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Job Loss by Wage Level: Lessons from the Great Recession in Ireland [*]

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Abstract: This paper explores the pattern of job loss in the Great Recession with a particular focus on its incidence by wage level, using data for Ireland. Ireland experienced a particularly pronounced decline in employment with the onset of the recession by international and historical standards, which makes it a valuable case study. Using EU-SILC data, our analysis identifies which employees were most affected. The results show that the probability of staying in employment, from one year to the next, is positively related to monthly wages both during the boom and in the bust. The gradient with wages, however, is much more marked in the bust, and remains significantly so even after controlling for a range of individual characteristics including part-time status, demographics, education, labour market history, industries or occupations.

JEL codes: E24, J23, J24, J62, J63

Keywords: skills, occupations, wages, Great Recession, Ireland, job loss, EU-SILC

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1. Introduction

The risk of losing one's job is a central aspect of economic security for the individual worker and his or her family, and its perceived precariousness an important feature of the "quality" of a job. But who is actually at greatest risk of losing their job in a deep recession, compared with a more benign economic environment? The longer-term "hollowing-out" of occupational structures driven by the combination of technology and trade has become a major focus for research, and concern about the "squeezed middle" is a prominent theme for politicians and commentators through the Great Recession and its aftermath. In that context, it is important to know whether recession accentuates such hollowing out and has a major impact on the middle of the occupational and wage distribution, or predominantly affects those who would traditionally have been seen as most at risk. Ireland's distinctive experience of boom and bust makes it a valuable case-study of job loss and the available data allows us to incorporate both individual and job characteristics into the analysis, including occupation and wage level, so that the incidence of job loss across the wage distribution can be identified and explored.

Following years of rapid economic growth, Ireland experienced a severe economic downturn in 2008, the effects of which were magnified by a domestic banking crisis and the bursting of a domestic property bubble. Approximately 15% of all employment positions held in the first quarter of 2008 had disappeared by mid-2012, according to QHNS data. Although most of the decline in employment in Ireland happened along the extensive (headcounts) rather than intensive (hours) margin, job loss figures understate the full extent of the deterioration in the labour market,[1] which included significant pay cuts in the public sector. Reductions in employment income, together with falling asset prices and increased tax burden affected most households. Real average equivalised disposable income fell by 13 percent between 2008 and 2013 (Savage et al. 2015). While the country's progressive tax and transfer has been credited with mitigating the worst of the distributional impact of the crisis by shielding the bottom of the income distribution, real equivalised disposable household income at the bottom decile fell by 22 percent over that period (Savage et al. 2015). The study of Savage et al. (2015) further reveals that most of

[1] Hours worked remained relatively stable within industries or occupations. See e.g. O'Farrell 2013, Mühlau 2014.

the decline in average income in the bottom decile has been driven by households falling from the lower third of the distribution into the lowest decile. Changing labour market circumstances account for most of the deteriorating economic situation of poorer households during the crisis; see McGinnity et al. (2014), Mühlau (2014), Savage et al. (2015).

The aim of this study therefore is to get a better understanding of the dynamics of the labour market, and in particular, whether workers in specific parts of the wage distribution have been more affected than others. Existing evidence reveals a number of trends. In Ireland, as in other countries, younger workers, men, and workers with less education have experienced a higher incidence of job loss (see e.g. Autor, 2010; Elsby et al., 2015 for the US; McGinnity et al., 2014; Kelly and McGuinness, 2015; Savage et al., 2015 for Ireland).

It is often argued that this demographic of workers tends to be concentrated in in industries that are more sensitive to the business cycle. Labour market fluctuations by industry certainly played an important role in explaining the distribution of job loss in Ireland (e.g. McGinnity et al., 2014). The recession in Ireland coincided with the end of a property bubble. The construction sector, which employed about 20 percent of male workers in the first quarter of 2008, had lost 62 percent of its employment positions by the third quarter of 2012, according to QHNS data. Although the decline in jobs associated with specific industries may account for a large part of the gender differences in job loss, the trend was not systematic across industries.[2] In some industries – such as the professional, scientific and technical activities, or the financial, insurance and real estate activities – the rate of job loss has been higher for women than for men, on average. As well, in the wholesale and retail trade sector, which employed about 15 percent of all people at work in in the first quarter of 2008 divided almost equally between men and women, the timing of job loss varied significantly by gender.[3]

[2] From peak to trough, the rate of job loss in Ireland reached 9% for women compared to about 19 % for men (figures relate period from 2008Q1 to 2012Q3, QNHS seasonally adjusted series).
[3] Job loss was initially sharper for men, with the trough in the third quarter of 2009 at almost 16%, but the number of jobs started rising thereafter. In this sector, employment declined slower for women but reached a rate of job loss rate close to 19% at the trough, in the first quarter of 2014.

Another observation is that job loss has been particularly high in certain occupations. Assuming that differences in earnings between occupations reflect differences in labour market skills, then this shift can be interpreted as implying that certain skill groups have been more affected during the crisis. Several studies on US data have reported that workers in middle wage/ middle skill occupations have been disproportionately hit during the crisis, leading to a polarisation of jobs on the labour market; Autor (2010), Foote and Ryan (2015). Although accentuated during the crisis, this occupational polarization is reported to have started much earlier; Autor (2010). Similar trends in occupational polarisation have been described for a number of European countries before the crisis (Goos, Manning and Salomons, 2009) and are usually interpreted in the context of Skill Bias Technological Change arguments. In the case of European countries, however, evidence for polarisation appears somewhat sensitive to the ordering and/or grouping of occupations considered; e.g. Fernandez - Macias (2012).

The study of Mühlau (2014) for Ireland reveals that here was a slight increase in the number of people employed in top occupations (managers, professionals, associate professionals and technicians) during the Great Recession in Ireland. Similar trends are reported for the US, Autor (2010). Workers in "skilled trades" and "process, plant and machine operatives" occupations, however, experienced some of the highest rates of job loss in Ireland, see figure A1 in the appendix. These jobs would appear towards the middle or the bottom of the skills distribution, depending on the occupation ranking considered (see Mühlau, 2014). As discussed in Goldthorpe and McKnight (2004), even in boom years, employment conditions differ significantly across occupations. Workers in lower skill occupations typically experience less economic security (higher risk of dismissal), more income instability (e.g. monthly or hourly pay) and lower prospects for future wage growth.[4] The different contractual arrangements across occupations reflect in part the difficulty of "work monitoring" and the "human asset specificity" of employees in different jobs (Goldthorpe and McKnight, 2004).

[4] Aspect of the employment relation that varies between occupations also include the length of contract, length of notice period, fringe benefits like sick leave, pension contributions, length of pay period, fixed pay vs. hourly pay, pay by shift, predictability of working hours, etc. Remunerations conditions are likely to be affected by labour market regulations and union negotiations.

Provided specific parts of the wage distribution have been more affected than others during the crisis, we would like to know how far these trends can be explained by economy-wide shifts in the composition of industries or demand for specific skills/jobs (associated with occupations), and whether any variation can be attributed to individual specific circumstances. The individual characteristics considered include among others, labour market experience, education, family situation, the size of the firm, type of contract and wage quintile. Individual wages should therefore capture additional (unobserved) information about the person's skills/job quality, above the average effects associated with occupations, and other observable characteristics like education and labour market experience. Due to data availability, our analysis focuses on employees, which represented close to 83 percent of workers at the start of the crisis.

Our results suggest that the probability of staying in employment, from one year to the next, is positively related to monthly wages both during boom and early bust. The gradient with wages, however, is much more marked in the early part of the bust, and remains significantly so even after controlling for a range of individual characteristics including part-time status, demographics, education, labour market history, industries or occupations. Overall, the results are consistent with the argument that, at least in the early part of the crisis, employers tried to retain skilled (well-educated and experienced) workers, while taking advantage of the flexibility of part-time workers. One interpretation is that employment income reflects unobservable differences in skills and experience that are valued by employers, resulting in the positive association that is estimated here.

The paper is organised as follows: section 2 discusses the data used in the analysis, section 3 presents some descriptive statistics for the Great Recession in Ireland based on this data. Section 4 reports the findings of our empirical analysis and section 5 concludes.

2. Data and sample selection

Our analysis is based on data from the EU Survey on Income and Living Conditions (EU-SILC) for Ireland. The survey, conducted by the Central Statistics Office (CSO), was initially available for a small sample of households in 2003. It has been carried out annually on the full sample since 2004. The main advantage of using this data source (compared to labour

force survey data) is that it not only provides details on individuals' labour market history, but also includes information on their wages and on a wide range of individual and household characteristics – like education, children, health status, etc. – that may affect labour market circumstances.

To investigate the impact of the crisis on the distribution of job loss, we need to be able to identify which individuals have moved out of employment in the months prior to the interview. To do so, we consider the information provided by the 13 months labour market recall questions, available in each year of the survey. This information provides a useful time dimension to explore shifts in employment participation, over a year, for the entire sample (cross-sectional dimension of the survey), compared to only a quarter of interviewees that are re-contacted 12 months later for the follow up interview (longitudinal dimension of the survey).

Unfortunately, the reason why a person may have moved out of employment over the previous 13 months period is not documented. Presumably, during the boom, in the context of a buoyant economy, a large share of exits from employment may reflect quits. In contrast, at the start of the crisis, with a decline in demand and increase in economic uncertainty, a large share of exits from employment are likely to reflect dismissals. In fact, in the context of a slowdown, employees may opt to remain in their current employment position and therefore the number of employee-initiated separations may decline.

To identify the effect of the crisis on the labour market, we look at who are the employees who moved out of employment (over a 12 months period) during boom years, and compare this situation with what happened at the start of the crisis. Overall, the employment analysis is quite comparable across boom years (2004-2007), in spite of inevitable year-to-year variation in the sample. Data for 2004, however, does not include information on industries, and evidence suggests that employment in certain industries started slowing down in 2007, although the total number of jobs kept on increasing up to Q1 2008 (seasonally adjusted QNHS series). We selected 2006 as the reference boom year in our analysis. This year has the lowest share of people staying in employment at the bottom of the wage distribution, and therefore represents the worst case scenario for the 2004-2006 period.

QNHS data indicate that the largest decline in total employment occurred in 2009. From the peak in Q1 2008, the number of jobs declined by 3.5 percent in 2008, and by a further 7.5 percentage point in 2009, resulting in an 11 percent decline by the end of 2009. Statistics computed on cross-sectional SILC data suggest similar trends for 2009.

The proportion of people who had "never worked" started increasing in 2009, and among those still at work, the share of employees with a second job, stable up to 2008, declined in 2009. Also, the share of employees reporting wanting to work longer hours, but not being able to do so, was stable at 2.3 to 2.6 percent between 2006 and 2007, increased slightly to 3.7 percent in 2008 and more than doubled between 2008 and 2009, reaching 8.6 percent in 2009. The gradual decline in the share of current employees having changed job over the last year, and especially in order "to take up a better position" is another sign pointing to the slowdown of the labour market as the recession progresses, see Table 1. This could also indicate that, in times of uncertainty, employees are less willing to take risks and tend to stay in their current employment position, if they can. Overall, the share of people at work, in the working age population, was stable in 2006 and 2007 at about 65%, declined slightly to 62% in 2008 and dropped to 57% in 2009.

Table 1: Employee population (18-64), various characteristics, 2006-2009, SILC

	2006	2007	2008	2009
Works 30 hours a week or less (self-reported)	25.1	28.1	27.1	31.6
Wants but cannot find work for longer hours[1], %	2.3	2.6	3.7	8.6
Has a second employee position, %	1.4	2.1	2.1	1.0
Average of total usual weekly hours (all jobs)	34.6	34.5	34.5	33.3
Has changed job in the last 12 months[2], %	10.6	10.2	9.5	6.9
to 'take up or seek a better job' or 'to retire or live off private means'[3], %	6.1	6.0	5.3	3.2

Source: authors' computations from SILC data. Notes: [1] if respondent currently works for less than 30 hours a week and would like 'to work more hours, but cannot find a full-time job or work more hours in this job'. [2] includes promotions. [3] This question is asked to people who say they have changed jobs in the last 12 months. (check table

We therefore use data for 2006 as the reference period for the boom, and data for 2009 to investigate how the situation changed with the onset of the crisis.

Sample selection

The sample for analysis includes all respondents who stated that they were working as employees (full time or part time) 12 months prior to the month of the interview, and are aged 18-64 at the time of the interview. From this first selection are excluded respondents who, at the time of the interview, indicated that they had never worked. This excludes "vacations jobs undertaken by students, from which they return to studies or to other non-work situation and any other casual work undertaken from time to time". A few respondents are also omitted who stated working as an employee at the start of the period, but who report no employment income for the 12 months prior to the month of the interview. This group mostly consists of people who are employed as family workers and of people who report no employment income but some self-employment income over the period. The final sample for analysis included 4231 people who were employed 12 month prior to the interview in SILC 2006, and 3608 people who were employed 12 months prior to the interview in SILC 2009. [5]

Dependent variable

We are interested in the probability of being employed at the end of the year, for people who were employed at the start of the year. These employees are then defined as "employed" at the end of the period if they state working as an employee, in an apprenticeship or in a community employment scheme at the time of the interview, and either have worked for at least one hour (for payment or profit) in the last week, or are currently on (fully or partially) paid leave[6].

In other words, we compare the probability of an employee being in employment at the interview in 2006 and in 2009, conditional on that person being employed at the start of the recall period, that is, 13 months earlier. For the people who were interviewed in 2006, this implies estimating the probability of them being in employment in 2006, provided they

[5] Allowing for a broader definition of 'previously employed' that includes people who stated working as an employee 12 and /or 11 months prior to the month of the interview, had no impact on the results.

[6] Are therefore not considered to be currently employed, people who are on unpaid leave, including if they have missing information on whether they receive payment or not during their leave. The highest occurrence of unpaid leave is for unpaid 'own illness or injury' leave, followed by unpaid maternity leave, and unpaid holiday leave. The highest occurrence of paid leave is for paid holiday leaves, followed by paid 'own illness or injury' leave and paid maternity leave.

were also employed in 2005. These results are then compared the probability of being in employment in 2009, for the people who were employed in 2008 [7]

Overall, the end of period employment probability among employees in our sample declined substantially from 0.927 in 2006, (0.928 in 2004-06) to 0.875 in 2009.

Note that with less new jobs being created during the crisis, our current focus on flows out of employment will understate the total shift in the labour market between boom and bust. In addition, we only look at the characteristics of employees who are moving out of an employee position. Data from the Quarterly National Household Survey (QNHS) suggest that the rate of job loss has been much higher among the self-employed.

3. Some descriptive statistics

Individuals were asked to report their employment income for the period covering the 12 months prior to the month of the interview[8]. From that information, we can compute individuals' average monthly employment income for that period by dividing the total employment income (reported for the 12 months prior to the interview), by the number of months spent in employment over that period. [9] This average monthly wage is then used to as a proxy for the start of period monthly wage. Note that the current definition of earnings does not take into account the number of hours worked. Although we know whether a person worked part-time or full-time in each of the months prior to the interview, we do not have information on the number of hours worked each month. Therefore, while part-time employees are present in throughout a large part of the earnings distribution, they are over-represented towards the bottom. Our measure of wage therefore is a closer approximation of the total cost of the employee to the employer than individual skills – as measured by average hourly earnings – although it could be argued that part-time jobs also tend to be low skill jobs.

[7] As SILC 2009 interviews were conducted between Dec 2008 and Jan 2010, we are technically comparing employees' working status at the start of the period, between Nov 2007 and Dec 2008, with their employment situation at the end, between Dec 2008 and Jan 2010.

[8] This timing is not necessarily the same in all the countries that conduct EU-SILC surveys, but it is in Ireland.

[9] Our analysis is based on gross income figures. Using net income provides a similar story.

To keep the analysis tractable, we collapse the earnings distribution into 5 quintiles. Quintiles are computed on the whole sample of employees present at the start of the period, in 2006 and in 2009. The probability of being in employment at the end of the period, by wage quintiles, is presented in the second and third columns of Table 2. The top part of the table reports figures for boom years (2006 and 2004-06) and the bottom part reports statistics for 2009.

Two important trends emerge from this data. First, the probability of being employed at the end of the period is increasing with average monthly earnings, both in boom and in bust. Employees in top wage quintiles are at least 13 percentage points more likely to be in employment at the end of the period than employees in the lowest quintile. As mentioned earlier, data for 2006 shows the steepest wage gradient in boom years and the lowest end of period employment rate in the bottom quintile (Q1). Second, the share of employees in employment at the end of the period declined at all quintiles in 2009, compared to boom years, with the largest relative drop for middle wage earners. The probability of employment at the middle quintile declined by 8 percent, from 0.948 to 0.873 between 2006 and 2009; see third column of Table 2.

Both a shift in the composition of the sample between 2006 and 2009 and/or a shift in the way certain groups of employees fare in the labour market could account for the decline in employment probability that is observed between 2006 and 2009 in each quintile. For example, if part-time workers are more likely to move out of employment each year on average, an increase in part-time workers in 2009 could explain in part the decline in employment reported in 2009.

To get a better understanding of factors that may underlie shifts in the relationship between earnings quintiles and end of period employment rates, Table 2 presents statistics for sub-groups of employees who tend to be concentrated at the top or bottom of the wage distribution, or who are known to have been particularly hit by the crisis (e.g. construction workers). For each sub-groups, two columns of figures are reported. The shaded cells indicate the difference in end of period employment rates from to the sample average for 2006 (third column of table 2), in percent. The darker the shading, the larger the difference which can be either positive or negative. The columns in italics report the proportion of the

total quintile population in each sub-group. For example, figures for men in the top quintile in 2006 reveal first that 68 percent of employees in the top quintile (Q5) were male. Moreover, these employees' probability of being employed at the end of the period was similar to that of the population average – with a reported difference of zero percent from the population average.

Overall, figures for 2006 suggest that there was very little difference in average end of period employment rates between different sub-groups of employees. By contrast, statistics for 2009 highlight much larger disparities between end of period employment probabilities in different sub-groups. Some sub-groups relative situation hardly changed on average in 2009 (e.g. workers who started on a permanent contract), while other groups show large shifts (positive or negative) in their average probability of exiting employment between 2006 and 2009.

On average, gender differences in end of period employment rates remained relatively small between periods, in the SILC sample. In 2006, male employees had a 1.5 percent higher probability than the average (i.e. than women) of being in employment at the end of the period. This advantage mainly reflects their concentration top quintiles where the end of period employment probabilities are also higher. In 2009, male employees had about a 4 percent lower probability than the average to remain in employment in all quintiles except the top quintile. But, they do not appear to be as penalised on average, reflecting their on-going over-representation in top quintiles.

There was a general increase in the proportion employees with third level education in the sample, between 2006 and 2009, from about 21 to 26 percent for men, and from about 26 to 32 percent for women. While the share of people with third level education has remained stable in the top quintile at around 56 percent, it has increased at all other quintiles. There was also a notable increase of employees with third level education, from 6 to 11 percent, in the lowest quintile over that period. On average, employees with third level education are more likely than the population average and by construction than employees with lower levels of education, to be employed at the end of the period, in 2006 and in 2009. In 2006, this advantage was closely related to their concentration in top quintiles. The higher average probability of being employed at the end of the period increased substantially for

these groups, from 3.2 in 2006 to 8.2 percent in 2009. In addition, the few highly educated employees in the bottom quintile tended to drop out more than the average for that quintile in 2006 (possibly reflecting a low attachment to their employment position). But, they were more likely than other employees to be employed at the end of the period, in all quintiles, in 2009 with the highest gains in the second and third quintiles.

Figures in Table 2 suggests that older workers (aged 55-64) were 3 to 4.4 percent more likely than the average to be out of employment at the end of the period (in all quintiles except for the bottom one) in 2006. This could reflect a tendency for early retirement in 2006. There was more variation by quintiles for young workers (aged 18-30) in 2006, but the average difference with the sample was quite small at -1.6 percent. The situation of young workers worsened in 2009, while it improved for older workers, on average. It is also interesting to note the increase in the share of older workers and coincident decline in the proportion of young employees between 2006 and 2009.

At the time of the interview, respondents were also asked to provide information on a range of labour market characteristics. For the purpose of our analysis, however, we need information on individuals' labour market characteristics at the start of the period, in order to assess the link between their labour markets characteristics and probability of being employed at the end of the period. Usefully, many of the questions that were asked on respondents' current labour market situation (e.g. industry, occupation, size of company, supervisory position, labour market experience or type of contract) were also asked with reference to the last position held, if the respondent was not working at the time of the interview.

Table 2: average end of period employment probabilities by quintile, for all employees and selected sub-groups, boom years and 2009

Year	Wage quin-tile	All employees: probability of being employed at end of period — Average 2004-2006	All employees: probability of being employed at end of period — 2006		Employees with selected demographics: men — % dif from avg	men — *Share, row %*	with 3rd level education — % dif from avg	with 3rd level education — *Share, row %*	aged 55-64 — % dif from avg	aged 55-64 — *Share row %*	aged 18-30 — % dif from avg	aged 18-30 — *Share, row %*	Employees with selected labour market characteristics: started on a permanent contract — % dif from avg	started on a permanent contract — *Share, row %*	started in a part-time position — % dif from avg	started in a part-time position — *Share, row %*
Boom years	5	0.972	0.978		0.0	*0.68*	1.2	*0.57*	-3.1	*0.16*	-1.3	*0.05*	0.4	*0.98*		*0.02*
	4	0.963	0.970		0.6	*0.65*	-1.4	*0.28*	-4.0	*0.12*	0.5	*0.22*	1.0	*0.96*	-16.0	*0.04*
	3	0.947	0.948		-0.8	*0.54*	-1.2	*0.20*	-4.4	*0.10*	-1.6	*0.37*	1.5	*0.92*	2.4	*0.10*
	2	0.912	0.913		-1.4	*0.44*	0.6	*0.10*	-3.0	*0.09*	2.7	*0.44*	2.6	*0.87*	2.8	*0.21*
	1	0.842	0.828		-0.3	*0.29*	-11.1	*0.06*	0.4	*0.13*	-2.5	*0.36*	6.6	*0.73*	1.1	*0.76*
	Avg	0.928	0.927	**2006**	1.5	*0.52*	3.2	*0.24*	-2.4	*0.12*	-1.6	*0.29*	2.9	*0.89*	-6.2	*0.23*
		2009	% diff with 2004-6	% diff with 2006												
Bust	5	0.951	-2.1	-2.8	0.3	*0.70*	1.4	*0.56*	-8.6	*0.17*		*0.04*	-0.1	*0.95*		*0.02*
	4	0.923	-4.2	-4.9	-3.7	*0.54*	4.7	*0.37*	0.9	*0.14*	1.5	*0.21*	0.5	*0.96*	5.1	*0.08*
	3	0.873	-7.9	-8.0	-4.0	*0.59*	8.1	*0.25*	3.9	*0.12*	-3.5	*0.31*	0.9	*0.93*	7.5	*0.12*
	2	0.859	-6.1	-5.9	-4.2	*0.45*	8.5	*0.18*	-5.0	*0.13*	-1.5	*0.39*	3.7	*0.86*	7.6	*0.27*
	1	0.782	-7.1	-5.5	-4.4	*0.32*	3.7	*0.11*	6.1	*0.16*	-1.7	*0.32*	4.8	*0.75*	6.8	*0.78*
	Avg	0.878	-5.4	-5.4	-1.0	*0.52*	8.2	*0.29*	-0.6	*0.15*	-3.3	*0.25*	2.6	*0.89*	0.0	*0.25*

Note: see bottom of Table 2 cont.

Table 2 cont.: average end of period employment probabilities by quintile, all employees and selected sub-groups, 2006 and 2009

Year	Wage quin-tile	All employees	Employees in selected industries				Employees in selected occupations							
		probability of being employed at end of period	construction + other production		public admin + transport & communication		managers and senior officials		professionals + associate prof & technicians		skilled trades + plant & machine operatives		sales + elementary occupations	
		average	% dif from year avg	*Share, row %*	% dif from year avg	*Share, row %*	% dif from year avg	*Share, row %*	% dif from year avg	*Share, row %*	% dif from year avg	*Share, row %*	% dif from year avg	*Share, row %*
2006	5	0.978	-1.2	0.20	1.8	*0.26*	-0.7	*0.24*	0.3	*0.50*	-0.3	*0.12*	-2.0	*0.04*
	4	0.970	0.7	0.29	2.1	*0.22*	-1.2	*0.14*	-0.3	*0.36*	0.3	*0.21*	0.6	*0.11*
	3	0.948	-0.9	0.33	0.7	*0.15*	0.8	*0.12*	0.2	*0.21*	-0.6	*0.22*	-0.9	*0.16*
	2	0.913	-5.7	0.21	-3.2	*0.12*	1.7	*0.07*	-2.4	*0.11*	-5.0	*0.21*	1.2	*0.29*
	1	0.828	-3.9	0.11	4.2	*0.09*	4.1	*0.04*	-11.4	*0.07*	10.6	*0.10*	-0.3	*0.39*
	Avg	0.927	0.0	0.23	3.4	*0.17*	3.0	*0.12*	2.7	*0.25*	0.9	*0.17*	-3.3	*0.20*
2009	5	0.951	-5.1	0.18	1.3	*0.29*	0.7	*0.28*	0.8	*0.49*	-7.9	*0.09*	-4.6	*0.04*
	4	0.923	-13.0	0.23	5.5	*0.23*	4.1	*0.14*	2.6	*0.36*	-8.2	*0.16*	-13.0	*0.09*
	3	0.873	-16.0	0.32	13.2	*0.16*	10.5	*0.11*	3.4	*0.22*	-27.8	*0.21*	7.7	*0.19*
	2	0.859	-17.2	0.20	5.0	*0.10*	10.6	*0.06*	-6.2	*0.14*	-9.3	*0.14*	0.9	*0.28*
	1	0.782	-6.9	0.11	12.9	*0.05*	3.4	*0.07*	-19.4	*0.09*	-8.3	*0.10*	-0.9	*0.38*
	Avg	0.878	-11.6	0.21	9.6	*0.17*	7.8	*0.13*	3.7	*0.26*	-13.8	*0.14*	-3.7	*0.20*

Note: shaded cells represent cells with a higher / lower probability of employment by the end of the period than the population average in the same quintile. The darker the colour, the larger the difference with the population average. At least 30 observations per cell. Figures computed using sample weights.

For certain variables, like industry, occupation or the type of contract, the information collected at the time of the interview could be problematic if the person changed jobs over the 12 months prior to the interview. About 7% (unweighted, or 9% weighted) of respondents in 2006, and 4% (unweighted, or 5% weighted) in 2009 in our sample report a job change in the 12 months prior to the interview – note that these job changes include a change of contract with the same employer. Information provided on the reason for the job change was used to correct for the "start of period" type of contract.[10] Based on the information available, there is no way of knowing if an employee also changed industry or occupation when they changed jobs. It is hoped that if this happened, the numbers will be small enough not to drive our results.

Overall, there are relatively few missing observations for each of the labour market variables considered, with a maximum of 3.6% of the unweighted sample of employees aged 18-65 for labour market experience, in 2006. Most of the missing observations on work experience are for young people aged 18-21 and who are also employed at the end of the period. Some of these missing observations could be imputed using additional information from variables like their age, the age at which the person started their first job and the number of years spent in unemployment or out of work.

Looking at labour market characteristics, the share of employees on a permanent contract increased slightly in the lowest quintile, from 73 percent in 2006 to 75 percent in 2009 and declined slightly in the top quintile, from 98 to 95 percent, leaving the average unchanged between 2006 and 2009, at about 89 percent. In the two lowest quintiles, having a permanent contract is also associated with a higher than average probability of being employed at the end of the period, both in 2006 and 2009.

Employees who started in a part-time position are found in all quintiles but, as expected, are over-represented in the bottom quintile where they account for more than 75 percent of employees in 2006 and 2009. (See last col of Table 2). Part-time status is also linked to

[10] Each respondent was asked about the type of contract in their current or last position held, which here has been grouped into temporary and permanent contracts. This information refers to the type of contract in the last (present or past) position held. In the case of a job change, if the reason for the job change was due "the end of a temporary contract", the start of period contract is coded as temporary.

gender status with about 39 percent of female employees starting on in part-time position in 2006 and 2009, compared to around 9 to 14 percent of male employees in 2006 and 2009 respectively. Note that we do not have information on the number of hours worked each month. Instead, we know whether the respondent worked full-time or part-time each month, and the part-time status is self-reported. While concentrated at the bottom of the distribution, the share of part-timers increased at all quintiles between 2006 and 2009. The increase in the average share of employees, who started in a part-time position[11] from 23 percent in 2006 to 26 percent in 2009, mainly reflects an increase in men working part-time, increasing from 8 percent in 2006 to 14 percent in 2009. Figures for the top quintile are not reported given their small cell numbers (less than 30 observations)

In 2006, employees who started in a part-time position were almost 6 percent more likely on average to be out of employment by the end of the period. This trend appears to reflect their concentration in the two lowest quintiles. Strikingly, the relative employment disadvantage of part-timers disappeared in 2009, in spite of their on-going concentration in the lowest quintiles. This shift reflects the large advantage experienced by employees who started on a part-time position in 2009, relative to full-timers, in all quintiles. As full-timers are concentrated in higher quintiles where employment rates are also higher, the part-time advantage in lower quintiles cancels out on average in 2009. But these figures nevertheless suggests that people on low hourly wages (i.e. people working full time in lower quintiles) are particularly more likely to be out of employment by the end of the period in 2009 than people on higher hourly wages. As most part-time employees are also female employees, the part-time advantage in lower quintiles in 2009 could account for part of the relative advantage of women in lower quintiles in 2009.

As expected, employees working in construction and other production industries appear to have been particularly hit by the crisis, see Table 2 cont. in 2009. Their relative decline in employment rate is highest at the middle wage quintiles (between 13 and 17.2 percent) which are also where they are concentrated. Overall, in 2009 these employees experienced an 11.7 percent lower probability of being in employment at the end of the period, compared to the average. This average was already much lower in 2009 than in 2006. In

[11] Whether an employee worked full time or part time is documented for each of the 12 months prior to the interview.

absolute terms, employees in construction and other production had a 77 percent chance of being employed at the end of the period in 2009 on average, down from a 92 percent probability in 2006. By contrast, employees in public administration, transport and communications industries appeared unaffected by the crisis, in 2009. These employees already had a slightly higher than average employment rate in 2006, at 95 percent, which remained stable at the onset of the crisis, reaching 96 percent in 2009.

As also reported in other studies, and for a number of countries (Autor, 2010; Mühlau, 2014) occupations are another dimension that delineates which employees had a high or low risk of moving out of employment during the crisis. In 2006, however, there was relatively little variation in the end of period employment rate by occupation groups. At one end of the spectrum "managers and senior officials" had a higher than average probability of end of period employment (95.1 percent compared to 92.7 percent for all employees), and at the other end employees in "elementary occupation" had a probability of 89.3 percent of being employed by the end of the period. The average variation between occupation in 2006 was therefore much smaller than the average variation by quintiles (see second col of Table 2). In 2009, managers and other senior officials remained the occupational group with the highest end of period employment rate. Although at a slightly lower rate than in 2006, their end of period employment rate of 93.9 percent remained well above to the average of 87.7 percent. They were particularly advantaged in the middle quintiles.

Professionals and associated professionals/technicians are another groups of employees who tend to be concentrated in top quintiles. They have maintained a slight advantage in 2009, relative to the average, in terms of end of period employment rates. Unlike managers, however, these employees move out of employment at a rate larger than the average in the two lower quintiles. This tendency, which is driven by associate professionals and technicians in 2009, appears to have worsened at the onset of the crisis. These figures suggest that highly skilled employees are more likely than the average to remain in employment, especially if they are in the highest earnings quintiles. Interestingly the share of professionals and associated professionals has increased in the two lowest quintiles in 2009.

Skilled manual workers (skilled trades and machine/ plant operatives[12]) have been by far the worst hit occupational group in 2009. These employees display a lower than average probability of being employed at the end of the period of at least 7.9 percent, in all quintiles. Their largest relative penalty (27.8 percent lower than the average) relates to the middle quintile, where these workers are most represented. This trend translates in an average probability of 75.3 percent of being employed by the end of the period in 2009. By contrast, employees working in secretarial and administrative occupations (not shown), and which are also clustered around the middle quintiles, had a much higher end of period average employment rate, reaching 89.8 percent in 2009. This is even slightly higher than the population average of 87.5 percent.

In the remaining 3 occupational groups (personal services occupations, sales and customer service occupations, and elementary occupations) employees tend to be mostly found in bottom wage quintiles. Together, in 2009, these 3 occupational groups accounted for 61 percent of all employees in the lowest quintiles and 50 percent of employees in the second lowest quintile. The average situation of employees in personal and occupation services[13] (not shown) barely changed between 2006 and 2009, with a probability of 91.5 percent of being employed by the end of the period in 2006 and of 91 percent in 2009. For employees in sales and elementary occupations, their low performance in 2006 mainly reflected their concentration in the two lowest quintiles, where average employment rates are also lower. In 2009, sales and elementary occupations employees in the middle quintile had a 7 percent higher probability than the average to be employed by the end of the period. The relative situation of employees in these occupations at the very top, however, worsened significantly, although this concerns fewer employees. This trend suggests a reverse pattern than that found for professional and associated professionals, who are clustered at the top of the distribution. Employees in these occupations were relatively more penalised in top quintiles at the onset of the crisis.

[12] Occupations in skilled trades include bricklayers; roofers; wall tillers; plumbers; precision instrument makers, computer engineers (installation and maintenance); scaffolders; motor mechanics, auto electricians, tyre and exhaust fitters; carpenters, book binders, bakers, butchers, gardeners, bus drivers. Occupations in plant or machine operatives include: mechanical plant drivers/operatives and crane drivers; moulders and furnace operatives (metal); electroplaters, galvanisers and colour coaters; other automatic machine workers; assemblers and lineworkers (electrical and electronic goods); electrical, energy, boiler and related plant operatives and attendants.

[13] These include police officers; chefs; cooks; waiters; nurses' aides and ambulance staff; childminders, nursery nurses and playgroup leaders; housekeepers (domestic and non-domestic); caretaker; launderers, dry cleaners and pressers.

4. Probit analysis

The descriptive statistics presented above suggest that the probability of exit from employment, as reported in SILC data, is inversely related to employment income. These figures also indicate that end-of-period employment rates were lower in all quintiles in 2009 compared to earlier boom years. Additionally, the gradient with wages increased at the start of the crisis. In 2006, the probability of remaining in employment over the 12 months recall period was about 15 percent lower for employees in the bottom quintile than for employees in the top quintile (13 percent lower in 2004-06). By 2009, that gap had increased to about 18 percent. Overall, employees in the middle and lower wage quintile were particularly hard hit relative to employees on higher wages. There are, however, marked disparities in the employment outcome of different groups of employees across education levels, age, sectors or occupations. Additionally, employees with different characteristics tend to be clustered in different parts of the earnings distribution, which complicates the interpretation of the trends observed.

To get a better understanding of how the positive relationship that is observed between the end of period employment rates and individual earnings is related to individual characteristics, we run a probit analysis on the probability of being in employment in the month of the interview – provided the person was also employed 12 months earlier. Our analysis is based on the full cross-sectional data from the 2006 and 2009 SILC samples, taking advantage of the 12 months recall period, as discussed in the previous section.

We control for employees' initial location in the earnings distribution and a range of other variables that may influence the probability that an individual may move out of employment. Some variables, like age, may turn out to be significant in both periods but for different reasons. For example, older well-paid workers may choose to retire early during the boom but may be dismissed during the crisis if employers choose to layoff expensive workers first. We then compare findings for 2006 and 2009 to assess how the relationship has changed with the crisis. Figures computed on the larger 2004-06 boom sample are provided as sensitivity analysis, except for regressions that include industry controls. Information on industries is not available in 2004. Further sensitivity analysis on boom

years, between 2004 and 2007, provides very similar results and is reported in Table A2 in the Appendix.

We want to know, in particular, whether the inclusion of additional controls dampens the relative employment advantage of people in top quintiles, and whether these effects vary between boom and crisis years. Average marginal effects for wage quintile dummies are reported in the top part of Table 3. We only report results for wage quintile dummies – Q1 as default category – for clarity. Results for the other variables are discussed in the text. The marginal effects were computed using the "*margeff*" program for STATA. The advantage of using *margeff* in the current analysis is that it allows for the estimation of the marginal effects for sets of dummies that form a single underlying categorical variable, like the quintile dummies here; see Bartus (2005) for more details.[14]

The middle part of Table 3 indicates which other explanatory variables have been included in the regression. The lower part of the table reports tests on different groups of variables. These tests also give an indication on whether certain variables are (jointly) significant in 2006, 2004-06 and/or in 2009. Table 4 reports related results for men and women separately, although the samples being much smaller, the coefficients are not as precisely estimated. Quintiles in the male and female sub-samples are computed on the whole sample, so that average monthly earnings remain comparable across quintiles.

Similar to the descriptive statistics reported above, results in columns 1-3 of Table 3 indicate that employees with a monthly wage in higher quintiles were significantly more likely to be employed by the end of the period than employees with wages in the bottom quintile, in boom and bust. In 2006, an employee with a monthly wage in the second quintile (Q2) had an 8.5 percentage point higher probability of being employed by the end of the period, than employees with a wage in the bottom quintile (Q1). For employees with earnings in the top quintile (Q5), the advantage was 15 percentage points. These percentage point differences correspond to the differences in average employment rates between quintiles in the sample, see Table 2. For example, the probability of being employed by the end of the period in 2006 was 97.8 percent for employees in Q5 and 82.8

[14] The marginal effects estimated at the sample means of the independent variables (not reported) are smaller in magnitude but tell the same overall story.

percent for employees in Q1, see col 2 of Table 2. The difference between the two figures gives 15 percentage points.

For the top two quintiles, before the inclusion of other controls, the raw estimated marginal effect is higher in 2009 than in boom years (cols 1 - 3, Table 3). This relative increase only concerns the top quintile when comparing to data for 2009 and 2006 (cols 2 and 3, Table 3). As mentioned earlier, data for 2006 provides the steepest wage-employment profile of all boom years available (see table A2 in the appendix).

Looking at the middle and bottom quintiles in 2009, before the inclusion of other controls, the coefficient for Q2 is not significantly different from zero (i.e. from Q1) at the 5 percent level. The estimated coefficient for Q3 is not significantly different from Q2 (see tests for Q2=Q3), and even appears to be slightly lower in 2009 than in boom years. This suggests that, at the onset of the crisis, the relative position of workers in the middle and lower part of the wage distribution had significantly worsened relative to the situation of workers in Q4 and Q5. These trends appear to be driven by what happens in the male sample. Results in cols 7 and 8 of Table 4 suggest that the relative advantage of female employees in all quintiles, before the inclusion of other controls, did not change substantially between 2006 and 2009, except possibly for workers in Q4. For men, however, the relative advantage of employees in the top quintile increased substantially in 2009, while it declined for those in the second and middle quintiles (Q2 and Q3).

The inclusion of demographic and labour market controls (cols 4-5, Table 3) has little effect on the estimated marginal effects of all quintiles in boom years – except for a dampening of the estimated Q5 effect in 2006, mainly driven by what happens to men. At the onset of the crisis, however, including base controls affects the estimated probability of staying in employment across the wage distribution, in two ways. First, the relative advantage of employees in Q4 or Q5 – compared to workers with a wage in the bottom quintile – becomes even larger (col 6, Table 3). This trend is observed for both men and women. Second, while the relative position of employees in Q3 improves relative to workers in Q1, it does not significantly improve relative to workers in Q2, and remains much lower than the probability estimated for Q4 and Q5. As a results, even with the inclusion of demographic and labour market controls, employees in Q3 remain relatively worse off than

during the boom, when comparing their relative employment outcomes with employees in Q2 and Q4. Adding industry or occupation controls does not alter these conclusions (cols 7-11).

We discuss the role of explanatory variables in turn, starting with demographics. To allow for different exit of employment probabilities by gender, a female dummy is included. Women appear to have a significantly higher probability of remaining in employment in 2009, but this effect disappears with the inclusion of further controls. [15]

Overall, education seem to have no significant impact on the probability of staying in employment in 2006 and in other boom years, but third level education is positively and significantly related to the probability of being employed by the end of the period in 2009. Education controls are jointly significant in 2009 but not in 2006. The magnitude of the effect varies between 5 and 7 percentage points in the overall sample, depending on the specification considered. Here again, education appears to be particularly important in the male sub-sample in 2009. Men with third level education are about 9 percentage points more likely to be employed at the end of the period in 2009, while the effect is not significant in the female sub-sample. The increased importance of education for employment during the crisis is also reported in the unemployment study by Kelly and McGuinness (2015), based on QNHS data for 2006 and 2011.

[15] A related study by Wilkins and Wooden (2011) on Australian data reports that women are less likely than men to be dismissed but that this effect disappears once controls, like industry and occupation, are also considered.

Table 3: Average marginal effects from probit regressions, whole sample

	1	2	3	4	5	6	7	8	9	10	11
Year	**2004-6**	**2006**	**2009**	**2004-6**	**2006**	**2009**	**2004-6**	**2006**	**2009**	**2006**	**2009**
Q2	0.074***	0.085**	0.077*	0.072***	0.079***	0.137***	0.073***	0.084***	0.133***	0.082***	0.134***
	(0.0096)	(0.0182)	(0.0307)	(0.0113)	(0.0201)	(0.0293)	(0.0113)	(0.0198)	(0.0301)	(0.0198)	(0.0303)
Q3	0.107***	0.120**	0.090**	0.102***	0.113***	0.152***	0.103***	0.119***	0.159***	0.117***	0.159***
	(0.0079)	(0.0148)	(0.0303)	(0.0104)	(0.0184)	(0.0321)	(0.0104)	(0.0183)	(0.0308)	(0.0185)	(0.0312)
Q4	0.122***	0.142**	0.140**	0.115***	0.142***	0.196***	0.116***	0.148***	0.201***	0.142***	0.190***
	(0.0073)	(0.0120)	(0.0227)	(0.0100)	(0.0142)	(0.0272)	(0.0100)	(0.0140)	(0.0277)	(0.0146)	(0.0275)
Q5	0.129***	0.150**	0.169**	0.120***	0.134***	0.207***	0.121***	0.142***	0.202***	0.133***	0.191***
	(0.0065)	(0.0105)	(0.0191)	(0.0098)	(0.0161)	(0.0262)	(0.0099)	(0.0160)	(0.0276)	(0.0161)	(0.0274)
Base controls				X	X	X	X	X	X	X	X
Occupation dummies							X	X	X		
Industry dummies										X	X
Tests on coefficients											
Q2=Q3	0.001	0.028	*0.652*	0.001	0.031	*0.694*	0.001	0.026	*0.338*	0.025	*0.334*
Q2=Q4	0.001	0.001	0.008	0.001	0.001	0.007	0.001	0.001	0.002	0.001	0.005
Q2=Q5	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.004
Education dums=0				*0.983*	*0.572*	0.001	*0.988*	*0.555*	0.004	*0.569*	0.021
Age dummies=0				0.001	0.053	*0.283*	0.001	0.058	*0.145*	*0.107*	*0.195*
Kids controls=0				0.001	0.001	0.017	0.001	0.001	0.039	0.001	0.013
Occ. dummies=0							*0.134*	*0.740*	0.001		
Industry dummies=0										*0.318*	0.013
Pseudo R2	0.059	0.078	0.043	0.136	0.189	0.118	0.139	0.193	0.154	0.195	0.157
Observations	13020	4231	3608	12841	4174	3550	12836	4169	3548	4169	3542

Top of table: standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1. The base set of controls includes: female dummy, the share of time worked that was worked part-time in last 12 months, education dummies, age dummies, permanent contract dummy, reported years of work experience, poor health status dummy, partner dummy for women, partner dummy for men, number of children aged 0-1, number of children aged 1-5 and number of children aged 6 and over living in the household. Test on coefficients: the tests were computed on the coefficients of the probit regressions (coefficients not reported); p-values reported; p-values in grey italics indicate that the test cannot be rejected at the 10 percent significance level; small p-values were rounded up to 0.001.

Table 4: average marginal effects from probit regressions, male and female sub-samples

	MEN						WOMEN					
	1	2	3	4	5	6	7	8	9	10	11	12
Year	2006	2009	2006	2009	2006	2009	2006	2009	2006	2009	2006	2009
Q2	0.075**	0.075	0.067**	0.105*	0.0706**	0.096*	0.094***	0.091**	0.095***	0.149***	0.099***	0.153***
	(0.0322)	(0.0510)	(0.0311)	(0.0553)	(0.0312)	(0.0541)	(0.0221)	(0.0382)	(0.0259)	(0.0317)	(0.0254)	(0.0325)
Q3	0.116***	0.090*	0.092***	0.131**	0.092***	0.138**	0.128***	0.124***	0.132***	0.171***	0.137***	0.172***
	(0.0250)	(0.0500)	(0.0303)	(0.0569)	(0.0311)	(0.0546)	(0.0181)	(0.0313)	(0.0221)	(0.0286)	(0.0218)	(0.0302)
Q4	0.151***	0.141***	0.133***	0.179***	0.124***	0.169***	0.129***	0.165***	0.160***	0.226***	0.151***	0.220***
	(0.0177)	(0.0396)	(0.0192)	(0.0523)	(0.0203)	(0.0495)	(0.0195)	(0.0234)	(0.0193)	(0.0234)	(0.0195)	(0.0244)
Q5	0.152***	0.206***	0.111***	0.187***	0.094***	0.174***	0.150***	0.147***	0.164***	0.206***	0.159***	0.193***
	(0.0178)	(0.0288)	(0.0217)	(0.0435)	(0.0220)	(0.0407)	(0.0137)	(0.0281)	(0.0218)	(0.0303)	(0.0214)	(0.0320)
Base controls			x	x	x	x			x	x	x	x
Occupations			x	x					x	x		
Industries					x	x					x	x
Tests on coeffs												
Q2=Q3	*0.109*	*0.762*	*0.228*	*0.552*	*0.282*	*0.292*	0.086	*0.309*	0.043	*0.382*	0.038	*0.472*
Q2=Q4	0.002	0.091	0.001	0.044	0.001	0.027	*0.115*	0.004	0.001	0.001	0.007	0.002
Q2=Q5	0.001	0.001	0.003	0.003	0.027	0.004	0.001	0.079	0.004	0.086	0.006	*0.214*
Educ dum=0			*0.492*	0.002	*0.709*	0.002			*0.596*	*0.392*	*0.446*	*0.392*
Age dum=0			0.066	0.004	0.058	0.024			*0.583*	*0.304*	*0.702*	*0.307*
Kids dum=0			0.041	*0.345*	0.037	*0.271*			0.001	0.001	0.001	0.001
Occupations=0			0.060	0.001					*0.273*	*0.103*		
Industries=0					*0.488*	0.001					0.005	*0.738*
Pseudo R2	0.081	0.051	0.243	0.178	0.236	0.195	0.071	0.059	0.195	0.199	0.208	0.184
Observations	2144	1804	2113	1769	2116	1765	2087	1804	2056	1779	2053	1777

Notes: quintiles computed on the whole sample. Earnings thresholds for each quintile are therefore comparable across male and female regressions and with regressions presented in Table 3 on the whole sample. For more information see bottom of Table 3.

Non parametric age effects are included, where the employees' age are grouped in 8 categories:18-23, 24-29, 30-35, 36-41, 42-47, 48-53, 54-59 and 60-64. We also considered finer age differences (using 16 age bands) or a combination of these age groups into 3 age bands. All approaches suggested evidence of early retirement for older workers during the boom, although the effect was smaller when considering larger age bands. This is probably due to the fact that the effect is likely to be more diluted in a larger group[16]. No particular other effects can be noted on other variables following a change in the age specification. Age dummies are usually jointly significant in 2006 and in other boom years (effect driven by the male sub-sample), but not in 2009.

Following the argument that living with a partner may provide insurance against labour market uncertainty we also included a dummy if the employee is currently living with a partner. In SILC data, the number people living with a partner was stable to 2008 and increased in in 2009 both in the wider population and in the employee sub-population. The observation that the rate of cohabitation increases in economic down-turns is consistent both with the economies of scale that cohabitation confers (by reducing associated budgetary pressures) and an insurance motive in relation to increased labour market uncertainties. Marital rates provide a similar picture.

The partner variable has been constructed on the actual observed number of people living in the same household and their reported relationships to one another. This variable was interacted with gender to allow for separate male and female effects associated with having a partner. Note that we only observe a person's cohabitation status at the date of the interview, and it is possible that a person's employment status affects the probability of moving in or staying with a partner, rather than the reverse.[17] We also tried to control for marital status and marital status conditional on the person living with the husband/wife, by gender, with no impact on the results.

[16] The age dummies are never/always jointly significant when consider 3/16 age groups. The finer age categorisation also implies a larger R squared in 2009.

[17] If cohabitation is indeed (also) a way of insuring against labour markets uncertainty, we should see that the partner who are less likely to be affected by the crisis, e.g. women, stay in employment more during the crisis than in pre-crisis time. High unemployment benefits, however, have been shown to crowd out the insurance labour supply of women.

Children are allocated to the parent(s) who live(s) in the same household at the time of the interview. This definition implies that step-parents living in the same household are considered as parents in our analysis, whereas parents who are not living with their child will be coded as having no children. For each parent, the number of children living in the household is grouped into babies (children aged 0-1), children aged 1-5, children aged 6-and above. The number of babies in the household is significantly inversely related to employment outcomes, with an average effect varying between 4 and 7 percentage points in boom years and around 5 percentage points in 2009. The presence of children in the household is an important determinant of the employment outcome of female employees.

Several other combinations of child variables have been considered, with no impact on the results. We tried to distinguish between households where babies (child up to 1 year old) were the only child/ren below the age of 6 and households where babies had siblings below the age of 6. We also tried to distinguish between the children aged 12-17 and those aged 18 or more. The number of children in each category was also replaced by a dummy indicating the presence or not of children in this age category, which provided weaker results. The inclusion/exclusion of any of these variables had little or no impact on the children controls currently included in the regression.

Poor health status at the time interview (end of the period) may have had a direct effect on the respondent's probability of moving out of employment. A health dummy was coded one if the person reported bad or very bad health, as opposed to fair, good or very good health. Respondents who reported poor health at the end of the period are significantly less likely to be in employment at the end of the period, in 2006 and in 2009. The effect is on the larger side in 2009, of about 10 percentage point, compared to about 4.5 to 8 percentage point in boom years depending on the specification considered.

Turning now to the labour market controls included, we do not have information on the number of hours an employee has worked each week or month, but we know whether the person has worked part time or full time in each of the months the person worked prior to the interview. The share of time worked part-time is included as a control in the regressions. This variable is defined as the number of months spent in part-time

work out of the total number of months spent in employment over the 12 months prior to the interview. [18]

The descriptive analysis pointed to the shift in the average exit probability of part-time employees, from an above average exit rate in 2006 to a below average exit rate in 2009. But, part time employees also tend to be over-represented in lower quintiles where the average exit rate is higher. Condoling for wages, part time status is associated with a significantly higher probability of being employed at the end of the period, reaching 9 to 10 percentage points, in 2009, while the effect implies an advantage of 3 percentage points or less in 2004 to 2006. This apparent growing importance of part time work at the onset of the crisis relates to trends observed in other European countries, with a significant share of job creation in Europe in recent years being in part-time and casual work. The estimated marginal effects of all wages quintiles increase when the part-time control is included in the regression in 2009. This dummy, which is strongly positive in 2009, remains significant with the inclusion of a wide range of other controls, while its effect is much smaller or insignificant in all boom years. This suggests that among those on low monthly wages, employees on low hourly wages, rather than on low hours, have been particularly affected at the start of the crisis.

The type of contract an employee has an important bearing on their probability of staying in employment from one year to the next, during boom and crisis years. This may not be so surprising, but the magnitude of this effect is quite stable, between 16 and 11 percentage points in boom years, and around 11-13 percentage points in 2009, depending on the specification considered.

The number of years of (non-student type) work experience at the start of the period is computed using the information collected at the time of the interview (in t) and deducting one year for people who are still employed at the end of the period. There are a few missing observations on years of experience, especially for young workers who are still in employment at the end of the period. Some of the missing values could be imputed using other available information on age, the age at which respondents

[18] In 2006 and 2009, only about 2 % of respondents switched between full-time and part-time employment in the 12 months prior to the interview, and therefore about 98% of respondents (weighted or unweighted) remained either in full-time or part-time work, throughout the period.

state having started their first jobs or left full time education, the time spent in unemployment or in other occupations, and the number of years of tenure in their current job.

Occupations dummies were included as a separate step, see cols 5-6 of Table 3. These were coded based on the employees' current or last reported job and organised in 9 groups: senior officials and managers; professionals; technicians and associate professionals; administrative and secretarial positions; skilled trade occupations; personal and services occupations; sales and customer service occupations; plant and machine operatives; and elementary occupations. Occupations appear to be important as a predictor for the employment outcome of workers in 2009. These the dummies are never jointly significant in 2006, or in other boom year combinations, see table A2 in the appendix.

To take into account the effect of working in hard hit industries, industry dummies are included in the last two columns of table 3. Employees' industries are documented regarding their current or last position, and based on the NACE classification: agriculture; construction, other production; commerce and finance; transport and communication; professional services; public administration; and other. The industry effect in 2009 presented in Table 3 is driven by the employment outcomes of men (see Table 4). This follows the trend already observed in many other instances, that men tend to work in industries that are more sensitive to demand shocks, like production and construction. [19]

Other variables where considered, but not included in the final analysis. We tried to control for company sizes, that is, if the respondent worked in a large company (50 or more employees) or in a very small company (10 employees or less). This follows the observation, for example, that small firms were more likely to go bankrupt during the Great Depression in the US, see e.g. Margo (1992). Firm size dummies were not significant (even in the larger boom year samples reported in Table A2) and had no impact on the results. As well, whether the respondent (last) worked in a supervisory position, or whether the respondent had "a say in the pay or promotion of the people"

[19] There is a significant overlap between the occupation and industry classifications and therefore the impact of the two variables was considered separately. Including both sets of variables at the same time has little effect on the results.

supervised did not appear to be significantly related to the probability of being employed at the end of the period. This could also be attributable to the small number of employees concerned.

Other potentially relevant variables, however, could not be included in the analysis. Immigration status (defined either as people born abroad or as non-Irish citizens) could have an important bearing on the probability exit from employment (e.g. McGinnity et al., 2014; Kelly and McGuinness, 2015). This variable could not be included as there were very few observations in 2009. From 1347 and 1288 people born abroad or non-Irish citizens in the 2006 and 2007 population samples respectively, the number of immigrant respondents dropped to 601 in 2008 and to 79 in 2009. This sharp decline in the number of immigrants in SILC samples does not reflect trends in the Irish population at the time. Whether a person worked in the public or private sector was only asked from 2007 onwards. Union memberships and tenure are other potentially important variables in this context that can only be inferred for people who are employed at the time of the interview.

6. Conclusions

This examination of the pattern of job loss with EU-SILC data in Ireland shows that employees on high wages (in Q4 and Q5) are more likely to stay employed than employees on lower earnings. Their relative advantage, however, increased significantly with the onset of the Great Recession and the scale of the crisis was felt more deeply across the lower and middle parts of the wage distribution.

The inclusion of a large set of individual controls, including industries and occupations, further widens the gap between the employment probability of employees in the top and bottom quintiles in 2009, while reduces the relative gap between workers in the top and lower middle of the wage distribution. Nevertheless, even after controlling for a large set of job and other individual characteristics, employees in the middle quintile remain relatively worse off during the crisis. That is, they experience statistically similar levels of job loss than workers in Q2, with employment rates lagging behind those of workers in Q4 and Q5. Our results suggest that they had a statistically significant higher probability of remaining in employment than workers in Q2 during boom years. This trend appears to be driven by what happened in the male sub-sample.

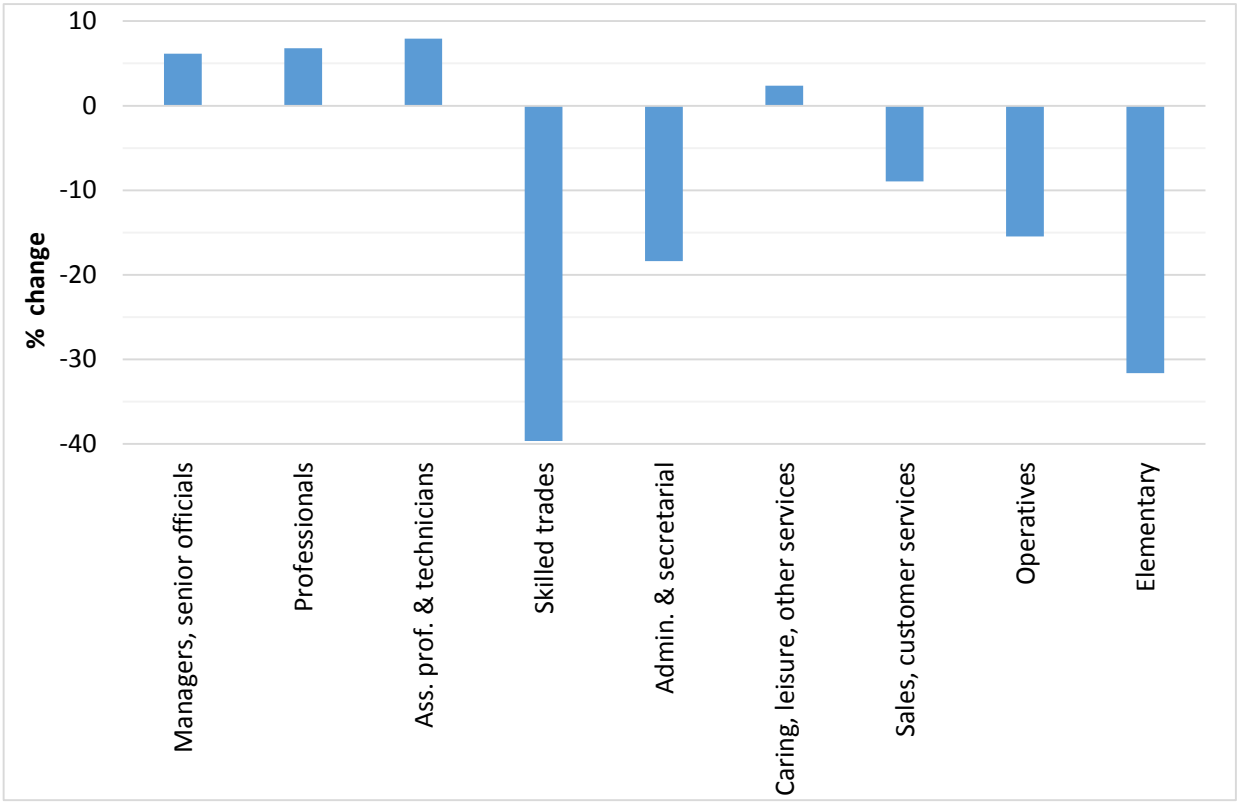
The fact that certain sectors were particularly hard hit, with construction experiencing a remarkable collapse, was key: skilled manual workers, who might in other circumstances have been relatively protected, were seriously affected, and the gendered nature of the job loss also reflects that sectoral pattern, with men make up a particularly large proportion of employees in the worst-affected sectors. Individual characteristics, other than industries and occupations, were predictors of movements out of employment in the preceding boom years. In contrast, occupation and industry dummies appear to be more informative as explanatory variables in the bust.

Occupations have been at the centre of recent research on job loss; our results show that occupation, together with industrial sector, was indeed an important predictor of job retention versus loss during the Great Recession in Ireland, but does not tell the whole story. There is still a significant effect attached individual wages, even after controlling for occupations and a large set of other explanatory variables. Additionally, the positive relationship between wage quintile and the probability of staying in employment from one year to the next was steeper in the bust than in the boom. This could be an indication that there is an important omitted explanatory variable, or that the wage effect reflects some unobservable workers characteristics that were particularly valued by the employer at the start of the crisis. [20] Assuming that wages capture the effect of unobservable employee skills, on top of observable differences – as proxied by occupation, experience and education - our results imply that in the Crisis employers sought to retain highly paid workers, and the same time favoured part-time workers among employees in low wage quintiles. This highlights the role of firm specific or employer decisions.

[20] Or job characteristics that are valued by the employee (lower quit rate in 2006).

Appendix

Figure A1: Percent change in the number of people at work in Ireland between 2007 and 2012, by occupations



Note: Authors' computations based on seasonally unadjusted QNHS quarterly figures, CSO. The chart represents differences between 2007 and 2012 in the yearly average of number of people in employment, by occupation. Occupational groups classified by UK SOC2010. Figures for the 2008-2012 instead provide similar story.

Table A2: average marginal effects from probit regressions, combination of boom years only

	1	2	3	4	5	6	7	8	9	10
Year	2004-6	2004-7	2005-7	2004-6	2004-7	2005-7	2004-6	2004-7	2005-7	2005-7
Q2	0.074***	0.070***	0.060***	0.072***	0.076***	0.072***	0.073***	0.077***	0.072***	0.074***
	(0.0096)	(0.0087)	(0.0106)	(0.0113)	(0.0101)	(0.0120)	(0.0113)	(0.0101)	(0.0120)	(0.0120)
Q3	0.107***	0.098***	0.096***	0.102***	0.102***	0.105***	0.103***	0.103***	0.106***	0.110***
	(0.0079)	(0.0079)	(0.0094)	(0.0104)	(0.0106)	(0.0124)	(0.0104)	(0.0106)	(0.012)	(0.0119)
Q4	0.122***	0.118***	0.119***	0.115***	0.122***	0.128***	0.116***	0.123***	0.129***	0.132***
	(0.0073)	(0.0066)	(0.0073)	(0.0100)	(0.0089)	(0.0097)	(0.0100)	(0.0091)	(0.0100)	(0.0096)
Q5	0.129***	0.129***	0.125***	0.120***	0.129***	0.128***	0.121***	0.129***	0.129***	0.130***
	(0.0065)	(0.0056)	(0.0064)	(0.0098)	(0.0087)	(0.0103)	(0.0099)	(0.0089)	(0.0106)	(0.0101)
Base controls				x	x	x	x	X	x	x
Occupations							x	X	x	
Industries										x
Tests, p-values										
Q2=Q3	0.001	0.001	0.001	0.001	0.002	0.001	0.001	0.002	0.001	0.001
Q2=Q4	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Q2=Q5	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Educ dum=0				*0.983*	*0.845*	*0.799*	*0.988*	*0.704*	*0.748*	*0.244*
Age dum=0				0.001	0.001	0.001	0.001	0.001	0.001	0.001
Kids dum=0				0.001	0.001	0.001	0.001	0.001	0.001	0.001
Occupations=0							*0.134*	*0.172*	*0.266*	
Industries=0										0.008
Pseudo R2	0.059	0.057	0.060	0.136	0.131	0.139	0.139	0.133	0.141	0.147
Observations	13020	16963	12688	12841	16736	12515	12836	16730	12509	12495

Note quintiles computed on whole population. See bottom of Table 3 for more information.

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