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# IMF Working Paper

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## Resolving Residential Mortgage Distress: Time to Modify?

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**IMF Working Paper**

European Department

**Resolving Residential Mortgage Distress:  
Time to Modify?**

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Authorized for distribution by Craig Beaumont

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**Abstract**

In housing crises, high mortgage debt can feed a vicious circle of falling housing prices and declining consumption and incomes, leading to higher mortgage defaults and deeper recessions. In such situations, resolution policies may need to be adapted to help contain negative feedback loops while minimizing overall loan losses and moral hazard. Drawing on recent experiences from Iceland, Ireland, Spain, and the United States, this paper discusses how economic trade-offs affecting mortgage resolution differ in crises. Depending on country circumstances, the economic benefits of temporary forbearance and loan modifications for struggling households could outweigh their costs.

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## Contents

Page

I. Introduction .....	5
II. Comparing Recent Crises .....	7
A. Foreclosure .....	14
B. Forbearance .....	16
C. Loan Modification .....	20
III. Time to Modify? Trade-offs and Policies .....	23
A. Considering the Effects of Foreclosure .....	24
B. Providing Breathing Space with Temporary Forbearance .....	26
C. Maximizing Recovery Through Modification .....	28
D. Reducing Distress Through Across-the-board Debt Relief .....	31
IV. Conclusion .....	32
References .....	35
Boxes	
1. Codes for Borrower Protections in Ireland and Spain .....	15
2. The Personal Insolvency Reforms in Ireland .....	18
Figures	
1. Household Debt Overhang .....	6
2. Economic and Housing Cycles .....	7
3. Mortgage Debt and Home Ownership at Cycle Peak .....	8
4. House Prices, Negative Equity, and Financial Distress at Cycle Trough .....	8
5. Foreclosures .....	14
6. Actual and Projected Mortgage Arrears .....	18
7. Loan Modifications .....	21
8. Resolution Targets and Outturns .....	23
Tables	
1. Crisis Origin, Initial Conditions, Resolution Approach, Policy Measures, and Outcomes in Iceland, Ireland, Spain, and the US .....	10
2. Examples of Innovative Modification Options .....	30
Annex	
I. Estimating Mortgage Arrears Using Macroeconomic Indicators .....	34

**Acronyms**

ARM	Adjustable Rate Mortgage
CCMA	Code of Conduct for Mortgage Arrears
DSA	Debt Settlement Arrangement
ECB	European Central Bank
ESM	European Stability Mechanism
FHA	Federal Housing Administration
GAAP	Generally Accepted Accounting Principles
HAMP	Home Affordable Modification Program
HARP	Home Affordable Refinancing Program
IFRS	International Financial Reporting Standards
LTV	Loan-to-value
MART	Mortgage Arrears Resolution Targets
PIA	Personal Insolvency Arrangement

“How did you go bankrupt?”  
 “Two ways. Gradually and then suddenly.”  
 — Ernest Hemingway, *The Sun Also Rises*

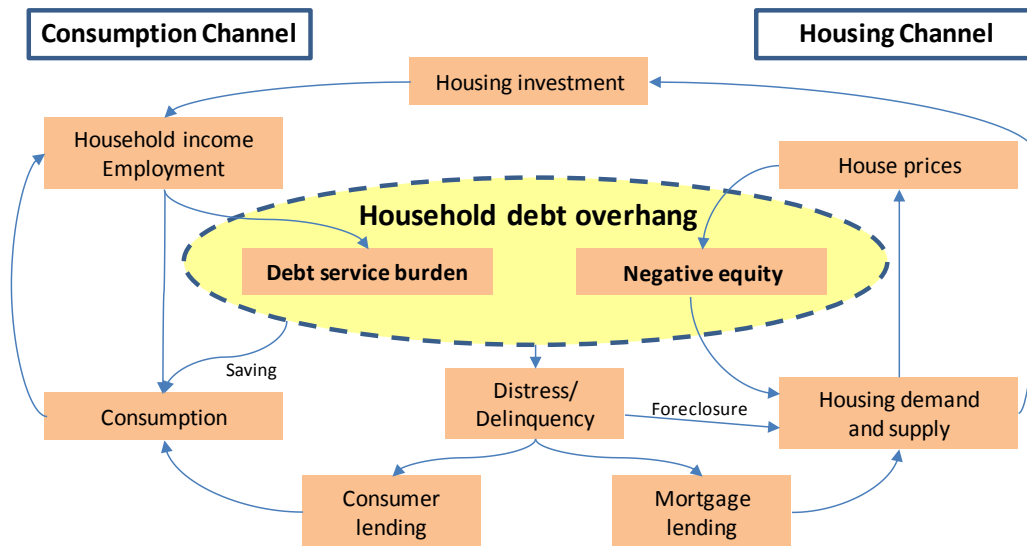
## I. INTRODUCTION

**After a rapid buildup of household debt, the recent crisis triggered unprecedented mortgage distress in several advanced economies.** In these countries, growth in the years preceding the global financial crisis was characterized by a rapid accumulation of household debt and rising property prices. The global financial crisis led to a sharp repricing of risk and reduced availability of bank funding. These developments laid bare real estate bubbles and unsustainable household debts, triggering severe housing busts in some cases:

- **Iceland.** A 50 percent devaluation of the krona in 2008 was followed by many household loan defaults, particularly of CPI indexed or foreign currency linked mortgages.
- **Ireland.** House prices halved by 2012 relative to their 2007 peak and construction collapsed, contributing to mounting job losses and sharp falls in income. Domestic demand was further depressed by a rise in household savings to reduce debt, and every fifth mortgage defaulted by 2013.
- **Spain.** The folding of a construction boom drove painful adjustments in labor markets and house prices from 2008, yet knock on effects were more contained as mortgage debt was less widespread and borrowers had higher home equity buffers.
- **United States.** Regional housing excesses and loose lending standards set the stage for historically high rates of mortgage delinquency alongside a 25 percent drop in house prices between 2007 and 2012.

**An overhang of household debt can cause negative feedback loops.** Debt overhang describes a situation in which a significant share of households owes large debts relative to their income and assets. High household debt can exacerbate the slump from housing busts through two main channels (Figure 1). First, households may hold back consumption in order to increase savings and repay debts, or households’ debt burden may limit their ability to borrow for consumption smoothing. Second, debt overhang and associated distress can weigh on housing markets. High debt can constrain households’ access to new mortgage lending while foreclosures add to the housing supply at a time when housing market turnover is limited. A resulting fall in house prices creates a negative feedback loop through declining household net worth and housing investment. In systemic crises, these channels can work as amplifiers, resulting in undershooting of demand, incomes, and house prices, and in turn worsening debt overhang and delinquency. Such adverse dynamics are especially challenging when monetary policy is constrained, as in a monetary union, and fiscal options are limited by high public debt.

**Figure 1. Household Debt Overhang**



Source: IMF staff.

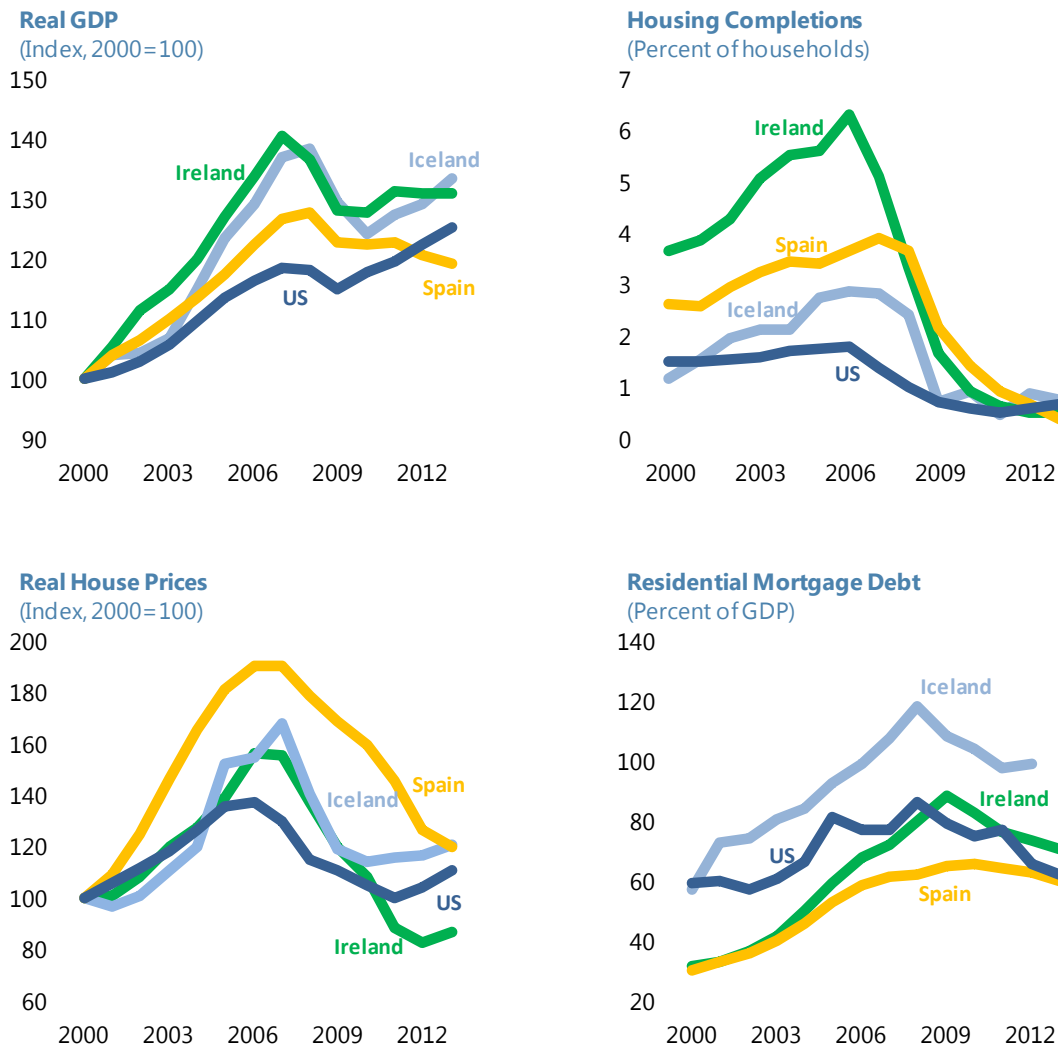
**As a result, a systemic debt overhang can shift the trade-offs that shape mortgage resolution policies.** In normal times, swift and low-cost foreclosure and insolvency procedures entailing the disposal of debtor's assets can promote timely resolution and protect against borrower moral hazard. In a systemic household debt crisis, however, applying this framework risks deepening and prolonging the recession. In contrast with corporate debt crises, where protracted corporate insolvency can reduce the recovery value and distort the allocation of financial resources, mortgage losses are less sensitive to the duration of distress. Deferring the enforcement of collateral during a period of uncertainty about borrowers' finances and illiquidity in housing markets can therefore act as a circuit breaker that contains a downward spiral of house prices and incomes and facilitates recovery. The recovery, in turn, enables lenders to triage cases suitable for value-maximizing loan restructurings from cases where least cost resolution requires foreclosure. However, maintaining a sound debt servicing culture and limiting moral hazard requires appropriate safeguards against free riding and efficient foreclosure as last resort.

**Drawing on recent cross country experience, this paper discusses the trade-offs in mortgage resolution and outlines policies to deal with mortgage arrears in crises.** After presenting selected country experience in Section II, Section III discusses the trade-offs associated with crisis policies to resolve mortgage distress involving foreclosure, forbearance, loan modification and debt relief. Section IV concludes.

## II. COMPARING RECENT CRISES

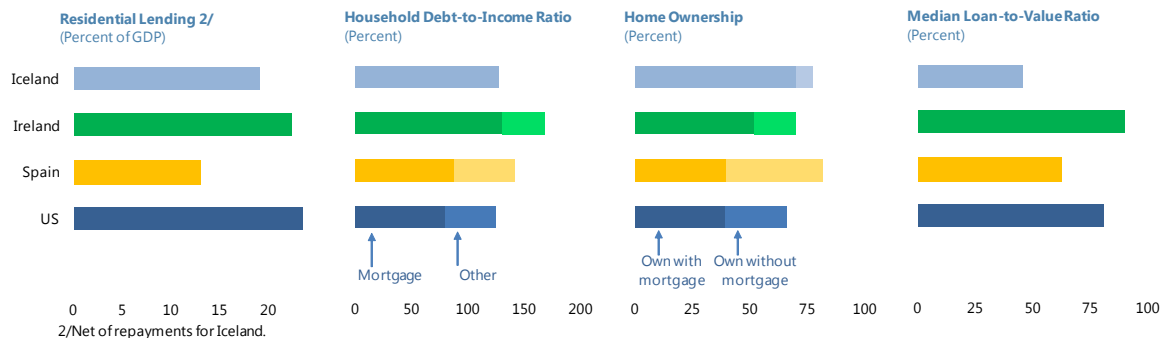
**The mortgage crises in Iceland, Ireland, Spain, and the United States were preceded by credit-fuelled housing booms.** Solid growth in these countries during the mid 2000s was closely linked to housing booms, featuring rising house prices, expanding mortgage debt, and elevated construction activity (Figure 2). Soaring household debt ratios (Iceland, Ireland), broadening of mortgage-financed home ownership (Iceland, Ireland, US), and high loan-to-value ratios at times of historically high house prices (Ireland, US) led to growing vulnerabilities (Figure 3).

**Figure 2. Economic and Housing Cycles**



Sources: Central banks; European Mortgage Federation; IMF WEO database; OECD; National Statistics Offices; US Bureau of Census; and IMF staff calculations.

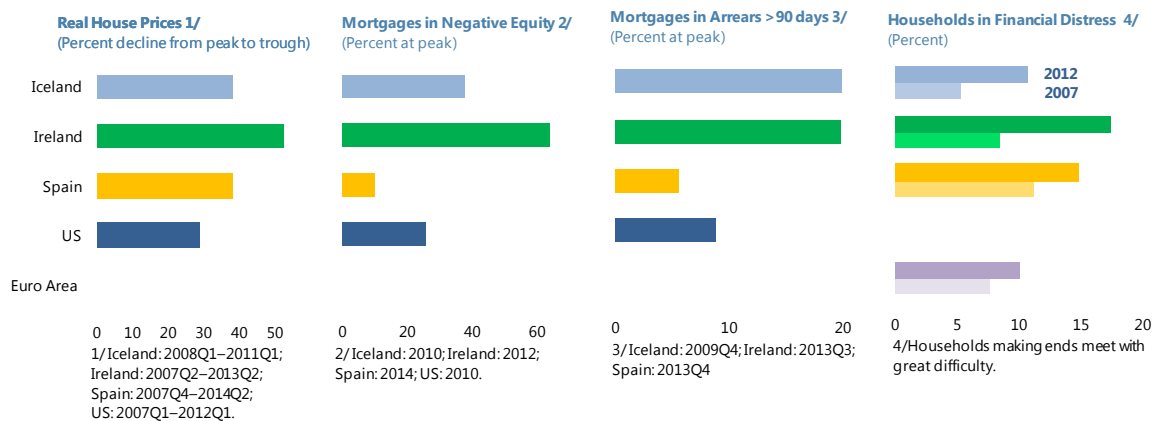
**Figure 3. Mortgage Debt and Home Ownership at Cycle Peak 1/**



Sources: Central banks; European Mortgage Federation; IMF WEO database; MBA; and IMF staff calculations.  
1/ Iceland: 2008Q1; Ireland: 2007Q3; Spain: 2008Q1; US: 2007Q1.

**Household debt distress became a key challenge in the ensuing bust (Figure 4).** Substantial falls in house prices, declining between 28 and 53 percent in real terms, dramatically pared household net wealth (Cussen *et al.*, 2012). Negative equity became widespread, affecting over one quarter of mortgages in Iceland, Ireland, and the US. A sizable portion of mortgage loans entered into deep arrears, particularly in Iceland and Ireland. Alongside falling incomes and rising unemployment, debt became a prominent concern among households, as evidenced by income and living conditions surveys in Europe.

**Figure 4. House Prices Decline, Negative Equity, Arrears, and Financial Distress**



Sources: CEBR; Central banks; Duffy and O'Hanlon (2014); Eurostat SILC; OECD; and IMF staff calculations.

**Existing frameworks to address household debt distress and crisis policy responses differed greatly across these countries.** Given the extent of the housing collapse and household financial distress, governments examined the adequacy of existing frameworks and initiated a range of policy measures to reduce debt overhang and assist the workout of mortgages in difficulty (see Table 1 for more detail):



- **Iceland.** In face of a devaluation shock and street protests, the government announced a foreclosure moratorium and froze temporarily the level of debt payments. Following this initial crisis response, the authorities implemented debt relief in different forms over an extended period of time, with the burden absorbed by banks and their external creditors as well as the public housing fund.
- **Ireland.** With an outdated bankruptcy regime that was hardly used in practice, a comprehensive insolvency reform was carried out. Extensive forbearance, such as interest only payments, helped smooth consumption but allowed arrears to build. Complicated by barriers to repossession and drawn out insolvency reforms, mortgage workout was much delayed. Resolution only began in earnest after the central bank imposed workout targets once the insolvency reform neared completion and signs of a recovery emerged.
- **Spain.** Debt distress was contained by lower debt ratios and higher buffers of housing equity, so the authorities relied on foreclosure procedures to resolve bad mortgage loans and uphold payment morale while protecting family homes of the most vulnerable. In response to concerns about “evergreening” of nonperforming loans through refinancing and restructuring, the Bank of Spain tightened provisioning and reporting requirements.
- **United States.** The Great Recession prompted the authorities to deploy stimulatory monetary and fiscal policies to support the recovery of employment, incomes, and asset prices, which also helped to shore up households’ balance sheets. In light of a perceived bias of lenders and servicers towards foreclosure, the authorities initiated a raft of measures to promote affordable loan modifications and foreclosure alternatives.

**The different approaches used to resolve distressed mortgages are seen in variations in the roles and terms of foreclosure, forbearance, and loan modification.** Foreclosure is used as an umbrella term for workouts involving the enforcement of collateral, i.e., the repossession of mortgaged homes by the lender. Forbearance describes interim situations in which the lender abstains from such enforcement—sometimes in a passive manner—or agrees to accept reduced debt service payments temporarily. Loan modification is defined as an amendment of loan terms that aims to provide a lasting cure, i.e., to avoid default for the remaining term. The following summarizes countries’ experiences with each of these workout types.

**Table 1. Crisis Origin, Initial Conditions, Resolution Approach, Policy Measures, and Outcomes in Iceland, Ireland, Spain, and the US**

	<b>Iceland</b>	<b>Ireland</b>	<b>Spain</b>	<b>United States</b>
<b>Crisis origin</b>	Real household debt in Iceland tripled between 1995 and 2007 with Iceland’s rise to a global financial hub. Besides consumption and car loans, households also incurred mortgage debt, often choosing CPI indexed, and later foreign currency indexed loans. The state-owned Housing Finance Fund, promoting home ownership, added further to the credit expansion. In 2007, problems in the US mortgage-backed securities market spilled over to Icelandic lenders. An <a href="#">IMF program</a> was put in place following a 53 percent devaluation of the krona in October 2008. Household distress became widespread, driven by devaluation, unemployment, and lost bank savings.	On foot of an extended period of economic growth, a vigorous housing boom developed from the late 90s during which construction flourished, household credit expanded (from about 30 to 130 percent of GDP), lending standards dropped, and house prices more than tripled. Credit growth took place against the backdrop of inadequate banking supervision. The global financial crisis triggered a drop off in lending and property prices, with highly leveraged developers becoming the first victims. The collapse of construction and domestic demand resulted in a severe fall in employment and income, followed by household financial distress. An <a href="#">IMF program</a> was approved in December 2010.	Following the introduction of the euro, the decline of interest rates and the improvement of funding conditions enabled a credit-fueled construction boom and a doubling of real houses prices. The global financial crisis triggered a collapse in construction and housing demand, leaving a large stock of unoccupied dwellings, partly in remote areas. Falling incomes, high unemployment and fiscal adjustment weighed on household finances. To support the ongoing restructuring of its financial sector threatened by corporate loan losses, Spain requested <a href="#">financial assistance</a> from EU partners in June 2012.	The US experienced a virtuous cycle of rising mortgage borrowing and house prices, boosting wealth and spending since the late 1990s. The cycle was exaggerated by entrenched expectations of continued house price rises, low long term interest rates, and an erosion of underwriting standards. Household indebtedness at 125 percent of income masked vulnerabilities from the expansion of subprime lending. As house prices peaked between 2005–07, early payment defaults started to occur, triggering foreclosures that further depressed house prices. The crisis reached systemic dimensions following the failures of major financial institutions in 2007–08.
<b>Initial conditions</b>	Iceland’s devaluation and subsequent inflation implied a large increase in nominal debt for many households. The resulting shock proved too large to be addressed through Iceland’s existing framework for resolving nonperforming loans and household insolvency. The dire situation of many households motivated calls for debt relief, leading to protests which contributed to the fall of the government in January 2009. The subsequent implementation of broad-based debt relief was crucially facilitated by buffers in the form of households’ large pension fund savings as well as loss absorption through foreign creditors of the failed lenders.	Ireland entered the crisis with no experience of significant mortgage distress. An analysis by BlackRock found that banks had limited skill and capacity for mortgage collection and modification. The legal environment did not facilitate timely resolution, as the punitive bankruptcy regime—providing discharge only after 12 years—was not utilized in practice. Repossession entailed lengthy and uncertain court procedures, nurtured by a political environment that remained hostile to repossession. From 2011, the most common type of repossession proceeding was impeded by a court ruling affecting all mortgages taken out before 2009. Systemic bank failures—with all except one bank nationalized—implied an immediate priority on stabilizing the financial system.	Initial conditions suggested that buffers and strong creditor rights would contain mortgage loan losses: <ul style="list-style-type: none"> <li>• Banks accumulated extra reserves given dynamic provisioning rules.</li> <li>• A low average loan-to-value ratio of 65 percent provided a buffer against negative equity.</li> <li>• Variable rates reduced loan service given lower ECB rates.</li> <li>• Efficient foreclosure procedures and full recourse without debt discharge under Spain’s 2003 insolvency law was believed to uphold credit discipline.</li> </ul>	The US commanded a deep market for housing finance and extensive experience in handling mortgage distress. Among the distinguishing features that influenced mortgage delinquency and workout were: <ul style="list-style-type: none"> <li>• Strong monetary transmission, also facilitated by unconventional monetary policies ensuring low mortgage rates.</li> <li>• Lenders’ limited recourse in some states, elevating the role of negative equity and borrower moral hazard.</li> <li>• Common securitization of mortgage loans causing legal challenges and principal-agent problems between originators, servicers, and mortgage investors.</li> </ul> <p>US foreclosure procedures are deemed efficient, although many states require substantially longer judicial foreclosure.</p>

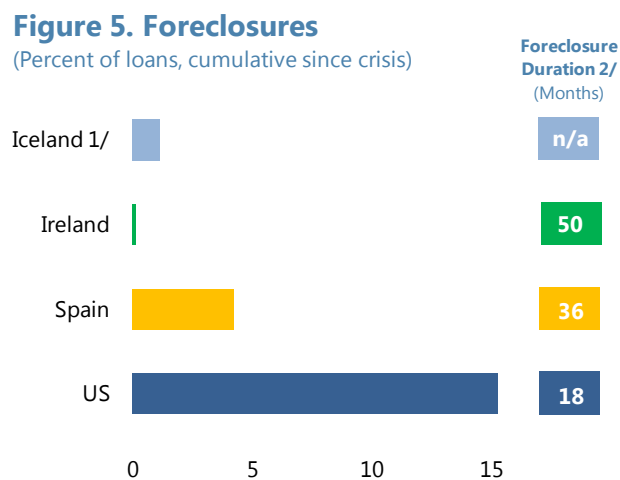
	Iceland	Ireland	Spain	United States
<b>Resolution approach</b>	<p>Initial measures in 2008 included a moratorium on foreclosure and the partial release of third-pillar pension savings. In response to the devaluation shock, a temporary freeze of the level of debt service on foreign currency linked loans was offered. Subsequently, legislation was passed for “payment smoothing” of debt service on foreign currency and CPI indexed loans. Under the system, monthly payments are determined by a new mortgage payment index, which reflects employment and wage levels, and any difference to the contractual obligation is credited to a special account subject to ceilings. In addition, steps were taken to facilitate voluntary workouts without court involvement. The foreclosure moratorium was extended twice, and finally phased out in 2011.</p> <p>Subsequently, Iceland’s approach shifted towards debt relief. Public pressure for more generous workout offers and a Supreme Court ruling questioning the legality of loan indexation stalled take-up of Iceland’s voluntary resolution scheme. Informed by an <a href="#">expert group analysis</a>, the government mandated lenders to provide a time-bound offer to write down qualifying mortgages to 110 percent of collateral value, delivering principal reductions of an estimated 3 percent of GDP. Subsequently, the restructuring of loans picked up, but another Supreme Court ruling in early 2012 stoked expectations of debt relief for borrowers with indexed loans.</p> <p>In 2014, a new government delivered on its election promise to provide additional</p>	<p>The policy response encompassed three partly overlapping elements:</p> <p><b>(i) Protection and support.</b> The authorities established strong borrower protections, including a Code of Conduct on Mortgage Arrears. Families under financial pressure received a Mortgage Interest Supplement. Debtor counseling was expanded.</p> <p><b>(ii) Insolvency reform.</b> Work on reforms of the personal insolvency framework started in 2010 and completed in 2013 with the establishment of the Insolvency Service Ireland overseeing three innovative workout schemes for personal debt, including a novel arrangement for mortgage debt. Bankruptcy was reformed to reduce the discharge period to three years, closer to international practice, and unintended barriers to repossession were removed.</p> <p><b>(iii) Workout.</b> Starting from a situation dominated by implicit forbearance, a step-by-step approach to promote workouts was taken:</p> <ul style="list-style-type: none"> <li>• An <a href="#">expert group</a> in 2010 recommended banks to develop and publish Mortgage Arrears Resolution Procedures, establish centralized arrears support units, and assess borrowers’ financial position using a standard financial statement.</li> <li>• An <a href="#">interdepartmental working group</a> set out a range of options for mortgage resolution in mid 2011. In late 2011, the central bank required banks to develop Mortgage Arrears Resolution Strategies focused on loan modification. It also conducted a review of banks’ operational capacity for loan collection. During 2012,</li> </ul>	<p>Supported by ESM financial assistance, Spain carried out comprehensive bank diagnostics and recapitalized banks after bringing provisioning levels in line with expected losses from retail mortgages and foreclosed housing.</p> <p>In response to concerns that some banks’ refinancing of troubled loans may represent “evergreening”, the Bank of Spain clarified provisioning and reporting standards applicable to refinanced loans from September 2013.</p> <p>The authorities deemed the existing foreclosure framework sufficiently efficient and conducive to prevent moral hazard. In 2012, a phased restructuring framework including loan modification, debt relief of up to 25 percent, and a two year right to stay upon foreclosure for highly distressed households was introduced. Following social unrest linked to foreclosures and considering the need to alleviate the burden on the most vulnerable borrowers hit by the crisis, eviction was suspended for vulnerable households conditional on narrow eligibility criteria, and late interest was capped. In 2013, partial discharge of a limited portion of debt remaining after foreclosure and a payment plan of up to 10 years was introduced.</p>	<p>Lenders and servicers deployed both foreclosure and loan modification from the outset. These individual efforts were gradually standardized, facilitated by industry and government efforts, such as government sanctioned protocols and net present value models. Initial policy initiatives to promote loan modification over foreclosure, such as the Hope for Homeowners program achieved limited success, blamed in part on its tight guidelines for participation. In 2009, the Home Affordable Modification Program (HAMP) introduced a standardized waterfall for modifications with the objective to reach a monthly payment to income ratio of 31 percent, and provided incentive payments to encourage less costly short sales or deed in lieu of foreclosure. Costs are shared between the private sector and the Federal Government which allocated \$50 billion for housing programs under the <a href="#">Troubled Asset Relief Program</a> (TARP). Monetary easing also contributed to debt affordability. Together with improved refinancing chances through HARP, this benefitted borrowers collectively by \$60 billion per year, more than modification.</p> <p>Over time, policies focused on overcoming a perceived bias towards foreclosure. Under the specific circumstances of the originate-to-distribute model of US housing finance, the servicer of the mortgage loan, rather than the originator or holder has the primary power to decide over modification or foreclosure. Servicers have limited incentives to modify loans due to the associated cost and potential legal liability. Policies that increased the incentive for servicers lead to a pickup in HAMP modifications. The administration also set overall targets to</p>

	<b>Iceland</b>	<b>Ireland</b>	<b>Spain</b>	<b>United States</b>
	debt relief over 2014–17 through two measures: a 13 percent write-down of inflation-indexed mortgages (4¼ percent of GDP) financed by a bank levy, mainly borne by foreign creditors of the failed banks' estates, and an offer for a tax free reallocation of voluntary pension contribution towards mortgage repayments with an estimated uptake of another 4¼ percent of GDP.	<p>the central bank pressed banks to address issues identified with strategies on operational capacity, but workout implementation remained slow.</p> <ul style="list-style-type: none"> <li>In early 2013, anticipating the launch of the Insolvency Service and the removal of repossession impediments, the central bank implemented supervisory targets for banks' loan workouts within the new framework.</li> </ul>		kick-start trial modifications and threatened monetary penalties and sanctions. A lawsuit and following settlement about unsound foreclosure practices further contributed to reduced foreclosure activity. Attempts to allow courts to weigh in to cram down minority creditors blocking modification, such as under Chapter 13 bankruptcy, failed to garner sufficient political support in 2009.
<b>Measures</b>	<p>Oct-08 Foreclosure moratorium; Temporary freeze of FX loans</p> <p>Nov-08 Payment smoothing of indexed loans; Third-pillar pension payouts, increase of mortgage interest subsidies</p> <p>Mar-09 Payment smoothing of FX loans</p> <p>Oct-09 Law establishes a framework for decentralized debt restructuring</p> <p>Nov-09 Payment smoothing extended</p> <p>Jun-10 Supreme Court rules on loan indexation</p> <p>Dec-10 <a href="#">Measures</a> to address household debt problems, including: <ul style="list-style-type: none"> <li>Fast-track procedure to adjust mortgage debt to 110 percent LTV</li> <li>Expansion of voluntary debt mitigation framework</li> <li>Interest tax rebate and subsidy</li> </ul> </p> <p>May-14 Government launches new <a href="#">household debt relief program</a></p>	<p>Feb-09 <a href="#">Code of Conduct for Mortgage Arrears</a> (CCMA)</p> <p>Dec-10 <a href="#">Protections extended</a>, including 12 month moratorium on repossession upon default and requiring lenders to establish a Mortgage Arrears Resolution Process; "<a href="#">Justice Dunne ruling</a>" implies repossession under summary proceedings is not available for mortgages prior to 2009</p> <p>Dec-12 <a href="#">Personal Insolvency Reform Act</a> passes</p> <p>Mar-13 Central bank introduces <a href="#">Mortgage Arrears Resolution Targets</a> (MART)</p> <p>May-13 Updated <a href="#">Impairment Provisioning and Disclosure Guidelines</a> released</p> <p>Jun-13 <a href="#">Code of Conduct for Mortgage Arrears</a> modified</p> <p>Jul-13 Barriers to repossession removed by <a href="#">Conveyancing Reform Act</a></p> <p>Sep-13 <a href="#">Insolvency Service</a> starts operating</p> <p>Nov-13 Personal bankruptcy reform becomes effective</p>	<p>Mar-09 Mortgage assistance scheme introduced</p> <p>Mar-12 <a href="#">Protections of mortgagors without resources</a>, including the "Code of Good Practices" and "dación en pago"</p> <p>Nov-12 Strengthening of <a href="#">protections against eviction</a></p> <p>Apr-13 <a href="#">Bank of Spain</a> clarifies criteria for classifying refinanced loans</p> <p>May-13 <a href="#">Mortgagors protections law</a>, including amendments to foreclosure</p>	<p>Aug-07 <a href="#">FHA Secure Program</a> for refinancing subprime ARMs, followed by HOPE NOW's "Teaser Freezer" initiative</p> <p>Oct-08 <a href="#">Housing and Economic Recovery Act</a>: Hope for Homeowners program</p> <p>Feb-09 <a href="#">Homeowner Affordability and Stability Plan</a> announced: <ul style="list-style-type: none"> <li><a href="#">Making Home Affordable</a> (MHA) program, including Home Affordable Refinancing Program (HARP) and Home Affordable Modification Program (HAMP)</li> <li>Homeowner support schemes</li> </ul> </p> <p>May-09 <a href="#">Home Affordable Foreclosure Alternative</a> (HAFA) and Home Price Decline Protection Incentives</p> <p>Mar-10 <a href="#">Principal Reduction Alternatives</a> (PRA) and <a href="#">Unemployment Program</a> (UP)</p> <p>Jun-10 Income verification required for HAMP trials</p> <p>Jul-11 <a href="#">Additional mortgage relief to unemployed homeowners</a> (12 month foreclosure stay)</p> <p>Jan-12 HAMP <a href="#">extended and expanded</a></p> <p>Feb-12 <a href="#">National Mortgage Settlement</a></p> <p>May-13 MHA <a href="#">extended</a> to end 2015</p>

	<b>Iceland</b>	<b>Ireland</b>	<b>Spain</b>	<b>United States</b>
<b>Outcomes</b>	<p>Aggressive bail-in allowed channeling losses to creditors of the failed banks, mostly non-residents. This created space to conservatively provision loans, which later was used for debt relief. More than half of mortgage loans underwent restructuring, while foreclosures remained limited. Cumulative write-offs are estimated at 15 percent of loan principal by end 2011. A second round of debt relief was implemented in 2014, combining an average 13 percent write-down of the principal of inflation-indexed mortgages and a 4½ percent of GDP allowance to divert third-pillar pension contributions to prepay mortgages, estimated to benefit 80 percent of households.</p>	<p>The Irish framework for resolution of mortgage distress could not cope with the crisis, reflecting a disfunctional bankruptcy regime, a lack of lender experience with workouts, and strong political resistance to repossession. The authorities addressed these issues over time, during which mortgage loans in arrears rose to about 20 percent of all mortgages and the stigma of default declined. Mortgage loan workouts started in earnest only in 2013, following the establishment of resolution targets by the central bank, a bottoming of house prices in mid 2012, and once the reforms of the insolvency framework and repossession were completed. However, banks experienced difficulties engaging with some borrowers on restructuring, particularly where arrears had built for years without consequence. At the same time, this lengthy process has deferred resolution into a period of declining unemployment and rising collateral values.</p>	<p>Mortgage default rates were contained by low interest rates, equity buffers, and possibly intra-family support, with family members often serving as loan guarantors, despite high unemployment. Full personal liability for mortgage debt and a credible foreclosure threat likely contributed to low levels of delinquency, but loan refinancing also played a significant role in the workout. Lenders pursued the workout of problem loans in a timely manner, although a large share of refinanced loans did not prove durable. The large overhang in housing supply contributed to a drawn-out adjustment of house prices, which ground to a halt in 2014, the longest lasting house price correction among sample countries.</p>	<p>House prices started stabilizing at end 2010. By 2012, household balance sheets had improved, incomes and consumption rose, and the recovery firmed. More than 10 percent of mortgages were modified. Negative equity fell from around 25 percent in 2010–11 to 11 percent of mortgagees in mid 2014. With about 21 percent of mortgages foreclosed or affected by short sales between 2007 and 2014, the crisis left a notable imprint on American home ownership.</p>

## A. Foreclosure

**Foreclosure was widespread in the US and Spain, while largely absent in Ireland** (Figure 5). In the US, 6.2 million foreclosures have been completed since 2007, representing about 15 percent of current mortgage accounts. Survey data from the National Association of Realtors indicate that an additional 7 percent of mortgagees disposed their homes in short sales. In Spain, about 4.2 percent of mortgages have been foreclosed between 2008 and 2013 (Fuentes *et al.*, 2013). Despite about 20 percent of Irish mortgagees being in arrears at some point, the number of repossession proceedings remained small throughout the crisis and has picked up only recently. Since 2009Q3, banks completed repossessions of only 0.1 percent of mortgage accounts. In addition, 0.3 percent of mortgagees chose to surrender their homes voluntarily. In Iceland, foreclosure affected about 1 percent of mortgage accounts since the start of the crisis to end 2012.



Sources: Central banks; CoreLogic; Fuentes *et al.* (2013); and IMF staff calculations.

1/ Until end 2012.

2/ Time expected between default and recovery from Fitch.

### Foreclosure rates reflect countries' circumstances and policies:

- Ireland.** Legal and regulatory impediments reinforced lenders' hesitance to repossess Irish residential properties. Impediments included the individual repossession moratorium under the CCMA (Box 1) and a legal lacuna blocking banks from using less costly summary proceedings from 2011. In addition, judicial repossession procedures were often lengthy and uncertain. Lenders may also have been influenced by the deep political and popular concern about loss of the family home. However, in response to supervisory resolution targets, banks initiated legal demands against about 4 percent of mortgage accounts in 2014, but completion of these proceedings will likely take time.
- Spain.** Foreclosure procedures were relatively efficient, and foreclosed collateral often fully satisfied lenders' claim as negative equity was less widespread and deep. Lenders transferred foreclosed assets to separate management companies which were required to sell at least 5 percent of their holdings annually. In some cases, lenders provided mortgage-to-rent conversions which allowed families to remain in their homes and reduced the need for foreclosure sales. Besides protections for the most vulnerable, no measures to limit foreclosures were taken at the outset, and the authorities introduced limited protections from foreclosure only in 2012 (Box 1).

- **United States.** Foreclosure duration and cost varied between states, and the process could be significantly shorter in states allowing for nonjudicial foreclosure. Many US states limit lenders' recourse to the collateral, and even in full recourse states lenders often did not pursue a shortfall from foreclosure sales. For loans retained by banks, accounting rules forced lenders to charge off the difference between the principal amount of delinquent and the collateral net of cost to sell after 180 days, thereby limiting incentives to provide forbearance or restructures in hope for recovery. Regulators generally expected banks to sell foreclosed inventory within five years. Federal, state, and local governments tried to restrain the large rise in foreclosures, such as through right-to-cure laws, foreclosure moratoria, and mandatory mediation laws.

### **Box 1. Codes for Borrower Protections in Ireland and Spain**

**Ireland and Spain introduced codes to strengthen borrower protections in response to their crises.** These codes aimed to protect vulnerable borrowers and built on existing consumer protection regulations, such as on loan collection. The code introduced in Ireland at the start of the crisis reflected the central bank's mandate for consumer protection. The "Code of Good Practices" in Spain was introduced midway in the crisis mainly to protect the most vulnerable households.

**In 2009, Ireland introduced the Code of Conduct for Mortgage Arrears (CCMA).** The first version of the [CCMA](#) protected defaulting borrowers from repossession for a period of six months, later extended to 12 months. In January 2011, following an [expert report](#), a new [CCMA](#) became effective that regulated the interaction between borrowers and lenders through a Mortgage Arrears Resolution Process (MARP). The MARP aimed at facilitating agreements on alternative repayment terms and protects borrowers from inappropriate collection practices. For the duration of the MARP, lenders are barred from pursuing repossession. Compliance with the CCMA was supervised by the central bank, although courts have also taken compliance with the CCMA into account during repossession proceedings.

**In 2013, a review addressed serious obstacles to collection and resolution posed by the CCMA:**

- **Contact rules.** The CCMA's limit on unsolicited contacts to three per month was found to unduly constrain banks' ability to engage with borrowers and was abandoned. Instead, the revised CCMA required lenders to develop a contacts policy and record all calls.
- **Cooperation and engagement.** While protections under the CCMA were intended to extend only to cooperating borrowers, a narrow definition of noncooperation allowed stalling tactics by some borrowers. The revised CCMA required meaningful engagement by the borrower, in particular with regard to provision of required information.

**In Spain, the authorities tailored new protections to the most vulnerable.** The authorities extended protections for vulnerable households through two measures. In 2012, the "Code of Good Practices" introduced the option of "dación en pago", under which eligible borrowers are granted a two-year right of tenancy following foreclosure and any deficiency is forgiven. In addition, the authorities passed an emergency decree in late 2012 to introduce a moratorium on evictions for vulnerable homeowners. Emphasizing the importance of maintaining debt servicing discipline, the authorities were careful to restrict the circle of beneficiaries of these measures. To be eligible, households must have an annual income of less than €19,200 and mortgage payments exceeding 50 percent of income.

## B. Forbearance

### **Substantial forbearance mitigated debt distress in the short run yet left many households uncertain about their financial position.**

- **Iceland.** Borrowers with foreign currency denominated loans were eligible for a temporary freeze of the level of debt service payments, with the difference being added to the outstanding loan balance. It is estimated that about two-thirds of borrowers of foreign currency denominated mortgages took advantage of the scheme, representing about 10 percent of households (Ólafsson and Vignisdóttir, 2012). The freeze remained in place for about half a year, although some loans benefitted for longer.
- **Ireland.** Forbearance occurred both implicitly and explicitly. Implicit forbearance resulted from lenders choosing not to initiate debt collection and instead tolerating an accumulation of arrears. Explicit forbearance was also applied, with lenders offering temporary restructuring arrangements such as time-bound payment holidays, interest reductions, or amortization relief. Temporary arrangements which allow only interest payments were common. Interest-only arrangements reduced debt service to particularly low levels for “tracker” mortgages which were mostly originated around the cycle peak and link their interest rate directly to the ECB rate. Amounts forborne were substantial: in the four quarters to mid 2013, payments past due for more than 90 days increased by €0.9 billion (0.6 percent of GDP), often without consequence for delinquent borrowers. Explicit forbearance through temporary arrangements had been granted to 48,000 homeowner mortgages (6.3 percent of accounts) by mid 2012, which reduced debt service by an estimated €0.3 billion (0.2 percent of GDP) per year.
- **Spain.** At end 2013, banks reported 10 percent of mortgage loans as refinanced or restructured. It had been suspected that a portion of refinanced or restructured loans involved “evergreening”, which is akin to forbearance, for instance by rescheduling or capitalizing past due payments (IMF, July 2013). A clarification of loan classification rules by the Bank of Spain in mid 2013 resulted in the reclassification of 13 percent of all refinanced and restructured private sector loans from performing to doubtful.
- **United States.** Some mortgage servicers offered forbearance agreements with a temporary reduction or suspension of mortgage payments. In particular, payment plans amend the scheduled terms and payments in the short- to medium-term in order to return mortgages to a current and performing status. Based on a sample of mortgage servicers reporting to the OCC, payment plans were initiated for a cumulative total of 3.3 million mortgages (14 percent of the current stock) since 2008 (OCC, 2014).

**Forbearance often reflects a preference to “wait and see” to reduce uncertainties, reinforced by country specific constraints.** Hope for a cyclical recovery—in regard of both borrower’s debt service capacity and collateral values—can induce both lenders and borrowers to “wait and see”, especially when lenders’ opportunity costs in terms of forgoing other profitable investments are



low. The preference to “wait and see” is sometimes reinforced by country specific circumstances, such as:

- **Accounting rules.** The incurred loss accounting model under IFRS, which is followed by banks in Iceland, Ireland, and Spain, generally allows for more discretion in determining loans’ accrual status and provisioning than US GAAP (Fratantoni and Moore, 2013). This can induce banks to provision “too little and too late” (Gaston and Song, 2014) and discourage the early workout of distressed loans.
- **Barriers to loan collection.** As discussed, borrower protections—in particular foreclosure moratoria—can limit lenders’ options in pursuing delinquent borrowers. In particular in Ireland, legal barriers to repossession from a 2011 court ruling (“Dunne judgment”) weakened banks’ leverage vis-à-vis delinquent borrowers. In addition, borrower protections such as limits to the number of contacts lenders can make with delinquent borrowers inhibited banks to engage effectively with struggling clients.
- **Evolving legal and policy frameworks.** In Iceland, a framework for household debt restructuring was built up in stages. Successive adjustments elevated borrowers’ expectations of more generous debt relief and reduced their willingness to pursue a settlement. In Ireland, the reform of the personal insolvency framework (Box 2) raised uncertainty. Borrowers, on one hand, hoped that the framework would facilitate more debt relief. Lenders, on the other hand, were unsure about key issues, such as the acceptable levels of household expenditures under resolutions facilitated by the new framework. As a result, both parties were inclined to defer bilateral mortgage workouts until the reforms were completed.
- **Banks’ operational constraints.** In some cases, notably in Ireland, it took significant time for banks to build strategies, capacity, and culture for loan collection, which involved the establishment of call centers, the introduction of software, and the development of loan modification options.

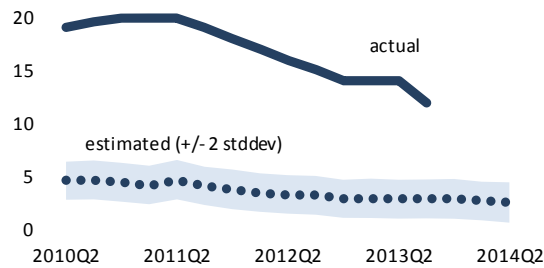
**Forbearance likely contributed to the extent of mortgage arrears accumulation in Iceland and Ireland.** Figure 6 displays the evolution of the share of mortgage loans in arrears compared to a projection based on macroeconomic indicators. Projections are derived from an OLS model calibrated with UK data on mortgage arrears, unemployment, house prices, and household debt service ratios, motivated by the UK’s data availability and largely unchanged resolution framework. Annex I provides technical details. For Iceland, the model is not well specified to project the effect of devaluation that caused the higher than projected level of mortgage arrears, although forbearance and protracted workout also contributed. Results for Ireland show that arrears not only peaked far above projected levels, but also accumulated over a longer period. This result is likely driven by the large cohort of vulnerable borrowers (about half of all mortgages were originated near the peak of the boom between 2005 and 2007), implicit forbearance, and the lack of enforcement action. Projected arrears levels in Spain are mainly driven by the large increase in unemployment, while higher home equity buffers, lenders’ full

recourse, lack of discharge, and timely loan resolution contained the occurrence and accumulation of actual arrears. Results for the US are largely in line with model projections.

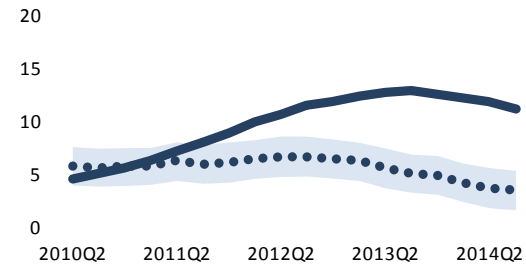
**Figure 6. Actual and Projected Mortgage Arrears >90 days past due**

(Percent)

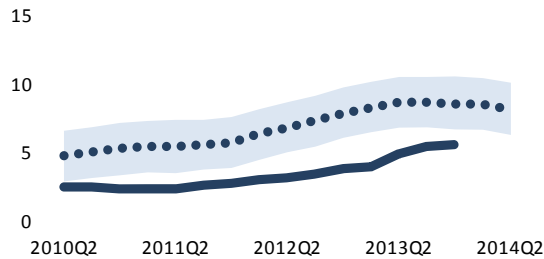
**Iceland**



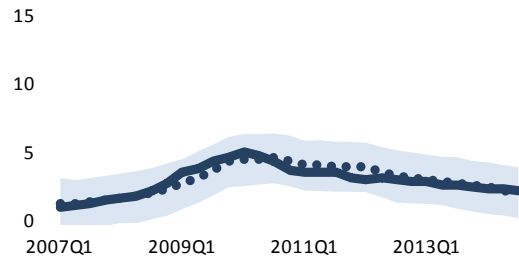
**Ireland**



**Spain**



**USA**



Sources: Country authorities; and IMF staff estimates.

**Box 2. The Personal Insolvency Reforms in Ireland**

**Ireland adopted comprehensive personal insolvency reforms.** Following a [report](#) by the Law Reform Commission, the [Personal Insolvency Act](#) reformed bankruptcy terms and introduced new procedures to address personal debt distress in December 2012. The new arrangements became effective in the second half of 2013 when the [Insolvency Service Ireland](#) opened its doors.

**The reform introduced three new debt resolution processes:**

- **Debt Relief Notices** for small debts of up to €20,000 allow for the discharge of unsecured debt for persons with essentially no income or assets.
- **Debt Settlement Arrangements (DSA)** for unsecured debts provide for the adoption of revised payment arrangements, normally over a five year period, with remaining debts written off. DSAs are broadly comparable to the [Individual Voluntary Agreements](#) in the UK.
- **Personal Insolvency Arrangements (PIA)** for secured debt including mortgages of up to €3 million (or higher if agreed by creditors) and unsecured debt (no limit) provide for the adoption of a revised payment arrangement over a six-to-seven year period.

**Majority creditor approval is required to conclude a DSA or PIA.** Upon application for a DSA or PIA, a debtor will be granted a protective certificate against enforcement actions for a 70-day period (with possible extension). A proposed payment arrangement is then prepared by a personal insolvency practitioner appointed by the debtor. Any arrangement must be approved by both the debtor and a qualified majority of creditors. For the DSA, creditors representing 65 percent of all claims must

approve. For the PIA, two thresholds apply, 65 percent overall as well as more than 50 percent of secured creditors and 50 percent of unsecured creditors. For secured creditors, any difference between loan principal outstanding and collateral value can be classified as unsecured debt, which affects the vote of the unsecured debt class when a mortgage is in significant negative equity.

**The arrangements are administered by the Insolvency Service and approved by courts.** The Insolvency Service of Ireland provides guidance and regulates personal insolvency practitioners. Court approval is required for the granting of the protective certificate and the approval of final arrangements.

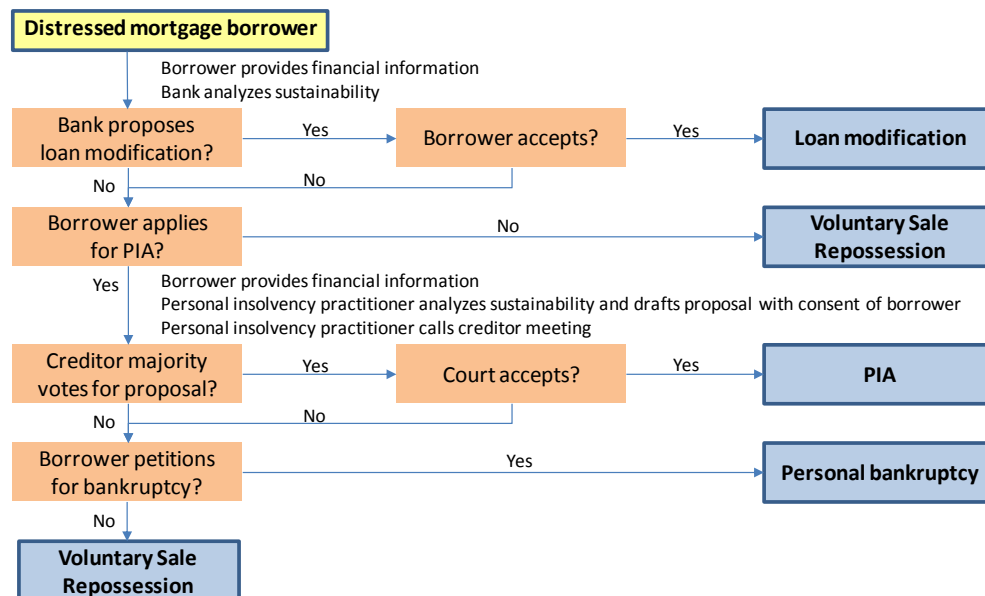
**The PIA is specifically tailored to facilitate resolution of household debt distress involving mortgages alongside other debts.** The aim of the PIA is to resolve any unsecured debt over a period of up to seven years and to restructure secured debt on a sustainable path thereafter. Eligibility for a PIA requires that borrowers cannot meet current debt payments in full and that restructured debt payments are consistent with [guidelines](#) on income and allowable living expenditures. To encourage debtors to adhere to the arrangement, the PIA may only be engaged in once. A 20 year clawback provision provides for sharing of capital gains if the property is sold at a profit.

**The reform also introduced substantial changes to the Bankruptcy Act.** The Bankruptcy Act of 1988 provided for discharge after an onerous 12 year period and was barely used in practice. The 2012 reforms shortened discharge from bankruptcy to three years, with payment plans for up to five years.

**CCMA and personal insolvency reforms created to a two-step framework for the case-by-case workout of home mortgages and other household debt.** The framework is illustrated in a chronological flow chart below. In a first step, lenders and distressed borrowers engage bilaterally to conclude suitable solutions as stipulated by the [CCMA](#). If the bilateral approach does not lead to an agreement, borrowers can apply for a PIA. In case neither leads to an acceptable solution or the borrower is not cooperating, lenders can pursue repossession. The full recourse nature of mortgage loans means that banks can collect any shortfall between outstanding loan amount and collateral value. In this case, borrowers can apply for a DSA, or avail of personal bankruptcy.

### Case-By-Case Workout of Distressed Household Debt in Ireland

(Stylized flow chart for distressed holders of mortgages on principal residences)



### C. Loan Modification

**Countries implemented measures to facilitate loan modifications to varying extent.** In contrast to the generally available schemes for payment smoothing and principal reduction that dominated in Iceland, measures in Ireland, Spain, and the US aimed at facilitating case-by-case renegotiations of distressed loans based on affordability, often by establishing a standard process:

- **Iceland.** Initial take-up of various household debt restructuring schemes was slow, mostly due to expectation of further assistance. Prompted by a June 2010 Supreme Court ruling, the authorities agreed with lenders on a comprehensive package of measures in December 2010, which included offering eligible borrowers a principal reduction to an LTV of 110 percent. In 2014, a new household debt relief program offered an across-the-board 13 percent write-down of the principal of inflation-indexed mortgages.
- **Ireland.** Several initiatives by the central bank, such as the piloting of durable loan modification options in 2012, had little impact on accelerating the number of long term restructures. In 2013, loan restructurings picked up following the introduction of Mortgage Arrears Resolution Targets (MART) that encompassed bilateral negotiations with lenders on long-term loan modifications, Personal Insolvency Arrangements (PIAs), together with the possibility for a loss of ownership through repossession or voluntary surrender.
- **Spain.** At the outset, no measures were taken to promote loan modifications. In 2012, the “Code of Good Practices” was introduced to allow banks to opt-in to a mechanism for out-of-court loan modifications for the most vulnerable borrowers. This mechanism was reformed in 2013 to allow a larger group of borrowers to apply.
- **United States.** Until 2009, loan modification remained infrequent despite efforts by lenders, servicers, and the HOPE NOW alliance. Subsequently, the evolution of the Home Affordable Mortgage Program (HAMP), which included an incentive payment offered to creditors, resulted in a pickup of loan modifications. The HARP and the FHA’s streamlined refinancing program prevented delinquencies by allowing borrowers in negative equity to refinance their loan at lower rates or longer maturities.

#### **Loan modifications have been widely used in this crisis to work out distressed loans**

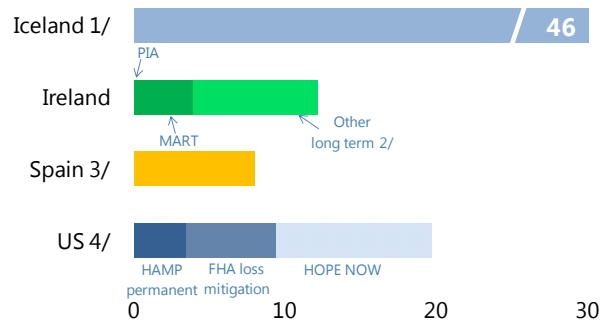
(Figure 7). Available statistics on loan modifications suggest that about 10 percent or more of all mortgage accounts underwent some type of modification or restructuring in each of the four countries. Collating statistics on the number of loan modifications for cross country comparison is hampered by the scarcity of data and the lack of a common definition of loan modification:

- **Iceland.** The Central Bank of Iceland’s Financial Stability Report provides a breakdown of household loans into delinquent loans, loans performing after restructuring, and performing loans without restructuring as of July 2014. No separate breakdown is available for

mortgages. These restructurings include the schemes for payment smoothing and principal reductions to achieve a 110 percent LTV ratio for mortgages.

- Ireland.** Statistics on loan modifications are taken from the Central Bank of Ireland's mortgage arrears statistics which show that 14.5 percent of mortgages on owner occupied homes were restructured as of September 2014. Stripping out restructures which likely constitute temporary arrangements—such as interest-only—yields a lower share of 12.2 percent of all mortgages, as shown in the text figure. These restructures likely cover all long-term solutions concluded under the MART supervisory framework, including a small number of PIAs.

**Figure 7. Loan Modifications**  
(Percent of loans)



Sources: Central banks; ISI; US Treasury; and IMF staff calculations.

1/ Household loans which perform after restructuring.

2/ Selection of restructurings classified as long term.

3/ Mortgage loans reported refinanced or restructured.

4/ Cumulative since April 2009. Categories may overlap.

- Spain.** As mentioned before, the Bank of Spain's Financial Stability Report states that banks classified 8 percent of mortgage loans as refinanced or restructured in mid 2014, down from 10 percent at end 2013. About half of all refinanced or restructured private sector loans were categorized as performing, which requires objective and verifiable evidence of recovery. It is not known what share of these performing private sector loans were mortgages.
- United States.** According to the Housing Scorecard released by the Department of Housing and Urban Development, almost 10 percent of all mortgage loans have been modified under HAMP or FHA schemes and 10 percent of loans under HOPE NOW since April 2009, although these categories may overlap. In aggregate, these modifications are estimated to reduce borrowers' loan payments by \$6.2 billion (0.04 percent of GDP) per year. Separately, HARP enabled the refinancing of about 8 percent of loans, allowing borrowers in negative equity to benefit from lower mortgage rates.

**Some schemes specify that modified loan terms must be consistent with borrowers' capacity to pay.** For example, in the US, HAMP provided incentives to lenders to limit debt service to a certain portion of income. In Ireland, proposed terms for PIAs must allow sufficient income to cover essential living expenditures.

- HAMP.** HAMP guidelines required the lender to first reduce payments on eligible first-lien loans to an amount representing no greater than a 38 percent payment to current income ratio. The government then matched further reductions in monthly payments with the lender dollar-for-dollar to achieve a 31 percent ratio. Prior to HAMP, re-default rates (after two years) were

initially high at 63 percent for modifications concluded in 2008. By 2014, the same metric declined to 20 percent for modifications concluded in 2012 as the economy recovered and modifications increasingly focused on borrowers' ability to sustain payments over time (OCC, 2014). A report by the Special Inspector General found that modifications receiving the least reduction in payment or debt as well as underwater mortgages and subprime borrowers were most at risk of re-default (SIGTARP, 2013).

- **PIA.** The Insolvency Service provided detailed guidelines for reasonable living expenditures, which varied with household size and provided flexible allowances for transport, childcare, and special circumstances, such as related to healthcare. Borrowers were eligible for a PIA if their debt service obligations exceeded their available income after deduction of reasonable living expenditures. While borrowers were expected to align their living expenditures with the guidelines, agreed insolvency arrangements reduced monthly debt service payments accordingly. For the small number of [arrangements concluded](#) until Q3 2014, median debt write-offs amounted to 17 percent for secured debt and 88 percent for unsecured debt.

**Achieving high participation of eligible borrowers in loan modification schemes was often a challenge.** Experience showed that distressed borrowers were often reluctant to enter into renegotiations with lenders. Obstacles included:

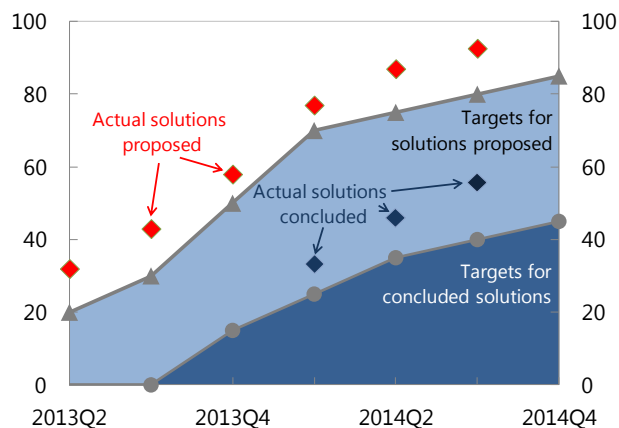
- **Entry barriers.** In Ireland, extensive financial self-reporting via 10-page standard financial statements posed an entry barrier, at least for some less financially literate borrowers. Provision of debt counseling and advisory services, in part paid for by lenders, helped to overcome this problem. Also, high initiation fees for PIAs deterred some borrowers, in particular given the risk that creditors veto the proposed arrangements.
- **Expectation uncertainty.** As mentioned before, borrowers displayed a preference to delay decisions, particularly in Iceland and Ireland. In Iceland, a political debate about further debt relief likely raised borrowers' expectations and held back their applications for a newly introduced voluntary resolution scheme. In Ireland, borrowers were reluctant to be early users of the new insolvency framework. To reduce uncertainty about the new framework, the Insolvency Service Ireland published comprehensive information, such as detailed case studies and quarterly reports on the number of cases processed and debt reduction achieved.

**Some countries applied supervisory or regulatory pressure to accelerate workouts.** In 2011–12, the Central Bank of Ireland engaged with banks to enhance capacities for loan collection and resolution, such as through a Distressed Credit Operational Review (carried out by BlackRock Solutions) and the Mortgage Arrears Resolution Strategy. In March 2013, frustrated with mounting arrears and low extent of durable workouts, the central bank introduced a supervisory framework—the already mentioned [Mortgage Arrears Resolution Targets](#) (MART)—which defined quarterly targets for the six main mortgage lenders to propose and conclude workout solutions. Targets were set on a rolling basis, usually two quarters in advance (Figure 8). Specification and monitoring of the targets absorbed significant resources, including for audits to

assess whether a modification qualified as durable based on central bank guidelines on sustainable resolution. Pressure to conclude modifications was also applied in the US, where the administration asked servicers to ramp up implementation to a cumulative 500,000 trial modifications as part of a “[Mortgage Modification Conversion Drive](#)” in November 2009. Servicers were required to submit a schedule demonstrating their plans to reach a decision on loan modifications and were subject to monetary penalties and sanctions for failing to meet agreed performance obligations. In 2012, servicers committed to provide \$20 billion of relief to borrowers, including \$10 billion of principal reduction, as part of the [mortgage servicing settlement](#).

**Figure 8. Resolution Targets and Outturns**

(Percent of cases >90 days past due 1/)



Source: Central Bank of Ireland.

1/ ACC Bank, AIB, BoI, KBC Bank Ireland, PTSB, and Ulster Bank.

**This section offers some preliminary conclusions.** First, differences in starting conditions and country specific situations help to explain the different extent of debt distress. Likewise, the experience suggests that there is no “one-size-fits-all” approach and that policy formulation should take into account important country specific factors. A stronger recovery from crises generally helps mortgage workouts and hence affects the perceived success of policy initiatives. Second, the analysis suggests that some form of forbearance was present in all countries, although differing in its scale and nature. In some cases, forbearance likely affected borrower behavior. Third, loan modification was a frequently used solution for distressed loans, partly facilitated by policy initiatives. This seems to reflect a growing consensus that modifying mortgage loans has economic or social benefits that outweigh its cost vis-à-vis foreclosures, at least in times of crisis.

### III. TIME TO MODIFY? TRADE-OFFS AND POLICIES

**Loan modification can offer a mutually beneficial way to resolve debt distress.** Foreclosure typically destroys substantial value via legal and transaction costs, neglect of property during the process, and relocation cost, among other factors. Avoiding deadweight losses from foreclosure provides incentives for debtors and creditors to look for alternative solutions, such as loan modification at terms that lower the cost to both parties. However, asymmetric information and coordination problems can hinder loan renegotiation and prevent these benefits being realized. Policies that facilitate loan modification by overcoming these obstacles, while protecting debt service discipline, are therefore welfare enhancing.

**Achieving the optimal extent of mortgage modification can warrant a policy response tailored to crises.** When crises require resolving large scale mortgage distress, avoiding

excessive foreclosure can prevent significant negative externalities on property prices and the economic recovery. In crises, timing plays an important role. At the height of the crisis, it may be beneficial for borrowers and lenders to “wait and see”, while during the recovery phase, non-performing loans should be resolved to help restore financial intermediation and growth. Policies to promote the right mix of forbearance, modification, and foreclosure must therefore reflect the severity of debt distress and the state of the recovery.

**The adoption of exceptional policies in systemic crises should be executed in a manner that avoids undermining sound intermediation in normal times.** Housing crises can develop in a manner that makes it difficult to distinguish a “soft landing” from the onset of a systemic crisis. At the start of a cyclical downswing, monetary policy and social safety nets provide a broad first line of defense. As a housing crisis manifests, a stronger policy response may be appropriate. These crisis policies must balance their benefits for resolving crisis distress and containing downturns against their possible long term costs. For instance, while a case can be made for a well-targeted foreclosure moratorium when a crisis strikes, if the moratorium stays in place for too long, it may undermine debt service discipline and lead to lower credit supply and higher mortgage rates in the long term.

#### A. Considering the Effects of Foreclosure

**The right to foreclose on delinquent mortgages has important benefits.** Lenders’ ability to seize the underlying property following default decreases lenders’ expected loan losses and deters opportunistic behavior of borrowers. Strong foreclosure rights and their enforcement are therefore positively associated with the availability and low cost of mortgage finance (Clauretie and Herzog, 1990; Pence, 2006).

**However, large scale foreclosures carry negative price externalities which can trigger more defaults.** Empirical evidence largely supports the notion that widespread foreclosure sales depress house prices. As borrowers’ perceived negative equity is an important contributor to default, additional house price declines from foreclosures can trigger further defaults. The effect on house prices mainly works through two channels:

- **Foreclosure discounts.** Foreclosed homes often sell at a significant discount due to neglected maintenance and a “firesale” mark down if disposed quickly in an illiquid market. In the US, this discount is estimated to amount to 28 percent (Campbell *et al.*, 2011). Given real estate turnover is lower than normal in housing downturns, distressed sales can make up a significant portion of the market—between 27 and 40 percent in the US in 2008—and weigh on house price indices (Case, 2008).
- **Price spillovers.** Foreclosure sales can have broader spillover effects on house prices. Distressed sales in the US are associated with price discounts, of up to 9 percent, on other non-distressed sales in the nearby neighborhood (Immergluck and Smith, 2006a; Harding *et*



*al.*, 2008, Lin *et al.*, 2009). These effects are found to be persistent and more pronounced during downturns. Also, foreclosed homeowners usually turn to rental housing which reduces demand for home purchases (Mian *et al.*, 2014; Molloy and Shan, 2011).

**Moreover, foreclosures have social costs.** Besides price distortions, foreclosures are associated with social cost from families relocating, such as worse educational achievements (Nelson *et al.*, 2011). Unoccupied foreclosed homes can also attract crime (Immergluck and Smith, 2006b).

**At the same time, limiting foreclosure to minimize price disruptions and social effects could prolong adjustment.** While limiting or slowing down foreclosures may help contain house price undershooting, it could delay a necessary price adjustment. Slowing the conclusion of foreclosure procedures imposes additional cost from the neglect of homes awaiting foreclosure (Kobie and Lee, 2010; Gerardi *et al.*, 2012). Fratantoni and Moore (2013) and Gerardi *et al.* (2013) argue that US measures such as right-to-cure laws, foreclosure moratoria, and mandatory mediation laws slowed foreclosure procedures but did not reduce the ultimate number of foreclosures completed.

**While lenders are unlikely to fully internalize these costs of foreclosure, they may change their loan collection practices in crises.** Lenders may prefer to delay or avoid the initiation of foreclosure proceedings in a systemic housing crisis reflecting the following factors:

- **Collateral recovery value.** First, foreclosure may result in a shortfall of the collateral value net of foreclosure cost vis-à-vis the outstanding loan principal. Even in full recourse systems, this shortfall is difficult to collect and is often written off. Second, the recovery value is uncertain, particularly in the midst of crises. If foreclosed properties are disposed quickly, proceeds are likely cut by a firesale discount. Retaining foreclosed houses, however, involves costs and operational risks from managing the properties. Third, administrative and personnel outlays for handling foreclosure cases can be high. Posner and Zingales (2009) find that foreclosure cost range between 10 and 30 percent of the collateral value in the US.
- **Option value.** A completed foreclosure cannot be reversed. By holding a loan against a deed, lenders have first a claim on the mortgagee's payments and second a claim on the collateral. Foreclosing implies forgoing the former, which may hold better profitability prospects than a foreclosed home, depending on the outlook for household incomes and house prices.
- **Regulatory incentives.** Regulations influence lenders' foreclosure decisions. For instance, Fratantoni and Moore (2013) note that under IFRS, interest accrual into bank revenues is not necessarily suspended even when the loan is delinquent, providing an accounting incentive for banks to keep the loans on their balance sheet. In contrast, US GAAP has a strict rules-based non-accrual treatment for loans 90 days or longer past due, except when in collection.

**A foreclosure moratorium helps to reduce negative externalities but creates incentives for borrowers to default.** A foreclosure moratorium provides borrowers more time to self-cure and introduces a possible circuit-breaker in downward house price spirals. A moratorium also has the

social benefit of shielding against homelessness, in particular if social housing supply is inadequate. However, delaying foreclosure can also provide a free riding incentive. For the US, where some states prolonged the foreclosure process, Zhu and Pace (2011) and López-Vicente (2013) find that expected foreclosure delay is associated with higher default rates. Also, foreclosure moratoria could be politically difficult to remove. As pointed out by Gerardi *et al.* (2013), these considerations suggest that individual assessments by lenders, which are likely more targeted, are preferable over a blanket moratorium.

**A foreclosure tax could be introduced to incentivize alternatives to foreclosure.** A foreclosure tax levied on lenders (without recourse to the delinquent borrower) would make foreclosure more costly and help reduce foreclosure activity. Taxation would be more efficient than making foreclosure procedures more lengthy. Given the broader benefits of foreclosure, such tax should be limited to crisis periods when the negative externalities of large scale foreclosures are strong.

## B. Providing Breathing Space with Temporary Forbearance

**Providing distressed households temporary forbearance in crisis times can help moderate downturns and improve resolution outcomes:**

- **Temporary shocks.** Some borrowers may have suffered only a temporary shock and will be able to resume debt service. Temporary relief from debt service pressures can reduce the crisis-related distress of households and serve as a circuit breaker for the vicious cycle caused by debt overhang.
- **Prolonged time window for self-cure.** A significant part of borrowers—about one quarter based on US experience—succeed in catching up on arrears without requiring a significant modification of their repayment terms in the long run. Based on experience by Freddie Mac, Cutts and Merrill (2008) find that the “sweet spot” for self-cure in normal times is about one year. Given a recovery from crisis is often drawn out, crisis conditions may justify a longer time window for self-cure than in normal times. However, forbearance should not be extended in cases where a turnaround is unlikely.
- **Cushioning household consumption.** For households under strain, temporary forbearance that lowers their debt service payments in line with current affordability levels will support disposable incomes and reduce uncertainties, potentially raising consumption. Lydon (2013) finds that Irish households with debt problems spend 18 percent less on consumption controlling for other characteristics, though other factors may also be at play. Time bound relief through temporary restructuring allows households to more smoothly adjust their spending patterns, helping to dampen multiplier effects from other shocks to aggregate demand, such as falling house prices. However, excessive or prolonged forbearance may defer needed adjustment, which can unduly delay the recovery and cause economic distortions.

- **Workout choices.** More efficient workout choices can be made once economic conditions begin to stabilize. Granting time to borrowers in default until their debt service capacity and collateral values have stabilized helps improve lenders' decision making on more permanent workout options. For instance, the presence of negative equity greatly affects lenders' choice between loan modification and foreclosure. House prices, however, may have undershot at the height of the crisis when markets dry up, but typically rebound during the recovery phase. Calibrating loan modification offers also becomes easier when economic conditions have stabilized. While the downturn is ongoing, modified loan terms could turn out too onerous, leading to re-defaults which breed uncertainty and increase renegotiation costs.

**The benefits of temporary forbearance are partly offset by the costs of free riding and prolonged uncertainty:**

- **Free riding.** Solvent borrowers may opportunistically exploit a forbearance option, eroding lenders' cash flow and possibly endangering financial stability. Also, temporary relief by one mortgage lender could be exploited to the benefit of other lenders to the same client.
- **Uncertainty.** While reducing immediate pressures, temporary forbearance leaves residual uncertainty about the long term solution. Such uncertainty hanging over borrowers can lead to reduced upkeep of the house (Melzer, 2010) and distort economic decisions such as relocation for better employment prospects. Uncertainties around the value of loans in forbearance can also weaken banks' access to cheap funding, among other effects.
- **Arrears and NPL accumulation.** Excessive or prolonged forbearance may defer needed adjustment and can lead to a rise in arrears in ways which undermines the capacity of banks to lend. A lack of credit demand during a crisis may limit any repercussion at first. However, as the economy begins to recover, a large stock of accumulated non-performing loans could delay the restoration of financial intermediation.

**Appropriate safeguards when applying temporary forbearance are needed to keep these distortions in check.** Lenders' due diligence of a household's debt affordability and appropriate entry in central credit registers should be the first line of defense against free riders. An explicit agreement on the terms and duration of a temporary forbearance arrangement also alleviates uncertainty, and thus is preferable over implicit or informal types of forbearance. However, developing operational capacity to conduct due diligence and implement formal forbearance agreements may take time, rendering forbearance less suitable as crisis measure.

**The above considerations suggest that selective and time-bound forbearance arrangements can benefit also lenders and the economy.** Lenders have incentives to provide forbearance expecting that economic conditions improve over time (ESRB, 2012). Lenders also have incentives to implement explicit forbearance arrangements to maintain a customer relationship and enable a more permanent workout. These incentives could be supported by policies. For example, impairment accounting and reporting as well as taxation of debt relief could be adjusted temporarily during systemic crises for formal forbearance arrangements.

### C. Maximizing Recovery Through Modification

**Loan modification can offer a higher net present value than foreclosure in some cases.**

Case-by-case loan modifications amend the original loan terms by reducing interest, altering amortization and extending maturity consistent with the expected debt servicing capacity of the borrower. Loan modifications can also include a partial reduction in principal. Lenders may be able to realize a higher net present value from loan modification, taking into account the cost of renegotiation and risk of re-default, than from a foreclosure sale which is costly and may be insufficient to repay the outstanding principal.

**Borrower free riding, creditor coordination, and balance sheet implications reduce lenders' incentives to offer loan modification.** First, lenders may avoid loan modifications as these could be seen as signaling all borrowers to renegotiate instead of cutting expenditures or augmenting income to avoid foreclosure (Riddiough and Wyatt, 1994). Second, in cases where significant amounts are owed to several creditors, coordination problems may result in renegotiation costs that exceed the benefits of achieving a loan modification. Third, burdening banks' books with modified loans could be an obstacle for attracting cheap funding and growing new business.

**Free riding can be contained by setting appropriately tight eligibility criteria, robust verification, and reasonable access cost for loan modifications:**

- **Eligibility.** Access to loan modifications can be limited to households subject to some measure of distress or hardship. If the modification scheme is implemented during the recovery phase, access could be restricted to borrowers already in distress to avoid influencing future borrower behavior. The calibration of eligibility criteria requires a fine balance between containing free riding, minimizing the re-default risk, influencing consumption behavior, and loan resolution cost.
- **Verification.** Rigorous screening of borrower's applications can help eliminate cases of abuse. Lenders need to verify statements of incomes and expenditures from borrowers, and penalties could be applied for misreporting. However, information collection and verification are costly, and total information cost must be weighed against its benefits.
- **Initiation fees.** Reasonable upfront fees can serve as signaling device, possibly deterring borrowers at the margin of debt distress from renegotiating. However, the deterring effect must be balanced with the risk that eligible households are excluded from the scheme. Fees charged upfront could be reimbursed through the terms of the deal once successfully concluded. For example, in Ireland, the initial cost charged by the personal insolvency practitioner are capitalized as unsecured debt and included in the settlement of a PIA.

**Creditor coordination problems can be best resolved through a complementary statutory approach.** Household debt is typically dominated by a mortgage loan on the primary property, but there are often also second liens or high balances of unsecured credit card debt or consumer

loans. In addition, there may be unpaid taxes or social security contributions which can constitute a priority claim. In these cases, a modification of the mortgage loan can be insufficient to restore lenders' debt affordability. Instead, both mortgage and other debts need to be modified or partially written off which may create difficult coordination problems among different claimants. As discussed in Section II, some countries have therefore put in place a statutory approach that can bind all creditors. In Ireland, a PIA requires the consent of a supermajority of secured and unsecured creditors and is subject to court review. Alternatively, under bankruptcy all unsecured debt is discharged after three years whereas mortgage lenders can choose to stay outside bankruptcy. In the US, Chapter 13 of the Bankruptcy Code provides for a court-administered adjustment of all debts while borrowers keep their property and cure delinquent mortgage payments over time. Supervisors can also promote the adoption of protocols among lenders to speed up coordination. In Iceland, for example, a sector wide agreement on a bank-administered scheme provides that the collateralized portion of a mortgage is serviced in full while other debts are canceled after three years (IMF, 2012).

**Sound re-underwriting standards should prevent credit misallocation.** Modifying loans has opportunity costs by binding capital and liquidity which cannot be used for lending to other profitable projects. However, crises dampen credit demand and elevate credit risks across the economy, suggesting opportunity costs of loan modifications are lower at least temporarily. From a supervisory point of view, loan modification is only problematic if seen as disguising bad loans or delaying unavoidable write-downs (ESRB, 2012).

**Innovative forms of loan modification arrangements can also help to overcome obstacles to loan modification** (Table 2). For instance, resuming debt payments is often a challenge for long term delinquent borrowers, leading to repeated re-defaults. To address this problem, lenders often find it useful to withhold a permanent modification until the successful completion of a trial modification. Also, a clause for sharing improved debt service capacity leaves an incentive for borrowers to increase income or reduce expenditure, while reducing the incentive for lenders to defer a permanent loan modification in hope of recovery. Empirical evidence from recent mortgage crises suggests that besides affordability, negative equity is often a trigger for borrowers to cease debt service (Ghent and Kudlyak, 2011; McCarthy, 2014). Concepts such as split mortgages or shared appreciation schemes resolve borrowers' concerns about servicing underwater mortgages while allowing lenders to benefit from a recovery in house values. However, without a reduction in loan principal some borrowers may still feel strained by debt. Thus, modifications that aim primarily at making debt service affordable may fail to fully address, or possibly even worsen the effects of debt overhang from high loan principal.

**Table 2. Examples of Innovative Modification Options**

<b>Trial modification</b>	A trial period allows borrowers to showcase their debt service commitment and provides time to further calibrate the efficiency of the loan modification terms, in particular when the recovery is ongoing. In the US, HAMP requires borrowers to enter into a 90-day Trial Period Plan, during which a Net Present Value test is carried out to determine whether the borrower can be offered a permanent loan modification.
<b>Split mortgage</b>	A split mortgage divides the original principal into a part that continues to be serviced in full and a warehoused part that falls due at a later time. The warehoused part may be charged interest. At maturity, this portion may be refinanced, repaid if borrower circumstances allow, paid off from the sale of the home, or written off.
<b>Shared appreciation</b>	A shared appreciation modification reduces the outstanding balance on a mortgage until the borrower is no longer underwater, while entitling the lender to a portion of any home price gain once the home is sold.
<b>Earned principal forgiveness</b>	Arrears or principal forgiveness necessary to ensure long term sustainability may be granted to borrowers that remain in good standing on their mortgage payments. In Ireland and the US, earned principal forgiveness schemes forebear interest on a portion of the loan which may subsequently be forgiven if the borrowers remain current on all debt service obligations.
<b>Negative equity transfer</b>	Products allowing the transfer of negative equity to a new mortgage give mortgagees in negative equity the opportunity to benefit from refinancing at lower rates or move to smaller homes, which may improve their overall debt servicing capacity.

Source: IMF staff.

**Regulatory and tax measures can incentivize loan modifications.** Measures can include:

- **Prudential and accounting rules.** Adjustments to risk weights, provisioning requirements and accounting rules could encourage banks to modify loans. For example, reducing risk weights and provisioning for long term loans could encourage maturity extension modifications. Where risk weights and provisioning requirements are linked to LTV and debt service-to-income ratios, modified loans could be allowed to benefit from lower risk weights and provisioning requirements reflecting the improvement in these ratios. Requiring performing second liens and other loans of delinquent mortgage borrowers to be re-classified could incentivize restructuring, especially in multi-creditor situations.
- **Taxation.** Debt relief granted to borrowers is often taxed as income. The borrower may not be able to afford this new tax liability which can only be handled through bankruptcy. Easing or eliminating the taxation of debt relief—at least as a temporary crisis measure and accompanied by safeguards to limit its abuse—could facilitate debt restructuring. Tight limits on the deductibility of impairment losses could be relaxed temporarily to incentivize loan workouts. Tax measures could also make foreclosure more costly and promote foreclosure alternatives, for example by reducing transfer taxes for mortgage-to-rent conversions.
- **Subsidies.** Subsidizing loan counseling has been found to improve the likelihood of cures (Collins *et al.*, 2011). In the US, servicers receive incentive payments for completed trial

modifications, and the government augments debt relief granted in HAMP-qualifying modifications to reduce the debt service-to-income ratio from 38 to 31 percent.

- **Funding for modified loans.** Modified loans could remain eligible collateral for cheap central bank funding. Lenders could receive access to special funding sources or other exemptions to offset the capital and carry cost from modifying loans.
- **Obstacles from securitization.** A careful review of rules on securitization may facilitate loan modification in markets where securitization is common. Particularly in the US, securitization rules and associated rules on accounting and taxation have been found to discourage or obstruct loan modification (Adelino *et al.*, 2009; Eggert, 2007; Piskorski *et al.*, 2010).
- **Supervisory monitoring and guidance.** Supervisors can play an active role by closely monitoring and reporting on lenders' workout capacities and outcomes, such as Ireland's Mortgage Arrears Resolution Targets framework.

**Loan modifications are most effectively deployed during the recovery phase, following on from temporary forbearance arrangements.** Determining durable terms for loan modifications is more difficult while crisis-induced risks to incomes and house prices are still elevated. Re-default rates in the US dropped significantly as soon as the recovery took hold, although this may partly be driven by an increased focus on improving borrowers' debt service sustainability and more generous modification terms. Free riding and coordination problems may also become less pressing during the recovery as borrowers' financial situation improves and lenders have restored some loss absorption capacity. Resolving a mortgage crisis through case-by-case loan modification therefore dovetails well with formal forbearance arrangements (which can be transferred into a trial modification) as well as foreclosure prevention that diminishes the risk of house price undershooting. However, securing the collaboration of borrowers requires that foreclosure remains a resolution option throughout the entire loan workout phase.

#### **D. Reducing Distress Through Across-the-board Debt Relief**

**Across-the-board debt relief can mitigate debt overhang more quickly and broadly.** Across-the-board debt relief is defined as debt reduction for a broad cohort of households, without particular regard to their individual circumstances. The primary objective of debt relief is to improve the overall solvency of the household sector to contain negative feedback cycles from debt overhang and boost consumption. By easing negative housing equity, debt relief also reduces default incentives and neglected maintenance. Given its less complicated design, debt relief initiatives can be developed and implemented more quickly than, for instance, a case-by-case loan modification framework.

**However, debt relief is costly and poorly targeted.** A broad-based reduction in debt overhang likely requires substantial debt relief to achieve a notable effect on consumption. Summers (2014)

estimates that \$1 spent on debt relief increases consumption by only \$0.15 in the US. Across-the-board debt reduction is not directly targeting debt servicing difficulties of individual households, and may prove unnecessary in most cases but insufficient in many others.

**Debt relief could endanger financial stability and damage credit supply in the long run.** If the required write-down exceeds lenders' loss absorption capacity, debt relief could trigger financial stability risks. Well designed debt relief programs may therefore provide for government support (Laeven and Laryea, 2009). Debt relief premised on shifting the burden of debt write-downs to lenders would likely require intrusive administrative or legal measures, which in turn could damage future financial intermediation.

#### IV. CONCLUSION

**Debt overhang in the aftermath of a systemic housing crisis can cause a weak and protracted recovery.** The effects of debt overhang from excessive debt payment burdens or declines in household wealth can create negative feedback effects that hamper the recovery and increase the cost of a crisis. As in other downturns, monetary policy and social safety nets provide a first line of defense. In addition, policies that temporarily allow forbearance of lenders vis-à-vis borrowers and facilitate the modification of distressed mortgages can help to contain the undershooting of house prices by reducing the extent of foreclosure and associated deadweight losses and social costs. Systemic crises can affect the trade-offs involved in these policy choices and warrant policies that deviate from "normal" times. However, different country circumstances suggest there cannot be a "one-size-fits-all" approach, and policy formulation should take into account important country specific factors as well as the stage of the recovery.

**Temporary forbearance offers breathing space during a crisis, but should be selective and time-bound.** Forbearance can reduce household financial distress in the short run, helping households to adjust their consumption more smoothly. However, temporary forbearance can induce free riding and should only be considered in cases of sufficiently strong prospects for a recovery of the borrower's debt service capacity. While forbearance can help to act as a circuit breaker at the peak of the crisis, it is important that lenders remain selective in granting forbearance and reach formal forbearance agreements in order to avoid an erosion of the debt service culture and to ensure that borrowers remain engaged. Temporary forbearance can also tie in with loan modification by serving as a "trial modification" and bridging a period of elevated uncertainty about future incomes and house prices.

**Systemic housing crises can tilt workout choices from foreclosure towards loan modification.** Foreclosures are costly and can have negative externalities on house prices. Negative equity and prospects for the recovery of borrowers' income suggest that loan modification becomes a net present value efficient solution for a larger share of delinquent borrowers. However, renegotiation cost and other obstacles often obstruct loan modification.



**Policies can help to facilitate loan modification.** Frameworks for orderly debt renegotiation in form of a code of conduct for lenders dealing with distressed borrowers, together with an efficient statutory framework for personal insolvency, can shape expectations and improve coordination, thereby facilitating timely loan modification. Prudential policies can set appropriate incentives to encourage loan modifications and facilitate the use of innovative modification techniques. A temporary tax exemption could help to enable loan principal relief. Depending on the availability of fiscal resources, support could be provided for mortgage counseling and targeted incentive payments could promote loan modifications. However, experience from Ireland and the US shows that even with such policies, a significant number of mortgages can remain unsustainable and require foreclosure.

**Efficient foreclosure procedures provide a resolution of last resort and an important incentive for constructive borrower behavior.** In cases where constructive cooperation between borrowers and lenders breaks down, or where no sustainable loan modification would be net present value optimal, foreclosure must remain as last resort. Delays in foreclosure procedures have been found to increase defaults and overall workout costs. Instead, a temporary increase in foreclosure costs through fees or taxes could reduce lenders' reliance on foreclosure as workout tool. To avoid a deterioration of credit service culture, protections from foreclosure should only be extended to cases where other solutions are likely sustainable (with exceptions for hardship cases), and a foreclosure threat needs to remain present to deter strategic borrower behavior.

**Across-the-board debt relief is costly and may require intrusive government intervention.** Across-the-board debt relief is sometimes considered as crisis measure as it can be implemented quickly and provides immediate relief to many mortgagees. However, the macroeconomic benefit of a broad-based debt reduction tends to be small relative to its cost, and blanket debt reductions are not well targeted to address debt servicing difficulties. Implementing across-the-board debt relief can also have negative ramifications for the supply of mortgage credit in the long run.

## ANNEX I. ESTIMATING MORTGAGE ARREARS USING MACROECONOMIC INDICATORS

**Data on mortgage arrears in the UK span several decades, providing a suitable time series for estimating macroeconomic determinants of arrears.** The relatively short time series of mortgage arrears available for Iceland, Ireland, Spain or the US limits the robustness of estimating country specific models. For the UK, however, detailed statistics on mortgage arrears are available from the Council of Mortgage Lenders starting in 1970. Also, the UK has in place a well tested framework for resolving arrears that has not undergone significant changes since 1986.

**Using UK data, the level of mortgage arrears is regressed on unemployment, house prices, and debt service ratios.** The sample period for mortgage arrears starts in 1987 and encompasses two housing cycles. Determinants of mortgage defaults include variables that are related to households' willingness and ability to pay, following earlier empirical studies (Breedon and Joyce, 1993; Whitley *et al.*, 2004). Households' willingness to pay is proxied by changes of nominal house prices which affect housing wealth and negative equity. Ability to pay is proxied by the unemployment rate, given that unemployment often triggers debt distress, and the ratio of total debt service over income.

**This parsimonious specification yields a reasonable explanatory power and robustness.** The dependent variable is the share of UK mortgages more than three months past due at a quarterly frequency, using linear interpolation for semiannual arrears data prior to 2008. As explained above, the set of independent variables include: (i) the annual percentage change in the nominal house prices index (dHP); (ii) the unemployment rate (UE), measured as difference to its long term average; and (iii) the debt service ratio (DSR) based on an average sized mortgage loan with 20 years remaining maturity at the current mortgage interest rate, expressed in percent of average household income. The regression is specified similar to Breedon and Joyce (1993) to describe long run arrears dynamics:

$$\begin{aligned} \text{Arrears} = & -1.91 - 0.068dHP + 0.49UE + 0.046DSR \\ & [0.43] \quad [0.010] \quad [0.049] \quad [0.015] \end{aligned}$$

Independent variables are lagged by two quarters. Coefficients are significantly different from zero and with the expected sign, although the debt service coefficient is small relative to the variance of observed debt service ratios. The specification achieves an adjusted  $R^2$  of 0.65. Alternative specifications, such as using logs, yield broadly similar results.

**The estimated coefficients are used to project arrears levels in Iceland, Ireland, Spain, and the US.** This relative analysis attempts to compare arrears levels between countries while controlling for some macroeconomic determinants. Resulting differences between observed and projected arrears levels could suggest different sensitivities to macroeconomic drivers, such as fewer defaults in response to house price slumps in jurisdictions with full recourse. Differences could also be explained by unobserved factors, such as the duration or cost of foreclosure procedures, or the distribution of debt and the impact of macroeconomic shocks across households.

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