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Title: Decomposing Internal Migration Rates in Ireland from 2002 to 2011

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Abstract

Research on internal migration in Ireland has been neglected which is largely due to a focus on the high levels of emigration. This research adds to this gap by firstly investigating the determinants of internal migration in Ireland in 2002 and 2011 using census data provided by IPUMS. Secondly, the Oaxaca-Blinder decomposition technique is utilised to explore how these determinants have changed over time and during the Great Recession. The parameters are broken down into composition and behavioural effects, including the percentage contribution of each variable to the total change in the internal migration rate.

The findings indicate that determinants of internal migration changed between 2002 and 2011. Notably, homeowners and unemployed individuals became less likely to have internally migrated in the previous year during the Great Recession. This supports the idea that certain individuals become more risk averse during times of economic uncertainty. Despite this, the aggregate internal migration rate increased marginally from 2 to 2.1 percent. However, the results from the decomposition indicate this was driven by changes in the composition of the population, namely more people obtaining third level education and a decline in the number of homeowners. In fact, an underlying trend of reduced migration propensity was identified in Ireland, consistent with patterns observed in other countries. Absent other effects, changes in the internal migration behaviour would have reduced the internal migration further. Overall, the results highlight how migration behaviour is dynamic, changes over time and is context dependent.

Keywords: internal migration, Ireland, decomposition, Great Recession, migration determinants, compositional effects, behavioural effects

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1. Introduction

Internal migration can be defined as a move that crosses a boundary within a country (Bernard and Perales, 2015). Internal migration has consequences for housing, labour markets and regional economic development (Cooke, 2011). In demography, internal migration is recognised as an important component of population change and migration is often perceived as the most 'volatile' component of population projections (Stillwell, 2005). The importance of internal migration has been highlighted when creating regional population projections, planning and policies. Therefore, modelling methods have been applied to seek explanations for internal migration as well as contribute to projections (Stillwell, 2005). It is important to distinguish internal migration from residential mobility which does not cross a boundary and is not associated with a change in daily activity space (Bernard and Perales, 2015). Furthermore, there can be a misclassification bias in using boundaries to indicate internal migration, as there will inevitably be short distance moves across a border - often termed as 'pseudo migration' (Thomas et al., 2019). This research aims to firstly identify and investigate the determinants of internal migration in Ireland in 2002 and 2011. Secondly, by using the Oaxaca-Blinder decomposition technique, this study will explore how these determinants have changed over time in Ireland, focusing on the 'Celtic Tiger' (1990s to 2007) to the Great Recession (2007 to 2012) period.

From the middle of the 1990s, Ireland's economy experienced exponential growth and Ireland was undergoing major societal transformation resulting in these years being termed as the 'Celtic Tiger' period. During this time, employment soared, the number of people in employment grew by nearly 50 percent (Barrett and McGuinness, 2012) - the population was growing, becoming highly educated and emigration was declining. However, the global recession in 2007 exposed the vulnerability of the Irish economy and resulted in a dramatic economic decline (Barrett and McGuinness, 2012). GDP fell, unemployment soared and the level of outward migration increased. However, the effect on internal migration within the country has been understudied for both the 'Celtic Tiger' period and the Great Recession.

Previous migration research in Ireland has mostly concentrated on emigration and neglected internal migration (Kelly et al., 2013). In fact, Kelly et al. (2013) explained that the high rate of emigration from Ireland resulted in the view that those who did not emigrate were immobile. Furthermore, it is often argued that Ireland's historic low rate of internal mobility was due to its high rate of emigration (Hughes and Walsh, 1980). Historically, internal migration in Irish was indeed 'sluggish', a defining characteristic of Irish demography and was low by international comparison (Hughes and Walsh, 1980; Fitzpatrick, 1989; Guinnane, 1997). In the period 1961-71, for every five individuals that left their province[1] one was likely to move to Dublin and the remaining four emigrated (Hughes and Walsh, 1980). Despite historic low rates of internal migration, it still was a major component of demographic change in several counties - particularly those in the East (Hughes and Walsh, 1980). Additionally, internal mobility has been proportionally increasing in recent years as emigration has declined. The most recent census in 2022, reveals that 5.3 percent of the population moved address within the State and 1.5 percent moved across a county border (CSO, 2023a). The rates for 2011 and 2016 are also around 6 percent which would indicate that internal mobility has not increased as emigration decreased (see *Figure 1* for net migration in Ireland).

[1] Ireland has four provinces: Connaught, Leinster, Munster and Ulster.

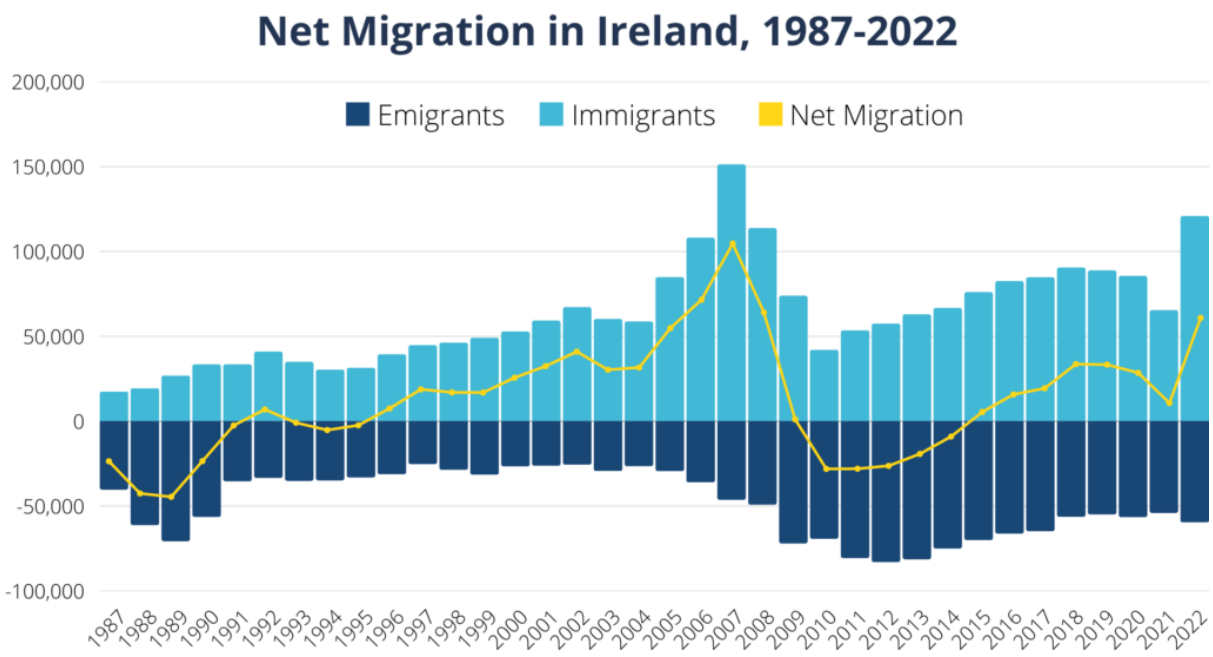

Figure 1: Net Migration to and from Ireland, from 1987-2022. Source: EMN Ireland, 2022

A study by Long (1991) which examined residential mobility differences in selected countries found that Ireland had a comparable low rate of mobility. The study uses the proportion of the population that moved from one housing unit to another in a fixed time period (usually one year or five years). The proportion of people who had moved in the previous year was six percent in Ireland. In comparison, the rate in Great Britain was just under ten percent, the US was 17.5 percent and New Zealand was 19 percent. Belgium and the Netherlands had the most similar rates to Ireland with 7.3 and 7.7 percent respectively. Within Ireland, there were also variations across counties. Dublin had the highest rates of mobility with 7.8 percent and three counties had rates of less than four percent. It has been suggested that these areas of low mobility are typically rural, experienced high rates of outmigration among youth, and subsequently had a large share of elderly who typically do not move (Long, 1991).

Research Objective

This research aims to firstly identify and investigate the determinants of internal migration in Ireland in 2002 and 2011. This research deviates from previous analysis as individual level data are utilised, whereas others typically use macro level data. The first aim will be achieved by creating a binary logistic regression run separately for each year and comparing the coefficients. Secondly, by using a decomposition technique, this study explores how these determinants have changed over time and during a recession. For the decomposition, the Oaxaca-Blinder decomposition technique (Blinder, 1973; Oaxaca, 1973) is employed to explore how annual migration rates changed as a function of rate (behavioural) and composition effects. Composition effects describe how changes in the population's composition influenced the internal migration rate between the two years (Cooke, 2011). Rate effects describe how changes in the behaviour among specific subgroups influence the mobility rate (Rogers and Castro, 1981; Champion et al., 1998; Cooke, 2011). The findings of this research add to the limited academic literature on internal migration in

Ireland and seeks to inform policy making in Ireland, particularly relating to housing, regional labour markets and development.

2. Theoretical Framework

2.1 Literature Review of Migration Modelling

A plethora of studies have contributed to the literature on migration modelling (Lee, 1966; Isserman, 1985; Ledent, 1986; Mueser, 1989; Rogers, 1990; Boyle and Shen, 1997; Van Imhoff et al., 1997; Rogers et al., 2002). It is important to distinguish between micro and macro approaches to migration modelling (Stillwell and Congdon, 1991). Macro approaches typically examine aggregate migration flows with macro variables such as population size or economic conditions. Micro approaches are at the individual level typically using microdata. Champion et al. (1998) categorised migration models into a four-fold framework. This includes 1) aggregate (macro) cross-sectional models; 2) disaggregate (micro) cross-sectional models; 3) aggregate (macro) time series models and 4) disaggregate (micro) time series models. The cross-sectional models are typically used to explain the determinants of migration and time series are used to predict migration through trend extrapolation. The analysis for this paper is a disaggregate (micro) cross-sectional model to determine the change in components of internal migration rates between 2002 and 2011 in Ireland.

Arguably, the first attempt to decompose changes in net migration was estimated by Kriesberg and Vining (1978). They calculated the effect of out-migration on net migration in Japan. In 2011, the Oaxaca-Blinder decomposition technique was used to explore how annual inter-county migration rates in the US changed as a function of rate and composition effects (Cooke, 2011). The analysis concluded that about 63 percent of the decline in migration rates between 1999 and 2009 can be attributed to the direct effects of the economic crisis and another 17 percent of the decline can be attributed to demographic changes. The remaining 20 percent of the decrease in migration is due to a decline in migration behaviour, or increased rootedness, which applies to all demographic categories. Additionally, a further study decomposed inter-provincial migration in China from 1985 to 2000 using a multilevel Poisson migration model (Shen, 2015). They found that just over 62 percent of the total increase in migration was due to changes in the value of explanatory variables. The remaining change was due to changes in the value of model parameters.

Determinants of internal migration that have been identified in previous research, include economic, demographic, labour market, housing, environment and policy[2] variables (Stillwell, 2005; Champion et al., 1998). The determinants listed below can trigger migration (for instance moving in with a partner) or be a variable which affects migration propensities such as age (Stillwell, 2005). It is also crucial to acknowledge that these determinants work in both directions, they can increase or decrease migration propensities. When a migration does occur, it is likely the result of a combination of different determinants and factors, which are constantly repeated over time (Hjälm, 2014; Stockdale and Haartsen 2018; Schewel, 2020).

2.2 Determinants of Internal Migration

2.2.1 Economic and Labour Market Determinants

The majority of migration research includes economic drivers for migration (Korpi and Clark, 2015; Czaika and Reinprecht, 2022). These theories typically focus on cost-benefit, human capital or investment

[2] Policy variables will not be discussed further in this paper, as it is beyond the intended scope.

approaches (Sjaastad, 1962; Korpi and Clark, 2015). Internal migration research has highlighted how mobility can be strongly related to regional economic development (Fan, 2005). Furthermore, regional economic divergence has shaped migration flows (for China see Fan, 2005). For Ireland, economic factors that fuelled emigration also contributed to the decision to migrate internally (Kelly et al., 2013). Even at the start of the 20th century, Antrim and Dublin were noted as being counties of absorption rather than dispersion due to their employment opportunities and settlement size (Ravenstein, 1885; Kelly et al., 2013). Internal migration in Ireland has appeared to support standard economic models of migration whereby the population moved in response to economic opportunities (Hughes and Walsh, 1980).

Labour market opportunities can also be a driving factor behind internal migration (Stillwell, 2005). Labour market factors both encourage out migration due to lack of opportunities and encourage migration to a particular area. Studies have supported the phenomenon that migration flows respond to labour market factors such as unemployment rates and job opportunities (Todaro, 1969; DaVanzo, 1978; Hughes and McCormick, 1985; Geis et al., 2013). Indeed, unemployed individuals in the US are more likely to move (Cooke, 2011). Although labour market factors are considerably more important for longer-distance migration rather than shorter distance moves (Champion et al., 1998). Research in Ireland has found that labour market factors are indeed associated more with longer distance moves (Hughes and Walsh, 1980). Although it has been proposed that the strength of labour market factors might be changing over time. For instance, Long (1991) predicted that future mobility would be affected by the increase of longer distance commuting and remote working. The rapid increase in remote working could reduce the significance of labour market factors for migration.

The Great Recession

During an economic recession, there are many factors which can push or pull an individual to move or indeed stay. It is thought that traditional labour market factors could become strengthened during a recession, particularly as unemployment rises (Sjaastad, 1962; Korpi and Clark, 2015; Levy et al., 2017). Furthermore, regional disparities in job opportunities can shape migration flows particularly out of areas that were the hardest hit during the recession (Fan, 2005). However, studies on economic factors during economic crises have produced mixed results. While it might be expected that during the Great Recession, internal migration would increase as unemployment increased, initial migration rates in the US and Italy declined (Levy et al., 2017; Bonifazi and Heins, 2017). This aligns with previous research that identified a limited response to deteriorating economic conditions during a recession (Gordon, 1985; Pissarides and McMaster, 1990). It is argued that the relationship between economic conditions and migration weakens during a recession as workers' propensity to migrate weakens. There are a number of theories which could explain this limited response such as risk aversion, the reliance on existing social networks and housing market constraints which hinder mobility (Wolf and Longino, 2005; Dohmen et al., 2016; Hetschko and Preuss, 2020).

Levy et al.'s (2017) study did find that internal migrants in the US were more motivated by economic considerations during the recession. However, there was not a large-scale behavioural change towards labour migration. On the other hand, Cooke's (2011) decomposition results reveal that the increase in the number of people who were unemployed due to the recession resulted in the internal migration rate in the US being 6 percent higher than it would have been, all else being equal. This would align with the assumption that traditional labour market theories would be strengthened during an economic recession.

High rates of unemployment in Ireland during the Great Recession likely also contributed towards higher internal migration rates. While unemployment increases at the macro level, it could be the case that the strength of the unemployed factor decreases on the individual level, such as in Levy et al's (2017) study. Thus, it is hypothesised that unemployed individuals would be less likely to have internally migrated in the previous year during the Great Recession, compared to the 'Celtic Tiger' period (*Hypothesis 1*).

It has also been argued that people are becoming less sensitive to migration drivers due to a rise in rootedness and a longer term trend of declining internal migration (Levy et al., 2017; Shuttleworth et al., 2021). Indeed, other studies such as Shuttleworth et al's (2021) highlight that the Great Recession had little impact on changing residence or the distance moved in Northern Ireland. While they acknowledge the role of economic uncertainty, they note that like other countries, Northern Ireland has been experiencing a decline in internal migration which predates the Great Recession. Bonifazi and Heins (2017) agree that it is difficult to confirm the effect of the recession as there have been changes to intensities and timings of internal migration in Italy. The age at which individuals leave the parental home, finish their education and begin family formation are all increasing. It has been argued that this postponement of events in the life course was driving the decline in mobility rates and contributing to low internal mobility in Italy (Bonifazi and Heins, 2017).

2.2.2 Demographic Determinants

The composition of a population is a key determinant of internal migration rates due to differing migration propensities among subgroups (Champion et al., 1998). One of the key features of population composition is the age structure. Age is indicative of propensity to migrate but does not inherently determine a migration (Stillwell, 2005). Rogers and Castro (1981) argued for the construction of a model migration schedule which mirrored age-specific fertility and mortality rates. They found that age-specific migration schedules were remarkably consistent. Young adults in their early twenties had the highest migration rates. The lowest migration rates were found for young teenagers. For children, the migration rate mirrors that of their parents, with a peak at birth. Subsequently, it was discovered that age specific migration rates reflect events across the life course (Warnes, 1992). A number of studies have highlighted the relationship between migration rates and life stages such as childhood, employment, retirement and elderly (Rogers et al., 1978; Rogers and Castro, 1981). Equally, the lifecourse approach has been used to study staying motives as it has been found that key life stages can trigger or reaffirm staying (Geist and McManus, 2008; Stockdale and Haartsen, 2018). The propensities to move are affected by different factors at each lifestage. For example, young adults are influenced by the location of higher education institutions and concentration of entry level jobs whereas older ages are influenced more by proximity to family.

However, mobility among younger ages was found to be declining in the US and older age groups were moving more in 2009, in comparison to 1999 (Cooke, 2011). The changing age composition resulted in a 32.7 percent decline in internal migration in the US from 1999 to 2009. In addition, Wolf and Longino (2005) found that mobility rates had declined for all age groups in the US. The largest decline was among those aged between 20 and 29 years. On the other hand, when analysing cross-country differences, Long (1991) found that age composition had relatively modest effects in the differences between residential mobility. Thus, while age composition might have an effect within a country, across countries the significance appears to be weaker. It has also been argued to use a birth cohort perspective (Plane, 1993).

Large cohort sizes might be faced with reduced employment opportunities and are thus encouraged to migrate (Wilson, 1983). Furthermore, it is proposed that the economic disadvantages faced by the post-World War Two 'baby boomers' resulted in reduced mobility rates among this cohort (Plane and Rogerson, 1991; Wolf and Longino, 2005).

Other demographic variables which could influence internal migration rates include gender, marital status and having children. While gender has been found to be significant, it is much less pronounced than age for migration propensity (Rogers and Castro, 1981; Stillwell, 2015). Additionally, marital status and having children are important demographic variables, particularly for migration propensities (Mincer, 1978; Devis, 1983). Therefore, populations which differ by their household composition such as the proportion of single households, number of children and dual-earner couples are likely to influence migration propensities. A now quite outdated study which included demographic variables found that mobility rates in Ireland across counties were highest among those aged 15 to 20 years old (Hughes and Walsh, 1980). Those that were unmarried and economically active also had considerably higher propensities. Unsurprisingly, rates declined rapidly with age. However, moves that occurred within a county, reached a plateau until the age of 40 years, where it began to decline. Thus, the effect of being a young adult on migration propensities is stronger for internal moves as opposed to residential mobility. There was also no difference between those who were married and single for intra-county moves.

Demographic determinants at the macro level include population size, density and degree of internationalisation. In terms of population size, Long's (1991) cross country comparison found that the size of the country does not seem to determine the internal migration rate. However, if all else is equal, areas that have a high population density are less attractive to migrants (Fotheringham, 1986). Therefore, it could be population density rather than size which influences migration decisions. A further component is the degree of internationalisation. For instance, in Long's (1991) study excluding 'foreign-born' individuals in the sample lowered internal migration rates. Therefore, excluding this group can distort results, particularly where they compose a large proportion of the population. For instance, among the internal movers in Hong Kong, 22 percent were 'foreign-born' individuals. The propensities of this subgroup to migrate can also change over time. In Cooke's (2011) decomposition, 'foreign-born' individuals were less likely to move in 1999 than they were in 2009.

2.2.3 Housing Determinants

The housing opportunities approach has been implemented in migration research (Clark et al., 1986; Long, 1991). There are a variety of housing factors which likely influence mobility rates including; house prices, vacancy rates, quality of housing stock (including size and composition), number of new builds, number of demolitions, derelict houses and housing tenure (Stillwell, 2005). Housing tenure has been well studied (Boyle, 1993). In particular, public (council) housing has been highlighted as a significant barrier to migration (Hughes and McCormick, 1987), that these tenants have reduced migration propensities (Hughes and McCormick, 1985) and if they do migrate it is likely to be over a shorter distance (Boyle and Shen, 1998). On the other hand, it has been noted that rising rates of home ownership might encourage immobility (Wolf and Longino, 2005). The dominance of owner-occupied households in England meant that the availability and affordability of housing strongly influenced mobility decisions (Champion et al., 1998).

For example, it has been suggested that local mobility rates may have declined due to housing becoming unaffordable (Van Vliet, 1990).

Housing has also been a determinant of mobility in Ireland (Hughes and Walsh, 1980). Historically, a high proportion of the population lived on farms, which restricted mobility. Furthermore, rates of homeownership were very high, including in urban areas. In addition, among those who rent, a high percentage rent from local authorities and moving between these areas is difficult under the system. There are also wider contextual and institutional factors which have affected rental practices, homeownership and building regulations which influence mobility in Ireland (Scott et al., 2017). For example, the housing bubble in Ireland prior to the Great Recession is linked to a house-building boom (Murphy and Scott, 2014). In addition, the subsequent housing crash is likely to have influenced residential mobility behaviour among homeowners. The housing bust during the Great Recession in the US created a housing 'lock' which decreased homeowners' propensity to migrate (Karahan and Rhee, 2012; Modestino and Dennett, 2012). It is likely that this is also the case for Ireland, where homeowners are less likely to have internally migrated in the previous year during the Great Recession, compared to the 'Celtic Tiger' period (*Hypothesis 2*).

2.2.4 Environmental Determinants

In areas with advanced economies, environmental factors can play a major role in internal migration decisions (Stillwell, 2005). Environmental factors can include the physical, social and political characteristics of an area in addition to perceived quality of life can influence mobility. Literature has discerned a notable increase in 'rootedness' or reduced mobility (Cooke, 2011; Fischer, 2002; Schewel, 2020). This might be due to an increased ability to stay, favourable housing and labour market conditions and the ability to commute further distances (Fischer, 2002). Green (2018) identified technological change (specifically transport, the internet and ICT) as a driver of internal migration and immobility. For instance, transport can reduce the necessity to migrate, particularly as commuting longer distances becomes more commonplace. However, in the absence of effective public transport policies, those without access to a car might become more likely to migrate. The internet and ICT has been termed by Green (2018) as more of an enabler than a driver. For instance, access to information such as job opportunities in a different region can increase migration. On the other hand, the increase in working from home arrangements can reduce mobility as commuting can become substituted.

Fischer (2002) identified increased rootedness across age, gender, race and housing tenure in the US. However, there was no significant decline in mobility among older renters, service workers and those with lower levels of education. The motives for staying are multidimensional and have similar determinants to that of migrating. Usually, motives are associated with embeddedness, family ties (Mulder and Gillespie, 2023), location-specific capital, loyalty or as a type of 'learned behaviour' (Bernard and Perales, 2015; Schewel, 2020). A study by Scott et al. (2017) which examined rural mobilities in Ireland found that respondents wanted to live close to family and to raise children in a locality similar to where they grew up, highlighting a sense of 'rootedness' to their local area.

2.3 Conceptual Model

As discussed, Ireland has experienced a low internal mobility rate which appears to have stayed rather consistent despite remarkable differences in the population and socioeconomic conditions (Long, 1991; CSO, 2023). Firstly, the Great Recession is likely to have affected the migration propensities of unemployed individuals, whereby as the number of unemployed increased, at the individual level people potentially became more risk averse. Thus, unemployed individuals are less likely to have internally migrated in the previous year during the Great Recession compared to the 'Celtic Tiger' period (*Hypothesis 1*). Furthermore, the bursting of the 'housing bubble' is likely to have reduced the migration propensities of homeowners during the Great Recession, resulting in homeowners being less likely to internally migrate *(Hypothesis 2).* However, it is also expected that Ireland is similar to other countries where there is an overall trend of migration decline (Wolf and Longino, 2005; Shuttleworth et al's, 2021). It is possible that there has been an increased 'rootedness' among the Irish population strengthening an individual's attachment to their current location and reducing the necessity to migrate. As can be seen in the conceptual model *(Figure 2),* demographic and environment factors are included in addition to economic, labour market and housing factors. Lastly, the decomposition results will explore how the determinants have changed over time and the influence of composition factors such as an ageing population, higher education levels and increasing diversity in household structures as well as deeper behavioural changes.

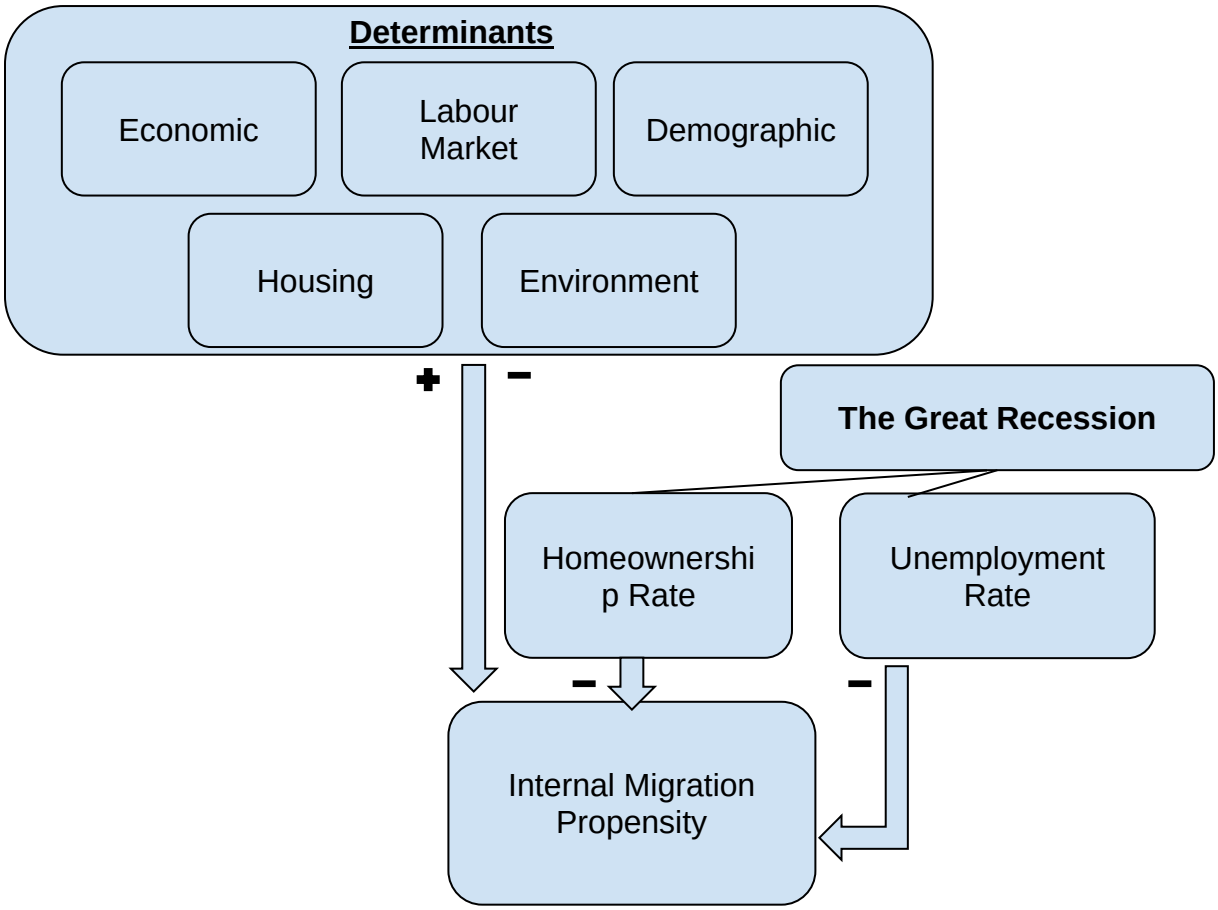

Figure 2: Conceptual Model

3. Methodology

3.1 Dataset and Analytical Sample

The data for this analysis was obtained from the Integrated Public Use Microdata Series (IPUMS) International dataset (Minnesota Population Center, 2020). IPUMS combines global census microdata into a harmonised data series (Ruggles et al., 2003). The data for Ireland is provided by the national statistical office (CSO) who conduct a census every five years. The census data which is provided to IPUMS is restricted to a ten percent random anonymised sample of the population. The two sample years are 2002 and 2011. This results in a year pertaining to the 'Celtic Tiger' sample and the 'Great Recession'. For 2002, the initial sample contains 410,688 individuals and 474,535 individuals for 2011.

The sample excludes those living in communal establishments and absent persons. Communal establishments include individuals who were not enumerated in a private household such as in a hospital, prison or hotel. Absent persons are defined as people who usually reside in a private household but who were temporarily away from their usual residence at the time of census. The sample will also be restricted by age. As children are likely to be moving with parents, they will be removed from the sample. Since the age variable in IPUMS is categorical and in five-year intervals, the sample will exclude those under the age of 20. With these restrictions, the sample size is reduced to 267,367 individuals for 2002 and 319,609 for 2011.

As the paper is concerned with internal migration in the previous year, those who were living abroad in the previous year are removed. This resulted in 7,773 observations for 2002 and 6,523 for 2011 being removed. Furthermore, there were 11,032 'missing' observations for 2011. These are individuals who had been living in the county of Tipperary in the previous year. Tipperary covers two regions, Mid-West and South-East, therefore, it is not possible to discern an internal move. Thus, these observations are removed. Additionally, a number of the independent variables also contained a relatively small number of missing values. These were investigated and appeared to be missing at random. Therefore, listwise deletion is used for missing values, with the exception of socioeconomic group, see below. The final analytical sample size is 235,253 individuals for 2002 and 278,416 for 2011.

3.2 Dependent Variable

The dependent variable is created using migration status within the previous year which contained four categories specifying whether someone was living in the same administrative unit, a different administrative unit, abroad or unknown. An administrative unit in Ireland is determined at the regional NUTS3 level (see *Figure 3*). Since those who were living abroad and missing are excluded from the analytical sample the dependent binary variable was created using those that were living in a different administrative unit signifying an internal migration.

Figure 3: Administrative units (NUTS3 regions) in the Republic of Ireland. Source: Transport Infrastructure Ireland (2023).

3.3 Independent Variables

The first key independent variable to test *Hypothesis 1* will be activity status. It is a categorical variable which was created by combining employment status with the class of worker. Both unpaid family workers and unknown were excluded due to small sample sizes. Eight categories remained including: wage/salaried worker, employer, self-employed, unemployed, housework, unable to work, in education and retired. The second key independent variable to test *Hypothesis 2* will be ownership of dwelling. This is a binary variable of whether an individual owns or rents their home. Households that acquired their residence with a mortgage or other lending agreement are considered as homeowners. In the IPUMS variable, renters include private,

renting from local authorities and those living "rent-free". The economic and labour market control variables will include socioeconomic group and class of worker. Socioeconomic group was recoded into four categories: high (employers and managers, higher professional), medium (lower professional, non-manual, manual skilled, own account workers), low (semi-skilled, unskilled, farmers, and agricultural workers) and unknown. As there were quite a number of 'unknown' in the sample, they are included as a separate category.

Demographic variables include age, sex, marital status, age of youngest child in the household, educational attainment, Irish born and disability status. Age was recoded into ten-year intervals. Marital status has four categories including single/never married, married/in union, separated/divorced and widowed. The age of the youngest child in the household was recoded into five-year intervals until the age of 20 (Rogers and Castro, 1981). Children that are older than 20 who are living with their parents are grouped together in an additional variable "20+". Educational attainment contains five categories including primary/no formal education, lower secondary, upper secondary, third level - non degree and third level - degree or higher. Irish born refers to whether an individual was born in Ireland or abroad. Disability status indicates whether an individual self-reported having any form of disability or not.[3]

An additional variable for housing factors will be dwelling type - as an indicator of the composition of housing stock (Stillwell, 2005). This variable was created by combining data from 2002 and 2011, and reducing the number of categories. The variable now contains five categories indicating detached, semi-detached, terraced house, flat/apartment and caravan/temporary structure. Environmental variables include urban-rural status and region in addition to technological change indicators such as whether the household has internet access and cars. It should be noted that rural areas in 2002 were defined as less than 1,000 habitants, and in 2011 the definition changed to 1,500 habitants. There are eight regions in Ireland, which can be seen in *Figure 3*. Dublin is set as the reference category since previous literature has highlighted it as the most mobile region (Long, 1991). Internet access defines whether a household has access to the internet or not. There is a slight difference in the definition of the number of cars available, for 2002 it is defined as the number of cars available for personal use and for 2011 it is the number available for the household.

It is also important to note that the independent variables are reported at year *t*. Year *t* is the sample year for completing the census, 2002 or 2011. As the data is cross-sectional, there is no information for time variant variables. This means that the interpretation of the results needs to consider the nature of the variable. For instance, the age of a person at the time of the move is known, however the marital status is only known at the time of recording and the length of time is unknown. For example, a separation can trigger an internal move, but in this dataset the time of separation is unknown.

3.4 Analytical Method

This analysis uses binary logistic regression to test the hypotheses, run separately for 2002 and 2011. While the census data is collected on the household level, the units of analysis are individual. To resolve this the

[3] It should be noted that disability rates in the Irish samples are comparably higher than other countries (Minnesota Population Center, 2020) as the definition is broad.

cluster option will be used in STATA. Thus, the standard errors are adjusted to correct for within-cluster correlations.

This analysis builds upon Cooke's (2011) paper, which used the Oaxaca-Blinder decomposition technique to explore how annual inter-county migration rates changed as a function of rate and composition effects in the US (Blinder, 1973; Oaxaca, 1973). Composition effects describe how changes in the population's composition affected the migration rate between the two years (Cooke, 2011). Rate (behavioural) effects describe how changes in the behaviour among specific subgroups influence the migration rate (Rogers and Castro, 1981; Champion et al., 1998; Cooke, 2011). For the analysis, the Oaxaca module for STATA will be used to determine the estimates (Jann, 2008). The model is the same as the one used to test the hypothesis and thus the dependent variable is binary. This means that the logit option is specified to account for non-linearities. To resolve the identification problem, which occurs due to the choice of reference category in categorical variables, the effects are normalised (Yun, 2003; Kalemba et al., 2021). Normalisation of the equation means that the constant and estimates of the dummy variables are identified through "normalised" regression equations which are included in the decomposition.

4. Results

4.1 Descriptive Statistics

Table 1 contains the descriptive statistics for 2002 and 2011 as well as the percentage point difference in each variable. The number of internal migrants in both years is similar, with a 0.1 percentage point increase in 2011. Unsurprisingly, the proportion of unemployed individuals drastically increased from 4.9 percent in 2002 to 12 percent in 2011. There was also a significant decline in the number of individuals who were not in the labour force due to housework (5.7 percentage points). The proportion of homeowners decreased substantially from 83.6 percent in 2002 to 74.8 percent in 2011. Married/in union individuals compose the majority in both samples, although there was a slight decrease in 2011. The proportion of single/never married individuals increased slightly (1.2 percentage points). Notably, the proportion of separated/divorced individuals increased quite drastically, increasing by around 30 percent. There are signs of an ageing population as there are notable increases in the proportion of people aged 30-39 years and 60-69 years in addition to a sharp decline in the proportion of 20-29 year olds in the 2011 sample.

In 2011, there was also a substantial increase in the proportion of individuals obtaining a third level degree. In addition, there was a very steep increase in the proportion of non-Irish born individuals which increased by about 80 percent (8.3 percentage points) from 2002 to 2011 reflecting the growing diversity of the Irish population. The proportion of individuals that do not have an own child living with them increased from 49.9 to 52.1 percent. This includes both childless households in addition to 'empty nesters'. The proportion of individuals that self-reported having any form of disability also substantially increased from 2002 to 2011, by about 50 percent. The number of individuals that have access to the internet doubled between 2002 to 2011.

Table 1: Descriptive Statistics for 2002 and 2011

	2002 (%)	2011 (%)	Difference
N	45.8 (235,253)	54.2 (278,416)	8.4
Internal migrant			
Yes	2.0	2.1	0.1
No	98.0	97.9	-0.1
Activity Status			
Wage/salaried worker	49.1	46.3	-2.8
Employer	4.3	3.5	-0.8
Self-employed	6.7	6.3	-0.4
Unemployed	4.9	12.0	7.1
Housework	16.0	10.3	-5.7
Unable to work	4.2	4.3	0.1
In education	3.6	4.6	1
Retired	11.2	12.8	1.6
Ownership of dwelling			
Owned	83.6	74.8	-8.8
Not owned	16.4	25.2	8.8
Socioeconomic group			

High	20.5	20.6	0.1
Medium	45.2	48.4	3.2
Low	21.3	17.3	-4
Unknown	12.9	13.6	0.7
Age			
20-29	22.2	19.0	-3.2
30-39	22.2	23.6	1.4
40-49	19.9	19.9	0
50-59	15.9	16.1	0.2
60-69	10.2	11.6	1.4
70+	9.7	9.7	0
Sex			
Male	49.4	49.1	-0.3
Female	50.6	50.9	0.3
Marital status			
Single/never married	34.4	35.6	1.2
Married/in union	54.7	53.2	-1.5
Separated/divorced	4.7	6.1	1.4
Widowed	6.1	5.2	-0.9
Age of youngest child in household			
0-4	15.7	17.1	1.4
5-9	7.8	7.6	-0.2
10-14	7.8	6.5	-1.3
15-19	6.1	5.7	-0.4
20+	12.8	10.9	-1.9
None	49.9	52.1	2.2
Educational attainment			
Primary or no formal education	21.4	14.9	-6.5
Lower secondary	21.9	16.5	-5.4
Upper secondary	29.8	36.8	7
Third level, non-degree	10.8	5.0	-5.8
Third level, degree or higher	16.1	26.8	10.7
Irish born			
Yes	89.8	81.4	-8.4
No	10.2	18.6	8.4
Disability			
Yes	9.5	14.5	5
No	90.5	85.5	-5
Dwelling type			
Detached House	47.8	45.6	-2.2
Semi-detached House	28.1	28.5	0.4
Terraced House	18.0	16.7	-1.3
Flat/Apartment	5.8	9.0	3.2

Caravan/Temporary Structure	0.4	0.2	-0.2
Urban-rural status			
Rural	33.6	37.3	3.7
Urban	66.4	62.7	-3.7
Region			
Border	10.8	11.5	0.7
Midlands	5.7	6.3	0.6
West	9.7	10.1	0.4
Dublin	29.0	29.0	0
Mid-East	10.3	11.9	1.6
Mid-West	8.6	6.9	-1.7
South-East	10.8	9.2	-1.6
South-West	15.0	15.1	0.1
Internet access			
Yes	39.8	79.3	39.5
No	60.2	20.7	-39.5
Number of cars (mean)	1.5	1.6	0.1

4.2 Unemployment

As can be seen in *Table 2*, unemployed individuals in 2002 were exp(0.384) or 1.47 times more likely to have internally migrated in the previous year compared to wage/salaried workers ($p<0.001$). Unemployed individuals in 2011 were 0.97 times less likely to have internally migrated within the previous year compared to wage/salaried workers ($p=0.479$). Thus, in 2011 the coefficient reversed were those who were unemployed were *less* likely to have internally migrated in the previous year. Thus, *Hypothesis 1* that unemployed individuals would be less likely to have internally migrated in the previous year during the Great Recession is supported. In summary, unemployed individuals in 2002 had an increased likelihood of internally migrating in the previous year, but this was not found for 2011. These findings are in line with other studies which highlight that migration propensities of unemployed individuals are reduced in times of a recession (Gordon, 1985; Pissarides and McMaster, 1990). Also, it is likely that unemployment is reducing an individual's desire to take risks which is exacerbated in a recession (Dohmen et al., 2016; Hetschko and Preuss, 2020).

Interestingly, retired individuals have a similar coefficient to those who are unemployed and are the only other group who is more likely to have internally migrated in the previous year, compared to a wage/salaried worker in both 2002 and 2011 (2002:1.39 times, $p<0.05$ and 2011:1.15 times, $p=0.190$). In 2002, the group that were the least likely to have internally migrated in the previous year were employers ($p<0.001$) whereas in 2011 it was those who were unable to work ($p<0.001$). Curiously, those in education were 0.94 times *less* likely ($p=0.283$) to have internally migrated in the previous year compared to a wage/salaried worker in 2002, whereas in 2011 they were 1.15 times *more* likely ($p<0.001$). It is possible this is influenced by the increase in the number of people returning or continuing education during the recession.

Table 2: Binary logistic regression of internally migrating within the previous year, 2002 and 2011

	2002			2011		
	Coefficient	Standard Error	P-value	Coefficient	Standard Error	P-value
Activity Status (ref. Wage/salaried worker)						
Employer	-0.517	0.118	0.000	-0.254	0.119	0.033
Self-employed	-0.019	0.080	0.810	-0.038	0.078	0.627
Unemployed	0.384	0.066	0.000	-0.034	0.049	0.479
Housework	-0.021	0.067	0.757	-0.193	0.074	0.009
Unable to work	-0.178	0.137	0.192	-0.522	0.113	0.000
In education	-0.067	0.062	0.283	0.361	0.042	0.000
Retired	0.332	0.149	0.026	0.140	0.107	0.190
Ownership of dwelling (ref. Not owned)						
Owned	-0.839	0.050	0.000	-0.969	0.042	0.000
Socioeconomic group (ref. High)						
Medium	-0.146	0.042	0.001	-0.133	0.039	0.001
Low	-0.606	0.070	0.000	-0.545	0.065	0.000
Unknown	0.019	0.064	0.761	0.640	0.050	0.000
Age (ref. 20-29 years)						
30-39 years	-0.413	0.046	0.000	-0.292	0.039	0.000
40-49 years	-1.217	0.078	0.000	-0.645	0.062	0.000
50-59 years	-1.628	0.108	0.000	-0.711	0.078	0.000
60-69 years	-1.984	0.156	0.000	-0.923	0.105	0.000
70+ years	-2.505	0.209	0.000	-1.230	0.144	0.000
Sex (ref. Male)						
Female	-0.038	0.029	0.184	0.070	0.027	0.010
Marital status (ref. Single/never married)						
Married/in union	0.005	0.063	0.938	-0.599	0.055	0.000
Separated/divorced	0.482	0.086	0.000	0.242	0.067	0.000
Widowed	0.299	0.164	0.069	-0.022	0.117	0.850
Age of youngest child in household (ref. None)						
0-4 years	-0.425	0.069	0.000	-0.630	0.061	0.000
5-9 years	-0.860	0.124	0.000	-1.376	0.119	0.000
10-14 years	-0.911	0.157	0.000	-1.415	0.151	0.000
15-19 years	-1.229	0.232	0.000	-1.412	0.177	0.000
20+ years	-0.567	0.148	0.000	-0.561	0.110	0.000

Educational attainment (ref. Primary or no formal education)						
Lower secondary	0.103	0.098	0.291	0.335	0.092	0.000
Upper secondary	0.649	0.091	0.000	0.750	0.084	0.000
Third level, non-degree	1.039	0.097	0.000	0.808	0.107	0.000
Third level, degree or higher	1.448	0.095	0.000	1.493	0.087	0.000
Irish born (ref. Yes)						
No	0.033	0.049	0.497	-0.339	0.043	0.000
Disability (ref. No)						
Yes	0.168	0.084	0.047	-0.051	0.052	0.322
Dwelling type (ref. Detached house)						
Semi-detached house	0.249	0.056	0.000	-0.157	0.048	0.001
Terraced house	-0.223	0.074	0.003	-0.184	0.059	0.002
Flat/apartment	0.301	0.077	0.000	0.072	0.061	0.233
Caravan/temporary structure	0.275	0.247	0.266	0.047	0.327	0.885
Urban/rural status (ref. Rural)						
Urban	0.141	0.060	0.020	-0.106	0.046	0.020
Region (ref. Dublin)						
Border	0.759	0.076	0.000	0.333	0.062	0.000
Midlands	1.347	0.080	0.000	0.544	0.072	0.000
West	0.865	0.071	0.000	0.329	0.062	0.000
Mid-East	1.435	0.061	0.000	0.776	0.055	0.000
Mid-West	0.649	0.077	0.000	0.504	0.065	0.000
South-East	0.967	0.071	0.000	0.451	0.063	0.000
South-West	0.288	0.069	0.000	-0.159	0.060	0.009
Internet access (ref. Yes)						
No	0.098	0.043	0.022	-0.130	0.051	0.011
Number of cars	0.003	0.020	0.867	0.114	0.019	0.000
Intercept	-3.992	0.132	0.000	-3.579	0.118	0.000
N	235,253 (2002)			278,416 (2011)		
Pseudo R-squared	0.1679 (2002)			0.1626 (2011)		

4.3 Homeownership

As expected, homeowners were significantly less likely to have internally migrated in the previous year in both years compared to renters. In 2002, homeowners were 0.43 times less likely to have internally migrated in the previous year compared to renters ($p<0.001$). In 2011, homeowners' likelihood of internally migrating

reduced to 0.38 times less than that of renters ($p<0.001$). The result supports *hypothesis 2* that homeowners would be less likely to internally migrate during the Great Recession as the coefficient is significantly different from the coefficient obtained for the Celtic Tiger period (t-test=-2.751: $p<0.001$). This finding is in line with previous research which highlighted a housing 'lock' created by the Great Recession (Karahan and Rhee, 2012; Modestino and Dennett, 2012). Therefore, homeowners in 2011 were significantly less likely to have internally migrated in the previous year compared to renters, supporting *hypothesis 2.*

4.4 Specific Subgroups

The descriptive statistics in *Table 1* highlight how the internal migration rates of certain subgroups were altered from 2002 to 2011. The effect of marital status on the likelihood of being an internal migrant in the previous year changed between the two time periods. In 2002, married/in union individuals had a similar likelihood (1.01 times) to have internally migrated in the previous year compared to an individual who is single ($p=0.938$). However, in 2011 married/in union individuals were significantly less likely (0.55 times) to have internally migrated than an individual who is single ($p<0.001$). The findings for 2011 are more aligned with previous research that single individuals are more mobile. Furthermore, the most mobile group in both years were those who are separated/divorced, which is in line with previous studies (Spring et al., 2024).

In 2002, those who were not born in Ireland were 1.03 times more likely to have internally migrated in the previous year compared to an individual born in Ireland ($p=0.497$). However, in 2011, those who were not born in Ireland were 0.71 times less likely to have internally migrated compared to Irish-born individuals ($p<0.001$). This result might suggest that the effects of the Great Recession had more of an adverse effect on the internal migration behaviour of non-Irish born individuals. Other groups that had significantly changed between years include those with a disability, who were more likely to have internally migrated in the previous year in 2002 (1.18 times;$p=0.047$) whereas in 2011 they were 0.95 times less likely ($p=0.322$), compared to someone without a disability. In addition, those without internet access were 1.1 times more likely to internally migrate in 2002 than those that had access ($p=0.022$) but in 2011 this reversed, where those without the internet were 0.88 times less likely to move than someone who had internet access ($p<0.005$). It is possible that this reflects how internet access became less of a 'luxury' good and those without access in 2011 could be interpreted as an indicator of experiencing deprivation. This is similar to the effect of the number of cars available where each additional car increased the likelihood of internally migrating by 1.12 times in 2011 ($p<0.001$) but was not statistically significant in 2002 (1 time; $p=0.867$). Thus, the number of cars available might be acting as a type of proxy for wealth.

4.5 Oaxaca-Blinder Decomposition

Table 3 presents the results from the Oaxaca-Blinder decomposition. The table includes the parameters broken into composition and behavioural effects as well as the percentage of the total change due to each effect. A positive value indicates that the effect would have led to an increase in the internal migration rate all else being equal and a negative value indicates a decrease.

Changes in the composition of activity status from 2002 to 2011, would have led to the internal migration rate being 58 percent higher, all else being equal. These effects are largely driven by the increase in the

proportion of unemployed individuals during the Great Recession. The increase in the proportion of people who were unemployed alone resulted in the internal migration rate being 43 percent higher than it would have been otherwise. Changes in the behaviour of subgroups overall reduced the internal migration rate by 3.2 percent. Unemployed individuals were less likely to have internally migrated in the previous year in 2011 than they were in 2002 and this resulted in a 31.8 percent decrease in the internal migration rate. On the other hand, wage/salaried workers were more likely to have internally migrated within the previous year and this would have increased the internal migration rate by 50 percent. It is likely that this behaviour is being influenced by the Great Recession and labour migration is becoming more dominant.

The total effect of the differences in the composition of homeownership rates meant that internal migration would have been 113.8 percent higher in 2011 than 2002, absent other effects. This is due to the decline of homeowners, who are known to be less migratory (Champion et al., 1998; Stillwell, 2005; Wolf and Longino, 2005). In 2011, homeowners were less likely to have internally migrated in the previous year, resulting in a 97.7 percent reduction in the internal migration rate, all else equal. On the other hand, the difference in behaviour among renters in 2011 compared to 2002 led to a 19.1 percent increase in the internal migration rate, absent other effects. Overall, this change in behaviour is responsible for a 78.6 percent decrease in the internal migration rate.

The total effect of the differences in the age composition between 2002 and 2011 resulted in a 61.8 percent decrease in internal migration. This is largely driven by the decrease in the proportion of those aged 20-29 years, who have higher migration propensities (Rogers and Castro, 1981; Stillwell, 2005). Interestingly, younger ages were significantly less migratory in 2011 than they were in 2002. For instance, changes in the behaviour of those aged 20-29 years resulted in a 263.2 percent decrease in the internal migration rate. Other studies have found similar trends of migration decline among younger adults (Wolf and Longino, 2005; Cooke, 2011). On the other hand, older ages became more migratory. This finding has also been found in other studies (Cooke, 2011; Kalemba et al., 2021). It has been argued that changes in the migratory behaviour across ages have been exacerbated by delays in the lifecourse such as the transition to adulthood and leaving the parental home as well as the age of retirement.

The total compositional effect of educational attainment led to a 204.7 increase in the internal migration rate. This is largely driven by the increasing number of individuals obtaining a third level degree, which by itself would have increased the internal migration rate by 130.2 percent. This supports Bernard and Bell's (2018) hypothesis that the likelihood to internally migrate increases with educational attainment. The total effect of behavioural changes was largely driven by those with lower and upper secondary becoming more likely to have internally migrated in 2011 than 2002.

The total compositional effect of changes in marital status among the population would have led to a 5.7 percent increase in the internal migration rate, all else being equal. Curiously, the behavioural effect is large (-126.8 percent) driven by married/in union individuals becoming significantly less migratory contributing to a 308.6 percent decrease in the internal migration rate. On the other hand, single individuals became more migratory, increasing the internal migration rate by 180.8 percent. It is possible that as married individuals are more risk averse (Dohmen et al., 2016) the recession exacerbated this effect.

The total compositional effect of changes in ages of children in the household would have led to a 33.8 percent increase in the internal migration rate, all else equal, which is largely being driven by the increase in the proportion of households without children (22.7 percent) which are known to be more mobile (Mincer, 1978; Kalemba et al., 2021). Furthermore, childless individuals became significantly more migratory in 2011 than they were in 2002 resulting in a 210.1 percent increase in the internal migration rate.

The compositional effect of the increase in the proportion of non-Irish born individuals increased the internal migration rate by 4.2 percent, all else equal. Non-Irish born individuals became less migratory in 2011 than they were in 2002, and this resulted in a 34.3 percent decline in the internal migration rate. Curiously, Irish-born individuals became significantly more likely to internally migrate and this would have increased the internal migration rate by 300.6 percent, all else equal.

The decomposition also included two technological change variables which are thought to affect mobility which are internet access and availability of cars (Green, 2018). As more people gained access to the internet, the internal migration rate would have declined by 58.9 percent, all else being equal. There is also a divergence of behaviour where those with internet access became more mobile in 2011 than they were in 2002 and those without became less. Interestingly, those with cars became more migratory in 2011 in comparison to 2002 which would have increased the internal migration rate by 302 percent, all else being equal.

The constant is large and negative (-826.78 percent) which can be interpreted as an overall trend of migration decline across all groups and increasing "rootedness" (Kalemba et al., 2021). This is in line with other studies which highlight longer term trends of declining internal migration rates (Cooke, 2011; Kalemba et al., 2021). Although these results would suggest that the decrease in internal migration behaviour is quite drastic in Ireland. It is possible that this effect is exacerbated by the Great Recession, which could be influencing immobility. It is also possible that there is an omitted variable bias, where there are significant variables which are not included in the analysis resulting in this large constant (Kalemba et al., 2021).

In summary, the variables which were considered in this analysis which had the largest compositional effect were educational attainment (204.7 percent) and homeownership (113 percent). Overall, changes in the composition of the Irish population alone between 2002 and 2011 would have increased the internal migration rate further if it had not been offset by behavioural changes. The migratory behaviour of certain subgroups differed substantially from 2002 to 2011, which overall decreased the internal migration rate. Of note, younger adults becoming less migratory suppressed internal migration rates by 263.2 percent. On the other hand, childless individuals were more migratory in 2011 than 2002, increasing internal migration by 210.1 percent.

Table 3: Oaxaca-Blinder decomposition results for 2002 to 2011

	Parameters		% of total change	
Variable	Composition effects	Behavioural effects	Composition effects	Behavioural effects
Activity Status				
Wage/salaried worker	-0.00000557	0.0006074	-0.46	50.16

Employer	0.0000796	0.0003015	6.57	24.90
Self-employed	0.000000639	0.0000557	0.05	4.60
Unemployed	0.0005211	-0.0003853	43.03	-31.82
Housework	0.0000107	-0.0004027	0.88	-33.26
Unable to work	-0.000000689	-0.0002659	-0.06	-21.96
In education	-0.00000987	0.0003802	-0.82	31.40
Retired	0.000106	-0.000329	8.75	-27.17
Subtotal			57.97	-3.15
Ownership of dwelling				
Owned	0.000689	-0.0011833	56.90	-97.72
Not owned	0.000689	0.0002315	56.90	19.12
Subtotal			113.80	-78.60
Socioeconomic group				
High	0.00000379	-0.0007775	0.31	-64.21
Medium	0.0000217	-0.0015785	1.79	-130.36
Low	0.0003129	-0.0005259	25.84	-43.43
Unknown	0.0000265	0.0012559	2.19	103.72
Subtotal			30.13	-134.28
Age				
20-29 years	-0.0007672	-0.0031869	-63.36	-263.18
30-39 years	0.0002396	-0.0025925	19.79	-214.10
40-49 years	-0.000000395	-0.000371	-0.03	-30.64
50-59 years	-0.000013	0.0008977	-1.07	74.13
60-69 years	-0.0001894	0.0008935	-15.64	73.79
70+ years	-0.0000175	0.0013	-1.45	107.36
Subtotal			-61.76	-252.64
Sex				
Male	-0.00000111	-0.0005789	-0.09	-47.81
Female	-0.00000111	0.0005935	-0.09	49.01
Subtotal			-0.18	1.21
Marital status				
Single/never married	-0.0000419	0.0021888	-3.46	180.76
Married/in union	0.000056	-0.0037365	4.62	-308.57
Separated/divorced	0.0000726	0.0000526	6.00	4.34
Widowed	-0.000018	-0.0000398	-1.49	-3.29
Subtotal			5.67	-126.76
Age of youngest child in household				
0-4 years	0.0000654	0.0000982	5.40	8.11
5-9 years	0.00000673	-0.0004781	0.56	-39.48
10-14 years	0.0000573	-0.0004602	4.73	-38.00
15-19 years	0.0000396	0.0000675	3.27	5.57

20+ years	-0.0000341	0.0006693	-2.82	55.27
None	0.0002746	0.0025437	22.68	210.07
Subtotal			33.82	201.54
Educational attainment				
Primary or no formal education	0.0007799	-0.0001372	64.41	-11.33
Lower secondary	0.0005407	0.0009673	44.65	79.88
Upper secondary	0.00000184	0.000464	0.15	38.32
Third-level, non degree	-0.0004207	-0.0006137	-34.74	-50.68
Third level, degree or higher	0.0015767	0.000056	130.21	4.62
Subtotal			204.68	60.81
Irish born				
Yes	0.0000255	0.0036404	2.11	300.64
No	0.0000255	-0.0004153	2.11	-34.30
Subtotal			4.22	266.34
Disability				
Yes	0.0000769	-0.0002269	6.35	-18.74
No	0.0000769	0.0021613	6.35	178.49
Subtotal			12.70	159.75
Dwelling type				
Detached house	0.0000478	0.0017164	3.95	141.75
Semi-detached house	0.00000986	-0.001478	0.81	-122.06
Terraced house	0.0000836	0.0007961	6.90	65.74
Flat/apartment	0.0001089	-0.0000801	8.99	-6.61
Caravan/temporary structure	-0.00000608	-0.00000554	-0.50	-0.46
Subtotal			20.16	78.36
Urban-rural status				
Rural	-0.000048	0.000905	-3.96	74.74
Urban	-0.000048	-0.0017894	-3.96	-147.77
Subtotal			-7.93	-73.04
Region				
Border	-0.0000035	0.0000364	-0.29	3.01
Midlands	0.0000581	-0.0004519	4.80	-37.32
West	0.00000617	-0.0001994	0.51	-16.47
Dublin	0.00000174	0.0027918	0.14	230.56
Mid-East	0.0001874	-0.0004895	15.48	-40.42
Mid-West	0.0000442	0.0005587	3.65	46.14
South-East	-0.000053	-0.0001748	-4.38	-14.44
South-West	-0.0000115	-0.0000177	-0.95	-1.46
Subtotal			18.96	169.59

Internet access				
Yes	-0.0003565	0.0009909	-29.44	81.83
No	-0.0003565	-0.0014968	-29.44	-123.61
Subtotal			-58.88	-41.78
Number of cars	0.00000483	0.0036572	0.40	302.02
Constant		-0.0100115		-826.78

5. Conclusion and Discussion

5.1 Hypotheses

In summary, *Hypothesis 1* that unemployed individuals would be less likely to have internally migrated in the previous year during the Great Recession is supported. This is unsurprising as other studies have highlighted how migration propensities of unemployed individuals are reduced during a recession (Gordon, 1985; Pissarides and McMaster, 1990). Unemployment itself can also increase the chance of an individual becoming more risk averse, thereby discouraging internal migration (Dohmen et al., 2016; Hetschko and Preuss, 2020). *Hypothesis 2* that homeowners would be less likely to have internally migrated during the Great Recession, is supported as homeowners in 2011 were significantly less likely to have internally migrated in the previous year compared to renters. This is consistent with other studies which found a housing 'lock' in other countries during the Great Recession (Karahan and Rhee, 2012; Modestino and Dennett, 2012). These findings reinforce the idea that economic uncertainty during the recession decreased migration propensities among various subgroups, such as homeowners and unemployed individuals. Therefore, this research highlights the importance of considering the economic context in migration studies.

5.2 Decomposition

The results from the decomposition show that the increase in the internal migration rate in 2011 is due to differences in the population composition. In fact, if the population composition had stayed the same, internal migration would have been significantly reduced due to differences in behaviour among the different subgroups and a general migration decline. While a general migration decline is evident in this analysis, recent data also supports the perception that there has been an overall aggregate decline in internal migration in Ireland (CSO, 2023). This is in line with other countries which have highlighted a longer-term trend of internal migration decline (Cooke, 2011; Kalemba et al., 2021). Furthermore, this research also supports the notion that people are becoming less sensitive to migration drivers, evidenced by the negative coefficients in the decomposition (Levy et al., 2017; Shuttleworth et al., 2021). However, there were certain subgroups who became more sensitive to migration drivers, such as childless households. In conclusion, the results of this decomposition suggest that the aggregate level of internal migration in Ireland was driven by changes in the population composition. Similar to other studies, behavioural changes were significant and absent other effects would have reduced the internal migration rate.

5.3 Significance

This research addresses a significant gap in the literature on internal migration in Ireland. Furthermore, the two time periods ('Celtic Tiger' and the Great Recession) that are analysed also add to the literature on internal migration during economic booms and busts. By including the Oaxaca-Blinder decomposition, this research goes a step further to provide a comprehensive overview of internal migration in Ireland. The determinants of internal migration were identified, largely aligning with previous theory, but also the results reveal how the determinants have changed strength over time. This is likely due to two vastly different macroeconomic contexts but also could indicate that individuals are indeed becoming less sensitive to the 'typical' migration drivers (Levy et al., 2017; Shuttleworth et al., 2021). Crucially, this research has found that migration propensities are indeed not static, change over time and need to be interpreted in context. In particular, the results highlight how it was compositional factors which caused the slight increase in internal

migration in Ireland. Thus, decomposition techniques such as Oaxaca-Blinder add important context and further understanding to internal migration and would be particularly useful to employ in other migration studies.

There are likely a number of underlying barriers to internal migration which could be addressed at the policy level. With the added benefit of hindsight, housing market interventions should have been employed to remove the housing 'lock' and build affordable housing. It is likely that as housing has become more unaffordable in Ireland, mobility rates have decreased (Van Vliet, 1990). This is particularly poignant as Ireland is currently experiencing a severe housing crisis which is encouraging emigration and restricting individuals' choice of where they want to live such as young adults unable to leave the parental home (Hearne, 2020). Furthermore, regional development policies should be considered to reduce the push factors out of certain areas and regions such as by increasing investment and employment opportunities.

5.4 Limitations and Future Research

This research addressed a gap in the literature where internal migration in Ireland had been previously neglected. However, this analysis has a number of limitations. Firstly, the data is cross-sectional resulting in internal migration being reported within the previous year (year t-1). While this does not affect time-invariant variables, it does mean that time-variant variables are unknown prior to the move. This does affect the interpretation of the results as it is the likelihood of an internal move having occurred within the previous year. While a suitable longitudinal dataset is absent for Ireland, future research should aim to utilise longitudinal data which is more suitable for incorporating time-variant factors.

Another important consideration is emigration. As can be seen in *Figure 1*, emigration increased from 2002 to 2011. This is important as Ireland's low internal mobility rate is thought to be considerably influenced by emigration (Hughes and Walsh, 1980). It is likely that the increase in emigration between 2002 and 2011 somewhat suppressed the internal migration rate. For instance, individuals who might otherwise have chosen to internally migrate emigrated instead. It is possible that this is one of the underlying mechanisms behind the decline in internal migration in the 20-29 year age group.

The results of this analysis do indicate that certain variables and determinants were exacerbated by the Great Recession whereby the recession made some subgroups more migratory and others less. However, it is difficult to obtain the direct effects of the recession. Therefore, future research could examine internal migration in Ireland over time to test whether the recession years align with overall trends. In addition, qualitative research could provide deeper insights into the motivations and barriers to internal migration in Ireland.

Future research could utilise recent data to examine migration trends and behaviour in the current context. For instance, it has been suggested that changes in migration behaviour among ages is influenced by delays in the lifecourse (Kalemba et al., 2021). This would be interesting for future analysis as vital life events such as leaving the parental home are becoming delayed in Ireland. Investigating current migration trends would provide valuable insights into evolving internal migration patterns and add to limited literature on internal migration in Ireland.

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Appendix

Reflection Report

Choosing a Dataset

Although limited, there were a few other potential datasets that could have been utilised to measure internal migration in Ireland. For instance, The Irish Longitudinal Study on Ageing (TILDA) uses retrospective data to ask respondents about migration histories. However, questions focus on international migration and the only section containing information about internal migration are contained within the childhood questions. Respondents are asked about where they grew up and information on internal migration can be obtained using this. However, it is inadequate for this research as it is only comparing internal migration from now to their childhood and migration history in between is missing.

In addition, there is another study called Growing Up in Ireland (GUI) which is a longitudinal study that has followed the lives of children and young people. The oldest cohort are currently 25 to 26 years old. The dataset contains useful information about migration histories, information on leaving the parental home and also migration intentions. While it would have been useful if this research was focusing on young adults and children, they were not the intended focus.

As a result, this left the census (CSO) data being the most adequate for answering the research objectives. However, accessing census microdata from outside of Ireland is difficult and it would have been a lengthy process to have gained approval. Therefore, I opted to use the IPUMS sample, which is a ten percent sample of the census data. The variables of interest were included and the sample size was still large enough to conduct the analysis, therefore IPUMS was chosen as the most adequate dataset.

Data Issues

As emigration is an important component of Irish demography, I wanted to choose two years which had similar emigration rates as this is something I cannot control for in the regression. Initially, the two sample years which were selected were 2002 and 2022. However, there were comparability issues with the 2022 sample. Even though it is included in the harmonised variable of migration status within the previous year it is measured differently to all the other years. The other years separate residential migration (moves within the same administrative unit) from internal migration (moves to a different administrative unit). For 2022, this is combined meaning that it was possible to obtain whether an individual had moved, but not whether they had crossed a boundary. I contacted IPUMS about this discrepancy and unfortunately this was how the data was provided to them by the CSO. Therefore, I was left with two options, to examine overall mobility (in other words combine internal and residential moves) or to change the sample years. I felt that changing the sample years was the most straightforward and beneficial option. This left me with the 2002 and 2011 sample years. These years are significant in the Irish context as 2002 is in the middle of the Celtic Tiger period and 2011 the Great Recession. Therefore, I opted to include the recession as a focus of the analysis.

Results

As I opted for writing the thesis in the journal article format, I had to be selective in which results I reported. Thus, here I present findings which were not included in the main text. The results for the hypotheses and determinants can be found in *Table 2* and the decomposition results in *Table 3*.

Gender

In 2002, females were 0.96 times *less* likely to have internally migrated in the previous year compared to males (p=0.184). In 2011, this increased to females being 1.07 times *more* likely than males (p=0.01). This might support the notion of a feminisation of migration. In the decomposition, we can see that females became more migratory in 2011 compared to 2002, resulting in a 49 percent increase in the internal migration rate. However, this is essentially offset by males becoming less likely to internally migrate, reducing the internal migration rate by 48 percent.

Self-employed and employers

Initially, the data for employment status was generalised into employed, unemployed and outside of the labour force. However, following a suggestion to include more detail I reran the model with a more detailed activity status variable. In comparison to a wage/salaried worker, employers were the least likely to have internally migrated in the previous year (0.6 times) and this was statistically significant ($p<0.001$). In 2011, they were not the least likely to have internally migrated (this was those who were unable to work), however employers were still 0.78 times less likely to have internally migrated in comparison to a wage/salaried worker ($p<0.05$). From the decomposition, the increase in the likelihood for an employer to internally migrate from 2002 to 2011 contributed 24.9 percent to the internal migration rate.

For the self-employed in 2002, the likelihood of internally migrating within the previous year is similar to wage/salaried workers (0.98 times; p=0.810). In 2011, the likelihood decreased slightly to 0.96 times (p=0.627). Thus, the differences between the self-employed and wage/salaried workers' propensities to migrate were minimal and not statistically significant in 2002 and 2011. The decomposition results highlight that the self-employed became more migratory in 2011 than 2002 and this would have increased the internal migration rate by 4.6 percent. Therefore, these two findings suggest while the self-employed became slightly more migratory in 2011 this was not to the same extent as wage/salaried workers (the reference group).

Socioeconomic group

The results for socioeconomic groups were expected. Those with high SES were the most likely to have internally migrated in the previous year in both 2002 and 2011, albeit the unknown group were more likely in 2011. It is quite interesting that the unknown group were 1.89 times more likely to have internally migrated in the previous year in 2011 ($p<0.001$). This is despite the proportion of this group being relatively similar to 2002. A person's socioeconomic group is deduced from their current or previous occupation. It is possible that the missings are not at random and are indeed people with a higher SES. From the decomposition results, those in the medium socioeconomic group had the greatest reduction in migration behaviour (-130 percent). Followed by the high SES group (-64 percent) and the low SES group (-43 percent). In terms of the composition, the decline in the proportion of low SES individuals increased the internal migration rate by 26 percent.

Educational attainment

While educational attainment was discussed in the decomposition results due to the large proportion of people gaining third level education some further results are highlighted here. As expected, the likelihood of having internally migrated in the previous year increases with each level of educational attainment. In

2002, those with a third level degree were 4.25 times more likely to have internally migrated compared to someone with primary education ($p<0.001$). This increased to 4.45 times in 2011 ($p<0.001$).

Disability

In 2002, those with a disability were 1.18 times *more* likely to have internally migrated in the previous year ($p<0.05$), in comparison to someone without. This effect reversed in 2011, where those with a disability were 0.95 times *less* likely to have internally migrated in the previous year ($p<0.322$). As discussed in the main text, the number of people self-reporting having a disability is quite high in Ireland due to a broad definition, 9.5 percent of the 2002 sample and 14.5 percent in 2011. The 2011 sample does report more detail on the type of disability. For instance, the 2011 includes employment disability, blind or vision impaired, deaf or hearing-impaired, mental disability, psychological disability, personal care limitation, independent mobility difficulty and work disability. The 2002 sample only includes disability status and employment disability. Employment disability is highly correlated to 'unable to work' in the activity status variable hence why disability status is used. It is unfortunate that the 2002 sample does not include the same level of detail as the 2011 sample as it would have provided interesting analysis, particularly for people with mental health difficulties. In the decomposition, those with a disability became less migratory (-18.7 percent) and those without became significantly more migratory (178.5 percent).

Dwelling type

While dwelling type is included as it has been shown to affect migration propensities the addition of this variable is limited in this research as it is only reported after the potential move has taken place. Although the expected pattern emerges where in both 2002 (1.35 times) and 2011 (1.07 times) those living in a flat/apartment were the most likely to have internally migrated in previous year, in comparison to a detached house. The other dwelling type which was more migratory was caravan/temporary structure which is expected however the small sample sizes likely influenced their statistical insignificance.

Urban/rural

In 2002, those living in an urban area were 1.15 times *more* likely to have internally migrated in the previous year, in comparison to those living in a rural area ($p<0.05$). In 2011, this reversed where those living in an urban area were 0.9 times *less* likely to have internally migrated in the previous year ($p=<0.05$). As was previously noted, rural areas in 2002 were defined as less than 1000 habitants, and in 2011 the definition changed to 1500 habitants. The migratory behaviour among those living in rural areas did in fact increase, as can be seen in the decomposition results. This contributed 74.7 percent to the increase in internal migration. Those living in urban areas became less likely (-147.8 percent) to have internally migrated in the previous year. The increase in the proportion of people living in rural areas would have resulted in a 7.9 percent decline in the internal migration rate, all else being equal. Unfortunately, it is unknown whether the moves that did take place were urban-urban, or urban-rural and so forth. However, there does appear to be proportionally more moves to rural areas which perhaps is return migration sparked by the recession.

Region

The results for region are quite interesting as the reference group (Dublin) was selected due to it being cited as the most mobile region. In fact, in 2002 Dublin was the region with the smallest likelihood of internal migration within the previous year and was the second least in 2011 (the least being South-West;

comprising Cork and Kerry). The regions with the highest likelihood of an individual having internally migrated in the previous year were the Mid-East (2002; 4.2 times and 2011; 2.2 times) and the Midlands (2002; 3.8 times and 2011; 1.7 times). This supports the idea of a return to roots or counter urbanisation movement particularly among the commuter belt area in the Mid-East. Changes in the regional composition increased the internal migration rate by 19 percent, largely driven by moves to the Mid-East region (15.5 percent). Individuals living in the Dublin region were more likely to have internally migrated in 2011 than 2002 and this would have resulted in a 230.6 percent increase in the internal migration rate, all being equal. It is possible that this is influenced by labour migration to the capital during the recession.

Internet

In 2002, those without internet access were 1.1 times *more* likely to have internally migrated in the previous year compared to those with access ($p<0.05$). Whereas in 2011, those without internet access were 0.88 times *less* likely to have internally migrated in the previous year compared to those with access
2002 ($p=0.011$). It is likely that as internet access became more readily available, that those without access in 2011 were living in areas with more deprivation or were of an older generation. The decomposition results highlight this divergent effect were those with access became more migratory and those without became less. It would be interesting for future studies to focus on the remote working aspect, which is available in the most recent sample year 2022.

Future Dataset?

In Shuttleworth et al. 's (2021) paper they used the Northern Ireland Longitudinal Study (NILS) to examine internal migration trends. The dataset is comprehensive and includes major life events containing over 40 years' worth of data. The data primarily comes from health card registration data which are linked to census and administrative data. A dataset similar to this would have been ideal for this study. This is due to the advantages of longitudinal data in migration research. As discussed, the cross-sectional nature of IPUMS means that time-variant variables are not captured and this is the biggest limitation of this research. Thus, a similar dataset to NILS could be created for the Republic of Ireland using the PPS (Personal Public Service) number which could link different administrative data. Furthermore, if this type of dataset were to be created, it might also be possible to link it to NILS and thus cross border moves and working patterns could be examined.