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Risk Weights on Irish Mortgages

Paul Lyons & Jonathan Rice

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Abstract

Risk weighted assets for Irish residential mortgage lending are high in a European context. In this note, we explore the main contributors to these higher mortgage risk weights. One key driver is the underlying credit quality of the stock of outstanding mortgages. Mortgage default rates are higher in Ireland than many other European countries and this is true both historically and over recent years. The majority of recent defaults stem from pre-global financial crisis originated loans, highlighting the central role of these loans issued under weaker lending standards in pushing up risk weights. A second key driver of higher mortgage risk weights relates to higher modelled loss-given-default. Irish loss rates on mortgage defaults that occurred in the financial crisis years (2009-2013) are more severe than that observed in most other EU countries. This is predominately due to the longer time to resolve defaulted loans in Ireland, associated with a particularly severe crisis. Moving forward, as banks originate new loans, with lower probability of default, these will replace crisis period loans and will place downward pressure on mortgage risk weights. Regulatory reforms such as the introduction of the 'output floor' under Basel III will narrow the gap between overall Irish risk weights and those in other countries. Nevertheless, the risk weight applicable to Irish mortgages will likely remain at the higher end of EU comparisons over the medium term.

1 Introduction

Risk weighted assets link the minimum amount of capital that a bank must have, to the risk profile of the bank's asset book.² Under rules established by the Basel Committee on Banking Supervision (BCBS), and implemented in the EU via the Capital Requirements Regulation (CRR) and Capital Requirements Directive (CRD), banks with riskier assets are required to have more capital, resulting in a larger amount of equity to absorb potential losses.

Irish retail banks have higher average risk weights on domestic mortgages than the vast majority of other European banks, leading to higher (Pillar I) capital requirements. Since banks with higher average risk weights are required to have more capital for every euro lent, higher average risk weights will directly improve a bank's capacity to absorb losses, proportionate to the higher risk of losses that they face. This comes directly from the

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² The key role of RWA is to act as the measure of unexpected loss for banks portfolios, acting as a measure of the loss under a tail or extreme event.

minimum CET1 capital requirements prescribed by European law and the national regulator, expressed as a ratio to Risk Weighted Assets (RWAs) as follows:

$$\text{Minimum CET1 Capital Requirements (X\%)} = \frac{\text{CET1 Capital}}{\text{RWA}}$$

As RWA enters the denominator of this ratio, the higher a bank's total RWA, the more capital it will need to meet capital requirements. In this way, RWAs play a direct role in determining a bank's capital requirements. Understanding the drivers of risk weights is an important element of the Central Bank's broader work around bank capital, which covers the interactions between macroprudential buffers and other elements of the capital framework, such as minimum requirements.

In this FS Note, we overview the drivers of the relatively higher risk weights on Irish mortgages. There are a number of reasons for these higher risks weights. Key contributors are the underlying credit quality of the stock of mortgages, the longer time to resolve non-performing exposures, structural differences in the repossession process as well as the particularly severe crisis experienced in Ireland. The forthcoming Basel III regulatory reforms are likely to close the gap between Irish risk weights and those of other European countries.

2 Risk Weight Density for Lending Portfolios

The risk weight density (RWD) for Irish retail lending (defined as risk-weighted assets expressed as a percentage of total loan exposures) is 49% based on June 2021 data. This compares with a European average of 33%.³ However, headline figures/differentials do not necessarily account for portfolio composition differences – with some banks having a relatively larger share of mortgages on their books - which are generally associated with lower risk weights than other asset classes (e.g. business loans).

In calculating risk weights, banks follow one of three different approaches – Standardised (STA), where risk weights are prescribed directly based on the asset type, the Foundation Internal Rating Based approach (F-IRB), or the Advanced Internal Ratings Based approach (A-IRB). The difference between the latter two approaches is that for F-IRB, the bank need only to determine obligors' probability of default (PD), whereas for A-IRB banks must

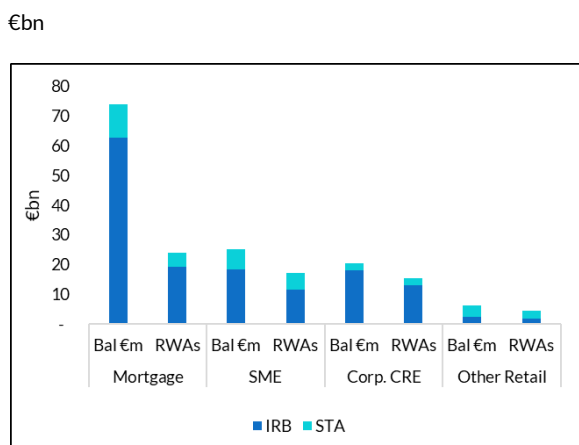
³ Based on EBA TE data as at June 2021. Countries in average include: SE, NL, LU, BE, FR, AT, DK, UK, ES, DE,PT,FI,IT,NO and IE

calculate their own estimates of PD, loss given default (LGD) and exposure at default (EAD) based on historical experience.

IRB-compliant banks use a prescribed formula to calculate risk weights (per Basel⁴) based on their own estimated risk parameters. This formula is a function of the one-year PD, LGD, EAD, maturity (M) and correlation between exposures and a factor for systemic risk (R). For banks’ lending to Irish customers that were included in the most recent EU-wide transparency exercise, 81% of total lending exposures follows the IRB approaches with the remaining 19% following the STA approach. Chart 1 breaks this down by the main exposure types. Residential mortgages covered by IRB models, which are the focus of this Note, represent 31 per cent of the total RWAs of the lending categories covered in Chart 1.

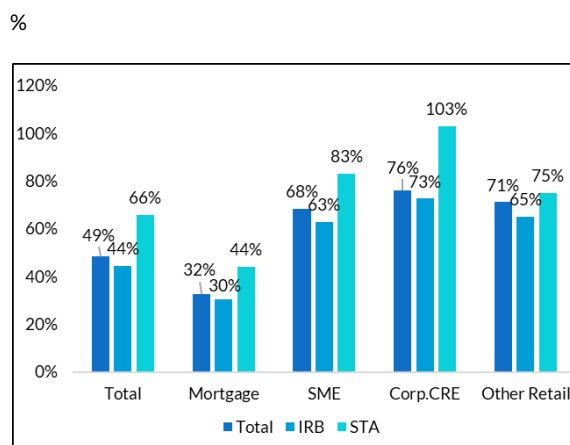
Residential real estate mortgages have an average risk weight of 32 per cent, SMEs have an average risk weight of 68 per cent while the risk weights for the combined corporate and commercial real estate portfolios was 76 per cent at June 2021 (Chart 2).

Chart 1: Exposure, risk weights and risk weight approach for major lending portfolios of banks’ lending in Ireland.



Source: EBA Transparency Exercise data for June 2021. Exposures and risk weights represent all lending to Irish customers by any bank included in the EBA sample lending in Ireland. Mortgage and SME are lending for mortgages and small and medium enterprises respectively. Corp. CRE is lending to corporates and for commercial real estate purposes while Other Retail represents other non-mortgage consumer credit lending. We include only the main lending portfolios of banks and exclude items such as market risk and operational risk.

Chart 2: Average risk weights for major Irish retail banks by portfolio type



Source: EBA Transparency Exercise data for June 2021. Exposures and risk weights represent all lending to Irish customers by any bank included in the EBA sample lending in Ireland. Mortgage and SME are lending for mortgages and small and medium enterprises respectively. Corp. CRE is lending to corporates and for commercial real estate purposes while Other Retail represents other non-mortgage consumer credit lending.

Two key inputs to the calculation of IRB risk weights are PDs and LGDs, which we discuss in more detail later. Under the Basel capital framework, PDs are required to be based on

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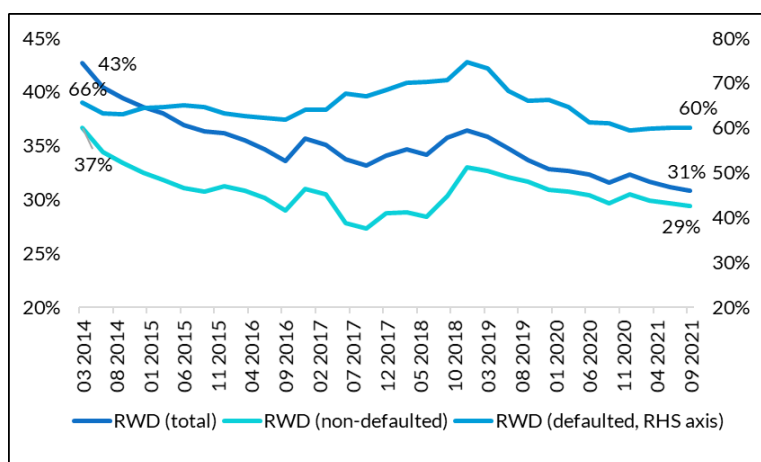
https://www.bis.org/basel_framework/chapter/CRE/31.htm?tldate=20191216&inforce=20220101&publis hed=20191215

long-run data, capture the likely range of variability in one-year default rates, and include an appropriate mix of both good and bad years in historical datasets, whilst LGDs are required to be conditioned to the most conservative of banks long-term average experience and a period reflecting economic downturn conditions for the relevant jurisdiction.⁵ The time-period used for modelling retail mortgages in Ireland will therefore typically incorporate data from before, after and during the financial crisis period 2009-2013.

3 Retail Mortgage Risk Weights and EU Comparison

Since 2014, the internally modelled risk weights for mortgages held by the Irish retail banks have been declining. Chart 3 below shows overall mortgage risk weights (incl. non-performing) of 43 per cent in March 2014 decreasing to 31 per cent in June 2021. The line *RWD (defaulted, RHS axis)* shows the risk weight density on non-performing mortgages against the right-hand side axis, which increased to a peak in December 2018, before declining to 60 per cent in June 2021. The line *RWD (non-defaulted)* shows the risk weight density on performing mortgages, which falls to 29 per cent in June 2021, from a peak of 37 per cent in March 2014.

Chart 3: Irish Retail Mortgages under IRB approach – Risk Weight Density – (2014 to 2021) split by performing status.



Source: COREP returns for Irish Banks. Includes AIB, BOI and PTSB. Note: most banks implemented new models over this timeframe and so the trend is not a reflection of RWDs from the same model or models over time. Note the risk weight % for September 2021 in this chart differs from Chart 2, due to the sample being different (3 banks versus 5 banks).

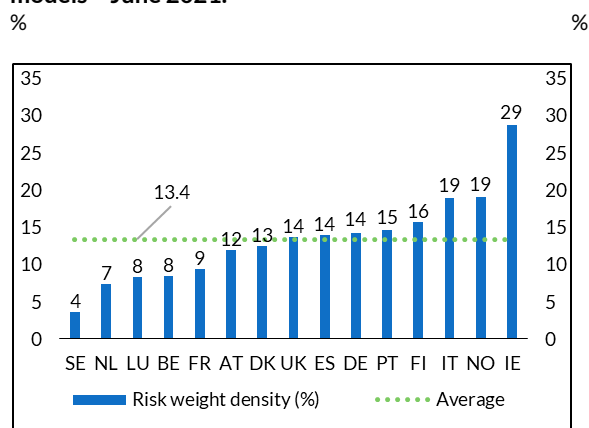
RWDs fell as the economy improved, non-performing loans (NPLs) become a smaller proportion of the portfolio due to resolution of defaulted loans, delinquency and forbearance levels declined and loans issued under more prudent lending standards made

⁵ Further legislative detail is included in Appendix 1.

up a greater proportion of the stock of mortgages. Countering this decrease, banks implemented updated mortgage models as they sought to align models with updated regulatory guidance, incorporating their own recent credit experience. Chart 4 compares the RWD on domestic performing mortgage exposures under the IRB approach for the sample of banks that were part of the 2021 EU-wide transparency exercise.⁶ Despite the gradual reduction in recent years (shown in Chart 3), Irish mortgage RWDs are above European averages. At June 2021, lending by banks included in the EU-wide transparency exercise had domestic IRB retail RWDs over two times the reported European average.

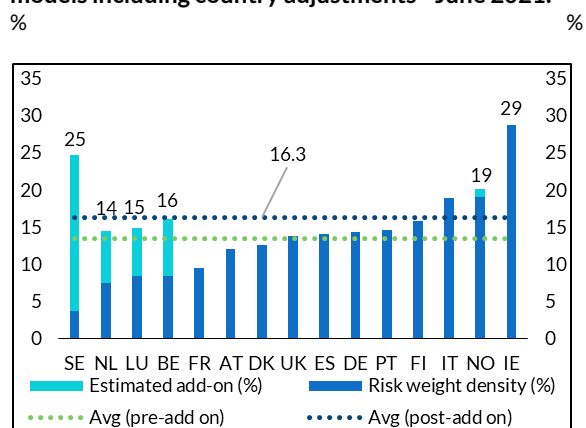
With reference to the current average Irish risk weight of 29 per cent, this implies that for every 100,000 euro lent by Irish banks for a mortgage, the minimum Pillar 1 capital requirement is approximately 2,320 euros (100,000 x 29% x 8%) while the same requirement using the average EU risk weight would be 1,072 euros.⁷ However, reported risk weights do not always reflect the final RWD on mortgages portfolios, as a number of authorities have introduced risk weight floors to raise minimum risk weights in their countries. To illustrate the challenges with cross-country comparisons, Chart 5 includes data before and after risk weight floors for these countries (SE, NL, LU, BE & NO).

Chart 4: Risk Weight Density (RWD) on performing mortgage exposures using Internal Rating Based (IRB) models – June 2021.



Source: EBA 2021 Transparency Exercise Data. Figure represents mortgage lending to customers in the respective country, e.g. for IE, the figure of 29% represents the average risk weights on IRB mortgage lending for all lending from banks in the EBA sample to customers in Ireland. The dashed line represents the average of all countries in the sample.

Chart 5: Risk Weight Density (RWD) on performing mortgage exposures using Internal Rating Based (IRB) models including country adjustments – June 2021.



Source: EBA 2021 Transparency Exercise Data along with reporting (including Article 458s). This figure overlays Chart 4 with risk weight add-ons based on regulatory actions in specific countries. To note, the PRA introduced a RW floor of 10 per cent on IRB residential mortgages for the UK in January 2022.

⁶ <https://www.eba.europa.eu/risk-analysis-and-data/eu-wide-transparency-exercise>

⁷ For comparison here we assume a total capital requirement of 8% of RWA, in reality the capital requirement (as % of RWA) differs by bank and across countries.

Chart 5 compares Irish mortgage risk weights with the same sample of countries as in Chart 4, but includes additional 'add-ons' to reflect the introduction or the impending introduction of macroprudential measures to address 'low' risk weights in certain countries. In doing so, this represents a better comparison with, and narrows the differential between, Ireland and other countries. Adjusting for known and imminent floors, Chart 5 shows the aggregate risk weight density on performing mortgages in Irish banks is 29 per cent compared to an EU median of 16.3 per cent, equating to a risk weight density for Ireland of 1.8 times the EU average.

To pick Sweden as one example, the EU transparency exercise data shows Sweden with a very low RWD of 4 per cent whereas, in reality, the Financial Supervisory Authority of Sweden applies a RW density floor of 25 per cent to all mortgages (using [Article 458 of CRR](#)). Credit risk models on Swedish mortgage exposures often generate risk weights that from a broader perspective can be considered to be relatively low since credit losses in the mortgage portfolios have been virtually non-existent for a long period of time. In order to also account for the broader systemic risks that could arise from the Swedish mortgages of individual credit institutions, the floor was raised to 25 per cent in 2014.⁸ Belgium has also imposed macro prudential measures, meaning the low RW density of 8 percent is in reality higher.⁹ Similarly the UK and NL are applying regulatory measures on 1 January 2022 due to perceived limitations in the RW densities currently being output by IRB models. Furthermore, in terms of cross country comparisons, structural differences in mortgage markets need to be considered, for example both France and the Netherlands have well developed mortgage default insurance markets in place, protecting lenders in the event of borrower default, therefore reducing credit risk.

In comparing across countries, forward-looking considerations include the impact of the [IRB repair program](#) across banks and the expectation that the arrival of Basel III reforms¹⁰ will reduce the gap between Irish risk weights and those in other jurisdictions. Basel III reforms, with the proposed IRB parameter floors (5 basis points for IRB PD on mortgages) and the output floor that limits banks total risk weights to 72.5% of total standardised risk weights will have a significant impact on many larger banks /countries with lower risk

⁸ Sweden: https://www.esrb.europa.eu/pub/pdf/other/esrb.notification180627_SE_CRR.pdf

⁹ Belgium Art 458: https://www.esrb.europa.eu/pub/pdf/other/esrb.notification180314_crr_be.en.pdf

¹⁰ See [Basel IV Output floor](#).

weights, thus reducing the gap in overall risk weight differences with Irish mortgages (see recent EBA QIS¹¹).

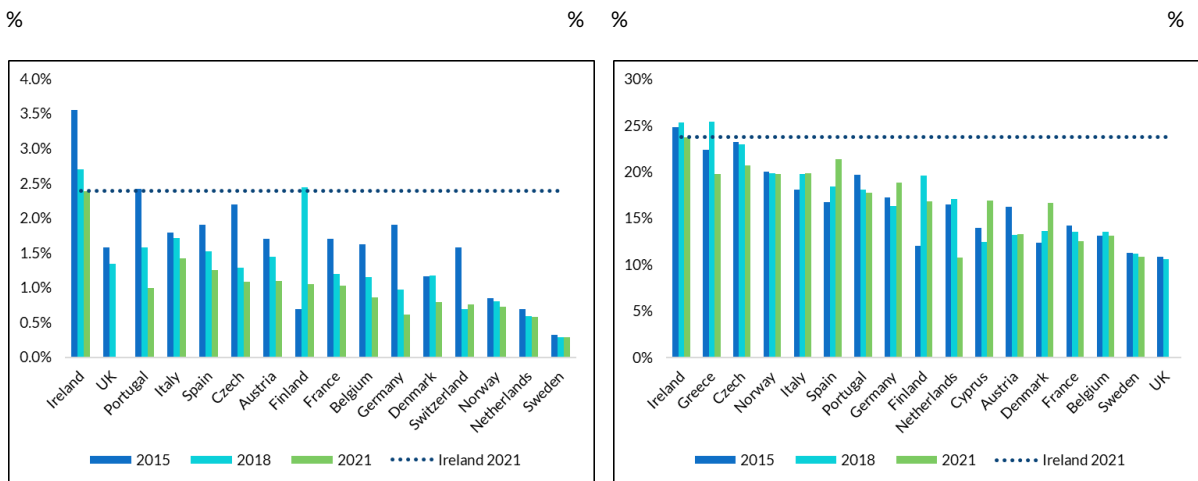
4 Factors underpinning higher modelled risk weights for Irish mortgages

In terms of the factors underpinning higher level of modelled mortgage RWAs in Ireland relative to other countries, both PD (Chart 6) and LGD (Chart 7) for Irish mortgages are relatively higher than EU averages.

In addition, we observe that the PD on Irish mortgages, while still higher than EU averages, has been falling since 2015 due to favourable economic conditions and an improvement in lending standards. In contrast, the LGD (which is estimated to reflect downturn conditions) has remained broadly stable (as for other countries) and elevated (relative to EU averages).

Chart 6: Probability of Default (PD) – Exposure weighted Average Performing IRB PD by year

Chart 7: Loss Given Default (LGD) – Exposure weighted average performing IRB LGD by year



Source: EBA Risk Dashboard Data. Retail Mortgages. Greece PDs are reported as more than 10 per cent for each year. Greece is excluded from chart and the year 2021 is excluded for the UK due to a Brexit related fall in the sample of UK banks. Data refers to annual averages for each referenced year.

Source: EBA Risk Dashboard Data. Retail Mortgages. The year 2021 is excluded for the UK due to a Brexit related fall in the sample of UK banks. Data refers to annual averages for each referenced year.

4.1 Summary Statistics

Table 1 below shows a number of summary statistics that help to better understand the drivers of higher risk weights in Ireland. The statistics are populated using a snapshot of loan level data from AIB, BOI and PTSB as at June 2021, and in addition, a single column on the right hand-side gives the shares (% of € balance) across referenced categories as at Dec 2014.

¹¹ See: [Basel III Monitoring Exercise](#), September 2021

As can be seen in Table 1 below, loans originated prior to 2010 have a higher average PD (2.3 per cent), a higher average origination loan-to-income (OLTI, 3.4 per cent) and a higher risk weight density (30 per cent). As these loans continue to amortise and are replaced by 'better' quality new lending, the average PD of the performing book, would, all things being equal, be expected to decline further.

Non-performing loans and those which have fallen into arrears also have significantly higher risk weight densities, and the shares of both non-performing loans, and loans in arrears have been decreasing over time (as seen by comparing the column *Share (bal)* for 2021, to the column *2014 Share (bal)*), which has reduced aggregate risk weights over recent years.

Average risk weights are significantly higher where a borrower has a forbearance measure currently in place (at 75 per cent), or where a forbearance measure existed in the past (38 per cent). This large difference in risk weights by forbearance cohort appears to be predominantly driven by the PD models, as seen by the higher average PDs shown in Table 1 for the *Current Forbearance* and *Previously Forborne* loans (9.3 per cent and 2.8 per cent respectively). There appears to be less risk differentiation in LGD models, as LGDs do not increase with OLTIV, origination loan-to-value (OLTV) or when a borrower has current or past forbearance.

Table 1: Mortgage loan cohorts split by status

	Share of Total Balance	RW%	Avg. PD	Avg. LGD	Avg. OLTV	Avg. OLTIV	2014 Share (bal)
Origination Year							
pre-2010	40%	30%	2.3%	20%	67%	3.4	79%
2010-2015	14%	16%	0.7%	20%	71%	2.7	21%
2016-2021	45%	26%	0.9%	26%	69%	2.8	-
Performing Status							
Performing	96%	26%	1.4%	22%	69%	3.1	85%
Non-Performing	4%	55%	100%	30%	66%	3.4	15%
Forbearance Status							
No Forbearance	87%	22%	0.9%	23%	68%	3.1	86%
Current Forbearance	4%	75%	9.3%	19%	67%	3.2	5%
Previously Forborne	9%	38%	2.8%	21%	72%	3.7	9%
Arrears Status							
0 dpd (and performing)	96%	26%	1.4%	22%	69%	3.1	86%
1-30 dpd	0.3%	81%	42.8%	21%	67%	3.0	2%
31-60 dpd	0.1%	66%	78.2%	21%	68%	3.1	1%
61-90 dpd	0.1%	50%	92.6%	22%	66%	3.3	1%

90+ dpd	4%	55%	100%	31%	66%	3.4	11%
Borrower Type							
Private Dwelling House	91%	26%	1.4%	22%	69%	3.1	80%
Buy to Let	9%	64%	3.6%	32%	69%	2.5	20%
Modelling Approach							
Advanced IRB	83%	26%	1.4%	22%	69%	3.1	84%
Standardised	17%	36%	NA	NA	73%	3.2	16%
Borrower Location							
ROI	78%	26%	1.4%	22%	69%	3.1	73%
UK	22%	14%	0.9%	16%	NA	NA	27%

Source: CBI Loan Level Database. Includes data from three of the five Irish retail banks: AIB, BOI and PTSB. The sample for origination year and forbearance status is performing IRB, PDH & ROI customers only. The sample for performing status and arrears status is IRB, PDH & ROI customers only. The sample for borrower type is performing IRB & ROI only. The sample for modelling approach is performing, PDH & ROI only. The sample for borrower location is performing IRB & PDH only.

Private Dwelling Houses (PDH) mortgages have lower risk weights than Buy-To-Let (BTL) mortgages. Again, this appears to reflect the higher PD on BTL mortgages, due to their higher default propensity during the Irish financial crisis, however the average LGD is also higher for BTL loans (32 per cent, versus 22 per cent for PDH loans). Irish banks holdings of BTL loans has decreased significantly since 2014, with just 9 per cent of total mortgage stock being BTL as at June 2021 versus 20 per cent at December 2014.

As shown in Table 1, the risk weight density on standardised loans is higher than those modelled on an Advanced IRB basis (36 per cent versus 26 per cent), and the share of standardised loans has decreased since 2014, which has resulted in a reduction in aggregate risk weights. Finally, average risk weights on UK PDH mortgages are almost half that observed for ROI PDH mortgages, and there has been a reduction in the share of UK mortgages held by Irish banks since 2014.

The share of performing mortgages originated prior to 2010 in the overall stock has gradually fallen, but remains substantial. In December 2014, it accounted for 79 per cent of the total stock of mortgages, due to low new business volumes over the 2010-2014 period. In June 2021, it accounted for 40 per cent of the total stock of mortgages (Table 1).

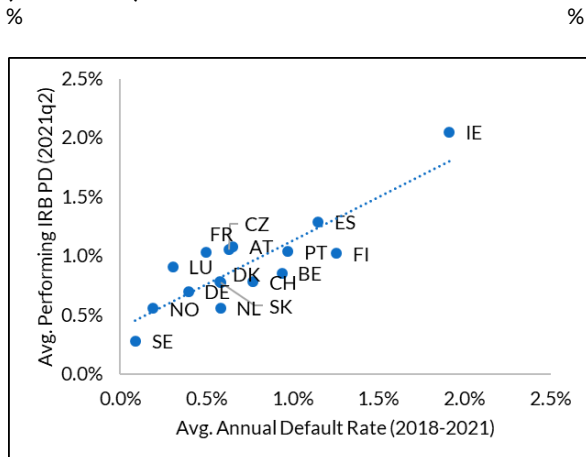
4.2 Probability of Default (PD)

In Chart 8, we look at the relationship between recent average default rates (2018 to 2021) and the average IRB PD at June 2021. Aside from Italy (which we remove as it is an outlier with respect to recent data points), Ireland has the largest share of recent mortgage loans

flowing into default over the time period. This is consistent with the higher average modelled PDs in 2021. This suggests that the higher modelled PD reflects underlying higher riskiness of the mortgage stock in Ireland, relative to other countries. Notably, Irish average default rates have been consistently above EU averages both in recent years and in the longer run.

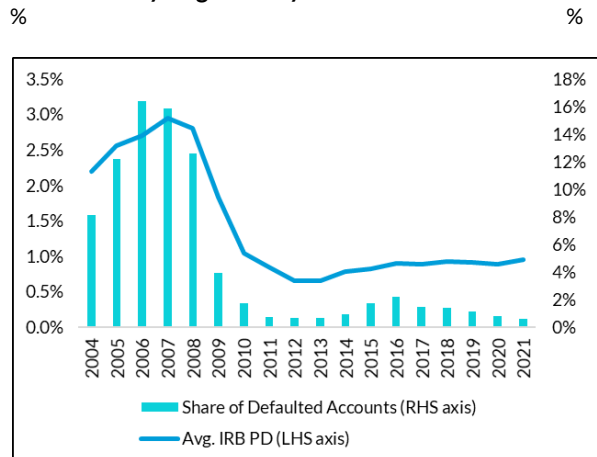
Chart 9 shows that the vast majority of recent defaults (those occurring since 2018) were on loans originated prior to the Irish financial crisis (85 per cent). This means that these loans – which were issued at much looser lending standards before the financial crisis – continue to drive Ireland’s recent high default rates. Consistent with that higher risk, they also push up average modelled PDs and capital requirements. Also included in Chart 9 are the average current performing IRB PDs (as at June 2021), split by origination year. The relative riskiness of pre-crisis originations appears to be captured effectively by banks’ own internally reported PDs.

Chart 8: Exposure Weighted Average Performing IRB PD (Retail Mortgages) and recent annual default rates (2018-2020)



Source: EBA Risk Dashboard Data. The caution mentioned earlier also apply here for cross-country comparisons of risk parameters. Irish data sample is Irish mortgages held by EBA participating banks. Italy removed as an outlier.

Chart 9: Share (expressed as annual share of total count) of Retail Mortgage Defaults occurring from 2018-2021 by origination year.



Source: CBI Loan Level Database. The line shows the average IRB PD on ROI PDH mortgages loans across origination years (for example, the 2012 value of 0.8% means the average PD in June 2021 of loans originated in 2012 is 0.8%). The columns show the shares of defaults occurring between 2018 and 2021 split by year of loan origination. Includes the five main Irish retail banks.

4.3 Loss Given Default (LGD)

A key lesson arising from the GFC was that banks were not estimating LGD in a uniform way, resulting in large unwarranted variability. As a result, the EBA repair package and EBA methodologies provide detailed clarity on the estimation of LGD models including the

specification of realised LGDs on which banks' LGD estimates must be based.¹² The EBA PD and LGD guidelines (EBA GLs) specify that LGD estimates should be based on the institutions' own loss and recovery experience, which means that for every defaulted facility the banks calculate a realised LGD for that facility based on observed cash flows. Irish banks are generally quantifying downturn LGD based on the subset of defaults which were observed over the downturn period (typically over the period between 2009 and 2013). It is important to note, that while this subset of loans defaulted during this downturn period, the workout process typically did not conclude over this period. The vast majority of these defaulted loans were not resolved until after 2013, and some still remain as NPLs on Irish bank's balance sheets.

To give a sense of the role that LGD differentials have on risk weights across countries, we estimate that if Irish LGDs were in line with the average LGD across European countries (4.3 percentage points lower), this would reduce average Irish risk weights for IRB performing mortgages by approximately one-fifth.¹³ Some of the key factors that result in higher LGDs in Ireland in comparison to the EU average are highlighted below.

Severity of Downturn, Irish Recovery Practices and impacts on Time in Default

A key contributor to higher LGDs in Ireland was the length of time loans remained in default following the Irish financial crisis. The Irish economy suffered an unusually large and prolonged shock and this was observed in the Irish mortgage and housing markets. The extended period of time it took for Irish banks to resolve defaults occurring during the crisis years was connected to customers continued inability to service their loan repayments and the specific recovery practices in place in the banks throughout this period, where banks were slow to provide deep or lasting loan restructuring. The time to resolve loans was further exasperated by the absence of immediate consequences for non-payment (Honohan, 2013)¹⁴, as can be illustrated by the extremely limited numbers of repossessions observed per Chart 10 below. The impact of the lack of consequence was illustrated in previous Central Bank of Ireland research (O'Malley, 2018), on the effect of the 'Dunne judgement'. For certain cases, the judgment effectively removed a bank's ability to repossess a house in the event of mortgage default which was likely to have contributed to

¹² The EBA repair programme was introduced to repair IRB internal models to address the concerns about undue variability of own funds requirements and to restore trust in IRB models by ensuring comparability of risk parameters. It includes the issuance new IRB related guidelines and technical standards to which institutions must adhere to

¹³ This is a simple estimate by applying an LGD scalar at an aggregate level, so ignores any loan level link between PDs and LGDs which may result in non-linearity in the relationship, and a different outcome.

¹⁴ See <https://www.bis.org/review/r131016h.pdf>

prolonging the default resolution process via limiting repossessions undertaken and reducing the consequences for non-payment.

The combination of the aforementioned factors contributed to the extended time to resolution for Irish downturn defaults. Table 2 below gives an indication of the length of time it took for cases defaulting in the downturn to be resolved. As shown in the table, between 10 – 15 per cent of defaults occurring in the downturn remained in default as at June 2021 - a default duration in excess of 9 years.¹⁵

Table 2: Shares of Defaulted Downturn Mortgage Stock Remaining in Default by Year

	% of original downturn defaults remaining in default		
	2009-2011	2012	2013
2009-2011	100%	-	-
2012	93%	100%	-
2013	89%	91%	100%
2014	71%	74%	75%
2015	62%	64%	62%
2016	55%	51%	54%
2017	48%	42%	46%
2018	25%	27%	23%
2019	17%	21%	16%
2020	16%	20%	15%
2021	13%	14%	12%

Source: CBI Loan Level Database. Includes data from the five Irish retail banks – AIB, BOI, PTSB, KBC and UBI DAC. This table shows mortgages remaining in default as a share of the original stocks of defaults occurring during the downturn period (2009-2013). The table splits these original downturn defaults into three cohorts, defaults occurring in 2009-2011, defaults occurring in 2012 and defaults occurring in 2013. For aid of interpretation, the number 13% in the final row '2021' and first column '2009-2011' of the table means that 13% of the defaults occurring during the period 2009 to 2011 remain in default on the balance sheets of Irish banks as at June-2021.

For loans that fall into default, there are a number of ways a resolution can be reached. The loss associated with each loan's final resolution outcome is a key input into the banks LGD models. This value is often referred to as the realised loss/LGD – since this is the loss value that was realised upon resolution of the defaulted loan.

¹⁵ Changing default definitions over the time sample may result in loans, which had returned to performing status, returning to default status. This analysis used to produce this table includes these loans as remaining in default, however the effect of this on the overall shares is thought to be small.

Typically, the lowest realised losses occur on defaulted loans that return to a performing status shortly after default via full repayment of any outstanding arrears without the need for bank intervention or any amendment to the terms and conditions of the loan contract (known as a self-cure). The realised loss is usually larger for loans that receive a change in the contractual terms via a restructure agreement. Such agreements range in complexity from a short-term solution (such as a temporary interest only or moratorium) to longer term solutions (such as term extensions and arrears capitalisations) depending on an assessment of the repayment capacity of the borrower. Finally defaulted loans may be realised through repossessions (either voluntary or forced), or through portfolio loan sales by banks.

Chart 10 shows the stocks of PDH mortgages across time which have either been restructured (split into temporary and long-term), or repossessed. The dashed line shows the total stock of PDH mortgages in arrears over time. Although this chart includes mortgages that fell in arrears both during and after the downturn years, much of the slow reduction in the stock of arrears evident over the time sample reflects the slow workout times of defaults previously mentioned in Table 2. During the earlier years, from 2010 to 2012, the stock of PDH mortgages in arrears was rising rapidly. In addition, the stock of temporary restructure arrangements was also increasing, indicating that banks were most likely to offer temporary loan forbearance at this time.

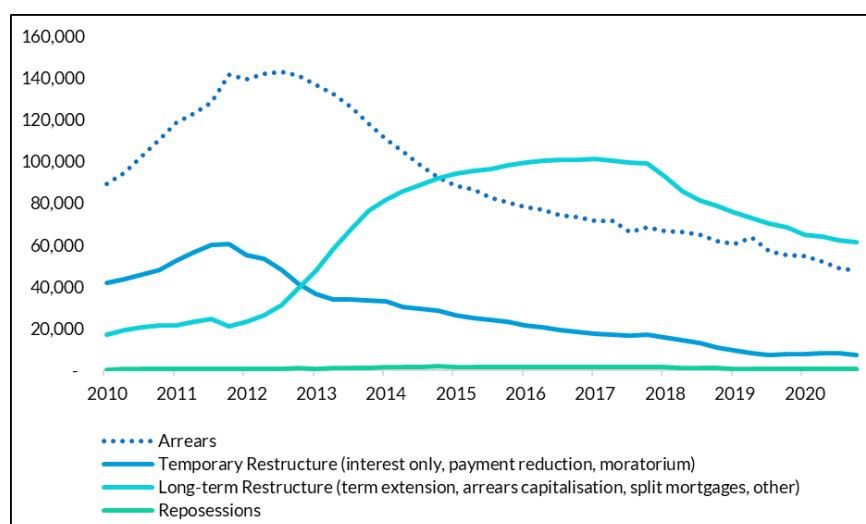
By early 2013, the Central Bank was concerned about the quality and timeliness of response by banks. This concern resulted in the imposition of the Mortgage Arrears Resolution Targets (MART) framework. Through MART, the Central Bank imposed quarterly quantitative targets on the six main mortgage lenders (accounting for approximately 90 per cent of the Irish mortgage market).¹⁶

Following the introduction of the MART framework, there is a sizeable increase in the stock of PDH mortgages with long-term restructures in place, while the number of new temporary restructures began to steadily decline. The quantity of long-term restructures kept increasing steadily up to 2017 from which point portions of this stock were sold via a

¹⁶ See Donnery et al. (2019) for further detail on the MART Framework and on the resolution of non-performing loans in Ireland. [https://www.centralbank.ie/docs/default-source/publications/quarterly-bulletins/quarterly-bulletin-signed-articles/resolving-non-performing-loans-in-ireland-2018-\(donnery-fitzpatrick-greaney-mccann-and-o%27keeffe\).pdf?sfvrsn=6](https://www.centralbank.ie/docs/default-source/publications/quarterly-bulletins/quarterly-bulletin-signed-articles/resolving-non-performing-loans-in-ireland-2018-(donnery-fitzpatrick-greaney-mccann-and-o%27keeffe).pdf?sfvrsn=6)

number of portfolio loan sales by the banks. The number of repossessions remains low throughout the time-period.

Chart 10: Irish Retail PDH Mortgage arrears, restructures (by type) and repossession statistics.



Source: CBI Mortgage Arrears 2021Q3 Data Release. The dashed line shows the total quantity of PDH mortgages in arrears across time. The dark blue line shows the total quantity of PDH mortgages which received a temporary restructure. The light blue line shows the total quantity of PDH mortgages which received a long-term restructure. The green line shows the total quantity of PDH mortgages which were repossessed. The data includes the five Irish retail banks – AIB, BOI, PTSB, KBC and UBI DAC.

Discounting Effects, House Prices and the Collateral Recovery Process

To understand the contribution of a prolonged time in default on LGD, it is important to understand the role of discounting. Everything else constant, a prolonged period of resolution for defaulted mortgages results in higher LGDs. As per CRR requirements and EBA guidelines further detailing these requirements, banks are required to apply an annual discounting factor to the book value of the loan when calculating LGDs (Euribor rate +5 per cent). This discount rate is applicable to all European banks and seeks to capture the uncertainty inherent in the recovery processes and the time value of money. This has a larger impact on the estimated LGD for Irish mortgages given the longer time it has taken historically to resolve defaulted mortgage in Ireland in comparison to EU averages.

To illustrate this point, in Chart 11 below, we demonstrate the size of discounting effects on LGD using the hypothetical case of a mortgage which defaulted in 2011, and returned to a performing status after ten years in default (self-cure). Importantly, in order to isolate discounting effects on LGD, we assume full repayment of arrears by the borrower, and no change to the loan repayment conditions on return to performing status. The line captures

the contribution of regulatory discounting effects on the LGD for this loan, which reach 28 per cent after ten years in default.¹⁷ The columns in Chart 11 show the depletion rate of the stock of 2011 defaults across Irish banks, where 62 per cent remained in default in 2015. Again, the material decrease post 2017 is noticeable when loans sales became a material feature of banks NPL reduction strategies. To illustrate the impact, were a 2011 defaulted loan to self-cure in 2015 it would generate a LGD of 12 per cent. It is important to note that Chart 11 illustrates the impact on LGD in the instance of a complete recovery of outstanding amounts including any interest accrued during the defaulted period. The probability of a complete recovery diminishes with time in default, as the likelihood of alternative recovery strategies increases (e.g. loan sales, collateral liquidation). Where the total outstanding amount is not recovered (e.g. exposure is sold for less than its outstanding amount), the associated loss is significantly larger.

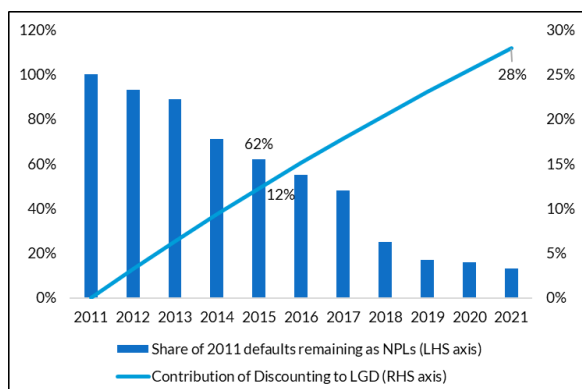
Next, we consider other factors which may influence mortgage LGDs, house prices and the duration of the legal repossession process. Chart 12 shows the peak to trough house price decline in the period following the financial crisis on the y-axis, and EBA survey data on the length of time it takes for a loan to complete a repossession once it enters the legal process on the x-axis (*Time to Recovery*) for a sample of European countries. Ireland has the most severe peak to trough decline in house prices and one of the longest average times to recovery of collateral within the sample.¹⁸

In the case of repossession, house prices impact the recovery value of collateral for a bank, however the quantity of repossessions has been very low in Ireland (as shown in Chart 10 above), and furthermore Irish house prices had experienced a strong recovery by the time the majority of repossessions were taking place¹⁹. Also, while a longer duration for the legal repossession process will increase the contribution of discounting effects on the realised LGD, the impact on LGDs is likely to have been small given the low number of repossessions.

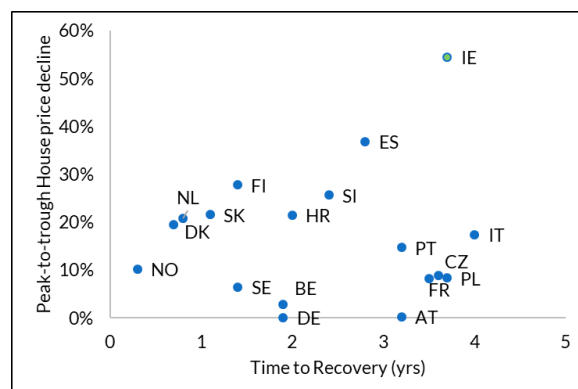
¹⁷ The illustration does not include any impact of the costs incurred by the institution associated with the management of defaulted exposures, which will be larger for those loans with longer time in default.

¹⁸ The median time to recovery for IE was 3.7 years v and average 2.3 years for the EU27, Source: [Table 21 of this EBA Report](#). It should also be noted that the Irish data point here is based on a small sample of loans which includes voluntary repossessions, and therefore it is likely to be a lower bound estimate.

¹⁹ Relatedly, price haircuts on repossessions are likely due to collateral depreciation, where properties were vacant for considerable periods of time.

Chart 11: Impact of time in default on LGD for a full recovery of outstanding amount.

Source: Authors calculations. The loan used in this example is assumed to default in 2011 and repay interest arrears in full in 2021. The line shows the LGD on this loan across time, illustrating the impact of discounting effects. The columns show the share of 2011 defaults remaining in a default status across time.

Chart 12: Legal complexities and house price peak-to-trough across European countries

Source: Table 21 of this [EBA Report](#) (Time to recovery data), World Bank, CSO and authors' calculations (house price peak to trough fall). To calculate the peak to trough fall in house prices, the highest value of each country's house price index from 2005 to 2013 informed the peak and the lowest value post 2013 informed the trough.

Overall, modelled LGDs in Ireland are higher relative to other countries. A key driver of that has been the long workout periods of mortgage loans that defaulted during the financial crisis. In turn, there are three main factors underpinning those long workout periods.

- Firstly, the higher LGD reflects the unusually large shock observed in the Irish mortgage and housing markets during the financial crisis. In particular, due to the prolonged period to work through the sheer volume of defaulted loans during the financial crisis, the ratio of PDH mortgage accounts in arrears of 90 days or more as a percentage of all PDH mortgages increased rapidly to a peak of 12.9 per cent (~100,000 mortgage accounts) in September 2013. Banks lacked the operational capabilities and bandwidth to deal with this rapid surge in non-performing loan cases and consequently there was a long time lag in resolving these cases. The delayed application of deep or lasting restructuring in addition to the nature of the specific restructuring products put in place contributed to the elongated default resolution periods.
- Secondly, the absence of immediate consequences for non-payment in terms of the decreased likelihood of repossession, which is a very limited feature of Irish recovery practices. This was illustrated historically by the effect of the Dunne judgement in 2011 which created additional uncertainty for banks, contributing to prolonging the default resolution process via limiting repossessions and reducing the consequences for non-payment.

- Thirdly, it takes longer in Ireland for institutions to realise the value of the collateral for defaulted assets. The November 2020 EBA benchmarking exercise on national loan enforcement frameworks across EU Member States illustrated Ireland recording the lowest recovery rates for exposures subject to a litigation process. According to an S&P study, the full legal process for repossession can typically take as long as 42 months in Ireland, considerably longer than in other European countries such as the UK (at 18).²⁰ In situations where collateral repossession proves difficult, banks may struggle to recover loans for a considerable period-of-time.

5 Conclusion

Risk weighted assets play an important role in ensuring that the capital held by banks corresponds with the overall risk profile of their assets. Irish banks' performing mortgage portfolio modelled risk weights are higher than other European banks. We explore the reasons for this in this FS Note with one reason being the underlying riskiness of the mortgage stock in Ireland, relative to other countries.

Irish mortgages have higher default rates than many other European banks both historically and over recent years. Around 85 per cent of defaults in recent years stem from loans that were originated prior to the financial crisis, which continue to contribute significantly to the riskiness of Irish banks' loans book and, as a result, have relatively higher mortgage risk weighted assets. The fact that Irish banks lending has improved over time – due in part of the introduction of the Central Bank mortgage measures, and economic conditions in recent years – will, all things being equal, contribute to a gradual lowering of RWAs, though this will take time. Irish loss rates on mortgage defaults that occurred in the financial crisis years (2009-2013) are more severe than that observed in most other EU countries, predominantly due to the long period of time these loans remained in default, the significant volume of mortgage loans that defaulted during the financial crisis which led to delays in resolution and the legal repossession system in Ireland.

On completion of the EBA repair program and following the introduction of the Basel III reforms, the differential between model risk weights across the EU will narrow, with banks in EU countries with current 'low' risk weights converging to a higher level. Nevertheless,

²⁰ Page 6 of <https://bpfi.ie/wp-content/uploads/2021/07/Sale-of-NPLs-to-Investment-Funds-6-Sept-2019.pdf>

given factors such as the performance of the pre-crisis loans that are still on Irish banks' loan books or the longer workout periods for resolving distressed debt in Ireland, the risk weight applicable to Irish mortgages will likely remain at the higher end of EU comparisons over the forthcoming years.

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Appendix 1: Requirements set by Capital Requirements Regulation

Box 1: Requirements set by Capital Requirements Regulation (CRR)

The Capital Requirements Regulation (CRR) sets out requisites to which each EU institution must adhere to in order to use the IRB approach for a portfolio of loans. A number of key requirements are outlined below:

- Banks are required to build models which are able to rank obligors according to risk with respect to the probability of default (PD) and loss severity on defaults (LGD). Models are required to have appropriate risk differentiation and institutions must identify and use relevant risk drivers in order to segment their portfolios into appropriate grades (pools of similar risk levels per their observed risk measures i.e. default rate and realised LGD) based on the credit quality of their individual obligors and their transactions. This should consider risk drivers such as obligor characteristics, financial information, trend information and behavioural information in order to provide a meaningful differentiation of risk [CRR 170](#).
- **PDs:** In relation to PD calibration, the key requirement is that they must be estimated per grade from long run averages of one year default rates ([CRR Article 180 \(1\) \(a\)](#)). The long run average must be based on historical default rate observations over a period which reflects the likely range of variability of default rates including an appropriate mix of good and bad years ([EBA GL on PD and LGD estimation Para 84](#)).
- **LGDs:** Regulatory LGDs are a less understood component of the IRB framework, and requirements relate to the underlying calculation of loss institutions must calculate for each default, as well as the identification and calibration of LGDs to downturn conditions. Firstly, LGDs must be estimated based on an institutions own economic loss observations per their own loss and recovery experience, for all observed defaults within the institution ([CRR Article 181 \(1\) \(a\)](#)). As such the LGDs are a measure of economic loss as opposed to accounting loss, and including material discount effects as well as material direct and indirect costs associated with collecting on the loan ([CRR Article 5](#)). The discount rate applied is a uniform rate EU wide, the 3-month EURIBOR rate at the date of default of the loan, increased by an add-on of 5%-points ([EBA GL on PD and LGD estimation Para 143](#)).
- **Downturn LGD:** Secondly, banks are required to use LGD estimates conditioned for an economic downturn in order to limit the capital impact of such a downturn ([CRR Article 181 \(1\) \(b\)](#)). Institutions are required to identify the downturn period based on historically observed economic conditions, and condition LGDs for this stressed period. Where institutions have sufficient loss data from their identified downturn period (that show elevated loss levels in comparison to those of other economic conditions), realised LGDs should be calculated as averages of all defaults that

occurred in the downturn period where the recovery process is complete, further adjusted for those defaults where the recovery process is incomplete. The incomplete process should be comparable to the recovery patterns observed on the closed cases from the period ([EBA GL on Downturn LGD estimation Section 5](#)). Alternatively, where a downturn period identified occurred prior to the period the institution has loss data available, institutions are required to apply haircuts to key model parameters or extrapolate the impacts of the identified downturn on long run averages via statistical models ([Section 6](#)).

- **Downturn Period:** Finally, should an institution be unable to identify a downturn of sufficient severity, institutions should apply a conservative add-on to the long run average LGD of 15 percentage points ([Section 7](#)). In practice, Irish institutions identify the Irish financial crisis as their downturn period, calibrating to the defaulted observations from that period. As Irish institutions typically utilise the Foundation IRB approach for their NFC portfolios, they do not estimate LGD for non-retail exposures, instead utilising a regulatory prescribed 45% LGD level.



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