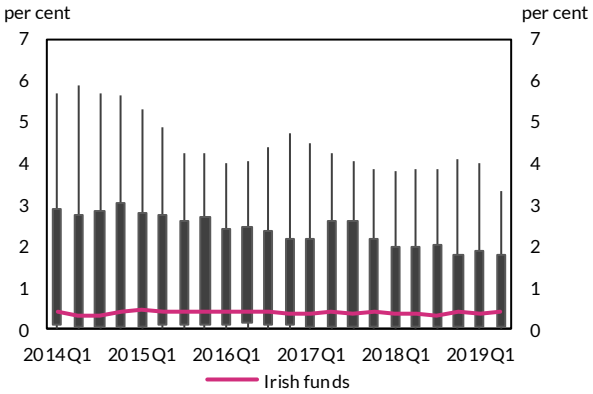
Irish government debt and Irish resident banks' holdings



Source: Central Bank of Ireland.
Note: Last observation September 2019.

Chart 67: Irish-resident funds are less exposed to domestic sovereign debt than their peers

Distribution of investment funds' exposure to domestic sovereign debt as per cent of issued bonds across euro area countries



Source: Central Bank of Ireland and European Central Bank.
Notes: Exposure of Irish is holdings of Irish-resident investment funds of debt securities issued by Irish general government. Exposure of funds from other countries s holdings of debt securities issued by domestic general government. Amounts of issued bonds denotes debt securities issued by general government of each country, and is taken from ECB's Quarterly Sectoral Accounts.

Resilience

Credit institutions

Banking sector capitalisation has remained broadly stable over the past six months, at levels that are substantially higher than in the first half of this decade. Non-performing loan ratios have continued to decline since the last Review. Funding sources are stable, with funding costs remaining very low. Vulnerabilities persist, however. Banks face a number of challenges to profitability, including high operational costs and the low interest rate environment. Provision coverage on NPLs has fallen in recent years, increasing vulnerability to potential future house price falls. Many retail banks require substantial information technology investment to mitigate operational risks. More progress is required to ensure the resolvability of Irish banks.

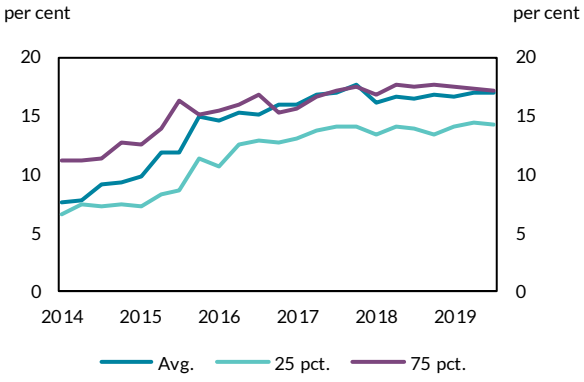
Bank capital ratios have remained stable over the last six months, at levels that are substantially higher than in the first half of this decade. Loss-absorbing capital is the primary source of resilience in any banking system. Higher levels of capital mean larger buffers to absorb negative shocks. Common Equity Tier 1 (CET1) capital has remained stable relative to risk-weighted assets across the five domestic retail banks in recent quarters (Chart 68). The Irish banking system's "fully-loaded" CET1 ratio continues to be substantially higher than it was in the first half of this decade.[41] There is considerable variation across banks: while the system-wide average is 17 per cent, in the bottom quartile banks have CET1 ratios around 14 per cent.[42] Banks' profitability has been the most important contributor to improved resilience through retained earnings (Chart 69). By contrast, the contribution of reductions in total and risk-weighted assets has been relatively small.

Irish banks continue to be less levered than most European peers, partly driven by the relatively high level of risk weights in Ireland. The leverage ratios of Irish banks, which measure capital resilience without adjusting assets for their riskiness, are among the highest in Europe (Chart 70). For a given level of capital, Irish banks can therefore absorb larger losses. Leverage ratios will generally be higher in countries with higher risk-weight densities (RWAD, the ratio of risk-weighted assets to total assets), as banks are required to fund themselves with more capital for each euro of lending to reflect the likelihood of higher defaults and losses on these portfolios (Chart 70). RWAD can also move due to changes to cyclical model inputs and methodologies, with potential material effects on the CET1 ratio and the implied level of resilience reported. (See Box 4.) These densities may change even if banks do not alter the composition of their current loan book. An increase in RWAD of 10 percentage points would lead to a reduction in Irish CET1 ratios of 3 percentage points, while an analogous reduction in RWAD would improve the CET1 ratio by 4 percentage points (Chart 71).

[41] Capital Requirements Directive CRD IV "fully loaded" capital ratios are used throughout this section.
[42] With five retail banks in the sample, the 25th percentile refers to the 2nd lowest CET1 ratio, while the 75th percentile refers to the second highest CET1 ratio in each quarter.

Chart 68: Risk-based capital ratios are high in a historical context, and stable in recent quarters

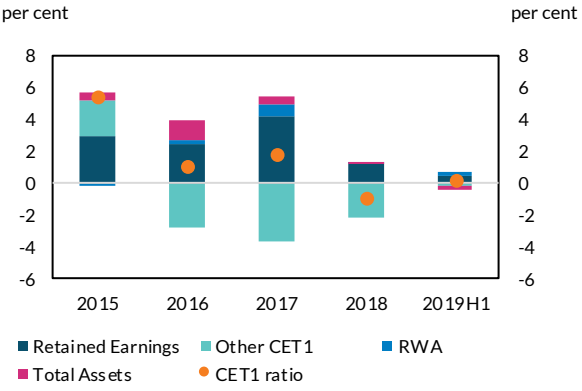
Fully-loaded Common Equity Tier 1 capital ratios for domestic retail banks



Source: Central Bank of Ireland.
Notes: Avg. is the asset-weighted system average. 25 pct. and 75 pct. correspond to the 25th and 75th percentiles respectively. "Fully loaded" definition of capital as defined by Capital Requirements Directive CRD IV is used for the five domestic retail banks included in the sample. Last observation at 2019Q3.

Chart 69: The improvement in capital ratios since 2014 has been driven primarily by retained earnings, with smaller contributions from risk weighted assets and deleveraging

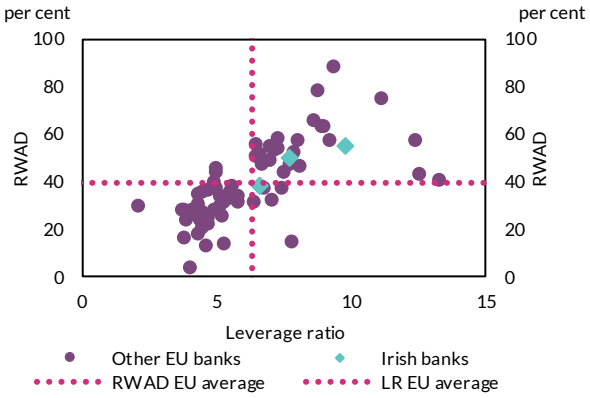
Composition of the annual change in the average Common Equity Tier 1 ratio since 2014



Source: Central Bank of Ireland.
Note: Annual change for 2015-2018 and half-yearly change for H1 2019. Sample includes five domestic retail banks. Risk weights and total assets contribute negatively to the Common Equity Tier 1 ratio, so positive values here signify reductions, and *vice versa*. "Other CET1" refers to all changes to CET1 capital not coming from retained earnings.

Chart 70: Irish banks have higher levels of capital relative to total assets than European peers

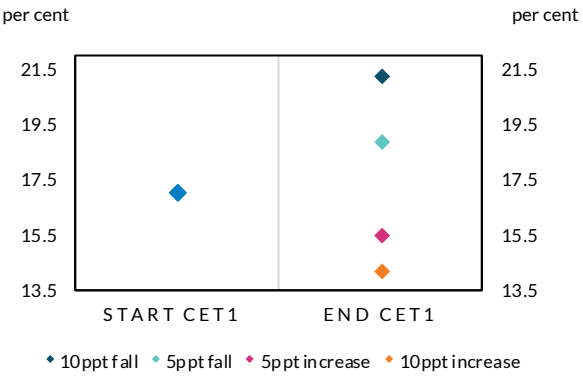
Basel III leverage ratio vs risk-weighted asset density



Source: S&P Global.
Notes: Dashed lines refer to in-sample median of variable reported on each axis. Reference date Q2 2019. Irish banks include BOI, AIB and PTSB. Half-yearly data not reported for Ulster Bank and KBC.

Chart 71: Changes to risk weight densities would have material effects on CET1 ratios

Change in CET1 ratios for a range of hypothetical changes in risk weight densities for Irish retail banks



Source: Central Bank of Ireland.
Note: "Fully loaded" definition of capital as defined by Capital Requirements Directive CRD IV applied. Five domestic retail banks included. Reference date 2019Q2.

According to the 2018 EU-wide stress test, Ireland's largest retail banks could absorb losses in a European recession. In 2018, European Banking Authority tested whether the EU banking sector had enough capital to withstand a Europe-wide recession. The 2018 exercise tested the impact of important threats to the financial system that remain relevant to Irish retail banks today, including repricing of global risk premia, an EU-wide recession, structural banking sector challenges and debt sustainability concerns. The macroeconomic shocks applied within this exercise were more severe than those currently forecast by the Central Bank in the event of a disorderly Brexit, while Irish bank balance sheets have become healthier since end-2017 (the balance sheet cut-off date

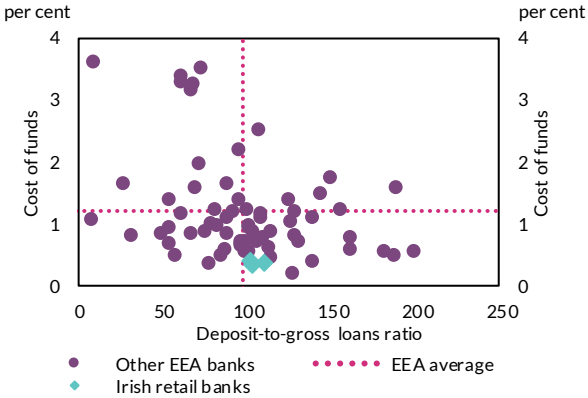
for the 2018 EBA stress test), driven primarily by reductions in NPL ratios. The next European stress testing exercise will occur in 2020.

Irish banks' lending continues to be funded primarily by customer deposits, while funding costs remain among the lowest in Europe. The loan books of Irish banks are almost precisely the same size as their customer deposit base (Chart 72). Customer deposits – especially insured deposits – tend to be more stable sources of funding than short-term wholesale borrowing. Due to their large deposit bases, Irish banks have Liquidity Coverage Ratio (LCR) and Net Stable Funding Ratio (NFSR) levels above minimum regulatory requirements.[43] Irish bank funding costs have continued to be among the lowest in Europe in the last six months, driven by the dominance of cheap deposits as a funding source; as of August 2019, the overnight deposit rates for households and NFCs were 0.04 and 0.03 per cent, respectively.[44]

NPL ratios have continued to fall since the last *Review*, owing mostly to a combination of portfolio sales, redemptions and successful restructures. Irish banks' NPL ratios have been steadily declining since the crisis (Chart 73). The weighted average NPL ratio for all retail banks fell from 8 per cent in December 2018 to 7 per cent in June 2019. Some lenders have more progress to make than others, with higher-NPL banks continuing to have ratios above 10 per cent. NPLs reduce banks' resilience to adverse shocks, and hamper the profitability of banks through the costs associated with resolving them. Banks with high NPL ratios typically also experience higher funding costs. The value of an NPL is uncertain, and is likely to fall in the event of an adverse macroeconomic shock. Despite the recent improvements reported here, the level of NPLs remains higher than European norms, and a sustainable reduction in NPLs remains a supervisory priority.

Chart 72: Irish bank loans are mostly funded through customer deposits, while Irish banks' funding costs are among the lowest in Europe

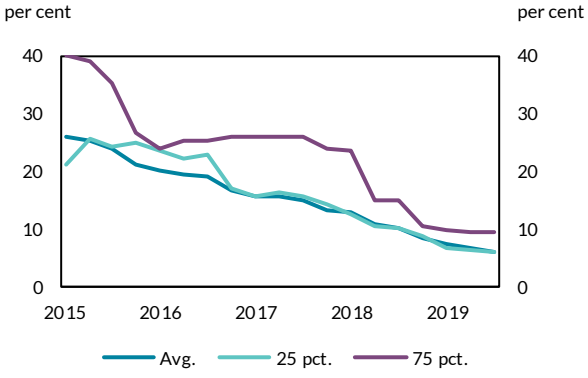
Deposit-to-gross loans ratio and cost of funds for Irish and European banks



Source: S&P Global.
Notes: Chart shows deposit-to-gross loans ratio and the cost of funds for 71 European banks. Irish retail banks include AIB, BOI and PTSB. Data as at 2019Q2. Half-yearly data not reported for Ulster Bank and KBC.

Chart 73: NPL ratios have continued to decline

NPL ratios for Irish retail banks



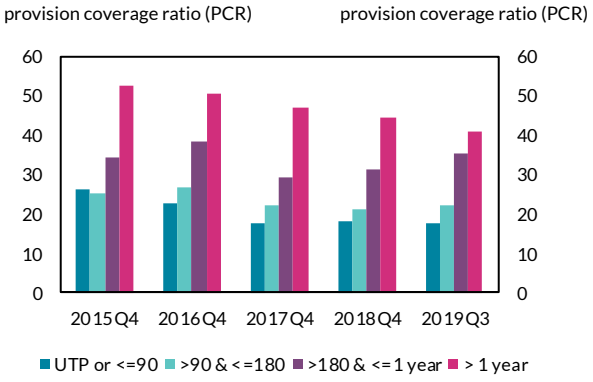
Source: Central Bank of Ireland.
Notes: Avg. is the asset-weighted system average. 25 pct. and 75 pct. correspond to the 25th and 75th percentiles respectively. Five domestic retail banks included in the sample. Last observation at 2019Q3.

[43] The Liquidity Coverage Ratio, which measures banks' ability to cover potential funding outflows over a 30-day stress horizon, was, on a weighted average basis, 141 for AIB, BOI and PTSB at June 2019. The Net Stable Funding Ratio, which measures stability of funding and maturity mismatch relative to assets over a one-year horizon, was 128 at June 2019 for the same three banks. These ratios were substantially above the required regulatory minimum of 100 per cent.
[44] Retail deposit interest rates are reported in Table B.1.1 of the Central Bank of Ireland's *Retail Interest Rates* statistics.

Provision coverage ratios (PCR) have fallen for Irish bank NPLs in recent years, partly reflecting strong house price forecasts. Downward revisions to Irish house price forecasts will lower PCRs and could erode profitability and, in the face of severe shocks, capital. Provisions are booked against NPLs to reflect the losses that banks expect to experience on these loans. PCRs for real estate loans will be lower when property prices and expectations are higher, as banks expect to recover underlying collateral of greater value. In line with the improving economy, PCRs have been falling since 2014 (Chart 74). For NPLs with low arrears, PCRs are now below 20 per cent, while for NPLs with long-dated arrears, PCRs are 41 per cent. The recent adjustment to a less optimistic outlook for Irish house prices (see *Risks: Mortgage measures*), may lead to an increase in PCRs and a subsequent reduction in profits. If residential property prices were to fall by 20 per cent, for example, CET1 capital ratios would reduce by 100bps on average across the five domestic retail banks through an increase in provisions on the existing stock of Irish mortgage NPLs (Chart 75).[45]

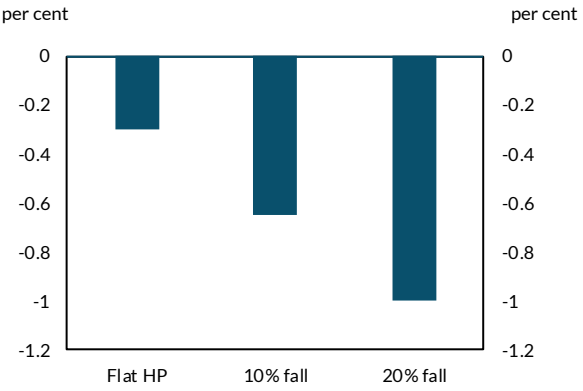
The ECB's Supervisory Expectations for Prudent Provisioning (SEPP) create a further potential headwind to Irish banks' profitability and capitalisation.[46] If NPLs are not resolved and remain on banks' balance sheets, and banks do not increase PCR in the meantime, these SEPP will steadily increase PCR levels beginning in 2020, with the likelihood of a resulting depletion of CET1 capital.

Chart 74: Provision coverage on NPLs has fallen in recent years, in line with improving economic conditions
Provision coverage ratio on NPLs for five retail banks



Source: Central Bank of Ireland.
Notes: Data for five retail banks. PCR is measured as the ratio of provision levels to outstanding loan amount for NPLs. UTP refers to loans deemed Unlikely to Pay despite not being in arrears.

Chart 75: Low provisions on NPLs create a vulnerability, with a turnaround in house price growth having potential material effects on bank capital
Impact of 3 house price scenarios on bank CET1 ratio through increased provisions on existing mortgage NPLs



Source: Central Bank of Ireland calculations.

Weak profitability is a key challenge facing the banking sector. Profitability is the first line of defence against unexpected losses. Irish bank profitability, when measured by Return on Average Equity (ROAE) or Return on Average Assets (ROAA), fell in the first half of 2019. Part of this fall in profitability was due to exceptional items, which may not persist in the future. Still, Irish banks' relative position in the European sample – itself a sector that faces profitability challenges - has

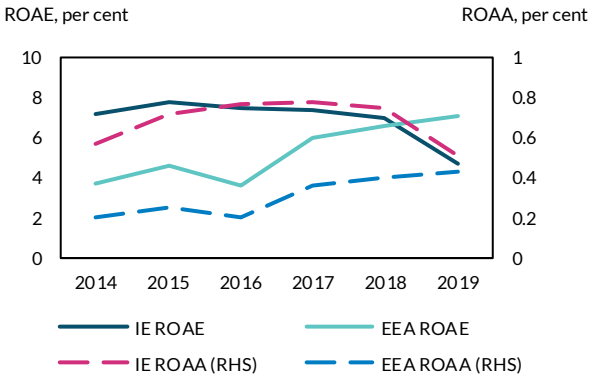
[45] This analysis only considers the Irish mortgage NPL stock and does not assess the effect of any new defaults, other portfolios or other means through which adverse shocks can affect bank profitability and capital. A house price shock of 20 per cent is picked as an illustrative test, rather than a forecast.
[46] Information on the ECB's supervisory expectations can be found here.

weakened since 2015 (Chart 76). While measures of European bank profitability have improved gradually in recent years, this has not been the case for Irish banks.

Recent ECB announcements suggest that the low interest rate environment will persist for longer than was expected earlier this year, which would place continued downward pressure on banks' interest margins. Irish banks rely predominantly on net interest margins for generating profit (Chart 77). The longer period of low interest rates is likely to exert continued downward pressure on banks' earnings in Ireland and more broadly in Europe. Box 5 highlights that Irish banks share many characteristics with the banks that are likely to suffer the most from low interest rates, as identified by recent research.[47]

Chart 76: Irish bank profitability is weakening in a European context

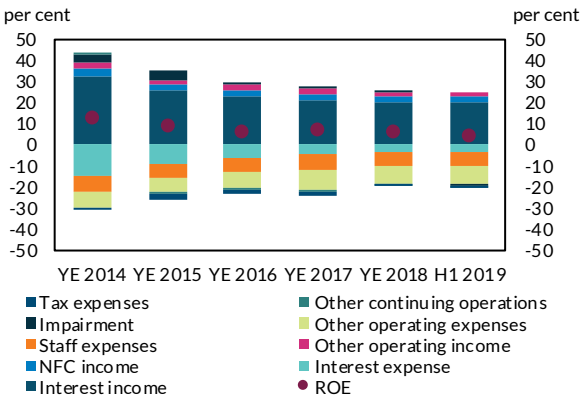
Weighted average ROAE and ROAA for Irish and European banks.



Source: S&P Global.
Notes: Weighted average ROAE and ROAAs for a time-varying sample of 86 European banks and 3 Irish banks and are weighted by total assets. Irish retail banks include AIB, BOI and PTSB. Last observation at 2019Q2. Half-yearly data not reported for Ulster Bank and KBC.

Chart 77: Interest income remains the predominant source of Irish banks' profits

Percentage contribution of components to banks' Return on Equity



Source: Central Bank of Ireland.
Notes: ROE measured as the profit or loss for the year divided by average total equity. Data on five domestic retail banks used.

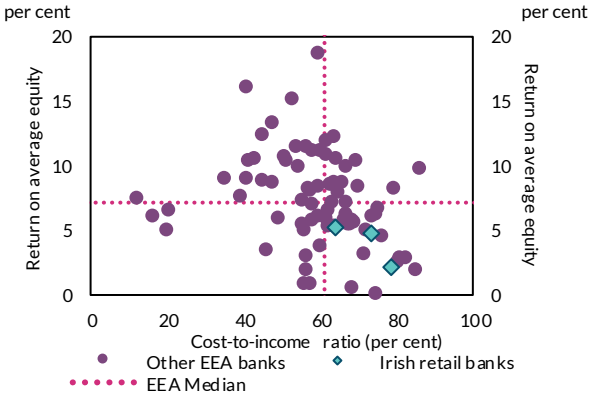
Irish banks' operating costs are also higher than most European peers, and 25 per cent higher than in 2015. Banks with higher cost-to-income ratios generally have lower return on equity. Irish banks appear in the bottom-right quadrant of (Chart 78), where cost-to-incomes are above average, and ROAEs are below average. The main reason for growth in cost-to-income ratios has been an increase in costs of close to one quarter (Chart 79).

Banks continue to issue more loss-absorbing debt instruments, improving their resolvability. The retail banking sector is issuing more "bail-in-able" debt that absorbs losses during a crisis and makes bank resolution simpler and less costly, continuing their path towards meeting their Minimum Requirement for own funds and Eligible Liabilities (MREL). Irish domestic retail banks completed a number of MREL-eligible debt and capital issuances during the second half of 2019, reducing MREL shortfalls by €1.9bn. As a result, the shortfall of the retail banking sector is now 7.5 per cent of the total MREL requirement (Chart 80). Further progress is needed to close MREL shortfalls and continue to remove other identified barriers to resolution.

[47] See Molyneux, P., Reghezza, A. and Ru, X. (2019) "Bank margins and profits in a world of negative rates", Journal of Banking & Finance, Vol. 107.

Chart 78: The cost base of Irish banks is a key factor hampering profitability

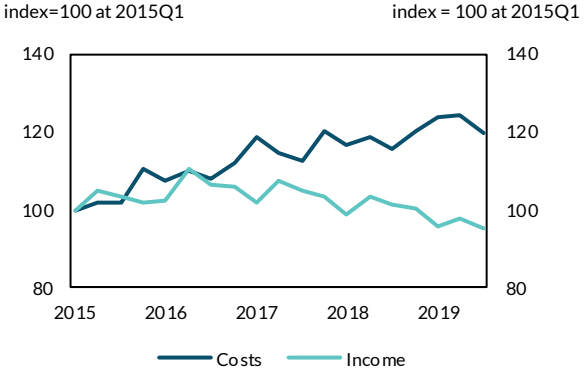
Cost-to-income and ROEs for Irish and European banks.



Source: S&P Global.
Note: Chart shows cost-to-income ratio and the return on average equity for 86 European banks. Irish retails banks include AIB, BOI and PTSB. Data are as at 2019Q2. Half-yearly data not reported for Ulster Bank and KBC.

Chart 79: Costs have risen by almost a quarter since 2015, while income levels are slightly down

Evolution of the cost-to-income ratio and its components since 2015

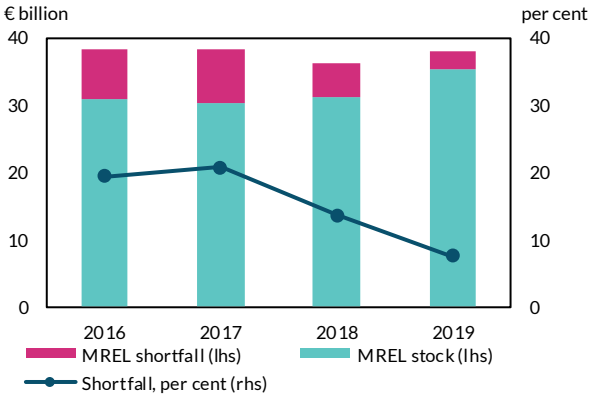


Source: Central Bank of Ireland.
Note: Five retail banks included. Asset-weighted average reported. Costs and income indexed to a value of 100 in 2015 Q1. Data are quarterly. Last observation at 2019Q3.

Operational resilience needs to become as much of a focus for financial institutions as financial resilience. The increasingly interconnected, complex and technology-dependent nature of financial services mean that strengthening the operational and cyber resilience of the financial sector is a priority for prudential soundness, consumer protection and, financial stability. Investment is required to keep pace with competition from both "FinTech" entrants across a range of business lines, as well as cyber threat actors who are becoming ever more sophisticated in their attack methods. Financial institutions need to make informed strategic decisions about investment in information technology and security to remain competitive, secure, and operationally resilient in this complex and evolving operating environment.

Chart 80: Retail banks have moved closer to their MREL targets, improving their resolvability

MREL stocks and shortfalls from MREL targets in the Irish retail banking sector.



Source: Central Bank of Ireland.
Notes: 2019 figures show progress during the year up to 31 October 2019. Data on five domestic retail banks used.

Household and corporate sectors

Households

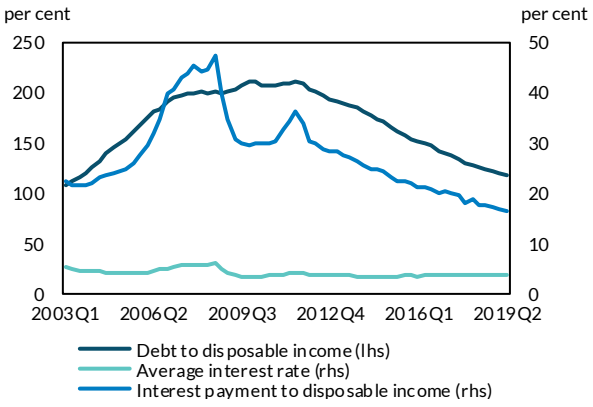
Household sector resilience continues to strengthen. Household debt levels and debt service burdens continue to decline relative to household incomes, slowly bringing levels closer to European averages. The most indebted segment of households has deleveraged the most quickly. The large group of households who have had their loans restructured are particularly vulnerable, and have a high likelihood of default even in the absence of a macroeconomic shock.

Households on aggregate are continuing to reduce their debt levels relative to their disposable incomes (Chart 81). This continues the trends seen in the previous *Review*. This reflects not only recent increases in incomes, but also three years of declines in debt per person. However, the aggregate household debt to income ratio remains high relative to the European average.

Fewer households have very high loan-to-income ratios (Chart 82). Current loan-to-income ratios compare the outstanding balance of the loan with household income in that year. High current loan-to-income ratios indicate that households are less resilient to adverse shocks. As of 2017, over 90 per cent of mortgage holders had current loan-to-income ratios below 3.5. This represents a substantial improvement in household resilience relative to 2013, when the top 10 per cent of households had LTI levels greater than 4.5.

Chart 81: Households are continuing to reduce their debts

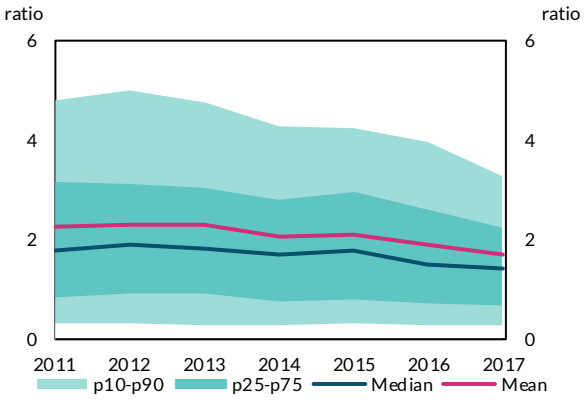
Household sector debt to disposable income and weighted average interest rates on outstanding loans



Source: CSO and Central Bank of Ireland
Notes: Interest rate calculated as a weighted average of interest rates on all household debt types. Last observation 2019Q2.

Chart 82: Fewer households have a very high loan-to-income ratio

Current loan to income ratios for outstanding loans



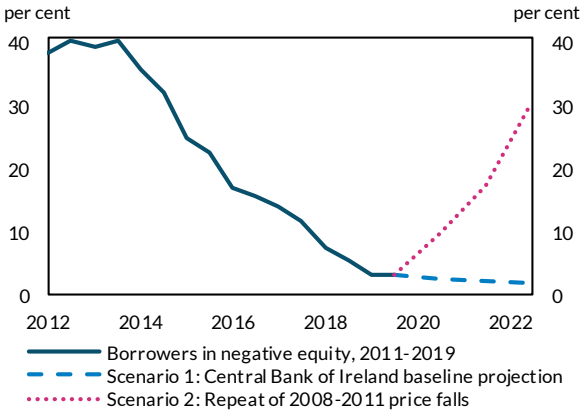
Source: CSO Survey on Income and Living Standards and Central Bank of Ireland calculations.
Note: Last observation 2017.

As a result of their lower debt levels, households are less vulnerable to falling into negative equity even if house prices were to fall. Under Central Bank baseline projections, the proportion of households falling into negative equity will continue to decline (Chart 83).[48] Resilience to extreme shocks has improved: households are now less vulnerable to falling into negative equity even if crisis-level house price decreases were to occur. This points to an underlying strengthening in household resilience, not entirely driven by the growth in house prices.

[48] All analyses using Central Bank data include both Primary Dwelling House (PDH) and Buy-to-Let (BTL) mortgages for five largest domestic retail banks.

Chart 83: Due to lower debt levels, households are less vulnerable to falling into negative equity

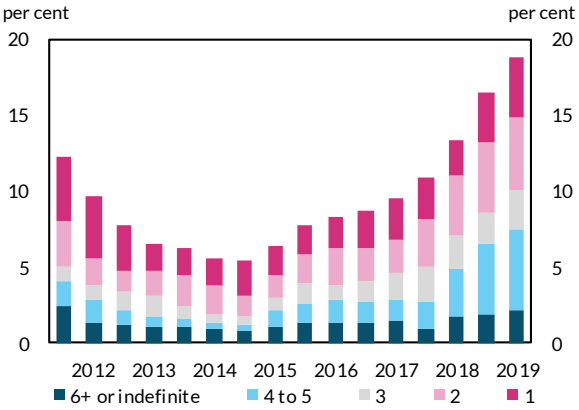
Mortgage borrowers at Irish retail banks in negative equity



Source: Central Bank of Ireland.
Notes: Scenario projections are as at 30 June each year. In each scenario, loans amortise on schedule, while new loans originate each year at 2018 LTVs and volumes.

Chart 84: While more households are protecting themselves from interest rate rises through mortgage fixation, four-fifths of mortgages are still variable rate

Proportion of mortgages at retail banks that are on a fixed rate by period of remaining fixation



Source: Central Bank of Ireland.
Notes: Shares of mortgage accounts at retail banks. Loans with a remaining fixation period of less than one year are excluded. Last observation June 2019.

The household sector interest burden is now lower than at any other time over the past 15 years (Chart 81). The mortgage-service-to-income ratio measures the proportion of a household's after-tax income that is spent on mortgage payments (including both interest and principal repayments). Mortgage service-to-income is a common measure of default risk, since higher values imply that households are less able to cut consumption to avoid default. Due to the low interest burden and falling debt, mortgage service now represents less than 30 per cent of income for the majority of the household sector, and less than 40 per cent for almost all households.[49]

More households are also protecting themselves against interest rate rises. The proportion of mortgages at retail banks with an interest rate fixation has trebled since 2014 (Chart 84). The proportion of mortgages whose interest rates are fixed for a further four or more years has grown especially rapidly over the past 12 months. These households will not experience increases in their monthly repayments if interest rates rise during that time (see *Risks: Global repricing*). However, despite this increase in fixation, four-fifths of mortgages at retail banks continue to be exposed to a turnaround in bank funding costs.

Unemployment shocks could lead to an increase in the number of loans entering default. Most households will be able to continue to pay their mortgages under the macroeconomic forecast by the Central Bank for a no-deal Brexit scenario (Chart 85). However, were unemployment and house prices to change by the same amount as in 2008-2011, the number of households entering arrears would increase significantly, while remaining below the default rates seen in 2012.

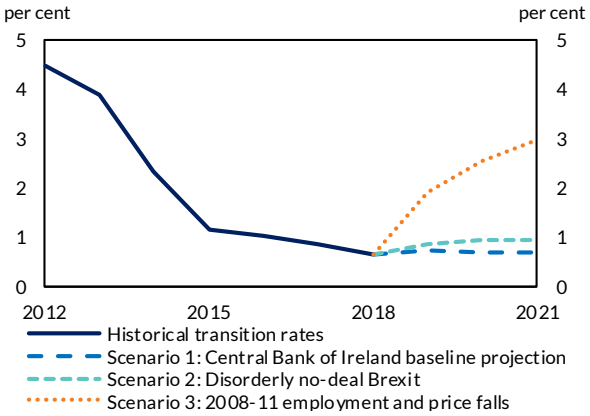
While the aggregate position of the household sector has improved, close to 109,000 mortgage accounts are restructured from their original contract terms and are particularly vulnerable to additional shocks.[50] On average, households with a restructured mortgage are spending 7 per cent more of their net income each month on mortgage payments than regular borrowers (Chart 86). The difference is larger for those with the highest debt burdens. The most burdened 10 per cent of

[49] See Household Credit Market Report, 2019
[50] Central Bank of Ireland Mortgage Arrears Statistics Report that the number of PDH mortgages at June 2019 classified as currently restructured was 94,355, with an additional 14,519 Buy-to-Let mortgages restructured.

restructured mortgages have payment burdens in excess of 45 per cent of net income, compared with the 28 per cent paid by the top 10 per cent across the overall market.

Chart 85: Unemployment shocks or falls in house prices could also lead to an increase in defaults

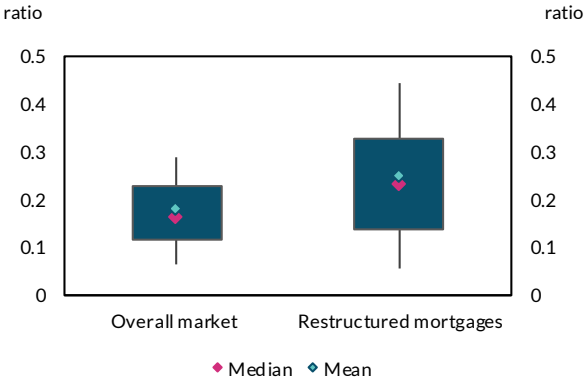
Mortgages at retail banks entering three months of arrears



Source: Central Bank of Ireland.
Notes: Share of loans at retail banks beginning each year 0-90 days past due that become 91+ days past due by the end of the year. Disorderly no-deal Brexit scenario details have been published in the *Quarterly Bulletin*, October 2019.

Chart 86: Households with restructured mortgages are more vulnerable to future shocks

Mortgage service to income ratios for restructured and non-restructured loans

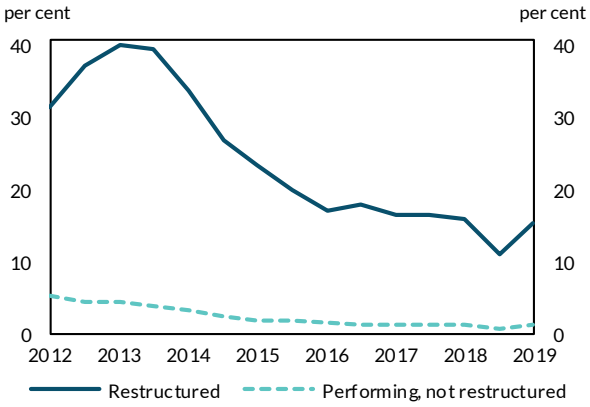


Source: CSO SILC and Central Bank of Ireland calculations
Notes: Data are from 2017. Income data for restructured loans are taken at the time the household went through the Mortgage Arrears Resolution Process. Therefore, income data is measured between 4 and 0 years prior to the loan data.

Restructured mortgage accounts are also more likely to default, even without an additional macroeconomic shock. Around 15 per cent of loans that have been restructured entered arrears or increased their existing overdue balances in the first half of 2019. By comparison, only 1 per cent of performing loans without a restructure entered into arrears over the same period (Chart 87). The proportion missing payments among the restructured loans during the economic recovery has far outstripped the level experienced across the mortgage market during the crisis.

Chart 87: Households who are already restructured are more vulnerable to default

Proportion of restructured and non-restructured mortgages increasing their arrears balance



Source: Central Bank of Ireland.
Note: Number of mortgages at Irish retail banks. Last observation June 2019.

Non-financial corporations

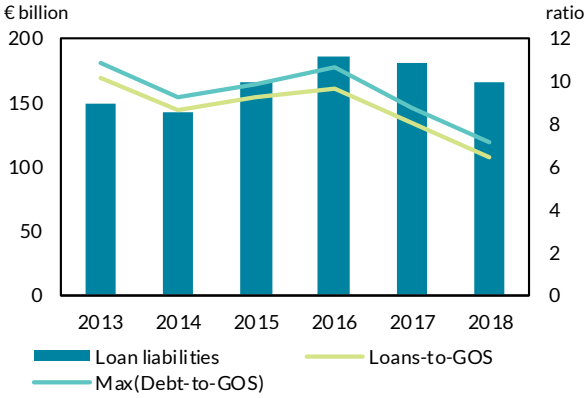
The resilience of Irish NFCs is broadly unchanged since the publication of the last Review. The indebtedness of the aggregate Irish-owned NFC sector fell between 2016 and 2018. The leverage and cash holdings of the largest Irish corporates have been quite stable since 2013. SMEs broadly continue to deleverage, though there is some evidence of increasing indebtedness among agricultural firms.

Irish NFC debt fell between 2016 and 2018 both in nominal terms and relative to gross operating surplus (GOS). The loan liabilities of Irish NFCs fell from €187bn in 2016 to €165bn in 2018 (Chart 88). The ratio of loan liabilities-to-GOS fell from 9.6 to 6.5 over the same period. The maximum possible ratio of debt-to-GOS for these firms was 7.2 in 2018, down from 10.7 in 2016.[51]

Debt-to-asset ratios of large Irish corporates have been quite stable since 2013 (Chart 89). The asset values and nominal debt levels of the largest 25 Irish corporates rose at similar rates in this period so that leverage remained stable. The median debt-to-asset ratio in 2018 was 22.9 per cent. There is substantial variation in leverage across firms; the least indebted firms have ratios under 5 per cent and the more indebted firms have ratios above 30 per cent.[52]

Chart 88: Irish NFC loan liabilities fell in 2018 both in nominal terms and relative to gross operating surplus

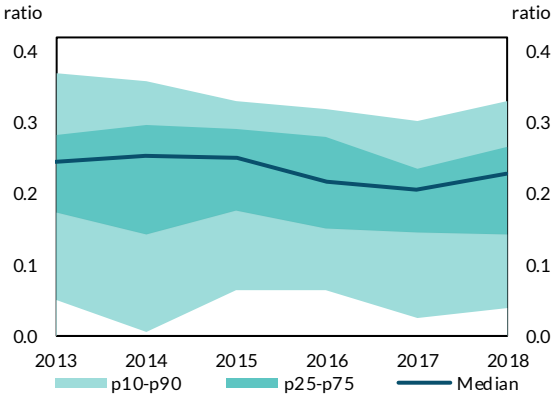
Irish NFC loan liabilities, loans-to-GOS ratio, and the maximum possible debt-to-GOS ratio



Source: CSO.
Notes: Re-domiciled firms and those with a non-Irish ultimate parent are excluded. Debt is defined as loan liabilities plus debt security liabilities.

Chart 89: Debt-to-asset ratios of the largest Irish corporates have been stable since 2013

Debt-to-asset ratios of the largest 25 Irish corporates by turnover



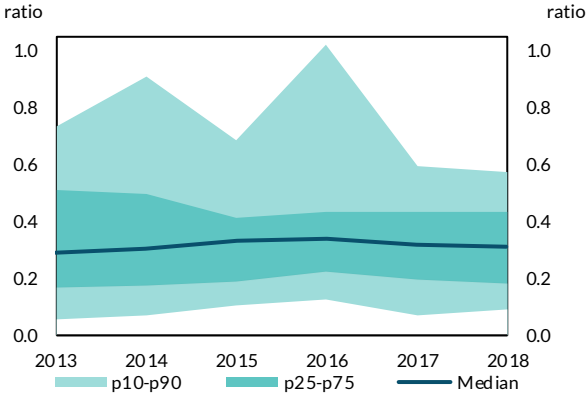
Source: Companies Registration Office; Dun and Bradstreet.
Note: Foreign-owned and re-domiciled companies are excluded.

Large Irish corporates typically hold a third of the value of their current liabilities in cash and cash equivalents. Half of these firms hold cash and cash equivalents worth between 18 and 43 per cent of current liabilities (Chart 90). Cash holdings allow firms to meet their short-term obligations in the event of a deterioration in economic conditions. The median ratio of cash and cash equivalents to total assets for these firms was 7 per cent in 2018 and the average ratio was 10 per cent. These estimates are slightly lower than those reported by researchers in the academic literature.[53]

[51] Debt security liability statistics are not available separately for non-redomiciled Irish-parent NFCs, but it is possible to calculate a maximum debt-to-GOS ratio for these firms using loan liability data and aggregated NFC debt liability data.
[52] Bank and capital market debt typically make up 40 per cent of liabilities for these companies. Other major liabilities include trade credit, accruals, and taxation. Liabilities-to-assets ratios of these firms have declined modestly since 2013.
[53] Pinkowitz et al. (2016) report a median cash-to-assets ratio of 9.55 per cent and an average ratio of 13.36 per cent in a sample of publicly-listed firms from 40 countries in 2011.

Chart 90: Irish corporates typically hold a third of the value of their current liabilities in cash

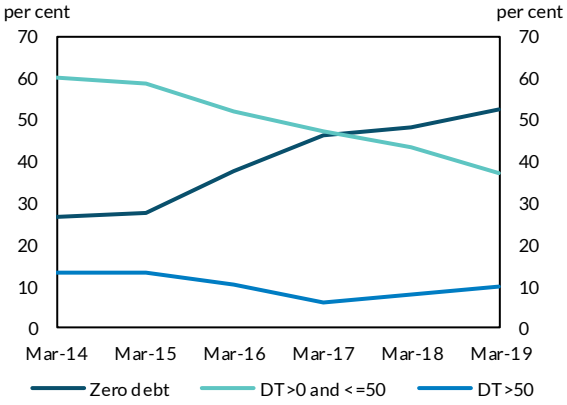
Cash and cash equivalents-to-current liabilities of the largest 25 Irish corporates by turnover



Source: Companies Registration Office; Dun and Bradstreet.
Notes: Foreign-owned and re-domiciled companies are excluded.

Chart 91: SMEs broadly continue to deleverage

Proportion of SMEs with various debt-to-turnover ratios



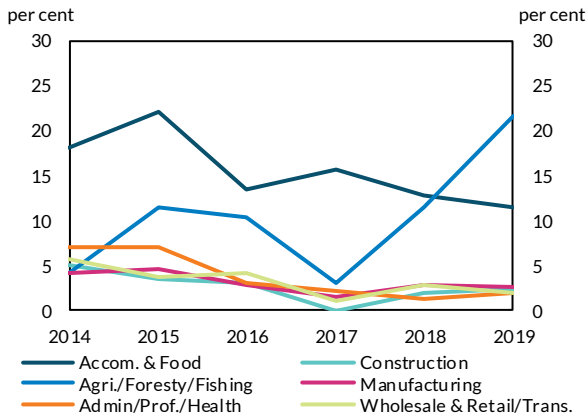
Source: Department of Finance Credit Demand Survey.
Notes: Survey data are as of March in each year. Debt-to-turnover is defined as outstanding debt divided by annual turnover.

SMEs broadly continue to deleverage (Chart 91). Fifty-three per cent of Irish SMEs report in surveys that they have no debt. This is up from 48 per cent in 2018 and 27 per cent in 2014. Fewer than 10 per cent of SMEs have a debt-to-turnover ratio of over 50 per cent. Aggregate lending data also show that SMEs have reduced the amount of debt they owe to Irish banks.[54]

A significant minority of SMEs in the Agriculture, Forestry & Fishing and Accommodation & Food sectors are highly leveraged (Chart 92). These sectors are exposed to the risks of a disorderly Brexit (see *Risks: Brexit*). For example, 22 per cent of agriculture SMEs in 2019 report having debt-to-turnover ratios of over 100 per cent. In contrast, the share of firms with similarly high debt-to-turnover ratios is below 5 per cent for most other sectors.

Chart 92: A significant minority of Agriculture and Accommodation & Food SMEs are highly leveraged

Proportion of SMEs with debt-to-turnover ratios higher than 100 per cent by sector



Source: Department of Finance Credit Demand Survey.
Notes: Survey data are as of March in each year. Debt-to-turnover is defined as outstanding debt divided by annual turnover.

[54] See Table A.14.1 of the Central Bank of Ireland's SME and Large Enterprise Credit and Deposits release. The SME credit growth rate, adjusting for reclassifications, foreign exchange effects, and revaluations, was -21.4 per cent between 2013Q4 and 2019Q2.

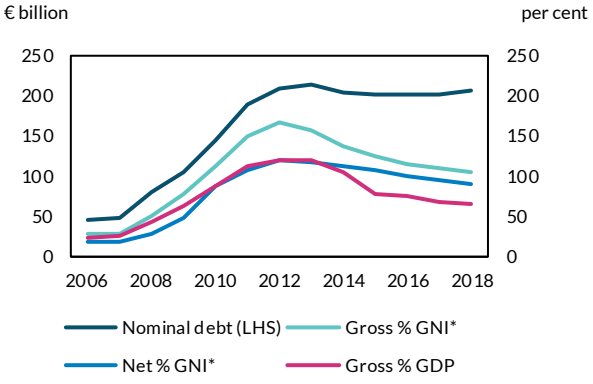
Sovereign

The Irish government's debt ratios have improved in recent years, suggesting a more resilient position. Improvements have been primarily driven by recent economic growth. By contrast, outstanding debt balances have only fallen marginally. Interest payments, in line with the prevailing interest rate environment, remain low. Increases in tax revenue have been driven in large part by unexpected corporate tax windfalls, leaving the government vulnerable if these receipts are not repeated. A range of shocks are shown to have the potential to leave the debt-to-GNI ratio 10 to 20 percentage points above baseline expectations over the medium term.*

Irish general government gross debt remains at a very high level when measured both in nominal terms and as a percentage of GNI* (Chart 93). The latter has fallen significantly from its 2011 peak of 150 per cent, with the magnitude of the decline particularly notable compared to other high debt euro area economies (Chart 94). The debt to GNI* ratio was still greater than 100 per cent in 2018, however, leaving it the fifth highest in the euro area despite cumulative GNI* growth of 44 per cent over the period 2013-2018.[55]

Chart 93: Debt reductions have played only a modest role in improving government indebtedness ratios

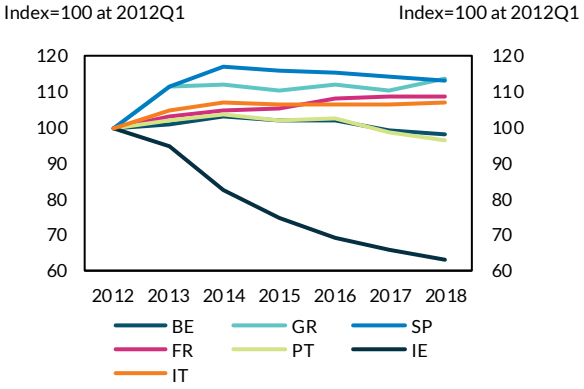
Evolution of various Irish debt measures



Source: CSO.

Chart 94: The reduction in Ireland's debt-to-GDP ratio has been well in excess of European peers

Change in debt to GDP ratio in high debt euro area countries (2012 = 100)



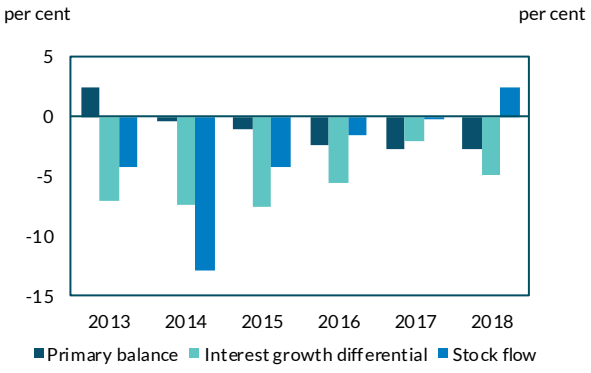
Source: Eurostat, CSO and CentralBank of Ireland calculations.
Note: Debt ratio used is as a percentage of GDP for all countries except Ireland, where GNI* is used. BE: Belgium, GR: Greece, SP: Spain, FR: France, IT: Italy, PT: Portugal, IE: Ireland.

The decline in the debt to GNI* ratio in recent years has been supported by favourable factors that are unlikely to continue indefinitely (Chart 95). Both the outstanding amount owed by the Irish sovereign and the level of economic activity to service that debt could be damaged by a macroeconomic shock resulting from a disorderly Brexit (see *Risks: Brexit*), a change in global financial conditions (see *Risks: Global repricing*), a reduction in MNE activity, export flows, or corporate tax receipts in Ireland (see *Risks: Tax and trade*) or a change in investor perceptions of European sovereign debt (see *Risks: Sovereign debt*). Short-term funding risks though are significantly mitigated by the €19.5bn in cash and other liquid short-term investments.

[55] Modified Gross National Income (GNI*) was €137bn in 2013, and €197.5bn in 2018 (CSO National Income and Expenditure 2018).

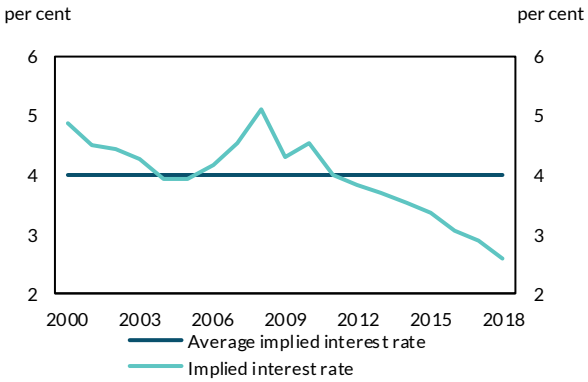
Recently, there has been a sizeable differential between interest costs and the rate of economic growth, driven by both very strong nominal GNI* growth and below average implied interest rates (Chart 96). This pattern has led to a 35 percentage point reduction in the debt to GNI* ratio since end-2012. The stock flow adjustment, which includes transactions that affect the debt but not the deficit (such as the recovery of revenues from the sale of financial assets), has reduced it by a further 20 per cent. Primary surpluses (excesses of revenue over non-interest expenditures) have played a smaller role, with the pace of improvement in the primary balance having stalled notably in recent years despite significant windfall revenues (Chart 97). These revenues are volatile, difficult to forecast, and particularly vulnerable to shifts in the international tax policy environment (see *Risks: Tax and trade)*. The average improvement in the underlying primary balance – which excludes the impact of financial sector support – has been just 0.1 per cent since 2015.

Chart 95: The differential between interest costs and the economic growth rate has been a consistent driver of falling government indebtedness
Decomposing the change in the Irish debt ratio



Source: CSO and Central Bank of Ireland calculations.
Notes: Debt ratio used is Debt to GNI*, this removes the impact of very strong GDP growth in 2015. "Stock Flow" refers to one-off adjustments to the debt ratio from transactions such as asset sales.

Chart 96: There have been substantial reductions in the average cost of borrowing for the Irish government in recent years
Implied interest rate on Irish government borrowing 2000 - 2018



Source: CSO and Central Bank of Ireland calculations.
Notes: Implied interest rate = interest payment (t) / stock of national debt (t - 1)

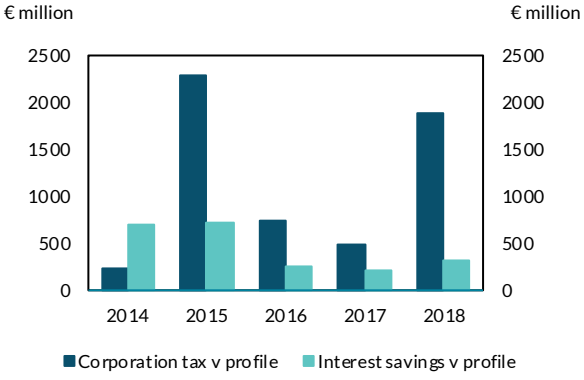
Assuming that an orderly Brexit occurs, the general government balance is projected to increase to around 1 per cent of GNI* in the coming years and stabilise at that level over the medium term. Against this backdrop, the current Central Bank baseline scenario is for the ratio of debt to GNI* to continue to decline in the coming years, but remain at an elevated level, falling to 75 per cent of GNI* by 2025 (Chart 98). To understand the vulnerability of this baseline path to shocks, the debt-to-GNI* ratio is subjected to a number of stress scenarios. These scenarios are:

- A growth shock, leading to a GNI* contraction of around 0.5 per cent in 2020 and 2021.
- A primary balance and interest rate shock[56], resulting in a small positive primary balance occurring in 2020 and 2021, along with an increase in interest rates on new sovereign borrowing of 200 basis points over the entire projection horizon.

[56] The primary balance shock is calculated as half a standard deviation of the average underlying primary balance between 2010 and 2019 (1.8 per cent). Using the underlying primary balance ensures that the impact of financial sector support is excluded.

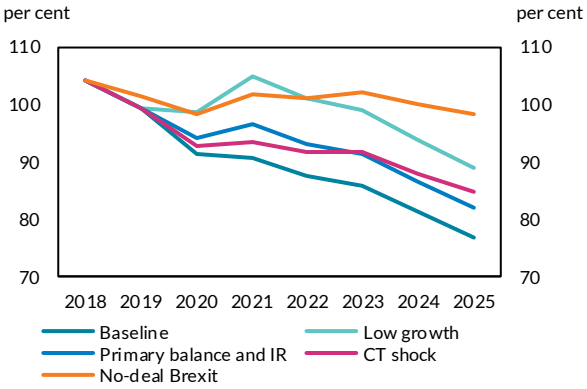
- A disorderly Brexit shock, incorporating recent Central Bank model outputs on macroeconomic responses[57] along with the Government's projected fiscal response.
- A corporation tax shock, which assumes that receipts experience a permanent reduction of €3bn in 2020.[58]

Chart 97: The government has benefited from unexpectedly large corporation tax receipts and interest cost savings repeatedly since 2014
Windfall gains from corporation tax receipts and interest expenses relative to forecasts, 2014-2018



Source: Department of Finance and Central Bank of Ireland calculations.
Notes: Data are measured as the differential between annual observed amounts and amounts forecast by the Government at the beginning of each year.

Chart 98: Under certain adverse scenarios, the debt to GNI* ratio could be substantially higher than baseline forecasts
Debt sustainability analysis of the debt-to-GNI* ratio under five scenarios



Source: Central Bank of Ireland.

Some of these scenarios will leave government debt ratios 10 to 20 per cent higher than under the baseline, though still lower than current levels. Chart 98 illustrates the impact that these various shocks have on the debt to GNI* ratio. The impact ranges from moderate in the case of the primary balance and interest rate shock, to significant in the hard Brexit shock case. While in each scenario the debt ratio is higher than the baseline at the end of the projection horizon, the ratio declines over time, suggesting the debt outlook appears sustainable. This sustainability does not imply that vulnerabilities do not persist, however. The potential coincidence of multiple sources of risk would imply deeper macroeconomic deteriorations than those modelled in each individual scenario under Chart 98, leading to weaker fiscal positions.

[57] Conefrey, T., Hickey, R. and Walsh, G. 'Debt and Uncertainty: Managing risks to the public finances', Central Bank Economic Letter No. 11 2019. The level of output and employment are 5 and 4 per cent lower over the medium term, respectively, under this scenario. These paths lead to negative consequences for revenue and expenditure (via both automatic stabilisers and the €650m of contingency measures outlined in the recent Budget).
[58] Corporate tax shocks based on economic modelling carried out in recent Central Bank research (Conefrey, T., O'Reilly, G. and Walsh, G. 'Fiscal Windfalls: A Model-Based Analysis', Central Bank Economic Letter No. 3 2019). The figure of €3bn is at the lower end of a range of estimates from this paper, and so can be considered a conservative shock to apply to the debt sustainability analysis.

Non-bank financial sector

Ireland has one of the largest non-bank financial sectors in the world, when compared to the size of the local economy. Non-bank financial entities are generally internationally focused, but issues of domestic importance also exist. Funds that invest in Irish commercial real estate own a third of that market. While incentives for leverage in these funds have been limited by recent tax changes, their leverage and liquid buffers remains similar to those reported in the last Review. These funds are more levered than similar funds in other European countries. The Central Bank will be conducting a deep dive on property funds to assess the resilience of this growing form of market-based finance to the domestic economy.

The solvency position of domestic insurance firms remains above regulatory requirements. The low interest rate environment has prompted a shift in non-life insurers' asset allocations and may present challenges to their profitability.

Investment funds

Most Irish-resident investment funds are internationally focused, although they are becoming more important as investors in the Irish economy. Investment funds form the largest part of the non-bank financial intermediation sector in Ireland. Looking at the global economy, the size of the Irish non-bank financial intermediation sector is larger than most of its peers (Chart 99).[59] Over 90 per cent of both the sector's assets and liabilities are not directly relevant to the domestic economy. Nonetheless, over recent years, Irish funds are becoming more important for commercial real estate and – to a lesser extent - domestic banks, and can potentially act as an indirect shock amplifier to the local economy.

Investment by funds is particularly important in the financing of commercial real estate (CRE). Irish investment funds now account for over 35 per cent of the CRE market (Chart 100), as they have invested a total of €18 billion in Irish property and land. This represents a potentially beneficial diversification of CRE funding away from domestic retail banks. Nonetheless, this new form of financing also poses potential vulnerabilities. Highly levered funds may have to sell their assets if the cost of their debt rises; for example, if global risk is repriced (see *Risks: Global repricing*). Funds with large liquidity mismatches may also have to sell assets quickly to fulfil redemptions. Such asset sales could put downward pressure on asset prices, amplifying any market downturn and raising the cost of finance for borrowers.

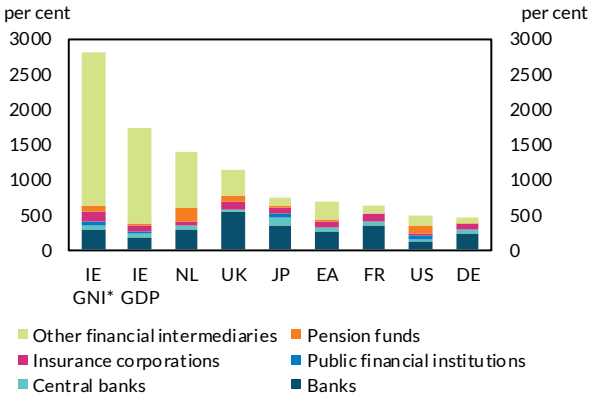
The distribution of Irish funds investing in commercial real estate has a tail of highly-levered entities. While the median Irish investment fund investing in CRE has a leverage of around 2.4, leverage is significantly higher in the tail of the distribution (Chart 101).[60] In particular, 25 per cent of these funds have a leverage ratio of over 5.9; and 10 per cent of them have a leverage higher than 14. One factor influencing the level of measured leverage in CRE funds was the announcement in the 2016 Finance Act that a 20 per cent tax rate would be applied on foreign investors holding shares of funds investing in Irish property. This incentivised investment funds to swap a portion of their equity for shareholder loans, increasing measured leverage. Recent Budget

[59] Measured as other financial intermediaries (OFI) as per cent of the gross domestic product (GDP).
[60] Estimated with a ratio of assets to equity. Using other measures such as gross or commitment method from the AIFM Directive yields similar results.

2020 Financial Resolution No. 7 removed the tax incentive for increases in leverage through shareholder loans in real estate funds, which is expected to reduce measured leverage.[61] However, even without shareholder loans, 10 per cent of Irish fund investing in CRE would have a leverage ratio of over 6.8.

Chart 99: Non-bank financial sector in Ireland is very large in relation to the size of the economy

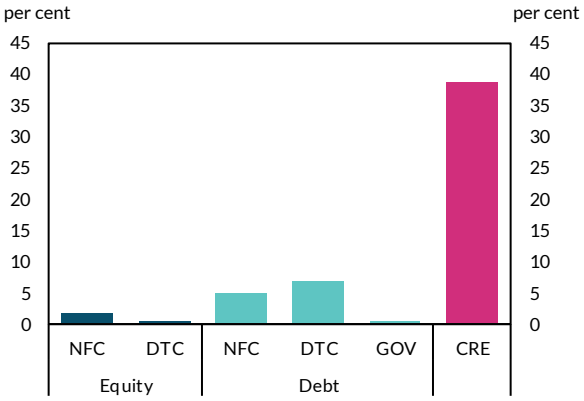
Financial assets by institution type as a percentage of the country's GDP in 2017, selected countries



Source: Central Bank of Ireland and Financial Stability Board.
Notes: Proportion of GNI* as well as of GDP shown for Ireland, as GDP is not seen as an accurate measure of the domestic economy in Ireland. IE – Ireland, NL – the Netherlands, UK –United Kingdom, JP – Japan, EA - Euro area, FR – France, US –United States, DE – Germany.

Chart 100: Investment by funds is particularly important in the financing of CRE

Irish assets held by Irish investment funds as a share of each market



Source: Central Bank of Ireland Centralised Securities Database.
Notes: Asset holdings exclude equities issued by Irish-authorised investment funds. Counterparty basis may not reflect the ultimate beneficiary's domicile. DTC refers to 'Deposit Taking Corporations' and GOV refers to Governments. Assets exclude equities issued by Irish-authorised investment funds. Market outstanding in a given category calculated as a sum of market outstanding values for each security in a given category in which Irish-authorised investment funds have an exposure. Market outstanding value for commercial real estate (CRE) based on data from Cushman & Wakefield. Data for 2019Q2.

Irish funds investing in commercial real estate are more highly levered than most of their European peers (Chart 102). While some of the difference between Irish and European funds can be explained by the tax incentives described above, Irish funds investing in CRE were consistently more levered than real estate funds in over 90 per cent of European countries before the tax changes were introduced in 2016. Furthermore, if shareholder loans are removed from the measure of leverage at the end of 2018, leverage reduces from 1.19 to 0.68 (Chart 102), which is still higher than the leverage of real estate funds in more than 90 per cent of European countries. This suggests that even assuming shareholder loans are not used for financial leverage, Irish CRE funds are comparatively more levered.

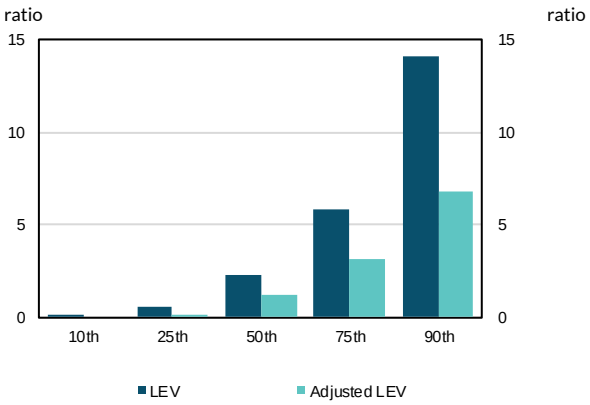
Irish resident funds that invest in the domestic CRE market have held stable cash buffers over time and long redemption periods. These funds hold around 5 per cent of their assets in liquid holdings (Chart 103). Liquid holdings, such as cash or deposits, allow funds fulfil typical redemption flows without the need to sell real estate assets. Liquidity is particularly important for funds holding CRE, as it is not possible to sell a large building in a short period of time without affecting market prices. Without liquidity buffers, even relatively limited redemption requests could lead to CRE funds having to sell their assets at a large discount. The majority of Irish CRE funds give investors at most one opportunity per year to redeem their investments, and can also limit large redemption requests with "gates" (temporary periods when funds do not allow redemptions) and redemption

[61] See Budget 2020.

fees. This reduces the risk that CRE funds may have to sell properties quickly at discounts to meet redemptions.

Chart 101: Irish-resident funds that invest in CRE have a tail of highly-levered entities

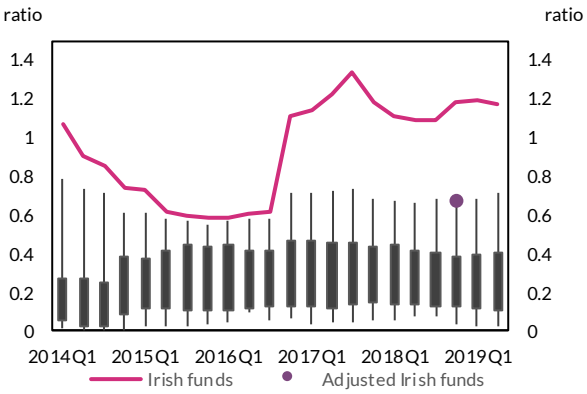
Distribution of leverage in Irish-domiciled real estate funds



Source: Central Bank of Ireland and European Central Bank.
Notes: Financial leverage ratio is total assets under management divided by total net asset value minus 1, and can be biased where non-equity liabilities are used by funds for purposes other than leverage. Aside from shareholder loans, as discussed, this bias is expected to be small for Irish real estate funds. Bars show the 90th, 75th, 50th, 25th and 10th percentiles of leverage of real estate funds domiciled in Ireland. Irish real estate funds are those investment funds resident in Ireland which hold Irish real estate. Adjusted leverage metric calculated assuming that shareholder loans would be equivalent to equity. Data for 2019Q2.

Chart 102: Irish-resident funds that invest in CRE are more highly-levered than their European peers

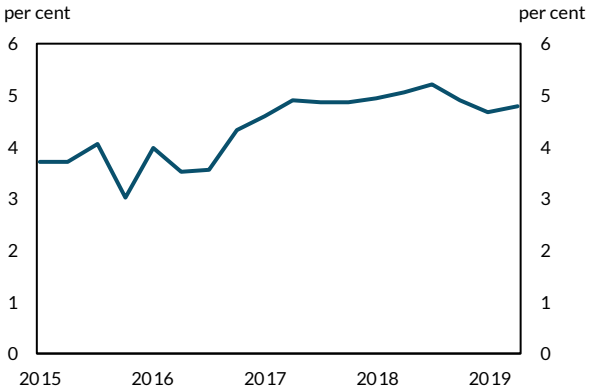
Distribution of leverage in real estate funds across European countries



Source: Central Bank of Ireland and European Central Bank.
Notes: Financial leverage ratio is total assets under management divided by total net asset value minus 1, and can be biased where non-equity liabilities are used by funds for purposes other than leverage. Aside from shareholder loans, as discussed, this bias is expected to be small for Irish real estate funds. Box plots show the 90th, 75th, 25th and 10th percentiles of leverage of real estate funds across other European countries. Irish real estate funds are those investment funds resident in Ireland which hold Irish real estate. Real estate funds in other countries are those that self-identify as real estate funds. Adjusted value assuming shareholder loans would be equivalent to equity. Data for 2014Q1-2019Q2.

Chart 103: Irish resident funds that invest in CRE have stable liquidity buffers

Liquidity buffers of Irish-authorised investment funds with holdings of Irish CRE



Source: Central Bank of Ireland.
Notes: Liquidity buffer is defined as (liquid assets/total assets). Liquid assets are defined as cash, deposits, advanced economies' government short-term debt, euro-zone bank short-term debt, and advanced economies' equities. The composition of funds with Irish real estate holdings changes over time. Data for 2014Q1-2019Q2.

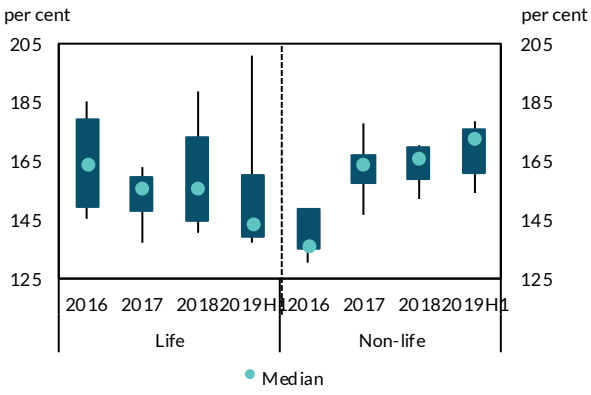
Insurance firms

Domestic insurance firms' solvency positions are above regulatory requirements and the quality of available capital is high. The insurance sector in Ireland comprises life, non-life and reinsurance firms operating across a range of geographical markets. The companies providing insurance cover in the domestic market include both life and non-life firms. Domestically-focused life and non-life insurers' available capital ("own-funds") continues to exceed the regulatory Solvency Capital Requirements (SCR) under Solvency II (Chart 104). The median solvency position of the domestic life insurers weakened marginally in the first half of 2019 as firms move towards their target solvency coverage levels, amongst other factors. Capital quality remains high for both domestic life and non-life firms with Tier 1 unrestricted capital accounting for 97 per cent and 95 per cent of total own funds, respectively.[62]

Non-life firms continue to reduce their holdings of sovereign bonds in response to suppressed investment income. At an aggregate level there is a noticeable shift in non-life insurers' investment asset allocation from sovereign bonds to riskier corporate bonds and collective investment funds (Chart 105). In particular, BBB-rated bonds now account for 24 per cent of investments, up from 17 per cent in 2012 (Chart 106). If widespread corporate credit rating downgrades were to occur, firms' required capital under Solvency II would increase. Increasing investments in collective investment funds could raise firms' investment risks as any common investment behaviour could exacerbate the transmission of shocks in times of market stress, although such assets can also offer portfolio diversification.[63]

Chart 104: Domestic insurers' solvency positions are above regulatory requirements

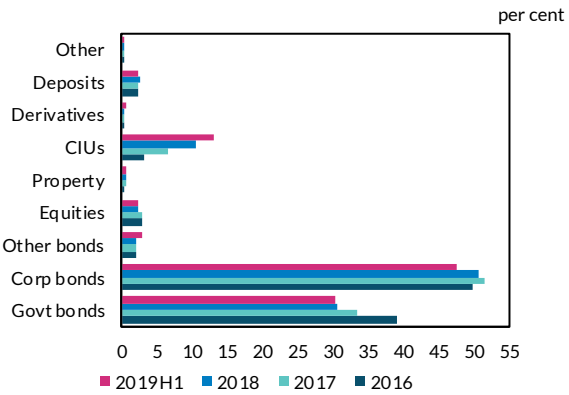
Solvency position of domestic life and non-life insurers



Source: Central Bank of Ireland.
Notes: The solvency position is measured as eligible own funds as a percentage of solvency capital requirements (SCR). Firms must maintain a SCR ratio of 100 per cent or higher to comply with regulatory requirements. The box at each point shows the interquartile range of solvency positions and the vertical lines show the 10th and 90th percentiles. Sample is time varying comprising the largest domestic life and non-life insurance firms. Last observation 2019Q2.

Chart 105: Domestic non-life insurers continue to reduce their holdings of sovereign bonds

Domestic non-life insurers' investment asset allocation



Source: Central Bank of Ireland.
Notes: Data are for domestically-focused non-life firms who collectively write approximately 65 per cent of Irish-risk business. Last observation 2019Q2.

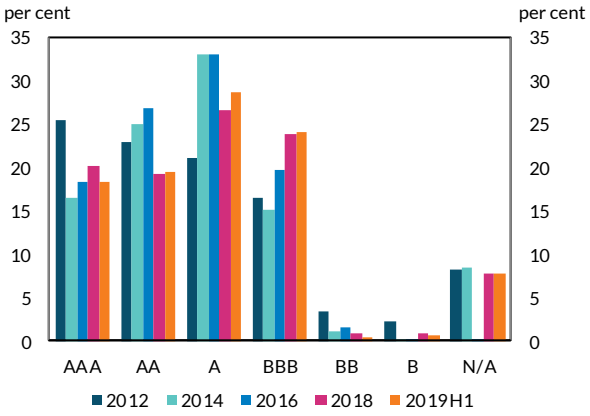
The low interest rate environment presents challenges for insurers' profitability. Investment income has been a declining share of the non-life sector's profitability in recent years (Chart 107).

[62] Insurers' 'Own funds' are divided into 3 'tiers' based on both 'permanence' and 'loss absorbency' (tier 1 being the highest quality). Tier 1 is also divided into 'restricted' and 'unrestricted' tier 1 which includes issued share capital and reserves.
[63] See Chapter 3 *Falling Rates, Rising Risks* of IMF Global Financial Stability Report, October 2019.

A prolonged low interest rate environment is likely to result in a continuation of declining investment income as proceeds from maturing assets are reinvested in lower-yielding assets. The short-term nature of non-life insurers' products, however, helps to lessen firms' interest rate sensitivity as firms can reprice contracts to offset pressure on income. In aggregate, non-life insurers' underwriting performance continues to improve. This is in part due to reserve releases and some improvement in combined ratios.[64] The low interest rate environment does not pose a direct immediate risk to domestic life insurers which predominantly sell non-guaranteed unit-linked products (comprising 90 per cent of assets under management), where the risks are primarily borne by the policyholder, but could have an impact on business models in the longer term. New sales could decline or lapse rates, which are currently low, could increase if policyholders are unsatisfied with prolonged low returns, thereby creating profitability challenges for firms.

Chart 106: Domestic non-life insurers' financial asset quality has been declining

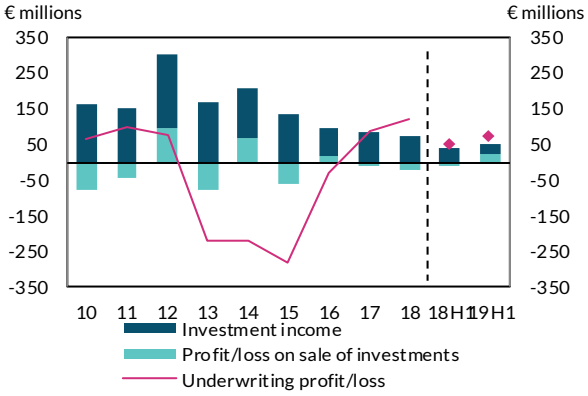
Domestic non-life insurers' financial assets by asset rating.



Source: Central Bank of Ireland.
Notes: Categories are as per cent of total financial assets. Data are for domestically-focused firms who collectively write approximately 65 per cent of Irish-risk business. Last observation 2019Q2.

Chart 107: Domestic non-life insurers' investment income is declining

Domestic non-life insurers' underwriting profits and investment income and gains/losses.



Source: Central Bank of Ireland.
Notes: Data are an aggregation of domestically-focused firms who collectively write approximately 65 per cent of Irish-risk business. Profit/loss on sale of investments includes realised and unrealised gains and losses. Data relate to firms' domestic and global business. Last observation 2019Q2.

[64] Combined ratios are calculated as the cost of incurred claims and expenses as a percentage of earned premium income. A combined ratio below 100 per cent indicates that a company is making an underwriting profit, while a ratio above 100 per cent means that the cost of claims is greater than the premium earned, resulting in an underwriting loss.

Box 4: Risk weighted assets, cyclical movements, and bank capital regulation

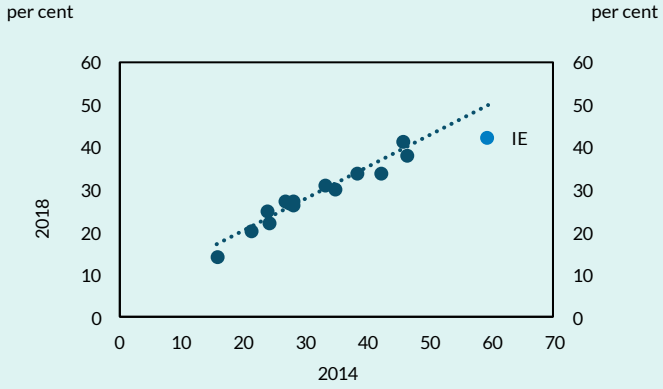
By Fergal McCann and Frances Shaw (Macro-Financial Division)

Regulatory bank capital requirements are built on the concept of risk-based regulation. To ensure that banks fund themselves with capital commensurate with their level of risk, their assets are weighted according to their risk level, with capital requirements are set as a percentage of their risk weighted assets (RWA). Credit risk weighted assets can be estimated using two methods, a standardised approach (SA) or an internal risk based (IRB) approach where banks use their own internal models to estimate their credit risk weights.

One feature of Basel model-based risk-weighted regulation is that it has the potential to result in pro-cyclical capital requirements.[1] Risk-based capital requirements under the IRB approach will increase during periods of economic weakness and fall as an economy enters into an expansion. As risk weights fall during benign economic times, banks are required to fund themselves with less capital relative to total assets, which may act to amplify periods of economic exuberance. Analogously, higher risk weights may lead to weaker bank lending during periods of economic weakness.[2]

Since the crisis, international capital standards have strengthened considerably, with authorities requiring banks to hold more capital as a percentage of RWA. Therefore, as the denominator of the ratio, it is important to understand how RWA evolves in response to the economic cycle. A decrease in RWA can increase the CET1 capital ratio without a bank having any additional capital. Chart A shows a sample of EU country IRB risk weights for performing credit exposures between 2014 and 2018, removing non-performing loans to eliminate the effect of loan portfolio sales on aggregate RWA densities. A decline is evident for all EU countries. Ireland is the most important outlier, with the largest decrease in RWA densities, reflecting the strength of the Irish economic recovery. Over the same period, Table 1 confirms that risk weights across Europe have moved in a pro-cyclical fashion: densities have decreased with falling unemployment rates and increases in house prices and GDP per capita.

Chart A: RWA densities have fallen since 2014 across Europe



Source: EBA transparency exercises 2015 - 2018
Notes: Risk weight density (RWA / exposure) by EU country of exposure and includes mortgage, SME, corporate and retail exposures only. IE sample includes BOI, AIB, Ulster Bank and KBC exposures.

Table 1: RWA densities across Europe have decreased with falling unemployment rates and increases in house prices and GDP per capita

	Unemployment	House price index	Log GDP per capita
Total	1.212***	-0.216***	-0.236***
Mortgage	0.798	-0.185**	-0.154
Commercial	1.532**	-0.253***	-0.322***
SME	2.143***	-0.272**	-0.264**

Source: EBA, CSO and OECD, 2014 to 2018 half-yearly data
Notes: Fixed effect panel regression. Results from 12 univariate regressions of RWA densities on economic indicators. ** and *** indicate statistical significance at the 5% and 1% level.

[1] Borio et al (2001)
[2] These patterns of pro-cyclicality are studied in Kashyap and Stein (2004), Malovana (2018), Broz et al. (2017) and Cannata et al. (2012).

Box 5: Low-for-longer: challenges for European banks

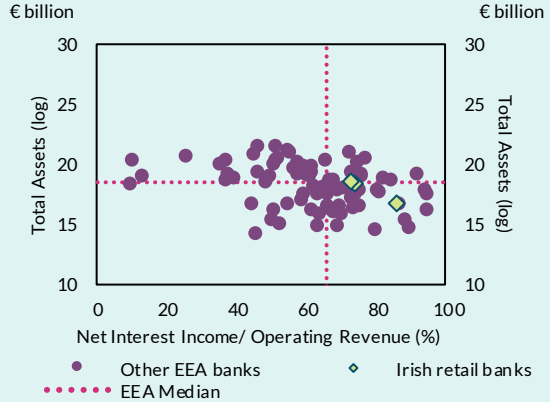
By Paul Lyons and Joe Morell (Macro-Financial Division)

This box examines the impact of the low-for-longer (LFL) interest rate environment on European banks. At its September meeting, the ECB confirmed that a low or lower interest rate environment will persist for the foreseeable future and at least until inflation "robustly" converges to the ECB's target of close to, but below, 2%. This Box highlights the increased challenges for Irish banks in a prolonged low interest rate environment by identifying a number of characteristics of Irish banks that may exacerbate the negative impact vis-à-vis their European peers. These include, a high dependence on interest income, their relatively smaller size and lower cost efficiency compared to European peers. It should also be noted that low rate environment has important positive effects for banks through lower loan loss provisions, maintaining demand for banking services and by lowering bank funding costs.

The main financial stability risk posed by a LFL environment relates to the increased profitability pressures for banks[1]. Low rates affect bank profitability mainly through net interest margins (NIMs), defined as the difference between the interest income received by banks and the interest paid by banks. Specifically, when short-term interest rates decline, banks may struggle to lower deposit rates, particularly as household deposit rates approach zero. If returns on loans and other interest-bearing assets decline, this will lower NIMs. Low interest rates may also encourage increased risk-taking by banks (as they search for yield), in response to declining profits, which could further result in medium-term financial vulnerabilities. Banks may be able to offset lower NIMs through business model adjustments, for instance, by lowering operating costs, loan book growth or by increasing fee and commission-based business.

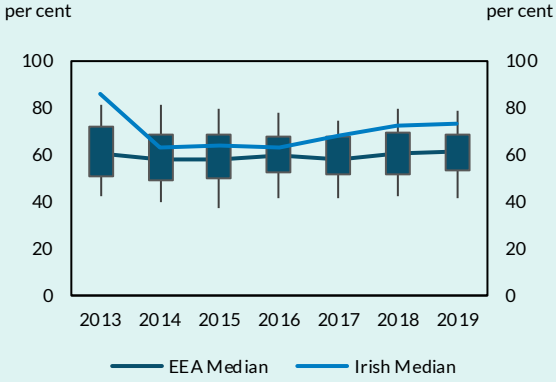
Recent research has highlighted a number of bank characteristics that may leave lenders more exposed to profitability risks in an LFL environment.[1] Chart A shows that most European banks and all Irish banks can be characterised as having a high dependence on interest income, making them particularly vulnerable to the low interest rate environment. Larger banks, as measured by total assets, tend to have more diversified income sources that may insulate them more from declining interest income sources. Lower cost efficiency can also be a drag on profitability. Chart B shows the trend in the cost-to-income ratio for Irish banks compared to European peers. For Irish banks, this ratio has been trending upwards with a cost-to-income ratio of 73% as at Q2 2019 compared to a European equivalent of 60%.

Chart A: LFL risk factors for European banks



Source: S&P Global.
Notes: Chart contains data for 86 European banks. Three Irish banks included in sample: AIB, BOI, PTSB. Data as at 2019Q2.

Chart B: Cost-to-income ratios for European banks



Source: S&P Global.
Notes: Chart contains data for 86 European banks. Three Irish banks included in sample: AIB, BOI, PTSB. Last observations as at 2019Q2.

[1] Molyneux, P., Reghezza, A. and Xie, R., 2019. Bank margins and profits in a world of negative rates. Journal of Banking & Finance.

Macroprudential policy

The Central Bank uses macroprudential policies to promote financial stability in Ireland and to mitigate the impact of negative shocks on the continuous provision of financial services to the real economy. There are two facets to the goal of macroprudential policy: first, to make the domestic banking system more resilient so that it can better withstand adverse shocks and continue to provide financial services to the real economy; second, to reduce the emergence of imbalances or vulnerabilities, such as excessive household indebtedness, in the domestic financial system. The Central Bank has a range of macroprudential policy tools at its disposal to help it address these objectives and it reviews these tools at regular intervals (Table 3). The prevailing risk environment, the Central Bank's assessment of the required resilience in the financial system, the effectiveness of activated policies and interactions between these policies inform whether changes need to be made to the policy mix.

This section outlines the outcome of the Central Bank's latest reviews of its currently active policy instruments: the mortgage measures, the countercyclical capital buffer, and buffers for systemically important institutions. These reviews all concluded in Q4 2019 and are being announced as part of the *Financial Stability Review*. This is in line with the move for this publication to explain the Central Bank's policy actions to safeguard financial stability and ensure that the resilience of the financial system is proportionate to the risks it faces. This section also outlines the Central Bank's recognition of measures taken in other countries and discusses further macroprudential policy measures for the banking sector.

Table 3| Summary of macroprudential policies for the banking sector

	Mortgage Measures	O-SII	CCyB
Objective	(i) Increase resilience of banks and borrowers to negative economic and financial shocks (ii) Dampen pro-cyclicality of credit and house prices	Increase resilience of systemically important banks, defined as those institutions whose failure would have a large impact on the financial system.	Increase banking system resilience to cyclical risks
Rate	LTV: 70% - 90% depending on borrower type LTI: 3.5 times A proportion of new lending above the limits is allowed *See Table 4 for more detail*	0.5% - 1.5% depending on the institution	1%
Type of risk addressed	Cyclical and structural	Structural	Cyclical
Exposures in scope	Proportion of newly originated mortgage exposures	All exposures	Irish exposures
Effective from	Feb 2015	Jul 2019 on a phased basis	Jul 2019
Next review	Q4 2020	Q4 2020	Q1 2020

Active macroprudential policy measures[65]

Mortgage measures

The Central Bank annually reviews the calibration of the mortgage measures. The 2019 review finds that the measures continue to meet their objectives of strengthening bank and borrower resilience and reducing the likelihood and impact of a credit-house price spiral emerging. The Central Bank has decided that the LTV and LTI limits, and the related allowances, will remain unchanged in 2020.

The main findings of this year's review are as follows:

- *The mortgage measures have been effective in strengthening borrower and lender resilience and in limiting the potential for an adverse credit-house price spiral to emerge.*
    - *If the measures had not been introduced in 2015, both the level of house prices and the proportion of highly indebted mortgage borrowers would likely have been significantly higher in 2019 than their currently observed levels, all else being equal.*
    - *While the objective of the mortgage measures is not to target house prices, Central Bank analysis suggests that – in the absence of the mortgage measures – affordability pressures for mortgage borrowers would have been even more acute.*
- *The measures were first introduced in early 2015, at a time when house prices were still recovering from the financial crisis. Since then, there have been several years where house prices have grown faster than incomes due to supply constraints. As a result, the measures have become more binding: of those drawing down mortgages, more households are borrowing at or close to the maximum available.*
    - *This is consistent with the measures being effective in maintaining prudent lending standards, even in a market where supply shortages have driven house price rises.*
    - *The extent of this varies by borrower type and region, with the measures being most binding for first-time borrowers in Dublin. This reflects the greater imbalances between house prices and incomes in the city, itself due to a greater imbalance between housing supply and demand in Dublin.*
    - *The supply response has been strongest in areas where house prices are higher and it is these areas where the measures are more binding.*
- *An in-depth review of the functioning of the allowances did not identify a better alternative to the current system. As always, the Central Bank is open to making changes in response to well-reasoned, evidence-based, alternative approaches that still allow the objectives of the measures to be met and that enable practical monitoring of compliance with the measures.*

[65]This report is for information purposes only. Any information in this report should not be construed as legal advice or a legal interpretation of the measures. Please see the Annex C for further details.

This section contains the main findings of the 2019 review of the Central Bank's macroprudential mortgage measures. The Central Bank is committed to annually reviewing the calibration of the mortgage measures, to ensure that they continue to meet their objectives of:

- increasing the resilience of banks and borrowers to negative economic and financial shocks, and;
- dampening the pro-cyclicality of credit and house prices so a damaging credit-house price spiral does not emerge.

The 2019 review of the mortgage measures assessed the effectiveness and impact of the mortgage measures, particularly in the context of the broader housing market. As for each annual review, the Central Bank assessed whether the measures as currently calibrated continue to meet their objectives. The review also examined the operation of the measures in the context of developments in the broader housing market. Challenges remain in the broader market to ensure a sustainable and affordable delivery of housing.[66]

Calibration of the measures

The conclusion of the 2019 review is that the measures continue to meet their objectives and thus the calibration (Table 4) will remain unchanged in 2020. This calibration is based on a body of empirical research by Central Bank staff that has been published over the last number of years, as well as international experience and evidence from such measures. The framework has different limits for different types of borrowers and there is flexibility for banks to lend above the limits in certain cases. In particular:

- A higher LTV limit of 90 per cent applies for FTBs, with 5 per cent of new lending to these borrowers allowed above the 90 per cent limit. The rationale for this higher limit relates to the fact that these borrowers are significantly less likely to default than SSBs. This finding has recently been further supported by additional evidence on mortgage defaults occurring since 2013.[67] Traditionally in Ireland over the years, with the exception of a few years during the 2000s, banks have - for their own risk management purposes - required a minimum deposit, typically around 10 per cent, when lending for a mortgage.
- A lower LTV limit of 80 per cent applies for SSBs. However, banks have flexibility to lend above this limit, with 20 per cent of new lending to these borrowers allowed above the 80 per cent limit. In addition, borrowers who are in negative equity and are selling their home and purchasing a new one are exempt from the LTV limit, instead banks' own lending standards apply to these borrowers.
- The 3.5 times LTI limit applies to both FTBs and SSBs. For FTBs in particular, there is also flexibility to exceed this limit, with 20 per cent of new lending to FTBs allowed above 3.5 times LTI. 10 per cent of new lending is allowed above the limit for SSBs.

The combination of both LTV and LTI limits is an important part of the framework for the mortgage measures. These limits complement each other in addressing the different elements of financial stability risks that can arise from housing and mortgage markets. Both the LTV and LTI

[66] See Kennedy, G. and S. Myers (2019), "An overview of the Irish housing market", Financial Stability Note Vol. 2019, No. 16 (forthcoming).
[67] See Giuliana, R. (2019) "Have first time buyers continued to default less?" Financial Stability Note Vol. 2019, No. 14.

limits can also act through the expectations channel, as stable limits throughout the housing cycle may reduce the element of credit demand that is motivated by speculation and changing lending standards.

The LTV limit provides protection against house price falls, which would push borrowers into negative equity and increase the risk of default. An LTI limit without an accompanying LTV limit could leave banks exposed to severe house price shocks, as happened in Ireland after 2008. By reducing the probability of a mortgage being of higher value than the underlying property, the LTV limit also protects borrowers from the challenges linked to negative equity, such as the potential inability to access other finance or move to another property (See *Resilience: Households*). Having a minimum deposit also reinforces the positive benefits of the LTI limit in reducing the probability of default, which can be higher where negative equity is a prominent feature in the market, and by minimising the reliance on mortgage debt and the debt servicing burden. Thus it is important that borrowers provide a minimum deposit when getting a mortgage.

The LTI limit, on the other hand, provides a buffer against the effects of income and employment shocks, thus increasing the resilience of borrowers and reducing the probability of default. At its core, the LTI limit aims to promote affordability of the mortgage for the borrower throughout the life-cycle of the loan, and in particular during periods of economic difficulty. The LTI limit is also more effective in preventing house price bubbles, as it links house price growth more closely to household income, which has tended to grow more slowly than house prices during exuberent periods.

Table 4| Details of the LTV and LTI Regulations – 2020

LTV Limits	**For primary dwelling homes (PDHs):**	First-time buyers (FTBs): 90% Second and subsequent buyers (SSBs): 80%	5% of new lending to FTBs allowed above 90% 20% of SSB new lending allowed above 80%
	For buy-to-let borrowers (BTLs):	70% LTV limit	10% of new lending allowed above the BTL limit
LTI Limit	**For PDHs**	3.5 times income	20% of new lending to FTBs allowed above 3.5 limit 10% of SSB new lending allowed above 3.5 limit
Exemptions	**From LTV Limit** Borrowers in negative equity	**From LTI Limit** BTL borrowers Lifetime mortgages	**From both limits:** Switcher mortgages Restructuring of mortgages in arrears

The mortgage measures continue to meet their objectives

The primary question considered in the annual review of the mortgage measures is whether the measures continue to meet their objectives of strengthening bank and borrower resilience and reducing the likelihood and impact of a credit-house price spiral emerging. The evidence from the 2019 review is that this continues to be the case.

- *Bank and borrower resilience*

While there continue to be shifts in the distribution of LTVs and LTIs in new lending, there is no evidence of a generalised deterioration in mortgage lending standards. New mortgage lending in aggregate has continued to expand, albeit at a slower pace. Both the volume and the risk characteristics of that lending do not point to excessive levels of indebtedness in new lending. Chart 57 - Chart 60 in *Risks: Mortgage Measures* outline the distribution of new lending by LTV and LTI over time and show that average LTVs and LTIs across borrower groups have increased only a little since 2015.

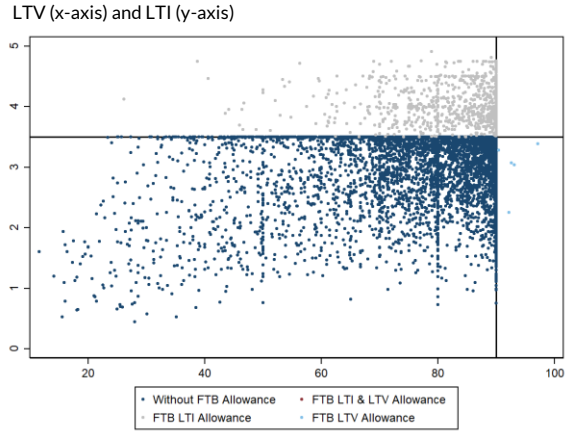
The mortgage measures are gradually promoting overall resilience in banks' mortgage books. As the mortgage measures operate through the flow of new lending, they have an incremental effect on the overall stock of outstanding mortgages. As of June-2019, 26 per cent of outstanding mortgage lending at Irish retail banks had been issued subject to the Central Bank's mortgage measures.

As discussed in *Risks: Mortgage Measures*, the mortgage measures have become more binding in H1 2019, with a larger share of lending clustered just below the LTV and LTI limits compared to H1 2018. Given the growth in house prices relative to incomes in recent years in the context of constrained housing supply, these increased shares of lending around the limits are to be expected. For FTBs in H1 2019, 46 per cent of borrowers had an LTV between 89 - 90 per cent.

Within the allowance group, loans with an LTV allowance generally had LTVs below 90 per cent and loans with an LTI allowance generally had LTIs below 4.5 times gross income (Chart 108 and Chart 109), reflecting banks' own credit policies and lending standards. These upper limits within the allowance group have been broadly consistent across time periods with no indications of an increase in the maximum LTVs and LTIs for borrowers with an allowance.

Chart 108: Allowances generally have LTI below 4.5 times LTI for FTBs…

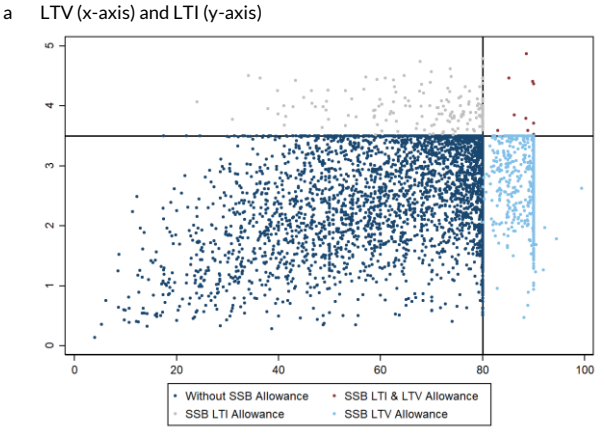
Allocation of Allowances for FTBs, H1 2019



Source: Central Bank of Ireland calculations using MT Data
Notes: Sample used is all new property purchase/self-build loans with an allowance. LTV<=100 LTI<=5

Chart 109: …and below 4.5 times LTI and 90 per cent LTV for SSBs

Allocation of Allowances for SSBs, H1 2019



Source: Central Bank of Ireland calculations using MT Data
Notes: Sample used is all new property purchase/self-build loans with an allowance. LTV<=100 LTI<=5

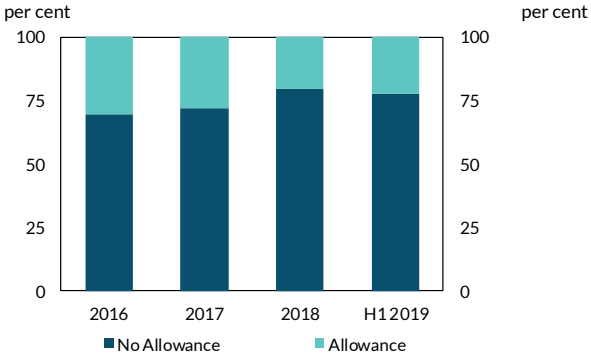
The allowances are an important feature of the mortgage measures as they allow flexibility for certain types of borrowers to exceed the LTV and LTI limits subject to the banks' own lending

standards.[68] The importance of this flexibility can be seen in the proportion of allowances going to Dublin borrowers. Borrowers with allowances are more likely to be from Dublin, particularly so for the LTI allowances for both FTBs and SSBs.[69] Chart 110 shows that between 20 and 30 per cent of borrowers in Dublin have received an allowance in each period, higher than the equivalent share for other parts of the country, illustrating the importance of the allowances for these borrowers.

Borrowers with an allowance tend to be younger across all allowance types while the income characteristics of borrowers receiving an allowance tends to differ across the allowances. In H1 2019, borrowers who received an allowance tend to be younger than borrowers who do not. For the FTB LTI limit, borrowers with an allowance were on average 32 years old while those without an allowance were 35 years old.[70] The income characteristics of borrowers receiving an allowance tends to differ across the allowances and has changed over time. For the SSB LTV allowances, borrowers with an allowance tend to have higher incomes than those without an allowance but for SSB LTI allowances, they tend to have lower incomes. For FTB LTI allowances, they previously had tended to have lower incomes that those without an allowance but this has switched to slightly higher incomes in more recent years (Chart 111). Recent research has highlighted that the proportion of FTB LTI allowances going to Dublin borrowers has an effect on the aggregate income of borrowers with an allowance, as Dublin borrowers tend to have higher incomes than non-Dublin borrowers.[71]

Chart 110: Between 20 and 30 per cent of Dublin borrowers receive an allowance each period

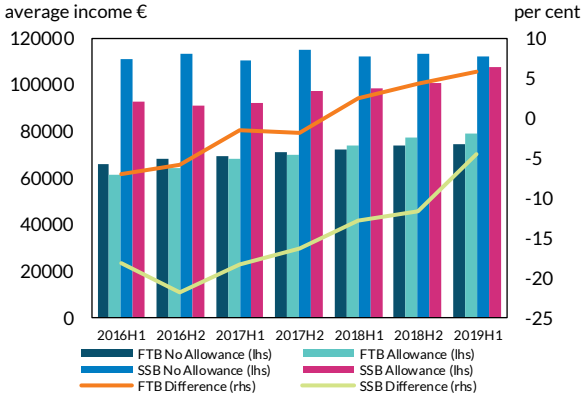
Percentage of Dublin borrowers with and without an allowance over time (Per cent of number)



Source: Central Bank of Ireland calculations using MT Data
Notes: PDH in-scope borrowers only

Chart 111: The difference in the average income of borrowers with and without an LTI allowance varies by borrower type and has increased over time

Average income of LTI allowance and non-allowance FTB and SSB borrowers and the difference in average LTI allowance and non-allowance incomes over time



Source: Central Bank of Ireland calculations using MT Data
Note: PDH in-scope borrowers only.

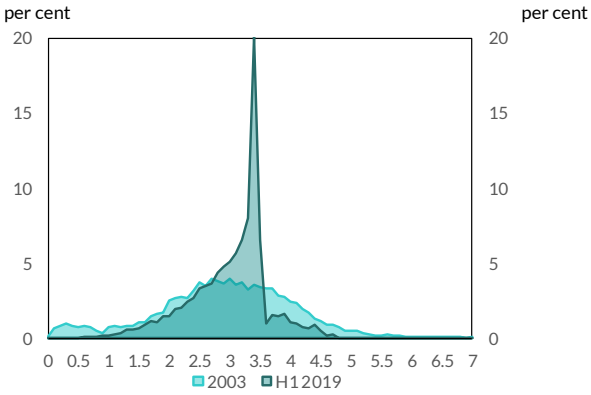
[68] Kinghan, C. and McCann, F. (2019) "Lending above macroprudential mortgage limits: The Irish experience since 2015", Financial Stability Notes No. 8.
[69] 66 per cent of LTI allowances for FTBs went to Dublin borrowers and 73 per cent for SSBs in H1 2019. See *New Mortgage Lending – Data and Commentary* for H1 2019.
[70] See *New Mortgage Lending – Data and Commentary* for H1 2019.
[71] Kinghan, C. and McCann, F. (2019) "Lending above macroprudential mortgage limits: The Irish experience since 2015", Financial Stability Notes No. 8. Over the period 2016 to 2018, Kinghan and McCann have shown that both in and outside of Dublin, low and mid-income borrowers were more likely to get an allowance. In 2018 and 2019, these patterns are similar but with the differentials narrowing, as higher-income borrowers become relatively more prevalent in the allowance group.

As discussed in *Resilience: Households*, due to the low interest burden and falling debt, origination mortgage service now represents less than 30 per cent of income for the majority of the household sector, and less than 40 per cent for almost all households.[72] Recent research[73] into origination mortgage servicing burdens and the LTI limits finds that even if interest rates were to increase by 200 basis points, just over a third of floating rate loans and almost a fifth of all loans would face a mortgage service to income ratio of over 30 per cent, a level often considered to be an upper bound for sustainable mortgage servicing burdens. This compares with 72 per cent of floating rate loans and 69 per cent of all loans in 2007/08, suggesting that new mortgage lending is more sustainable than lending taking place during the previous cycle.

The mortgage measures have effectively maintained lending standards, despite robust house price growth in recent years. One way of illustrating this is to look at the distribution of new lending at a similar point in the last housing cycle. The reference point is chosen by looking at the last time the house price to income ratio was at 4.4 times (its Q1 2019 level), which was Q4 2003. Chart 112 and Chart 113 show the distribution of the LTI of new lending for FTBs and SSBs for H1 2019 compared to 2003. The right tail of the distribution, i.e. lending at high LTI levels, is significantly curtailed compared with the last cycle. As loans with higher LTIs are generally riskier, this implies higher bank and borrower resilience compared to a similar point in the last cycle.

Chart 112: The proportion of high LTI lending is much lower than it was at a similar point in the last cycle for FTBs…

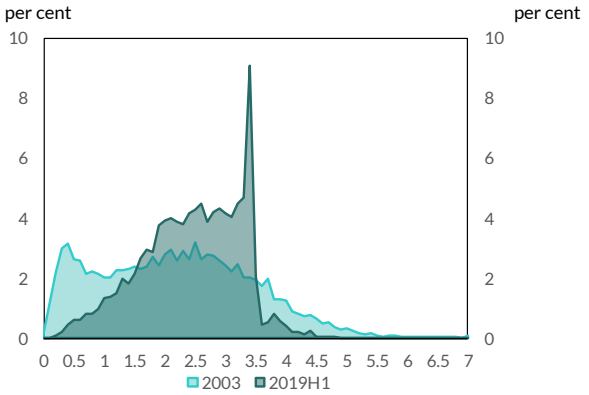
Distribution of LTI for FTBs in 2003 compared to H1 2019



Source: Central Bank of Ireland calculations using MT and LL Data.
Notes: LTI is presented in categories of 0.1, i.e. LTI of 3.4 refers to loans with a LTI>=3.4 and <3.5. LTI is unrounded and to 4 decimal places.

Chart 113: …and for SSBs.

Distribution of LTI for SSBs in 2003 compared to H1 2019



Source: Central Bank of Ireland calculations using MT and LL Data.
Note: LTI is presented in categories of 0.1, i.e. LTI of 3.4 refers to loans with a LTI>=3.4 and <3.5. LTI is unrounded and to 4 decimal places.

Of those accessing mortgage credit, at least 13 per cent of borrowers appear to have taken a lower LTI ratio than they would otherwise have had without the measures. Recent research on new mortgage lending identifies a group of borrowers who appear to have taken a lower ratio than they would otherwise have had without the measures.[74] This group is identified based on "bunching" at or just below the 3.5 LTI threshold. A bunching estimator shows that at least 13 per cent of borrowers took on less debt than they would have if there were no LTI limit. An estimate of

[72] See Household Credit Market Report, 2019.
[73] Kelly, J. and Mazza, E. (2019), Mortgage servicing burdens and LTI caps" Financial Stability Notes No. 13
[74] Gaffney, E. (2019) "Mortgage borrowers at the loan-to-income limit", Financial Stability Notes No. 11.This research considers only borrowers who received a mortgage and does not address constrained borrowers who were not able to access mortgage finance.

the aggregate reduction in new lending as a result of these constrained borrowers taking less leverage was in the €50m - €100m range in 2018, which equates to 0.5 to 1 per cent of total mortgage lending and so the effect on new lending volumes from this cohort of borrowers has been relatively small.

These borrowers tend to have lower incomes and to rely on a single income source, and respond to the LTI limit by taking less debt and using higher deposits. While these constrained borrowers have similar characteristics compared to other borrowers in terms of age, region and previous homeowner status, they tend to have the lowest incomes among all borrowers entering the mortgage market. These borrowers are more likely to depend on a single household income and to engage in lower-paid work. Gaffney (2019) discusses how these characteristics have historically been associated with a higher risk of default. These borrowers also buy houses of lower value compared to borrowers who get an allowance. In the case of FTBs, these borrowers also provide larger deposits relative to property value and household income; they also fund more of the deposits with gifts and other non-earned wealth.

This research illustrates how the LTI measure reduces leverage to higher-risk borrowers, thus increasing bank and borrower resilience. The research provides further information on the transmission channel between the LTI measure and the objective of increased bank and borrower resilience. The share of borrowers affected by this constraint has increased by 7 percentage points since 2016. The degree to which mortgage borrowers are experiencing binding constraints will continue to form an important part of future reviews.

Taken together, the analysis suggests that new mortgage lending has been effective in strengthening borrower and lender resilience. Analysis of new lending standards from a number of different perspectives suggests that the mortgage measures have improved the level of resilience of new mortgage lending. However, it is important that this remains under close review.

- *Procyclicality of mortgage lending and the potential for a credit – house price spiral to emerge*

The pace of growth in new mortgage lending remains strong, but there is no evidence of a bank credit – house price spiral emerging. As discussed in *Risks: Mortgage Measures*, there do not appear to be excessive links between lending volumes, lending standards, and house prices, that would present immediate concerns for financial stability. The overall housing market has witnessed more moderate increases in activity levels and prices over the past year. New mortgage lending has also been expanding at a slower pace.

As a result of the low levels of housing supply relative to medium-run estimates of demand, house prices are estimated to be around, or even below, long-run fundamentals, but they remain high compared to income and, to a lesser extent, rent on a historical basis. The suite of model-based approaches used by the Central Bank to assess misalignment in house prices indicate that prices are somewhat below what would be expected given economic fundamentals in 2019Q2. Statistical indicators of house price valuations, such as house price-to-rent and house price-to-income ratios, however, exceed historical averages. Higher positive deviations from long-run averages of price-to-income are typically associated with higher probabilities of house price declines in the future.

As discussed in *Risks: Mortgage Measures*, the slowdown in house price growth over the past year does not appear to be driven by developments in new mortgage lending. The "unexpected" decline

in house price growth has not been driven by "unexpected" developments in new mortgage lending growth. Indeed, much of the shocks to house price growth are not explained by shocks to the main explanatory factors in the model, such as new lending, disposable incomes, housing supply per capita and interest rates, but rather to factors outside the model. This would suggest that confidence and sentiment in the market, which are not separately identified in the current model, may be important drivers in slower house price growth through 2019.

Taking a longer perspective, Central Bank analysis suggests that, if the measures had not been introduced in 2015, house prices would have been significantly higher in 2019, all else being equal. Actual developments in house prices and new lending are compared to an estimated counterfactual where no measures were introduced in 2015 (see Box 6 for further details). Any differences are interepreted as being due to the introduction of the mortgage measures. As with any model, this approach comes with caveats, particularly when considering counterfactual analysis over an extended period, as a number of other shocks may be of relevance and not just the mortgage measures. The analysis finds that, if the measures had not been introduced, residential property prices would have been 11 per cent higher at the end of 2015 and 26 per cent higher by end March 2019 than was actually the case.

While the mortgage measures do not target house prices, this suggests that – in the absence of the mortgage measures – affordability pressures for borrowers would have been even more acute. This can be measured using the house price to income ratio. As discussed in Box 6, if the measures had not been introduced, the house price to income ratio would have been between 4.9 and 5.4 times as of March 2019, compared to the actual level of 4.4 times. Taking this ratio as one measure of affordability, this indicates that housing would have been between 13 per cent and 25 per cent less affordable in the absence of the measures. Indeed, had this counterfactual level of house prices been observed, it would likely be consistent with some degreee of overvaluation in the market – suggesting that the measures have been effective in limiting the potential for a credit-house price spiral to emerge.

Box 6: Estimating the impact of mortgage measures on the housing market

By Niamh Hallissey, Martin O'Brien and Sofia Velasco

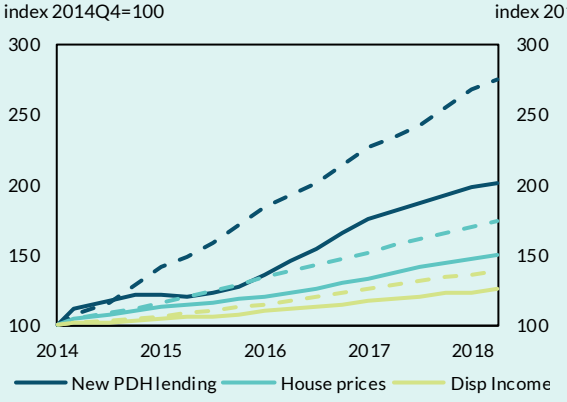
This Box provides a comparison of the developments in the housing market over the last five years to a scenario of "no mortgage measures". We use a model that captures the relationships across a number of housing market variables up to 2014Q4. Based on those relationships, we project counterfactual values of variables such as house prices, new lending, and economy-wide disposable income, from 2015Q1 to date. The difference between the counterfactual and the observed values of these variables over time can, with a degree of model error, be attributed to the change in the policy framework with the introduction of the mortgage measures.

The "no mortgage measures" scenario would have seen a stronger rate of growth in new mortgage lending than what has been observed since 2014 (Chart A), which was robust in any case at an annual average growth of 20 per cent. House prices would have also grown faster in a "no measures" scenario than the actual annual house price growth of 10 per cent on average over the period.

The counterfactual developments in house prices and in economy-wide disposable income can be translated into the house-price-to-income-ratio (HP-to-I). Chart B displays the observed HP-to-I ratio and that implied by two different approaches taken to estimate what the ratio might have been if the measures had not been introduced. The two approaches account for some aspects of uncertainty around the model estimates and provide an upper and lower bound for the ratio in the "no measures" scenario. This analysis finds that if the measures had not been introduced, the HP-to-I ratio would have been between 4.9 and 5.4 as of March 2019, compared to the actual level of 4.4 times (Chart B).

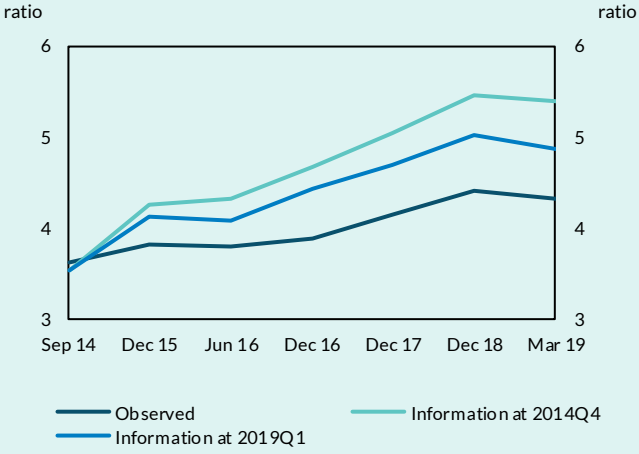
Overall, this suggests that the gap between house prices and people's incomes would be even higher in the absence of the mortgage measures than what is currently the case.

Chart A: Observed and counterfactual "no-measures" scenario



Source: Central Bank of Ireland
Notes: Data represented as indices based on 4-quarter sums for new PDH lending and economy-wide disposable income and 4-quarter averages for house prices. Solid lines refer to observed data, with the corresponding colour dashed line referring to the "no measures" counterfactual scenario. The estimation is performed in a 5-variables Bayesian-VAR setup that includes new lending for PDH mortgages, the mortgage interest rate, house completions, economy-wide disposable income and residential house prices. Last observation 2019Q1.

Chart B: House price to income ratio



Source: Central Bank of Ireland.
Notes: HP-to-I ratio is calculated by generating nominal house price values benchmarked against the developments in the house price index used in the model, and comparing that to average annual household disposable income. Average annual household disposable income is the annual economy-wide disposable income from the model divided by the estimated number of households, Last observation 2019Q1. The upper bound counterfactual HP-to-I ratio is based on an "out-of-sample" projection from 2014Q4. The lower bound counterfactual HP-to-I ratio is based on a "within-sample" projection from 2014Q4.

Additional elements of the 2019 review of the mortgage measures

The 2019 review considered the impact of the measures from a number of different perspectives. Beyond the assessment of the extent to which the measures meet their objectives, this included: an analysis of how the impact of the measures has changed over time as house prices have grown faster than incomes; an assessment of the practical implementation of the measures; and a review of the functioning of the allowances.

- *Effectiveness of the measures over the cycle*

The mortgage measures are designed to ensure that lending standards remain prudent throughout the housing market cycle. These measures were introduced as the housing market was beginning to recover from the previous crisis, to foster safer lending standards as housing market activity began to improve. This was particularly important in an environment of supply constraints that were likely to be a feature of the market for several years.

Recent research highlights that the measures have become more binding over the last number of years amid increasing house price growth, with more households borrowing at or close to the maximum available.[75] One measure of the proportion of borrowers bound by the mortgage measures rose from 29 per cent at the time of the introduction to 46 per cent at end June 2019. The measure of degree to which the measures are binding is constructed by estimating what proportion of borrowers take more than 90 per cent of the credit that is available to them. At an aggregate level, 46 per cent of borrowers were bound by the measures at end-June 2019, but the effects vary across borrower type and region (Table 5). A higher proportion of borrowers with an allowance tend to utilise most of the credit available to them (69 per cent), as do borrowers in Dublin and the greater Dublin area (68 per cent) and borrowers earning between €60,000 and €100,000.

The higher proportion of bound borrowers in Dublin reflects greater imbalances between house prices and incomes in the city. Chart 114 shows a scatter plot of house price and income variation in Ireland, with anything above the 45 degree line being less affordable relative to those below the line. This shows that although borrowers in Dublin and the surrounding areas have higher than average incomes, this is more than offset by higher house prices. These imbalances require Dublin borrowers to take out larger mortgages relative to incomes in order to obtain a similar property and thus require those borrowers to take a larger proportion of credit that is available to them.

These findings are consistent with the measures being effective in maintaining prudent lending standards, even in a market where supply shortages have driven rapid house price rises. As price pressures have grown and affordability for borrowers has decreased, the measures have ensured that looser lending standards have not further fuelled price pressures and thus further decreasing borrower affordability. As house prices have stabilised over the past year, so has the measure of the degree to which the measures are binding.

Housing supply has also responded in areas where house prices are higher and it is these areas where the measures are more binding. Comparing the measure of bindingness with planning permissions provides an indication of whether supply is responding in areas where the mortgage

[75] Kelly, R. and Mazza, E. (2019) "A measure of bindingness in the Irish mortgage market", Financial Stability Notes No. 12.

measures are binding. Chart 115 shows that planning permissions per 1,000 of population are highest in those areas where the measures are more binding.

Table 5: The mortgage measures have become more binding over time

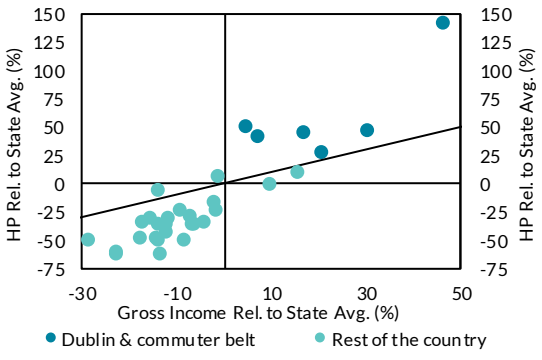
Heat map of bound borrowers by quarter (2015 – 2019 H1)

		2015-q2	2015-q3	2015-q4	2016-q1	2016-q2	2016-q3	2016-q4	2017-q1	2017-q2	2017-q3	2017-q4	2018-q1	2018-q2	2018-q3	2018-q4	2019-q1	2019-q2
	All Loans	29	30	29	30	34	35	35	35	36	39	40	39	44	42	43	43	46
	Within	17	21	24	26	28	28	27	30	30	33	33	35	36	39	40	41	41
	Allowance	57	55	53	53	62	65	65	57	56	59	61	63	66	67	66	59	69
FTB	Overall	37	36	36	38	41	42	42	41	43	46	46	48	49	51	52	51	53
	Within	23	25	29	32	34	35	33	36	37	39	40	42	44	47	49	48	48
	Allowance	65	64	64	65	74	77	73	69	64	69	71	73	71	75	81	75	82
Location	Dublin	53	53	53	52	58	58	59	58	57	62	62	65	64	67	67	67	68
	GDA	47	43	43	41	52	48	53	45	52	52	55	58	60	61	65	62	67
Income	< 40k	39	41	35	39	42	42	40	41	43	50	48	44	50	52	53	51	46
	40k-50k	39	36	38	37	42	46	43	39	43	46	43	46	44	47	50	45	53
	50k-60k	38	39	40	43	47	45	46	46	49	46	47	49	53	52	51	52	55
	60k-70k	40	38	40	43	45	47	51	46	46	51	56	54	59	57	61	57	58
	70k-80k	30	35	37	41	44	42	42	44	50	52	51	53	51	59	61	56	62
	80k-90k	37	34	30	29	35	37	37	39	41	48	45	48	49	57	57	53	55
	90k-100k	43	25	21	31	33	31	32	38	32	40	44	41	43	44	49	52	57
	100k+	26	25	28	27	34	33	33	33	33	31	35	42	39	37	32	42	39

Source: Kelly, R. and Mazza, E. (2019) "A measure of bindingness in the Irish mortgage market", Financial Stability Notes No. 12
Notes: Bound loans are defined as the proportion (number) of loans with take-up greater than 90 per cent of credit available. Within loans are loans classified within scope of the measures and below both LTV and LTI limits. Allowance is the group of loans above one or both limits as part of the proportionate cap. GDA is the Greater Dublin Area and is defined as properties in counties Kildare, Louth, Meath, and Wicklow.

Chart 114: Dublin and the surrounding areas have greater imbalances between house prices and incomes than other areas

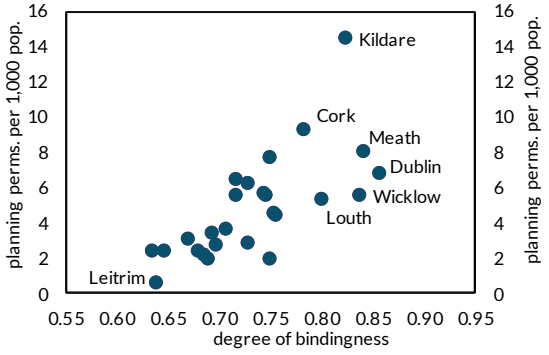
Regional income and house price dispersion in 2016



Source: Kelly and Mazza (2019)
Notes: Scatter plot of differential (per cent) from national average in income (CSO household median gross income by county) and house prices (CSO county level Residential Property Price Index) in 2016.

Chart 115: In 2018 there was more new supply in countries where the measures are more binding

Bindingness of mortgage measures and planned residential units per county - 2018



Source: CSO and Central Bank of Ireland.
Notes: Planning perms. per 1,000 pop. = units with planning permission per county/1,000's of population. Population data are based on Census 2016.

- *Implementation and functioning of the measures*

As part of the regular reviews, the Central Bank assesses whether the current text of the Regulations[76] continues to be appropriate given experience from the practical implementation, supervision and monitoring of the measures. A wide-range of topics are considered each year. No changes to the Regulations were proposed as a result of the 2019 assessment.

A review of the list of exemptions found that these continue to be appropriate. A deeper assessment of whether the exemption for switchers (with no increase in capital) remained appropriate, given broader considerations around the level of switching activity in the market, found that switchers should remain exempt from both the LTV and LTI limits. It was decided that removing this exemption would increase the risk that borrowers could be 'trapped' from switching, unless they received an allowance.

An important feature of the annual reviews is the assessment of banks' credit policies in relation to mortgage lending. A limited desk-based assessment of the banks' credit policies and their interpretation of the Regulations did not flag any concerns in relation to the operation of the mortgage measures.

Broader topics related to new lending including the use of incentive schemes were also examined. The main area of focus was on non-cash bank incentives and in particular payment moratoriums. Moratoriums allow the borrower to defer payment of their mortgage for a set period, with the deferred payments added to the overall balance of the mortgage. These products were considered from both a financial stability and a consumer protection perspective. In relation to the former, there are currently no financial stability concerns in relation to these products and no adjustments to the Regulations were considered necessary as a result of the review. From a consumer protection perspective, the Central Bank looked at whether consumers were appropriately informed about the impact of such products on their mortgage. In this regard, the Consumer Protection Code 2012 sets out key information that must be provided to borrowers in respect of incentives.

A review of the cross-border effects of the Regulations, as recommended by the ESRB[77], found no evidence to indicate notable cross-border spillovers of the measures. The review found that the UK market continues to be the largest non-domestic market for Ireland's domestic retail banks. The ratio of cross-border lending to the UK over the whole loan portfolio did not change significantly before and after the introduction of the mortgage measures. However, recent research signals evidence of shifts in the cross-border lending risk profile by domestic banks, with banks taking on moderately higher levels of risk in the UK mortgage market since the introduction of the measures.[78]

- *Functioning of the allowances*

For the 2019 review, a deeper analysis on the effect of the allowances on the mortgage market was carried out and alternatives to the current system of allowances were also considered. The

[76] The Central Bank (Supervision and Enforcement) Act 2013 (Section 48) (Housing Loan Requirements) Regulations 2015 (S.I. No. 47 of 2015)(as amended)
[77] ESRB/2015/2 ESRB Recommendation on the assessment of cross border effects of and voluntary reciprocity for macroprudential measures.
[78] Fergal McCann & Conor O'Toole, 2019. "Cross-Border Macroprudential Policy Spillovers and Bank Risk-Taking," International Journal of Central Banking.

operation of the allowances is an important part of the mortgage measures and the smooth functioning of the allowances helps increase the effectiveness of the limits.

Under a 'proportionate cap' or allowances policy, lenders may grant a certain proportion of their loans above the limits. Compliance with the proportionate caps in Ireland is on an annual basis. The allowances are set in terms of the percentage of the total value of lending. Consequently, the allowance limits are proportionate to lending, and do not 'run out'. Over time and with stability in the different measures, banks have managed the allowances in a smoother fashion.

The allowance limits are not a target and banks are not expected to reach the maximum allowance limits every year. Rather, banks should lend within their own credit policies. In order to be compliant with the measures, banks appear to leave a buffer below the maximum allowable level when issuing allowances. For example, 20 per cent of SSB new lending is allowed above the 80 per cent LTV limit. However, in 2018 and 2017, 16 per cent and 17 per cent of SSB new lending was issued above the limit, respectively.[79]

Seasonal patterns in the mortgage market appear to be stable since the introduction of the measures. No strong evidence of change in the seasonality of the mortgage market as a result of the measures has been observed in the data. Looking specifically at allowances, there again appears to be consistency in the timing of drawdowns across the calendar year. On specific allowance types, some changes to seasonal patterns have been observed, with LTI allowances being less prevalent toward the end of 2018 relative to other years. This change does not reflect the functioning of the system of allowances, but more likely a temporary adjustment by financial institutions to changes to the mortgages rules at end-2017. Seasonal trends will continue to inform the ongoing review of the functioning of the measures.

The way in which the banks manage the allowances and a number of alternative policy options, including rolling limits for managing allowances, were considered as part of the review. Rolling limits are used in the UK and in New Zealand. In the UK, the limits are complied with quarterly, but the flows of loans for compliance are during a rolling period e.g. the UK has a rolling 4-quarter period. Banks can run over the limits in some months, but if they do, they need to run below the limits in other months to ensure they meet the limit for the 4 quarters as a whole. In New Zealand, large banks comply with the limits over a three-month rolling window. Smaller banks must comply over a six-month rolling window.

The assessment did not find that such rolling limits would offer more flexibility than the current annual compliance period in Ireland. Both of the above regimes seem operationally less flexible than the system of allowances in Ireland. Under a rolling system, lenders would still need to comply with the limits at a fixed point in time, possibly as much as quarterly if the UK model was adopted. The current annual compliance period in Ireland already offers a large degree of flexibility to lenders and moving to a rolling limit system may result in increased reporting and compliance demands on lenders.

The allowance regime will remain the same in 2020. The Central Bank is open to making changes in response to well-reasoned, evidence-based, alternative approaches, that still allow the objectives of the measures to be met, and that enable monitoring of compliance with the measures.

[79] Central Bank (2019) Financial Stability Review 2019: 1, pg. 62

CCyB rate

The Central Bank carried out its latest review of the CCyB rate during 2019Q4. Following this review, the CCyB rate on Irish exposures is being maintained at 1 per cent. The 1 per cent rate has been in effect since July 2019.The objective of the CCyB is to increase resilience in the Irish banking system to cyclical systemic risks. The current calibration reflects a balance between the continuing build-up of cyclical systemic risk in Ireland and the downside risks to the Irish economic outlook.

The Central Bank's primary objective in using the CCyB is to promote banking sector resilience. In meeting this objective, the principle adopted by the Central Bank is that the buffer should be increased sufficiently early in the cycle in order to effectively increase resilience. This approach emphasises the importance of having a buffer available to release in the event of a downturn, and thus supporting banks' provision of credit to the economy during such time.

The Central Bank's decision to maintain the CCyB rate at 1 per cent reflects the gradual build-up of cyclical risk both domestically and globally, while excessive credit growth is not currently apparent. The gradual build-up of systemic risk is evident in three areas in particular. First, the continuing strengthening of the credit environment. Second, the labour market already appears to be at full capacity with (baseline) macroeconomic projections remaining favourable. Third, global financial vulnerabilities have continued to build-up.

The macro-financial outlook in Ireland is subject to significant uncertainty and the Central Bank remains ready to adjust the CCyB rate in either direction as appropriate. However, as outlined in *Risks: Domestic Imbalances*, in the absence of a disorderly Brexit, projections for the Irish economy continue to be favourable and may give rise to overheating dynamics. In such circumstances, were a continuation of the build-up of domestic cyclical risk, against the backdrop of an advanced global cycle, to lead to a further emergence of imbalances, an incremental increase in the buffer rate would be warranted.

Domestic indicators analysed within the Central Bank's framework, including credit, asset prices and risk pricing, indicate that cyclical risks continue to build-up. In line with the Central Bank's framework for the CCyB, the dashboard in Table 6 presents the trajectory and the level of imbalances related to a number of indicators concerning credit, asset prices, the economy and risk pricing. Overall, Table 6 points to the fact that cyclical risks are continuing to gradually build-up although with some shifts in the relative balance between developments in asset prices, economic activity and credit. Measures of the credit gap, a required reference indicator for setting the CCyB rate, suggest that while cyclical risk has been building, imbalances in the credit environment are not currently observed (*Risks: Cyclical* Chart 39).[80] Having been on a general upward trajectory for some time, the alternative gap has been close to balance in recent quarters while the standard and national specific measures remain well below zero. While growth in house prices has been moderating, prices remain high relative to incomes and rents on a historic basis. With regard to indicators of credit growth, aggregate figures remain low, but there is a large variability across sectors. Growth of lending to large enterprises and consumer credit is particularly pronounced while there continues to be a decline in BTL mortgage lending. However, this decline is linked to

[80] Due to the distinctive characteristics of the Irish economy, the standard credit gap has limited value. In order to address the statistical shortcomings of the standard gap, the Central Bank developed an alternative national credit gap. For further information see Central Bank of Ireland, Financial Stability Note 4, 2018.

specific changes in the rental sector, such as the greater role of institutional investors. [For a more detailed discussion of cyclical developments in these areas see *Risks: Cyclical*].

As a small, globalised economy, the domestic financial cycle is susceptible to changes in the global environment and thus it is important to also consider indicators of global financial conditions. The IMF Global Financial Conditions Index indicates that accommodative conditions in advanced economies have eased further over the last six months. In addition, credit risk premia remain compressed relative to historical benchmarks. These conditions facilitate further increases in global indebtedness and create the potential for a sharp and destabilising reversal of market sentiment. There is evidence that the search for yield has led to a deterioration in credit standards in some market segments globally, while also increasing risk taking in the non-bank finance sector. A sudden drop in global risk appetite might have direct and indirect repercussions for the Irish economy and its financial system. Irish banks and insurance firms have direct exposures to global financial markets through their foreign assets and liabilities.

In line with the CRD IV framework, the 1 per cent CCyB rate on Irish exposures is subject to automatic reciprocity. As such institutions in other Member States are also subject to this rate on their Irish exposures. Similarly, the capital requirements of Irish institutions are required to reflect the CCyB rates in the countries in which they have credit exposures. Currently, a number of countries have positive CCyB rates in effect, with a number of others having announced positive rates which will come into effect in the coming months. Looking beyond the EU, the US, which is the only third country identified as material for Ireland, has a CCyB rate of 0 per cent.

Table 6| CCyB indicator dashboard related to the build-up of cyclical systemic risk

CCyB indicator dashboard related to the build-up of systemic risk								
		Trajectory		Indicator		Latest obs date	Threshold	Qualitative assessment
		Persistance	*12-month change in indicator*	*Latest observation*	*Risk level*			
Credit growth	Household credit growth		1.4 pps	0.1%		Sep-19	Historical average	Credit environment continues to stengthen gradually. Aggregate credit growth remains modest but hides strong growth in certain areas.
	Domestic NFC credit growth		1.6 pps	3.5%		Sep-19	Historical average	
	Private Household: PDH Mortgage		0.7 pps	4.1%		Jun-19	No threshold established	
	Private Household: BTL Mortgage		-0.5 pps	-13.0%		Jun-19	No threshold established	
	Private Household: Non-mortgage		5.2 pps	5.4%		Jun-19	No threshold established	
	Irish Private Sector Enterprises: Large Enterprises		11.9 pps	15.8%		Jun-19	No threshold established	
	Irish Private Sector Enterprises: SMEs		0.5 pps	-3.0%		Jun-19	No threshold established	
Credit gaps	Standardised credit gap		15.1 pps	-80.2pps		Jun-19	Lower threshold for CCyB setting (BCBS 2010)	While gap measures have been on a general upward trajectory they remain negative and do not indicate unsustainable imbalances in credit.
	National credit-to-GNI* gap		13.5 pps	-63.6pps		Jun-19	Lower threshold for CCyB setting (BCBS 2010)	
	Alternative National Specific gap		5.4 pps	-1.0pps		Jun-19	Lower threshold for CCyB setting (BCBS 2010)	
New lending	Mortgage Lending: 4-quarter volume		€0.8 bn	€8.8 bn		Sep-19	No threshold established	Mortgage lending has recovered strongly from subdued levels. Scope for some further sustainable increases in the near term.
	Mortgage Lending-to-Disposable Income ratio		0.4 pps	6.7%		Jun-19	Model Benchmark (2003Q1-2018Q1)	
	Lending to SMEs: 4-quarter volume		€0.0 bn	€5.3 bn		Jun-19	No threshold established	
Real estate	Residential property price growth (m)		-7.4 pps	1.1%		Sep-19	MIP threshold	Rate of growth in property prices has been modest in recent months. Relative to incomes, residential real estate prices are above long-run averages.
	Residential property price-to-income ratio		2.9%	4.4		Jun-19	Historical average	
	Res. real estate misalignment measure		-5.0 pps	-11.2%		Jun-19	Zero	
	Commercial real estate price growth		0.0 pps	1.6%		Sep-19	Historical average	
Indebtedness	Total credit-to-GDP ratio		3.4 pps	241.4%		Jun-19	MIP threshold	Total credit in Ireland is substantially impacted by the presence of foreign-owned MNCs. More domestically relevant measures have been on a downward trajectory for some time, although still indicate relatively high levels of indebtedness.
	National credit-to-GNI* ratio		-3.3 pps	88.3%		Jun-19	Euro area aggregate (bank credit-to-GDP)	
	Household debt-to-income ratio		-9.0 pps	119.8%		Mar-19	Euro area average	
Macro-economy	Employment rate		0.6 pps	69.1%		Jun-19	Historical average	At or approaching full employment/capacity constraints.
	Unemplomentrate		-0.7 pps	5.2%		Jun-19	Historical average	
Bank balance sheets	CET1 Ratio - retail banks		0.6 pps	17.0%		Sep-19	CRD IV minimum requirement	Well above minimum requirements/benchmarks.
	Leverage ratio - retail banks		0.1 pps	8.7%		Sep-19	European average	
Market conditions	Commercial real estate spreads (bps)		96.9 bps	520 bps		Sep-19	Historical average	Against a background of accommodative global financing conditions, Irish government bonds spreads are low by historical comparison.
	Irish gov bond spreads - monthly avg (bps)		-9 bps	48 bps		Oct-19	Historical average	

Notes: The table provides a visual representation of the Central Bank's high level approach that informs the setting the CCyB rate during the build-up phase. As such indicators and shading are presented from the point of view of monitoring a build-up in cyclical systemic risk. Indicators can be interpreted differently from other perspectives. The indicator trajetory relates to the degree of persistance in each indicator and the change in the indicator over the previous 12 months. The coloring of the trajectory is based on the length of time an indicator has been trending in a direction that is indicative of a rise in cyclical systemc risk (Green: no sustained rise in systemic risk, Amber: sustained trajectory indicating build-up of systemic risk, Red: more persistent trend of increasing systemic risk). The shading of the latest indicator value represents the level of risk associated with the current level of each indicator relative to its threshold value (Green: low risk - red: high risk). Grey shading is used where no threshold value is available. For further details on the indicators and thresholds see the Central Bank of Ireland bi-annual Systemic Risk Pack. CCyB rate decisions are made on the basis of guided discretion.

Buffers for systemically important institutions

The O-SII buffer framework looks to reduce the probability and impact of a failure of a systemically important institution. Arising from the Central Bank's 2019 O-SII review, six institutions are being (i) identified as systemically important and (ii) required to maintain an associated supplementary capital buffer. Barclays Bank Ireland plc (BBI) and Bank of America Merrill Lynch International DAC (BAMLI) are identified and receiving buffer requirements for the first time. Unicredit Bank Ireland plc (UniCredit) and Depfa Bank plc (Depfa) are no longer designated as O-SIIs. The 2019 review has resulted in no policy change for the four other existing O-SIIs (AIB Group plc (AIB), Bank of Ireland Group plc (BOI), Citibank Holdings Ireland Ltd. (Citibank) and Ulster Bank Ireland DAC (UBI)).

The objective of the O-SII framework is to reduce the probability of failure of a systemically important institution, given the potentially greater impact of failure of those institutions on the domestic economy. Institutions that are systemically important to the domestic economy or to the economy of the European Union are referred to as O-SIIs.[81] The failure of one of these systemically important institutions would have a greater impact on the financial system and economy than the failure of a non-O-SII. Higher capital requirements for these institutions, in the form of O-SII buffers, aim to reduce the probability, and impact, of their (potential) failure.

Six credit institutions are being identified as systemically important as a result of the Central Bank's 2019 O-SII assessment. Systemic importance is based on the concept of impact of failure and is assessed using indicators relating to size, importance, complexity and interconnectedness. More formally, EBA guidelines provide a framework for identifying O-SIIs.[82] The first step in the assessment of systemic importance was carried out using the mandatory scoring process of the EBA methodology and applying the standard 350bps threshold. On the basis of this assessment, six institutions are being designated as O-SIIs by the Central Bank (Table 7). No additional credit institutions are being identified on the basis of the second step, which incorporates supervisory judgement.

No investment firms have been identified as systemically important in this assessment. A separate assessment was carried out for investment firms. The EBA guidelines are less specific regarding the O-SII assessment of investment firms and the assessment considered a bespoke set of indicators appropriate for the Irish investment firm population as well as the changing nature of the prudential regime for investment firms at a European level. On the basis of this assessment, no investment firm is identified as an O-SII.

O-SII buffers ranging from 0.5 per cent to 1.5 per cent are being applied to identified O-SIIs. These buffers are being phased-in over the period to July 2021. CRD IV allows designated authorities to require O-SIIs to maintain a buffer requirement of up to 2 per cent (of risk-weighted assets). The maximum buffer of 2 per cent has not been utilised by the Central Bank, providing scope to tighten the O-SII buffer for any institution, if required in response to developments in the banking sector.

[81] Differentiating these institutions from institutions that are systemically important at a global level, referred to as G-SIIs.
[82] See, EBA Guidelines in relation to the assessment of O-SIIs.

Table 7 illustrates the O-SII buffers being applied on the basis of this year's assessment.[83] The policy implications of the outcome of the 2019 O-SII review can be summarised as follows:

- No change in policy towards AIB, BOI, Citibank and UBI, which are all existing O-SIIs.
- BAMLI and BBI are being designated as O-SIIs for the first time by the Central Bank. Therefore, the O-SII buffer results in new capital requirements for these institutions. Both these entities have expanded their operations arising from the UK's decision to leave the EU. The designation of both BAMLI and BBI as O-SIIs, and the related buffer requirement, is reflective of the expansion which has occurred at these institutions.
- UniCredit and Depfa are no longer identified as O-SIIs. UniCredit has deleveraged its balance sheet in recent years and has limited interaction with the domestic economy. As a result of the re-designation, UniCredit's O-SII buffer, which has been in effect since July of this year, no longer applies. Depfa is an institution in wind-down and no buffer requirement had been applied. Therefore there are no practical implications in terms of capital requirements in this case.

The Central Bank undertakes an O-SII assessment on (at least) an annual basis. Therefore, changes in the banking sector overall and the systemic importance of individual institutions are captured on an on-going basis and reflected, as appropriate, in the outcome of these regular reviews. As outlined above, for example, the movement of business from the UK to Ireland in response to the UK's decision to leave the EU has resulted in O-SII buffers being applied to two institutions for the first time. In the absence of clarity regarding the timing and nature of the outcome of Brexit, uncertainty prevails over the full extent of assets being transferred from the UK to Ireland. Were there to be further movement of business from the UK to Ireland, this will be taken in account in future assessments.

Transfers of business such as these have a direct effect on the systemic importance of the institution(s) in question. However, in a relative assessment such as the EBA identification process, transfers of business also reduce the relative importance of other institutions (all else equal). This highlights the importance of the flexibility in the framework (e.g., the role for supervisory judgement). This flexibility could become increasingly important to ensure that the relevance of domestically-focused institutions to the domestic economy is not crowded out in the O-SII assessment by the (expansion of) internationally-focused institutions located in Ireland.

In addition, as referred to in Financial Stability Review 2019:I, CRD V is changing certain aspects of the legislative framework of the O-SII buffer. In particular, the 2 per cent buffer cap will no longer apply. Instead authorities will be able to impose O-SII buffers of up to 3 per cent, and subject to certain engagement with the European Commission above this level.[84] In the context of these changes, the Central Bank's approach to the O-SII framework will evolve as necessary to ensure it continues to capture institutions' systemic importance appropriately and adequately.

[83] As a member of the SSM, decisions by the Central Bank relating to the application of the O-SII buffers are made in conjunction with the ECB and are without prejudice to any powers of the ECB under the SSM Regulations in this respect. To carry out its functions in this regard, the ECB have developed an "O-SII buffer floor methodology", details of which can be found here.

[84] It will also be the case under CRD V that applying a buffer which would result in a combined G/O-SII and SyRB buffer of >5 per cent for an institution, would require authorisation from the European Commission.

Table 7| Outcome of 2019 O-SII review

Institution	EBA Score	O-SII Buffer	*applicable as of*		
			1 July 2019	1 July 2020	1 July 2021
		%	%	%	%
AIB Group plc	1172	1.5	0.5	1.0	1.5
Bank of Ireland Group plc	1777	1.5	0.5	1.0	1.5
Citibank Holdings Ireland Limited	1424	1.0	0.25	0.5	1.0
Bank of America Merrill Lynch International DAC	773	0.75		0.5	0.75
Barclays Bank Ireland plc	583	0.75		0.5	0.75
Ulster Bank Ireland DAC	375	0.5	0.25	0.5	0.5

Recognition of macroprudential measures taken by other countries

The reciprocation of macroprudential measures enhances the effectiveness and consistency of macroprudential policy in the EU. Macroprudential policy measures taken in one country are likely to have external effects on financial stability in other countries through cross-border linkages. In order to ensure the effectiveness of macroprudential measures, the ESRB has established the process of reciprocation whereby a Member State applies the same or equivalent macroprudential measure that is activated in another Member State in order to address a risk related to a specific exposure. The Central Bank has laid out a reciprocation framework[85] in line with the ESRB Recommendation on voluntary reciprocity for macroprudential policy measures.[86] Reciprocity involves two distinct processes; responding to ESRB reciprocation recommendations and conducting an annual review of outstanding reciprocation recommendations.

On 15th July 2019 the Central Bank decided to reciprocate a French macroprudential measure under Article 458 of Regulation (EU) No 575/2013 ("CRR").[87] As the designated authority in charge of the application of Article 458 CRR, the Central Bank conducted an assessment and decided to comply with the ESRB Recommendation (ESRB/2018/8). The Central Bank decision was informed by an assessment for Ireland which showed that the amount of relevant exposures were above a materiality threshold provided as part of the ESRB Recommendation.

The French measure tightens the limits for large exposures of French systemically important credit institutions to highly indebted large non-financial corporations (NFCs) that have their registered office in France to 5 per cent of eligible capital. The measure applies to G-SIIs and O-SIIs at the highest level of consolidation of their banking prudential perimeter.

From 1st August 2019, the Central Bank reciprocated the French measure for institutions identified as O-SIIs in Ireland. O-SIIs with exposures to the French NFC sector that are below the materiality threshold as defined in the ESRB Recommendation are exempt from applying the measure.

[85] Central Bank of Ireland (2016) Macro Financial Review 2016:1, Pg. 50.
[86] ESRB/2015/2 ESRB Recommendation on the assessment of cross border effects of and voluntary reciprocity for macroprudential measures.
[87] Announcement: Decision by the Central Bank of Ireland to reciprocate a French measure under Article 458 of Regulation (EU) No 575/2013 ("CRR").

There are four other active measures for which reciprocity has been recommended by the ESRB.[88] The Central Bank's annual review of the outstanding reciprocation recommendations confirmed that the conditions for non-reciprocation continue to be met and that the decisions to not reciprocate the measures remains appropriate.

Future macroprudential policy measures

Systemic risk buffer

The Minister for Finance has agreed, following a request from the Central Bank, to transpose the systemic risk buffer (SyRB) into Irish law and to designate the Central Bank with the powers to implement it at a future date. The Central Bank will announce the buffer rate and any phase-in period in due course after the legislation is provided.

The discretion to introduce the SyRB will complete the macroprudential toolkit for bank capital and will enable the Central Bank to calibrate the overall toolkit appropriately to the risks facing Ireland.

The Irish economy is both small and globalised and as a result is more sensitive to developments in the global financial cycle as well as being more prone to structural macroeconomic shocks.[89] The Irish economy is considerably more volatile than its peers across a range of macro-financial variables, in part related to the small and highly-globalised nature of the Irish economy and financial system. Small countries such as Ireland face a greater degree of macroeconomic 'tail risk' at all stages in the financial cycle.[90] Ireland's highly-globalised nature can also be seen in its reliance on the activity of foreign owned MNEs, as discussed in *Risks: Tax and trade*. Although these firms bring many benefits, they do represent one channel through which the Irish economy could experience an idiosyncratic structural shock that would have significant macro-financial consequences.

Thus, the Irish banking system is exposed to higher systemic risk than other banking sectors.[91] This higher risk calls for levels of capital in the Irish banking system, at all stages in the cycle, that reflect this higher level of risk. This risk reflects both a higher sensitivity to global cyclical developments, as well as being more vulnerable to structural macroeconomic shocks. Thus, the level of capital in the Irish banking system should be comprised of both cyclical and structural capital buffers.

Ongoing Central Bank analysis highlights the importance of economic structure for the appropriate range of capital requirements in a given country.[92] A current focus of analysis in the Central Bank is a comparision of appropriate capital ranges for banking sectors in countries that are small and highly globalised with those in larger economies. Consistent with the higher degree of risk these countries have, the appropriate capital level is generally estimated to be higher for

[88] ESRB (2019) Reciprocation of Measures: Belgium, Estonia, Finland and Sweden.
[89] See Box 2, *Financial Stability Review 2019:I*
[90] O'Brien, M. and Wosser, M. (2019), "Assessing Structure-Related Systemic Risk of OECD Countries", (Mimeo).
[91] See *Financial Stability Review 2019:I* and Lane, P. (2019), "Tail Risks and the Irish Economy", Lecture, UCD School of Economics (16th April).
[92] McInerney, N., O'Brien, M., Wosser, M. and Zavalloni, L. (2019), "Rightsizing Bank Capital for Small, Open Economies", (Mimeo).

small, highly-globalised countries than those countries which do not exhibit such characteristics to the same extent. This analysis will inform the calibration of the SyRB in Ireland.

The SyRB is just one element of the macroprudential toolkit and further consideration will be given to the overall capital framework as part of the Central Bank's work programme over the coming years. The framework for bank capital, both macro and microprudential, is complex and will be undergoing further changes over the coming years with the implementation of CRR II / CRD V[93] and BRRD / SRM and future changes to the Basel framework. The Central Bank will continue to develop its broader capital framework, taking account of the regulatory changes, and will continue to consider how the various elements of the framework interact.

[93] See *Financial Stability Review 2019:I* for a discussion of the forthcoming changes to the macroprudential framework.

Annex A - Property market roundtable sessions 2019

Introduction

In October, the Central Bank hosted a number of events with property market experts and practitioners. Following on from similar events held in previous years, these sessions ensure that the Central Bank has as much information as possible on issues in the broader property market as part of the annual review of the Mortgage Measures. This Annex provides a qualitative high-level summary of the topics and viewpoints raised by participants at these events.

The Central Bank annually assesses if the mortgage measures continue to meet their objectives of:

- increasing the resilience of banks and borrowers to negative economic and financial shocks, and;
- dampening the pro-cyclicality of credit and house prices so a damaging credit-house price spiral does not emerge.

A wide-ranging and open discussion took place over the course of these events. The discussions saw many areas of consensus among the wide-range of participants, as well as contrasting viewpoints, reflecting the diverse professional backgrounds of the attendees.[94] There was a broad acknowledgement that issues in the property market are multi-faceted. Topics raised included market sentiment, demographic trends, viability challenges, construction costs, planning, building regulations, affordability considerations, the rental market, institutional funding as well as the impact of the Central Bank's mortgage measures.

Market Overview

Weak market sentiment at the current juncture was repeatedly raised. The most common explanation was uncertainty in the market, both in relation to Brexit and to policy uncertainty.[95] It was noted that demand remains robust for properties priced under €400,000 and that the market is weaker at the higher end of the price distribution.

The importance of supplying the correct housing mix to meet current needs, future demographic demands and to reduce environmental harm was raised. Ireland remains a European outlier in demographics with a relatively low rate of urbanisation and a high average household size (2.7 persons per household). Experts predict additional demand pressures as Ireland's average household size converges to the European average, in particular for new stock of smaller homes. One participant observed that Ireland has a relatively homogenous housing stock that is ill-suited to meeting the diverse needs of its residents. They also maintained that the location of new housing supply has been inadequate, with the emergence of a relatively large housing price premium for the capital in recent decades. Sustainability concerns were also raised about more first-time buyers (FTBs) moving to the commuter belt.

[94] See list of attendees at the end of the annex.
[95] The meetings took place in advance of the Budget 2020 announcement that confirmed the continuation of the Help to Buy scheme for two more years.

Supply-Side Developments

Industry representatives highlighted viability as a challenge in supplying the appropriate housing mix in Ireland, particularly for the build-to-sell market. Viability was raised by the property and construction industry in terms of 'build to sell' apartments. They maintained that it is more viable to build new apartments as 'build to rent', rather than 'build to sell'. They noted that 'build to rent' is fuelling activity on the supply side in terms of apartments. From a viability perspective, their view was that the cost of constructing an apartment means that the selling point is too high for the market. From a funding perspective, institutional investors are drawn to 'build to rent' as opposed to 'build to sell' apartments. The 'break-up' premium' was discussed. Developers are willing to sell apartments in bulk to institutional investors at a lower price, as it takes longer to sell the units individually on the market. Furthermore, institutional investors are drawn to the rental return they will accrue. It is also easier for developers to secure forward funding by adopting this approach. In certain instances, the role of bank lending is reducing, with developers acquiring commercial lending through other channels – including institutional investors and mezzanine finance. Members of the construction and property industry asserted that ultimately capital is drawn to projects where there is a return on investment, with 'build to rent', office developments and hotels being the most popular as a result.

A number of contributors referred to the different standards required for 'build to rent' and 'build to sell' apartments, which they said was impacting supply and increasing land values. The view of certain academics was that small units and reduced height restrictions increase land values and as a result, 'build to sell' becomes more challenging from a viability perspective. Contrasting views emerged on the impact of regulation with the property and construction industry associating new regulations with increasing the cost of building. They also maintained that Ireland adopts even higher standards than the EU average when EU regulations are introduced. However, an opposing view put forward by other participants was that building to a high standard does not increase costs, as the cost of implementing these standards falls when everyone adapts to the new standards. Furthermore, it was also noted by one academic that regulations provide certainty, increase standards and support the reputation and longevity of an asset.

Difficulties in achieving economies of scale were raised by a number of attendees, in particular those from the property and construction industry. High construction costs including indirect costs such as levies (which are linked to the provision of infrastructure and public services) and taxes (including VAT) were also flagged by this sector as increasing costs. Representatives from the property industry had differing views on the feasibility of delivering housing between €250,000 and €270,000.

Divergent views were also shared on the efficiency of the planning system in Ireland. While one representative advocated 'fast-track planning', one participant was against 'planning deregulation' and argued that a more participative approach to planning should be adopted in Ireland, in order to avoid legal objections to developments.

One participant called for an audit of constructions costs to establish whether construction costs are fundamentally a driver of weak housing supply.[96] Data quality issues and the importance of

[96] Such an audit would not be in the remit of the Central Bank.

having accurate housing data was also raised by a number of participants. For example, one suggestion was for the creation of a statutory database of land transactions.

The issue of affordability and how it is now more expensive to rent than to pay a mortgage was another common theme across the meetings. With higher demand for rental properties, the departure of domestic landlords (i.e., household-owned buy-to-lets) from the private rental sector was seen as a negative development by members of the property and construction industry. They assessed that the stock of rental properties has remained flat, despite the increased role of institutional investors in the private rental sector. What participants referred to as the 'exodus' of domestic landlords was seen as particularly problematic in cities such as Cork and Galway, as the professionally managed institutional system is generally Dublin focused.

Feedback on the Mortgage Measures

In terms of the Central Bank's mortgage measures, the 3.5 loan-to-income (LTI) ratio and the need to save for a deposit while renting were referenced by some participants as factors impacting the supply of mortgage credit and thus home ownership rates. Property and construction representatives repeatedly raised the impact of the 3.5 LTI on people's ability to secure a mortgage that covers the developer's delivery cost of a house. Other participants felt that the focus should be on increasing supply and making housing affordable, rather than changing the mortgage measures.

Furthermore, some participants called for the mortgage measures allowances framework to be changed. Concerns were raised about the interaction between the allowances and the seasonality of the mortgage market. No specific alternatives were raised at the meetings, but the broad suggestion was to increase flexibility around the annual compliance period. However, it was reported that institutions are finding it easier to manage their pipeline of allowances in 2019, compared to 2018.

Rent affordability in retirement requires consideration. One participant flagged that the state would potentially be required to support retirees pay their rent in the future, due to falling home ownership rates. One participant also noted that a drive towards longer-term renting in Ireland is underway, but with little examination of the socio-economic impact of such a change.

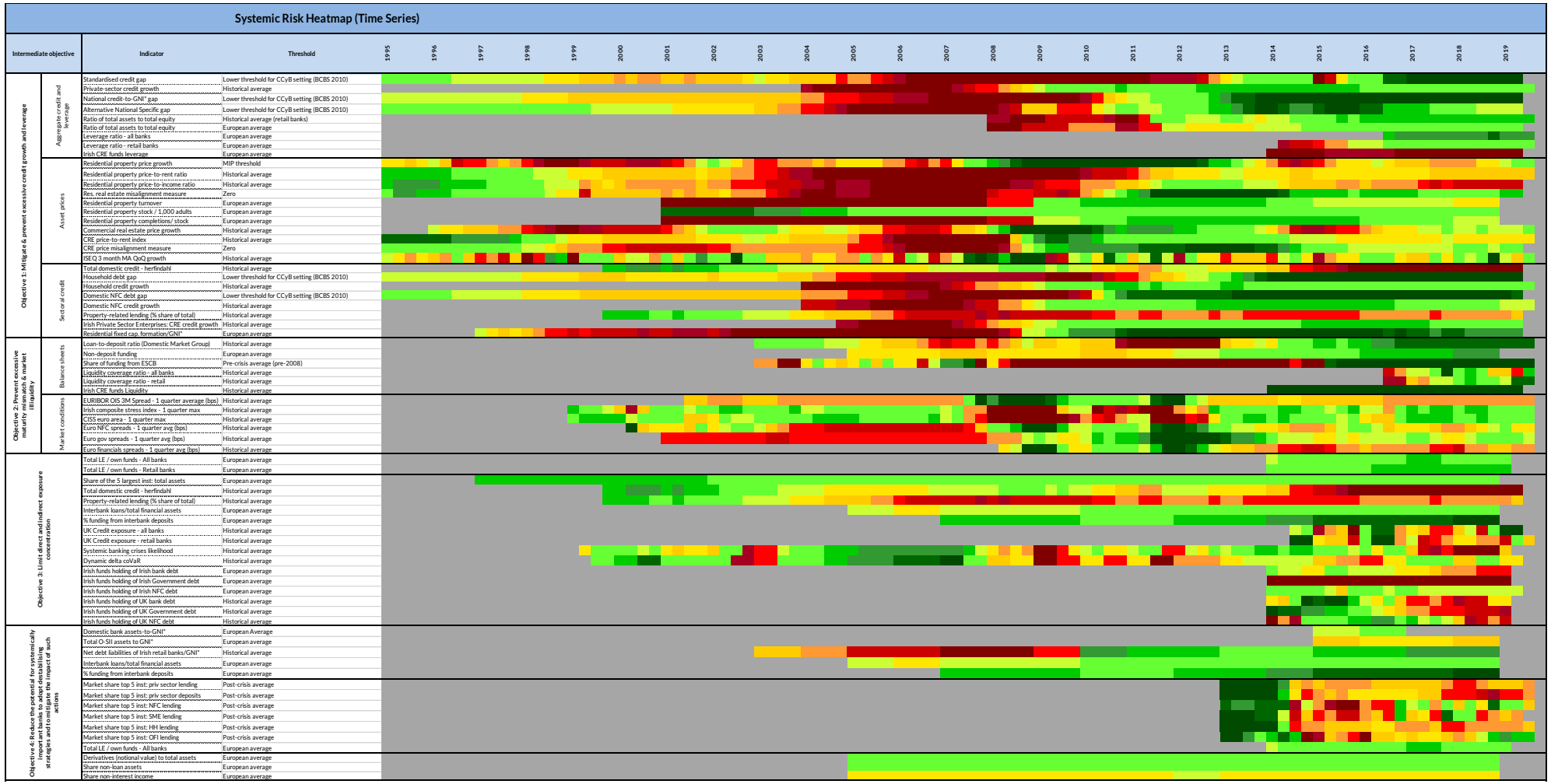
Participant	Institution
Ali Ugur	Banking and Payments Federation Ireland
Annette Hughes	EY – DKM Economic Advisory Services
Austin Hughes	KBC Bank
Brian Gaffney	Bank of Ireland
Brian Vaughan	Bank of Ireland
Charles Coyle	IRES Real Estate Investment Trust
Conall Mac Coille	Davy
Conor O'Gallagher	JLL
David Duffy	Property Industry Ireland
Dermot O'Leary	Goodbody Stockbrokers
Edward McCauley	Society of Chartered Surveyors Ireland
Frank Allen	Ó'Cualann Cohousing Alliance
Garrett Dorrian	IRES Real Estate Investment Trust
Hugh Brennan	Ó'Cualann Cohousing Alliance
Ivan Gaine	Property Industry Ireland /Sherry FitzGerald
James Benson	Construction Industry Federation
John O'Sullivan	Society of Chartered Surveyors Ireland/Lisney
Kevin Nowlan	Irish Institutional Property/Hibernia Real Estate Investment Trust
Lorcan Sirr	Technological University Dublin
Loretta O'Sullivan	Bank of Ireland
Marian Finnegan	Sherry FitzGerald/Cushman & Wakefield
Marie Hunt	CBRE
Mark O'Donnell	Property Industry Ireland/Richmond Homes
Micheál Mahon	Society of Chartered Surveyors Ireland
Michael O'Flynn	Property Industry Ireland/O'Flynn Group
Michael Stanley	Irish Institutional Property/ Cairn Homes
Myles Clarke	CBRE
Neil Durkan	Construction Industry Federation/Durkan New Homes
Orla Hegarty	University College Dublin
Pat Farrell	Irish Institutional Property
Peter Collins	Irish Institutional Property /Kennedy Wilson
Ronan Lyons	Trinity College Dublin / Daft.ie
Sean O'Neill	Property Industry Ireland/Park Developments
Tom Parlon	Construction Industry Federation

Annex B – Systemic Risk Pack

Systemic Risk Heatmap

>1.5 SDs below	>1.0 SDs below	>0.5 SDs below	Threshold	>0.5 SDs above	>1.0 SDs above	>1.5 SDs above

Intermediate objective		Indicators	Threshold	Risk level	Last observation	Latest observation date	6 month change	Annual change
Objective 1: Mitigate & prevent excessive credit growth and leverage	Aggregate credit and leverage	Standardised credit gap	Lower threshold for CCyB setting (BCBS 2010)		-80.2pps	Jun-19	13.3 pps	15.1 pps
		Private-sector credit growth	Historical average		1.0%	Sep-19	0.3 pps	1.5 pps
		National credit-to-GNI* gap	Lower threshold for CCyB setting (BCBS 2010)		-63.6pps	Jun-19	5.8 pps	13.5 pps
		Alternative National Specific gap	Lower threshold for CCyB setting (BCBS 2010)		-1.0pps	Jun-19	-0.9 pps	5.4 pps
		Ratio of total assets to total equity	Historical average (retail banks)		8.28	Sep-19	0.17	0.00
		Ratio of total assets to total equity	European average		8.62	Jun-19	0.09	-0.04
		Leverage ratio - all banks	European average		10.7%	Sep-19	-0.1 pps	-0.1 pps
		Leverage ratio - retail banks	European average		8.7%	Sep-19	-0.1 pps	0.1 pps
		Irish CRE funds leverage	European average		117.3%	Jun-19	-1.3 pps	8.0 pps
	Asset prices	Residential property price growth	MIP threshold		1.1%	Sep-19	-2.7 pps	-7.4 pps
		Residential property price-to-rent ratio	Historical average		17.50	Sep-19	-1.0%	-4.4%
		Residential property price-to-income ratio	Historical average		4.41	Jun-19	0.0%	2.9%
		Res. real estate misalignment measure	Zero		-11.2%	Jun-19	-4.1 pps	-5.0 pps
		Residential property turnover	European average		3.1%	Dec-18	-	0.1 pps
		Residential property stock / 1,000 adults	European average		424.7	Dec-18	-	0.0 pps
		Residential property completions/ stock	European average		0.9%	Dec-18	-	0.2 pps
		Commercial real estate price growth	Historical average		1.6%	Sep-19	-1.3 pps	0.0 pps
		CRE price-to-rent index	Historical average		95.86	Sep-19	-0.1%	0.3%
		CRE price misalignment measure	Zero		-6.8%	Jun-19	-0.7 pps	-0.5 pps
		ISEQ 3 month MA QoQ growth	Historical average		2.0%	Nov-19	-7.4 pps	10.1 pps
	Sectoral credit and leverage	Total domestic credit - herfindahl	Historical average		0.48	Jun-19	-0.3 pps	-0.7 pps
		Household debt gap	Lower threshold for CCyB setting (BCBS 2010)		-41.3pps	Jun-19	2.6 pps	6.1 pps
		Household credit growth	Historical average		0.1%	Sep-19	0.6 pps	1.4 pps
		Domestic NFC debt gap	Lower threshold for CCyB setting (BCBS 2010)		-22.3pps	Jun-19	3.2 pps	7.3 pps
		Domestic NFC credit growth	Historical average		3.5%	Sep-19	-0.7 pps	1.6 pps
		Property-related lending (% share of total)	Historical average		66.1%	Jun-19	-0.6 pps	-1.4 pps
		Irish Private Sector Enterprises: CRE credit growth	Historical average		0.6%	Jun-19	1.1 pps	1.8 pps
		Residential fixed cap. formation/GNI*	European average		2.2%	Jun-19	0.3 pps	0.3 pps
Objective 2: Prevent excessive maturity mismatch & market illiquidity	Balance sheet mismatch and liquidity	Loan-to-deposit ratio (Domestic Market Group)	Historical average		92.3%	Sep-19	-0.7 pps	0.6 pps
		Non-deposit funding	European average		18.0%	Dec-18	-	-2.3 pps
		Share of funding from ESCB	Pre-crisis average (pre-2008)		0.3%	Sep-19	-0.2 pps	-0.3 pps
		Overnight interbank borrowing volume 1M avg.	No threshold established		0.0%	Jun-17	-	-100.0%
		Overnight interbank borrowing int rate 1M avg.	No threshold established		-0.4%	Nov-16	0.0 pps	-0.3 pps
		Overnight interbank borrowing spread 1M avg.	No threshold established		0.0%	Nov-16	0.0 pps	-0.1 pps
		Liquidity coverage ratio - all banks	Historical average		165.8%	Oct-19	7.9 pps	-2.4 pps
		Liquidity coverage ratio - retail	Historical average		150.7%	Oct-19	7.0 pps	8.4 pps
		Irish CRE funds Liquidity	Historical average		4.8%	Jun-19	-0.1 pps	-0.2 pps
	Market conditions	EURIBOR OIS 3M Spread - 1 quarter average (bps)	Historical average		5.2pps	Nov-19	-0.1 pps	1.4 pps
		Irish composite stress index - 1 quarter max	Historical average		0.09	Sep-19	46.0%	194.6%
		CISS euro area - 1 quarter max	Historical average		0.12	Sep-19	-0.2 pps	0.2 pps
		Euro NFC spreads - 1 quarter avg (bps)	Historical average		103.7pps	Nov-19	-11.0 pps	-7.6 pps
		Euro financials spreads - 1 quarter avg (bps)	Historical average		97.1pps	Nov-19	-9.8 pps	-10.7 pps
		Irish gov bond spreads - monthly avg (bps)	Historical average		47.6pps	Oct-19	-8.4 pps	-9.0 pps
		Euro gov spreads - 1 quarter avg (bps)	Historical average		52.5pps	Nov-19	-19.3 pps	-26.4 pps
Objective 3: Limit direct and indirect exposure concentration	Large exposures	Total LE / own funds - All banks	European average		394%	Mar-19	28.8 pps	12.5 pps
		Total LE / own funds - Retail banks	European average		229%	Mar-19	(4.34)	-11.0 pps
		10 largest LE / own funds - All banks	No threshold established		103%	Mar-19	-2.4 pps	-3.0 pps
		10 largest LE / own funds - Retail banks	No threshold established		132%	Mar-19	-7.2 pps	-16.7 pps
		LE to NFCs/ own funds - All banks	No threshold established		24%	Mar-19	7.3 pps	3.6 pps
		LE to NFCs/ own funds - Retail banks	No threshold established		9%	Mar-19	-0.5 pps	-1.3 pps
		LE to credit inst./own funds - All banks	No threshold established		84%	Mar-19	-8.6 pps	-22.9 pps
		LE between dom. retail banks / own funds	No threshold established		2%	Mar-19	-0.2 pps	0.0 pps
		LE between dom. retail banks	No threshold established		€0.7 bn	Mar-19	-0.1 pps	0.0 pps
	Sectoral concentration & interconnectedness	Total domestic credit - herfindahl	Historical average		0.48	Jun-19	-0.3 pps	-0.7 pps
		Property-related lending (% share of total)	Historical average		66.1%	Jun-19	-0.6 pps	-1.4 pps
		Interbank loans/total financial assets	European average		0.0%	Dec-18	-	-3.9 pps
		% funding from interbank deposits	European average		5.7%	Dec-18	-	-2.5 pps
		UK Credit exposure - all banks	Historical average		22.9%	Jun-19	-1.3 pps	-1.8 pps
		UK Credit exposure - retail banks	Historical average		26.5%	Sep-19	-0.5 pps	-0.2 pps
		Systemic banking crises likelihood	Historical average		3.0%	Mar-19	-2.3 pps	-3.0 pps
		Dynamic delta coVaR	Historical average		5.1%	Sep-19	-0.6%	0.5%
		Irish funds holding of Irish bank debt	European average		1.9%	Jun-19	-3.3 pps	-2.9 pps
		Irish funds holding of Irish Government debt	European average		40.4%	Jun-19	0.0 pps	1.9 pps
		Irish funds holding of Irish NFC debt	European average		4.1%	Jun-19	1.0 pps	0.7 pps
		Irish funds holding of UK bank debt	Historical average		6.2%	Jun-19	0.1 pps	-0.6 pps
		Irish funds holding of UK Government debt	Historical average		11.3%	Jun-19	0.5 pps	1.0 pps
		Irish funds holding of UK NFC debt	Historical average		2.8%	Jun-19	0.6 pps	0.3 pps
Objective 4: Reduce the potential for systemically important banks to adopt destabilising strategies and to mitigate the impact of such actions	Size	Domestic bank assets-to-GNI*	European average		112.1%	Jun-19	-18.5 pps	-31.8 pps
		Total O-SII assets to GNI*	European average		195.6%	Jun-19	-	-16.1 pps
	Interconnectedness	LE to credit institutions - All banks	No threshold established		€56.3 bn	Mar-19	13.5%	0.1%
		LE to credit institutions - Retail banks	No threshold established		€11.4 bn	Mar-19	3.0%	-8.0%
		LE to Irish gov - All banks	No threshold established		€37.6 bn	Mar-19	-4.8%	-9.6%
		LE to Irish gov - Retail banks	No threshold established		€24.3 bn	Mar-19	-4.9%	-11.6%
		Net debt liabilities of Irish retail banks/GNI*	Historical average		-17.1%	Jun-19	-0.1 pps	-1.8 pps
		Interbank loans/total financial assets	European average		0.0%	Dec-18	-	-3.9 pps
		% funding from interbank deposits	European average		5.7%	Dec-18	-	-2.5 pps
	Concentration	Market share top 5 inst: priv sector lending	Post-crisis average		87.7%	Sep-19	0.7 pps	-0.5 pps
		Market share top 5 inst: priv sector deposits	Post-crisis average		81.7%	Sep-19	-1.5 pps	-2.3 pps
		Market share top 5 inst: NFC lending	Post-crisis average		90.6%	Sep-19	0.9 pps	0.1 pps
		Market share top 5 inst: SME lending	Post-crisis average		97.7%	Jun-19	0.1 pps	1.0 pps
		Market share top 5 inst: HH lending	Post-crisis average		93.3%	Sep-19	-0.3 pps	-0.5 pps
		Market share top 5 inst: OFI lending	Post-crisis average		78.4%	Sep-19	0.8 pps	-1.6 pps
		Share of the 5 largest inst: total assets	European average		46.1%	Dec-18	-	0.6 pps
		Total LE / own funds - All banks	European average		393.6%	Mar-19	28.8 pps	12.5 pps
	Complexity	Derivatives (notional value) to total assets	European average		122%	Dec-18	-	17.2 pps
		Share non-loan assets	European average		31%	Dec-18	-	0.7 pps
		Share non-interest income	European average		26%	Dec-18	-	0.7 pps


Systemic Risk Heatmap (Time Series)
Intermediate objective
Indicator
Threshold
1995
1996
1997
1998
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2006
2007
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2019
Objective 1: Mitigate & prevent excessive credit growth and leverage
Aggregate credit and leverage
Standardised credit gap
Lower threshold for CCyB setting (BCBS 2010)
Private-sector credit growth
Historical average
National credit-to-GNI* gap
Lower threshold for CCyB setting (BCBS 2010)
Alternative National Specific gap
Lower threshold for CCyB setting (BCBS 2010)
Ratio of total assets to total equity
Historical average (retail banks)
Ratio of total assets to total equity
European average
Leverage ratio - all banks
European average
Leverage ratio - retail banks
European average
Irish CRE funds leverage
European average
Asset prices
Residential property price growth
MIP threshold
Residential property price-to-rent ratio
Historical average
Residential property price-to-income ratio
Historical average
Res. real estate misalignment measure
Zero
Residential property turnover
European average
Residential property stock / 1,000 adults
European average
Residential property completions/ stock
European average
Commercial real estate price growth
Historical average
CRE price-to-rent index
Historical average
CRE price misalignment measure
Zero
ISEQ 3 month MA QoQ growth
Historical average
Sectoral credit
Total domestic credit - herfindahl
Historical average
Household debt gap
Lower threshold for CCyB setting (BCBS 2010)
Household credit growth
Historical average
Domestic NFC debt gap
Lower threshold for CCyB setting (BCBS 2010)
Domestic NFC credit growth
Historical average
Property-related lending (% share of total)
Historical average
Irish Private Sector Enterprises: CRE credit growth
Historical average
Residential fixed cap. formation/GNI*
European average
Objective 2: Prevent excessive maturity mismatch & market illiquidity
Balance sheets
Loan-to-deposit ratio (Domestic Market Group)
Historical average
Non-deposit funding
European average
Share of funding from ESCB
Pre-crisis average (pre-2008)
Liquidity coverage ratio - all banks
Historical average
Liquidity coverage ratio - retail
Historical average
Irish CRE funds Liquidity
Historical average
Market conditions
EURIBOR OIS 3M Spread - 1 quarter average (bps)
Historical average
Irish composite stress index - 1 quarter max
Historical average
CISS euro area - 1 quarter max
Historical average
Euro NFC spreads - 1 quarter avg (bps)
Historical average
Euro gov spreads - 1 quarter avg (bps)
Historical average
Euro financials spreads - 1 quarter avg (bps)
Historical average
Objective 3: Limit direct and indirect exposure concentration
Total LE / own funds - All banks
European average
Total LE / own funds - Retail banks
European average
Share of the 5 largest inst: total assets
European average
Total domestic credit - herfindahl
Historical average
Property-related lending (% share of total)
Historical average
Interbank loans/total financial assets
European average
% funding from interbank deposits
European average
UK Credit exposure - all banks
Historical average
UK Credit exposure - retail banks
Historical average
Systemic banking crises likelihood
Historical average
Dynamic delta coVaR
Historical average
Irish funds holding of Irish bank debt
European average
Irish funds holding of Irish Government debt
European average
Irish funds holding of Irish NFC debt
European average
Irish funds holding of UK bank debt
Historical average
Irish funds holding of UK Government debt
Historical average
Irish funds holding of UK NFC debt
Historical average
Objective 4: Reduce the potential for systemically important banks to adopt destabilising strategies and to mitigate the impact of such actions
Domestic bank assets-to-GNI*
European Average
Total O-SII assets to GNI*
European average
Net debt liabilities of Irish retail banks/GNI*
Historical average
Interbank loans/total financial assets
European average
% funding from interbank deposits
European average
Market share top 5 inst: priv sector lending
Post-crisis average
Market share top 5 inst: priv sector deposits
Post-crisis average
Market share top 5 inst: NFC lending
Post-crisis average
Market share top 5 inst: SME lending
Post-crisis average
Market share top 5 inst: HH lending
Post-crisis average
Market share top 5 inst: OFI lending
Post-crisis average
Total LE / own funds - All banks
European average
Derivatives (notional value) to total assets
European average
Share non-loan assets
European average
Share non-interest income
European average

Annex C - Important information regarding policy measures

This report discusses:

- The annual review of the Central Bank of Ireland ("Central Bank") requirements in relation to residential mortgage lending as contained in the Central Bank (Supervision and Enforcement) Act 2013 (Section 48) (Housing Loan Requirements) Regulations 2015 (S.I. No. 47 of 2015)(as amended) ("the Regulations");
- The Counter Cyclical Capital Buffer - this power was designated to the Central Bank in the European Union (Capital Requirements) Regulations 2014, which transposed the Capital Requirements Directive IV (Directive 2013/36/EU) into Irish law;
- The Other Systemically Important Institutions Buffer - this power was designated to the Central Bank in the European Union (Capital Requirements) Regulations 2014, which transposed the CRD IV (Directive 2013/36/EU into Irish law, and
- Reciprocation of measures under Article 458 of the Capital Requirements Regulation (Regulation EU no 575/2013/EU). The Central Bank is the designated authority in charge of the application of Article 458 CRR. Furthermore, SI No. 29 of 2019 confers specific functions under Article 458 CRR on the Bank including the power to make reciprocation decisions about Article 458 CRR measures taken in other Member States.

(together the Measures).

This report is for information purposes only. Any information in this report should not be construed as legal advice or a legal interpretation of the Measures. It is a matter for any regulated financial service provider who may fall within the scope of the Measures to seek legal advice regarding the application of the Measures to their particular set of circumstances. This report should not be taken as a substitute for legal advice. For further information, and avoidance of doubt, relevant entities should consult the most up-to-date text of the Measures directly.

The Central Bank has a range of supervisory and enforcement powers available to it in circumstances where a regulated financial service provider fails to comply with the requirements in the Measures. Nothing in this report should be construed so as to constrain the Central Bank from taking action where it is deemed to be appropriate.

Data used in this report are as were available at 15 November 2019.

Abbreviations

Country and currency abbreviations follow the European Union standards.

AIB	Allied Irish Bank
AMECO	Annual macro-economic database of the European Commission's Directorate General for Economic and Financial Affairs
BBI	Barclays Bank Ireland plc
BEPS	Base erosion and profit shifting
BIS	Bank of International Settlements
BOI	Bank of Ireland
BPFI	Banking & Payments Federation Ireland
BRRD	Bank Recovery and Resolution Directive
BTL	But-to-let
CBOE	Chicago Board Options Exchange
CBRE	Coldwell Banker Richard Ellis Group
CCP	Central clearing counterparty
CCyB	Countercyclical capital buffer
CET1	Common equity tier 1
CLO	Collateralised Loan Obligation
CRD	Capital Requirements Directive
CRE	Commercial real estate
CSO	Central Statistics Office
DBEI	Department of Business, Enterprise and innovation
EBA	European Banking Authority
ECB	European Central Bank
EEA	European Economic Area
EPS	Earnings per share
ESM	European Stability Mechanism
ESRB	European Systemic Risk Board
ESRI	Economic and Social Research Institute
EU	European Union
FDI	Foreign direct investment
FINREP	Financial reporting
FSR	Financial Stability Review
FTB	First-Time Buyer
GDP	Gross domestic product
GNI	Gross national income
GOS	Gross operating surplus
ICSI	Irish composite stress index
IMF	International Monetary Fund
IRB	internal risk based
JLL	Jones Lang LaSalle
KBC	Kredietbank ABB Insurance CERA Bank
LCR	Liquidity coverage ratio
LTI	Loan to income ratio
LTV	Loan to value ratio
MFI	Monetary financial institution
MMIF	Money Market and Investment Funds
MREL	Minimum requirement for own funds and eligible liabilities
MSCI	Morgan Stanley Capital International
MF-VAR	Mixed frequency Vector Autoregressions
NFC	Non-financial corporation
NMDI	New mortgage lending to disposable income
NPL	Non-performing loan
NTMA	National Treasury Management Agency
OECD	Organisation for Economic Co-operation and Development
OFI	Other financial institution
O-SII	Other Systemically Important Institutions
PDH	Primary dwelling house
PMI	Purchasing managers' index
PTSB	Permanent PTSB
PRS	Private rental sector
REIT	Real Estate Investment Trust
ROAE	Return on average equity
ROE	Return on equity
RWA	Risk-weighted asset
RWAD	Risk-weighted asset densities
SCR	Solvency capital requirement
SCSI	Society of Chartered Surveyors of Ireland
SEPP	Supervisory Expectations for Prudent Provisioning
SME	Small and medium enterprise
SRM	Single Resolution Mechanism
SSB	Second and subsequent buyer
SSM	Single Supervisory Mechanism
UBI	Ulster Bank Ireland

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