Regional Economic Resistance and Divergence in Ireland 2011-2022

Chris van Egeraat, Declan Curran, Proinnsias Breathnach

Keywords: Regional resilience; Regional resistance; Industrial structure; FDI; Divergence; Ireland

1. Introduction

We have seen a surge of academic interest in the concepts of economic resilience and resistance, which refer respectively to the ability of national and regional economies to recover from the impact of external shock, and, the capacity to withstand potential external shock (Briguglio, Cordina, Farrugia, and Vella, 2008; Christopherson, Michie, and Tyler, 2010; Hassink, 2010; Hill, Wial, and Wolman, 2008; Hudson, 2010; Martin, 2012; Pendall, Foster, and Cowell, 2010; Pike, Dawley, and Tomaney, 2010; Simmie and Martin, 2010; Williams and Vorley, 2017; Martin, 2018; Li and Wang, 2022; Sutton and Godwin, 2022). While the incidence of adverse conditions, in the form of general and sectorally-specific recessionary downturns, could be considered to be an inherent feature of the functioning of capitalism, a number of additional factors have contributed to the recent burgeoning of interest in how economies respond to systemic shocks. These factors include globalisation processes, which have increased the exposure of national and regional economies to disturbances emanating from other parts of the world; the accelerating pace of technological change and its potentially undermining impact on regional economies dependent on technologies which rapidly become outdated; the expected onset of ecological crises thought to be associated with climate change; and the recent succession of non-climate-related natural disasters. It has also been argued that the accelerating financialisation of the global economy prompts progressively speculative forms of investment leading to increasingly frequent "bubble" creation and post-bubble crashes (Foster and Magdoff, 2009). The exceptional

severity of the financial crisis 2007-2009 has been of particular importance in focusing the minds of both academics and policy-makers on issues relating to resilience and resistance (Bristow, Healy, and Norris, 2014; Martin, Sunley, and Tyler, 2015).

Perhaps an inevitable consequence of the expanding body of literature relating to economic resilience has been a proliferation of differing interpretations of the term's meaning, leading to a lack of definitional and conceptual clarity (Martin, 2012). Thus, while Pike et al. (2010, p. 61) point to the underdeveloped state of theorisation of the "causal agents, relationships and mechanisms" associated with the resilience concept, Pendall et al. (2010) have highlighted the need for empirical exploration of the concept and the development of replicable analytical methods employing reliable qualitative and quantitative data for this purpose. There has, for example, been great variation in the time-frames applied both to the systemic shocks which test regions' resilience and the length of time over which responses to these shocks are monitored. Thus, shocks have been seen as short, one-off events (such as natural disasters or stock-market crashes), medium-term events (such as the emergence of new competitor technologies or regions), and long-term events (such as the decline of old industrial regions in advanced economies). There has also been much debate over the relative roles of restoration of pre-shock configurations or restructuring of these configurations as forms of post-shock recovery, and the respective impacts of these forms of recovery on long-term regional development trajectories (Martin, 2012).

A related issue is how recovery should be measured, whether in terms of basic indicators such as output, incomes, employment and population or in structural terms such as sectoral reconfiguration or enhanced entrepreneurial activity. This, in fact, is an issue that figures little in much of the recent literature on regional economic resilience - a literature which could be described as being long on theoretical discussion and short on empirical investigation. An exception to this is the work of Ron Martin and colleagues on the impact of successive recessions on employment in the UK regions from the early 1970s to the late 2000s (Fingleton, Garretsen, and Martin, 2012; Gardiner, Martin, and Tyler, 2012; Martin, 2012). Employing a variety of analytical techniques, this research has revealed a complex picture of the regional geography of recessionary impacts and post-recession recovery. There was considerable regional variation in the employment effects of recessions (although less so

with respect to the most recent recession) and in rates of post-recession employment recovery, with the spatial patterns of variation differing between recessionary periods. Furthermore, while those regions which experienced the lowest employment losses in the recession of the early 1980s tended to portray the strongest post-recession employment growth, the relationship between these variables, while not as strong, was reversed for the early 1990s recession and its aftermath. Regional differences in sectoral configuration have been a key determinant of the extent of recessionary impact, while for some regions, specific local characteristics (separate from sectoral mix) had significant positive or negative impacts.

The present paper adds to the body of empirical explorations of regional economic resilience and resistance through an examination of employment trends in state-aided firms in the Irish regions between 2011 and 2022. Such firms comprise the key element in the economic base underpinning the respective regional economies. A detailed breakdown by sector and nationality (Irish/foreign) enables us to monitor the performance of the different sectors and nationality groups which combine in varying combinations in the economic bases of the different regions. The examination of sectoral and nationality mix of Irish regions will be used to assess the regions' capacity to withstand potential external shocks post-2022, in this context referred to as economic resistance.

This paper continues with an exposition of the methodology. This is followed by a presentation of the broad national trends in employment in agency-assisted firms during the 2011-2022 period. The next section provides an analysis of regional resistance, which includes a descriptive account of the patterns of regional and sectoral employment change in state-assisted firms and an examination of the roles of sectoral and nationality mix in shaping the observed patterns of regional employment performance. The subsequent section considers the implications of the findings for regional economic divergence trends and the policy aim of balanced regional development in Ireland. The paper finishes with a summary of the findings and concluding remarks.

Methodology

While other studies have used total regional employment as their basic yardstick for monitoring regional economic change, the analysis here focuses specifically on employment in firms which are in receipt of assistance by one of the four Irish government agencies involved in enterprise promotion and development – the Industrial Development Agency (responsible for promoting inward investment in Ireland), Enterprise Ireland (responsible for promoting export activity in indigenous enterprise), Údarás na Gaeltachta (responsible for promoting development in the Gaelic-speaking districts, mainly on the western seaboard) and Shannon Development (which until 2014 has had a specific development remit for the Mid West region). Hereinafter, these firms are referred to as "agency-assisted" firms. For the purposes of the present analysis, agency-assisted firms in primary activities (a disparate group of little analytical value, and accounting for just over three per cent of total employment in assisted firms in 2011) have been excluded.

Employment and other data for agency-assisted firms are derived from an annual survey conducted by the Department of Enterprise, Trade and Employment. These firms accounted for one-sixth of all employment in manufacturing and services in 2011. Agency-assisted manufacturing firms comprised about 80 per cent of all manufacturing employment and 90 per cent of total merchandise exports [1]. Assisted services firms, while representing only seven per cent of total services employment, accounted for around 70 per cent of all services exports (which, in turn, comprised 49 per cent of total exports in 2011). Assisted firms, therefore, account for the great bulk of national exports. Foreign firms, which account for 55 per cent of all employment in assisted firms, export almost all (95 per cent) of their output. Assisted indigenous firms have a much lower export orientation (just over 50 per cent of output); however, many of these are engaged in import-substituting activities or are deemed to have some strategic or innovative value. Overall, therefore, assisted firms can be regarded as acting as key drivers of economic development at both national and regional levels, and trends in employment in these firms provide a key indicator of regional economic wellbeing.

For the purposes of this paper, employment data for agency-assisted firms by nationality, region and sector for the years 2011 and 2022 were extracted from the Department's survey database. The year 2011 is here considered as the beginning of a period of recovery and growth in Ireland following the global financial and economic crisis. In contrast with the study conducted by Breathnach et al. (2015), in which the analysis was based on 'regional functional fields', the analysis in the current study is based on the territories of the former eight regional authorities (Figure 1). This increases the policy relevance of the study since, although the regional authorities were disbanded in 2014, the regions are still in use as statistical units to support regional planning. Table 1 shows the population of each of these regions in 2011 (the mid-point of the period used for the empirical analysis). The relatively large population of the Dublin region compared to other regions may be noted.

Table 1. Regional population data, 2011.

Region	Regional Population
Border	391,900
Dublin	1,261,500
Mid-East	657,400
Mid-West	466,800
Midlands	283,800
South-East	410,300
South-West	662,300
West	440,800
State	4,574,900

Source: Central Statistics Office

A distinctive and important feature of the analysis presented here is that the employment data are disaggregated into fifteen manufacturing and four services sectors. These include 17 sectors representing individual NACE three-digit codes or combinations thereof and residual

Other Manufacturing and Other Services sectors (which, between them, accounted for approximately ten per cent of total employment in agency-assisted firms in 2011). The separate identification of the Software & Computer Services, Financial Services and Other Business Services sectors is particularly useful as, unlike most other services subsectors, in Ireland these are strongly export-oriented and account for a large proportion of Ireland's total exports (42 per cent in 2011).

The methodology used in this paper was adapted from that used by Breathnach et al. (2015) in their study of regional economic resilience in Ireland during the global financial crisis. Breathnach et al. (2015), adopted an ex-ante approach to predict the impact of a recession on future (post-recession) regional employment performance (the level of resilience). It examined how 'regional functional fields' performed in terms of employment in agency-assisted firms in the largely recessionary 2006-2011 sub-period compared with the expansionary 2001-2006 sub-period which immediately preceded it. The authors divided both sectors and regions into three "growth categories" i.e. those which lost employment in both the 2001-2006 and 2006-2011 sub-periods, those which gained employment in both periods, and those which gained employment in the first period and lost employment in the second period. The first growth category was regarded as encompassing sectors/regions undergoing long-term decline (i.e. they would probably have continued to decline even if the recession had not occurred). These were referred to as LTD (long-term decline) sectors/regions. The second growth category involved sectors/regions whose growth trajectory was not halted by the recession (although it may have been slowed down). These were referred to as LTG (long-term growth) sectors/regions. The third growth category referred to sectors/regions whose growth trajectory was reversed during the recession, and which might have continued to grow in the absence of recession. If the latter is the case, then these sectors/regions might be expected to resume growth once relatively "normal" conditions return. These were referred to as RS (recession-sensitive) sectors/regions.

The analysis identified those sectors and regions falling into the three growth categories employed above and set out their respective employment performances in the two sub-periods. It subsequently examined the relationship between regional employment

performance during the recession and prior regional sector and nationality mix. A resilience index, based on the balance between, on the one hand, sectors which grew in both sub-periods and sectors which experienced pre-recession growth and contraction during the recession, and, on the other, those which declined in both periods, was proposed which sought to link regional employment change during the recession to pre-recession sectoral composition.

The predictive value of the ex-ante approach was tested in a recent study by Van Egeraat et al. (2023) by linking the regional employment performance categories pertaining to the 2001-2011 period and the regional employment performance in the post-recession period (2011-2022). The study established evidence of a link, with the three regions with the lowest resilience index values (in 2006), experiencing the weakest employment growth in the post-recession period and the region with the highest resilience index by far, Dublin, also experiencing by far the strongest increase in employment. The correlation coefficient between the resilience index and post-recession employment change confirmed strong predictive power.

The current paper aims to predict the administrative regions' capacity to withstand potential future shocks after the 2011-2022 period. It adopts the same general approach used by Breathnach et al. (2015) - using the current sectoral mix to predict future regional performance. However, given the fact that Ireland is currently not experiencing a recession, it is not possible to apply the same methodology involving LTD, RC and LTG categories. We still use regional differences of sectoral mix, but we now apply the differences in performance during a period of employment growth. Since virtually all sectors and regions experienced employment growth in the 2011-2022 period, we employ two new growth categories, i.e. those sectors/regions which experienced above-average growth (AAG) and those which experienced below-average growth (BAG). We here employ the concept of regional resistance, which refers to a region's capacity to withstand external shocks (whereas resilience refers to a region's ability to recover where it has been impacted negatively by an external shock) (Martin, 2012). One might expect that regions with a high share of AAG employment relative to BAG employment would be more resistant to employment loss during recession.

Patterns of sectoral/regional employment change 2011-2022

Before presenting the detailed tables on sectoral and regional employment change, by way of context Table 2 presents broad national trends in employment in agency-assisted firms. It shows that total employment in these firms grew strongly (71.2%) between 2011 and 2022. Employment in foreign firms grew faster (85.1%) than employment in indigenous firms (52.0%). The foreign sector's share of total employment therefore increased over the period, from 58.0% to 62.7%. The table also subdivides total employment into manufacturing and services components. These components show diverging trajectories over the period, with services employment growing at a substantially faster rate (108.2%) than manufacturing employment (45.8%). Thus, the services share of total employment grew from 40.6% in 2011 to 49.4% in 2022. This had important implications for the indigenous/foreign division of employment, as foreign firms had a dominant (63.6%) share of services employment in 2011, and stronger growth in foreign services employment saw the foreign share of this sector increase to 69.9% in 2022.

Table 2: Employment change in agency assisted firms by nationality and broad sector, 2011-2022

	2011	2022	% Change, 2011-2022
Total Employment	293,445	502,309	71.2
Irish firm employment	123,250	187,326	52.0
Foreign firm employment	170,195	314,983	85.1
Foreign (%)	58.0	62.7	
Manufacturing employment	174213	254013	45.8
Manufacturing share of total employment (%)	59.4	50.6	
Foreign share of manufacturing employment (%)	54.2	55.6	
Services employment	119232	248296	108.2

Services share of total employment (%)	40.6	49.4
Foreign share of services employment (%)	63.6	69.9

Table 3 shows employment change between 2011 and 2022 in those sectors residing, respectively, in the below-average growth (BAG) and above-average growth (AAG) growth categories. The average growth rate of all sectors was 52.8%. Ten of the 19 sectors (accounting for 37.1% of total 2011 employment but only 28.3% in 2022) fell into the BAG category – all in Manufacturing. Nine sectors (of which 4 were in Services) are included in the AAG category, whose share of employment rose from 62.8% in 2011 to 71.6% in 2022. The Printing, Textiles, Furniture and Other Manufacturing sectors experienced negative or particularly low growth rates. The Plastic & Rubber products sector, with a growth rate of 53.7%, just makes it into the AAG category. The services sectors experienced very high growth with the Other Business Services sector nearly tripling in size and Software & Computer Services, starting from an already large base in 2011, more than doubling its employment.

Table 3: Employment in below average growth (BAG) and above average growth (AAG) sectors, 2011-2022

Sector	2011	2022	% change, 2011-2022
BAG sectors			
Meat processing	13,303	18,876	41.9
Dairy processing	7,075	8,972	26.8
Other food and beverages	22,765	28,465	25.0

Textiles, clothing, leather	3,207	3,283	2.4
Timber processing	4,353	5,469	25.6
Printing/reproduction of recorded media	3,018	2,192	-27.4
Metals and engineering	23,671	35,332	49.3
Electronic products	18,479	25,121	35.9
Furniture	2,818	3,300	17.1
Other Manufacturing	10,370	11,473	10.6
Total	109,059	142,483	30.6
BAG share of total employment	37.2	28.4	
AAG sectors			
Cement and concrete products	2,739	4,717	72.2
Pharmachemicals	23,494	41,897	78.3
Plastic and rubber products	6,512	10,012	53.7
Medical Devices	27,380	46,778	70.8
Electrical engineering	5,029	8,126	61.6
Other business services	12,894	35,911	178.5
Software and computer services	64,577	135,035	109.1
Financial services	22,687	40,286	77.6
Other services	19,074	37,064	94.3
Total	184,386	359,826	95.1
AAG share of total employment	62.8	71.6	

Table 4 shows the employment performance of those regions in the BAG and AAG categories. All regions experienced healthy employment growth in the 2011-2022 period and the average of all regional growth rates stands at 63.2%. However, there are substantial

differences in the rates of growth. The four AAG regions include three of the four main urban centres of Ireland as well as the Midlands, the region bereft of significant urban centres. The Dublin region experienced by far the strongest increase in employment, nearly doubling in size. These regions together accounted for 64.5% of total employment in 2011 (and 68.9% in 2022). The regions in the BAG group display employment growth rates ranging from 41.6% to 57.5%. The Border region's performance was by far the weakest.

Table 4: Employment in below average growth (BAG) and above average growth (AAG) regions, 2011-2022

Region	2011	2022	% change, 2011-2022
BAG regions			
Border	20,840	29,505	41.6
Mid East	32,436	47,735	47.2
Mid West	28,892	44,042	52.4
South East	22,093	34,800	57.5
Total AAG regions	104,261	156,082	49.7
AAG regions			
Dublin	101,889	197,625	94.0
Midlands	10,425	18,141	74.0
South West	47,669	81,371	70.7
Total AAG regions	189,184	346,227	83.0

Explaining regional employment performance 2011-2022

The role of sectoral mix in explaining regional employment performance 2011-2022

Having shown the varying overall sectoral and regional employment performances during the 2011-2022 period, the paper now examines the extent to which regional performance may have been linked to regional sectoral mix. A feature of Table 11 is the great variation between sectors in terms of growth during the 2011-2022 period. Accordingly, the varying sectoral mixes of the different regions can be expected to have had a major bearing on these regions' respective employment performances during that period. Table 13 shows (in columns 2-3) for each region, the division of employment between the two growth categories for 2011 and the region's overall employment performance between 2011-2022. This allows us to assess, in a post-hoc fashion, the extent to which the sectoral mix at the beginning of the period may have influenced actual employment performance by region during the period in question.

Table 5 provides some evidence of a link between employment performance and prior sectoral mix. The average share of AAG employment for regions is 55.5%. The Dublin region, with by far the highest share of AAG employment (81.1%), also exhibits by far the highest level of employment growth in 2011-2022. The West and South West regions, two other regions with relatively high shares of AAG employment, exhibit what are among the highest rates of employment growth. Meanwhile, the Border and Mid East regions, the two regions with the lowest shares of AAG employment in 2011, exhibit the lowest level of employment growth in the subsequent period. The main outlier here is the Midlands region that, despite a relatively low proportion of AAG employment (45.3%), still had the second highest rate of employment growth between 2011-2022. The anomaly is driven to a large extent by the positive performance of a relatively small number of companies in the BAG Meat processing and Metals & engineering sectors.

Table 5: Growth category distribution and employment change, 2011-22

	% Employment by growth category 2011

Region	AAG	BAG	% change 2011-2022	Index[a]
Border	43.8	56.2	41.6	0.78
Dublin	81.1	18.9	94.0	4.30
Mid East	44.5	55.5	47.2	0.80
Mid West	51.8	48.2	52.4	1.07
Midlands	45.3	54.7	74.0	0.83
South East	49.7	50.3	57.5	0.99
South West	55.8	44.2	70.7	1.26
West	71.7	28.3	68.1	2.53
Ireland	62.8	37.2	71.2	

Notes: [a] AAG employment divided by BAG employment

We also calculate a simple index to predict the regions' employment performance during the 2011-2022 period. Given the fact that the period under consideration does not contain a recessionary sub-period, it is not possible to calculate the resilience index proposed by Breathnach et al. (2015). Instead we propose a simpler index which divides, for each region, the share of employment taken by AAG sectors by the share taken by BAG employment in 2011. Further on we will employ this index to predict employment performance of regions in the context of a potential future shock post-2022. Although this is comparable to the resilience index, it is calculated differently and we will later refer to this as the resistance index. The concept of regional resistance refers to a region's capacity to withstand external shocks (Martin, 2012). One might expect that regions with a high share of AAG employment relative to BAG employment would have a greater capacity to withstand potential external shocks.

The values of this index, based on the 2011 sectoral mix, are shown in column 5 of Table 5. The index shows that the Border, Mid East, Midlands and South East regions had among the lowest index (below one) and, on the basis of the 2011 sectoral mix, were expected to have the least favourable employment performance over the 2011-2022 period. The Midland's

anomalous position is again evident here. The Dublin, West and South West regions had the highest index values and would be expected to have the best employment performance. The Pearson correlation coefficient between this index and employment change for the 2011-2022 period suggests a very strong relation (0.8).

Having again demonstrated a strong relation between sectoral mix and employment performance over the 2011-2022 period, we now employ the approach to explore the likely resistance of Irish regions to potential future shocks post-2022, based on each region's sectoral mix in 2022. Table 6 presents (in columns 2 and 3) for each region, the division of employment between the two growth categories for 2022. We observe that all but one region experienced an improvement in their sectoral mix, resulting in a greater proportion of employment accounted for by AAG sectors. The strongest positive restructuring in the 2011-2022 period is experienced in the Dublin, Mid West and South East regions. Dublin, a region that already had a strong sectoral mix in 2011, experienced strong growth of its share of AAG employment (9.3 percentage points), so that by 2022 over 90% of its employment was accounted for by AAG sectors. In the Mid West and South East regions the share increased by 9.3 and 8.4 percentage points respectively. But in both of these regions the share of AAG sectors remains below the average of all regions. Meanwhile, the Border region was the only region that experienced a deterioration of its sectoral structure, with the share of employment in AAG sectors falling from 43.8% to 42.7%.

Table 6: Growth category distribution and employment change, 2011-22 and employment by growth category 2022

	% Employment by growth category 2022			
Region	AAG	BAG	% change 2011-2022	Resistance Index
Border	42.7	57.3	41.6	0.75
Dublin	90.4	9.6	94.0	9.42
Mid East	47.1	52.9	47.2	0.89
Mid West	61.1	38.9	52.4	1.57

Midlands	49.8	50.2	74.0	0.99
South East	58.1	41.9	57.5	1.39
South West	63.6	36.4	70.7	1.75
West	77.5	22.5	68.1	3.44
Ireland	71.6	28.4	71.2	

Notes: [a] AAG employment divided by BAG employment

Table 6 shows (in column 5) what this restructuring means for the regional resistance index, based on the 2022 sectoral mix. The index suggests that the Border region is the least resistant to potential future shocks. It has by far the lowest index value (0.75) and the index has fallen since 2011. Other regions with relatively low resistance indexes include the Mid East and the Midlands, although the resistance of these two regions has improved due to sectoral restructuring during the 2011-2022 period. At the other end of the spectrum, Dublin has a very high index of 9.42. The West also has a strong resistance index while those of the South West and Mid West are also relatively strong.

The foreign sector's role in explaining regional employment performance 2011-2022

A potentially significant factor in determining regional employment performance during the 2011-2022 periods is the role of the foreign sector, which is generally associated with greater dynamism and technological sophistication than the indigenous sector. Table 7 shows the proportion of employment in each region accounted for by foreign firms in 2011, and also the rate of total employment growth in each region between 2011-2022. The foreign-firm share of employment ranges from a high of 64.7% (Dublin) to a low of 41% (South East). There is some indication of a link between foreign firm presence and employment performance. Three of the regions with relatively high proportions of employment in foreign firms (Dublin, West and South West) are among the four regions with the highest employment performance. At the same time, the region with the second highest foreign firm presence (Mid West) had a relatively low employment performance and the region with the third lowest foreign firm presence (Midlands) had the second highest employment performance. The Pearson

correlation coefficient between foreign-firm share and rate of employment growth is moderate (0.49).

Table 7: Foreign firms' share of employment 2011 and 2022, and total employment change, 2011-22 (%)

Region	Foreign firms' share of total employment, 2011	Total employment change, 2011-22	Foreign firms' share of total employment, 2022
Border	42.5	41.6	39.4
Dublin	64.7	94.0	71.5
Mid East	53.1	47.2	49.3
Mid West	62.0	52.4	61.7
Midlands	44.8	74.0	48.6
South East	41.0	57.5	47.0
South West	59.8	70.7	66.4
West	62.0	68.1	65.4
Ireland	58.0	71.2	62.7

Table 8 shows the post-2011 employment performance of those sectors dominated (i.e. >70% of total employment), respectively, by foreign firms and by Irish firms. Of the five foreign-dominated sectors, all but one reside in the AAG category, compared with three out of eight Irish-dominated sectors. While the foreign sector, therefore, performs better, not all foreign-firm dominated sectors experience above-average growth. Thus, whereas during this period there is again evidence that foreign firms tend to be found in sectors characterised by AAG, the relationship between the two is again not clearcut, as foreign firms dominate the Electronics sector that has been performing below average and Irish firms dominate a number of sectors that are performing above average. One might therefore conclude that, in line with previous studies (Breathnach et al., 2015), in this period too, it is the sectoral mix, per se, more than the nationality mix which has the main impact on regional growth performance.

Table 8: Growth performance of sectors by foreign/Irish domination, 2011-22

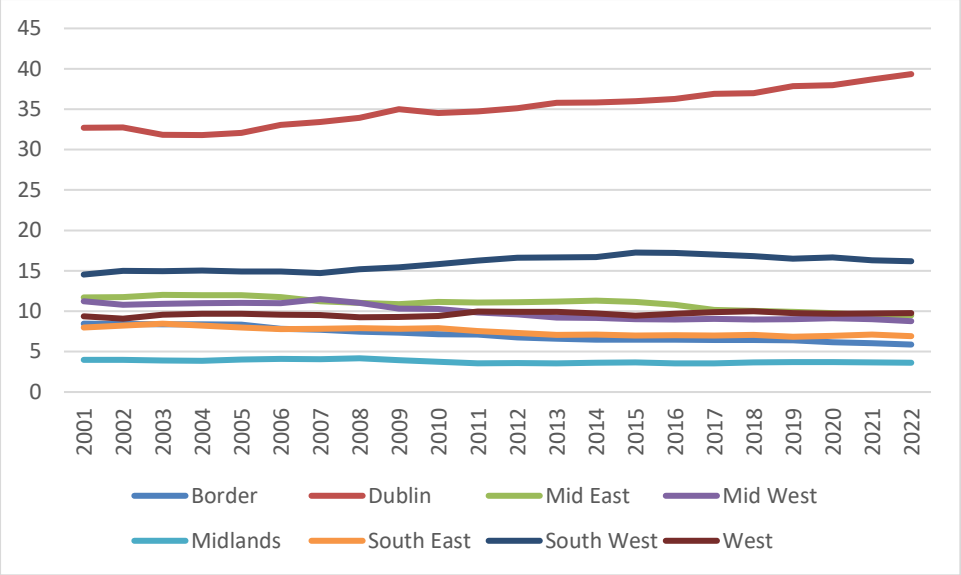
Sector	Growth Category	Total Employment 2011	Foreign % 2011	Total Employment 2022	Employment change 2011-22 (%)
Foreign-firm dominated					
Medical Devices	AAG	27,380	94.6	46,778	70.8
Electronic products	BAG	18,479	91.0	25,121	35.9
Pharmachemicals	AAG	23,494	90.0	41,897	78.3
Financial services	AAG	22,687	83.2	40,286	77.6
Software and computer services	AAG	64,577	79.9	135,035	109.1
Plastic and rubber products	AAG	6,512	54.1	10,012	53.7
Irish-firm dominated					
Other Manufacturing	BAG	10,370	42.1	11,473	10.6
Other food and beverages	BAG	22,765	41.4	28,465	25.0
Electrical engineering	AAG	5,029	40.0	8,126	61.6
Metals and engineering	BAG	23,671	31.9	35,332	49.3
Other services	AAG	19,074	17.0	37,064	94.3
Other business services	AAG	12,894	16.4	35,911	178.5
Furniture	BAG	2,818	14.9	3,300	17.1
Printing/reproduction of recorded media	BAG	3,018	14.1	2,192	-27.4
Textiles, clothing and leather	BAG	3,207	13.6	3,283	2.4
Cement and concrete	AAG	2,739	11.6	4,717	72.2
Meat processing	BAG	13,303	10.2	18,876	41.9
Timber processing	BAG	4,353	9.1	5,469	25.6
Dairy processing	BAG	7,075	3.5	8,972	26.8

Finally, in order to explore the resistance of the regions to potential future shocks post-2022, Table 15 (in column 8) also presents the proportion of employment in each region accounted for by foreign firms in 2022. The foreign-firm share of employment in 2022 ranges from a high of 71.5% (Dublin) to a low of 39.4% (Border). Based on the foreign firm share, we may expect the Dublin, Mid West, South West and West regions to be in the best position to withstand a potential future shock. At the other end of the spectrum, the Border, Midlands, Mid East and South East regions, all with foreign firm shared below 50%, can be expected to be less resistant.

Implications for regional economic divergence

For over twenty years, balanced regional development and creating a counter-balance to Dublin have been core aims of both the National Spatial Strategy (Department of the Environment and Local Government, 2002) and the National Planning Framework (Government of Ireland, 2018). In spite of this, the historical trend of regional divergence continues unabated. Figure 1 presents the changes in the regional shares in employment in all agency-assisted firms. The share of the Dublin region in agency-assisted firms increased from 32.7% in 2001 to 34.7% in 2011 and, by 2022, Dublin's share has increased to 39.3%. The combined share of the three most vibrant regions (Dublin, South West and West) increased from 56.6% to nearly two thirds (65.3%) over the same period.

Figure 1: Regional shares (%) employment all agency-assisted firms, 2001-2022



The concentration of foreign firm employment is even starker, with the share of the Dublin region growing from 35.8% in 2001 to 38.7% in 2011 (See Figure 2). By 2022, Dublin accounted for nearly 45% of employment in foreign firms. The combined share of the three most vibrant regions (Dublin, South West and West) increased from over 60% to over 72%. Figure 3 shows Dublin's share in the annual growth of employment in foreign firms. This share ranged from 39.6% to 61.9%. In all but two years, Dublin's share of the growth in foreign firm employment was higher than Dublin's existing share in foreign firm employment. In the four years up to and including 2022, Dublin's share of the growth (ranging from 55%-62%) has been substantially above its existing share of employment in foreign firms.

Figure 2: Regional shares (%) employment agency-assisted foreign firms, 2001-2022

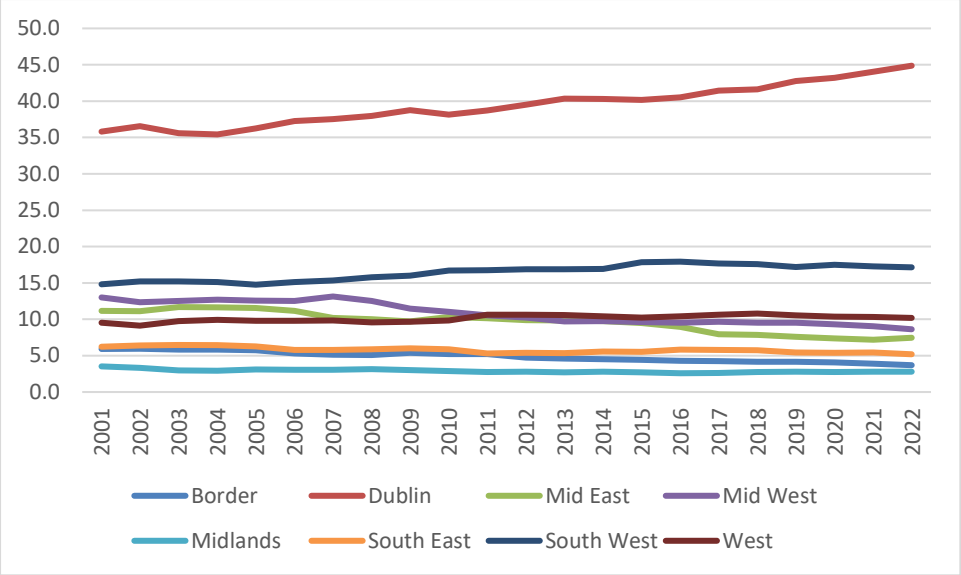
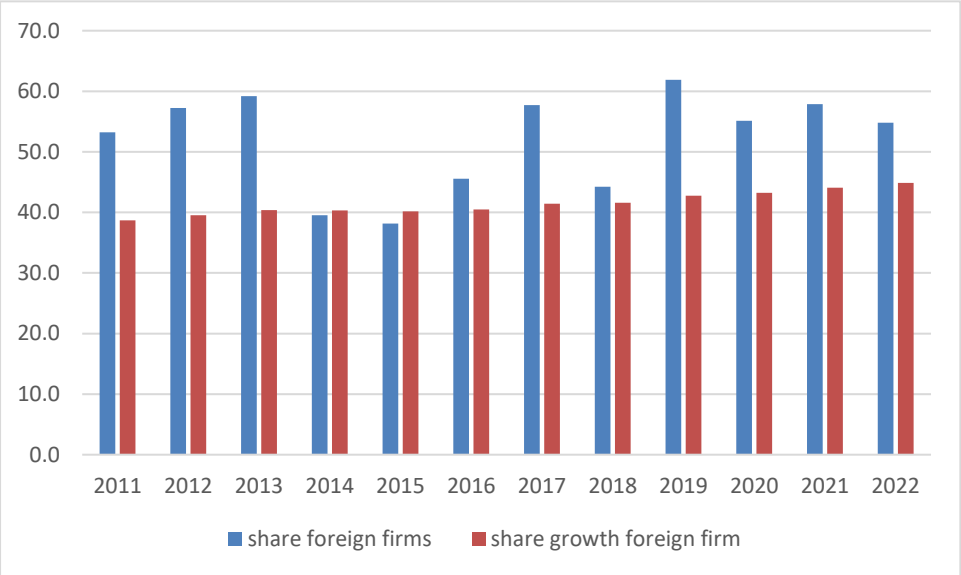


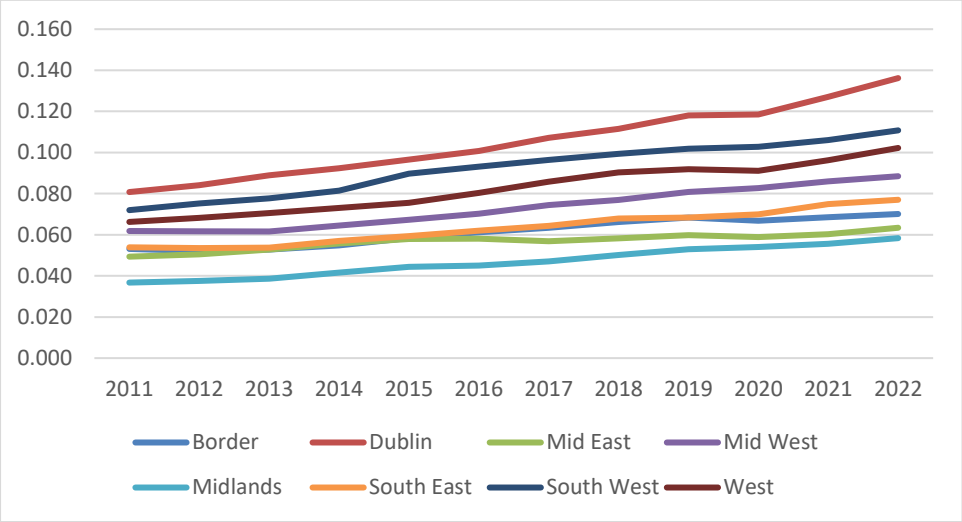
Figure 3: Dublin's share (%) in foreign firm employment and in annual growth foreign firm employment, 2011-2022



To put this into perspective, Figure 4 presents regional employment in agency-assisted firms per head of regional population. Employment per capita in the Dublin region increased from 0.081 in 2011 to 0.136 in 2022, a growth of 67.9%. This compares to a much lower employment per capita in the Midlands region, where it grew from 0.037 to 0.058 over the same period, a rate of growth of 56.8%. Thus, employment in agency-assisted firms is not

only becoming concentrated in a select number of regions, it is also becoming concentrated at a rate faster than that of the population as a whole. Some of this reflects the increasing levels of inter-regional commuting, notably commuting into the Dublin region from a spatially extensive hinterland. But it is not all down to commuting. Other regions, notably the South West and the West, are characterised by relatively high and strongly growing levels of employment per capita as well (0.111 and 0.102 respectively in 2022).

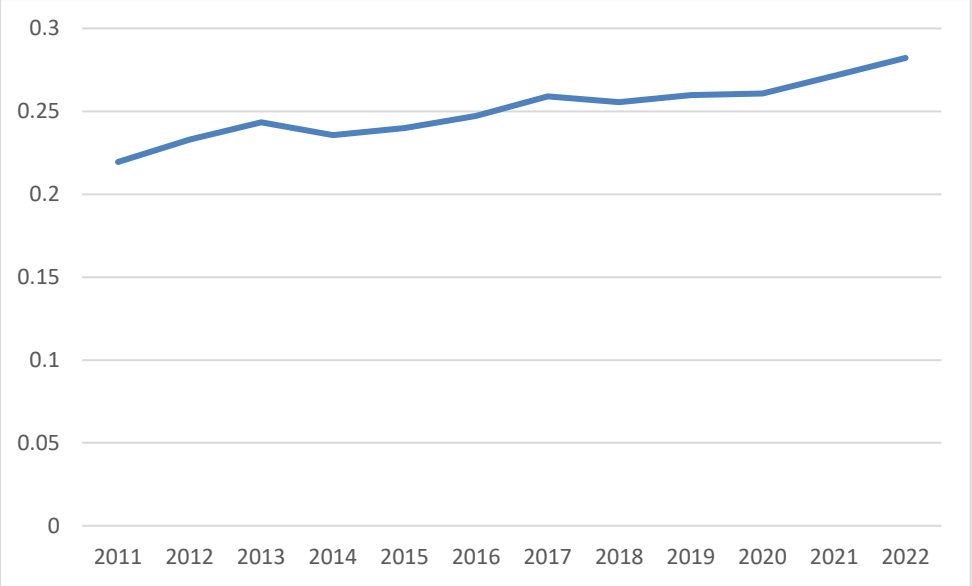
Figure 4: Regional jobs in agency assisted firms per head of population, 2011-2022



Source: Central Statistics Office for population data

Figure 5 presents the coefficient of variation, a simple measure to assess the level of dispersion of observed values of a given variable across a set of units. In this case, the variable of interest is employment in agency assisted firms per capita and the units in question are our eight regions. The higher the coefficient, the greater the dispersion of the variable amongst the regions. The figure shows clear evidence of overall regional divergence with the coefficient rising from 0.22 in 2011 to 0.28 in 2022.

Figure 5: Coefficient of variation for employment in agency assisted firms per capita, 2011-2022



Note: the coefficient of variation is calculated as the ratio of the standard deviation to the mean and shows the extent of variability in relation to the mean.

Conclusions

This paper has examined how Ireland's administrative regions coped during the 2011-2022 period of economic recovery, as measured in terms of employment in firms in receipt of assistance from the state's enterprise agencies. A 19-sector taxonomy was used, with both regions and sectors being classified in terms of those which experienced below and above average growth during the 2011-2022 period. We first established, in a post-hoc fashion, the relation between sectoral mix in 2011 and employment performance during the 2011-2022 period. Three regions with relatively high shares of above-average growth sectors in 2001 (Dublin, West and South West) exhibited rates among the highest in terms of employment growth, while the two regions with the lowest shares of above-average growth employment in 2011 (Border and Mid East) exhibited the lowest level of employment growth. The correlation between sectoral mix in 2011 and employment performance was found to be strong. Regarding nationality mix, in line with the findings of previous studies (Breathnach et al., 2015) although there is evidence that foreign firms tend to be found in sectors characterised by above-average growth, the relationship between the two is not clearcut, and

the correlation between foreign-firm share in regional employment and rate of regional employment growth is only moderately positive.

Having demonstrated a strong relation between sectoral mix and employment performance over the 2011-2022 period, the same approach was employed to predict the performance of regions in the context of potential future shocks post-2022. In this context the paper employed the term regional resistance, which refers to a region's capacity to withstand external shocks. The paper proposed a resistance index which divides, for each region, the share of employment taken by above-average growth sectors by the share taken by below-average growth sectors in 2022. Based on this index, the paper suggests that the Border region is the least resistant to potential future shocks. It has by far the lowest resistance index value and the index has fallen since 2011. Other regions with relatively low resistance indexes include the Mid East and the Midlands. The Dublin, West and South West regions all have high levels of resistance. Based on 2022 nationality mix, one might expect the Dublin, Mid West, South West and West regions to be in the best position to withstand a potential future shock, while the Border, Midlands, Mid East and South East regions can be expected to be less resistant.

The findings presented here have clear regional policy implications. Over 20 years ago the Government launched the National Spatial Strategy (Department of the Environment and Local Government, 2002). Against the background of continuing disparities in per capita disposable income between the Dublin region and the rest of the country, the aim was to deliver 'balanced regional development' - more balanced social, economic and physical development between regions. The NSS framework recognised that the location of enterprise was the key driver of influencing spatial patterns of development. The implementation of the NSS encountered many challenges (Meredith & van Egeraat, 2013) and in February 2013 the Minister for the Environment, Community and Local Government announced that the strategy had failed and would need to be replaced by a new framework (Ó'Riordáin and Van Egeraat, 2016). Recognising that the continuing level of spatial divergence was untenable, one of the policy objectives of the new National Planning Framework (Government of Ireland, 2018) was that the projected level of population and employment growth in the

Eastern and Midland Regional Assembly area would be at least matched by that of the Northern and Western and Southern Regional Assembly areas combined.

However, in spite of the long-term focus of the Irish Government on establishing balanced regional development, this paper gives evidence of continued regional divergence over the last decade, with an increasing share of employment in agency-assisted firms, particularly in firms in high-growth sectors and in foreign firms, becoming concentrated in a small number of statistical regions. These tend to be the regions with the largest urban centres, notably Dublin. By 2022, Dublin accounted for nearly half of foreign-firm employment. Overall, employment per capita in Dublin is the highest of all regions, and is growing at the fastest rate. Thus, employment in agency-assisted firms is not only becoming concentrated in a select number of regions, it is also becoming concentrated at a faster rate than that of the population as a whole. The rising coefficient of variation for regional employment in agency-assisted firms per capita points to overall regional divergence.

We need to qualify the statements about regional economic divergence on at least two points. Firstly, this research does not deal with all employment. The research only analysed the employment dynamics of agency-assisted firms. These only account for 80 per cent of all manufacturing employment and seven percent of total services employment. Employment in non-agency assisted firms and institutions, notably in public services, shows lower levels of regional concentration. However, assisted firms can be regarded as acting as key drivers of economic development at both national and regional levels. Secondly, some of the impact of divergence in employment performance is cushioned by differences in the level of regional government expenditure and progressive taxation. Public finance tends to act as a 'regional stabiliser' (Pike et al, 2017), reducing the differences in regional disposable income per capita. This effect is evident in the Irish regions as well (Walsh 2023).

Still, we do observe regional economic divergence and variations in levels of regional resistance to potential future shocks. The definition of regional development is a normative one, and regional development is whatever we define it to be. Some observers might argue that there is nothing wrong with large differences in economic performance amongst regions. Notably scholars adhering to the 'new economic geography' or 'urban economics' schools of regional development (Pike et al., 2017) tend to emphasise the importance of 'economic

motor' regions and perceive spatial disparities as necessary for national growth. These call for a move away from redistributive regional development policies to spatially neutral perspectives. But if we include the notion of spatial equity in the definition regional development in Ireland, there is a need for strong policy intervention. In its absence, the trend will be one of further regional divergence post-2022.

Regional policy in Ireland should not just aim to stimulate higher levels of enterprise in the lagging and less-resistant regions (Border, Mid-East and Midlands) but focus on stimulating employment in the above-average growth sectors. Some of these sectors show a preference for the larger urban centres which puts the less-resistant regions at a disadvantage. But, with the proper incentives and support, relevant companies can be stimulated to invest in the less-resistant regions.

Acknowledgements

We wish to thank the NESC Secretariat for funding this research. We would also like to thank Maurice Dagg and David Hegarty at the Department of Enterprise, Trade and Employment for providing access to the Employment Survey data.

Notes

[1] As the Department of Enterprise data are not directly comparable to national accounts data published by the Central Statistics Office, approximate proportions are given here.

References

Baxendine, S., Cochrane, B. & Poot. J. (2005). *Description and spatial analysis of employment change in New Zealand regions 1986-2001* (Discussion Paper No. 57). University of Waikato, New Zealand: Population Studies Centre.

Breathnach, P., Van Egeraat, C. and Curran, D. (2015) Regional Economic Resilience in Ireland: The Roles of Industrial Structure and Foreign Inward Investment, *Regional Studies Regional Science* 2(1).

Briguglio, L., Cordina, G., Farrugia, N. &Vella, S. (2008). *Economic vulnerability and resilience: concepts and measurements* (Research Paper No. 2008/55). WIDER (World Institute for Development Economics Research): United Nations University, Helsinki..

Bristow, G., Healy, A. & Norris, L. (2014). *Economic crisis: resilience of regions* (ESPON ECR2 Final Report). Retrieved from ESPON website: http://www.espon.eu/main/Menu_Projects/Menu_AppliedResearch/ECR2.html

Christopherson, S., Michie, J. & Tyler, P. (2010). Regional resilience: theoretical and empirical perspectives. *Cambridge Journal of Regions, Economy and Society*, 3, 3–10.

Department of the Environment and Local Government. (2002). *The national* spatial strategy 2002–2020: People, places and potential. Dublin: The Stationery Office.

Fingleton, B., Garretsen, H. & Martin, R. (2012). Recessionary shocks and regional employment. *Journal of Regional Science*, 52, 109–133.

Foster, J.B. & Magdoff, F. (2009). *The great financial crisis: Causes and consequences*. New York: Monthly Review Press.

Gardiner, B., Martin, R. & Tyler, P. (2012). *Spatially unbalanced growth in the British economy* (Working Paper No. 1). University of Cambridge: Centre for Geographical Economic Research.

Government of Ireland (2018) *Project Ireland 2040: National Planning Framework*. Dublin: Government of Ireland

Hassink, R. (2010). Regional resilience: a promising concept to explain differences in regional economic adaptability? *Cambridge Journal of Regions, Economy and Society*, 3, 45–58.

Hill, E.W., Wial, H. & Wolman, H. (2008). *Exploring regional economic resilience* (Working Paper 2008–04). University of California Berkeley: Institute of Urban and Regional Development.

Hudson, R. (2010). Resilient regions in an uncertain world: wishful thinking or a practical reality? *Cambridge Journal of Regions, Economy and Society*, 3, 11–25.

Lamarche, R., Srinath, K. & Ray, M. (2003). Correct partitioning of regional growth rates: improvements in shift-share theory. *Canadian Journal of Regional Science*, 26, 121-141.

Li, M. and Wang, X. (2022) How Regions React to Economic Crisis: Regional Economic Resilience in a Chinese Perspective, *Sage Open* Vol. 12 (4)

Martin, R. (2012). Regional economic resilience, hysteresis and recessionary shocks. *Journal of Economic Geography*, 12, 1–32.

Martin, R. (2018) Shocking Aspects of Regional Development: Towards an Economic Geography of Resilience. In G Clark, M. Feldman, M Gertler and D. Wójcik (eds.), *The New Oxford Handbook of Economic Geography*, Oxford: Oxford University Press. 839-864

Martin, R., Sunley, P. & Tyler, P. (2015). Local growth evolutions: recession, resilience and recovery. *Cambridge Journal of Regions Economy and Society*, 8, 141-148.

Meredith, D. and van Egeraat, C. (2013) Ten years on: Revisiting the NSS, *Administration*, 60(3), p. 3-13.

Nevin Economic Research Institute. (2015). *Quarterly Economic Observer*, Spring.

Nogueira, C.A.G & Lopes, D.A.F. (2008). *Employment growth in Ceará: a shift-share analysis* (2000-2005) (Texto Para Discussão No. 49). Instituto de Pesquisa e Estrategía Economica do Ceará, Secretaria do Planejamento e Gestão, Governo do Estado do Ceará, Brazil.

Ó'Riordáin, S. and Van Egeraat, C. (2016) The National Spatial Strategy: Lessons for implementing a National Planning Framework, *Administration*, 64(4), 5-21

Pendall,R., Foster, K.A. & Cowell, M. (2010). Resilience and regions: building understanding of the metaphor. *Cambridge Journal of Regions, Economy and Society*, 3, 71–84.

Pike, A., Dawley, S. & Tomaney, J. (2010). Resilience, adaptation and adaptability. *Cambridge Journal of Regions, Economy and Society*, 3, 59–70.

Pike, A. Rodriguez-Pose, A. and Tomaney, J. (2017) *Local and Regional Development*, Abingdon: Routledge

Ray, M. (1990). Standardising employment growth rates of foreign multinational and domestic firms in Canada: from shift-share to multifactor partitioning (Working Paper No. 62). International Labour Organisation, Geneva: Multinational Enterprises Programme.

Simmie, J. & Martin, R. (2010). The economic resilience of regions: towards an evolutionary approach. *Cambridge Journal of Regions, Economy and Society*, 3, 27–43.

Sutton, J. and Godwin, A. (2022) Regional economic resilience: towards a system approach. *Regional Studies Regional Science*, Vol. 9(1), 497-512.

Walsh, J. (2023) Income Distribution and Redistribution in Ireland: A Geographical Exploration. Maynooth: Maynooth University Social Sciences Institute.

Williams, N. and Vorley, W. (2017) *Creating Resilient Economies*, Cheltenham: Edward Elgar Publishing.