

Stefan Gerlach: Macro prudential policy in Ireland

Address by Mr Stefan Gerlach, Deputy Governor of the Central Bank of Ireland, to the ESRI Conference on Economic Renewal “Financial Stability after the Crisis”, Dublin, 29 February 2012.

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1. Introduction

I am delighted to be here this morning. Since the ESRI was established in 1960, it has been a major contributor to the debate on a wide range of economic issues facing Ireland. This conference, entitled “Financial Stability after the Crisis,” is yet another of a long series of such events that focus on the policy questions of the day.

Today I will talk about “Macro prudential policy in Ireland.” Unfortunately, recent financial sector developments across the world have shown the serious consequences of macro prudential policy failures. Thus, there is little doubt that, in Ireland and elsewhere, much attention must and will be paid in the future to ensuring that macro prudential frameworks are effective so that we can avoid events such as a repetition of the housing bubble, the bursting of which has had such devastating consequences here in Ireland.

I should say from the outset that while the question of how to design macro prudential policy has been increasingly prominent in the public debate; it remains an admittedly arcane field of economic policy. My talk this morning I hope will remove some of the mystique surrounding this topic and help trigger more public discussion about how best it can be pursued.

2. The macro prudential policy framework

In the last 20 years or so, it has become widely recognised that in order to conduct monetary policy well, it is essential that there is clarity about the framework of policy. To my mind, clarity of the framework is equally important for effective macro prudential policy. It is therefore natural to start my talk by reviewing it.

The framework consists of four parts:

1. The goal or objective of macro prudential policy.
2. The indicators policy makers will use to judge if systemic risk is present.
3. The policy instruments that are available to deal with these risks.
4. The decision-making procedures used to set policy.

In my discussion today, I will follow this structure. I will also say a few words comparing monetary and macro prudential policy, since they are closely related but distinct policies. Nevertheless, I will argue, they should not be thought of as close substitutes.

2.1 The goal of macro prudential policy

The goal of macro prudential policy is to ensure the stability of the overall financial system by limiting the build-up of systemic risk. It is important to understand that this is not necessarily the same as the stability of individual financial institutions.

Historically, financial regulation and supervision has had a micro prudential focus, that is, it has focussed on individual financial firms. The underlying rationale was that if individual firms were safe and sound, then so too would be the overall financial system. Thus, policies that were desirable for individual firms were seen as also desirable for the broader financial system. But, of course, that is a fallacy of composition because actions undertaken by one

financial institution to reduce risk can lead to difficulties elsewhere in the financial system, that is, externalities can arise.

In modern financial systems such externalities can be significant. Financial institutions interact by trading in a myriad of markets and instruments, leading to a high level of interconnectedness. Shocks can therefore be transmitted rapidly across the global financial system.

Unfortunately, individual firms have little reason to consider how their actions impact on other firms; they tend to act as price takers and disregard how their trading decisions might impact on asset prices. They also tend to hold similar portfolios and are therefore exposed to the same shocks.

To see why this can be a problem, suppose that some event occurs leading financial institutions to rebalance their portfolios. If the shock is large and they do so collectively, markets may become one sided and prices can plunge, leading to financial distress being transmitted across the financial system. Because of such externalities, it is essential that macro prudential policy makers worry about the health and resilience of the financial system as a whole.

It should be noted that such commonality in behaviour can be encouraged by regulators. For instance, the use of mark-to-market valuation practices and value-at-risk methodologies, and the reliance on credit ratings can lead firms to behave in similar ways magnifying the impact of economic disturbances on markets. Remuneration practices that provide incentives for investors to hold similar portfolios can also have this effect.

2.2 Macro prudential indicators

The second part of the framework is the indicators that policy makers use to judge whether systemic risk is present. Since risk can arise anywhere in the economy, it is necessary to use a broad range of indicators.

It is useful to distinguish between the time series and the cross sectional dimension of risk, both of which must be captured by the macro prudential indicators. The time series dimension of risk relates to the cyclicity of the financial system. These risks build up over time, and are often related to over-optimism about economic prospects associated with positive economic developments. An example of this is the expansion of credit during times of rapid economic growth and generalised asset price increases.

Cross sectional risks relate to the interconnectedness of the financial system that arises, for instance, from exposures between financial firms through wholesale funding markets, derivatives markets or through large exposures to a single counterparty.

After having selected appropriate indicators, policy makers face two problems. First, the indicators must be accurately benchmarked, that is, a judgement must be made of what their “normal” range is and when they signal that risks are accumulating. This may be done by comparing them against a historical average, a peer group or a model-based estimate of a “natural” level. Nonetheless, there will always be competing views on the size and importance of any deviation from that level and a healthy dose of judgement is therefore essential when formulating policy.

Second, no matter how good the indicators are, there is an unavoidable limit to how informative any indicator can be arising from the possibility of multiple equilibria. That is, a certain reading of an indicator may be compatible with financial stability if confidence is high and incompatible with stability if it is low. Moreover, the economy can switch from one state or equilibrium to another with little or no forewarning from the indicators.

For instance, if economic conditions are weak, an increase in long bond yields arising from concerns, warranted or not, about a government’s creditworthiness will make it more difficult

for it to finance the public debt and therefore lead to an increase in sovereign risk. Such self-fulfilling prophecies are much less likely to occur if economic conditions, and therefore the government's finances, are strong.

2.2.1 Types of indicators

Given the range of risks to guard against, there are a large number of indicators that potentially may be useful. The IMF-BIS-FSB (2011) have suggested distinguishing between three sets of indicators.

The first of these comprise aggregate indicators of financial imbalances. These rely on macro economic data and balance sheet data to capture risks building in the financial system and the broader economy. These would include, for instance, indicators of bank credit, liquidity and maturity mismatches, and sectoral imbalances. Such data are typically available quarterly or at most monthly.

The second set consists of indicators of financial market conditions, which are typically available at much higher frequencies than aggregate indicators, even continuously. These can be direct indicators such as bond yields or CDS spreads, or indirect indicators derived from analytical models such as default probabilities calculated using credit risk models.

The third set contains indicators of interconnectedness that capture cross-section risks by focusing on common exposures and interconnectedness between countries, sectors of the economy, or financial institutions. For instance, payments system data can be used to assess tensions in the network of interbank transactions.

2.2.2 Housing market indicators

Many, if not most, severe financial crises have been related to reckless property lending. Bordo and Jeanne (2002) study 15 advanced economies – Australia, Canada, Denmark, Finland, France, Germany, Ireland, Italy, Japan, the Netherlands, Norway, Spain, Sweden, the UK and the US – over the period 1970–2002. They identified 20 episodes of housing booms, of which 11 were followed by a bust. Of these 11 boom-bust cycles, 6 experienced banking crises. In a study of 14 OECD countries, Barrell et al. (2010) found that a single percentage point rise in real house price growth is sufficient to raise the probability of a crisis by up to 0.74%. Similarly, work by the IMF6 found that approximately 40 per cent of house price booms were followed by busts, resulting in, on average, 30 per cent house price declines, and lasting for approximately four years. The result was an average output loss of 8% of GDP, reflecting greater effects on consumption and banking systems thus making house price busts more costly than those associated with equity prices busts.

Given the importance of the housing market for financial stability, it is instructive to explore whether and how the build-up of imbalances in the Irish property sector before the crisis appeared on various macro prudential indicators. One conclusion we can draw from this exercise is that even simple measures can be useful for guarding against a build-up of risk.

These two panels in Figure 1 show indexed prices, rents, and price-to-rent ratios for both residential property on the left and commercial property on the right. A price-to-rent ratio can be thought of as the property market equivalent of the price-earnings ratio in equity markets. Theory suggests that it will depend on the growth rate of rents and the interest rate used to discount future rents in much the same way as stock prices depend on dividends. While this ratio can thus evolve over time and will be highly sensitive to these variables, one would not expect the “normal” level to fluctuate strongly. Thus, the tripling of the price-rent ratio in the residential property market between 1995 and 2007, and the 50% increase of the same ratio in the commercial property market between 2003 and 2007, ought to have struck observers as out of line and as not unlikely to be reversed.

Thus, price-rent ratios in the residential and commercial property markets would have provided plenty of grounds to be worried that prices could come tumbling down. What risks did that pose for banks' balance sheets?

To explore this issue, the panel to the left in Figure 2 shows the share of Irish banks' lending that was accounted for by property. Here speculative property-related lending includes the construction, buying and developing of property or other projects which are not pre-let or pre-sold, that is, that are at risk of not generating any income stream or sales revenue. The panel shows that banks' property-related lending rose from about 40% of total loans in 1999 to about 65% by 2007.

It is also of interest to look at lending to business sectors as a percentage of GDP which is shown in the right-hand panel of Figure 2. While lending to most sectors remained broadly constant over the time period considered, the red portion of the graph shows how lending to the construction and real estate sectors increased from about 10% of GDP in 1999 to about 60% in 2009. It doesn't take too much imagination to conclude that in this situation a large fall in property prices, if it were to happen, could have a devastating effect on banks' balance sheets.

Overall, these figures illustrate that even simple macro prudential indicators showed that Irish property prices were high, given fundamentals, and that banks were highly exposed to the property market before the crisis struck.

3. Macro prudential instruments

The third part of the macro prudential framework consists of the instruments or the tool kit. In addition to being important in their own right, the instruments help define what macro prudential policy is and what it is not. It must be remembered that a number of other public policies impact on systemic risk but do not constitute macro prudential policy because their primary objective is not the stability of the overall financial system. For instance, a tight micro prudential regulatory and supervisory regime and monetary policy that leans against financial imbalances are both likely to reduce the need for macro prudential intervention yet do not constitute macro prudential policy. The IMF (2011) proposes two criteria for what constitutes a macro prudential tool: it explicitly and specifically targets systemic risk, and it is controlled by the macro prudential authority.

Like most aspects of macro prudential policy, the toolkit is in its formative stage. At present, it relies largely on prudential instruments adapted to address systemic risk. New tools specifically designed to address systemic risk are likely to be developed in coming years.

While some macro prudential tools have been implemented, few, if any, have been used on a systematic basis over time and across economies. As such, care must be exercised in employing them. In particular, it is not straightforward to calibrate the setting of the instruments precisely as there is little if any experience to draw on.

Furthermore, there is a risk of unintended consequences in the form of regulatory arbitrage or unexpected responses by financial institutions. For instance, measures aimed at limiting credit supply may simply push activity into the shadow banking system or lead foreign lenders to step forward. Macro prudential policy will therefore necessarily be a process of trial-and-error, at least initially.

Moreover, policy-makers will likely employ several tools and it may be difficult to assess their interactions in advance. Finally, there is a need to recalibrate macro prudential policy in response to changes in monetary policy. Let me therefore leave the framework of macro prudential policy for a moment and consider the links between monetary and macro prudential policy.

3.1 Monetary policy and macro prudential policy

It is sometimes argued that monetary and macro prudential policy are close cousins, and that changes in one can substitute for the other. Of course, they both affect the supply of credit in the economy and therefore firms' and households' spending decisions. In turn, that means that they both affect economic activity and inflation. There is therefore a need for some coordination between them to ensure that they do not operate at cross purposes. This is one reason why it is essential that the central bank is crucially involved in the formulation of macro prudential policy. But despite their similarities, there are important differences between these policies pertaining to their focus and scope, the clarity of the policy objective, the policy horizon and the tools used, as set out in Table 1.

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First, the focus of the two policies is different. Monetary policy focuses on the most likely rate of inflation at some future date. By contrast, macro prudential policy aims to avoid some highly adverse and unlikely tail event. Since crises occur rarely, it is difficult for the public to monitor the success of macro prudential policy.

The policy horizons are also different. Monetary policy impacts on inflation with a time lag of about 2 years. Since senior central bankers are typically appointed for a period of five or six years, it is reasonably easy for the public to judge their performance and ascertain whether price stability has been achieved. By contrast, asset price bubbles are slow to develop and shocks of sufficient magnitude to burst a bubble happen only rarely. Thus, it is possible for macro prudential policy to be too lax for an extended period of time without a collapse occurring. This makes it difficult for the public to judge whether policy makers are achieving their objective.

The clarity of the objectives also differs. Monetary policy is typically geared at ensuring that inflation is at some announced target level. In the case of the euro area, this level is "below but close to two per cent". Since there is monthly data on inflation, it is simple to monitor the central bank's skill in pursuing price stability.

Assessing financial stability policy is arguably much harder. As an illustration many analysts define it as the absence of financial instability. This difficulty in defining financial stability makes it problematic for the public to judge how successful macro prudential policy is.

Further differences concern the instruments. Monetary policy in normal times – that is, when the interest rate is above some lower bound and interbank markets function properly – is conducted by controlling nominal short-term interbank rates. This is a blunt instrument that affects the economy in many ways. By contrast, macro prudential policy can – in principle – be made to focus on only some banks or some types of lending.

While some observers have suggested that monetary policy can be used as a macro prudential tool, the earlier consensus that monetary policy should focus on ensuring price stability remains unchanged. Nevertheless, there is broad agreement that financial developments needs to be taken into account more fully in monetary policy than previously was the case in many central banks (IMF 2010). One reason central banks did not monitor financial market developments sufficiently closely before the crisis was that macro economic models typically do not rely on information from corporate balance sheets, financial intermediaries and asset prices (Kohn 2009).

Overall, the thrust of the analysis above is that monitoring how well macro prudential policy is conducted is difficult. In particular, it is hard for the policy maker to demonstrate what benefits come from pursuing particular policy actions. This is particularly so if policy is successful and financial stability is maintained, in which case all the public can see is the macro prudential policy makers moving their instruments and making statements, but no evidence of financial instability.

By contrast, the costs of various macro prudential policy measures will be readily felt. Since a tightening of macro prudential policy is likely to reduce the profitability of financial firms, one would expect on occasion strong reactions from the financial sector when macro prudential policy is tightened.

This combination of difficult-to-measure future benefits and obvious and immediate costs can lead to a strong bias against taking macro prudential action, even when policy makers believe it is necessary. This arguably was the case in a number of countries before the financial crisis erupted in 2007–08. It is therefore essential to strengthen policy makers' willingness to act against perceived risks by providing them with clear objectives and independence, and by making them accountable for the outcomes of policy.

3.2 Macro prudential tools addressing excessive property lending

What are the tools available to macro prudential policymakers? Many instruments have been discussed and, in the interest of brevity, Table 2 outlines only a few possible tools that have been adopted elsewhere to address risks arising from property-related lending.

For instance, dynamic provisioning requires banks to hold provisions against expected losses due to inherent credit risks. This tool has been implemented in Spain, where banks are required to build up buffers of against performing loans in an upturn, which can then be drawn down in a recession.

Sector lending limits are hard limits on the individual bank or system-wide share of lending to individual sectors. The Central Bank of Ireland instituted a form of this measure in the 1970's and 1980's when it advised banks not to increase private-sector credit to what were considered "non-productive sectors", that is, property companies and the financial and personal sectors.

Increasing risk weights raises the amount of capital banks must hold against certain types of exposures. For instance, the risk weights on mortgages for buy-to-let properties could be increased relative to those for primary dwellings. This would tend to reduce this type of lending and ensure that banks' resilience was bolstered by the additional capital buffer.

Altering risk weights is a tool available under Pillar I of the Basel rules. Macro prudential policy makers could also address risks under Pillar II, where capital add-ons can be applied for risks not fully addressed under Pillar I. For instance, additional capital could be required to address concentration risk as lending to certain sectors of the economy increases.

A loan-to-income ratio is generally defined as the percentage of a borrower's monthly disposable income accounted for by debt repayments. It is a simple tool to ensure the creditworthiness of borrowers by limiting their repayment burden. Tightening LTIs in the upswing would help to ensure against income shocks in the downswing and limit the overall level of credit in the economy as some loans would no longer be permissible and others would be reduced in size.

I will focus a little more closely on a time-varying LTV limit as it is, perhaps, the most frequently cited macro prudential tool and is defined as the ratio of the value of a loan to the value of the underlying property. The LTV ratio is intended to ensure that the underlying collateral – the property – is sufficient to cover the loan, were the borrower to default. For borrowers, negative equity occurs when the value of their outstanding mortgage falls below

the value of the property. Needless to say, this is less likely to happen the lower the initial LTV ratio.

Figure 3 shows that the proportion of new loans with a LTV ratio above 80% increased every year preceding the crisis. Thus, property lending expanded not only because property prices rose but also because banks were willing to provide funding for an increasing fraction of purchase prices as the bubble was growing. One wonders what would have happened if banks had maintained LTV ratios of at most 80% throughout this period.

Varying LTVs over the financial cycle seems desirable and will prevent banks from expanding lending rapidly when the property market is exuberant. This would increase the resilience of the banking sector by maintaining the collateral margin when prices are rising and thus limiting the potential losses in real estate portfolios were prices to fall. Further, by increasing the own funds required upfront by home purchasers, they limit credit demand and lean against house price increases. Of course, the LTV limits could then be relaxed if the property market weakened.

However, if prices are rising too rapidly, the additional collateral buffer may not be sufficient. Moreover, LTV limits become less effective when house price increases are large, as capital gains can be used to finance deposits for second homes. Finally, the effectiveness of this instrument may be undermined by borrowers “topping up” any short-fall in own funds with personal loans or second mortgages.

4. Decision-making arrangements

The fourth component of the macro prudential framework concerns the decision-making arrangements. It is important to recognise that the precise arrangements underpinning macro prudential policy depend on country-specific circumstances. In many countries, macro prudential policy is conducted by a financial stability committee, reflecting the fact that the powers to set the relevant policy tools are spread among a number of government agencies and regulators. If so, the establishment of a formal committee seems desirable.

For instance, in the United Kingdom the interim Financial Policy Committee has been established within the Bank of England with the objective of identifying, monitoring and taking action to reduce systemic risks with a view to protecting and enhancing the resilience of the UK financial system. It is a committee of the Bank of England’s Court of Directors and is chaired by the Governor of the Bank. The members include senior representatives of the central bank and the microprudential supervisor, the chief executive designate of the Financial Conduct Authority, four external members and a representative of the Treasury.

In the United States, the Financial Stability Oversight Committee (FSOC) has the objective of identifying risks and responding to emerging threats to financial stability. The objective of the FSOC is to ensure coordination and information sharing across the various supervisory organisations in the US. Voting members of the FSOC include the Secretary of the Treasury, the Chairman of the Fed, the Chairman of the Securities and Exchange Commission, the Chairperson of the Federal Deposit Insurance Corporation, and representatives from other relevant authorities.¹⁷

In the European Union, the European Systemic Risk Board (ESRB) is charged with macro-prudential oversight of the financial system. Voting members of the ESRB include the President and Vice-President of the ECB, Governors of EU Central Banks, Chairs of the three European Supervisory Authorities, a member of the European Commission, and representatives of ESRB advisory committees. The Head of Regulation from each Member State and the President of the Economic and Financial Committee are non-voting members. Where the ESRB identifies a significant risk it issues warnings to the relevant authorities, and where appropriate, recommendations for remedial action. The ESRB recently recommended that five criteria regarding the macro prudential mandates of national authorities be set down in national legislation.

First, central banks must play a pivotal role in macro prudential policy. There are several reasons for this. Importantly, central banks have considerable analytical resources and technical expertise. In particular, they have staff that has expertise in analysing financial sector developments. Moreover, they have oversight of payments systems and serve as lenders of last resort. Finally, there are obvious links between monetary policy and macro prudential policy.

Second, it is essential that policy makers have access to information and data on the components of the financial system. This must include, for example, data on individual financial institutions and developments in payments and settlements systems.

Third, the macro prudential policy maker must enjoy independence. Every now and then, macro prudential policy will have to be tightened to constrain the financial system during a boom. There will then no doubt be strong pressures from financial institutions and borrowers alike not to do so, and there is always a risk that political pressures will arise. For much the same reasons as monetary policy makers are independent, macro prudential policy makers must also be.

Fourth, good policy requires policy makers to be accountable. Thus, the macro prudential policy makers should explain to the public, through regular reports and perhaps also to parliament or a parliamentary committee, what measures it has taken and why.

Fifth, the objectives of policy must be clear in law and the policy makers must have legal power to set the policy instruments as needed to achieve these objectives, that is, there must be a firm legal basis for macro prudential policy.

4.1 Macro prudential policy in Ireland

It is of interest to take stock of the current situation in Ireland in light of the ESRB's five recommendations. First, as the Central Bank of Ireland is responsible for financial regulation and supervision, it has access to the relevant information and the technical expertise necessary to analyse macro prudential risks. Furthermore, it controls many potential policy instruments necessary to conduct macro prudential policy. An advantage of an integrated central bank and micro prudential supervisor is that it allows macro and micro prudential policy to be pursued in unison and policy trade-offs that arise to be internalised and discussed within a single institution.

The primary role of the Central Bank in relation to macro prudential policy is clear. Firstly, the 2010 amendment to the Central Bank of Ireland Act (1942) states that the "stability of the financial system overall" is an objective of the Bank. Although not legally binding, the Memorandum of understanding on roles and responsibilities in relation to the financial sector between the Department of Finance and the Central Bank of Ireland that was signed in 2011 states that the "Central Bank has the statutory objective of stability of the financial system overall."

Similarly, the 2007 Memorandum of Understanding (MoU) on financial stability between the Department of Finance, the Central Bank and the Financial Regulator, also holds that the central bank is responsible for the stability of the financial system. That said, there is little doubt that the Department of Finance also has responsibilities in this area. Indeed, the MOU reflects the high level of cooperation on financial stability issues which operates in practice between the Department and the Central Bank.

5. Conclusions

In the years ahead, policy makers across the world will do their best to avoid a repetition of the financial crisis that started in 2007. In doing so, much attention will be paid to strengthening the macro prudential framework. There is much to be done. More work is needed on developing indicators for financial stability analysis. That said, there is likely to be

an upper bound to how well any indicator can help predict the development of financial tensions. A better understanding of what instruments are likely to be most effective, and how they are best used, must also be reached. Furthermore, it is important to determine how the task of preventing asset market bubbles from developing should be shared between macro prudential and monetary policy, if at all.

Ensuring that policy makers are willing and able to act on any information that suggests that financial stability may be at risk is crucial. Tightening macro prudential policy will never be popular since the costs of doing so are obvious and the benefits much harder to pin point. Clarity regarding the objective of macro prudential policy, where responsibility lies for policy and what the accountability arrangements are, as well as the independence of the decision makers are all essential features of a strong macro prudential framework.

REFERENCES

Bank of England, (2011), "Instruments of macroprudential policy", Discussion Paper, December.

<http://www.bankofengland.co.uk/publications/other/financialstability/discussionpaper111220.pdf>

Barrell, Ray, E. Philip Davis, Dilruba Karim and Iana Liadze, (2010), "Bank regulation, property prices and early warning systems for banking crises in OECD countries", National Institute of Economic and Social Research, Discussion Paper No. 330, February. <http://www.niesr.ac.uk/pdf/dp330.pdf>

Borio, Claudio and Mathias Drehmann, (2009), "Assessing the risk of banking crises – revisited", BIS Quarterly Review, March. http://www.bis.org/publ/qtrpdf/r_qt0903e.pdf

BIS, (2010), "Macroprudential instruments and frameworks: a stocktaking of issues and experiences", CGFS Papers No. 38. <http://www.bis.org/publ/cgfs38.pdf>

BIS, (2011), "Central bank governance and financial stability: A report by a Study Group", May. <http://www.bis.org/publ/othp14.pdf>

BIS-FSB-IMF, (2011), "Macroprudential policy tools and frameworks", Progress report to G20, 27 October. <http://www.imf.org/external/np/g20/pdf/102711.pdf>

Bordo, Michael D. and Olivier Jeanne, (2002), "Monetary Policy and Asset Prices: Does "Benign Neglect" Make Sense?", IMF working Paper WP/02/225. <http://www.imf.org/external/pubs/ft/wp/2002/wp02225.pdf>

CEBS, (2010), "Guidelines on the management of concentration risk under the supervisory review process (GL31)". <http://www.eba.europa.eu/documents/Publications/Standards---Guidelines/2010/Concentration-risk-guidelines/Concentration.aspx>

Espinosa-Vega, Marco A., Charles Kahn, Rafael Matta and Juan Sole, (2011), "Systemic Risk and Optimal Regulatory Architecture", IMF Working Paper WP/11/93 <http://www.imf.org/external/pubs/ft/wp/2011/wp11193.pdf>

European Central Bank, (2010), "Analytical models and tools for the identification and assessment of systemic risks", Financial Stability Review, Special Feature B, June. <http://www.ecb.int/pub/pdf/other/financialstabilityreview201006en.pdf?3ab15dfbf4e228e6e0a4ef14b01a78ce>

European Systemic Risk Board, (2011), "Recommendation on the macro-prudential mandate of national authorities", (ESRB/2011/3), December. http://www.esrb.europa.eu/pub/pdf/recommendations/ESRB_2011_3.en.pdf?c39d6a7fa3d12f1e89e069616470c68122

Everett, Mary and John Kelly, (2004), "Financial Liberalisation and Economic Growth in Ireland", Central Bank of Ireland, Quarterly Bulletin, Autumn.

<http://www.centralbank.ie/publications/Documents/2004%20Autumn%20Financial%20Liberalisation%20and%20Economic%20Growth.pdf>

Group of Thirty, (2010), “Enhancing financial stability and resilience – Macroprudential policy, tools and systems for the future”, October. http://www.group30.org/images/PDF/Macroprudential_Report_Final.pdf

Hart, Oliver and Luigi Zingales, (2010), “A new capital regulation for large financial institutions”, FEEM Working Paper No 124.2009.

HM Treasury, (2011), “A new approach to financial regulation: the blueprint for reform”, June. http://www.hm-treasury.gov.uk/d/consult_financial_regulation_condoc.pdf

Honohan, Patrick, (2010), “The Irish banking crisis, regulatory and financial stability policy 2003–2008”, a report to the Minister for Finance by the Governor of the Central Bank, May. <http://www.bankinginquiry.gov.ie/The%20Irish%20Banking%20Crisis%20Regulatory%20and%20Financial%20Stability%20Policy%202003-2008.pdf>

Honohan, Patrick, and Luc Laeven, (2005) (eds.), Systemic Financial Crises: Containment and Resolution, Cambridge University Press, UK.

IMF, (2003), “When Bubbles Burst”, World Economic Outlook, Chapter II, April. <http://www.imf.org/external/pubs/ft/weo/2003/01/pdf/chapter2.pdf>

IMF (2010), “Central Banking Lessons from the Crisis”, May. <http://www.imf.org/external/np/pp/eng/2010/052710.pdf>

IMF, (2011), “Macroprudential policy: an organizing framework”. <http://www.imf.org/external/np/pp/eng/2011/031411.pdf>

Kashyap, Anil, K., Raghuram G. Rajan and Jeremy C. Stein, (2008), “Rethinking Capital Regulation”, paper prepared for Jackson Hole conference, August. <http://www.kc.frb.org/publicat/sympos/2008/KashyapRajanStein.08.08.08.pdf>

Kennedy, Gerard and Tara McIndoe Calder, (2011), “The Irish Mortgage Market: Stylised Facts, Negative Equity and Arrears”, Central Bank of Ireland, Research Technical Paper 12/RT/11. <http://www.centralbank.ie/publications/Documents/12RT11.pdf>

Kohn, Donald L., (2009), “Monetary Policy Research and the Financial Crisis: Strengths and Shortcomings”, speech given at the Federal Reserve Conference on Key Developments in Monetary Policy, Washington, D.C., October. <http://www.federalreserve.gov/newsevents/speech/kohn20091009a.htm> 23

Reinhart, Carmen, M., and Kenneth S. Rogoff, (2008), “Is the 2007 US sub-prime financial crisis so different? An international historical comparison”, American Economic Review 982, 339–44.

Saurina, Jesus, (2009), “Loan loss provisions in Spain: A working macro-prudential tool”, Revista de Estabilidad Financiera, 17, Banco de España, pp. 11–26. <http://bde.eu/webbde/Secciones/Publicaciones/InformesBoletinesRevistas/RevistaEstabilidadFinanciera/09/Noviembre/ief0117.pdf> 24