Journal of the Statistical and Social Inquiry Society of Ireland
Vol. XLIV

Symposium on the Labour Market

The Equality Impact of the Unemployment Crisis

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(read before the Society, 19th February 2015)

1. INTRODUCTION

The extent of the Great Recession in Ireland is well documented. Real GDP fell by 10 per cent between 2008 and 2010 (Barrett and McGuinness, 2012). The impact that this large fall in economic activity had on the country's labour market was severe, with Ireland's overall unemployment rate increasing from 4.6 per cent in 2006 to 15 per cent in 2012,[2] while the numbers in employment fell from 68.5 per cent to 58.8 per cent over the same time period. Long-term unemployment also increased considerably from 1.5 per cent in 2006 to 9.2 per cent in 2012. Fortunately, some modest economic growth since 2012 (see Duffy et al., 2014) has resulted in unemployment beginning to fall and increases in employment: by Quarter 1 2015, the unemployment rate stood at 9.9 per cent and the employment rate 62.2 per cent, while the long-term unemployment rate has fallen to 5.9 per cent.[3]

The collapse in the property sector was a very significant factor in Ireland's economic downturn, resulting in the highest level of job losses occurring in the construction sector. From peak to trough, construction sector employment fell by 65 per cent between 2007 and 2013. Apart from the information and communication sector, education, health and the arts, all other sectors also experienced a decline in the numbers employed, but none to the extent of the construction sector (see Figure 1 below).

There has been considerable debate about where the costs of the recession have fallen across society in terms of social class, income groups, age groups, household types, and by gender (e.g. Barry and Conroy 2013; Callan et al., 2012; Gerlach-Kristen, 2013; Keane et al., 2014; NESC, 2013; TASC, 2012; Whelan et al., 2015). While much of this work has focused on outcomes such as income loss, poverty, debt and financial stress, this paper focuses on the distribution of unemployment effects, given the rapid rise in unemployment that took place with the recession. Unemployment is a key measure of the cost of the recession as it has strong consequences for social cohesion, and impacts directly on income and poverty. The experience of unemployment has been shown to leave 'scars' on future outcomes, such as a person's career and wages, and also their happiness, job satisfaction and health (Arulampalam, 2001; Scarpetta and Sonnet, 2010). However, it must be noted that as a measure of the effect of recession, unemployment has its weaknesses, namely because it excludes those who do not participate. Thus, it does not account for groups who may be marginalised from the labour market; for example, the long term unemployed and inactive. Nevertheless, there is a strong argument against using the unemployment to population ratio as an indicator for unemployment, as using the total population as the denominator includes groups who actively choose to stay out of the labour market, such as stay-at-home mothers.[4]

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[2] http://www.cso.ie/en/qnhs/releasesandpublications/qnhspostcensusofpopulation2011/
[3] http://www.cso.ie/en/qnhs/releasesandpublications/qnhspostcensusofpopulation2011/
[4] The full report of this research project (McGinnity et al., 2014) also includes analysis of labour market participation and employment across the equality grounds.

This paper attempts to add to the existing literature on the labour market impact of the Great Recession by focussing on the equality impact of the unemployment crisis. Specifically, we examine how the exposure to unemployment risk varies across five of the equality groups that are covered by the Equality Acts[5] – age, gender, family status, marital status and nationality - before and after the recession. We were unable to examine the impact of the recession on the other four grounds that are covered by the Equality Acts - disability, membership of the Traveller community, religion and sexual orientation - as labour market statistics are not collected on a regular basis for these groups.[6]

Previous research has shown that the negative impact of the recession on Ireland's labour market has not been evenly spread across the population (Barrett and Kelly, 2012; Russell et al., 2014 and Kelly et al., 2014). This paper builds on this existing research by incorporating sector information into the analyses and examining its impact on unemployment risk and how this has changed pre and post recession. The paper also adds to a body of work that has established differences between these 'equality groups' in terms of employment, poverty and discrimination in Ireland (see McGinnity *et al.*, 2014). Furthermore, the paper adds to the international literature that has assessed the effect of the Great Recession from a gender equality perspective (Bettio et al., 2013; Rubery and Rafferty, 2013; Hogarth et al., 2009; Scarpetta and Sonnet, 2010).

A variety of theoretical perspectives are drawn upon to inform expectations about the distribution of labour market risks across the equality groups. Theories of the 'reserve army of labour' suggest that some groups of workers have a more tenuous link to the labour market, and will be drawn into employment in periods of high demand and will withdraw when demand falls. This literature has seen women as more contingent participants in the labour market, who are carers first and workers second (Holst, 2000). The recent nature of rises in female employment in Ireland, compared to other EU countries, could mean this process is more likely to emerge than in countries with a longer established tradition of high female employment. Migrants have also been viewed as a reserve army who will 'go home' as the economy falters and, thus, act as a 'shock absorber' (Borjas, 2001). Similarly, young people have been identified as playing this buffer role (Bettio and Verashchagina, 2013).

These predictions are echoed in the Insider/Outsider approaches which have also identified young people, women and migrants as being particularly vulnerable to unemployment as labour market entrants (or re-entrants), who must compete with insiders protected by trade unions and employment regulation. Of course not just being outside the labour market but the type of job held will be salient for unemployment risk. Theories of labour market segmentation (Doeringer and Piore, 1971; Edwards et al., 1975) would predict that to the extent that women, migrants, and young people are over-represented in flexible, insecure, lower skilled jobs in the secondary labour market, they are more vulnerable to labour market downturns than those in secure, long-term contracts in the primary segment.

By contrast the segregation perspective argues that the concentration of women/young people/migrants in sectors (or occupations) is key to understanding the impact of recession To the extent that women are typically overrepresented in the public sector, for example, they may be sheltered from job losses, if the public sector sheds fewer workers (Bettio and Verashchagina, 2013). The unemployment risk of all the equality groups thus will be strongly affected by the sectoral pattern of job loss and it is important we analyse groups' concentration in the vulnerable sectors.

The remainder of the paper is structured as follows. In Section 2, we describe the data and methodology that is used in the paper. Section 3 discusses sectoral changes in employment between 2007 and 2012, along with presenting the unemployment rates of the various equality groups examined in the paper pre and post recession. The results from our analyses are presented in Section 4, while Section 5 concludes with a summary of the research findings and a discussion of the policy implications from the work conducted.

2. DATA AND METHODOLOGY FOR MEASURING UNEMPLOYMENT RISK

The data used in the paper come from the Quarterly National Household Survey (QNHS) data file, which is compiled by the Central Statistics Office (CSO).[7] The main objective of the QNHS is to provide quarterly data on labour market indicators, such as employment and unemployment. The survey is continuous and targets all private households: 3,000 households are interviewed per week, with the total sample for each quarter being approximately 39,000. Households participate in the survey for five consecutive quarters. In each quarter, one-

[5] The Employment Equality Act, 1998 and the Equal Status Act, 2000.
[6] As of 2014, disability status data is available in the Quarterly National Household Survey (QNHS). We were unable to use the data in this paper as the data is available from Q1 2010 and, therefore, does not cover the pre-recession time period.
[7] The CSO is Ireland's national state statistical collection organisation.

fifth of the households surveyed are replaced and the QNHS sample involves an overlap of 80 per cent between consecutive quarters and 20 per cent between the same quarters in consecutive years. Participation in the QNHS is voluntary; however, the response rate is high (approximately 85 per cent in recent years).[8]

In this paper, QNHS data from Quarter 4 (Q4) 2007 and 2012 were used: Q4 2007 captures our pre-recessionary time point and Q4 2012 the end of the recession period.[9]. The analyses focus on all individuals aged between 15 and 64:[10] the sample consists of 46,337 individuals for 2007 and 33,637 for 2012.[11] However, the data was weighted to ensure that it was representative of the population in Ireland in Q4 2007 and 2012 respectively.

The QNHS includes two measures of a person's economic status: the International Labour Organisation (ILO) measure, which is the official measure that is used in the published QNHS report to identify the numbers in employment, unemployment and inactivity, and a self-defined Principal Economic Status (PES) measure. In this paper, the official ILO measure[12] was used to define unemployment.

As well as including information on a person's economic status, and data for five of the equality grounds – gender age, nationality, marital status and family status, the QNHS also contains educational attainment and geographic location information. These data were included as additional covariates in our estimated models. In relation to nationality, we refer to eight different groupings: i) Irish; ii) UK; iii) Rest of EU15, which refers to the 'older' Member States (prior to enlargement in 2004) excluding Ireland and the UK (hereafter referred to as 'EU15 exc. Ireland & the UK');[13] iv) New Member State (NMS), which refers to the ten Member States that joined the EU in 2004, plus Bulgaria and Romania who joined in 2007;[14] v) Africa, vi) Asia, vii) North America/Australia and Oceania, and viii) Rest of Europe/World. For the models in which we included sector information, this data is measured according to the European industrial activity classification (NACE Rev.2).[15] For the unemployed, this information relates to their previous sector of employment, while for the employed it is their current sector.[16]

In terms of methodology, we began by estimating a binary probit model to identify the characteristics associated with being unemployed. The dependent variable for this model was set equal to 1 if the respondent was unemployed and 0 if he/she was employed.[17] Our estimated specification included data on five of the equality groups with controls for educational attainment and geographic location. We then estimated a second unemployment specification in which we included a set of controls that captured sector of current or previous employment. The coefficient estimates produced through probit estimation cannot be readily interpreted as measuring the impact on the dependent variable of a one-unit increase (decrease) in an explanatory variable because of the non-linear nature of the estimation procedure. Thus, marginal effects were calculated after estimating the probit models, using the mean of the explanatory variable as the base, as marginal effects give a measure of the size of the relationship between the dependent and explanatory variable. The results from this analysis are presented in Table 1. All specifications were weighted, and they were also estimated using an estimation command that accounts for clustering of individuals within households in the QNHS.[18]After estimating our initial binary probit models (without and with sector controls), we ran a series of probit models where we included 2012 year interaction terms to test for significant differences in the equality ground coefficients between the pre recessionary (Q4 2007) and the economic recovery (Q4 2012) time points. If we find positive (negative) and significant coefficients on these interaction terms, we interpret this as evidence of an increase (decrease) in the specific equality groups category's unemployment risk relative to the group's reference category in 2012. These results are presented in Table 2.

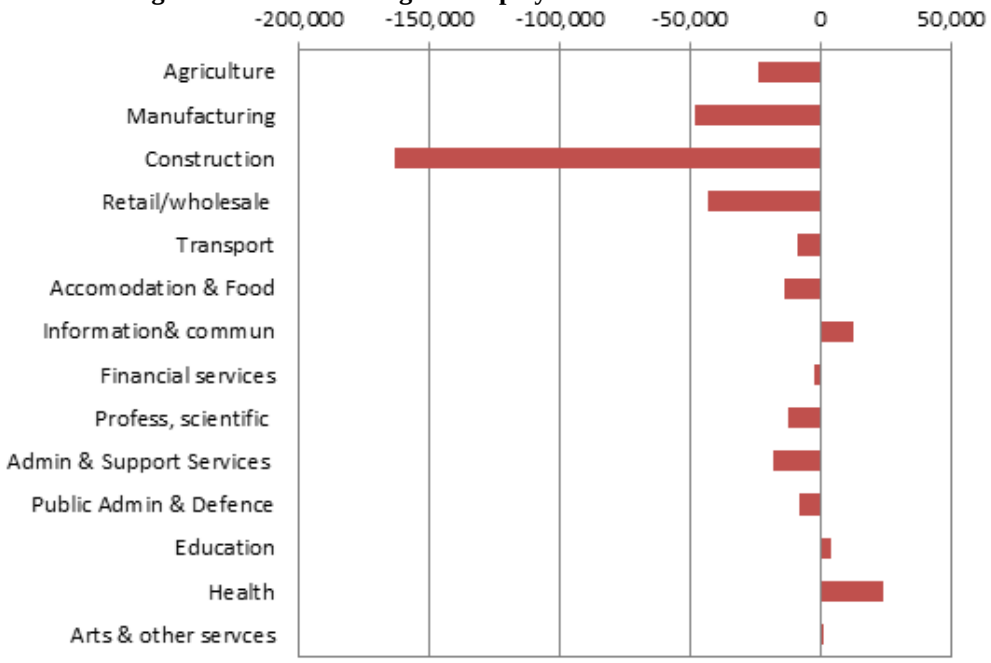
[8] Information provided by the CSO.
[9] Ireland had begun to record modest economic growth during 2012 (see Duffy et al., 2014).
[10] As well as imposing this age restriction, self-employed individuals and those with no sector information were excluded from the analysis.
[11] This reflects the fall in the sample size of the QNHS. In Q4 2007, the total sample size was 78,528, while in Q4 2012 the total sample size was 57,879.
[12] The ILO regards an individual as being in employment if he/she worked in the week before the survey for one hour or more for payment or profit, and includes all persons who had a job but were not at work in the week before because of illness, holidays, etc. An individual is defined as unemployed if, in the week before the survey, he or she was without work but was available for work and had taken specific steps in the preceding four weeks to find work (i.e. was looking for a job).
[13] This category consists of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Italy, Luxembourg, Netherlands, Portugal, Spain and Sweden.
[14] New Member States: Bulgaria, Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Romania, Slovakia, Slovenia.
[15] See http://www.cso.ie/en/surveysandmethodology/classifications/classificationofindustrialactivity/ for further details on measurement of sector of employment.
[16] In addition to the data exclusions listed in footnote 11, individuals that never worked were excluded from the sector specifications.
[17] Following convention, the unemployment model was estimated only for those participating in the labour market.
[18] To correct for clustering, the models were estimated using the STATA command vce (cluster *varname*).

3. JOB LOSSES BY SECTOR AND UNEMPLOYMENT RATES

As indicated in Section 1, the recession in Ireland had a strong sectoral dimension, as found in other European countries and the U.S. The property bubble led to a disproportionate share of (male) employment becoming concentrated in the construction sector, and its subsequent collapse led to a sharp drop in employment in that sector. More than 162,000 construction jobs were lost between 2007 and 2012 (see Figure 1), this constituted just over half of all job losses in the period (303,000). Note 2007 was a peak in construction employment, which experienced rapid growth in the latter years of the boom.[19] Findings from the U.S show that the national unemployment rate would have remained stable, and similar to other stable economies (such as Germany) had employment in the construction sector remained secure in the boom and bust phases (Hoffman and Lemieux, 2014).

Manufacturing and agriculture were also hard hit by the recession. Sectors driven by domestic demand, such as wholesale and retail, and accommodation and food, were affected by the fall in household income and consumer spending. Organisations providing administrative and support services also experienced a strong contraction (22 per cent). On the other hand, employment in the public sector was not as hard hit during this period: the health sector continued to grow over the period, while employment in education also showed a slight increase between 2007 and 2012. The information and communication sector also experienced growth in employment over this period.

Figure 1. Sectoral Change in Employment between 2007 and 2012



Source: Constructed using QNHS microdata, Q4 2007 and Q4 2012.
Note: Analysis based on all employed aged 15 and over.

These sectoral patterns of employment loss are important as the members of the equality groups are not randomly distributed across these sectors. This led to greater exposure for some groups and protection for others. Appendix Table A1 presents the sectoral distribution for three equality grounds – gender, age and nationality – pre-recession in 2007. In terms of gender, it is clear that in the period immediately prior to the recession, men were over-represented in the three sectors with a high subsequent level of job loss: agriculture, manufacturing and, in particular, construction. Women were over-represented in wholesale and retail and in accommodation and food, but also in health and education, which, as indicated previously, were two sectors that continued to grow for much of the recessionary period.

Young people also had a high level of exposure to the declining construction sector: in 2007, construction accounted for 17 per cent of employment among the under 25s, and for almost one-third of employment for young men aged under 25 years. Young people were also more highly concentrated in the wholesale and retail sector (26 per cent). In this case, it was predominantly young women, with 32 per cent of women aged under 25 years employed in this sector. Relative to young people, older workers aged 55 to 64 years were less exposed to the job losses in the construction sector and somewhat over-represented in the health sector.

[19] For example construction employment grew by 43% between 2003 and 2007, compared to an overall growth in employment of 18% in the period (see Russell et al., 2014, Table 2.3).

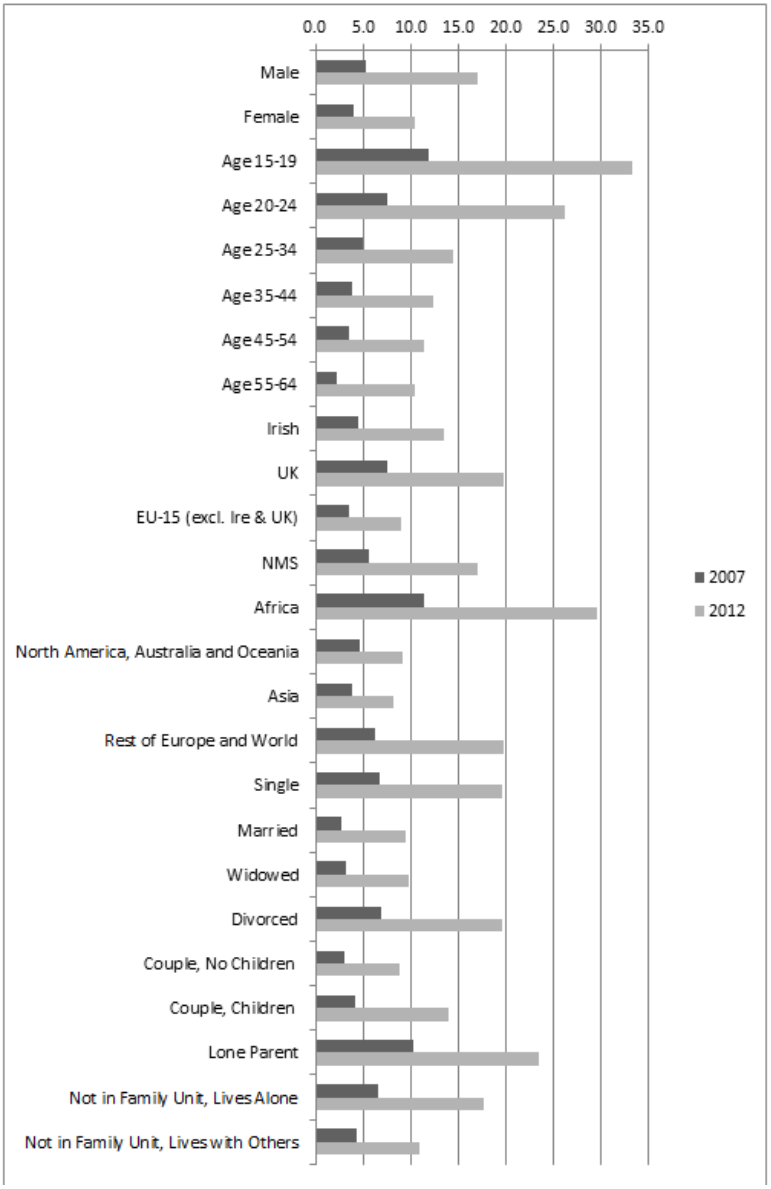
Compared with natives, non-Irish nationals faced a slightly greater threat from job losses in the construction, manufacturing, and wholesale and retail sectors, but they were particularly exposed to job losses in the accommodation and food sector, which accounted for 14 per cent of their employment compared with 5 per cent of natives. Among non-Irish nationals, New Member State nationals had high rates of employment in construction (Appendix Table A1).

Figure 2 illustrates the unemployment rates for the various equality groups' pre and post recession. While none of the groups escaped the impact of the downturn, it can be seen clearly from this chart that some experienced significant increases in unemployment between 2007 and 2012.

Males in particular were badly affected by the downturn. Based on the sectoral employment information presented in Appendix Table A1, this increase in the male unemployment rate (from 5.3 per cent in 2007 to 17.1 per cent in 2012) is likely, to some extent, to be driven by the collapse in the construction sector.

Young people aged 15-19 and 20-24; UK, NMS and African nationals; single and divorced individuals; and couples with children, lone parents and individuals living alone were the other main equality groups that experienced the highest levels of unemployment over the crisis period. As with males, some of these groups were also highly exposed to the downfall in the construction sector.

Figure 2. Unemployment Rates of Equality Groups: 2007 and 2012



Source: Constructed with data from the QNHS, Q4 2007 and Q4 2012
Note: Analysis based on labour force participants aged 15-64 (self-employed included).

In relation to the youth unemployment rates, while both categories (aged 15-19 and 20-24) rates are quite high (33 and 26 per cent respectively), it is important to note that young people often choose to remain in education rather than enter employment when the economy is in recession. Given this, an alternative unemployment measure that is often used to assess the impact of a recession on young people is the unemployment ratio: this measure expresses unemployment as a ratio of the total youth population cohort as opposed to those in the labour force. In Ireland, the unemployment ratio of young people aged 15-19 increased from 3.2 per cent in 2007 to 5.4 per cent in 2012, while for those aged 20-24 their ratio increased from 5.8 per cent to 16.3 per cent over the same time period. Thus, those aged 20-24 seem to have been more severely affected by the recession.[20] As noted by the OECD (2009), young people are more vulnerable to unemployment during an economic downturn due to their concentration in temporary jobs and cyclically sensitive industries.

4. ECONOMETRIC RESULTS

Table 1 presents the results from our probit models of being unemployed relative to employed in both 2007 and 2012. Model 1 excludes sector, while Model 2 adds current/previous sector of employment. In 2007, men were somewhat more likely to be unemployed compared to women. In the aftermath of the downturn (2012), the negative effect of being male on becoming unemployed became stronger - increasing from 2 per cent to 8 per cent in the base model. This is consistent with Russell et al. (2014), who find a greater increase in unemployment among men than women. They also find larger falls in employment for men than women, a process of 'levelling down', where the gaps in male and female employment narrow considerably during recession (ibid.). The gender difference in becoming unemployed becomes smaller when we control for sector of previous employment, and decreases to 1 per cent in 2007 and just over 3 per cent in 2012. This suggests that gender segregation in the labour market is playing an important role in gender differences in unemployment risk.

Table 1 Probit Model of Unemployment: 2007 and 2012 (Marginal Effects)

	Model 1 (Base)		**Model 2 (plus Sector)**	
	2007	**2012**	**2007**	**2012**
Gender (Ref Male):				
Male	0.020***	0.082***	0.011***	0.034***
	(0.002)	(0.011)	(0.002)	(0.013)
Age (Ref Age 35-44):				
Age 15-19	0.030***	0.077***	-0.018***	-0.079***
	(0.004)	(0.018)	(0.004)	(0.009)
Age 20-24	0.020***	0.073***	0.002	-0.003
	(0.003)	(0.015)	(0.003)	(0.011)
Age 25-34	0.007***	0.007	0.006**	-0.000
	(0.003)	(0.005)	(0.002)	(0.006)
Age 45-54	-0.003*	-0.006	-0.003*	0.000
	(0.002)	(0.008)	(0.002)	(0.006)
Age 55-64	-0.017***	-0.000	-0.010***	0.012***
	(0.003)	(0.004)	(0.003)	(0.002)
Marital status (Ref Married):				
Single	0.023***	0.080***	0.016***	0.055***
	(0.004)	(0.012)	(0.004)	(0.007)
Widow	-0.009***	-0.027	-0.011***	-0.018
	(0.003)	(0.023)	(0.001)	(0.016)
Divorced	0.031***	0.102***	0.025***	0.089***
	(0.006)	(0.025)	(0.003)	(0.021)
Family Status (Ref Couple, No Children)				
Couple, with Children	0.010***	0.047***	0.006**	0.031***
	(0.003)	(0.006)	(0.003)	(0.003)
Lone Parent	0.050***	0.090***	0.031***	0.062***
	(0.005)	(0.010)	(0.003)	(0.011)
Not in Family Unit, Lives Alone	0.034***	0.051***	0.019***	0.036***
	(0.005)	(0.008)	(0.002)	(0.009)
Not in Family Unit, Lives with Others	-0.008**	-0.036***	-0.008***	-0.028***
	(0.003)	(0.010)	(0.003)	(0.005)

[20] In relation to young people not in employment, education or training (i.e., NEETS), this figure increased from 4.5 per cent to 5.1 per cent for those aged 15-19 between 2007 and 2012, while for those aged 20-24 the figure rose from 12.3 per cent to 22.8 per cent.

Table 1 Continued

	Model 1 (Base)		Model 2 (plus Sector)	
	2007	2012	2007	2012
Nationality (Ref Irish):				
UK	0.048***	0.098***	0.041***	0.073***
	(0.015)	(0.003)	(0.013)	(0.005)
EU-13	-0.000	0.007	-0.007	0.024
	(0.013)	(0.015)	(0.009)	(0.019)
New Member States (NMS)	0.002	0.028***	-0.006**	0.019***
	(0.003)	(0.006)	(0.003)	(0.005)
Africa	0.084***	0.224***	0.027***	0.172***
	(0.013)	(0.011)	(0.009)	(0.011)
Asia	0.005	0.010	-0.003	0.017
	(0.023)	(0.013)	(0.014)	(0.016)
North America, Australia and Oceania	0.057	-0.007	0.060	-0.007
	(0.050)	(0.054)	(0.047)	(0.047)
Rest of Europe/World	0.035**	0.110	-0.002	0.018
	(0.015)	(0.078)	(0.012)	(0.056)
Educational Attainment (Ref Primary or Less)				
Lower Secondary	-0.010***	-0.006	-0.005*	0.011
	(0.002)	(0.009)	(0.003)	(0.012)
Upper Secondary	-0.031***	-0.087***	-0.017***	-0.038***
	(0.002)	(0.008)	(0.002)	(0.008)
Post Secondary	-0.030***	-0.037***	-0.017***	-0.009
	(0.001)	(0.008)	(0.001)	(0.007)
Ordinary Degree	-0.036***	-0.102***	-0.021***	-0.041***
	(0.001)	(0.004)	(0.001)	(0.004)
Higher Degree	-0.044***	-0.140***	-0.026***	-0.069***
	(0.005)	(0.011)	(0.003)	(0.007)
Post-Graduate Degree	-0.037***	-0.126***	-0.024***	-0.075***
	(0.001)	(0.010)	(0.002)	(0.010)
Location (Ref Dublin):				
Border	0.014***	0.053***	0.012***	0.036***
	(0.004)	(0.005)	(0.003)	(0.010)
Midlands	0.005	0.055***	0.007***	0.049***
	(0.004)	(0.006)	(0.002)	(0.005)
West	0.002	0.046***	0.003	0.030***
	(0.003)	(0.011)	(0.003)	(0.006)
Mid-East	-0.006***	0.021***	-0.003	0.009
	(0.002)	(0.005)	(0.002)	(0.007)
Mid-West	0.009***	0.051***	0.004***	0.032***
	(0.003)	(0.004)	(0.001)	(0.003)
South-East	0.006	0.076***	0.004	0.049***
	(0.008)	(0.012)	(0.007)	(0.010)
South-West	0.005***	0.009**	0.004	-0.001
	(0.001)	(0.004)	(0.002)	(0.007)
Sector (Ref Industry):				
Agriculture, forestry and Fishing			-0.008**	-0.009
			(0.004)	(0.022)
Construction			0.017***	0.282***
			(0.002)	(0.017)
Wholesale and Retail			-0.004	0.016***
			(0.003)	(0.005)
Transportation and Storage			-0.012***	-0.015***
			(0.001)	(0.006)
Accommodation and Food Storage			0.013***	0.024***
			(0.002)	(0.008)
Information and Communication			-0.012**	-0.027***
			(0.005)	(0.005)
Financial, Insurance and Real Estate			-0.020***	-0.036***
			(0.001)	(0.002)
Professional, Scientific and Technical			-0.007**	0.030*
			(0.003)	(0.016)

Table 1 Continued

	Model 1 (Base)		Model 2 (plus Sector)	
	2007	**2012**	**2007**	**2012**
Administrative and Support Services			0.022***	0.027*
			(0.002)	(0.015)
Public Administration and defence			-0.025***	-0.076***
			(0.004)	(0.009)
Education			-0.012***	-0.038**
			(0.004)	(0.018)
Health and Social Work			-0.017***	-0.044***
			(0.003)	(0.005)
Creative, Arts and Entertainment			0.009	0.023
			(0.006)	(0.014)
Other Services			-0.005	0.015
			(0.006)	(0.014)
Observations	30,740	21,864	30,271	21,071
Pseudo R-squared	0.0679	0.108	0.0798	0.157

Note: Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

In relation to the age effects of the recession, in the model without sector those aged under 25 were more likely to be unemployed compared to those aged 35-44, both in 2007 and 2012. This result appears to have strengthened over the recession. Individuals aged 55-64 were less likely to be unemployed relative to those aged 35-44 prior to the economic crisis, but after the downturn there is no difference in the unemployment risk of these two age categories, showing that their relative advantage has disappeared. The fact that young people were severely affected in the Irish labour market echoes the findings of Kelly *et al.*, (2014) and Kelly and McGuinness (2014). Yet the sector models indicate that this relates strongly to the fact that young people were working in exposed sectors (e.g. construction and retail, see Appendix Table A1). In the models which account for sector, those in the youngest age group, 15-19, were *less* likely to be unemployed than prime-aged (35-44) adults, both before (2007) and particularly after the recession (2012). In fact, the sector models indicate that it is the older workers (55-64) who are at higher risk of unemployment in 2012 (see Table 1).

Regarding marital status, single people are more likely to be unemployed compared to married people, pre and post the downturn, but the positive effect of being single on becoming unemployed has grown since the recession, increasing from 2.2 per cent in 2007 to 8 per cent in 2012. With respect to family status, the positive effect of being a couple with children on becoming unemployed relative to couples with no children has increased since the economic downturn, from less than one per cent to 4.7 per cent. On the other hand, individuals not in a family unit that reside with others were less likely to be unemployed compared to couples with no children prior to the downturn, and this negative effect has strengthened since the recession. The pattern of effects for marital and family status, and how they change over time, is less affected by the inclusion of the sector controls than the gender and age effects (see Table 1).

Finally, with respect to nationality, the unemployment risk of NMS was no different to Irish nationals prior to the recession. However, this nationality group's risk of becoming unemployed has increased significantly since the downturn. Similarly, the effect of being an African on becoming unemployed has grown considerably since the downturn – from 8.2 per cent in 2007 to 22.5 per cent in 2012. Even when accounting for sector of employment, both these nationality groups experienced an increase in unemployment risk relative to Irish nationals during the recession period.

In relation to the other covariates included in the model, the results for education highlight the importance of having higher-levels of education, particularly third-level and above, on reducing the risk of becoming unemployed. In particular, the importance of education in moderating unemployment risks increased over the recession: this is true whether we account for sector or not. Educational qualifications protect against unemployment in the Irish labour market: this is even more the case in recession. This was also found by Kelly *et al.*, (2014).

There are also regional variations in unemployment risks. With the exception of the South-West region, those residing outside of Dublin have become more likely to be unemployed since the recession. Compared to manufacturing, we find a higher risk of unemployment in construction and accommodation and food storage in 2007, and for these sectors and also wholesale and retail a much higher risk of being unemployed in 2012. This is even after we account for the characteristics of those working in these sectors, and is particularly true of construction. For information and communication and the financial sectors, the unemployment risk is lower than manufacturing in 2007, and much lower in 2012.

Table 2 below presents results of the interaction models, which estimate whether the change in unemployment risk between 2007 and 2012 for the equality groups was statistically significant. 'Yes' indicates that the change over time in unemployment risk presented in Table 1 was statistically significant; 'no' that it failed to reach significance.

Table 2 Probit Model of Unemployment: Significant Changed Between 2007 and 2012

	Base Specification	**Sector Included**
Gender (Ref Male):		
Male	Yes	No
Age (Ref Age 35-44):		
Age 15-19	No	Yes
Age 20-24	Yes	No
Age 25-34	Yes	Yes
Age 45-54	No	No
Age 55-64	Yes	Yes
Marital status (Ref Married):		
Single	Yes	No
Widow	No	No
Divorced	No	No
Family Status (Ref Couple, No Children)		
Couple, with Children	Yes	Yes
Lone Parent	No	No
Not in Family Unit, Lives Alone	No	No
Not in Family Unit, Lives with Others	Yes	No
Nationality (Ref Irish):		
UK	No	No
EU-13	No	Yes
New Member States (NMS)	Yes	Yes
Africa	Yes	Yes
Asia	No	No
North America, Australia and Oceania	Yes	Yes
Rest of Europe/World	No	No

Note: See Table 1 for marginal effect results. Interaction model include controls for education, region and sector (results available from the authors on request).

For the base model without sector, Table 2 shows that the increased risk of unemployment for men between 2007 and 2012 was statistically significant – men were harder hit in the Irish labour market by the Great Recession. However, once sector is controlled for, this is no longer the case (Table 2). This implies that the increased risk of unemployment is fully accounted for by the fact that men were more likely to work in sectors more exposed to the downturn, particularly construction.

Similarly the model without sector shows an increased risk of unemployment for the 20-24 age group compared to the 35-44 age group, and the change in this coefficient is statistically significant over time; but once we control for sector the 20-24 year age group are no more at risk of unemployment than those aged 34-55, and this result did not change between 2007 and 2012. The relative advantage, in terms of lower unemployment risk, of the 55-64 year old group in 2007 is significantly reduced by 2012 in the base model, and when we control for sector we find a significantly higher risk of unemployment for this age group compared to prime age adults for the older working age group (55-64) in 2012.

For marital/family status and nationality, the main results are similar for both the base specification model and the model including sector. Adults living in couples with children are more likely to be unemployed relative to those in couples without children, and this risk has increased significantly over the time period (2007-2012). Compared to Irish nationals, we find an increased risk of unemployment for East European (New Member State) nationals, and also, in particular, for African nationals. Among non-Irish groups, these two groups were hardest hit by the recession in terms of unemployment risk.

5. CONCLUSIONS AND POLICY IMPLICATIONS

Using data from the 2007 and 2012 QNHS modules, this paper examined the impact of the recent economic recession in Ireland on the labour market outcomes of equality groups. We focussed specifically on their unemployment risks controlling for personal characteristics and region of residence, and in a second model we controlled for the sector where they worked. Overall, unemployment levels increased for all groups identified between 2007 and 2012.

Males are more likely to be unemployed compared with females both pre and post the recession; however, the gender gap in unemployment has widened between 2007 and 2012, with a larger increase in male unemployment levels. Results from a model which controls for sector suggest that the gender segregation of the Irish labour market protected female employment, due to the concentration of males in the construction and manufacturing industries that were more adversely affected by job losses during the crisis (see also Russell *et al.*, 2014).

Those aged 15-24 were more likely to be unemployed, and the size of the labour market disadvantage for younger age groups increased between 2007 and 2012 compared with the 35-44 reference age group. However, this finding is fully accounted for by sector of employment. Without sector, we find that the 45-64 age groups experienced significantly lower levels of unemployment compared with the 35-44 age group; the gap in unemployment rates between the 35-44, and the 55-64 age groups increased significantly over time. However, once we account for sector, we find a higher risk of unemployment for the 55-64 age group. These findings need to be interpreted in the light of concurent trends in labour market participation. Further work (see McGinnity *et al.*, 2014) showed that the youngest age groups displayed the sharpest fall in participation over the crisis period. For those aged 15-19, this has translated into increased participation in education and training, but for those aged 20-24 the Not in Employment, Education or Training (NEET) rate almost doubled from 12 to 23 per cent between 2007 and 2012.

Concerning unemployment in 2012, the majority of family/marital status categories were more likely to be unemployed compared with the married childless group. The exceptions to this were those cohabiting who had no children and those married with children. Lone parents emerge as a disadvantaged group in the labour market, but in the case of unemployment this disadvantage has not widened during the crisis.

In terms of unemployment by national groups, NMS and African nationals were more likely to be unemployed compared with the Irish group in 2007 and the size of the disavantage increased over time. There were no significant differences in unemployment rates between the Irish, Asian, EU15 (excluding Ireland and the UK), and 'Rest of Europe/World' groups.

Previous analysis finds no strong evidence of women acting as a labour reserve or 'shock absorber' in the recent recession, indeed their employment levels and labour market participation levels fell less than males meaning that the gender gap in these rates was at a historical low in 2012 (Russell *et al.*, 2014). Therefore, despite the relatively recent development of high female participation in Ireland, the evidence suggests that women have maintained their attachment to the labour market in the crisis. There is greater evidence that young people and migrants have played a buffering role in recession with higher falls in labour market participation and higher levels of emigration (McGinnity *et al.*, 2014b).

The segregation thesis provides a useful framework for analysing differences in the equality impact of the labour market crisis, as the findings highlight the important influence of sector of employment on the unemployment risk of certain groups. The influence of sector on unemployment mirrors findings from the US, where the employment performance of groups and regions was systematically linked to sectoral shocks, particularly in the construction sector (Hoffman and Lemieux, 2014) The concentration of young people into areas of the economy that are more exposed to fluctuations in demand (particularly retail and construction) has played an important role in their vulnerability to unemployment. Similarly, the segregation of men and women into different sectors of employment has sheltered some (e.g. women in health sectors and public sector) and exposed others (e.g. men in the construction sector). Understanding the processes that lead to occupational and sectoral segregation is therefore of continued importance, as is proactive planning around sectors of the labour market in which government supported training and employment subsidies are provided.

The findings from the model which includes sector show that young people are more affected by unemployment due to their concentration in vulnerable sectors like construction and wholesale and retail where many jobs were lost. Even if we can explain it, the exceptionally high unemployment rates among young people highlight the need for policy intervention. As well as the current negative impact on the income and quality of life of young people, one concern is with scarring effects, that is, how early difficulties with the transition to work can have knock-on effects for individuals' later career trajectories and well-being (Bell and Blanchflower, 2011). In particular unemployment scars may resonate for those employed in the middle and lower skilled sectors such as construction, as research suggests that workers in these sectors lost their jobs in periods when the economy-wide demand for skills typically employed in these sector has decreased **(**Acemoglu and Autor 2011 :Jaimovich and Siu 2012) Long term scarring will arise if these skills-sets are hard to transfer to growing sectors. The high level of youth unemployment highlights the importance of implementing the EU Youth Guarantee, which calls on countries to offer young people an education, training or work experience intervention within four months of leaving education or entering unemployment (OECD, 2014). Where training is offered as an option under the Guarantee, it is important that it relates to longer run skill demands in the labour market (Kelly *et al.*, 2014).

Given the findings on the increasing importance of education in recession, educational interventions to prevent early school leaving are also important, as it is those who leave school early who are most vulnerable to unemployment. While rates of completion of upper secondary education have increased over the past decade (Department of Education and Skills, 2012), there is a need for continued efforts to retain those who are disengaged from schooling. Byrne and Smyth (2010) highlight not only the need for initiatives to support retention in school, but also that acquiring qualifications is important for these young people.

Certain groups of migrant workers have been further disadvantaged in the economic recession experiencing a greater rise in unemployment compared to Irish nationals. Annual integration monitors have highlighted the lack of a clearly defined strategy for English language provision for adults as being a significant problem for labour market integration of migrants (McGinnity *et al.*, 2012). Cuts to educational supports for non-native English speakers at school level are also of concern as this is likely to disadvantage younger migrants.

The crisis has had a significant negative impact on the equality infrastructure in Ireland with steep cuts or closures in a range of agencies addressing inequality and discrimination (see Barry & Conroy, 2013) and in both State and non-governmental agencies promoting migrant integration (McGinnity *et al.*, 2014). Yet the results suggests that vulnerability to unemployment and position in the labour market remains strongly structured by characteristics such as age, gender, family status and nationality. This suggests the need for continued monitoring of outcomes on equality grounds and the development of policies to address the underlying causes.

References

Acemoglu, D and Autorm, D (2011). 'Skills, Tasks and Technologies: Implications for Employment and Earnings' in O. Ashenfelter and D.E. Card (eds.), *Handbook of Labor Economics.* Volume 4, Amsterdam: Elsevier

Arulampalam, W. (2001). 'Is unemployment really scarring? Effects of unemployment on wages'. Economic Journal, Vol. 111, pp. 585–606

Barrett, A. and McGuinness, S. (2012). 'The Irish Labour Market and the Great Recession' CESifo DICE Report 2/2012, pp.27-33.

Barrett, A. and Kelly, E. (2012). 'The impact of Ireland's recession on the labour market outcomes of its immigrants'. European Journal of Population, Vol. 28, No. 1, pp. 91– 111.

Barry, U. and Conroy, P. (2013). 'Ireland in crisis: women, austerity and inequality' in: M. Karamessini and J. Rubery (eds.), *Women and Austerity: The Economic Crisis and the Future for Gender Equality*. Abingdon, Oxfordshire: Routledge.

Bell, D.N.F. and Blanchflower, D.G. (2011). 'Young people and the Great Recession'. *Oxford Review of Economic Policy*, Vol. 27, No. 2, pp. 241–267.

Bettio, F. and Verashchagina, A. (2013). 'Women and men in the great European recession' in: M. Karamessini and J. Rubery (eds.), *Women and Austerity: The Economic Crisis and the Future for Gender Equality*. Abingdon, Oxfordshire: Routledge.

Bettio, F., Marcella, C., D'Ippoliti, C., Lyberaki, A., Samek Lodovici, M. and Verashchagina A. (2013). *The Impact of the Economic Crisis on the Situation of Women and Men and on Gender Equality Policies.* Luxembourg: Publications Office of the European Union.

Borjas, G.J. (2001). 'Does immigration grease the wheels of the labour market?' Brookings Papers on Economic Activity, Vol. 1, pp. 69–

Byrne, D. and Smyth, E. (2010). No Way Back? The Dynamics of Early School Leaving, Dublin: Economic and Social Research Institute

Callan, T., Keane, C., Savage, M., and Walsh, J.R. (2012). 'Distributional impact of tax, welfare and public sector pay policies: 2009-2012'. Quarterly Economic Commentary, Winter 2011/Spring 2012, pp.45–56.

Department of Education and Skills (2012). *Retention Rates of Pupils in Second-level Schools: 2005 and 2006 Entry Cohorts*. Dublin: Department of Education and Skills.

Doeringer, P. B., and Piore, M.J (1971). *lnternal Labor Markets and Manpower Analysis*, Lexington, Mass: Heath.

Duffy, D., FitzGerald, J., Timoney, K., Byrne, D. (2014). *Quarterly Economic Commentary, Winter* 2014. Dublin: Economic and Social Research Institute.

Edwards, R.C., Reich, M. and Gordon, D.M. (eds.) (1975). Labor Market Segmentation. Lexington, Mass: Heath.

Gerlach-Kristen, P. (2013). 'Younger and older households in the crisis', QEC Research Notes 2013/1/4. Dublin: Economic and Social Research Institute.

Hoffman, F. and Lemieux, T. (2014). 'Unemployment in the Great Recession: A Comparison of Germany, Canada and the United States'. *NBER Working Paper 20694*, Cambridge: NPER.

Hogarth, T., Owen, D., Gambin, L., Hasluck, C., Lyonette, and Casey, B. (2009). 'The equality impacts of the current recession', *Equality and Human Rights Commission Research Report* 47. Manchester: Equality and Human Rights Commission.

Holst, E. (2000): Die Stille Reserve am Arbeitsmarkt. Berlin: Ed. Sigma

Jaimovich, N. and Siu, H.E. (2012) 'The Trend is the Cycle- Job Polarization and Jobless Recoveries'. *NBER Working Paper 18334*. Cambridge: NBER.

Keane, C. (2013). *To Study or to Work ? The Impact of a Construction Boom on Male Educational Attainment.*

Keane, C., Callan, T. and Walsh, J.R. (2014). *Gender Impact of Tax and Benefit Changes: A Microsimulation Analysis*. Dublin: Equality Authority and Economic and Social Research Institute.

Kelly, E., McGuinness, S., O'Connell, P.J., Haugh, D. and González Pandiella, A. (2014). "Transitions In and Out of Unemployment among Young People in the Irish Recession", Comparative Economic Studies (published online 18 September 2014).

Kelly, E. and McGuinness, S. (2014). "Impact of the Great Recession on Unemployed and NEET Individuals' Labour Market Transitions in Ireland", Economic Systems (published online 4 December 2014).

Kingston, G., O'Connell, P. and Kelly, E. (2013). Ethnicity and Nationality in the Irish Labour Market: Evidence from the QNHS Equality Module. Dublin: Economic and Social Research Institute & Equality Authority.

Lunn, P. and Fahey, T. (2011). Households and Family Structures in Ireland: A Detailed Statistical Analysis of Census 2006. Dublin: Family Support Agency/ESR

McGinnity, F., Quinn, E., Kingston, G. and O'Connell, P.J. (2012). *Annual Monitoring Report on Integration 2011*. Dublin. Economic and Social Research Institute and Integration Centre.

McGinnity, F., Quinn, E., Kingston, G. and O'Connell, P.J. (2014). *Annual Monitoring Report on Integration 2013*. Dublin. Economic and Social Research Institute and Integration Centre.

McGinnity, F. Russell, H., Watson, D., Kingston, G. & Kelly, E. (2014) *Winners and Losers? The Equality Impact of the Great Recession in Ireland*, Dublin: The Equality Authority and the ESRI.

NESC (2013). The Social Dimensions of the Crisis: The Evidence and its Implications. NESC Report No. 134. Dublin: National Economic and Social Council.

Nolan, B., Callan, T., & Maıtre, B. (2013). "Ireland" in S. Jenkins, A. Brandolini, J. Micklewright, & B. Nolan (Eds.), *The great recession and the distribution of household income*. Oxford: Oxford University Press.

OECD (2014) *OECD Youth Action Plan: Options for an Irish Youth Guarantee*. Paris: OECD.

OECD. (2009).In: Helping Youth to Get a Firm Foothold in the Labour Market, OECD Labour and Employment Ministerial Meeting (28–29 September 2009). OECD Publishing, Paris.

Rubery, J. and Rafferty, A. (2013). 'Women and recession revisited'. *Work, Employment and Society*, Vol. 27, No. 3, pp. 414–432.

Russell, H., McGinnity, F. and Kingston, G. (2014). *Gender and the Quality of Work: From Boom to Recession*, Dublin: Economic and Social Research Institute and the Equality Authority

Scarpetta, S., and Sonnet, A. (2010). *Rising Youth Unemployment during the Crisis: The Impact of the Economic Crisis on the Situation of Women and Men and on Gender Equality Policies*. OECD: Paris.

TASC (2012) TASC's proposal for a more equitable budget. TASC: Dublin.

Watson, D., Lunn, P., Quinn, E. and Russell, H. (2011). Multiple Disadvantage in Ireland: An Equality Analysis of Census 2011. Dublin: Equality Authority and Economic and Social Research Institute.

Whelan, C.T., Russell, H., & Maitre, B. (2015) Economic Stress and the Great Recession in Ireland: Polarization, Individualization or 'Middle Class Squeeze'? *Social Indicators Research*, http://link.springer.com/article/10.1007/s11205-015-0905-x

APPENDIX

Table A1: Pre-Recession Sectoral Distribution of Employment by Gender, Age and Nationality, 2007

	Gender		Age				Nationality		
	Men	**Women**	**15–24 years**	**25–34 years**	**35–54 years**	**55–64 years**	**Non-Irish**	**Irish**	**All**
Agriculture	7.1	1.2	1.8	2.1	5.6	11.0	1.8	5.1	4.5
Manufacturing	17.4	8.4	9.8	14.5	14.5	12.0	15.0	13.2	13.5
Construction	21.2	1.5	17.3	13.6	10.7	10.5	14.0	12.3	12.6
Wholesale & retail	13.0	17.2	25.9	14.4	12.0	11.6	16.9	14.5	14.9
Transport	6.7	1.9	2.0	3.6	5.5	7.0	3.8	4.7	4.6
Accommodation & food	4.5	8.4	11.5	7.0	4.4	3.8	14.2	4.7	6.2
Information & communication	4.1	2.3	2.5	4.3	3.4	1.5	4.2	3.2	3.3
Financial services	3.6	6.7	4.9	6.6	4.4	3.0	3.0	5.4	5.0
Profess, scientific & technical	5.4	5.3	4.2	6.7	5.2	4.0	3.6	5.7	5.3
Administrative & support	3.4	4.3	3.8	4.1	3.6	3.8	6.1	3.4	3.8
Public administration & defence	4.4	5.7	1.7	3.8	6.8	5.3	.5	5.8	4.9
Education	3.1	11.2	3.3	5.9	8.0	7.8	2.9	7.3	6.6
Health & social work	3.1	19.7	5.2	9.3	12.0	13.9	9.4	10.6	10.4
Arts & other services	2.8	6.4	6.0	4.1	3.9	4.7	4.6	4.3	4.4
All	100	100	100	100	100	100	100	100	100

Source: Constructed using QNHS microdata Q4 2007 and Q4 2012.
Note: Analysis based on all employed aged 15 to 64 years.