

## Resolving Non-Performing Loans in Ireland: 2010-2018

Sharon Donnery, Trevor Fitzpatrick, Darren Greaney, Fergal McCann, and  
Mícheál O'Keeffe<sup>1</sup>

### Abstract

In the last decade, the Irish banking system experienced a systemic crisis, which saw Non-Performing Loan (NPL) ratios rise to among the highest levels in the euro area, followed by a sharp decline in NPL ratios that has not been experienced in many comparable countries. This article highlights the sequence of policy interventions that were implemented by the Central Bank of Ireland as a response to this systemic crisis, beginning with the 2011 stress test and recapitalisation exercise that formed part of the Financial Measures Program. It then outlines how certainty around capital adequacy allowed policy to focus on the operational capacity and incentives of the banks and borrowers to resolve the NPL crisis in Ireland, highlighting the many specific measures adopted and lessons learned during the process. We finish with a discussion of the risks and remaining challenges, with a focus on the large share of late-stage mortgage arrears cases outstanding on Irish banks' balance sheets in early 2018.

<sup>1</sup> Sharon Donnery is Deputy Governor-Central Banking at the Central Bank of Ireland. Trevor Fitzpatrick is Head of Function, in the Banking Supervision Analysis Division (BSAD), Darren Greaney is Senior Data Analyst, BSAD, Fergal McCann is Head of Function in the Financial Stability Division, Mícheál O'Keeffe is Senior Advisor to the Deputy Governor-Central Banking. The authors would like to thank Andrew Campbell for help with the data and Mark Cassidy, John Cullen, Grainne McEvoy, Maurice McGuire, Ed Sibley and Adrian Varley for helpful comments. The views expressed in this paper are the authors' and do not necessarily reflect those of the Central Bank of Ireland, or European Central Bank.

## 1. Introduction

The 2008 financial crisis had a severe impact on the Irish economy and financial system. In large part, the domestic financial crisis emanated from a highly leveraged banking sector that was over-concentrated in property-related lending. The deterioration in the macroeconomy that resulted in part from a reversal in credit-fuelled property prices led to a steep decline in economic growth and a pronounced rise in unemployment. The resultant decline in asset quality was reflected in a rapid increase in Non-Performing Loans (NPLs), which grew to such a level that the solvency of the domestic Irish banking system was compromised.

The aim of this article is to act as a stock-take of the Central Bank of Ireland's (henceforth "the Central Bank") policy response to this crisis and to highlight some of its remaining legacies. Ireland is a particularly interesting case study given that the growth in NPL ratios occurred earlier and with greater magnitude than in most other euro area economies. Furthermore, although the Irish recovery has been more rapid than in most other countries, a decade after the crisis, NPLs remain one of the primary sources of vulnerability facing the domestic economy today.

The key lessons of the paper lie in the sequencing of interventions, which began with the recapitalisation of the banking sector in 2011 through the Prudential Capital Assessment Review (PCAR). We argue that the certainty provided by the recapitalisation that accompanied the PCAR was necessary to provide a stable environment in which further policy initiatives could be implemented, both by the Central Bank and the Government.

Another important lesson lies in the significant time taken for NPL ratios to reach their peak. Despite the transfer of €74bn of loans, predominantly related to the Commercial Real Estate (CRE) market, to an asset management company, and a substantially more intrusive supervisory approach to NPL resolution

adopted by the Central Bank beginning in 2011, NPL ratios continued to grow until late 2013. This trend highlights the complex and slow-moving nature of many NPL cases, and in particular the profound nature of systemic solvency crises. While asset management companies can have an important role in NPL resolution, the Irish case demonstrates the importance of policy responses by central banks.

A further lesson to draw from this article relates to the highly intrusive nature of the supervisory response that was required in order for the banking system to begin to resolve the NPL crisis. A transition from policy interventions focussing on capital adequacy, to a supervisory approach that ensured that lenders first had operational capacity to measure, manage and resolve NPLs was made during the 2011-2013 period. This was then followed by publicly stated quantitative guidance on the speed and nature of sustainable solutions offered to borrowers with mortgage NPLs through the Mortgage Arrears Resolution Targets (MART) process, which began in 2013, and was coupled with non-public targets for NPL resolution in the Small and Medium Enterprises and Corporate asset classes. Such guidance ensured that lenders moved from a short-term forbearance model to one where longer-term sustainable restructuring products were offered to borrowers.

It must also be noted that the approach of the Central Bank was to ensure the delivery of our financial stability, prudential and consumer protection responsibilities, such that NPLs were reduced while ensuring that consumers were appropriately protected. Significant revisions to the Code of Conduct on Mortgage Arrears (CCMA), which was first introduced in 2009, were made during this period, putting the fair treatment of those in financial distress at the centre of the Central Bank's response to the crisis.

The paper proceeds by outlining the causes and potential consequences of NPLs, a

detailed description of policy developments at the Central Bank since 2010, followed by a discussion of the challenges and vulnerabilities that remain within the banking system.

## 2. The economics of NPLs: causes and consequences

A loan is classified as non-performing when repayments are more than 90 days past due or the debtor is assessed as 'unlikely to pay' in full without realisation of collateral for the loan.<sup>2</sup> The accumulation of NPLs on banks' balance sheets generally results from a highly leveraged banking sector, adverse developments in the overall macroeconomy, as well as from sector, region, or borrower-specific adverse shocks.

In the residential mortgage market, there are a variety of reasons for arrears. These include reductions in household income, borrower unemployment, non-mortgage debt accumulation, reductions in house prices (which affect borrowers' housing equity positions, which can reduce the incentives for borrowers to continue making payments), repayment increases through interest rate increases, or non-financial factors such as changes to family circumstances such as divorce and illness. The role of such factors in the Irish mortgage arrears crisis has been studied by, *inter alia*, McCarthy (2014), Kelly and O'Malley (2016), and Kelly and McCann (2016).

In the case of Small and Medium Enterprise (SME) and corporate debt, adverse developments in a firm's cash flow are likely to feature in default events. In the Irish case, McCann and McIndoe-Calder (2012) show that the ratio of the loan to total assets, the ratio of current assets to liabilities, the leverage, liquidity and profitability ratios, and specific sectoral factors (e.g. the elevated risk in property-related sectors) are all found to be significant predictors of default. Furthermore, the length of time the borrowing firm's owner has been with the firm mitigates the likelihood of default. As of end-2017, there

remains substantial variation in the share of outstanding loans in default in the Irish banks' SME lending portfolios. At the high end, the Construction and Hotels and Restaurants sectors have default ratios of 23-24 per cent while at the lower end the Manufacturing, Other Community Social and Personal Services, and Primary sectors have default rates of 11 to 13 per cent (see the Central Bank's SME Market Report 2017 H2).<sup>3</sup>

For Commercial Real Estate (CRE) projects, the key driver of unsustainable credit growth in the Irish case was the speculative nature of lending, which left projects reliant on strong final prices rather than a more prudent approach that would have relied on pre-sales or pre-letting based on an observable demand for the real estate. The collapse in property values during the financial crisis, combined with loose originating loan to value ratios, led to unserviceable debts in the sector. Furthermore, the rollover and refinancing of loans for CRE investment projects is common relative to other asset classes. A large decline in commercial real estate prices meant that the negative equity of most CRE projects in Ireland would have made refinancing of borrowings extremely difficult.

The Irish experience is different from many other countries in that high default rates across all economic sectors had, to some extent, links back to the property sector, with many business owners using bank loans to gain exposure to rising property prices in the pre-2007 period. Businesses with such property-related exposures were shown to have significantly higher default rates during the crisis (see McCann and McIndoe-Calder (2014)).

While it is clear that high levels of NPLs arise due to adverse economic developments, there are concerns among policymakers in Europe that causality may also run in the opposite direction: high legacy levels of NPLs on banks' balance sheets may also act to constrain credit growth. The key channels through which NPLs can adversely affect

<sup>2</sup> See the [EBA Implementing Technical Standards](#) on supervisory reporting on forbearance and non-performing exposures.

<sup>3</sup> Central Bank of Ireland SME Market Reports are available at the following link: <https://www.centralbank.ie/publication/sme-market-reports>

banks, and therefore the economy, are the capital, funding and profitability channels. The spillover effects to the real economy are exacerbated when banking-sovereign linkages are strong, as was evidently the case in Ireland before and during the crisis. We proceed to outline the mechanisms underlying each of the three channels below. It is important to note however that the literature is still very far from having reached a consensus on the relative importance of these channels, or indeed on the existence of a causal channel from NPLs to economic performance.

NPLs tie up bank capital, which can constrain new lending. Given the existence of capital constraints including the regulatory capital ratio, each euro of credit that is tied up on the bank's balance sheet as an NPL, is a euro that cannot be channelled into new lending. Constancio (2017) cites internal ECB calculations that estimate that if the entire amount of capital currently tied up in NPLs was used to support new lending, total credit volume in the euro area could increase by 2.5 per cent, with increases of up to 6 per cent in high-NPL countries. One issue that warrants further research in this area relates to non-linearities in the relationship: if the capital channel is in operation, the effect of NPLs on lending should be more pronounced for banks that are close to binding regulatory capital constraints.

Financial markets may perceive banks with higher NPL ratios as more risky, with a knock-on effect on funding costs, which may in turn act as an additional channel through which NPLs distort credit allocation. Analysis from the IMF shows that among the bottom 20 per cent of euro area banks by NPL ratio, funding costs were below or at zero, whereas for banks at the top of the NPL distribution, funding costs were above 100 basis points.<sup>4</sup> One potential implication of this channel is that banks with high NPLs pass on higher funding costs to borrowers in the form of higher interest rates. Focussing specifically on small firms, Holton

and McCann (2016) show that the premium charged for small loans versus large loans (the "Small Firm Financing Premium") is greater at banks with higher NPLs, and that this effect is exacerbated in cases of weak macroeconomic performance. Byrne and Kelly (2017) show that the pass-through of monetary policy rates to corporate lending interest rates in the euro area is weaker for banks with higher NPL ratios, leading to higher borrower costs during periods of accommodative monetary policy for customers of such banks.

NPLs also directly affect bank profitability through provisioning. Provisions on secured lending are typically connected to the value of the underlying collateral, which can fluctuate. Each euro that is tied up in a non-interest earning NPL is one euro that is not earning interest on a performing loan.<sup>5</sup> Central banks and supervisors aim for financial institutions to generate sustainable profits that will allow banks to serve the economy throughout the economic cycle. Such profitability will lead to improved market perceptions of banks and lead to reduced funding costs and a lower cost of equity. Fundamentally, this facilitates capital accumulation, which in turn puts institutions in a stronger position to meet regulatory requirements and to meet their core economic function of lending to the real economy.<sup>6</sup>

While the literature has begun to tackle the question, estimates of the causal effect of NPLs on lending can be difficult to identify empirically. Post crisis research still has many open research and policy questions.<sup>7</sup> One example of recent research attempting to identify an effect through the credit supply channel is Balgova et al. (2016), who have estimated that the resolution of NPL issues on banks' balance sheets has led to significant improvements in economic performance. They compare countries that have experienced falls in the stock of NPLs (as opposed to cases where the NPL ratio falls due to increases in new lending) to the contrasting case of

4 <https://www.imf.org/external/pubs/ft/scr/2015/cr15205.pdf>. For a further exploration in the Irish context, see 'Influences on Standard Variable Mortgage Pricing in Ireland' Central Bank of Ireland, May 2015.

5 Related to this is the fact that each non-interest-earning euro on the asset side of a bank's balance sheet is matched to a euro of funding (whether deposits or market-based) which bears a cost. This mismatch may induce banks to cross-subsidise on other products where they have pricing power.

6 See Deputy Governor, Prudential Regulation, Ed Sibley, Transforming banking for customers: a regulatory perspective, 20 October 2017, available here: <https://www.centralbank.ie/news/article/transforming-banking-for-customers-a-regulatory-perspective---deputy-governor-ed-sibley>

countries that have allowed high NPL levels to persist on banks' balance sheets for protracted periods. Using a propensity score matching analysis, they estimate that countries that engaged in active NPL reduction experienced a subsequent GDP growth rate that is 3-4 per cent higher and investment growth rates that are 10-15 per cent higher, compared to similar countries with NPL problems that were allowed to persist. Accornero et al. (2017), on the other hand, find no evidence from an analysis of Italian banks that NPL ratios are causally linked to lower credit supply.

The academic debate is still ongoing regarding the exact transmission mechanisms and the extent to which NPLs affect output, employment, consumption and other economic aggregates. This includes how firms' and households' income and expenditure patterns may change due to indebtedness. Furthermore, the embedding of the financial sector, bank lending behaviour, loan defaults and borrower indebtedness into general equilibrium macroeconomic models is an ongoing process. For this reason, empirical analyses on any of these transmission mechanisms is timely and welcome. New approaches such as agent-based models are promising and have been applied to markets such as the UK mortgage market to help design appropriate systemic risk mitigation policies.<sup>8</sup>

### 3. Developments in NPLs in Ireland<sup>9</sup>

The combined collapse in the real estate, labour and mortgage markets in Ireland from 2007 onwards was among the most severe experienced internationally during the recent crisis, and has been the source of much research and commentary. From its peak in April 2007 to its trough in March 2013, property prices fell 55 per cent nationally across all property types, according to the

Central Statistics Office house price index. From a minimum of 4.1 per cent in the fourth quarter of 2006, the unemployment rate reached a maximum of 15.1 per cent in the third quarter of 2011. The share of mortgages in arrears of more than ninety days stood at 3.3 per cent when the Central Bank began collecting data in September of 2009, and reached 12.9 per cent at its peak in September 2013.

In response to this rapidly deteriorating macroeconomic situation and the resultant effect on banks' asset quality, the Irish Government set up the National Asset Management Agency (NAMA) in December 2009.<sup>10</sup> Whilst losses were crystallised following the transfer to NAMA, these were covered by a government recapitalisation. NAMA therefore played a critical role in reducing uncertainty regarding potential future losses on banks' balance sheets. A total of €74bn of assets were acquired by NAMA from the Irish domestic banks at a value of €31.8bn, representing a total aggregate haircut of 57 per cent. These consisted in the main of commercial real estate assets, rather than residential mortgages.

Whilst NAMA is undoubtedly an important part of the Irish experience, it is noteworthy that it was established some years before NPLs peaked. Despite its establishment, banks were very slow to both recognise and address their wider NPL problems in the Irish case. A cross-country comparison shows that by 2012 the NPL ratio in the Irish banking system was the highest in the euro area.<sup>11</sup> This is despite the fact that a large proportion of Commercial Real Estate (CRE) loans had already been transferred from Irish banks' balance sheets to NAMA as mentioned above.

However, progress from the height of the crisis has been substantial. From a 2013 peak of 32 per cent, the aggregate domestic Irish

<sup>7</sup> See for example Nkuzu (2011), IMF (2015), Espinoza and Ananthakrishnan (2010) and Klein (2013).

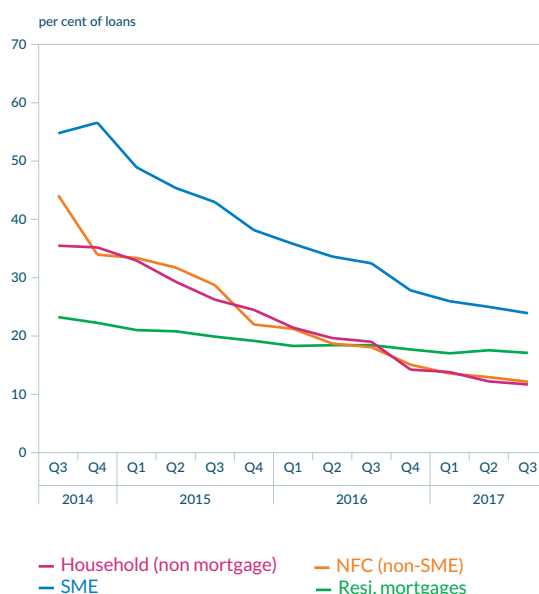
<sup>8</sup> Baptista et al. (2016).

<sup>9</sup> Four sources of data are used in the analysis in this and subsequent sections. The current definitions of NPL are the EBA ITS on NPLs that are the standard across the EU for reporting aggregate NPLs. Historical comparisons involve the use of previous Central Bank of Ireland definitions based on the regulatory reporting in existence at the time. Statistical data – mortgage arrears statistics – are used when discussing mortgage arrears statistics and aggregate restructures. Finally, granular loan level data are referenced when appropriate.

<sup>10</sup> See <https://www.nama.ie/about-us/>

<sup>11</sup> Data on Non-Performing Loan ratios from the World Bank are available here. The comparison refers to analysis of NPL ratios for Greece, Spain, Italy, Cyprus, Ireland, Slovenia and Spain.

Chart 1: Irish retail banks' sectoral NPL ratio



Source: Central Bank of Ireland Regulatory Returns.

Notes: Data consolidated and are collected in accordance with the EBA's FINREP reporting requirements.

banking system NPL ratio stood below 14 per cent at end-2017, in contrast to most other comparable countries where NPL ratios have either stabilised or continued to grow.<sup>12</sup> The evolution of the NPL ratio understates progress somewhat as the reductions occurred at a time when Irish bank balance sheets were also deleveraging. The volume of NPLs on Irish banks' balance sheets has fallen from over €80bn to €30bn over the period from 2013 to 2017. Figure 1 reports sectoral NPL ratios showing that NPL ratios have reduced across all asset classes. While the NPL ratio is highest in the SME sector at 2017Q3, the mortgage book remains the most important source of NPLs in aggregate due to its sheer size. As highlighted in the Central Bank's Macro-Financial Review 2017:II "almost two thirds of NPLs, by value, were for house purchases, over one fifth were to SMEs, larger corporates accounted for 10 per cent, while non-mortgage lending to households made up

3.5 per cent. In contrast, the largest category of NPLs for the euro area as a whole related to NFCs (approximately 60 per cent), while loans to households accounted for about one-third of the total".<sup>13</sup>

#### 4. The Central Bank's response

The policy measures introduced to address NPLs lie at the heart of the Central Bank's mission 'Safeguarding Stability, Protecting Consumers'. More specifically, the Central Bank Act gives the Central Bank the mandate for (i) 'stability of the financial system overall', and the (ii) 'proper and effective regulation of financial service providers and markets, while ensuring that the best interests of consumers of financial services are protected'.<sup>14</sup>

A stable financial system is one in which banks access funding and capital at reasonable cost, have regulatory capital ratios which would allow them to comfortably absorb the adverse effects of an economic deterioration, and meet credit demand in a prudentially appropriate way which does not lead to spirals between credit and asset prices. This is a necessary foundation for financial stability and ensuring consumers are protected and borrowers have access to credit that is appropriate.

The Central Bank's prudential and consumer protection mandates necessitated an approach that ensured banks had appropriate strategies and operations to sustainably resolve NPLs. The Central Bank's main consumer focussed policy instrument has been the Code of Conduct on Mortgage Arrears (CCMA), which came into force in February 2009 and was subsequently revised in later years. The CCMA is intended to ensure fair and transparent treatment of financially-distressed borrowers, and recognises mortgage arrears are unique when compared to other asset classes and each mortgage arrears case needs to be considered on its own merits.

<sup>12</sup> Data on Non-Performing Loan ratios from the World Bank are available here. The comparison refers to analysis of NPL ratios for Greece, Spain, Italy, Cyprus, Ireland, Slovenia and Spain. The comparable figure in Greece and Cyprus stands at 37 and 48 per cent per cent, respectively, from a position where NPLs were lower than in Ireland in 2012.

<sup>13</sup> Information on the composition of Irish banks' NPLs is contained in the Central Bank of Ireland Macro-Financial Review 2017:II.

<sup>14</sup> See Section 6A (2) (a) and (b) of the Central Bank Act.

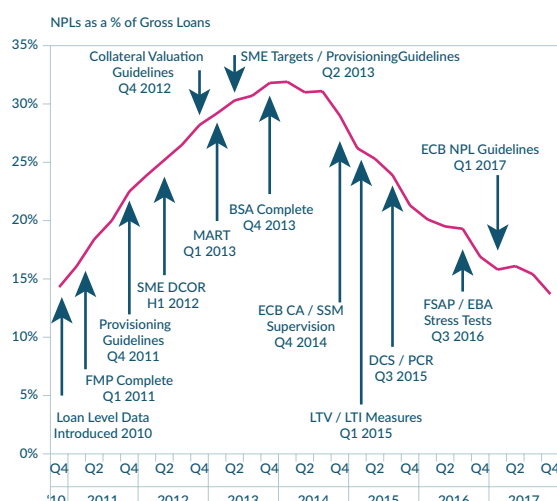
The overall response to the mortgage arrears crisis involved substantial interventions from the legal system and Irish Government agencies. Important examples included the closing of the “Dunne judgement” lacuna in conveyancing law, the setting up of the Insolvency Service of Ireland (ISI) and the Personal Insolvency Agreement (PIA) framework, and the shortening of bankruptcy terms.<sup>15</sup> While the Central Bank’s actions cannot be seen in isolation from such interventions, the aim of this article is to focus on the Central Bank’s policy response.

#### 4.1: Timeline of NPL build-up and policy response

Figure 2 provides a timeline of the range of measures that were taken by the Central Bank since December 2010. The chart also reports the NPL ratio across all asset classes at the major retail banks. Despite the fact that large Commercial Real Estate (CRE) loans had been transferred to NAMA, the extent of macroeconomic stress in the domestic economy manifested itself in a continuation of the growth in NPLs. Due to the complex nature and long gestation period of many NPLs, the NPL ratio across the system continued to rise from 15 per cent in December 2010 to 32 per cent in December 2013.

Since then, the ratio has steadily improved due to a combination of an improving economy, policy and supervisory intervention, and deployment of resources by banks to resolve individual NPL cases. The sequencing of the policy response was such that, first, capital adequacy and market perceptions of the Irish banking system needed to be put on a long-term sustainable footing. The PCAR round of stress tests, published in March 2011 and accompanied by significant recapitalisation of the banking system, substantially achieved this aim. With a sound footing in place, the Central Bank was then in a position to introduce several measures to address asset quality, while ensuring banks had appropriate strategies and operational processes in place to

**Chart 2: Retail Bank’s NPL Ratio and Important Milestones**



— NPL Ratio

Source: Central Bank of Ireland regulatory returns.

Note: At Q3 2014 the EBA's definition of non-performing was introduced. Prior to this date an internal definition was used equivalent to impaired loans and/or arrears > 90 days.

maintain progress. Such capabilities, combined with quantitative targets for NPL reduction through the Mortgage Arrears Resolution Targets (MART) program and a turnaround in the performance of the Irish economy, were of first-order importance in explaining the reversal in the Irish banks' NPL ratios from late 2013. The remainder of this article will provide a detailed description of the evolution of the policy response outlined in Figure 2.

#### 4.2: Addressing concerns around bank solvency: the Financial Measures Programme

Despite considerable policy intervention to address the crisis, in November 2010, the Irish Government formally applied for an economic and financial adjustment programme.<sup>16</sup> The Financial Measures Programme (“FMP”) implemented the Central Bank’s obligations under the agreement between Ireland and the European Commission, European Central Bank and International Monetary Fund. The

<sup>15</sup> [www.isi.gov.ie](http://www.isi.gov.ie)

<sup>16</sup> See Report of the Joint Committee of Inquiry into the Banking Crisis



Programme aimed to place the Irish banking system in a position where it could fund itself and generate capital without undue further reliance on the Irish or European public sectors.

In order to achieve these aims the Central Bank conducted a number of exercises, collectively referred to as the 'PCAR assessment'. The three exercises consisted of:

- An independent Loan Loss Forecast (conducted by a third party);
- Prudential Liquidity Assessment Review (PLAR), which had a particular focus on the banks' deleveraging plans; and
- Prudential Capital Assessment Review (PCAR) capital stress test.

The primary objective of these exercises was to assess the capital requirements of the domestic banks under severe, but plausible scenarios. Banks participating in PCAR 2011 were collectively required to raise €24bn in capital in order to remain above a minimum capital target of 10.5% Core Tier 1 (base) and 6% Core Tier 1 (stress), plus an additional protective buffer. This was a critical juncture for the Irish banking system and ensured the banks had sufficient capital to assist in tackling the elevated volume of NPLs on their balance sheets. Similar exercises have been completed since, with the Balance Sheet Assessment (BSA) in 2013 and Comprehensive Assessment in 2014, prior to the transition to the euro area-wide supervisory framework, the Single Supervisory Mechanism. Subsequently the European Banking Authority has introduced regular stress tests of European banks.

A further outcome of the PCAR exercise was that the delivery of loan-level information on all loans outstanding at the domestic banks to the Central Bank was regularised on a six-monthly basis from December 2011 onwards. These loan level data have been used for internal analysis, stress test model development, supervisory challenge,

and research and analysis supporting the introduction of the 2015 macroprudential mortgage regulations. The Central Bank also uses these data sources to provide market information to the public through the Household Credit Market Report and SME Market Report.

#### **4.3: Addressing strategic and operational concerns, 2011-2013**

Several strategic and operational measures were implemented by the Central Bank between 2011 and 2013 that placed a specific focus on the resolution of mortgage arrears and the mobilisation of adequate resources in support of those strategies. The introduction of such measures was motivated by the observation that lenders did not have appropriate strategies or operational processes for dealing with arrears cases.

To press banks to remediate these shortcomings and ensure appropriate board-level focus, in October 2011 mortgage lenders were required to submit to the Central Bank board-reviewed and approved mortgage arrears resolution strategies (MARS). The purpose was to ensure the fair treatment of borrowers, supported by detailed implementation plans to deal with the stock of arrears cases as well as new inflows, in both the early and late stages of arrears. This also placed the board of the banks at the centre of governance and management of the strategies and the process. This exercise also helped to mobilise resources within institutions to address mortgage NPLs within a coherent strategy.

Initial reviews found that strategies tended to be aspirational and featured a range of shortcomings, including an insufficient set of workout solutions to resolve arrears cases sustainably and an over-reliance on short-term forbearance strategies such as temporary interest-only or other reduced payments. If this risk went un-remediated, the level of arrears in the system would likely grow over time.



In 2012, recognising that the banks' operations for dealing with customers in arrears needed to be improved significantly, the Central Bank engaged a third party to undertake an independent Distressed Credit Operations Review (DCOR) of the operational capacity of banks to deal with the level and nature of arrears on their books.<sup>17</sup> The DCOR exercise focussed on challenging implementation plans, sustainable resolutions, assessing the development of appropriate debt resolution products, understanding the appropriateness of internal information including NPL-specific Key Performance Indicators and targets, and assessing the adequacy of resources and controls. The review was not only a top down review of processes and procedures, but was also supported by a detailed loan file review. The distressed residential mortgage credit operations review incorporated a review/re-underwriting of modified loan files by third parties with specific product expertise.

These reviews were very informative and assisted the Central Bank in developing risk mitigation programmes for each institution. Some of the deficiencies identified included a lack of arrears management experience within the banks; excessive and repeated use of short-term forbearance; lack of centralised specialist resources; structures and segmentation not aligned to workout activities; and no performance monitoring to track workout progress.

#### 4.4: Setting supervisory expectations

While MARS and communications around the results of DCOR led to increasing lender resources being allocated to NPL workout and resolution, some serious problems persisted, and the aggregate level of mortgage arrears continued to increase as the problem compounded. 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) on Republic of Ireland principal dwelling home/primary residence and buy-to-let mortgage portfolios. The targets were focussed on resolving arrears greater than 90 days and comprised the following components:

- Proposing sustainable solutions to borrowers;
- Concluding those sustainable solutions;
- Tracking of subsequent performance rates on the concluded solutions.

The Central Bank also published its Internal Guidelines on Sustainable Mortgage Arrears Solutions (Sustainability Guidelines) used by supervisors to assess restructuring solutions.<sup>18</sup> The Central Bank also introduced enhanced supervisory reporting requirements to monitor and challenge progress by banks in implementing sustainable solutions. On-site credit inspections by the Central Bank examined samples of these sustainable solutions during the MART programme.

The 2013 review of the CCMA clarified when a borrower can be considered 'not co-operating' and the serious impact of being so classified.<sup>19</sup> The revised CCMA amended the definition of 'not co-operating' to allow lenders to specify a timeline for return of information by the borrower and, more importantly, to clarify that there must be meaningful engagement by the borrower to allow the lender to assess their case. In order to protect borrowers in such circumstances, the revised code provided that borrowers must be notified in advance of being treated as not co-operating and how they can avoid it. In addition, the CCMA provides that borrowers can appeal a classification of 'not co-operating'. Lenders are since required to have a board-approved communications policy, provide borrowers with the Standard Financial

<sup>17</sup> The DCOR also examined banks' operational capacity to resolve SME distressed loans.

<sup>18</sup> See the internal guidelines: <https://www.centralbank.ie/docs/default-source/news-and-media/press-releases/2015/April/internal-guideline---sustainable-mortgage-arrears-solutions.pdf?sfvrsn=0>

<sup>19</sup> The review of the CCMA was a result of recommendations from the Government established Mortgage Arrears and Personal Debt Expert Group, which recommended the introduction of the four-step Mortgage Arrears Resolution Process (MARP).

Statement (SFS) template and assist borrowers to complete it.

In addition, the restriction on lenders commencing legal proceedings was refined. At the end of the Mortgage Arrears Resolution Process (MARP), lenders are required to provide the borrower with alternative options in the event that a restructure could not be agreed or was not appropriate. These options have to be outlined in written communication to the borrower and may include voluntary surrender or an arrangement under the Personal Insolvency Act before legal action can commence. Legal proceedings can only commence after three months from the issuance of written communication or eight months from the date the arrears arose, whichever date is later.

Following the various regulatory reforms, the Central Bank undertook an extensive programme of supervisory work to confirm whether regulated entities were demonstrating compliance with the measures introduced for the resolution of mortgage arrears. This included auditing banks' performance against the MART targets, assessing whether the proposed and concluded solutions were sustainable solutions (taking account of the Sustainability Guidelines and other key documents). The audits also involved challenging banks on their progress, as well as remediation of the findings. On-site assessments of implementation and CCMA compliance were carried out in several mortgage lenders during 2013-2015, as well as on-going supervision of consumer protection requirements.

#### 4.5: Monitoring asset quality and provisioning

The Central Bank has a key task of monitoring asset quality of lenders – ensuring loans are correctly classified, classifications are appropriately conservative, and ensuring loans are provisioned adequately. As part of setting the standard, in 2011, the Central Bank published guidelines that set out best practice regarding the policies, procedures and

disclosures banks should adopt with regard to impairment provisioning. An updated version of the guidelines was subsequently published in 2013. The intent of this measure was to ensure sufficiently robust procedures were adopted within banks and an appropriately conservative view was taken with respect to credit quality.

Following on from this during 2013, a Balance Sheet Assessment (BSA) was conducted by the Central Bank. The primary objective was to conduct a robust and comprehensive assessment of banks' balance sheets through an intensive Asset Quality Review (AQR) in order to assess the adequacy of provisions, risk classification, and the appropriateness of Risk Weighted Assets (RWA) of selected loan portfolios.

In 2015, the Central Bank completed an impairment provisioning review, the purpose of which was to ensure that appropriate practices were being maintained by the retail banks in relation to their credit loss provisioning on residential mortgages. The assessment comprised both qualitative and quantitative reviews and resulted in changes in provisioning practices within some institutions.

Since the introduction of the Single Supervisory Mechanism (SSM), credit risk identification and mitigation activities have taken place through, *inter alia*, credit risk inspections, deep-dives by the supervision teams, and as part of the assessment of firm-by-firm risks through the Supervisory Review and Evaluation Process.<sup>20</sup>

#### 4.6: Developments since the establishment of the Single Supervisory Mechanism

Following the establishment of the Single Supervisory Mechanism (SSM), it was clear that banks across the euro area were taking a very different approach to NPL workout and resolution and had been subject to a diverse set of supervisory practices. These factors, coupled with the high level of NPLs across the Eurozone led the Supervisory Board of the

<sup>20</sup> This process can inform the way in which capital requirements are set for banks in the SSM.

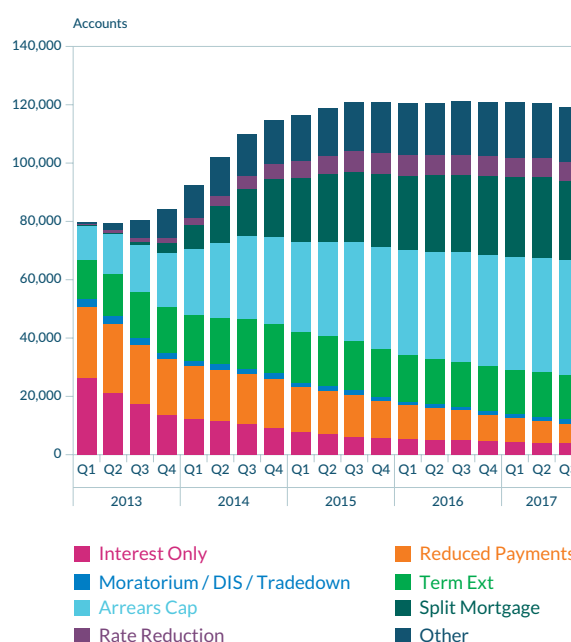
ECB in 2015 to establish a High Level Group to develop a consistent supervisory approach to the treatment of NPLs.

On 20 March 2017, following a public consultation, the ECB published its supervisory guidance on NPLs.<sup>21</sup> The guidance outlines measures, processes and best practices that banks are expected to incorporate when tackling NPLs. The guidance provides that banks should implement credible and ambitious strategies to work towards a holistic approach regarding the problem of NPLs. This includes areas such as governance and risk management, which should be closely monitored by their management bodies.<sup>22</sup>

An addendum to the guidance was published on 15 March 2018 and lays out how the ECB expects banks to provision for new NPLs going forward.<sup>23</sup> It supplements the NPL guidance in that it specifies the ECB's supervisory expectations when assessing a bank's levels of prudential provisions for new NPLs. The supervisory expectations take into account how long an exposure has been classified as non-performing and whether the exposure is secured or not. Specifically, the addendum outlines supervisory expectations that from 1 April 2018 new unsecured NPLs will be fully covered after a period of two years from the date of classification. For new secured NPLs, a certain level of provisioning is expected after three years of NPL vintage and then increasing over time until year seven. This will be applied on a case-by-case basis as part of the supervisory dialogue with banks.

At the EU level, the EBA have recently issued guidelines for consultation that are applicable to high NPL banks to strengthen the resilience of their balance sheets and support lending into the real economy. The guidelines are designed to ensure that consumers, who have taken out loans, are treated fairly at every stage of the loan life

Chart 3: PDH Restructure Composition



Source: Central Bank of Ireland Mortgage Arrears and Repossession Statistics.

Note: Includes data on banks, retail credit firms and unregulated loan owners.

cycle. The guidelines specify sound risk management practices for credit institutions for managing non-performing exposures (NPE) and forborne exposures (FBE), looking at the governance and operations of a NPE workout framework, the internal control framework and NPE monitoring, as well as early warning processes.<sup>24</sup>

As financial systems make progress dealing with the legacies of the crisis, supervisory guidance will shift its focus to ensuring that appropriate supervisory guidance is in place on credit underwriting and treatment of new NPLs to strengthen resilience in case of a future down turn.

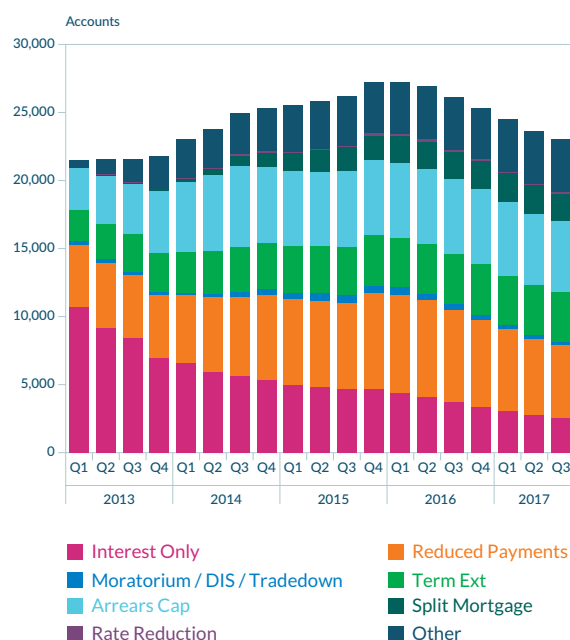
<sup>21</sup> [https://www.bankingsupervision.europa.eu/ecb/pub/pdf/guidance\\_on\\_npl.en.pdf](https://www.bankingsupervision.europa.eu/ecb/pub/pdf/guidance_on_npl.en.pdf)

<sup>22</sup> See speech by Deputy Governor, Sharon Donnelly, 'Setting the standard: Non-Performing Loans workout in the euro area', 3 Feb 2017, Bruegel.

<sup>23</sup> [https://www.bankingsupervision.europa.eu/ecb/pub/pdf/ssm\\_npl\\_addendum\\_201803.en.pdf](https://www.bankingsupervision.europa.eu/ecb/pub/pdf/ssm_npl_addendum_201803.en.pdf)

<sup>24</sup> <https://www.eba.europa.eu/-/the-eba-launches-consultation-on-how-to-manage-non-performing-exposures>

Chart 4: BTL Restructure Composition



Source: Central Bank of Ireland Mortgage Arrears and Repossession Statistics.

Note: Includes data on banks, retail credit firms and unregulated loan owners.

## 5: Loan restructuring in the mortgage market: the move to sustainable solutions

The previous section has outlined the series of steps taken by the Central Bank, and more recently the SSM, aimed at creating an environment in which adequately capitalised banks could offer sustainable solutions to borrowers in financial distress, while protecting their rights under the consumer protection codes. Given that the greatest focus was placed on loan restructuring in the mortgage market, we now turn to a discussion of the way in which mortgage restructurings have changed since 2012 in Ireland. Figure 3 illustrates that, for Primary Dwelling House (PDH) mortgages in 2012, short-term offers such as reduced payment arrangements and interest-only periods represented the majority of mortgage restructuring arrangements in place. Such short term solutions may ultimately be detrimental to borrowers given they may

result in higher repayments in future and leave borrowers vulnerable to changes in future circumstances.

The chart shows clearly that the importance of these has declined over time, while durable restructures such as split mortgages and term extensions have become much more prevalent in the retail banks. As of 2017 Q3, 33 per cent of the 119,070 restructured PDH mortgages were classified as having an Arrears Capitalisation, with another 23 per cent receiving a Split Mortgage and 13 per cent with a Term Extension. Interest Only arrangements now comprise 3.2 per cent of the total pool of restructured PDH mortgages, with another 5 per cent on Temporary Interest Rate Reductions.

The total number of BTL accounts restructured (Figure 4) stood at 23,034, or 18 per cent of all accounts, at 2017 Q3. There is a wider set of available resolution options for banks for the resolution of BTL arrears including appointment of rent receivers or outright sale of the collateral. In the BTL segment, temporary or short-term forbearance are more common than in the PDH segment of the market.

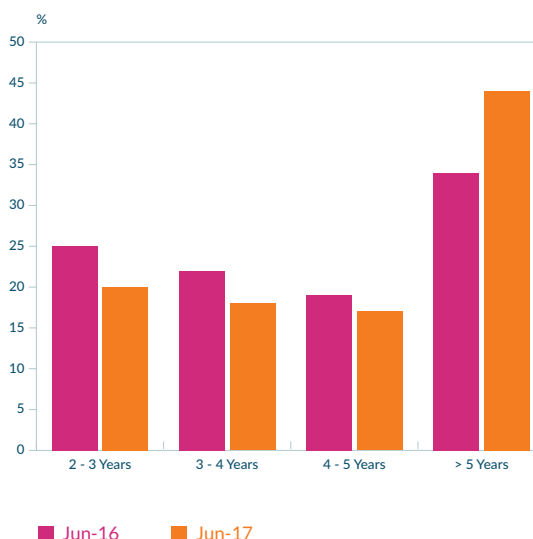
Within the non-financial corporate (NFC) sector, €8.9 billion of loans were classified as non-performing at end-2017, equivalent to an NPL ratio of 15.5 per cent. In total, €7.3 billion of NFC loans were forborne, meaning they have had a restructuring, and over three quarters of these forborne loans (77%) were classified as non-performing. As there are probation requirements for loans to meet the terms of their restructure for a fixed period, usually a year, forborne NPLs tend to reduce slowly over time. Nevertheless, looking back over the past number of years, Figure 1 in the introduction reported that reductions in impaired loans occurred across all asset classes. The volume of NPL reduction has been of a similar magnitude in the SME/Corporate sector to that experienced in the mortgage market.

Empirical analysis of Central Bank loan level data for Micro enterprise, Small and Medium Enterprise, Corporate and Commercial Real Estate loan exposures shows that the majority of the reduction in NPL ratios has been achieved through the exit of defaulted balances from the loan book rather than through the transition of defaulted balances back to performing loan status.<sup>25</sup> On a six-monthly basis from 2013 to 2016, between 2 and 3 per cent of the defaulted loan balances in the commercial loan portfolio have returned to loan performance, while 10 to 15 per cent of defaulted balances have exited the loan book in the subsequent six months. The data do not allow a distinction to be made between the various ways in which an impaired loan balance can exit the loan book: write-off, loan sales or company liquidation/insolvency. However, it is likely that substantial amounts of the NPL reduction in these asset classes have come via loan sales, with many investment reports highlighting the large volumes of sales of Irish CRE NPL portfolios in particular in recent years. This pattern contrasts strongly with the mortgage book, where modification and self-cure have been the dominant explanation for reductions in arrears rates, as outlined in McCann (2017).

## 6. Late-stage arrears and borrower engagement

Overall, mortgage NPLs have reduced by €10.7billion or 34% since the peak Q1 2014. Within the system there are €5.4 billion of performing forbore mortgage loans. Of accounts that have been restructured, 87 per cent of accounts are meeting the terms of their restructure. This is evidence of willingness and ability of borrowers and lending institutions to use the processes and protections within the CCMA to enter into arrangements that address mortgage arrears.<sup>26</sup>

**Chart 5: Retail Banks - Breakdown of PDH Loans in arrears > 720 days past due**



Source: Central Bank of Ireland loan level data.

While sustainable solutions have been put in place for many borrowers who have engaged, the ability to resolve long-term arrears has been more challenging. Arrears of more than 720 days ("720+") peaked in June 2015 at about 38,000 PDH accounts, and have since declined by 17%. As at December 2017, the figure stands at 28,946 PDH accounts, or 60 per cent of all mortgage arrears<sup>27</sup> cases in arrears of greater than ninety days. The retail banks account for 76% of the current stock (or approximately 21,800 accounts).<sup>28</sup> Former banks no longer actively lending in the Irish market, retail credit firms and unregulated loan owners account for the remainder.

Within the regulated banking sector, for which more detailed information is available, the average days past due (DPD) and arrears

<sup>25</sup> Data are for AIB, BOI and PTSB, and "commercial" exposures refer to all Micro, SME, Commercial Real Estate and Corporate lending. A more detailed description of these patterns is contained in the Central Bank's SME Market Report for 2017 H2 here: <https://www.centralbank.ie/publication/sme-market-reports>

<sup>26</sup> The performance of restructured mortgages is outlined in [here](#).

<sup>27</sup> The arrears figure denotes the value of arrears (payments not received by the contractual due date) expressed as equivalent days past due.

<sup>28</sup> It is important to note that there is not a one-to-one relation between the number of accounts and the number of households. The mortgage arrears data published by the Central Bank relate to accounts, which exceeds the number of households for a number of reasons including that some households may have two or more loans secured on the same property (e.g. the original mortgage used to finance the purchase of the property and a subsequent top up / equity release mortgage used for home improvement or renovation purposes).

balances of those loans in 720+ are increasing. Figure 5 reports that 44 per cent of loans in 720+ are more than 5 years past due as of June 2017 (increasing from 34% one year previously).<sup>29</sup> Therefore, although the stock of accounts in late-stage arrears has reduced, the weighted average DPD continues to increase.

The growth in arrears balances among the 720+ group of borrowers can be explained by a variety of factors. Firstly, financial distress among this group may be so great that even after the issuance of a restructuring arrangement, continued missed payments may arise. McCann (2017) shows that in the 720+ group, 14 per cent of borrowers were making full repayments on their currently contracted amount. Secondly, engagement of borrowers is essential to find a sustainable solution. As of end-2016 61 per cent of 720+ borrowers had engaged with their lender, meaning that in 39 per cent of cases no sustainable solution can be arrived at due to non-engagement. Thirdly, the quality and sustainability of the restructure offered after engagement can play a role. Where they engaged, the group currently in 720+ were significantly more likely to receive a short-term restructure arrangement than those currently in earlier stages of arrears, who were more likely to receive sustainable, longer term solutions (see McCann 2017).

Over half of the cases progressing to long-term arrears are classified as involving the potential for loss of ownership outcomes. It is important to understand that loss of ownership may take place in two main ways for PDH accounts: voluntary or enforcement. Voluntary actions include situations whereby the borrower voluntarily surrenders the property back to the bank. Other examples of voluntary actions are through a voluntary sale where a borrower agrees to sell as part of settling their debts with a bank or utilisation of a mortgage-to-rent scheme. Enforcement is through legal proceedings that result in a repossession order being sought and granted. At present, over two thirds of loss of ownership outcomes that have been concluded are related to a voluntary surrender and one third to repossession.

As part of a functioning mortgage market, it must be acknowledged that there will be cases where no viable modification is possible and the realisation of collateral by the lender is the only viable outcome. Such realisations of collateral by lenders must only arise after all appropriate steps have been taken by the lender in accordance with the CCMA. Cases where collateral realisation may be warranted include cases of non-engagement on the part of borrowers, as well as cases of particularly large debt relative to current debt service capacities. Since Q3 2009, 8,195 PDH properties resulted in loss of ownership with 2,722 resulting in repossession from a court order and 5,473 properties surrendered voluntarily.

The ability to undertake secured lending is ultimately dependent on the power to realise the security if needed. This is a cornerstone of secured lending and, by extension, an effectively functioning mortgage market. Relative to many other European jurisdictions, including those with lower levels of NPLs, the legal process through which lenders effect security is now substantially longer in Ireland and represents a challenge to private debt resolution.<sup>30</sup>

For borrowers in long-term arrears in the legal process, the lengthy duration of legal proceedings for residential property repossessions means that a group of borrowers will remain in arrears for the foreseeable future. For these borrowers, in addition to the protections offered by the CCMA, a range of advice and supports have been made available by the Government including through the Money Advice and Budgeting Service (MABS) and its related Mortgage Arrears Resolution Service ('Abhaile') to further assist borrowers who may be at risk of losing their homes.<sup>31</sup> The Personal Insolvency Agreement framework also remains in place and available to borrowers.

<sup>29</sup> Based on the June 2017 loan level data from five retail banks.

<sup>30</sup> See [https://www.bankingsupervision.europa.eu/ecb/pub/pdf/ssm.stock\\_taking2017.en.pdf](https://www.bankingsupervision.europa.eu/ecb/pub/pdf/ssm.stock_taking2017.en.pdf)

<sup>31</sup> [http://www.keepingyourhome.ie/en/mortgage\\_arrears\\_aid\\_and\\_advice\\_scheme.html](http://www.keepingyourhome.ie/en/mortgage_arrears_aid_and_advice_scheme.html)

## 7. Risks, vulnerabilities and the path ahead

Positive economic developments in recent years have led to a reduction in new arrears cases and have helped in resolving many existing NPL cases due to improvements in borrower circumstances. Recent research indicates that the majority of PDH mortgages flowing into arrears in 2016 had either a history of modification or previous default experience, highlighting the importance of the legacy of the last crisis as the economy continues its current period of sustained growth (see McCann, 2017).

Despite the positive effects of the macroeconomic environment, and whilst there has been significant progress in reducing Irish banks' NPL ratios, the composition of the borrowers that remain in default is such that the speed of resolution progress is likely to slow down from here. In the mortgage market, arrears of greater than two years form a majority of the cases remaining to be resolved, as highlighted in Section 6.

Furthermore, there is a sizeable group of borrowers vulnerable in the medium to long-term to economic shocks and interest rate rises. While much progress has been made, this is still a source of risk within the banking sector. Further vulnerabilities include the potential for a funding cost shock owing to changes in market perceptions of Irish banks' NPL profile, which is particularly pertinent given the risk that currently compressed global risk premia experience a reversal.

Longer-term issues include the durability of restructures in a low interest rate environment which will eventually normalise, as well as the ability of borrowers to sustain payments over long-duration restructures. Focussing on vulnerability to future payment increases, McCann (2017) shows that roughly one third of in-arrears mortgages that are currently making full contracted monthly payments will face an increase in their monthly repayments in the future. These payment increases will generally arise once interest-only or temporary payment moratoria periods cease. It is crucial for the sustainability of the mortgage portfolio of Irish banks that lenders closely monitor

the circumstances of borrowers making low or no-repayment mortgages, as well as the performing loans on tracker mortgages that will face repayment increases when ECB policy interest rates rise. McCann (2017) reports that a typical owner-occupier tracker mortgage holder will experience payment increases of 10 to 20 per cent per month if the ECB policy rate rises by 200 bps.

Finally, in the context of supervisory guidance around the reduction of NPL ratios, Irish banks may act to sell portfolios of distressed loans as one of the several options available to them. However, they also present important consumer protection issues which must be taken into consideration. Therefore, it is important that any conduct risk associated with such sales be mitigated by having a clear consumer protection framework in place. The Credit Servicing Act ensures that borrowers whose loans are sold to unregulated third parties are afforded the regulatory protections they had prior to the sale, including those protections provided by the Central Bank's Consumer Protection Code, the Code of Conduct on Mortgage Arrears and the SME Regulations. Under the Credit Servicing Act, if an unregulated firm buys loans from an original lender, then the loans must be serviced by a 'credit servicing firm' who is authorised and regulated by the Central Bank, thereby bringing such firms within the Central Bank's regulatory remit.

However, the underlying resolution strategies determined by the unregulated loan owners may be different to those adopted by banks due to differences in the nature of the underlying loan portfolios and variation in business models across the different types of institutions holding these loans. The Central Bank will continue to engage with this new category of regulated firm in order to ensure compliance with the CCMA and other regulatory requirements.

## 8. Conclusion

Throughout the crisis, its aftermath, and recovery, there has been an active debate about the policies and measures put in place to manage NPLs in Ireland. Given the Central Bank's mandate and mission to 'Safeguard



Stability, Protect Consumers', over the last decade, the Central Bank has actively developed and implemented policies to ensure a deliberate and determined reduction in NPLs, while at the same time ensuring borrowers are protected. This required a sequencing of the policy response encompassing the identification and recognition of losses through NAMA transfers and the FMP. For NPL and arrears resolution, ensuring appropriate strategies and governance within banks was required, which was accompanied by the allocation of appropriate resources to establish work-out and arrears support units, and targets to assess their effectiveness.

There are costs to these policies within financial institutions; however, they have to be weighed against the costs of inaction.<sup>32</sup> Some key lessons from the Irish experience include: (i) if left to their own devices, individual banks will not resolve their NPL problems; (ii) It is clear from the Irish experience that no single measure will resolve NPLs. A combination of active policy intervention, intensive supervisory focus, and robust legal initiatives are necessary. This needs to be complemented by a strong consumer protection framework to protect borrowers. (iii) It takes considerable time to address NPLs. Early intervention is therefore critical to achieve the best outcome for both borrowers and banks.<sup>33</sup>

There are also costs to policy decisions taken or proposed that are outside of the scope of supervisory or financial system oversight. For example, there are potential side-effects associated with exceptional policies such as repossession moratoria or the potential imposition of retrospective solutions on bilateral contractual relationships between borrowers and lenders, and various proposals to weaken ability to realise collateral.

Therefore, the implications of such proposals should be fully considered before they are proposed or implemented, and due consideration be given to the long-term effects of these measures. This is because the side-effects of such proposals may delay resolutions

for borrowers today, could undermine payment discipline, and may lead to lower supply of mortgage credit or higher interest rates for the overall market in the future.

## References

Matteo Accornero, Piergiorgio Alessandri, Luisa Carpinelli and Alberto Maria Sorrentino, 2017. "Non-performing loans and the supply of bank credit: Evidence from Italy." Banca d'Italia Occasional Papers, NumNo.ber 374.

Jochen R. Andritzky, 2014. "Resolving Residential Mortgage Distress; Time to Modify?," IMF Working Papers 14/226, International Monetary Fund.

Balgova, Maria, Michel Nies and Alexander Plekhanov, 2016. "The economic impact of reducing nonperforming loans." European Bank for Reconstruction and Development Working Paper No. 193.

Baptista, Rafa, J Doyne Farmer, Marc Hinterschweiger, Katie Low, Daniel Tang and Arzu Uluc, 2016. "Macroprudential policy in an agent-based model of the UK housing market." Bank of England Working Paper No. 619.

Bending, Tim, Markus Berndt, Frank Betz, Philippe Brutscher, Oskar Nelvin, Debora Revoltella, Tomas Slacik and Marcin Wolski, 2014. "Unlocking Lending in Europe." Working paper, Economics Department (Luxembourg: European Investment Bank).

Byrne, David and Kelly, Robert, 2017. "Bank Asset Quality and Monetary Policy Pass-Through." Research Technical Papers 11/RT/17, Central Bank of Ireland.

Constancio, Vitor, 2017. "Resolving Europe's NPL Burden: Challenges and Benefits." Speech, at event entitled *Tackling Europe's non-performing loans crisis: restructuring debt, reviving growth* organised by Bruegel, Brussels, 3 February 2017.

<sup>32</sup> See Andritzky, 2014 for a discussion.

<sup>33</sup> See speech by Deputy Governor, Prudential Regulation, Ed Sibley, Non-Performing Loans: The Irish perspective on a European problem, 22 September 2017

Espinoza, Raphael A. and Ananthakrishnan Prasad, 2010. "Nonperforming Loans in the GCC Banking System and their Macroeconomic Effects." IMF Working Paper Series WP/10/224.

Holton, Sarah and Fergal McCann, 2016. "Sources of the small firm financing premium: Evidence from euro area banks." Research Technical Papers 09/RT/16, Central Bank of Ireland

International Monetary Fund, 2015. "A Strategy for Resolving Europe's Problem Loans". IMF Staff Discussion Note. September 2015.

Kelly, Robert and Fergal McCann, 2016. "Some defaults are deeper than others: Understanding long-term mortgage arrears." *Journal of Banking and Finance*, Elsevier, vol. 72(C), pages 15-27.

Kelly, Robert and Terence O'Malley, 2016. "The good, the bad and the impaired: A credit risk model of the Irish mortgage market," *Journal of Financial Stability*, Elsevier, vol. 22(C), pages 1-9.

Kelly, Robert and Conor O'Toole, 2016. "Lending Conditions and Loan Default: What Can We Learn From UK Buy-to-Let Loans?," Research Technical Papers 04/RT/16, Central Bank of Ireland.

Klein, Nir, 2013. "Non-Performing Loans in CESEE: Determinants and Impact on Macroeconomic Performance". IMF Working Paper WP/13/72, International Monetary Fund

Kroszner, Randall S., Luc Laeven and Daniela Klingebiel, 2007. "Banking Crises, Financial Dependence, and Growth". *Journal of Financial Economics*, Vol. 84, No. 1, pp. 187-228

McCann, Fergal, 2017. "Resolving a Non-Performing Loan crisis: The ongoing case of the Irish mortgage market". Central Bank of Ireland Research Technical Paper 10/RT/17.

McCann, Fergal and Tara McIndoe-Calder, 2012. "Determinants of SME Loan Default: The Importance of Borrower-Level Heterogeneity". Research Technical Papers 06/RT/12, Central Bank of Ireland

McCann, Fergal and Tara McIndoe-Calder, 2014. "Property debt overhang: the case of Irish SMEs," Research Technical Papers 14/RT/14, Central Bank of Ireland.

McCarthy, Yvonne, 2014. "Dis-entangling the mortgage arrears crisis: The role of the labour market, income volatility and housing equity," Research Technical Papers 02/RT/14, Central Bank of Ireland

Nkuzu, M., 2011. "Nonperforming Loans and Macroeconomic Vulnerabilities in Advanced Economies. IMF Working Paper Series WP/11/161.

Schivardi, Fabiano and Enrico Sette and Guido Tabellini, 2017. "Credit Misallocation During the European Financial Crisis." CESifo Working Paper Series 6406, CESifo Group Munich.