

# Research Notes

*The Regional Dimension of the Unemployment Crisis*

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## Introduction

The economic crisis in Ireland has been subject to much commentary and different components of Ireland's economic crisis have been analysed in a range of papers. For example the impact of the recession on foreign direct investment and exports has been investigated (Barry and Bergin, 2012, Godart *et al* 2011), job creation and destruction was analysed by Lawless (2012) and the labour market consequences of the crisis have been outline in Barrett and McGuinness (2012). However, one aspect that has not received much attention is the spatial dimension of the crisis. This is surprising as national averages tend to mask considerable heterogeneity across regions. Thus one would expect different parts of the country are likely to have been impacted in different ways<sup>1</sup>.

One reason why there has been no systematic analysis of the regional dimension of the crisis is that data availability and particular availability of up to date data is more limited at the regional level. For example while Quarterly National Accounts are available for the third quarter of 2012, the most recent regional accounts are for 2009. Nevertheless up to date labour market data are available at the regional level from the Quarterly National Household Survey with the most recent publication referring to the third quarter of 2012<sup>2</sup>. The Census 2011 also has some relatively up to date data on labour market variables at a very disaggregated spatial scale.

This paper focuses on the regional dimension of the unemployment crisis. In particular it considers the evolution of the unemployment rate during the crisis and analyses the components that determine the change in the numbers unemployed. It also considers unemployment at the micro-spatial level.

## The Change in Regional Unemployment

The national unemployment rate remained below 5 per cent for the period between the fourth quarter of 1999 and the fourth quarter of 2007. From that

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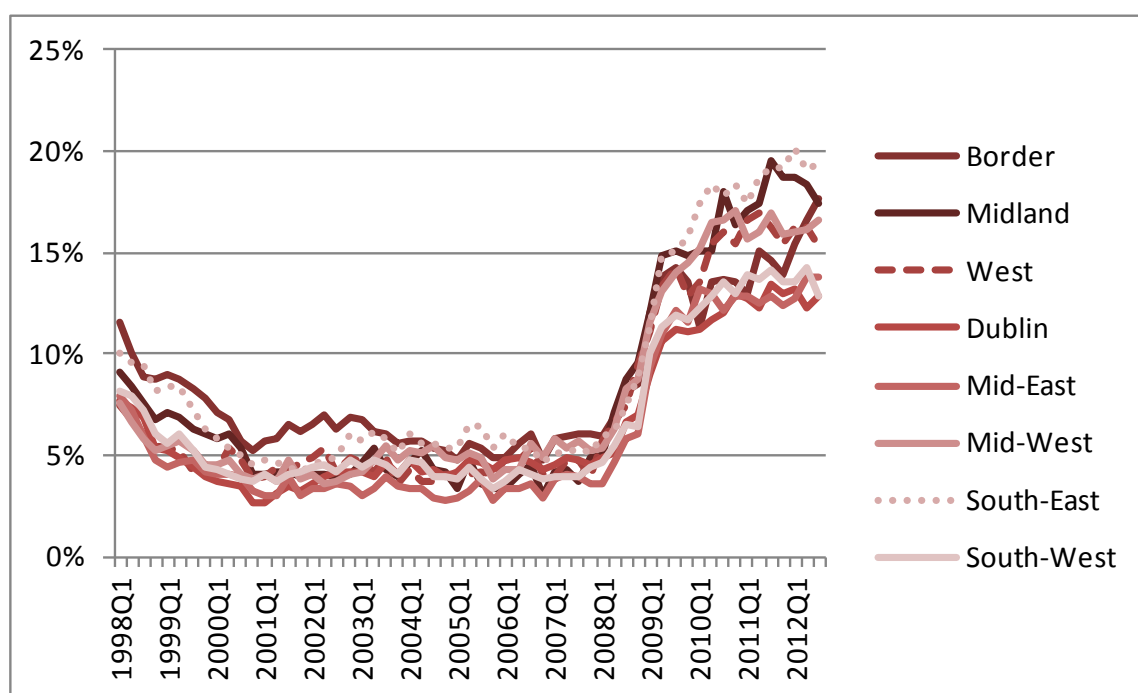
<sup>1</sup> An exception is Morgenroth (2010) which outlined the broad impact of the crisis at the regional level up to 2009, but did not carry out the more detailed analysis provided in this paper.

<sup>2</sup> That release also revises the series in light of the Census 2011 results.

level it trebled in a very short period and has been relatively stable at about 15% for a number of quarters. The evolution of regional unemployment rates is shown in Figure 1, which broadly corresponds to the national trends. However the graph also shows some important differences across the regions. For example at the start of 1998 unemployment rates were still at over 10% in the Border and South-East regions, while the West region had the lowest rate at 7.4%. All regions experienced a drop in unemployment rates and there was also convergence in unemployment rates across the regions during the boom, so that the difference between the regions reduced. However, the recession has not only resulted in a substantial rise in unemployment rates in all regions but has also led to divergence in unemployment rates across the regions (see Figure 1 and Table 1).

In 2012 the highest unemployment rate is found in the South-East (19.4%) followed by the Border (17.7%) and Midlands (17.4%) regions. The Midlands and the South-East also experienced the most significant rise in the unemployment rate. The lowest rates are recorded for Dublin (12.9%), South-West (12.9%) and Mid East (13.8%) regions, which are economically stronger regions with higher levels of income and output. The three regions with the highest unemployment rates in 1998 also have the highest rates in 2012, indicating a strong persistence of the differences that is likely to be due to underlying structural factors.

**FIGURE 1** Regional Unemployment Rates 1998 to 2012



Source: CSO Quarterly National Household Survey.

In order to identify the impact of the crisis one needs to decide on a base period against which the current level of unemployment can be compared with. As employment peaked in the third quarter of 2007 in six out of eight regions this quarter is taken as the baseline quarter against which the impact of the recession is measured. Table 1 shows both the unemployment rate and the total number of unemployed persons in the third quarter of 2007 and 2012 respectively. While the unemployment rate more than trebled nationally between these points, there is considerable heterogeneity across regions. For example the unemployment rate in the Midlands region is now 4.7 times that seen in 2007. On the other hand Dublin and the Mid-West experienced less than a trebling in unemployment rates. The absolute changes are also very striking with almost 325,000 people classified as unemployed compared to just under 108,000 in 2007. In the Midlands region the number of unemployed was as low as 4,900 in 2007 but now stands at 17,300. Since the crisis started the gap between the highest and lowest unemployment rate has increased significantly from 2 per cent to 7 per cent.

**TABLE 1** Unemployment Rate and Absolute Number of Unemployed for Q3 2007 and Q3 2012

	Unemployment Rate Q3 2007	Unemployment Rate Q3 2012	Number of Unemployed Q3 2007 (000s)	Number of Unemployed Q3 2012 (000s)	Change in Unemployment (000s)
	%	%			
Border	6.0	17.7	14.1	37.2	23.1
Midlands	3.7	17.4	4.9	22.2	17.3
West	4.7	15.3	10.3	32.8	22.5
Dublin	4.7	12.9	31.7	81.3	49.6
Mid-East	3.9	13.8	10.5	35.9	25.4
Mid-West	5.7	16.6	10.4	30	19.6
South-East	5.3	19.4	12.5	44.3	31.8
South-West	3.9	12.9	12.9	40.8	27.9
State	4.7	15.0	107.5	324.5	217.2

Source: CSO Quarterly National Household Survey.

### Components of Unemployment Change

The unemployment rate is a function of the number of persons in employment and the size of the labour force<sup>3</sup>. Changes in unemployment are thus due to changes in employment and the labour force, which are shown in Table 2. The first column of Table 2 shows the change in the numbers unemployed, the second shows the change in the numbers employed and the third column shows the change in the size of the labour force. Subtracting the change in employment

<sup>3</sup> Number Unemployed = Labour Force – Number Employed

from the change in the labour force yields the change in unemployment<sup>4</sup>. Overall the Border region suffered the most significant decline in employment (-22 per cent), followed by the South East (-19 per cent) and the Midlands (-18 per cent). Employment contracted by between 12 per cent and 14 per cent in the other regions, with the West region faring best.

While the Border region suffered the most dramatic employment contraction it also experienced the most significant contraction in the labour force (-11 per cent) which significantly dampened the increase in the numbers unemployed. For both the Border and Dublin the reduction in the labour force accounted for close to half the decline in employment. In contrast, the labour force hardly changed in the West region.

The labour force is a function of the number of persons of working age (here taken to be the population aged over 15 years) and the labour force participation rate in the labour force, and therefore changes in the labour force are a function of changes in these two variables, which are also shown in Table 2<sup>5</sup>. Most striking is the very significant decrease in the participation rate in the Border region (-13 per cent) and to a lesser extent in the Midlands (-9 per cent) and Mid-East (-8 per cent) regions. Also striking is the strong growth of the population aged 15 and over in the Midlands (6 per cent) and the Mid-East (5 per cent). Overall, while the population increased, participation rates have fallen so that these two components have opposite effects on unemployment i.e. the increase in the population has increased unemployment while the reduction in participation rates has decreased unemployment.

Given the multiplicative relationship between these two factors calculating the contributions of each to unemployment requires a slightly more difficult decomposition<sup>6</sup>. The results of the total decomposition are shown in Figure 2 which shows the contribution of changes in employment, population and participation rate to total unemployment. It should be noted that the change in population is shown as a negative impact as it has the effect to increase the unemployment rate. The graph shows that the drop in employment was made the largest contribution to the increase in unemployment in all regions. It also

<sup>4</sup> Formally  $\Delta U = \Delta LF - \Delta E$  where  $\Delta$  denotes the change in the variable and U, LF and E denote unemployment, the labour force and employment respectively. For the Border region the calculation is  $-26.4 - (-49.5) = -26.4 + 49.5 = 23.1$ .

<sup>5</sup> Labour Force = Working Age Population x Labour Force Participation Rate.

<sup>6</sup>  $\Delta LF = PR_0 * \Delta Pop - \Delta PR * Pop_0 + \Delta PR * \Delta Pop$ , where  $\Delta$  refers to a change, Pop refers to the population, PR to the participation rate and the subscript 0 refer the starting point Q3 2007. The first term yields the pure population effect, the second term gives the pure participation effect and the third term represents a second order interaction effect which is found to impact only marginally on unemployment (see Fuchs et al, 2008).

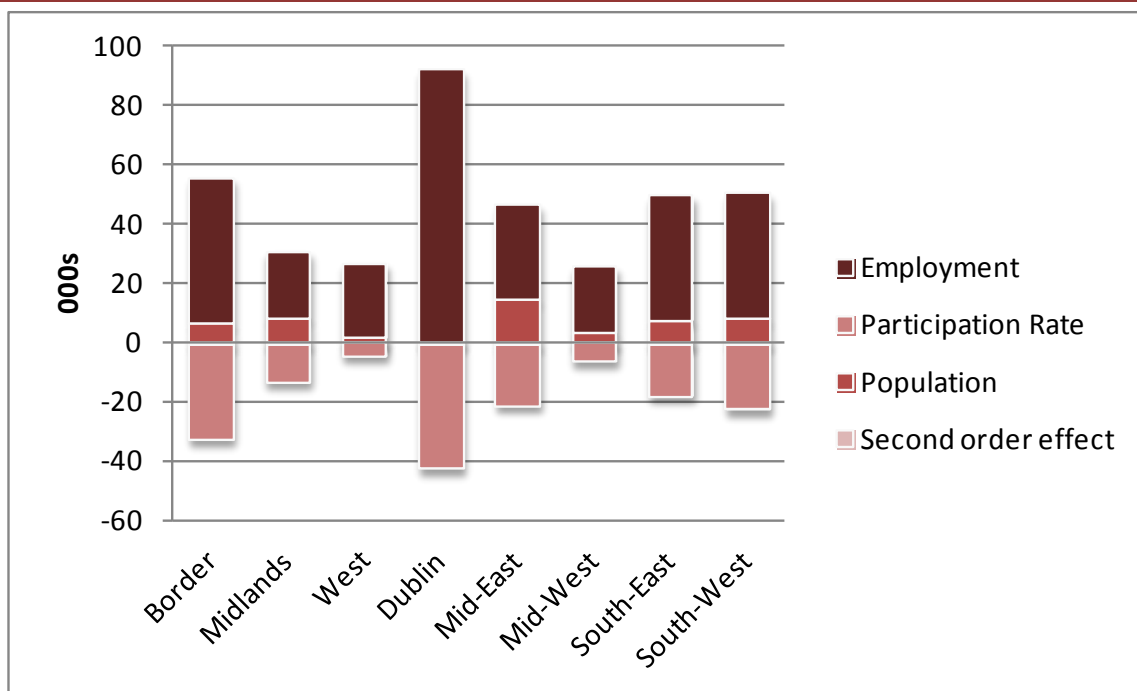
clearly shows the significant heterogeneity across regions regarding all components.

**TABLE 2** Components of the Unemployment Change between Q3 2007 and Q3 2012

	Change in Unemployment (000s)	Change in Employment (000s)	Change in the Labour Force (000s)	Change in the Population (aged over 15) (000s)	Change in Participation Rate (%)
Border	23.1 (164%)	-49.5 (-22%)	-26.4 (-11%)	10.1 (3%)	-13%
Midlands	17.3 (353%)	-22.4 (-18%)	-5.0 (-4%)	13.0 (6%)	-9%
West	22.5 (218%)	-25.3 (-12%)	-2.8 (-1%)	2.6 (1%)	-2%
Dublin	49.6 (156%)	-92.1 (-14%)	-42.5 (-6%)	-1.5 (0%)	-6%
Mid-East	25.4 (242%)	-32.1 (-13%)	-6.7 (-3%)	21.2 (5%)	-8%
Mid-West	19.6 (188%)	-22.5 (-13%)	-2.9 (-2%)	5.4 (2%)	-3%
South-East	31.8 (254%)	-42.1 (-19%)	-10.3 (-4%)	12.2 (3%)	-7%
South-West	27.9 (216%)	-42.5 (-13%)	-14.7 (-4%)	12.5 (2%)	-7%
State	217.2 (202%)	-328.5 (-15%)	-111.3 (-5%)	75.6 (2%)	-7%

Source: CSO Quarterly National Household Survey.

**FIGURE 2** Components of the Unemployment Change between Q3 2007 and Q3 2012

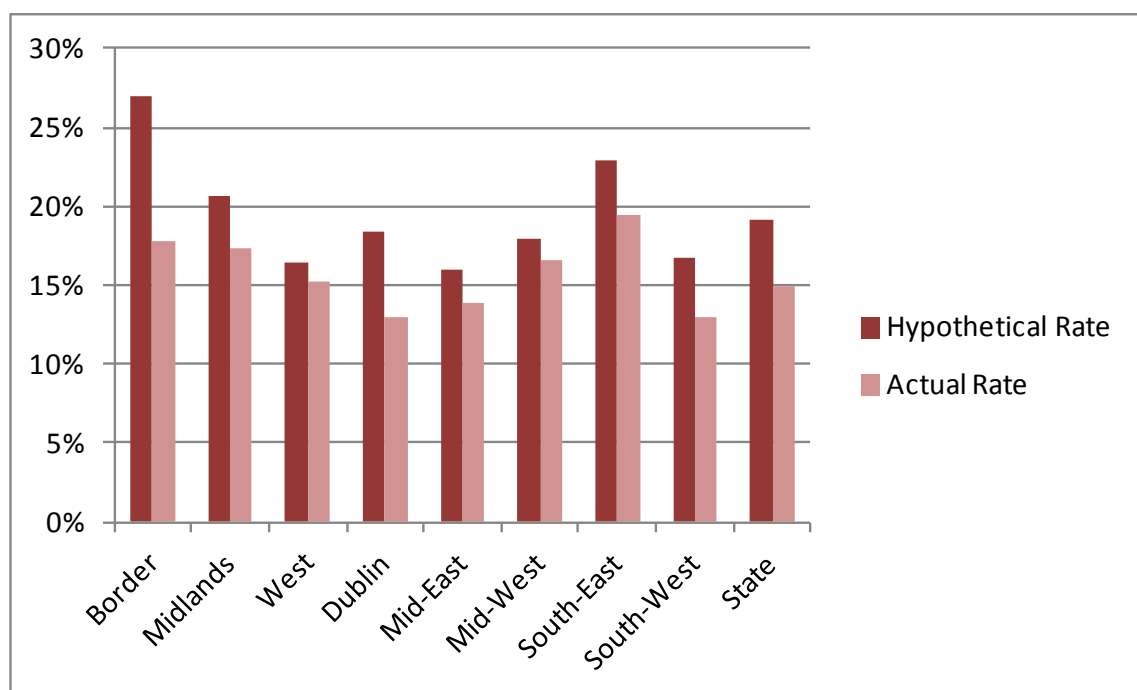


Source: Own calculations. The second order effects are very small and therefore barely noticeable. They are included here for completeness.

Having considered the components of change in unemployment it is also interesting to consider what the unemployment rate had been if the

demographic and participation changes had not occurred<sup>7</sup>. This calculation is easily done by dividing the numbers unemployed in 2012 by the labour force of 2007, which is shown in Figure 3 below. This shows that in the Border region in particular, the drop in participation rate of 13.5 per cent significantly dampened the rise in the unemployment rate, which could otherwise have reached 27 per cent. Dublin would also have experienced a significantly higher unemployment rate of 18 per cent instead of 13 per cent. However in the West the difference would have been quite modest (1 per cent) as the participation rate declined only slightly, as shown in Table 2.

**FIGURE 3** Actual and Hypothetical Unemployment Rate holding the Population and Participation at 2007 Levels



Source: Own calculations and CSO Quarterly National Household Survey.

### Employment Change

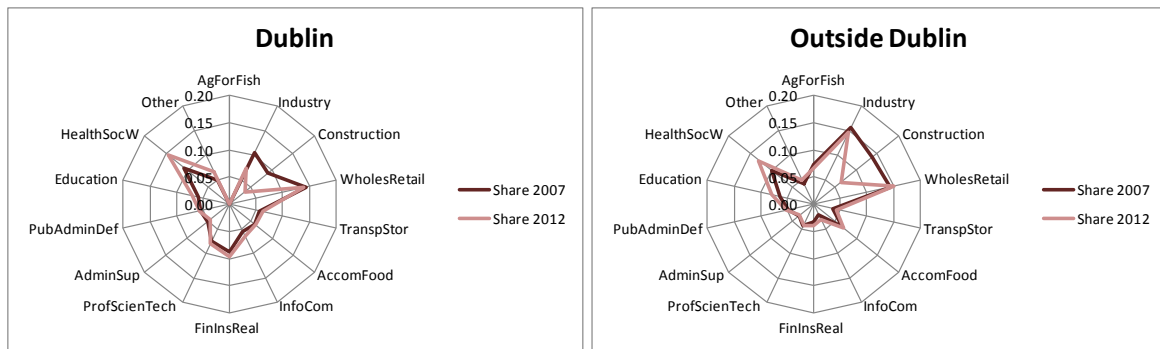
In the decomposition above total employment change was considered. However, it is well known that there are substantial differences in the sectoral composition of employment across regions (see Morgenroth 2009). Dublin in particular differs from the rest of the country in that it has a higher concentration of employment in services and particularly public services, which is shown in Figure 4 for 2007 and 2012. Dublin has a lower employment share in Agriculture, Industry and Construction and a higher share in Health and Social Work, Public Administration

<sup>7</sup> The impact of migration could not be considered here as regional migration figures for the period considered are not available.



and Defence, Financial Services Insurance and Real Estate, Professional, scientific and technical services. A sharp reduction in the share of employment accounted for by the construction sector can be seen in Figure 4, for both Dublin and outside of Dublin. Also notable is the fact that Health and Social Work and Public Administration increased their share of employment, reflecting the fact that both are largely public sector activities. Interestingly, the share of employment in industry in Dublin declined significantly during the crisis, while in the rest of the country this share remained almost unchanged.

**FIGURE 4** Sectoral Employment Shares in Dublin and the Rest of the Country Q3 2007 to Q3 2012



Source : CSO Quarterly National Household Survey <sup>8</sup>.

While Figure 4 clearly shows the differences in industrial structure, it is more difficult to identify the changes in employment by sector, which is more readily achieved in tabular form (see Table 3). Sectors that grew in all or all but one regions include Information and Communications, Education, and Health and Social Work. Other sectors declined but the level of change varies considerably across regions. The table clearly shows that employment in industry declined particularly strongly in the Dublin region. The accommodation and food services sector contracted particularly strongly in the Border and Midlands regions. Professional, scientific and technical sector employment declined by more than two fifth in the Midlands region. The West region benefitted from a 25 per cent increase in employment in education which constitutes 5 times the national average. The table shows that construction employment contracted by 63 per cent nationally, with a regional range between 69 per cent (West) and 55 per cent (Mid-East). Overall the change in construction employment is more uniform than the change in employment in any other sector, which suggests that the heterogeneity in the change in total employment is largely driven by changes in other sectors.

<sup>8</sup> *AgForFish* refers to Agriculture, forestry and fishing, *WholesRetail* refers to Wholesale and retail trade; repair of motor vehicles and motorcycles *TranspStor* refers to Transportation and storage, *AccomFood* refers to Accommodation and food service activities, *InfoCom* refers to Information and communication, *FinInsReal* refers to Financial, insurance and real estate activities, *ProfScienTech* refers to Professional, scientific and technical activities, *AdminSup* refers to Administrative and support service activities, *PubAdminDef* refers to Public administration and defence; compulsory social security, *HealthSocW* refers to Human health and social work activities and *Other* refers to Other NACE activities

**TABLE 3** Employment Change by Sector and Region between Q3 2007 and Q3 2012

Sector	Border	Midlands	West	Dublin	Mid-East	Mid-West	South-East	South-West	State
	%	%	%	%	%	%	%	%	%
Agriculture, forestry and fishing	-14	-23	-30	0	-27	-22	-18	-36	-24
Industry	-33	-18	-8	-41	-26	-26	-17	-14	-25
Construction	-63	-68	-69	-67	-55	-57	-66	-57	-63
Wholesale, retail trade; repair of motor vehicles and motorcycles	-17	5	-10	-17	-10	-15	-19	-3	-12
Transportation and storage	16	-4	27	-6	-4	-1	-16	-6	-3
Accommodation and food service	-30	-25	-17	-12	-10	7	-1	-4	-11
Information and Communication	-33	32	58	2	78	52	20	9	16
Financial, insurance and real estate	0	-20	15	-7	3	38	-12	-12	-4
Professional, Scientific, technical activities	-16	-43	-5	-9	-10	-8	-16	-22	-13
Administrative and support services	-34	0	-9	-26	-21	-31	-2	-12	-20
Public administration, defence; social security	-13	-14	-12	-10	-3	14	-10	-3	-8
Education	-1	7	25	4	3	5	2	1	5
Human health, social work	1	17	10	16	10	11	5	20	12
Other NACE	-8	-2	19	15	0	5	-4	-7	4
Not stated	0	0	0	0	0	0	0	0	-46
<b>Total</b>	<b>-22</b>	<b>-18</b>	<b>-12</b>	<b>-14</b>	<b>-12</b>	<b>-13</b>	<b>-18</b>	<b>-13</b>	<b>-15</b>

Source: CSO Quarterly National Household Survey.

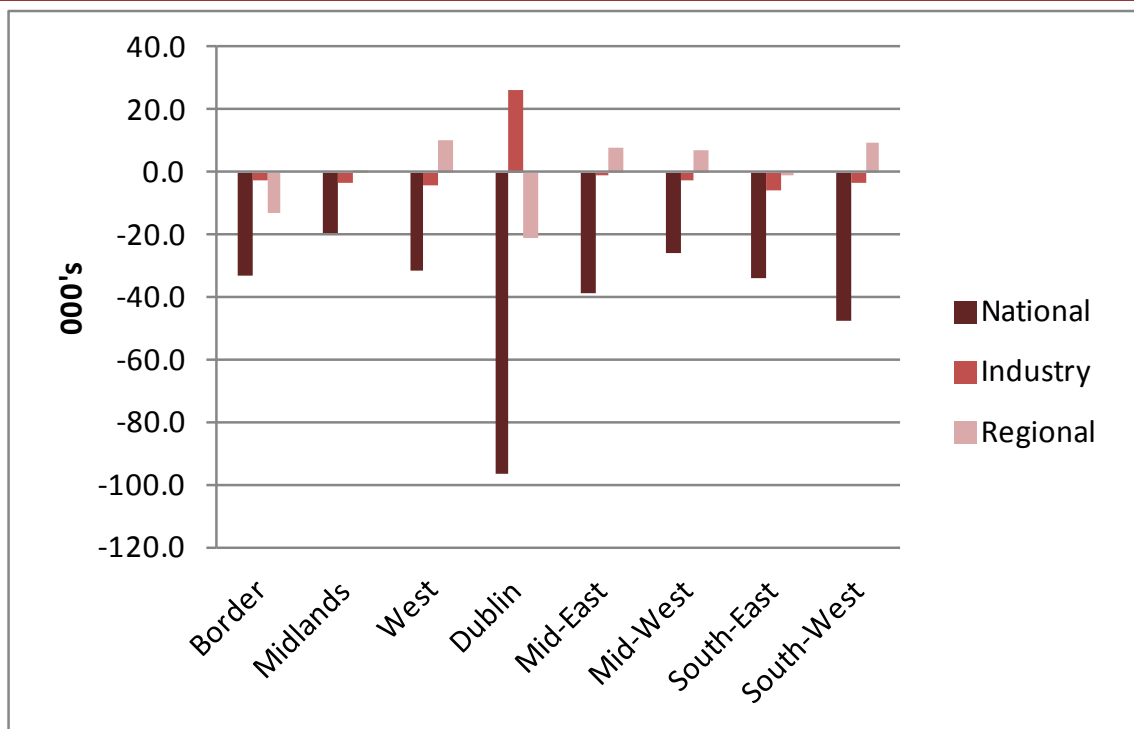
Given the considerable difference in economic geography between the regions and the very different growth performance of individual sectors, it is useful to consider how these compositional differences have impacted on employment change. Shift-share analysis has a long tradition as a method of analysis for this purpose.

Shift-share analysis decomposes the change in employment into a national component, an industry component and a regional component (Thirlwall, 1967, Jones, 2012). The national component identifies the change in employment had the national rate of change applied in the region, the industry component identifies the change in employment that is due to the employment trends in

each industry and the regional component measures employment change that is due to region specific factors.

The results of the shift-share analysis are shown in Figure 5 below. The most notable feature is that Dublin benefitted from the industrial mix present, while suffering more than other regions from the national trend which is not surprising given that Dublin significantly contributes to the overall national trend. Also notable is that the West, Mid-East, Mid-West and South-West had a positive regional component which implies that aspects specific to these regions had a positive impact on employment while such region specific factors had a negative impact on employment on the remaining regions. Overall the analysis suggests that the national trend contributed most to employment change in all regions. The region specific factors were also very important in all regions except the Midlands and the South-East.

**FIGURE 5** Shift-Share Components of Employment Change by Region Q3 2007 to Q3 2012



Source: Own calculations based on QNHS data.

### Micro-spatial Analysis

The analysis above has shown that there is significant heterogeneity across regions with respect to the unemployment rate and its underlying components. Such heterogeneity tends to be greater within regions than between regions and it is therefore also useful to consider unemployment at the micro-spatial level. This is possible using data from the CSO Census of Population, which provides

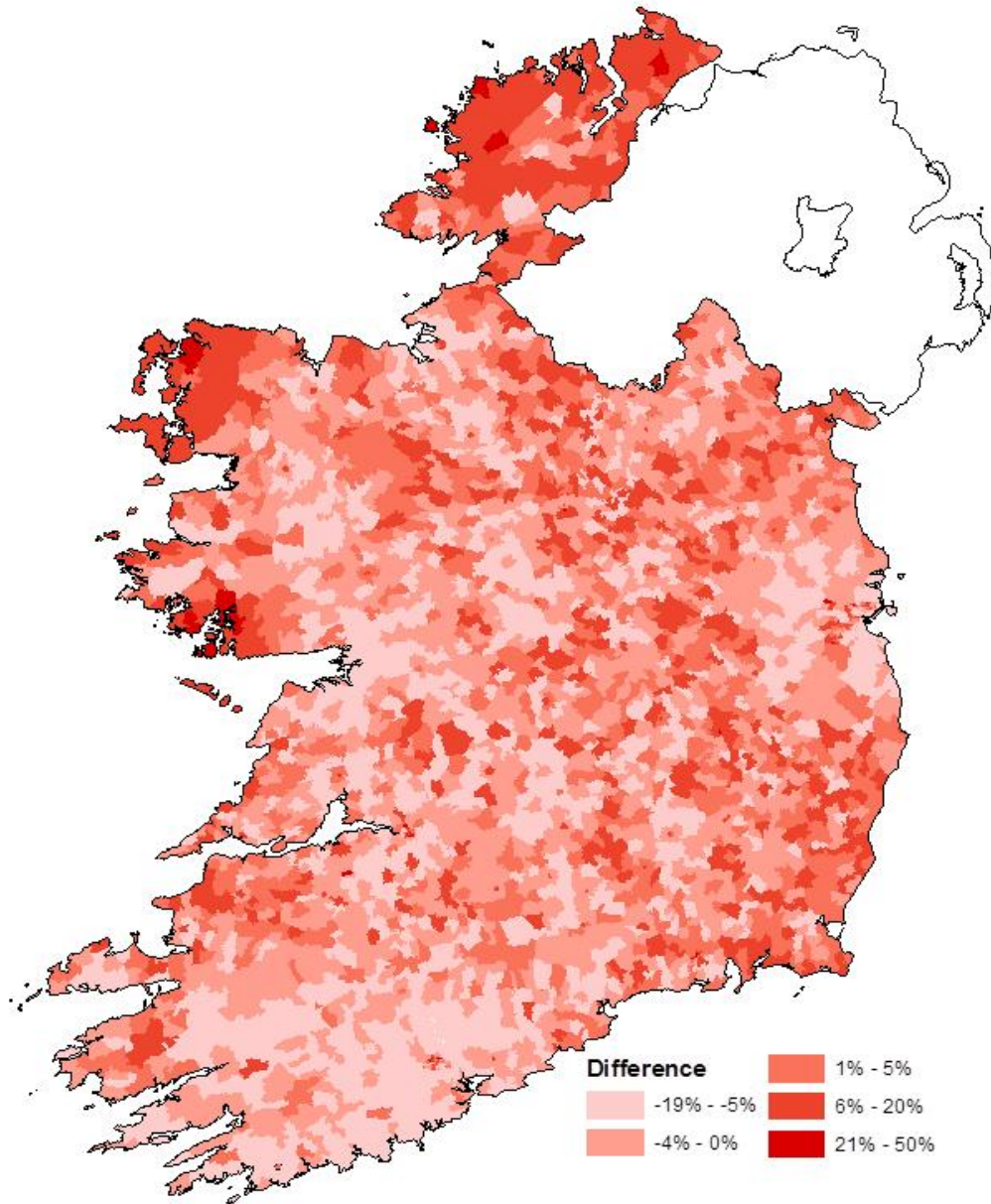
data for electoral districts as part of the Small Area Population Statistics (SAPS), which is available for census years<sup>9</sup>. Electoral districts are the smallest administrative units in Ireland. The SAPS gives details for just over 3,400 electoral divisions and they range in area from 5 hectares to just under 13,000 hectares and in population from 73 persons to just over 36,000 persons. Map 1 shows the deviation of the unemployment rate in each Electoral Division from the national average. An interesting spatial pattern can be observed, in that the hinterlands of Dublin, Cork and Galway and to a lesser extent Limerick, Sligo and Athlone have lower than average unemployment. Some of the most peripheral areas of Donegal, Galway and Mayo have substantially higher unemployment rates than the national average, but this is also the case in some urban areas in particular in Dublin, Cork and Waterford.

It is possible to consider some of the underlying drivers of the heterogeneity. The spatial pattern of the unemployment is highly persistent, as the correlation of unemployment rates between 2006 and 2011 is 0.67. However, the correlation between the unemployment rate in 2011 and 1991 is even higher at 0.74. The map gives an impression that more peripheral regions in general experience higher unemployment, and this is confirmed by the correlation between the unemployment rate and the average distance from an ED to all other EDs which is a measure of peripherality which is positive (0.13). However, the correlation between the unemployment rate and the agriculture share of employment which is a measure of the rurality of an ED is negative (-0.25). This may be due to some absorption of unemployed workers back into agricultural activities. Also interesting is that ED with a higher population density have a higher unemployment rate (correlation coefficient of 0.18). This basic analysis suggests that the differences are not simply reflecting an urban rural divide but are due to persistent underlying factors that have not been altered by the boom.

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<sup>9</sup> In Ireland a full census is taken every 5 years and the most recent census was taken in 2011.

**MAP 1** Deviation of the Local Unemployment Rate from the National Average 2011.



Source: CSO Census of Population, Small Area Population Statistics (SAPS).

### Summary and Conclusions

This paper has considered the regional dimension of the unemployment crisis. The analysis shows significant heterogeneity across regions. The unemployment rate in the region with the highest rate is 6.5 per cent higher than in the region with the lowest rate. Thus, national level statistics hide the fact that there are areas with considerably higher unemployment rates than the average and other with considerably lower rates.

A contraction in the labour force dampened the increase in the numbers unemployed, particularly in the Border and Dublin regions. In the Border region the unemployment rate would have reached 27 per cent if there had not been a very significant drop in the participation rate. As is well known, there are significant differences regarding the industrial specialisation across regions, with Dublin in particular having a very different industrial structure than the rest of the country. In addition the regions have been subject to differences in employment changes by sector. Nevertheless, national trends are responsible for significant proportion of the employment change, but regional factors also play a role. The analysis at the micro-spatial level shows that the heterogeneity at this level is significantly larger than even at the regional level.

The persistence of unemployment differentials suggests that there are underlying structural differences across regions. From a policy perspective this is important as national policies are unlikely to address these region and location specific factors. Indeed the persistence of the patterns suggests that past policies were ineffective at dealing with these structural differences.

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