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# Household vulnerability in rural areas: results of an index applied during a housing crash, economic crisis and under austerity conditions<sup>1</sup>

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**Abstract.** The emergence of the economic crisis in 2007/08 has increasingly exposed rural localities to exogenous shocks and ruptures within the globalised economy. Rather than focusing on economic growth alone, many commentators have begun examining how regions and localities can cope with economic crises by enhancing place resilience and reducing the vulnerability of places to global economic uncertainty. However, scant attention has been given to assessing economic vulnerability at the household scale. This paper attempts to marry and relate the global processes at work in both the literature on financialisation and vulnerability to facilitate understanding of and provide a framework for financialisation research at the household scale. In this context, we develop and apply a Household Vulnerability Index (HVI) to rural areas. Drawing on survey data, the index utilises both objective indicators (e.g. household income) and subjective indicators (e.g. household perceptions of future job insecurity) to provide a nuanced account of living conditions and life satisfaction among rural households in Ireland following a housing crash, economic recession and the widespread adoption of austerity measures across public policy. By adopting a vulnerability approach (rather than providing a ‘snapshot’), the HVI enables an assessment of not only current conditions for households, but also the probability of continued declining living standards and the exposure of households to further exogenous shocks. This provides a useful tool in assessing the potential impact of a range of public policies at the household level. In the case of Ireland, a link emerged between increased household vulnerability and rural localities that experienced an oversupply of houses during the recent speculative housing bubble, suggesting that the failure to effectively regulate development and finance has increased household exposure to financial risk.

## Introduction

Across Europe, there has been a dramatic unfolding of economic and political events in the wake of the economic and banking crisis of 2007/08. Many European economies remain fragile or in recession and this economic instability has been translated into political instability. European citizens have turned away from political parties perceived as being liable for the crisis and from those implementing austerity programmes, as is evident in a series of elections in Ireland, Spain, Greece, France, Italy and the recent collapse of the coalition government in the Netherlands. Perhaps more fundamentally, the crisis has also revealed the unsustainable nature of the dominant economic model underpinning growth during the 1990s/2000s. As outlined by Kitson et al. (2011), this model was based largely on consumers borrowing cheaply to spend rather than employers increasing wages to stimulate demand to achieve growth which resulted in dramatic increases in household and general government debt.

While the European policy response to the crisis has been dominated by austerity programmes, the actual impacts of the recession have been spatially diverse. While the crisis has hit all European countries, the problems manifest in Euro-zone peripheral countries are more severe and deeply rooted (Avellaneda and Hardiman, 2010). The so-called PIIGS countries (Portugal, Ireland, Italy, Greece and Spain) have been severely affected by dramatic property crashes (notably in Ireland and Spain), rapid increases in youth unemployment and emigration, ongoing banking crises that continues to undermine future economic prospects, the implementation of severe austerity measures to rebalance public finances and reduce

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national debt, and in the cases of Ireland, Greece and Portugal, the pursuit of so-called internal devaluation measures to increase competitiveness and to satisfy the conditions of International Monetary Funds/European Union bailouts. In this context, Europe's cities, regions and rural localities (particularly within the Euro-zone periphery) are increasingly vulnerable to exogenous shocks within the globalised economy.

In the case of Ireland (the empirical focus of this paper), the economic crisis has centred on the interrelated issues of a severe banking crisis and the bursting of a speculative, bank/developer-led housing bubble (Nyberg, 2011) which resulted in the nationalisation of some of Ireland's banks and the subsequent rescue of the state through an EU/IMF bailout to the tune of €67 billion. The consequences for the Irish economy has been dramatic, including significantly declining tax revenue (due to a previous reliance on construction sector related taxes), a GDP per capita decrease of 11.1% between 2008 and 2011 (Fraser et al, 2013), with unemployment levels currently standing at 14.3%. Rural regions and localities have been far from immune to these shifts within the global and national economy. Indeed, in the Irish case this has been aptly demonstrated by both the restructuring of rural space related to the housing boom, itself a product of neoliberal regulation and global financialisation of mortgage markets, and the subsequent recession, revealing new vulnerabilities in the face of recession and austerity conditions. While there is a growing literature examining these global conditions in relation to the regulation of the global economy (e.g. Aalbers, 2009; Peck et al., 2009) and the impacts of the housing and financial crisis on national economies (e.g. Kim and Renaud, 2009; Scanlon et al., 2011), there is currently a dearth of literature examining the actual impacts of the recession on household spaces or the everyday lived experience within the economic crisis. In this paper we address this significant gap by exploring rural household vulnerability within the context of the global financial crisis and the roll-out of austerity policy measures. To address this, we develop and apply a Household Vulnerability Index (HVI) for rural areas drawing on survey data and a range of both objective and subjective indicators. Before dealing with the approach being utilised, the next section locates the research within the financialisation and vulnerability literature. Thereafter, the economic crisis is discussed paying particular attention to the Irish case. Then, the HVI methodology is outlined in detail before it is applied in the results section of the paper. Finally, some broad conclusions are drawn in relation to the results and their implications for theory and policy.

### **Financialisation and household vulnerability**

Since 2007, housing and financial markets have experienced one of the greatest periods of volatility and uncertainty in modern history (Scanlon et al., 2011). Initially, the crisis was centred on the banking sector and the so-called credit crunch, with its roots in the sub prime mortgage lending practices in the US leading to bank failures and plummeting stock markets (Gotham, 2009). This has been swiftly followed by a sovereign debt crisis in Europe, notably in Greece, Portugal and Ireland, the wider risk of contagion to larger economies (such as Spain and Italy), and the emergence of a political discourse focusing on fiscal discipline through (mainly) reductions in the level of public services and a retraction of traditional welfare state measures. The financial crisis and the global banking collapse has plunged the economies of much of the developed world into what has been the longest and deepest recession of the post-war period, revealing the limitations of the global financial system based on speculation, leverage, dramatic rises in debt and deregulation (Kitson et al., 2011). David Harvey (2011) identifies two key factors to explain the current economic crisis: (1) the deregulation and empowerment of the most fluid and highly mobile form of capital – money capital – “to reallocate resources globally, finding new ways to absorb risks through the creation of fictitious capital markets” (p. 5); and (2) bubbles in the asset market (such as housing and property markets) compensating for the lack of other investment opportunities, fuelled by finance capital and facilitated by extensive financial innovations. In the wake of the financial crisis, a growing body of literature has examined financialisation relating to mortgage markets and home ownership, referring to a pattern of accumulation in which profit making occurs increasingly through financial channels rather than through trade and commodity production (Aalbers, 2009a). Research in this area, for example, has focused on

the linking of mortgage markets and stock markets through so-called securitisation investment vehicles (Gotham, 2009; Wainwright, 2009) originating in the US sub prime market, and globalisation of mortgage markets as a result of the financialisation of borrowers and markets and a globalisation of mortgage lenders (Aalbers, 2009b; van Heijden et al, 2011). For Aalbers (2009a) this transformation of the mortgage market has had profound effects on housing markets and the creation of housing bubbles, enabling the expansion of the mortgage market and allowing borrowers to buy more expensive homes fuelling a housing bubble. Furthermore, a surge in credit (often through transboundary flows of capital) has also fuelled speculative construction booms as banks facilitated often high-risk loans to developers. For example, a number of commentators have revealed that the Irish speculative boom in house-building stemmed from a surge in credit to developers and extraordinarily risky lending behaviour of banks, itself fuelled by foreign borrowing from banks (Honahan, 2009; Kelly, 2010).

This general expansion of credit, particularly to the mortgage market, led to rapid house price increases throughout the industrialised world over the last decade: between 1995 and 2006, real house prices rose in Ireland by 180 per cent, 133 per cent in the UK, 105 per cent in Spain, 90 per cent in Australia, 99 per cent in France, 104 per cent in Sweden, 93 per cent in the Netherlands, 69 per cent in the US and 52 per cent in Canada (Kim and Renaud, 2009). These rapid price increases are also associated with the rapid build up of mortgage debt over the last two decades; for example, Meen (2011) outlines that mortgage debt in the UK as a percentage of household income is now four times higher than at the start of the 1970s. At the household scale, the expansion of the mortgage market was facilitated by shifting bank lending practices and ‘new mortgage products’ including mortgages with longer durations than the traditional 20-25 years, an increase in loan-to-value ratios and the introduction of 100 per cent mortgages (i.e. no deposit required), and lending criteria moving away from income multiples to a limit based on the ratio of mortgage service cost to income (Duffy, 2010).

While financialisation research has grown significantly in recent years with an increasing consensus that financial institutions and markets perform a substantial role in shaping economic, social and cultural life, French et al. (2011) argue that research has been insufficiently attentive to space and place, both in terms of process and effects. In contrast, French et al. argue that “financialisation must be understood as a profoundly spatial phenomenon, holding out the promise of a financial, spatial-temporal fix for the crisis tendencies of contemporary Anglo-American capitalism” (p. 814). Moreover, Engelen et al. (2010) argue that although the crisis reveals a ‘global financial village’ (p.53), they note that the fallout from the crisis has not been homogenous across space, with some localities hit harder than others, suggesting that there are distinct geographies of financialisation. In this context, we seek to contribute to the financialisation literature in two ways: firstly, by examining an under-researched spatial context (rural localities) to examine place-specific outcomes of the crisis; and secondly, by applying the literature surrounding vulnerability as a framework for advancing financialisation research at the household scale.

The rationale for the rural focus in this paper is twofold. Firstly, from an international perspective, there is a growing body of literature highlighting the penetration of global financial markets into different spatial contexts to examine the impacts of a ‘global crisis’ at the local scale (Langley, 2006; Wainwright, 2010; French et al., 2011). These issues have been primarily addressed in the US context where the explicit geographies of the subprime crisis has been explored by researchers examining how local, primarily suburban, neighbourhoods have been affected by a crisis emerging from global financial networks (Wainwright, 2010): for example, see Immergluck (2008, 2009), Li and Morrow-Jones (2010) and Allen (2011) for studies of the foreclosure crisis in US suburbs, and Langley’s (2006) study into the making of suburban subjects as property investors through new financial products and services in an Anglo-American comparative context. Other scholars have investigated the impact of financialisation at the regional scale (Pike, 2006; Marshall et al, 2012; Wainwright, 2012). And yet Wainwright (2009) argues that there is a much more limited geographical literature outside of the US focusing on local and national scale studies.

In this paper, we seek to extend this analysis by examining an under-researched spatial context including the causes and consequences of the financial crisis beyond the city hierarchy to understand how financial networks and rural places and households have become intermeshed with global financial processes and the associated negative outcomes for rural housing markets (see Murphy and Scott, 2013). This intermeshing of rural places, households and international financial networks echoes the assertion of Woods (2007) that we have entered an era of the ‘global countryside’, whereby rural localities are characterised by complex entanglements in the global economy. Secondly, in a national context, while both urban and rural areas have experienced a housing crash in Ireland, significant differences exist between urban and rural housing systems to warrant an explicit rural focus. These include a distinctive system of housing supply in rural areas that has been traditionally reliant on self-build but increasingly has been the subject of speculative development, a political culture in rural Ireland which has traditionally celebrated development and has been marked by a *laissez-faire* approach to regulating house-building (Scott, 2012), and emerging evidence to suggest that the rural housing market is experiencing a deeper crisis than its urban counterpart with house prices continuing to decline outside of the major urban centres whereas urban centres have recently witnessed modest house price increases (CSO, 2013).

To examine the outcomes of financialisation within this rural context, we examine household spaces through a framework of vulnerability, focusing on the impacts of a housing crash, a recession and austerity conditions. The concept of vulnerability (and the interrelated concept of resilience) is gaining increasing momentum in providing an important framework for understanding how communities respond and adapt to environmental, social and economic changes (Adger, 2006; Wilson, 2012a). Notions of vulnerability and resilience have been widely utilised in ecology, and have been increasingly applied to examine the social-ecological interface associated with impacts resulting from or adapting to environmental risks (Gallopín, 2006). For Wilson (2012b) the ‘flip-side’ of vulnerability is resilience, suggesting that notions of resilience and vulnerability can be conceptualised as opposite ends on a unilinear spectrum. Thus, vulnerability is usually framed in negative terms as the susceptibility of a system to be harmed i.e. the degree to which a system is susceptible and unable to cope with adverse effects (for example, from environmental or economic risks) (Adger, 2006). For Adger, the concept of vulnerability provides a key analytical tool for:

‘... describing states of susceptibility to harm, powerlessness, and marginality of both physical and social systems, and for guiding normative analysis of actions to enhance well-being through reduction of risk’ (2006, p. 268).

However, stimulated partly by the recent economic crisis, commentators have subsequently looked to transfer vulnerability thinking to the field of local and regional economic development (Dawley et al., 2010; Hudson, 2010; Pike et al., 2010), indicating a shift in focus from economic growth to coping with economic crisis reflecting the widespread vulnerability of places to global economic uncertainty and exposure to exogenous risks, shocks and slow-burn processes of change. Within the rural geography literature, a number of studies have emerged in recent years examining rural resilience and vulnerability at the community scale. For example, Wilson (2012a; 2012b) conceptualises resilience and vulnerability at the scale of place-bounded rural communities by examining stocks of social, economic and environmental capital and how these interact. In this paper, however, we focus on vulnerability to exogenous economic shocks at the household scale in rural localities, addressing a significant gap in the literature.

While there is a paucity of studies examining household vulnerability as a result of the current economic crisis, a more extensive literature exists that examines both household and national economic vulnerability within a so-called developing world context (e.g. Gaiha and Imal, 2004; Guillaumont, 2009; Naude et al., 2009). Within these studies, vulnerability at the household level has often been defined as the risk of households falling into or remaining in poverty because of either idiosyncratic hazards (due to characteristics of individual households) or aggregate hazards (external to the household) (Naude et al., 2009). Therefore, by focusing on risk, household vulnerability studies can identify not just transient poverty, but also the probability of remaining in poverty or the exposure to external shocks that may draw

households into poverty; in other words, it attempts to capture household trajectories. Furthermore, as Naude et al. (2009) outline, vulnerability relates to an undesirable outcome (e.g. vulnerability *to* poverty) and that such vulnerability is due to exposure to risks. In this paper, drawing on Briguglio et al. (2009), we define household economic vulnerability as the exposure of a household to exogenous shocks related to the wider global economic crisis and subsequent adoption of austerity policies and the potential for diminishing life satisfaction and quality of life. Following Adger (2006), we attempt to identify the key parameters of household vulnerability to the stresses to which a household is exposed, household sensitivity and adaptive capacity. This will include identifying household or place-bounded assets that may assist in a time of crisis (e.g. support of friends and family) or act as a liability (e.g. diminishing local services). To examine these issues, we draw on both objective measures of vulnerability (e.g. employment status, income) and subjective measures and individual perceptions (e.g. perceived job insecurity) to develop a household vulnerability index, further discussed in the methodology section.

### **Economic crisis and the Irish context**

Ireland provides an interesting case to examine the impacts of the economic crisis at the household scale, where economic fortunes have declined significantly followed by the adoption of widespread adoption of austerity measures across public policy, earning Ireland the dubious honour of being labelled Europe's 'poster child' of austerity (see Kinsella, 2012). Prior to the economic crash, from the mid 1990s to mid 2000s, Ireland was transformed by economic growth and the so-called and well-documented 'Celtic Tiger' phenomena. While Ireland's initial economic success was based on foreign direct investment, low corporation tax and an expanding IT and financial services sector (Breathnach, 1998; Clinch et al. 2002), increasingly the economy became heavily reliant on the construction sector and a speculative property boom (Kelly, 2010). As Whelan (2010) highlights:

'As house completions went from 19,000 in 1990 to 50,000 in 2000 to a whopping 93,000 in 2006, construction had become the dominant factor in the Irish economy ... By 2007, construction accounted for 13.3 per cent of all employment, the highest share in the OECD' (p. 233).

Significantly, in parallel to this construction boom, the Irish housing market was also characterised by rapidly rising house prices: annual house price growth jumped from 8 per cent per annum between 1990 and 1993 to 22 per cent per annum between 1996 and 2002 (Norris and Winston, 2011).

New house-building became a significant feature of Irish life, and was central in restructuring rural space over the Celtic Tiger period. As recorded by the National Economic and Social Council (NESC) (2004), this increase in the level of overall construction is unprecedented and is also exceptional when compared to other European Union (EU) countries, both in terms of new construction as a percentage addition to the current stock of dwellings and also when the number of new dwellings is assessed relative to the size of the population. Rapid housing construction was not only a feature of Irish urban centres, but rural areas also witnessed rapid change. For example, over one quarter of the housing units built between 1991 and 2002 were detached dwellings in the open countryside (Walsh et al., 2007). Similarly, over the last decade, rural towns and villages within commuting distance of larger urban centres have also witnessed a rapid expansion of house-building activity (Meredith, 2007).

However, the fall-out from the financial crisis has been dramatic, particularly in relation to a boom and bust within the housing and property sector. As Kitchin et al. (2010) observe the subsequent collapse of the property and banking sectors has led to a contraction in the wider economy, with the drying up of credit, markets and tax revenue, leading to severe pressure of the public finances; an extensive bank bailout, including the establishment of the National Assets Management Authority (NAMA) that has acquired €88bn of property debt; and bank recapitalisation and nationalisation. The consequences of this collapse have further led to a joint EU/IMF bailout (2008) and the introduction of severe austerity measures across the public sector. At a household level, house prices are now 50 per cent lower than its

highest level in 2007: house prices in Dublin are now 55 per cent lower (apartments are 60 per cent lower), with house prices outside of Dublin lower by 47 per cent (CSO, 2012a). Unemployment levels have risen to 14.3 per cent (CSO, 2012b), and emigration has re-emerged as a characteristic feature of Irish life; for example, between May 2009-April 2010, official estimates suggest that 65,300 people emigrated, with a further 76,400 emigrating from May 2010-April 2011 (CSO, 2011b), a return to levels of emigration last witnessed in the 1980s. The combination of falling house prices and negative equity alongside increasing employment vulnerability and decreasing income levels (from wage deflation) increases the prospects of widespread mortgage default. Indeed, figures from the Irish Central Bank (2011) highlight that by the end of June 2011 there were 777,321 private residential mortgage accounts in Ireland, with 55,763 accounts in arrears for more than 90 days. In addition, a further 69,837 mortgage accounts have been 'restructured' to address repayment difficulties. Together, mortgages that have been restructured or are in arrears represent 12 per cent of the total residential mortgage market, prompting the current coalition government to establish an 'expert working group' to report on mortgage debt. At the end of March 2013, the number of private residential mortgage accounts in arrears of more than 90 days had increased to 95,554 (Irish Central Bank, 2013).

One of the consequences of the banking crisis and the subsequent recession has been sharp rises in levels of gross government debt throughout western economies, leading to governments embarking on programmes of reductions in public spending on a scale not seen for decades and leading to a new politics of austerity (Kitson et al., 2011). In the Irish case, the government adopted a commitment to spending cuts from 2008 onwards, outlined in a series of annual austerity budgets (Avellaneda and Hardiman, 2010). As outlined by Callan et al. (2010), budgets for 2009 and 2010 implemented substantial increases in direct taxes, primarily via the introduction of a new income levy and the doubling of the Health Contribution, itself replaced by a new Universal Social Charge in 2012. Social welfare payments were increased in 2009, and then cut for those of working age in 2010, particularly for those aged 21-25. The rates of universal child benefit were also cut. Public sector workers saw their take-home pay cut by a new pension levy and then by significant cuts in pay rates. In addition, there were substantial cuts to expenditure across government departments and a deferring of various capital projects, which along with reducing the public payroll bill resulted in a saving of €440 million in 2008 and €1 billion in 2009 (Drudy and Collins, 2011). More recently, the government has introduced new property taxes and announced plans to introduce new water charges. These policies are designed to not only reduce public expenditure and to attempt to increase tax revenue, but from the perspective of the EU/IMF bailout also to cause an 'internal devaluation' as a deflationary measure to increase Ireland's competitiveness in the absence of currency devaluation.

## **Objectives and Methodology**

### *Objectives and definitions*

The broad objective of the study is to examine the extent of rural household vulnerability in rural Ireland within the context of: (1) a major housing crash and; and (2) existing recessionary/austerity conditions and the associated implications of those factors for households. Within that broad context a number of more specific objectives were established for the research. The first was to analyse the extent of locational variation in rural household vulnerability across different counties according to the extent of housing oversupply in each location. Using housing oversupply levels as a proxy for over-development during the boom period, it was hypothesised that households in case study areas with higher levels of oversupply would be more vulnerable than those with lower levels. The second was to investigate the extent to which household vulnerability, as measured by a series of objective and subjective indicators, differed with respect to case study location. The final objective was to examine the extent to which rural household vulnerability differed for various vulnerability categories (i.e. income, employment, mortgages, stress/support etc).

To examine these issues, we draw on both objective measures of vulnerability (e.g. employment status, income) and subjective measures and individual perceptions (e.g. perceived job insecurity) to develop a household vulnerability index. In this context, the emerging literature surrounding quality of life studies provides some interesting insights. The quality of life concept has three principal characteristics (Shucksmith et al., 2009): it focuses on an individuals' perceptions of their life situations rather than a nations quality of life; it is multidimensional, covering multiple life domains and their interplay; and it brings together objective information on living conditions with subjective views and attitudes to provide a picture of overall well-being in society. The last decade has seen the emergence of extensive studies of quality of life and a new 'happiness' literature employing data from surveys as empirical approximations of individual well-being (e.g. Layard, 2010; Moro et al., 2008; Oswald and Wu, 2010). Primarily associated with the work of psychologists and economists, studies of individual well-being contend that individual and household income is an inadequate measure of individual well-being (Stiglitz et al., 2009). To address this, studies are increasingly measuring subjective well-being, concerning peoples' self-reported assessment of their own well-being. As outlined by Tinkler and Hicks (2012), survey questions of this nature aim to capture an individual's well-being by measuring how people think and feel, for example, by asking about their life satisfaction, happiness, and psychological well-being. What makes the questions subjective is that the questions ask respondents to rate their feelings rather than recall factual information, enabling respondents to assess quality of life in their own terms. This approach is in contrast to the more traditional approach which uses objective indicators such as level of educational attainment, health, and employment to determine well-being (Office for National Statistics, 2010).

#### *Household vulnerability indicators*

As stated earlier, there has been very little research undertaken in the literature in relation to the issue of household vulnerability; this is even more the case for households experiencing the dual impact of a major housing crash accompanied by recessionary/austerity conditions. In the case of our study we sought to analyse the extent of household vulnerability in rural areas using a number of household indicators in key areas relating to: employment (5), income/finances (2), mortgages (8), the housing market (2), stress/support (2), and life satisfaction (2). In total, information on 21 indicators of household vulnerability was gathered from respondents. The details of each of these indicators and how they were measured in each case study location is available in Table 1:

#### *Questionnaire survey and sampling strategy*

In order to gather the data required for our vulnerability indicators, a questionnaire survey was designed which asked questions specifically relating to the previously mentioned indicators and their measures, among other issues. The surveys were interview-administered at selected case study locations between July and August 2010.

Case study locations were selected on the basis of two key criteria. First, rural case study locations were defined to be any county beyond designated cities within the Republic of Ireland. Thus, the major cities and surrounding suburbs of counties Cork, Galway, Waterford, Kilkenny and Limerick were excluded. The entire Greater Dublin Area<sup>3</sup> was also excluded for similar reasons. Second, locations with varying degrees of housing oversupply were selected in an attempt, insofar as was possible, to avoid bias entering the results from varying dynamics of supply and demand in each county and their associated economic consequences but also to test our hypothesis that housing oversupply was linked to household vulnerability. To this end, information on estimated housing oversupply from Kitchin et al (2010) was used to select case study locations with high, moderate and low years of oversupply (Table 2). Two case study locations each from the high and low oversupply cohort were randomly chosen; one location was randomly chosen from the moderate cohort. The selected case study

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<sup>3</sup> The Greater Dublin Area consists of the administrative authorities of county Dublin as well as counties Meath, Kildare and Wicklow.

locations are designated with an asterisk in Table 2; they are also depicted graphically in Figure 1.

A sampling strategy was devised to select respondents within each of the five case study locations. Given the resource constraints, an ambitious target of achieving 180 responses within each case study location was set – a total of 900 responses. Within each location, it was important to ensure that only rural settlements were targeted for analysis. Thus, rural settlements were stratified according to a rural typology used in recent studies of rural planning in Ireland (see Scott, 2010) and houses were randomly sampled within these strata. In addition, only households who bought homes post-2000 were selected for inclusion as those were considered to be the households with a greater propensity to be suffering negative equity and its associated consequences given that the major house price boom occurred after this period (see Kitchin et al, 2010, 2011). However, while we utilise input data from the post 2000 period, it should be emphasised that the index itself has a broad back in that it can be applied within longitudinal (including the pre-2000 period) and other contexts. While the sampling within the strata was random, upper guideline limits were placed on the number of responses in each strata given the resource constraints alluded to earlier. Overall, a total of 728 valid responses were achieved after the data were cleaned. The stratification system and a breakdown of the total number of responses in each rural settlement strata by county are shown in Table 3 while Table 4 provides an summary of the overall sample characteristics. The data was gathered from households between July and August 2010.

#### *Developing an Household Vulnerability Index (HVI)*

In developing a Household vulnerability index it should be noted that we were attempting to measure vulnerability specifically within the context of Ireland's worst housing crash in history and its associated implications as well as the ongoing austerity measures/recessionary conditions existing in the country. In this sense, our analysis is not attempting to assess risk in the sense of traditional deprivation or poverty indices but focuses specifically on household vulnerability within the context of the objective and subjective indicators we have defined for our study.

*The first step* in developing an HVI was to rank each of the case studies under investigation according to whether they were more or less vulnerable. The ranking system ranged from 1-5 with 1 being more vulnerable and 5 being less vulnerable. To illustrate, consider the first indicator in the employment category – unemployment; the case study with the highest level (%) of unemployment is assigned a ranking of 1 (indicating 'more vulnerable' with respect to this indicator); then the case study with the second highest rate of unemployment is assigned a ranking of 2 and so on until the case study location with the lowest level of unemployment is assigned a ranking of 5 (indicating 'less vulnerable' with respect to this indicator). This process is then repeated for each of the 21 indicators under consideration (outlined above); in other words, each case study location is assigned a ranking of 1-5 based on the results emerging from the questionnaire surveys for each of the 21 indicators and their associated measures.

*The second step* involves assessing the number of rankings received in each of the categories 1-5. The total number of rankings from 1 to 5 is recorded for each of the case study locations. A composite ranking of household vulnerability is then acquired by summing the total number of 1 and 2 rankings (indicating 'more vulnerable') and 4 and 5 rankings (indicating 'less vulnerable'). Case study locations with the highest total number of summed 1 and 2 rankings are considered to be 'more vulnerable' while those with the highest total number of summed 4 and 5 rankings are considered to be 'less vulnerable'. In this way a composite household vulnerability index is devised of locations that are 'more vulnerable' and 'less vulnerable' on an overall basis. If the values after summation turn out to be the same in more than one case study location, the one with the highest total of number 1 rankings will be considered most vulnerable in relative terms while the one with the highest number of number 5 rankings will be considered least vulnerable in relative terms.

Each indicator is given equal weighting in the overall index. However, when summing the total number of 1 and 2 and 3 and 4 rankings for the development of composite

vulnerability, there is of course an argument that could be made for assigning some indicators more weighting than others in the overall index. Indeed, it could also be argued that one composite indicator per category might be used to make up the aggregate scores for vulnerability. In common with other work that attempts to assign weights to variables, the difficulty that arises here concerns how realistic weights can be derived for the study under consideration and the associated indicators being used (see Murphy and Killen, 2010). By definition, the use of weightings can often raise as many (if not more) issues than it apparently solves as one can argue over the precise magnitudes of the weightings that should be used and the manner in which those that cannot be measured directly should be incorporated into the analysis. As a result of these concerns and in the absence of any specific research as to how individual variables may contribute in a proportional sense to household vulnerability, we decided to assign equal weighting to each indicator in the composite vulnerability index. Having said that, it is notable that the index contains 4 and 8 indicators in the employment and mortgage categories respectively. Thus, in real terms these categories contribute greater weight to the overall composite index despite the fact that the individual indicators in these categories have equal weighting as those in other categories.

The results of the application of the approach and its outcomes in relation to the Irish case study are outlined and discussed with specific regard to the aforementioned approach.

### **Application of the Household Vulnerability Index (HVI)**

Table 5 shows the results of the ranking exercise outlined in step 1 of the development of the HVI whereby each county is assigned a ranking ranging from 1 to 5 – ‘more’ to ‘less’ vulnerable – according to the proportional results emerging for each of the indicators acquired from the questionnaire survey data. The rankings obtained from this Table were then used as input data for step 2 of the development of the HVI whereby a composite household vulnerability index (HVI) was devised for the cases under investigation (see Table 6). The results emerging from that exercise are shown in Table 7 which displays the final rank order of the results of the development of the composite index.

The results emerging are interesting and suggest that households in Longford are more vulnerable than any other county in the study areas considered with Monaghan being the second most vulnerable county in relative terms<sup>4</sup>. By way of contrast, Wexford emerged as the least vulnerable location in relative terms followed by Offaly. The results are interesting because they highlight that the more vulnerable households are located in the areas of greatest housing oversupply (i.e. Longford) while the less vulnerable households are located in areas with the lowest level of oversupply (i.e. Wexford). This implies a correlation between rates of housing oversupply and rural household vulnerability. Indeed, the work of Kitchin et al (2010) estimates that Longford has a current housing stock that would take over ten years to fill if household numbers grew at the same rate as between 1996-2006 (which is highly optimistic) highlighting the scale of overdevelopment in the county and explaining, to some extent at least, why households in the county are now in a more vulnerable position in relative terms according to our results.

It is interesting also that household's in Longford and Monaghan have a younger average age than other counties under consideration (Table 8). This suggests that locations with higher levels of household vulnerability are predominantly households with a younger age cohort. In order to investigate this relationship further an ANOVA was conducted to test the relationship between residential location and age. The results indicated that there was indeed a statistically significant relationship between age and residential location ( $p=0.002$ ). Indeed, it is precisely this age cohort that bought houses during the housing boom of the so-called ‘Celtic Tiger’ era indicating that these households are now suffering disproportionately from issues surrounding mortgage vulnerability and negative equity and the broader financial, employment, and stress-related issues resulting from the economic crisis and austerity

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<sup>4</sup> It should be noted that even though Monaghan and Sligo have identical values under the index, the fact that Monaghan was ranked number 1 for a greater number of indicators meant that it was placed above Sligo in the household vulnerability ranking.

policies. In fact, if one examines the data in Table 5, it can be seen that Longford has the highest number of 1 or 2 rankings in the mortgage and housing market categories highlighting the level of vulnerability being felt by those households when these specific indicators are considered. Moreover, Longford (72.9%) also has the highest level of negative equity of all case studies considered while Offaly has the lowest (36.8%); both of these counties have high and low levels of housing oversupply respectively also indicating a link between the two variables.

In order to further investigate the reasons for variation in household vulnerability, a disaggregated analysis of household vulnerability was undertaken using the previously outlined approach adopted for arriving at the results in Table 7. Table 9 presents the results of this disaggregated analysis and a number of key points emerge. First, it can be seen that Longford is ranked number 1 in the income/finance, mortgages, housing market and satisfaction categories which comprise 14 of the 21 indicators. In the mortgages category specifically, one can see that Longford is particularly vulnerable with respect to the absolute level of monthly mortgage repayments, difficulties meeting those repayments, the stress associated with making repayments as well as how repayments are affecting personal relationships. This indicates that Longford is particularly vulnerable with respect to mortgages. Given that mortgages have the greatest number of indicators in the composite index, it is therefore unsurprising that this county is considered more vulnerable in overall terms. In addition, Longford also has a high proportion of households with an income less than €40000 (40.3%) while it has the highest proportion of households who feel that they are worse off financially than they were five years ago (66.9%). Households in the county are also vulnerable with respect to satisfaction issues; in particular, Longford households have the lowest rate of life satisfaction (79.2%) and the second lowest rate of satisfaction with their homes (87.7%). Indeed a chi-square test suggests that there is a significant relationship between residential location and life satisfaction ( $p=0.001$ ) and between residential location and satisfaction with the home ( $p=0.000$ ). This indicates that there is a link between case study location and satisfaction issues whereby locations with high levels of oversupply (such as Longford) are those associated with low levels of satisfaction and vice versa.

The results also show that Monaghan is the second most vulnerable location for rural households in relative terms. Table 9 shows that, like Longford, households in Monaghan were also vulnerable with respect to mortgage issues albeit not to the same degree overall as Longford. In particular, households in Monaghan have high mortgage multiples in relative terms (20.9% of households) while more than half the households (53.4%) cite having mortgage repayment difficulties. Moreover, Monaghan also ranks joint first with regards to satisfaction issues, places second in relation to housing market indicators but ranks as most vulnerable in relative terms in relation to financial stress/support issues. With regard to the latter, close to half of households (44.7%) indicated that they did not have someone to turn to in times of difficulty highlighting that the level of available support (whether this is through formal or in formal structures) there is poor in relative terms.

If we turn our attention to the less vulnerable counties a number of interesting trends also emerge from the results in Table 9. As mentioned already, the results from the overall HVI (Table 7) show that Offaly is the least vulnerable location in relative terms; however, the disaggregated analysis provides additional insights into the nature of those results in the specific categories adopted. Table 9 shows that Offaly was ranked either 4 or 5 for all of the categories under consideration implying that households in the county are broadly more resilient and thus less vulnerable in relative terms than other locations. Wexford, which was second lowest in the overall index, ranked either 4 or 5 for most of the categories. In fact, Wexford was considered to be least vulnerable in the income/finance, mortgages, housing market and satisfaction categories. However, it is notable that households there are considered most vulnerable with respect to employment and also rank highly with respect to stress issues. More specifically, the results from Table 3 show that Wexford has the highest levels of unemployment (15.2%) and also ranks as being vulnerable with respect to the difficulty in finding a similar job to the one households have at present (95.5% think it would be difficult to find a similar job) as well as a significant proportion of households working less hours each

week than three years ago (33.8%). In addition, a large proportion of households in Wexford feel that the recession has made their lives more stressful (41.3%) Thus, while the overall results suggest that Wexford is a less vulnerable county than others, it is clear that specific problems exist with respect to household vulnerability even in this location. This implies that even in areas that are more resilient in relative terms than others, one should not simply assume that difficulties do not exist in those areas. Our results demonstrate that even areas that are more resilient overall may continue to face difficulties in specific areas and these should be identified and targeted for improvement on a prioritised basis.

## **Conclusion**

As Europe's rural localities increasingly face uncertain futures, this paper establishes a pragmatic approach for assessing rural household vulnerability in the aftermath of a major housing crash and existing conditions of economic crisis and austerity. In doing so, the research has identified key categories for analysis focusing primarily on financial indicators but also on more intangible factors like those related to subjective judgements on quality of life such as stress and related support as well as life satisfaction issues. In this regard, we drew both on objective measures of vulnerability (e.g. income measures), but also individual perceptions of change and life satisfaction – these subjective measures have implications beyond the individual household, as perceptions of insecurity, for example, have an impact on local and regional economies, such as undermining consumer confidence. Moreover, our research highlights the manner in which global economic processes, specifically through financialisation of the economy, have ramifications at all spatial scales; indeed, our work demonstrates the impacts of financialisation on household vulnerability at the local scale in rural locations. The results of our analysis of household vulnerability in rural Ireland emphasise, quite concretely, that financialisation does indeed need to be understood as an inherently spatial phenomenon (French et al, 2011). Indeed, our work concurs with that of Engelen and Konings (2010) in that the results reveal interesting spatial variability in household vulnerability.

The approach used has the benefit of being pragmatic in that data relating to indicators are easily attained and the index straight-forward to calculate. There is little doubt though that further development of the index would improve it considerably. In this regard, the assignment of weightings to specific indicators would be one obvious practical improvement that could be made but only if more specific information was available as to the contribution of each indicator to overall household vulnerability levels. Nevertheless, this is clearly an area where further research would be beneficial to our understanding of household vulnerability under these conditions. Moreover, it is always possible to add or subtract individual indicators from the index presented already. One possible way to do this would be to utilise stepwise regression analysis to provide additional insights into the exact contribution of each indicator to locational variation in household vulnerability scores and discard those that provide little in the prediction of locational variability in vulnerability scores. However, one would have to be cautious with such an approach as indicators that may be discarded may still tell us something useful about household vulnerability but perhaps not about how it varies by location. In policy terms, the index could be used as a basis from which relative household vulnerability is assessed in other countries; Ireland is used here as a case study, but the index has a broad back and could certainly be adopted, built-upon and improved for use in other nations.

The notion of vulnerability also proved a useful concept to underpin the analysis and to contribute to the literature on financialisation in terms of its impacts at the household scale. Rather than capturing a snap-shot of decreased living standards, vulnerability measures allow us to examine the extent to which households are at risk of declining living conditions and also the probability of enduring reduced living standards in the short and medium term. Additionally, it is possible to identify potential future shocks that may further expose households to risk. Indeed, Nettleton and Burrows (2001) found that households with mortgage repayment difficulties often experience a range of impacts, many of which are non-financial in nature while Waldron and Redmond (2013a) found that households in negative

equity and arrears reported frustration, stress and feelings of a diminished quality of life as a result of their property purchases going wrong. Indeed, Waldron and Redmond (2013b) have pointed to the inadequacy of government policy attempts to deal with individual suffering from mortgage-related difficulties. It is these kind of issues which are an inherent part of our analysis of household vulnerability and which could potentially be identified using our index as a proxy for a range of household difficulties and thereby improve government policy responses. Therefore, from a policy perspective, a household vulnerability index could prove a useful starting point for evaluating the potential impact of various policy measures such as reducing income benefit, child allowances, and public sector pay or increasing mortgage interest rates or motor fuel tax. Finally, by focusing on the actual impacts of recession and austerity conditions experienced by rural households, a vulnerability index may inform rural and regional development strategies that increasingly aim to promote resilience and enhance the ability of places to cope with ruptures and shocks as key policy aims.

Turning to our results more specifically, the development and application of the index to the Irish case is interesting given the considerable financial hardship currently being faced by Irish households across the country. Moreover, the application of such an index to rural households is something that has not been done before; indeed, there is very little analysis assessing these issues in either urban or rural contexts which is quite remarkable given the extent of financial hardship at the household level right across the globe. In this regard, analysis of the index provides a useful counterpoint to the growing literature that has examined the causes of the crisis by exploring the actual impacts of the crisis at the household scale. In an Irish context, our results show that there are degrees of household vulnerability and that households in some locations are more vulnerable than others. There is little doubt that this relates to a number of institutional factors that interact in a complex way to produce different outcomes for households in rural areas. These include the nature of the local governance and political context, the relative strength of the planning system and the practices of financial institutions. There is little doubt that the manner in which these factors vary by location had an impact on the relative outcome of household vulnerability in different areas.

Perhaps one of the most interesting results to emerge from our analysis is the link between household vulnerability and housing oversupply levels in the case study locations. More specifically, the results suggest that locations with lower rates of housing oversupply are less vulnerable and vice versa. Our results show that households in Offaly are least vulnerable while those in Longford are most vulnerable in relative terms and these happen to be the locations that area associated with least and most housing oversupply levels respectively. This suggests that the ramifications of housing overdevelopment are correlated to current household vulnerability in rural areas. In addition, it suggests that housing overdevelopment in rural areas has had far-reaching socio-economic and emotional impacts on individuals living in rural households and highlights the manner in which the failure to regulate development and finance can place households in potentially precarious positions. The implication here then is that household vulnerability relates to exogenous factors relating to both banking practices fuelling a speculative construction boom in rural localities (particularly in areas with low demographic demand for significant new dwellings) and the regulation of development within local authorities, which failed to provide a check on overdevelopment. These results are also interesting from another perspective. They point to a strong link between financialisation and negative emotional outcomes for individuals caught up in the local manifestations of the failure of financialisation policies on the ground. Thus, while financialisation is often seen to have negative 'hard' consequences for households (e.g. job insecurity, pay cuts etc.), 'soft' issues such as frustration, stress and life satisfaction have not been engaged with sufficiently in the scholarly literature.

Finally, as with the development of any such index, there is a danger that locations that rank as the least vulnerable are assumed to be coping appropriately, not classified as being 'at risk' and thus are not targeted for policy interventions or other forms of assistance. However, our disaggregated analysis show that even in locations that are least vulnerable, considerable vulnerabilities do still exist within specific categories and these should be

earmarked for assistance. In this regard, it is possible that a targeted approach to specific sectors is taken even in those areas that might appear less vulnerable in relative terms and similarly for areas that are most vulnerable overall but have some areas where less vulnerability exists.

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**Table 1. Household vulnerability indicators and measures**

	<b>Employment:</b>
<b>Ind.1</b>	Households that are <u>unemployed</u> are more vulnerable than those employed
<i>Measure</i>	The proportion of unemployed households in each case study location
<b>Ind.2</b>	Households that feel their <u>jobs are unsecure over the next five years</u> are considered more vulnerable than those who do not
<i>Measure</i>	The proportion of households in each case study location who feel their jobs are insecure over the next 5 years
<b>Ind.3</b>	Households who would <u>find it difficult to find a similar job</u> to their current one are considered more vulnerable than those who would find it easy
<i>Measure</i>	The proportion of households in each case study location who feel it would be difficult to find a job similar to their current one
<b>Ind.4</b>	Households with <u>lower average weekly working hours</u> are more vulnerable than households with higher hours
<i>Measure</i>	Mean average household weekly working hours per week in each case study location
<b>Ind.5</b>	Households <u>with less weekly working hours than three years ago</u> are considered more vulnerable than others
<i>Measure</i>	The proportion of households in each case study location who have less weekly working hours than three years ago (pre-recession)
	<b>Income/Finances:</b>
<b>Ind.6</b>	Households <u>with lower levels of income</u> are more vulnerable than those with higher income
<i>Measure</i>	The proportion of households in each case study location who with an average household income below €40000 euro. We use this figure because the average industrial wage in 2010 €41000.
<b>Ind.7</b>	Households that are <u>worse off financially than five years ago</u> are more vulnerable than others

<i>Measure</i>	The proportion of households in each case study location who feel they are worse off financially than they were 5 years ago
	<b>Mortgages</b>
<b>Ind.8</b>	Households <u>with a mortgage</u> are more vulnerable than households with no mortgage or rented households
<i>Measure</i>	The proportion of households in each case study location who have a mortgage
<b>Ind.9</b>	Households <u>that have re-mortgaged</u> are more vulnerable than those that have not
<i>Measure</i>	proportion of households in each case study location that have re-mortgaged their home
<b>Ind.10</b>	Households <u>with higher monthly mortgage repayments</u> are more vulnerable than those with lower repayments
<i>Measure</i>	The proportion of households in each case study location with mortgage repayments greater than €1000 per month
<b>Ind.11</b>	Households <u>with &gt;90% mortgage</u> are more vulnerable than those with a smaller mortgage (in proportional terms)
<i>Measure</i>	The proportion of households in each case study location with >90% mortgage
<b>Ind.12</b>	Households <u>with mortgages constituting a higher multiple of their annual household income</u> are more vulnerable than those with a lower multiple
<i>Measure</i>	The proportion of households in each case study location with a loan multiple greater than four times annual household income. We use this measure because a loan multiple was the standard approach for deciding on lending volumes to clients in the pre-boom period.
<b>Ind.13</b>	Households who are finding <u>mortgage repayments more difficult since the recession</u> are more vulnerable than those who are not
<i>Measure</i>	The proportion of households in each case study location who feel than mortgage repayments have become more difficult since the onset of the recession
<b>Ind.14</b>	Households who find <u>making mortgage repayments stressful</u> are more vulnerable than those who do not
<i>Measure</i>	The proportion of households in each case study location who agree that making mortgage repayments is stressful
<b>Ind.15</b>	Households who find that <u>making mortgage repayments is affecting personal relationships</u> is are more vulnerable than those who do not
<i>Measure</i>	The proportion of households in each case study location who agree that mortgage repayments is affecting personal relationships
	<b>Housing Market:</b>
<b>Ind.16</b>	Households who are <u>worried about the future of the housing market</u> are more vulnerable than those that are not
<i>Measure</i>	The proportion of households in each case study location who agree that they are worried about the future of the housing market
<b>Ind.17</b>	Households who are <u>in negative equity</u> are more vulnerable than households that are not
<i>Measure</i>	The proportion of households in each case study location who feel that their home is in negative equity
	<b>Stress/Support:</b>
<b>Ind.18</b>	Households who feel <u>under more stress since the economic downturn</u> are more vulnerable than those who do not
<i>Measure</i>	The proportion of households in each case study location who agree that they are under more stress since the onset of the recession
<b>Ind.19</b>	Households <u>with no available support in times of difficulty</u> are more vulnerable than those with support available
<i>Measure</i>	The proportion of households in each case study location who feel they have

	nowhere to turn in times of difficulty
	<b>Life Satisfaction:</b>
<b>Ind.20</b>	Households with <u>lower levels of overall life satisfaction</u> are considered more vulnerable than those with higher levels
<i>Measure</i>	The proportion of households in each case study location who are satisfied with their lives
<b>Ind.21</b>	Households with <u>lower levels of overall satisfaction with their home</u> are considered more vulnerable than those with higher
<i>Measure</i>	The proportion of households in each case study location who are satisfied with their home

**Table 2. Estimated years of housing oversupply in selected counties in the Republic of Ireland**

County	Years of Oversupply	Rank	
Leitrim	12.3	1	High
Longford*	11.6	2	
Sligo*	9.5	3	
Roscommon	8.9	4	
Donegal	8.1	5	
Cavan	7.9	6	
Kerry	7.4	7	Moderate
Mayo	6.8	8	
Monaghan*	6.2	9	
Laois	4.9	10	
Clare	4.1	11	
North Tipperary	3.8	12	
South Tipperary	3.3	13	Low
Carlow	3	14	
Westmeath	3	15	
Kilkenny	2.7	16	
Offaly*	2.6	17	
Wexford*	2.6	17	
Louth	2.1	19	

Source: After Kitchin et al (2010)

**Table 3. Rural settlement typology and survey responses**

	LA area					Total
	Longford (H)	Sligo (H)	Monaghan (I)	Offaly (L)	Wexford (L)	
Single rural house in the open countryside (one-off house)	5	20	17	39	34	115
In the open countryside as part of a cluster of 10 houses or less	26	10	17	19	13	85
In a village (less than 1500 residents)	45	36	31	40	35	187
In a town of 1500-5000 residents	41	40	29	27	39	176
In a town of 5001-10000 residents	33	30	29	43	30	165

	LA area					Total
	Longford (H)	Sligo (H)	Monaghan (I)	Offaly (L)	Wexford (L)	
Single rural house in the open countryside (one-off house)	5	20	17	39	34	115
In the open countryside as part of a cluster of 10 houses or less	26	10	17	19	13	85
In a village (less than 1500 residents)	45	36	31	40	35	187
In a town of 1500-5000 residents	41	40	29	27	39	176
In a town of 5001-10000 residents	33	30	29	43	30	165
<b>Total</b>	<b>126</b>	<b>147</b>	<b>123</b>	<b>123</b>	<b>151</b>	<b>728</b>

**Table 4. Sample Characteristics**

Characteristic	N	%
<i>Gender</i>		
Male	274	37.6
Female	454	62.4
<b>Total</b>	<b>728</b>	<b>100</b>
<i>Age</i>		
<24	43	5.9
25-34	271	37.2
35-44	230	31.6
45-54	98	13.5
55+	77	10.6
Declined to answer	9	1.2
<b>Total</b>	<b>728</b>	<b>100</b>
<i>HH Income (Gross €)</i>		
<20000	40	5.5
20000-30000	46	6.3
30000-40000	40	5.5
40000-50000	36	4.9
50000-60000	40	5.5
60000-80000	65	8.9
80000-100000	34	4.7
>100000	24	3.3
Did not wish to reveal	403	55.4
<b>Total</b>	<b>728</b>	<b>100</b>

**Table 5. Results from step 1 of developing the HVI**

	Employment					Income/Finance		Mortgages							Housing Market		Stress/Support		Satisfaction		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
	Unem. (%)	Job Security (%)	Diff. find job (%)	Mean Work Hrs	< hrs 3 yrs ago (%)	Inc-ome HH (%)	Fin-ance- 5 yrs ago (%)	Have Mort. (%)	Re-Mort. (%)	High Mth. repay. (%)	>90% mort. (%)	High Mort. Mult. (%)	Rep-ay. Diff. (%)	Pay. Stress (%)	Pay. Per. Rel. (%)	Neg. equity (%)	Home mkt. fut. (%)	Rec. Stress (%)	No supp. (%)	Life Sat. (%)	Home Sat. (%)
<b>Longford (H)</b>	3	4	1	2	3	2	1	5	5	2	3	4	2	1	2	1	2	4	2	1	2
	(11.5)	(23.4)	(100)	(32.0)	(28.0)	(40.3)	(66.9)	(8.8)	(4.1)	(20.3)	(34.6)	(11.5)	(50.0)	(50.0)	(16.9)	(72.9)	(43.8)	(44.4)	(43.0)	(79.2)	(87.7)
<b>Sligo (H)</b>	5	1	3	1	4	1	2	3	3	3	2	3	3	2	3	2	3	2	3	2	3
	(11.0)	(35.8)	(94.4)	(31.9)	(23.4)	(46.5)	(63.8)	(13.9)	(5.3)	(16.6)	(35.8)	(12.1)	(47.8)	(47.2)	(11.6)	(71.6)	(40.0)	(41.9)	(36.5)	(82.2)	(88.8)
<b>Monaghan (I)</b>	4	2	5	5	1	5	3	4	2	5	5	1	4	1	4	4	1	5	1	3	1
	(11.2)	(27.2)	(80.6)	(35.2)	(50.9)	(33.3)	(63.2)	(10.4)	(5.4)	(7.2)	(11.1)	(20.9)	(53.4)	(36.8)	(31.5)	(61.6)	(63.2)	(50.0)	(44.7)	(84.6)	(81.4)
<b>Offaly (L)</b>	2	5	4	3	5	3	5	2	1	4	1	2	5	3	4	5	5	3	5	5	5
	14.2)	(15.8)	(94.1)	(35.0)	(0.0)	(37.0)	(55.0)	(16.0)	(6.8)	(11.1)	(43.8)	(17.3)	(44.4)	(44.4)	(0.0)	(36.8)	(33.8)	(43.8)	(18.4)	(94.6)	(98.8)
<b>Wexford (L)</b>	1	3	2	4	2	4	4	1	4	1	4	5	4	5	5	3	4	1	4	4	4
	(15.2)	(24.5)	(95.5)	(35.1)	(33.8)	(33.3)	(62.3)	(28.2)	(5.26)	(27.4)	(18.1)	(7.1)	(44.6)	(32.2)	(0.0)	(66.6)	(36.2)	(41.3)	(33.3)	(89.3)	(90.6)

**Table 6**  
Results from step 2 of developing the HVI.

		More Vulnerable			Less Vulnerable	
		Rank 1	Rank 2	Rank 3	Rank 4	Rank 5
Longford (H)	$\sum$ All I with R1,2...R5 where I= HVI Indicator	5	8	3	3	2
	Composite: $MV=\sum R1 + R2$ ; $LV=\sum R4 + R5$	13			5	
Sligo (H)	$\sum$ All I with R1,2...R5 where I= HVI Indicator	3	6	10	1	1
	Composite: $MV=\sum R1 + R2$ ; $LV=\sum R4 + R5$	9			2	
Monaghan (I)	$\sum$ All I with R1,2...R5 where I= HVI Indicator	7	2	2	4	6
	Composite: $MV=\sum R1 + R2$ ; $LV=\sum R4 + R5$	9			10	
Offaly (L)	$\sum$ All I with R1,2...R5 where I= HVI Indicator	2	3	4	3	9
	Composite: $MV=\sum R1 + R2$ ; $LV=\sum R4 + R5$	5			12	
Wexford (L)	Composite: $MV=\sum R1 + R2$ ; $LV=\sum R4 + R5$	4	2	2	10	3
	$\sum$ All I with R1,2...R5 where I= HVI Indicator	6			13	

**Table 7. Composite HVI Ranking**

More Vulnerable		Composite	Less Vulnerable		Composite
1	2		4	5	
M (I) - 7	L (H) - 8	<b>L (H) - 13</b>	O (L) - 10	W (L) - 9	<b>W (L) - 13</b>
L (H) - 5	S (H) - 6	<b>M (I) - 9*</b>	M (I) - 4	M (I) - 6	<b>O (L) - 12</b>
W (L) - 4	O (L) - 3	<b>S (H) - 9</b>	W (L) - 3	O (L) - 3	<b>M (I) - 10</b>
S (H) - 3	M (I) - 2	<b>W (L) - 6</b>	L (H) - 3	L (H) - 2	<b>L (H) - 5</b>
O (L) - 2	W (L) - 2	<b>O (L) - 5</b>	S (H) - 1	S (H) - 1	<b>S (H) - 2</b>

**Table 8. ANOVA relationship between age and case study location**

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
					Lower Bound	Upper Bound
Monaghan (I)	110	35.14	10.346	.986	33.18	37.09
Sligo (H)	136	39.32	12.589	1.080	37.19	41.46
Offaly (L)	161	38.37	11.079	.873	36.65	40.10
Wexford (L)	150	41.27	13.140	1.073	39.15	43.39
Longford (H)	148	38.17	12.021	.988	36.22	40.12
Total	705	38.62	12.047	.454	37.73	39.51

**Table 9**  
Composite RHVI ranking by indicator category.\*

Employment		Income/Finance		Mortgages		Housing Market		Stress/Support		Satisfaction	
Ranking	Composite Value	Ranking	Composite Value	Ranking	Composite Value	Ranking	Composite Value	Ranking	Composite Value	Ranking	Composite Value
1. Wexford (L)	3	1. Sligo (H)	2	1. Longford (H)	2	1. Longford (H)	2	1. Monaghan (I)	1	1. Longford (H)	2
2. Sligo (H)	2	1. Longford (H)	2	2. Monaghan (I)	1	2. Monaghan (I)	1	2. Wexford (L)	1	1. Monaghan (I)	2
3. Monaghan (I)	2	3. Monaghan (I)	0	3. Sligo (H)	1	3. Sligo (H)	1	3. Longford (H)	1	3. Sligo (H)	1
3. Longford (H)	2	3. Offaly (L)	0	4. Offaly (L)	0	4. Offaly (L)	0	3. Sligo (H)	1	4. Offaly (L)	0
5. Offaly (L)	1	5. Wexford (L)	0	5. Wexford (L)	0	4. Wexford (L)	0	5. Offaly (L)	0	5. Wexford (L)	0

\* Note: Where there are ties in composite values additional weighting is given to the location with the highest number of ranked 1 indicators in assigning overall ranking