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## The Role of Decision-Making Biases in Ireland's Banking Crisis

**Pete Lunn**

*Abstract:* This paper considers Ireland's banking crisis from the perspective of behavioural economics. It assesses whether known biases in judgement and decision-making were instrumental in the development and severity of the crisis. It investigates evidence that key decision-makers, including consumers, businesspeople, bankers and regulators, as well as parties such as civil servants, politicians, academics and journalists, were influenced by seven specific phenomena which have been identified previously via experiments and field studies. It concludes that evidence is consistent with the influence of these established phenomena. Ireland's long boom, rapid financial integration and lack of relevant past experience may have increased the vulnerability of decision-makers to economic and financial reasoning that proved disadvantageous. The analysis has potential implications for attempts to prevent future crises.

*Keywords:* Decision-making biases; Financial crises; Behavioural economics; Ireland

*JEL Codes:* D03, D81, G01, G32

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# The Role of Decision-Making Biases in Ireland's Banking Crisis

## 1. Introduction

The report of the Commission for Investigation into the Banking Sector in Ireland (Nyberg, 2011) enters new territory in the search for the root causes of Ireland's banking crisis. It argues that the many institutional and policy failings identified by the Commission, and by previous investigations, are insufficient to explain the extent and simultaneity of poor economic and financial decisions in the period prior to the crisis. Rather, "stronger, irrational forces were present" (p. 94). Specifically, the Commission concludes that bankers, regulators and others were prey to "herding" and to "groupthink", leading them to underestimate risk substantially and with calamitous consequences. In turning to these two phenomena for explanation, the Commission departs from previous analyses by drawing on behavioural economics and related disciplines, such as behavioural finance, economic psychology and cognitive economics, which apply insights from psychology to economic contexts.

The present paper attempts a more exhaustive look at what these disciplines have to offer for understanding Ireland's banking crisis. Herding and groupthink belong to a category of phenomena that describe how our individual decisions gravitate towards the decisions of others around us, potentially magnifying mistakes. These phenomena form a significant subset of a much broader set of scientifically established influences on economic judgement and decision-making. Specifically, relatively recent advances in behavioural economics have improved understanding of how we make future projections, handle risk and uncertainty, and consider trade-offs over time. More is now understood also about the roles of optimism, confidence and scepticism in how we form and question our beliefs. What follows examines Ireland's crisis from the perspective of this work.

The present analysis largely (and necessarily for reasons of space) ignores many non-psychological causes of Ireland's banking crisis, although at various points below interactions between institutional and psychological factors are highlighted. The three official inquiries (Honohan, 2010; Regling and Watson, 2010; Nyberg, 2011) do a thorough job of examining the macroeconomic background, the role of various institutions, and the policy decisions that contributed to (or at least failed to prevent) the banking crisis.

Briefly, these reports show that from 2002 onwards Ireland's banks borrowed from international wholesale markets to fund increases in lending that were massive by international standards. The speed and scale of this expansion, driven by increased domestic competition, access to cheap international finance and apparent initial success, could only be achieved by a weakening of lending standards and large-scale wholesale borrowing. As extensively documented in the official reports, internal bank policies and rules governing

lending were increasingly bypassed and relaxed in a race to expand. Bank exposures became heavily concentrated in property-related assets, which benefitted from tax advantages, further concentrated in commercial property deals, and yet further among a relatively small number of developers. The reports reveal that the Financial Regulator failed to notice the danger and did not properly regulate governance and prudential standards, contributing to poor lending decisions. Similarly, the Central Bank failed to recognise associated financial stability issues or to notice the extent of systemic risk, instead placing emphasis on public and market perceptions. Consequently, the evidence suggests that the authorities, including the Department of Finance and leading politicians, did not seriously entertain the possibility that any bank was insolvent until late 2008, after the bank guarantee was announced. The failure was not limited to these key actors, however. The risk of a large fall in property prices was also underestimated by the wider community of journalists, experts and the public, including house-buyers. While some warnings were sounded in relation to specific pieces of the crisis jigsaw, economic and financial experts did not put the pieces together fast and accurately enough to provide useful warnings that reflected the scale of the problem. “Domestic doubters were few, late and usually low-key” (Nyberg, 2011, p. viii).<sup>1</sup> Furthermore, although Ireland’s crisis differs fundamentally from the global financial crisis,<sup>2</sup> it developed in an international context of widespread belief in the efficient markets hypothesis, deregulated markets, and consequent underestimation of the macroeconomic dangers posed by modern financial markets.

What follows does not challenge the above account, which provides the essential framework into which various decision-makers fit. Nor does it question the causes of the crisis as identified by these official investigations, without which the present analysis would not be possible. The aim is to complement these analyses by adding a stronger behavioural economic dimension, such that potential psychological factors are examined more scientifically.

The paper proceeds as follows. Section 2 addresses method. It argues for a more scientific approach to understanding decision-making during the banking crisis; defines seven well-

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<sup>1</sup> Despite this conclusion in the Commission’s report, which is accepted here, some economic experts and commentators continue to hold that warnings were given and that the primary problem is that they were ignored by the authorities and politicians. Ultimately, whether the warnings were sufficiently timely, accurate and severe is partly a subjective judgement. It also requires historical analysis beyond the scope of this paper. However, despite following up on many suggestions, this author has yet to encounter any paper or article prior to Kelly (2007) that contained a warning that came close to reflecting the scale of what was ultimately to occur.

<sup>2</sup> It is important to note that the Irish banking crisis differs fundamentally from the crisis that enveloped the global financial system. Although they share a number of things in common (a property bubble, bad loans, a long period of relative prosperity, intense competition in an era of deregulation and international integration of financial services), the Irish banking crisis did not revolve around bad loans being effectively hidden by complex securitisation, whereby financial assets were generated and traded that could only be valued via complex mathematical models. Rather, the Irish crisis centred on the more timeless and straightforward failing of reckless lending and borrowing (Honohan, 2009; Regling and Watson, 2010).

established judgement and decision-making phenomena that may be relevant; and discusses the type of evidence available to assess their role. Section 3 evaluates the possible influence of these seven phenomena, sketching hypotheses and sifting evidence. Section 4 concludes and discusses possible implications for crisis-prevention and financial regulation.

## 2. A Behavioural Economic Perspective

Any comprehensive analysis of Ireland's banking crisis must include an account of why so many people, in a range of different circumstances and roles, took decisions or made judgements they would later regret, either because of personal loss or a sense of failure. Property developers and other businesspeople over-extended themselves and ruined their businesses. Bankers broke their banks through reckless lending, mostly related to property; some also broke themselves, as they personally held much of their wealth in bank shares and property. People bought houses that turned out to be worth hundreds of thousands of euro less than they paid for them. Regulators, central bankers, civil servants and politicians failed to protect the people they served, with disastrous reputational and electoral consequences. Economists and other experts failed to provide timely, accurate and sufficiently salient warnings, damaging professional status. Nyberg (2011) concludes that the key issue for understanding Ireland's banking crisis is to uncover why these disadvantageous decisions and judgements were taken by so many people, in so many different contexts, *simultaneously*.

### 2.1 Beyond Folk Psychology

To date, analyses of Ireland's property bubble and consequent banking crisis, while isolating many important institutional factors, have mostly fallen back on psychological generalisations to explain this array of consequential misjudgements. Regling and Watson (2010) refer to "euphoric conditions", a "national blind-spot" and misjudgements that were "embedded in collective psychology". Honohan (2009, 2010) describes how the banks were caught up in the "mass psychology" of the bubble; a "construction frenzy"; international financial markets were "hysterical"; government policy created "a climate of public opinion which was led to believe that the party could last forever." Whelan (2010) pins the blame more straightforwardly on "over-optimism", especially in relation to the likelihood of the continuation of Ireland's abnormally high economic growth. In addition to hypothesising the existence of herding and groupthink, Nyberg (2011) refers to a national "mania"; Fitz Gerald (2011) calls it "madness".

Thus, while the investigations cited above offer extensive and incisive analysis of various causes of the crisis, their descriptions of psychological processes remain mostly in the realm of "folk psychology" – the everyday narrative of how and why people behave as they do. Folk psychological descriptions of bubbles mostly evoke heightened emotional states, like

euphoria, frenzy or mania, and we intuitively associate rash decision-making with such extreme states. Controlled empirical investigations do show that economic decisions can be influenced by emotions (see Rick and Loewenstein, 2009, for review). Decisions can be affected by immediate moods and, more consistently, investigators have shown that decisions are altered by the anticipation of future emotions, usually negative ones such as disappointment or regret. Yet there are in general good reasons to doubt the notion that heightened positive emotions adequately capture the highly correlated decision-making that characterises bubbles. Decisions such as investments or house purchases are rarely snap judgements, but are usually considered over extended periods and, consequently, in a variety of moods.<sup>3</sup> Tellingly, beginning with Smith, Suchanek and Williams (1988), bubbles and crashes have been observed in experimental asset markets in which subjects trade tokens with probabilistically determined pay-offs. Experimenters have complete control over the information available to traders and their communication with fellow market participants. Thus, bubbles and crashes occur in the absence of broader societal influences, be they infectious emotional states or widespread false beliefs about the future with respect to, say, the fixed supply of land or the impact of a new technology. Cognitive biases, such as extrapolation bias, offer a more plausible explanation for the observed behaviour (see Section 3.1 and Barberis, 2010, for theoretical overview).

This example illustrates how progress in behavioural economics can make it possible to improve on folk-psychological descriptions by considering psychological processes more scientifically, concentrating on phenomena that are well-defined and subject to empirical isolation and verification. The analysis that follows investigates the potential role in Ireland's banking crisis of seven such measurable, systematic behaviours. It is hoped that this approach increases scientific tractability and, therefore, improves our ability to recognise future economic problems more quickly and helps to design policies to, where necessary, counteract them.

## *2.2 Mistakes, Biases and Rational Behaviour*

Table 1 defines seven systematic findings in studies of economic judgement and decision-making. The seven phenomena are selected, firstly, because there is good field evidence that they operate in real market settings and, secondly, for their potential contribution to understanding the crisis. In principle, all seven could influence expectations about the future value of an asset.

It is usual to refer to most of these phenomena as behavioural "biases". Due to its prevalence, this terminology has become unavoidable and is adopted here. Yet it is

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<sup>3</sup> Note that this distinguishes house price and financial market bubbles, since price movements in the latter can be extremely rapid and, therefore, more driven by the emotion of a single day's trading.

unfortunate, since the term “bias” implies that the behaviours are somehow irrational or generally result in mistakes and are hence damage welfare. This assumption is related to the fact that these phenomena often violate the standard axioms of rationality as defined in neoclassical microeconomics. In some contexts the biases probably are disadvantageous and the Irish banking crisis may be one such example. But it remains an empirical question as to whether each behaviour is damaging overall to the welfare of decision-makers. As some have repeatedly pointed out (see Berg and Gigerenzer, 2010, for recent argument), there is presently scant evidence that people who exhibit these behaviours suffer worse overall economic outcomes. Furthermore, many of the listed biases are observed among trained experts, who are in some cases happy to defend the behaviour as generally beneficial.

**Table 1: Established behavioural decision-making biases**

<i>Bias</i>	<i>Definition</i>
Extrapolation bias (Projection bias, Overinference)	When predicting future outcomes based on the past, placing more weight on the most recent events
Confirmation bias (Myside bias)	The inclination to place greater weight on and to actively seek information consistent with prior beliefs
Overconfidence bias (Over-optimism bias, miscalibration)	A tendency to predict outcomes too positively and to overestimate the accuracy of predictions
Ambiguity aversion (Aversion to Knightian uncertainty, Illusion of explanatory depth)	Greater willingness to take risks in contexts where people feel able to quantify the risk, or where people feel relatively competent in assessing the risk.
Behavioural convergence (Bandwagon effects, Herding, Information cascades, Conformity, Groupthink)	The tendency to copy similar decisions made by others, or conform to majority views
Time inconsistency (Present bias, hyperbolic discounting)	Systematic changes in individual preferences over time, whereby more immediate rewards become disproportionately attractive
Loss/gain asymmetry (Loss aversion, endowment effect)	Giving greater weight to losses than to equivalent gains, including willingness to take risks to avoid or recover losses

Throughout this paper, therefore, the use of the term “bias” does not necessarily imply irrationality, poor decision-making or, when applied to professionals, low standards on behalf of individual decision-makers. After all, the ultimate outcomes for individuals in asset markets depend also on decisions taken by others – there may be no right answer. It is

generally the potential collective effect of a bias, when strong and widespread, that is illuminating.

The list in Table 1 is non-exhaustive and it is possible to make finer distinctions in some cases between the main biases listed on the left in Table 1 and the closely related effects in brackets below. Yet the aim is to group phenomena in such a way that their role in the crisis can be considered systematically. The two phenomena highlighted by Nyberg (2011) provide a useful example. “Groupthink” usually refers to the tendency of individuals within a defined group to adopt the group’s viewpoint rather than to form an intellectually independent assessment, while “herding” refers to the tendency of decision-makers more generally to follow the lead of other decision-makers. The notion of “information cascades” partly rationalises such behaviour by suggesting that observing the behaviour of others amounts to useful information for the decision-maker. All of the terms listed under “behavioural convergence” refer to the tendency to be drawn towards the decisions of others. This constitutes the deeper distinction between these terms and the other six listed, which are less social and more cognitive.

### *2.3 Evidence for Behavioural Biases*

In the analysis that follows, each bias is in turn related to specific decision-making contexts in Ireland, primarily during the lead up to the crisis over the 2002-2007 period. Some biases are potentially relevant also to initial responses, as the full scale of the difficulty confronting the banks began to emerge, mostly in 2008. The analysis aims to specify precise hypotheses regarding which phenomena were potentially relevant to which sets of decision-makers, and to which judgements or decisions. But before turning to specifics, some general consideration is required as to the nature of the available evidence and the appropriateness of the methodology adopted.

How might one empirically examine such hypotheses and hence assess the likelihood that the behaviours listed in Table 1 contributed? The evidence to be weighed comes in two forms. The first form of evidence is quantitative in nature and derives from international research on judgement and decision-making. The logic is that it is reasonable to infer that a bias is more likely to have been instrumental in Ireland’s banking crisis if there is good empirical evidence that the bias concerned is a consistent and strong influence on decisions taken in similar contexts elsewhere. Most of the biases in Table 1 were initially identified in economic laboratory experiments, the results of which offer a general indication of the regularity and strength of the particular bias when people make judgements or decisions of particular types. Evidence for the role of a bias is more persuasive, however, when gathered in real environments that resemble the situations of decision-makers during the crisis. For

some phenomena there are relevant field experiments,<sup>4</sup> but in most cases the field evidence consists of traditional econometric analysis of survey data with indicators that measure or proxy a certain bias. Increasingly, surveys include useful psychological indicators, such as individual perceptions, expectations or measures of confidence. Where experiments and survey data suggest that a bias operates for people in situations that parallel those faced by decision-makers before and during Ireland's crisis, especially if the bias is strong, this adds to the case that it may have played a role. For each of the phenomena listed in Table 1, the relevant international experimental and survey evidence is therefore summarised.

The second type of evidence examined consists of documentation or personal testimony relating to the Irish banking crisis itself, which can to some extent reveal whether observed behaviour was consistent with the predictions of a hypothesised bias. Much of the material unearthed by the three official inquiries is useful for this purpose. The evidence is unfortunately skewed towards decisions taken and judgements made in respect of the residential rather than commercial property market, as the former tended to be the subject of more discussion and debate at the time, despite the latter's critical role.

Such qualitative analysis is, of course, to some extent subjective. There may be other plausible interpretations of what was written, said and done. Illustrative quotations are selective and their representativeness dependent on subjective judgement. Moreover, since this exercise explicitly seeks indications that the relevant biases might have been instrumental, there is a danger of over-interpreting positive instances of the phenomena hypothesised (see Section 3.2 on confirmation bias). It is hence easier to establish the presence of a bias than to gauge its strength. But where an established behavioural bias predicts a certain behaviour which is then located in testimony or historical documentation, this strengthens the claim that the phenomenon was instrumental.

Investigators have employed similar qualitative approaches to study the global financial crisis (e.g. Shefrin, forthcoming; Coleman and Pinder, 2010). Based on documents relating to decisions taken by major banks and transcripts of meetings within the US Securities and Exchange Commission (SEC), Shefrin finds evidence consistent with overconfidence bias, confirmation bias and behavioural convergence. If one accepts the conclusion that these behavioural biases influenced US banking supervision, then one might infer that the same biases were likely to have operated among supervisors in Ireland too. Similar findings in Ireland to those of Shefrin's are examined below.

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<sup>4</sup> It is often assumed that field experiments are generally superior to laboratory experiments, since they provide evidence regarding whether a behaviour occurs in real-world economic settings. Laboratory experiments, however, have the unique advantage that the behavioural environment can be completely controlled, which permits greater certainty about what actually determines behaviour. An example is the study of bubbles in experimental asset markets. Distinguishing the effects of false beliefs or social norms from other drivers of bubbles, such as extrapolation bias, would be difficult in a field experiment, but can be accomplished in the laboratory.

Lastly, there is an established bias not listed in Table 1 that is nevertheless relevant. “Hindsight bias” (Fischhoff, 1975) refers to our tendency to perceive an event that has occurred as more predictable than actually it was, and to overestimate the degree to which we actually did predict it. Hindsight bias is a consistent empirical finding across experimental and field studies, involving a range of domains that includes economic predictions (Blank, Musch and Pohl, 2007). Arguably, Ireland is living through a period of extreme hindsight bias. From the perspective of 2011, given what we know now, the behaviour in the years up to 2008 of businesspeople, bankers, house buyers, investors, regulators, civil servants, politicians and even journalists and academics, can seem so extraordinary as to indicate an epidemic of euphoria, greed or unintelligence. Yet, clearly, many intelligent people who were neither euphoric nor greedy got caught up in Ireland’s bubble to the extent that they made judgements or decisions that turned out to be bad and, in certain cases, ruinous. What ultimately occurred was evidently not, therefore, that obvious or predictable.

Consider the economist who was arguably the first to put the pieces together, conduct relevant quantitative analysis and thus infer the potential scale of the crisis. Kelly (2007) was a prescient and controversial paper. Based on international historical data, it estimated that Irish house prices were likely to fall by 40-60%.<sup>5</sup> Yet, when considering the potential consequences, the paper stated that “the larger banks which dominate lending are well capitalised” (p. 54). Revisiting the paper four years on, the fact that it contains this statement may be surprising.<sup>6</sup> The surprise is an indication of the dangers of hindsight bias. The potential for a large fall in property prices to wreak such havoc in the banks was not at all obvious at the time. It seems that way now, when it has become part of our common understanding of what occurred. Understanding evolves.<sup>7</sup>

Hindsight bias looms large for any analysis of what caused the banking crisis and its potential influence must, therefore, be borne in mind throughout what follows. In aiming to understand behaviour at the time when the relevant judgements and decisions were made, what we know now can mask the truth, making it too easy to assume, incorrectly that key

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<sup>5</sup> Although this paper was published in 2007, its main arguments first appeared in a newspaper article in 2006, before the fall in property prices began.

<sup>6</sup> Indeed, within a year the author had changed his mind and was hence again ahead of the field in realising the potential extent of bank losses.

<sup>7</sup> Hindsight bias also plagues analyses of the global financial crisis, for which it is possible to perform a similar exercise. Nouriel Roubini is usually cited as the economist who first raised the red flag, in what proved to be a provocative seminar delivered at the International Monetary Fund in 2006. Frequently it is claimed that he saw the global financial crisis coming. The transcript (accessed at <http://www.businesscycle.com/news/press/1062/>) confirms that Roubini expected “a housing slump which could lead then to a systemic problem for the financial system”, resulting in recession. However, in the same seminar, he also said “I do not expect a global recession, I think it is going to be a slowdown”. Thus, even those who were quickest to develop an understanding of what was occurring initially underestimated its scale.

decision-makers “must have known”. Consequently, what was written and said at the time is more reliable than what has been written and said subsequently.

Overall, given the available types of evidence, it is a matter of judgement as to the extent to which the behavioural biases identified contributed to the crisis. In some cases, the analysis makes little progress beyond conjecture; in others the qualitative evidence is arguably quite strong. The aim is nevertheless to present the evidence in a systematic and balanced manner, thereby allowing that judgement to be better informed.

### **3. The Role of Specific Decision-Making Biases**

This section examines evidence for each of the potential biases separately. The order in which the specific behaviours are presented is not intended to reflect the degree of importance attached to each, but to assist in highlighting possible interactions between the behaviours.

#### ***3.1 Extrapolation Bias***

Where decision-makers must try to anticipate a future outcome, there might be good reason to believe that the underlying mechanism producing the outcome is changing over time. If so, then the most recent trend will more accurately reflect the state of the underlying mechanism, so it makes sense to give it more weight than trends further in the past. However, while this “extrapolation bias” may be beneficial most of the time, it may come unstuck if the outcome concerned is characterised by short-term momentum and longer-term (even partial) mean reversion. This dynamic structure, which appears to apply to certain macroeconomic time series and asset prices, has the potential to combine with extrapolation bias to generate bubbles and crashes (Fuster, Laibson and Mendel, 2010).

Extrapolation bias has been widely studied in asset markets, especially the US stock market, and it seems to be ubiquitous. Stock-market investors are biased towards stocks that have better recent performance (Chevalier and Ellison, 1997; Benartzi, 2001). In this context, the bias appears to be strong. Barber, Odean and Zhu (2009) show that the average stock bought by a large sample of individual investors outperformed the market in the previous three years by more than 60%. Most relevant for present purposes, extrapolation bias is displayed by consumers with respect to house prices, both in the UK (Muellbauer and Murphy, 1997) and the US (Case and Shiller, 2003; Piazzesi and Schneider, 2009).

There are some limited data on population expectations of future house prices in Ireland. Hughes and Duffy (2007) report that in January 2007, when Irish house prices peaked and

began their precipitous fall,<sup>8</sup> 56% of the population expected a continued rise over the coming year, while just 15% expected a decline. The results for a five-year time horizon were almost indistinguishable, with 58% expecting a rise and just 18% a fall. Only 3% expected, correctly, that prices would fall “a lot”. Thus, the public did not anticipate falling prices until they had in fact begun to fall, consistent with the extrapolation of more recent trends.

What about expectations among banks, authorities and experts? To assess this, five reports/commentaries from a range of relevant organisations were analysed, each of which was published at the end of 2006 and discussed prospects for the property market. These were: the regular property market assessments of the two biggest banks (AIB, 2006; Bank of Ireland, 2006), reports published by two large Dublin stockbrokers (Goodbody Stockbrokers, 2006; NCB, 2006), and the ESRI Quarterly Economic Commentary for Winter 2006 (Barrett, Kearney and McCarthy, 2006).<sup>9</sup> In addition, similar analysis was performed on four annual Financial Stability Reports (FSRs), published by the Central Bank and Financial Services Authority of Ireland (CBFSAI, 2004, 2005, 2006, 2007). Overall, the reports include monthly, quarterly and annual commentaries and cover a range of institutions.

Note that the intention here is not to criticise these forecasters and analysts, or to suggest that there were shortcomings in their application of professional methods. For, in addition to a warranted wariness of hindsight bias, it is extremely difficult to devise a method to forecast turning points in mean-reverting time series (see Fuster et al., 2010, for discussion). Moreover, it can reasonably be argued that, on average over an extended period, projection of the most recent trend is likely to be as good a method for forecasting house prices as any other. The aim is, therefore, not to judge the quality of forecasts, but to understand how expectations were being formed.

The analysis reveals that expectations of continued house price increases were not confined to households. The forecasts in four of the five commentaries (i.e. excluding the FSRs) were for further price increases in the year to come, in the range 3–6%; the fifth gave a forecast of a 27% rise in house prices over the following five years. Each of these professional commentaries, including those of the banks, made explicit quantitative reference to the most recent trends as their primary guide. With respect to the 2007 forecasts, all five reports quantified the first derivative of Irish house price indices over the preceding one or

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<sup>8</sup> More precisely, this is the month when the Permanent tsb/ESRI House Price Index peaked. The retrospective CSO Residential Property Price Index peaked in Q3 2007. A time lag of 4-6 months is associated with these indices, because they are based on the drawing down of mortgages rather than the agreement of deals. Thus, in reality, actual house prices began to fall in late 2006 or early 2007.

<sup>9</sup> It should be noted that no effort has been made here to examine the totality of relevant output written by the institutions or authors of the reports selected for analysis – a task beyond the scope of this paper and not commensurate with its aims. The purpose is only to analyse factors driving property price expectations just prior to the turning point in house prices.

two years, with three out of four also quantifying the second derivative over recent months. A basic rationale for the forecast was common to all five: the current rate of house price inflation was the starting point and this was then adjusted somewhat to reflect one or two other factors, perhaps the current trend in the second derivative, the current trend in interest rates, gradually declining affordability, or in one case changes in immigration trends. The following are examples:

“The pace of monthly house price increases continues to moderate. According to permanent tsb data, nationally prices rose by 0.7% in September, the first monthly increase of less than 1% since July 2005. On average prices rose by 0.9% per month in Q3 this year compared to the 1.4% average monthly increase in Q2. As a result, the annual rate of inflation edged downwards to 15.0% in September. We expect to see a further moderation in the monthly rate of price increases over the next couple of months as the impact of deteriorating affordability is felt. However, the annual rate is still likely to be some 12% or above by the end of this year but could fall to around 3 - 6 % by end 2007.” (AIB, 2006, p. 2)

“Between December 2005 and October 2006, new house prices rose by 8.8 per cent. We expect that the impact of current and anticipated interest rate increases should contribute to a moderation in inflation relative to recent months. We therefore assume that new house prices will increase by a rate of 10 per cent in 2006 and 6 per cent in 2007.” (Barrett, Kearney and McCarthy, 2006, p. 12)

The analytic structure here is a syllogism: the most recent trend and a source of downward pressure are combined to form the conclusion that the rate of increase will moderate. Although it is adjusted somewhat, the most recent rate of increase acts as the initial anchor, suggesting that the latest trend is accorded more weight than past trends, which are not considered.

Further evidence comes from examination of the four annual FSRs, published by CBFSAI, which also covered commercial property. Recent year-on-year comparisons of the first and second derivatives of house prices were the initial and primary focus for analysis. The same method was then extended to an analysis of rental yields and commercial property. The implicit assumption throughout these analyses was, again, that the most recent trends were the starting point for considering the future.

Thus, expectations of property prices were consistent with extrapolation bias among both the public and experts, including economic research teams at the major banks, independent economists and economists working for the authorities. As stated above, forecasting techniques that embed extrapolation bias may be no worse than other methods in terms of average forecasting performance over a period. But they are likely to go awry where the

series is mean-reverting and the recent trend is extreme, as was the case for property prices in Ireland. Overall, given the evidence above, it seems likely that extrapolation bias contributed to unrealistic expectations of further price increases among lenders and borrowers in Ireland's property market.

Ireland's extraordinary economic performance and associated income growth from the early 1990s onwards perhaps made it particularly vulnerable to extrapolation bias. Extreme trends during the boom were not confined to property prices. When deciding how much to borrow, households must (intuitively or otherwise) estimate not only price movements but also future income and employment prospects. Extrapolation bias may have led them to overestimate both and thus to over-borrow. Similarly, it may have afflicted businesses' estimates of revenue streams, especially but not only in property-related sectors.

Extrapolation bias was a potential contributor also to the waywardness of Irish macroeconomic forecasts. In part, Irish forecasts were inaccurate for the same reasons that international forecasts were: forecasters underestimated the potential macroeconomic impact of failure in the financial markets, perhaps because of excessive faith in the efficient markets hypothesis (Nyberg, 2011). But there were also domestic factors. Whelan (2010) documents how forecasts prior to the crisis anticipated that Ireland would continue to outstrip growth in other developed countries, concluding that forecasters were over-optimistic. This is possible, but extrapolation bias offers another explanation. Even where macroeconomic forecasters use formal models, they are not immune to the bias, which is often inadvertently built in by calibrating models with relatively recent data. More importantly, in truth, forecasting is part science and part art. Forecasters evaluate model output against intuition, which is potentially prey to extrapolation bias, especially where recent trends are extreme.

In summary, surveys and published material relating property price expectations just before the crash are consistent with extrapolation bias. The most recent trends carried greater weight than past trends, leading expectations astray. The bias may also have affected expectations of other economic variables. Note that extrapolation bias is a cognitive rather than social or emotional phenomenon. It was possible to get caught up in Ireland's bubble without falling victim to euphoria, frenzy, or even over-optimism.

### *3.2 Confirmation Bias*

The original demonstrations of confirmation bias are due to Wason (1960, 1968), who designed experimental tasks in which people were asked to test abstract rules. Subjects tended to seek positive instances of rules and failed to employ tests that could refute them. There is a large body of subsequent work on this bias (see Nickerson, 1998, for review).

Experimental and survey evidence shows that confirmation bias applies also to the consideration of ambiguous evidence, which tends to be interpreted in line with prior beliefs; that the bias is exhibited by experts as well as lay-people; and that confirmation bias applies across many reasoning domains, including economic contexts with real rewards and costly acquisition of information (Jones and Sugden, 2001). It is important to understand that these demonstrations occur in contexts where agents have no vested interest in their belief being accurate, yet they nevertheless tend to seek information that might confirm rather than refute it.

There were several critically important beliefs held prior to the banking crisis that were potentially subject to confirmation bias. For house buyers, investors, developers, bankers and bank supervisors, the main belief of interest was that high property prices would be sustained. The banks also had to assess beliefs regarding the ability of specific borrowers to repay loans. Those responsible for supervising the banks needed to form and update beliefs about the impact that a fall in property prices could have on bank balance sheets and the extent of systemic risk to the banking system as a whole. Indeed, as the guardian of the public interest with respect to financial stability, CBFSAI had a particular responsibility to assess the likelihood of financial problems with wider societal consequences, requiring them to consider possibilities that others might not, i.e. to focus on low probability events. To some extent, this responsibility to protect the public interest also fell on the wider community of policymakers, journalists and academics working in relevant areas of economics and finance.

With respect to property prices, it is interesting to scour the arguments considered by the 2006 commentaries analysed in the previous section, two of which were written by the research divisions of the largest banks. Four out of five of the commentaries included some analysis of supply and demand factors affecting property prices, especially residential property (the exception is Barrett et al., 2006, which confined the discussion to the above quote). All four note the scale of price increases in Ireland and refer to suggestions that prices might fall. Thus, the reports display an awareness of an alternative perspective, although sustained high prices is the universal conclusion. Looking across these four commentaries, however, the balance of factors examined favours confirmatory evidence, especially on the demand side. All four reports refer to Ireland's unique domestic demography and high immigration. Three refer to the need to "play catch-up" with the rest of Europe. Two point to falling household size. The only evidence cited that might question sustained high prices concerns likely interest rate movements and the possibility that prices may have outstripped "fundamentals", although here again the balance of evidence cited suggests that fundamentals were pushing prices up.

The strongest evidence against the sustainability of Irish property prices was to be had from international comparisons and from history. What was occurring was unprecedented. Prices

were extremely high by international standards and there was a history in other developed countries of strongly rising property prices being followed by substantial falls. Yet these lines of argument did not receive the same degree of attention as the confirmatory evidence and very little relevant data was sought, analysed or quoted.

It might be thought that incentives existed for some analysts to “talk up” the market. This argument applies less to the FSRs, which analysed property prices on an annual basis. Between 2004 and 2006 these reports considered only one argument for a potential fall in prices, namely whether prices were higher than could be justified by “fundamentals”. The approach is summarised clearly in 2004:

“In any assessment of the dangers for financial stability coming from the housing market, the concept of the fundamental house price is key.” (CBFSAI, 2004, p. 20)

This claim, repeated in successive years, is debatable for reasons discussed below (Section 3.4). Importantly for present purposes, it admits only one form counter-evidence to the sustainability of prices and, at a stroke, excludes the strongest forms. Indeed, after Kelly (2007) published estimates for OECD countries of the historical scale of house price falls relative to large price rises, the FSR 2007 dismissed the relevance of his work on the grounds that it did not centre on the relationship between prices and an estimate of “fundamentals”. Two other counter-arguments to Kelly were produced in the same report: that the analysis would not hold for nominal house prices and that history was anyway a poor guide, because we were living in an economic period characterised as the “Great Moderation”. This response is consistent with confirmation bias. Indeed, one established lesson of economic history is that financial crises tend to be preceded by dismissive rebuttals to warnings based on historical precedents, usually involving superficial arguments to the effect of “this time is different” (Reinhart and Rogoff, 2009). The morphing of the “Great Moderation” into the “Great Mortification” (Mirowski, 2010) is the latest in a long line.

Of course, influences other than confirmation bias might explain the interpretation of Kelly (2007) in the 2007 FSR. But even if the argument is limited to assessments of prices against some measure of fundamentals, it turns out that the FSRs ignored negative evidence. Arguably the most sophisticated econometric treatment of the gap between prices and fundamentals was Murphy (2005), which concluded that prices were well above fundamentals as early as 2004. The FSRs emphasised in-house econometric analysis instead, which showed prices in line with fundamentals (e.g. CBFSAI, 2005, Chart 27).

The persistence of beliefs about the prospect of a soft-landing for the property market and the financial soundness of the banks is a theme of the official report into the performance of

CBFSAI between 2003 and 2008 (Honohan, 2010), which highlights lack of scepticism and selective reading of evidence. For instance, with respect to the belief that the financial position of the banks was sound, the FSRs made little of in-house analysis of the commercial property market, which implied potentially serious problems for the banks (Kearns and Woods, 2006; Woods, 2007).

Honohan (2010) also had unparalleled access to files and testimony, which helps to assess how the banks compared their beliefs with evidence. The report quotes from documents relating to an inspection by the Financial Regulator of five banks related to five particular property developers, which was conducted in December 2007:

“all institutions confirmed to the inspectors that they have *no concerns* with the current or future repayment capacity of *any* of the borrowers.” (Honohan, 2010, p. 70, italics added)

However, the inspection documents also note that the banks concerned had failed to obtain Net Worth Statements from one developer and that in other cases the statements had not been verified by a third-party. The banks’ beliefs about the ability of these developers to repay were firm and yet, at least in a number of serious cases, clearly not subject to standard banking procedures that are designed to test the truth of claims that are too easily assumed and accepted by both parties to a loan. Instead, the banks accepted weak confirmatory evidence, even when being interrogated specifically in respect of the matter. The portfolios being investigated were ultimately transferred to NAMA.

In similar vein, when managers at one bank were questioned about exposure to property during an inspection in May-June 2007, the response was:

“The number of customers that this bank backs for unzoned land is very small and they are very high net worth individuals, e.g. [Messrs X and Y], who have years of development experience.” (p. 69)

Once again, the bank was relying on weak confirmatory evidence to support its beliefs about the ability to repay very large loans.

These passages in the report are also notable for the number of different signals contained in the files of the Financial Regulator, and available to the Central Bank, to the effect that the banks’ balance sheets might have become vulnerable. In addition to statistics showing that increases in bank lending were abnormally large by international standards and that loans

were concentrated in the property-related sector, there were clear indications of poor bank documentation related to loans, of erroneous beliefs held by banks regarding the exposure of developers to other banks, and of more straightforward failures of governance procedures at certain banks. Given such signals, the possibility that one or more banks was vulnerable to a downturn in the property market was a hypothesis that CBFSAI could have put effort into testing. Although there were other potential influences involved,<sup>10</sup> the phenomenon of confirmation bias predicts that even though the data and wherewithal for a quantitative examination of this hypothesis were available, time and effort would instead be directed to gathering evidence consistent with the prevailing theories that a soft landing was in store for the property market and the banks were essentially sound. From an examination of the contents of the FSRs, this is what occurred.

The available documentation makes CBFSAI the main focus for assessing the role of confirmation bias, but as the earlier analysis suggests, there is also evidence that the bias supported important and erroneous beliefs held by the banks themselves and by other economic and financial analysts. One consequence, as Honohan (2010) concludes, is that no representatives involved in the meetings of officials prior to the announcement of Ireland's extensive bank guarantee, on 30 September 2008, believed that any Irish bank, including Anglo-Irish Bank, might be insolvent. The problem was believed to be one of liquidity only. Confirmation bias may well have helped to ensure that no thorough quantitative analysis had been conducted, by CBFSAI or others, to test a hypothesis that was crucial to perhaps the most consequential decision of the crisis.

### *3.3 Overconfidence Bias*

This bias manifests itself in two ways. First, we tend to be too optimistic regarding assessments of our own ability or personal outcomes. Second, we are inclined to believe that our assessments of likely outcomes are more accurate than they in fact are. These phenomena apply to many types of judgement. For instance, one classic psychological study found that 93% of drivers thought their driving skills were above the median (Svenson, 1981).

Overconfidence in real market settings has been recorded for consumers and workers (see DellaVigna, 2009, for review), but studies of financial and business professionals are of particular relevance here. Malmendier and Tate (2005, 2008) provide some powerful evidence of overconfidence bias among business leaders using corporate data. They identified CEOs who held on to their own stock options (rather than diversified) as

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<sup>10</sup> For instance, Honohan (2010) conjectures that senior CBFSAI staff may have played down concerns because they were worried about causing public alarm, although Nyberg (2011) points out that this does not explain why they would play them down internally and in confidential communications with the government.

“overconfident”. They then found that this proxy predicted corporate behaviour, including willingness to pay for mergers and to use available funds to invest in projects.<sup>11</sup> Another study that may be telling in respect of Irish bankers, given the unprecedented and extended corporate success that occurred during Ireland’s boom, is Deaves, Lüders and Schröder (2010), who analysed dynamic data on overconfidence among stock market forecasters. They found that financial professionals were not only greatly overconfident in their forecasts, but also that their overconfidence increased in response to success.

The growth in the loan books of Irish financial institutions between 2003 and 2006 (see Regling and Watson, 2010, Chart 8), during which average annual increases at the major lending institutions were all in excess of 25%, perhaps four to five times international norms for successful banks, certainly suggests that executives’ confidence in their abilities to back successful projects and people was remarkably high. To be sure, the increases in the loan books were in part responses to increased competition and a battle for market share (see below). Yet it seems that after years of growth and high profits, bankers had formed views regarding their own skill that were consistent with overconfidence bias. Lyons and Carey’s (2011) interviews with the Chairman and Chief Executive of Anglo-Irish Bank, Seán Fitzpatrick, repeatedly reveal an extraordinary confidence in the ability to judge the creditworthiness of individuals through little more than personal relations. Ultimately, Fitzpatrick himself identified this as a problem that beset the bank:

“I was huge into people... The difference between Anglo and, say, AIB was not the product – in other words money. It was the people and the way they dealt with the customer base. That was the difference. That might have been the big mistake we made, but that was the difference.” (p. 45)

The fact that Anglo-Irish allowed the responsibilities of its Chief Risk Officer to transfer to the Finance Director in 2007, over-riding standard checks and balances, underlines the extent of misplaced confidence in its own judgement.

It can be argued that bankers were responding rationally to incentives in remuneration packages, which tended to place emphasis on market share and relatively short-term share-price performance. Such incentives may have been influential, but many of the executives responsible for the growth in loans did not only bet the bank on their abilities, they also bet (and lost) millions of their own money, in the form of bank shares and personal property portfolios (Nyberg, 2011). For bankers who had their own “skin in the game”, overconfidence bias provides a more consistent explanation of their behaviour.

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<sup>11</sup> Note that this finding was not due to insider knowledge, since the overconfident CEOs did not, in fact, benefit from holding on to their stock options.

The second manifestation of overconfidence bias concerns people's overestimation of the accuracy of assessments, referred to as "miscalibration". Again, there are many experimental demonstrations of this across decision-making domains for the population at large, but miscalibration among senior management is especially relevant. Ben-David, Graham and Harvey (2010) surveyed a sample of Chief Financial Officers (CFOs) at US companies and asked them to predict stock market returns, including the 10th and 90th percentiles of the distribution of market returns. Consistent with laboratory findings, Ben-David et al. found that realised returns stayed within the 80% confidence limit of the CFOs just 33% of the time over a period of nearly a decade. Even during the least volatile quarters, the confidence limit only covered 59% of returns. This finding is emphasised here because it gives an indication of the potential strength of overconfidence bias, even among those with expertise and experience operating in real markets. Often, biases in judgement and decision-making are not small deviations from otherwise accurate judgements, but large distortions. Furthermore, decision-makers whose predictions happen to prove relatively accurate respond by further narrowing their confidence limits, i.e. positive feedback increases miscalibration (Deaves et al., 2010).

The ubiquity and nature of miscalibration means that it is likely to have affected assumptions that were made by lenders and borrowers about the potential likelihood of negative events. Given the narrowing effect of positive feedback, this may have been particularly relevant for expectations of incomes and property prices in Ireland following a decade or more when average increases in both were strong and consistent. Miscalibration may also have led banks to underestimate the probability of radical change in international credit markets.

A more concrete indication of miscalibration is the choice of scenarios for the stress tests conducted for the FSRs. This example is particularly instructive, because it shows how intuitions subject to biases can interact with more formal economic analysis. The rationale for selecting scenarios in CBFSAI stress tests was most clearly spelled out in 2004,<sup>12</sup> where the FSR stated that:

"[the scale of the shocks applied to macroeconomic variables] was chosen so that they each had a probability of between one in a hundred and one in a thousand of actually occurring, based on the historical behaviour of the series in question. These probabilities were calculated by considering percentage changes in these variables over a long timeframe, adjusted for any underlying trend in the series, and fitting an interpolated probability density function." (Mawdsley, McGuire and O'Donnell, 2004, p. 106)

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<sup>12</sup> In the absence of similarly precise statements of criteria, I assume here that the target probability of occurrence stated in 2004 applies to subsequent years also.

The report went on to argue that the probability of all of the shocks occurring simultaneously was probably even lower than this. The task being undertaken here is not easy, as there are pitfalls aplenty in the available statistical methods for calculating extreme probabilities of events from historical data (Taleb, 2007). The particular method just described is approximate and potentially inaccurate, given evidence that some economic variables appear to have probability distributions with fat tails. As with other types of forecast, therefore, formal models must be combined with intuitions and judgement, which is where miscalibration may take its toll. In the event, the scenarios chosen for stress tests by CBFSAI were very much milder than what has in fact happened to the Irish economy in recent years. For instance, the 2004 stress tests assessed the impact on the banks of a recession resulting in a cumulative 5% drop in GDP over two years, with unemployment rising to 10% and house prices falling by 10%. The 2006 tests employed a 5% drop in GDP, unemployment at 10% and a 20% drop in house prices. We must be very wary of hindsight bias here, because it is possible that the probability of a recession as severe as the one Ireland actually experienced really was extremely low – perhaps we were just very unlucky. Yet in addition to Kelly (2007), which was prepared just months after the FSR 2006, Fitz Gerald et al. (2005) chose to simulate the impact of a house price fall of one-third, a figure that was based on an international comparison of house price cycles.<sup>13</sup> The fact that other qualified analysts were contemporaneously considering more severe scenarios for the Irish economy would suggest that the probability of occurrence of negative events was being underestimated by CBFSAI, consistent with miscalibration.<sup>14</sup>

Combining what was perceived at the time with what is known now, it is difficult to avoid the conclusion that the intuitions of borrowers, bankers and banking supervisors were in general badly miscalibrated, with the result that the Irish economy was at much greater risk than was perceived at the time, in relation to the property market, the stability of the banks and the associated macroeconomic prognosis.

### *3.4 Ambiguity Aversion*

Extrapolation bias, confirmation bias and overconfidence bias are relevant to situations where decision-makers must assess the likelihood of possible outcomes under uncertainty.

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<sup>13</sup> It is important to distinguish this simulation from the warning given later by Kelly (2007). The scenario was meant to show that the size of the building industry had left the economy vulnerable to a shock that might affect house prices. One example given was a rapid change in US indebtedness, which might damage confidence in Ireland. Such a shock was “not inevitable” and a soft landing remained possible. By contrast, Kelly (2007) definitively stated that Ireland was experiencing a large house price bubble by international standards and that a dramatic fall in prices was indeed inevitable.

<sup>14</sup> Again, similar analysis can be applied to the global crisis in respect of the role of the US housing market. In the context of arguing that economists and regulators were underestimating tail risk, Taleb (2007) wrote prior to the crisis that “the government-sponsored institution Fanny Mae, when I look at their risks, seems to be sitting on a barrel of dynamite, vulnerable to the slightest hiccup.” (p. 225, footnote)

Yet it is also the case that the nature of the uncertainty itself affects decisions. Since Ellsberg (1961), it has been understood that, over and above the general finding that we are risk-averse, we prefer situations where the risk can be quantified to those where it cannot, even if the actual degree of risk involved is the same.<sup>15</sup> That is, we have a general aversion to unquantifiable or “Knightian” uncertainty (Knight, 1921), more often termed “ambiguity aversion”. Amos Tversky (and colleagues) have since added a potentially important extension to Ellsberg’s work. The “competence hypothesis” states that the extent of ambiguity aversion is related to our feelings of competence, defined by how much we feel we know of what could be known. Experimental evidence supports this hypothesis. We prefer to take risks in relation to events with which we are familiar than those with which we are unfamiliar, even if the extent of perceived risk is in fact the same (Heath and Tversky, 1991; Fox and Tversky, 1995). This bias is consistent with the initially puzzling fact that financial portfolios tend to display concentration in more familiar assets, at the expense of apparently more rational diversity. For instance, investors’ holdings display concentration in stocks of geographically closer companies (Huberman, 2001) and in own-company stock (Benartzi, 2001).

The upshot of this research is that, in addition to our tendency for overconfidence when assessing the scale of risks, we are also more willing actually to take a risk the more competent we feel, rightly or wrongly, about assessing it. Feelings of competence were arguably not in short supply in the later years of the Celtic tiger. Public discussion prior to 2007 often implied or even claimed that the Irish economy was somehow operating a superior economic system to many other developed countries – the “Irish model” became a discussion point domestically and internationally. Low perceived uncertainty, including in respect of how the Irish economy as a whole worked and how Irish people did business, may therefore have been another factor that drove banks, businesspeople and households in Ireland to take on such large amounts of risk. This perception was epitomised in an interview given by Anglo-Irish Bank’s Finance Director, Willie McAteer, to Financial News in July 2003:

“We operate in greater Ireland. London is eastern Ireland, Boston is western Ireland, and then there’s mainland Ireland. Culturally, they are very similar regions; it would terrify us to lend money in France, for example.”

This expression of much greater willingness to lend in familiar regions parallels Tversky’s experimental work and is consistent with ambiguity aversion and the competence hypothesis. More broadly, this bias may go some way to explaining why so many wealthy

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<sup>15</sup> Ellsberg showed this through examples of people’s willingness to bet on the colour of balls drawn from an urn. We instinctively value a bet more highly when we know that an urn contains balls of two colours split 50-50 than when we know that the urn contains balls of two colours in an unknown proportion, although the expected value of such bets is identical.

Irish individuals, who lost fortunes in the crash, had such poorly diversified portfolios of assets.

Our feelings of competence can themselves be biased, especially when dealing with complex systems. Rozenblit and Keil (2002) report convincing demonstrations of what they call “the illusion of explanatory depth”, whereby people systematically overestimate their understanding of complex systems across a range of domains, but especially systems that allow real-time explanations and consist of many perceptible parts – criteria that economic and financial systems fulfil.<sup>16</sup> As economists, we therefore have reason to be wary of the illusion of explanatory depth. The extent to which the global crisis surprised the profession exposed excessive faith in formal economic and econometric models, and in markets generally. It seems that we overestimated our understanding and underestimated complexity and uncertainty (Lunn, 2008; Schneider and Kirchgässner; 2009; Colander et al., 2009) – effectively, a collective illusion of explanatory depth.

In the Irish case, this illusion was apparent not only with respect to the failure of macroeconomic models to foresee calamity, but also with respect to relevant microeconomic issues. Honohan (2010) argues that a majority of academic economists believed that house prices had “overshot equilibrium” by 2003-2004. The focus of economists at CBFSAI (see above), the OECD (2006), among the academic community more generally (e.g. Murphy, 2005) and, indeed, among economists at the major banks (AIB, 2006; Bank of Ireland 2006) was on comparing house prices to “fundamentals”. This expression is a short-hand for whether prices represent an equilibrium between supply and demand. Within this theoretical framework, the likely extent of a possible “correction” can be estimated by assuming that any price fall entails a return to equilibrium. This orthodox model of the housing market and the econometric models derived from it do not fit easily, however, with the volatile nature of historical house price series (e.g. Case and Shiller, 2003; Kelly, 2007), the cyclical patterns of which instead imply that prices frequently overshoot theoretical equilibria on the way down as well as on the way up. By placing faith in such models, however technically adept or sophisticated, even economists who concluded that prices had overshot fundamentals were likely to underestimate eventual price falls. Kelly (2007) explicitly rejected such models as useful for understanding Ireland’s bubble and instead outlined models based on information cascades.

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<sup>16</sup> This bias was probably an important factor in precipitating the global financial crisis. The apparent sophistication of mathematical models developed to price innovative and complex securities led traders to overestimate their ability to calculate risks accurately, thereby reducing perceived uncertainty and increasing willingness to take on risk. When events revealed the inaccuracy of the models, willingness to take the same risks changed extremely rapidly (Lunn, 2008; Honohan, 2008; Barberis, 2010).

### *3.5 Behavioural Convergence*

A vast interdisciplinary literature debates the rationality or otherwise of the fact that we tend to gravitate towards each others' decisions and judgements. For instance, the theory of information cascades (Bikhchandani, Hirschleifer and Welch, 1992) proposes that we observe the decisions taken by others and then employ them as useful information on which to base our own decision. This makes good sense for decisions taken under uncertainty where others possess good information that we do not. However, information cascades can also lead to the propagation of mistakes, if individual decision-makers overestimate the quantity or quality of information possessed by others. Finer distinctions between information cascades, groupthink, bandwagon effects, herding, social learning and so on, suggest alternative rationales for imitative behaviour, reflected in the very many models that have been developed (see Rifaat, Chater and Frith, 2009). The different rationales include: to improve our own decisions, to maintain our reputation, to influence the decisions of others, to maintain group dynamics, to avoid majority sanctions, and more.

Empirically, there is evidence of imitative behaviour among consumers (e.g. Huang and Chen, 2006) and in financial markets, which is extensively reviewed in Hirschleifer and Teoh (2003). These authors also examine the much smaller volume of research that investigates herding in corporate decision-making. Usefully for the present context, Morck, Sleifer and Vishny (1989) show that decisions by company boards to remove a management team are more common where company performance is below the industry average than where the company is in a poorly performing industry. Thus, evaluation of executive performance has a strong relative dimension; those who appear not to be keeping pace with the herd can get picked off. With reference to the global financial crisis, Shefrin (forthcoming) details evidence of banks trying to catch up with frontrunners through imitation. Internal documents at UBS bank reveal that while the bank initially stayed out of the market for mortgage backed securities, after an internal report identified this as a reason for its falling behind competitors it felt the need to increase its holdings. The result was huge losses and the ultimate bail out of UBS by the Swiss central bank.

In the case of the Irish banks, there is an obvious analogy with the practice that became known as "chasing Anglo". Anglo-Irish bank had increased its market share from 3% to 18% in a decade during which there was increased domestic competition and the entry to the market of foreign-owned banks. The drive to accelerate loan book growth and consequent lowering of lending standards may have partly reflected incentive structures, especially remuneration schemes that rewarded market share at the expense of longer term risk. Yet, as Lyons and Carey (2011) document, the primary method of competing with Anglo-Irish appears to have been imitation. Executives at other banks explicitly targeted the same customers and employed similar methods to woo them, rather than taking independent decisions about which were the most profitable projects to back.

Nyberg (2011) views such herding between banks as a strong factor in the development of the crisis. The Commission's interviews revealed that the other Irish institutions viewed Anglo-Irish as a direct threat and bank executives and boards feared that failing to follow a similar expansion strategy might result in loss of customers, declining bank value, potential takeover and loss of professional respect. In some cases they were urged in this direction by consultants. Anglo-Irish Bank was an apparent success story that executives in other banks sought to emulate. This gravitation towards the "Anglo model" increased the concentration of loans in property and among specific developers.

Behavioural convergence probably had an important role to play also with respect to consumer behaviour, but here it is harder to produce direct evidence and the analysis is therefore more speculative. Nevertheless, it is clear that the consistent and rapid growth in incomes and house prices meant that, for an extended period, taking out a mortgage for many multiples of household income appeared relatively safe and effectively became the norm. Moreover, unlike many other countries, Ireland had not experienced a crash in nominal house prices for more than a generation, so there were unlikely to be influential norms of borrowing behaviour borne of painful experience.<sup>17</sup> In addition to the increasing amounts borrowed, there was a steep and steady increase in the proportion of loans with high loan-to-value ratios and mortgage terms of thirty or more years (Duffy, 2010). The prevailing wisdom was that it was important to "get on the property ladder", regardless of how much one had to stretch to do so. The media may well have successfully egged consumers on. Property advertising and associated "journalism" became a very significant source of revenue for media outlets. Television shows obsessed about house buying and home improvements. Although international evidence in relation to the influence of the media in stoking house prices is sparse, there is good evidence that the media can have a "social amplification" effect in relation to perceptions and expectations of prices generally (e.g. Soroka, 2006). Given all these factors, in the years leading up to the crash the decisions facing younger adults and first-time buyers were particularly unpleasant. Those who considered holding out for a price fall could not have known how long they would have to wait, as prices rose, affordable properties seemed to shrink and creep yet further out of town, and the possibility of never being able to afford a home loomed. It takes courage to stay put when the herd gallops away.

Nyberg (2011) distinguishes herding, which occurs between individuals or organisations, from groupthink, whereby decision-makers are unwilling to depart or dissent from the decisions of their group. This phenomenon is very widespread in experimental and field

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<sup>17</sup> The previous fall in real house prices in Ireland, which occurred over a five-year period in the early-mid 1980s did not involve sizeable falls in nominal house prices, thereby avoiding imparting some of the painful financial lessons presently being learned. Prior to that, there was a period of declining house prices in the 1950s.

studies of group behaviour (see Baron, 2005, for recent review) and seems to have been echoed in many interviews conducted by the Commission, both with individuals involved in banking and those working for the authorities. For employees holding private doubts about the riskiness of bank lending or the threats building up in the banking system, fear of sanctions or of loss of influence apparently trumped incentives to follow-up troubling analytical arguments or to express genuine professional concerns. Although there is little more than anecdotal supporting evidence, it is possible that such influences also affected the behaviour of journalists and academics, who potentially risked strong public criticism (including accusations of trying to cause a crash) if they promoted negative analyses. The reaction to Kelly (2007) suggests such concerns were not unreasonable.

Lastly, returning to the banks, a specific context in which decision-makers influence each other is the committee. Given the number of committees with responsibility for oversight within the banks and CBFSAI (including the respective boards), biases specific to committee decision-making may also have played a role. In the absence of explicit structures designed to give voice to alternative viewpoints, group decisions tend to be more extreme than individual decisions (Sunstein, 2003), making it possible for committees to become less risk-averse than individuals would be. Experimental studies in this area point to the importance of designing committee systems to ensure that minority viewpoints are aired and debated, as this moderates and improves decisions.

### *3.6 Time Inconsistency*

One of the earliest and most established results of behavioural economics concerns behaviour in intertemporal choice experiments. When deciding between rewards separated by time, we discount the future at a non-constant rate, with a pronounced bias in favour of more immediate rewards (see Frederick, Loewenstein and O'Donoghue, 2002, for review). The upshot of this “hyperbolic discounting” is that individual preferences are not consistent over time. Several impacts on consumer behaviour in the field have been observed, including with respect to credit card usage and pension contributions (DellaVigna, 2009).

A field study of particular relevance is Ausubel (1999), who showed how manipulation of the “teaser rate” on credit cards could lead consumers to prefer cards with low initial interest rates that in fact turned out to be less beneficial for their borrowing patterns than the cards without the low rate. Given the low interest rates and aggressive marketing of mortgages that followed the introduction of the Euro, a similar bias would imply a disproportionate impact on the willingness of Irish households to take on debt.

Where this particular bias might have been especially damaging during the banking crisis, however, was in the various decisions that required individuals to weigh up the lure of

immediate rewards (or the avoidance of immediate aggravation) against longer-term risks. This decision structure would have applied to any loan officers or mortgage salespeople whose remuneration and advancement were linked to the number of deals they made. It would have applied to executives whose remuneration was partly based on market share or short-term share-price movements. It would also have applied to board members and supervisors for whom questioning bank strategies or demanding changes entailed immediate costs (or risks) in terms of reputation and perhaps prospects, in a climate where profits and incomes were rising strongly.

The problems of poor incentives and insufficient long-term incentives have been raised by many in the context both the global financial crisis and the Irish case. But the behavioural economics of intertemporal choice suggests not only that such incentive structures are poorly aligned, because they incentivise agents to take undesirable actions, but also that they are likely to be particularly powerful drivers of undesirable behaviour, because people have a disproportionate liking for more immediate rewards.

### *3.7 Loss/Gain Asymmetry*

The groundbreaking work of Kahneman and Tversky (1979) established experimentally that decision-makers respond asymmetrically to gains and equivalent losses. Specifically, losses appear to be weighted more heavily in our decisions than equivalent gains (i.e. we are loss-averse)<sup>18</sup> and, of particular interest here, our normally risk-averse preferences tend to switch to risk-seeking preferences in the domain of losses. Again, DellaVigna (2009) finds broadly supportive field evidence.

The point is worth emphasising: evidence shows that we become risk-seeking (i.e. willing to take gambles of negative expected utility) to try to recover losses; gambles that we would not take in pursuit of equivalent gains. As the scale of the banking crisis began to emerge, many individuals faced the prospect of sizeable losses, both financial and reputational. To the extent that their behaviour matched what is typically observed in decision-making problems, those facing the losses could be expected to take some gambles, perhaps risking further economic or reputational losses in the hope of recovering the situation. This behavioural pattern may help to make sense of the constant underestimation of the scale of the problem throughout the crisis by those in positions of responsibility. Denial may cause further poor decisions or come at the cost of being proved wrong again, or indeed of being

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<sup>18</sup> There is good field evidence to suggest that loss aversion slows the adjustment of house prices during crashes. Genesove and Mayer (2001) obtained sales data during the 1990-1997 housing slump in Boston that included the original purchase price of sellers. Controlling for other characteristics, the quoted price for dwellings being sold at a loss was biased upwards. The implication is that the greater the proportion of sales that realise losses, the more likely are sellers to hold out longer for a higher price. In the Irish market since 2007, an equivalent effect may be slowing price adjustment and reducing sales volume.

seen to be in denial, but if there is a chance that the situation may turn around, then these further losses may be risked and the scale of the problem still denied. The propensity to take risks when facing losses may also help to explain why some people dig themselves into deeper and deeper holes, such as rogue traders, problem gamblers, or experts who refuse to accept that they got it wrong. This pattern suggests that when people with wealth and reputation face losses on the scale seen during Ireland's banking crisis, it is a time to be wary of wrongdoing. At the moment of writing, various investigations are ongoing.

#### **4. Conclusions and Implications**

Drawing on international literature in behavioural economics, this paper has hypothesised that seven established biases in judgement and decision-making played a role in the Irish banking crisis. Similarities between the circumstances of decision-makers during the crisis and contexts that are known empirically to produce biased decision-making, dictates that the hypotheses should be considered seriously. For each of the seven biases, international research provides experimental evidence of its influence in certain decision-contexts and field evidence linking it to real-world behaviour. Furthermore, while the evidence is clearly stronger for some hypotheses than others, the present analysis has located publicly available evidence relating to Ireland's crisis that is consistent with a role for the seven biases. The analysis therefore adds a stronger behavioural economic dimension to previous analyses of the crisis, including the three official investigations.

Yet we must be wary of confirmation bias here, since this exercise explicitly set out to seek signs that the relevant biases might have been instrumental. Given this, of the evidence offered in the Irish context, greater weight should arguably be accorded to tests that might potentially have refuted the hypothesis in question. For instance, the examination of a range of economic commentaries at end-2006 might have revealed that property price forecasts weighted past trends equivalently to recent trends, thereby refuting extrapolation bias. A similar argument holds for confirmation bias. Thus, the evidence for these two biases being instrumental is arguably stronger than the evidence supporting a role for other biases, which mostly consists of confirmatory instances gleaned from large amounts of interviews and testimony.

Nevertheless, considering the seven phenomena at issue, the present analysis introduces a new perspective to attempts to understand Ireland's banking crisis. Nyberg (2011) identifies the simultaneity of disadvantageous decision-making as central to understanding the crisis and offers herding and groupthink as potential explanations. Both of these phenomena help to account for the simultaneity, since they are essentially about the influence on individual decision-making of observing decisions made by others. However, the present paper offers six other behavioural phenomena that potentially address the issue of simultaneity in a different way. These phenomena do not require a direct mechanism of contagion, be it

through social observation or collective emotion. Instead, they result in simultaneity because where a particular decision context interacts with a systematic human behaviour to make a particular misjudgement likely, many people faced with the same context may independently make the same misjudgement at the same time. Illusions simultaneously fool us all, with no requirement for communication or contagion, because they exploit common human propensities. Thus, if the cognitive biases hypothesised were instrumental in Ireland's crisis, then they entail a sort of economic illusion – an unreality seen and acted on simultaneously by many people, with different roles but similar intuitions. Heightened emotional states are not required. Contagion may amplify such biases in important ways, but it is not the root cause.

This point is important for addressing the following question: why would these decision-making biases have had a greater role in Ireland than elsewhere? Two answers to this question are offered here. First, the biases may have been enhanced by the length and extent of Ireland's boom, which was extraordinary by international standards. Given available evidence, the boom could be expected to have: exaggerated the extent of extrapolation bias and overconfidence bias; reduced perceived uncertainty and increased perceived competence; increased the perception that other people were doing very well by taking property-related risks; increased opportunities for more immediate rewards; and increased the size of financial and reputational losses when the crisis broke. In other words, with the possible exception of confirmation bias,<sup>19</sup> all of the biases considered were likely to be magnified either by the scale and/or length of Ireland's boom. A sense of this can be had from the words of Simon Kelly, one of the few property developers to have publicly described his experience:

“Once the bank trusted you, money was easily available to play in the duck shoot that was the Irish property market. It was a duck shoot because all you had to do was buy a site with money from the bank, and sell it when the market had risen. There was never an ‘if’ in this statement because we all expected the market to rise. A falling market was never considered a possibility because the Irish market had never fallen – or so we told ourselves. There had been blips in the past but house-price inflation had always kept these price falls very small and very short. We convinced ourselves and the bank that property was a rock-solid investment with very little risk.” (Kelly, 2010, p. 40)

This confessional passage contains at least three (confirmation, overconfidence, low perceived uncertainty) and arguably more of the seven biases at issue and gives an indication of how the combination of all of them may have led to such catastrophic decisions.

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<sup>19</sup> One can make a case that confirmation bias might have been exaggerated by the length of Ireland's boom, since there were sceptics of Irish economic success who increasingly appeared to have got it wrong.

The second reason why Ireland may have been especially prone to disadvantageous decision-making is that rules that existed to prevent it were not enforced and best practice not followed. Honohan (2010) and Nyberg (2011) list a large number of examples: the banks systematically violated their own stated policies on sectoral and individual lending limits, ignored lending criteria and failed to obtain standard documentation; the regulator did not correct governance failings, did not enforce prudential rules and allowed sectoral lending limits to be broken; the Central Bank did not respond to signals of excessive risk taking as dictated international best practice. Rules and practices have evolved in banking and bank supervision largely through painful experience. They mostly predate knowledge of the decision-making phenomena under discussion here. Yet they may nevertheless have acted to constrain the possibilities for poor decision-making, placing limits on how far biases could lure lenders and borrowers from well-trodden safe paths. Willingness to ignore these rules may have reflected lack of senior banking experience at executive and board level, as identified by Nyberg (2011). Ultimately, therefore, the combination of an extraordinarily long boom and a lack of banking experience due to Ireland's relatively late economic development, may have created a fertile environment for biases to flourish. As described earlier, institutional and psychological factors potentially interact.

If it were to be accepted that the behavioural phenomena hypothesised were instrumental, then what are the implications for policymakers? A number of possibilities might be considered, which can be grouped by decision-maker.

Firstly, the extent to which households overextended themselves suggests that there is scope for improved consumer protection in the mortgage and other credit markets. The prevailing regulatory approach, both internationally and in Ireland, has been to provide consumers with as much information as possible and to assume that they will then take informed decisions in their best interests. Following recent events, this assumption is being questioned in the UK (e.g. Financial Services Authority, 2009) and the US (e.g. Barr, Mullainathan and Shafir, 2008). The latter contribution proposes that regulators might establish default products, such that innovations must be sold in a context where the extent to which they deviate from established safe borrowing norms would be clear to consumers. In the lead up to the crisis, it is possible that the presence of an official default mortgage product with a more conservative borrowing limit might have induced better consumer decisions. Regulators may also be able to supply online services that allow consumers to independently assess their own creditworthiness by historically normal standards. A more strident and straightforward approach would be to enforce more conservative borrowing, through ceilings (e.g. on loan-to-value ratios) and the banning of products that exploit known behavioural biases (e.g. teaser rates).

With reference to the banks themselves, one lesson is simple. Rules that have evolved over decades of banking practice are there for a reason. They should be enforced, by banks and authorities alike.

The behavioural evidence examined here also adds to the weight of argument in favour of changing remuneration practices. In particular, there is a public interest argument for ensuring that executive compensation is dependent on long-term performance and risk management. A significant proportion of compensation could be held back for periods of five or even ten years.

But perhaps the greater lesson one might draw is that until a way is found to place limits on human behaviour, bank failures and regular financial crises are perhaps inevitable. Certainly, they feature regularly throughout financial history (Reinhart and Rogoff, 2009). If so, then the case can be made for much more conservative regulation to prevent the inevitable damage. This might involve endorsement of international efforts to raise capital requirements substantially and to bring offshore vehicles under regulatory control. In addition, if and when crises do strike, the likelihood of increased risk-taking by those facing losses means that there is a behaviourally informed case for clearing out the executives and directors responsible as rapidly as possible, and making similar changes to the relevant personnel in the regulatory system.

Turning to the role of financial regulation, despite our improved understanding of what contributes to bubbles, there remains no agreed mechanism for spotting them. That said, it is reasonable to assume that it would be useful for regulators to be better informed of the findings of behavioural economics and related fields, both from the point of view of monitoring the behaviour of consumers and financial service providers, and to ensure that their own decision-making limits the negative effects of known biases. Better knowledge, perhaps especially of confirmation bias, might have led to a more sceptical attitude to the claims being made by Irish banks and would surely have prompted a more open-minded approach to troubling analysis.

Finally, it is not comfortable, as an economist, to address biases that may have had a detrimental effect not only on agents in the economy but also on the quality of analysis provided to policymakers by economists. Once hindsight bias is stripped away, regardless of technical skill and despite the fact that some warnings were given at different points, it is incontestable that the severe events that unfolded in Ireland after the turn of the millennium were partly, perhaps largely, beyond the methods, models and intuitions of the profession. This observation is not limited to Ireland – so too were events on the global scale. Thus, the implication for the economics community is that we need to be open to alternative methods and models that might improve our intuitions.

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