Deconstructing Economic Growth in Northern Ireland

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August 2025

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Key Findings

Introduction

- Northern Ireland (NI) has displayed weak economic growth over the last two decades, with real GVA growing at the lowest rate across all 12 UK regions over the 2000 to 2022 period (1.2% per annum). The main drivers of economic growth are analysed in detail to provide insights into the disappointing economic performance in NI over the last two decades.
- Regional economic growth can be achieved by either increasing the labour that produces the goods and services or by raising the productivity of labour. Decomposing GVA growth into contributions from these two components demonstrates that the labour market has been the main factor driving economic growth in Northern Ireland in recent years. Over the period 2000 to 2022 employment growth contributed 0.7% to GVA growth per annum, while labour productivity contributed 0.5% per annum.
- An analysis of other UK regions reveals that, similar to Northern Ireland, the South West, East Midlands and Wales experienced average or above-average employment growth alongside low productivity growth. This pattern suggests a broader challenge: achieving high employment growth and high productivity growth simultaneously appears difficult. Other regions, such as the North West and Scotland, recorded above-average productivity growth but lower employment growth.

Role of place based factors and nationwide trends to regional employment growth

- Shift-Share Analysis of employment trends indicates that Northern Ireland's employment growth was partly constrained by legacy effects tied to its historical industrial structure. The region has traditionally had a high concentration in sectors that experienced low growth at the national level, such as Agriculture and Public Administration, and a low presence in faster-growing sectors like Professional Services and ICT. However, these industry-mix effects are gradually diminishing, reflecting a transition toward a more service-oriented economy.
- The analysis also underscores the importance of local context. Northern Ireland benefited from favourable industry-wide regional effects that provided a general uplift across the economy. Additionally, certain sectors in Northern Ireland outperformed their UK counterparts in terms of employment growth. Beyond Professional Services and ICT, the Manufacturing sector also performed relatively strongly. While manufacturing employment in Northern Ireland declined by 13% between 2000 and 2023, this was significantly less severe than the 35% drop observed across the UK as a whole. Moreover, Manufacturing employment in NI has exhibited an upward trend in recent years, driven in part by growth in the Food Products subsector. Building on the strengths of the local manufacturing base will be essential to maintaining competitiveness and supporting sustained employment growth.

Impact of structural changes on aggregate labour productivity

- An analysis of aggregate productivity demonstrates that changes in the industrial composition of the economy have exerted a downward influence on overall productivity over the past two decades. This trend is partly driven by a long-term shift toward a more service-based economy, which has generally led to a reallocation of labour from higher-productivity sectors to those with lower productivity levels. Notably, this includes the expansion of labour-intensive services such as Hospitality and Administrative Support. At the same time, the decline in manufacturing employment, a sector that typically generates above-average productivity, has further contributed to this downward pressure. However, the recent reversal of this trend, marked by an expansion in manufacturing employment, has helped to partially offset these effects.
- While sectoral shifts have played a role in dampening productivity growth, decomposition analysis indicates that the primary driver of weak aggregate productivity growth is limited productivity improvement within individual sectors. Therefore, beyond encouraging the expansion of high-productivity sectors such as Manufacturing and ICT, there is a clear need to enhance productivity performance across the wider economy. In the context of Northern Ireland, where the public sector represents a significant share of employment, this includes improving productivity in Public Administration and Health.
- Northern Ireland performs relatively unfavourably compared to other UK regions in terms of a range of metrics related to competitiveness and productivity. Achieving productivity improvements will require sustained policy interventions across several areas. Key priorities include increasing investment in research and development (R&D) and infrastructure, fostering entrepreneurship and innovation, and raising the skills and productivity of the local workforce through greater investment in education and training.

1. Introduction

1.1. Gross Valued Added (GVA) provides a key measure of regional economic performance. It quantifies the value of the goods and services produced within an economy taking account of the value of the intermediate inputs that were used to produce those goods and services. Regional economic growth occurs when a local economy increases the quantity of goods and services produced, which can be achieved by either increasing the labour that produces the goods and services or by raising the productivity of labour. The evolution of these two components – employment and productivity growth - are explored using regional economic data over the previous two decades to provide insights into the dynamics of regional economic growth, with a specific focus on the NI economy.

1.2. As shown in Table 1, NI has displayed weak economic growth, with real NI GVA growing at the lowest rate across all 12 UK regions over the 2000 to 2022 period (1.2% per annum). At the other end of the scale, London grew at 2.2% per annum. Subdividing the analysis into different periods, the NI economy performed relatively poorly during the period 2000 to 2008 and was hit the hardest by the economic downturn and collapse in the property market that followed the 2008 financial crisis. However, NI improved during the 2012 to 2019 recovery period, displaying a growth rate similar to the UK average. Similarly, NI ranked in the middle in terms of GVA growth following the pandemic and subsequent recovery period (2019 to 2022).

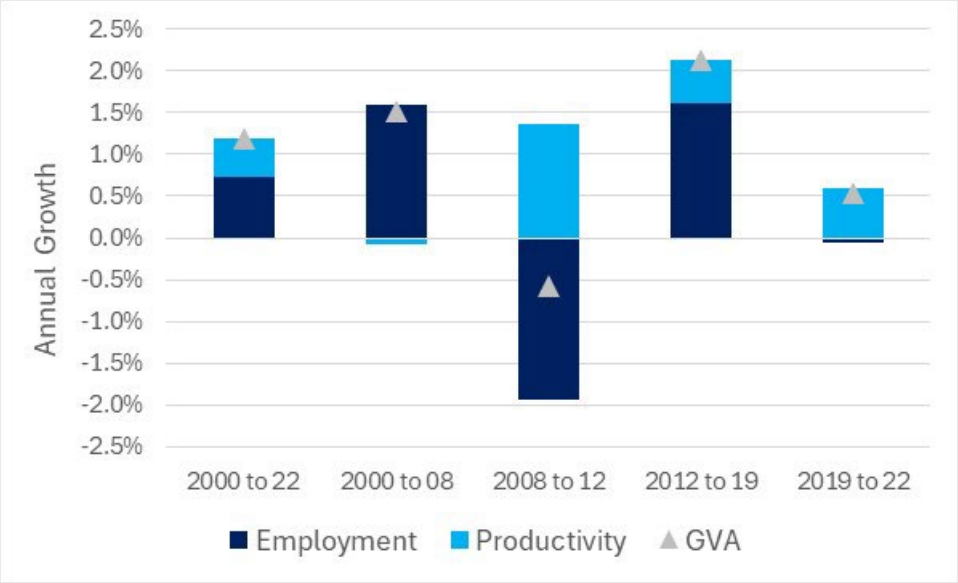
Table 1: Annual Real GVA Growth Rates

	2000 to 2022	2000 to 2008	2008 to 2012	2012 to 2019	2019 to 2022
Northern Ireland	1.2%	1.5%	-0.6%	2.1%	0.5%
Wales	1.3%	1.6%	0.8%	2.0%	-0.6%
West Midlands	1.3%	1.3%	0.4%	2.2%	0.4%
East Midlands	1.4%	2.1%	0.2%	1.6%	0.8%
Scotland	1.5%	2.8%	0.0%	1.6%	-0.3%
North East	1.5%	2.6%	0.4%	1.3%	0.7%
South West	1.5%	1.9%	0.2%	1.8%	1.7%
Yorkshire and The Humber	1.6%	2.3%	-0.5%	1.7%	2.0%
East	1.6%	2.2%	-0.3%	2.6%	0.5%
North West	1.8%	2.4%	0.1%	2.2%	1.5%
South East	1.8%	2.1%	1.2%	2.1%	1.2%
London	2.2%	3.3%	0.9%	2.6%	-0.3%

Source: ONS Regional Accounts, ONS Workforce Jobs and UUEPC calculations

1.3. GVA growth is decomposed into the contributions from employment and productivity (see Appendix 1 for details of the applied method). This decomposition highlights the important role of the labour market in driving economic growth over the last two decades. The contribution of employment growth to overall GVA growth in Northern Ireland was most marked during the periods of relatively strong growth (2000 to 2008 and 2012 to 2019). As shown in Figure 1, GVA growth between 2000 and 2008 is fully attributable to employment growth during the period 2000 to 2008. Labour productivity declined slightly during this period. While both employment and productivity exerted a positive impact on GVA growth during the period 2012 to 2019, employment growth contributed a substantially greater proportion (74%). The contribution of underlying components shifted during the 2019 to 2022 period due to negative impacts of the Covid-19 pandemic on the labour market, with all of the GVA growth attributable to increased productivity.

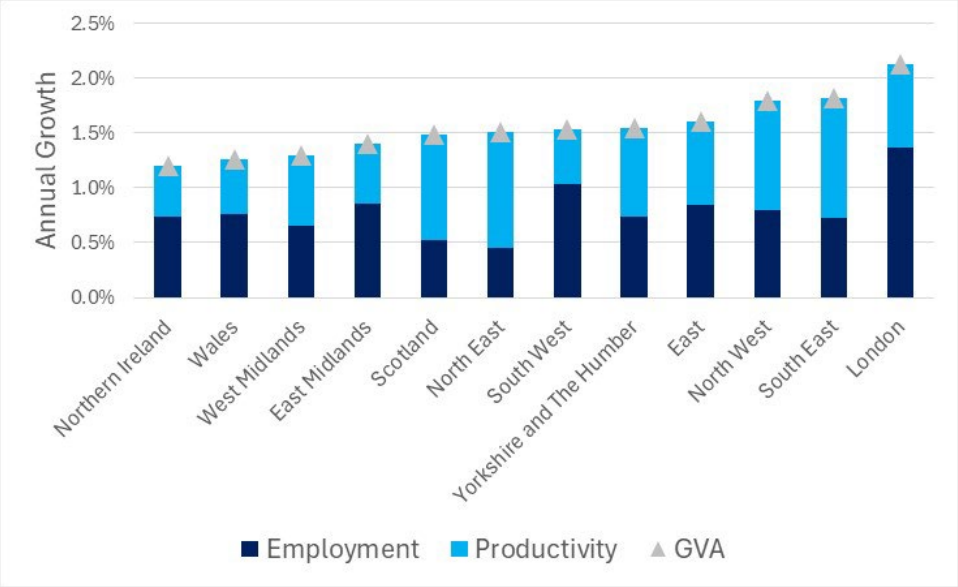
Figure 1: Contribution of Employment and Productivity to Annual GVA Growth, NI, 2000 to 2022, 2000 to 2008, 2008 to 2012, 2012 to 2019 and 2019 to 2022



Source: ONS Regional Accounts, ONS Workforce Jobs and UUEPC calculations

1.4. Over the entire period of analysis (2000 to 2022), employment growth contributed 0.7% to GVA growth, while labour productivity contributed 0.5% (Figure 2). This equates to employment growth accounting for 61% of GVA growth and labour productivity accounting for the remaining 39%. This contrasts with the North East and Scotland where employment growth accounted for 30% and 35% of GVA growth respectively. Over this entire period, NI's employment growth rate equalled the median rate of growth across the UK regions (NI employment grew by 0.7% per annum), while NI exhibited the lowest productivity growth (NI productivity grew by 0.5% per annum compared to a median rate of 0.8% across the 12 regions).

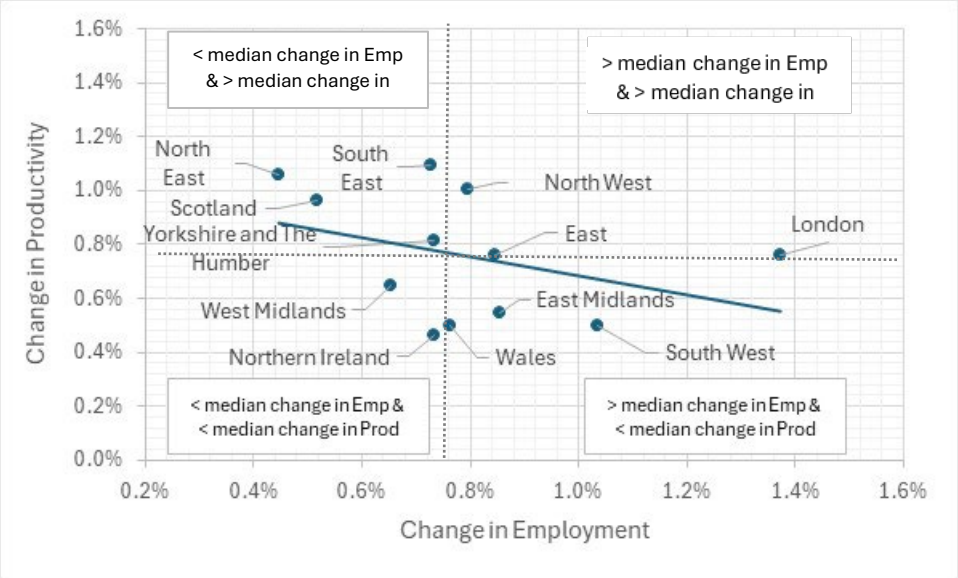
Figure 2: Contribution of Employment and Productivity to Annual GVA Growth, 12 UK regions, 2000 to 2022



Source: ONS Regional Accounts, ONS Workforce Jobs and UUEPC calculations

1.5. While care needs to be taken due to the limited number of observations, the regional data suggests a negative relationship between employment growth and productivity growth (Figure 3). Analogous to Northern Ireland, the South West, East Midlands and Wales experienced average or above average employment growth along with low productivity growth. Similarly, using a more detailed dataset of local authority districts in England, Wong and Zheng (2023) found that most areas experiencing high employment growth tended to be in local authority districts with low or even negative change in productivity. This implies that it is difficult to simultaneously achieve high employment growth and productivity growth. Conversely, the North West and Scotland displayed above average productivity growth in conjunction with low employment growth.

Figure 3: Relationship between employment and productivity growth between 2000 and 2022, 12 UK regions



Note: Dashed grey lines depict median change in employment and median change in productivity. Solid blue line depicts best-fit trend line.
Source: ONS Regional Accounts, ONS Workforce Jobs and UUEPC calculations

1.6. The employment and productivity components are analysed in greater depth within the remainder of the report to provide further insights into the evolution of economic performance in NI over the last two decades. Within Section Two, Shift Share Analysis is used to compare employment growth in NI to the UK as a whole and quantify the extent to which the performance of the local labour market reflects exogenous nationwide (UK) industry trends or unique regional-specific factors. Aggregate productivity growth is broken down into growth within individual sectors and growth due to structural change within Section Three. The extent to which the potential underlying drivers of economic growth vary across regions is explored in Section Four, while implications are drawn in Section Five.

2. Decomposition of Employment Using Shift Share

Shift Share Analysis (SSA) of 12 UK regions

2.1. SSA provides a means to analyse the underlying sources of economic growth. The growth rate of a particular region reflects the complex interaction of external and region-specific factors[1]. In terms of external factors, regional growth partly depends on exogenous factors that are determined by national industrial trends, with some industries growing faster than others in response to post-industrial transition developments, global forces and policies with industry specific implications. To varying degrees, these broad industry trends filter down to the regional level and consequently, regional growth is partially dependent on changes in certain industries at the national level in conjunction with localised differences in industrial composition. In addition, regional growth may partly reflect the contribution of unique regional factors that enhance (or detract) from the performance of businesses within the locality. Some places may perform better compared to others due to factors that impacts the competitiveness of businesses, including quantity and quality of infrastructure and skills and productivity of the workforce.

2.2. Within this chapter, the SSA framework is used to separate the underlying national and regional drivers of employment growth to gain insights into the sources of regional variation across the UK over the time period 2000 to 2023. Specific focus is given to NI. The traditional SSA technique has been widely applied in regional economics.[2] Here we apply the development of this technique using multi-factor partitioning based on the methodology set out by Ray *et al*. (2012) and empirical applications by Gardiner *et al*. (2013) and Visagie and Turok (2021). Further details on the multi-factor partitioning methodology are provided in Appendix 2.

2.3. Under this approach, the interest is in explaining the difference in the growth rate between specific regions and the national growth rate. In this case, the national growth rate is the UK and sub-regions are defined on the basis of the 12 broad regions in the UK, including NI. The analysis covers the period 2000 to 2023 and is based on ONS total workforce jobs by region and industry and includes both employees and self-employment.

2.4. Using this technique, SSA is used to disaggregate differential employment growth rates into three main components:

Industry-mix effect

2.5. Measures the change in regional employment that is attributable to industry trends at the national level (UK), taking into account the industrial structure of the local economy (specific region). A positive industrial mix effect indicates that a region has a higher concentration of employment in industries that are growing faster than the national (UK) average, while a negative industrial mix effect indicates that a region has a higher concentration of employment in industries that are growing slower than

[1] Martin *et al* (2019).
[2] See Selting and Loveridge (2002) and Lahr and Ferreira (2021) for comprehensive reviews of applications.

the national (UK) average. The industry-mix effect is dependent on nationwide trends, rather than industry trends in a particular region. Figure 4 shows the national level industry growth rates, while the Location Quotients in Table 2 provide an overview of which sectors were most concentrated in which region in 2000, i.e. the beginning period of employment growth. A region will tend to do better if it is highly concentrated in high growth sectors such as Professional Services and Health.

Industry-wide placed-based effects: Regional effects

2.6. Measures the industry-wide contribution to employment growth of the attributes of the local area that affect the regional competitiveness of all businesses within a region, regardless of industry. Attributes affecting regional competitiveness include geographic location; access to raw materials, components, or markets; availability of skilled labour; and the quality of local services and transportation facilities[3]. The regional effect contributes equally to the growth of every industry in the region.

Sector specific placed-based effects: Interaction effects

2.7. Having accounted for general industry-wide regional effects, the industry-place interaction effect captures the impact of sector specific regional advantages (or disadvantages). It measures the influence of regional attributes on the employment growth of individual industries in that region, such as access to natural resources or the spatial concentration of firms in specific industries[4]. In addition to quantifying the effect of sector specific regional advantages, it may also capture unusual events that impact specific industries in a region, e.g. the closure of a dominant firm in a region.

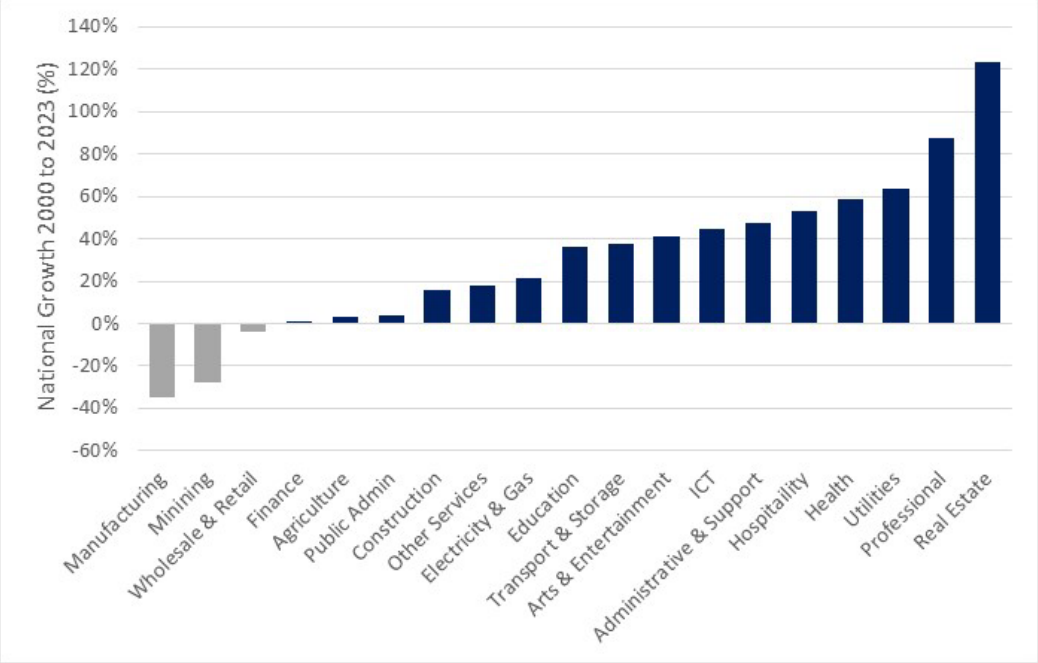
Table 2: Concentration of employment in an economic sector by UK region: Location Quotients (Employment 2000)

	North East	North West	Yorkshire and Humber	East Midlands	West Midlands	East of England	London	South East	South West	Wales	Scotland	Northern Ireland
Agriculture	0.65	0.50	0.88	1.18	0.92	1.00	0.16	1.12	1.23	1.68	1.69	4.12
Minining	1.08	0.43	1.15	1.49	0.53	0.55	0.34	0.44	1.01	1.25	4.12	1.15
Manufacturing	1.22	1.19	1.23	1.46	1.50	0.97	0.41	0.79	0.97	1.23	0.93	1.06
Electricity & Gas	1.13	0.96	0.97	1.06	1.39	0.98	0.53	0.81	1.26	1.34	1.42	0.90
Utilities	1.35	1.17	0.93	0.88	1.20	0.84	0.68	0.87	0.94	1.35	1.46	0.96
Construction	1.02	0.96	1.02	1.02	0.95	1.18	0.79	1.00	1.00	1.08	1.15	1.22
Wholesale & Retail	0.97	1.07	1.03	1.00	1.03	1.07	0.89	1.06	1.04	0.94	0.90	0.99
Transport & Storage	0.85	1.00	0.98	1.01	0.97	1.08	1.26	0.95	0.83	0.78	0.99	0.74
Hospitaility	0.95	1.01	1.03	0.91	0.86	0.93	1.01	0.95	1.15	1.09	1.20	0.87
ICT	0.61	0.73	0.65	0.62	0.71	1.20	1.96	1.25	0.78	0.47	0.67	0.48
Finance	0.55	0.83	0.87	0.52	0.77	0.87	1.98	0.93	0.93	0.59	0.99	0.59
Real Estate	0.66	0.94	0.81	0.64	0.92	0.95	1.51	1.11	1.23	0.84	0.69	0.53
Professional	0.72	0.81	0.73	0.75	0.77	1.06	1.66	1.23	0.84	0.61	0.87	0.53
Administrative & Support	0.75	0.88	0.88	0.94	0.89	1.01	1.46	1.15	0.85	0.72	0.86	0.54
Public Admin	1.30	1.00	0.96	0.87	0.79	0.79	0.94	0.96	1.17	1.17	1.22	1.56
Education	1.09	1.06	1.08	1.11	1.07	0.99	0.78	1.00	1.01	1.13	0.93	1.19
Health	1.28	1.08	1.09	1.02	0.96	0.88	0.74	0.93	1.10	1.25	1.14	1.29
Arts & Entertainment	1.07	0.90	0.93	0.86	0.85	0.99	1.30	0.98	0.91	1.13	1.03	0.73
Other Services	1.15	1.02	0.90	0.87	0.98	1.03	1.04	1.09	1.04	0.98	0.93	0.79
Households	0.87	0.61	0.79	1.38	0.80	1.30	0.87	1.55	1.66	0.67	0.41	0.24

Note: A Location Quotient >1 indicates the region is more specialised in an economic sector compared to UK, while a value of <1 indicates that the region is less specialised compared to UK.

[3] Ray *et al.* (2012)
[4] Visagie *et al.* (2021).

Figure 4: UK employment growth between 2000 and 2023



2.8. Combining the regional and interaction effects captures the impact of **place-based advantages** and the impact of local dynamics. In contrast, the industry-mix effect reflects the influence of broader **national industry trends**. The results of the application of this technique to employment for the 12 regions in the UK are shown in Table 3.

Table 3: Difference between regional and national growth of employment and SSA decomposition (thousands), 2000 to 2023

	Diff. Regional & National Growth	Industrial Mix Effect	Regional Effect	Interaction Effect	Allocation Effect*
London	813	399	331	72	11
South West	104	-13	117	-6	6
East Midlands	24	-103	134	-11	5
Northern Ireland	-26	-35	60	-53	2
East of England	-59	0	-58	-7	6
Wales	-74	-38	-26	-14	3
North West	-92	-70	-1	-29	8
South East	-93	108	-185	-26	10
North East	-97	-27	-56	-17	3
Yorkshire and Humber	-106	-74	-50	13	6
West Midlands	-118	-139	11	3	6
Scotland	-276	-9	-277	3	6

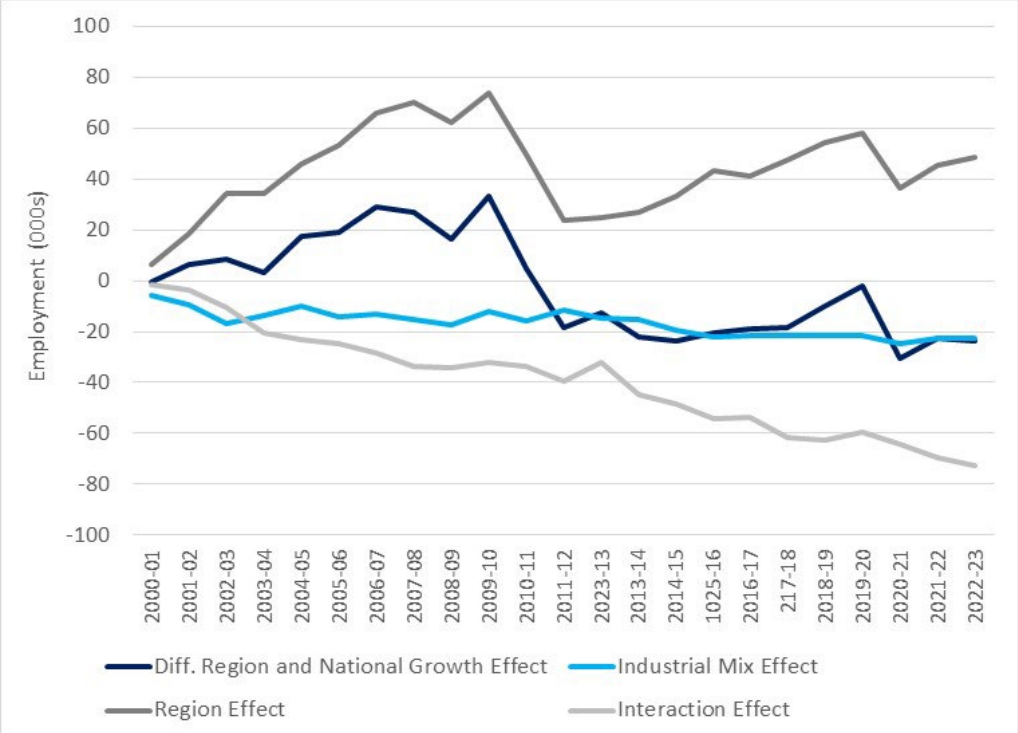
*The allocation effect is used for balancing purposes and is of less relevance from an interpretation point of view. The four individual effects (Industrial Mix, Regional, Interaction and Allocation effects) sum to yield the difference between total employment growth in the region and national employment growth. See Appendix 2 for further details.

Shift Share Analysis Results

2.9. The results show that **NI** grew at a slower rate compared to the UK as a whole over the period 2000 to 2023. NI would have gained 26,000 more jobs over the period 2000 to 2022 had it grown at the same rate as the UK average.

2.10. Decomposing NI's growth into different components indicates that the **industrial mix effect** exerted a negative impact on employment growth, demonstrating that the initial structural makeup of the economy was a significant disadvantage. The dynamics in Figure 5 show that the downward impact of the industry-mix effect grew steadily over the period of analysis. As shown in Figure 6, NI has relatively low levels of concentration (Location Quotient less than 1) in sectors that performed strongly at the national level over the period of analysis, such as Professional Services, ICT, Hospitality and Transport sectors. As a result, these sectors contributed less to the industry-mix effect than would have been the case had the sectoral concentrations been closer to the UK average. In contrast, NI has higher than average levels of specialisation (location quotient greater than1) in sectors that underperformed at the national level, such as Agriculture and Public Administration.

Figure 5: Shift Share Analysis Dynamics Northern Ireland

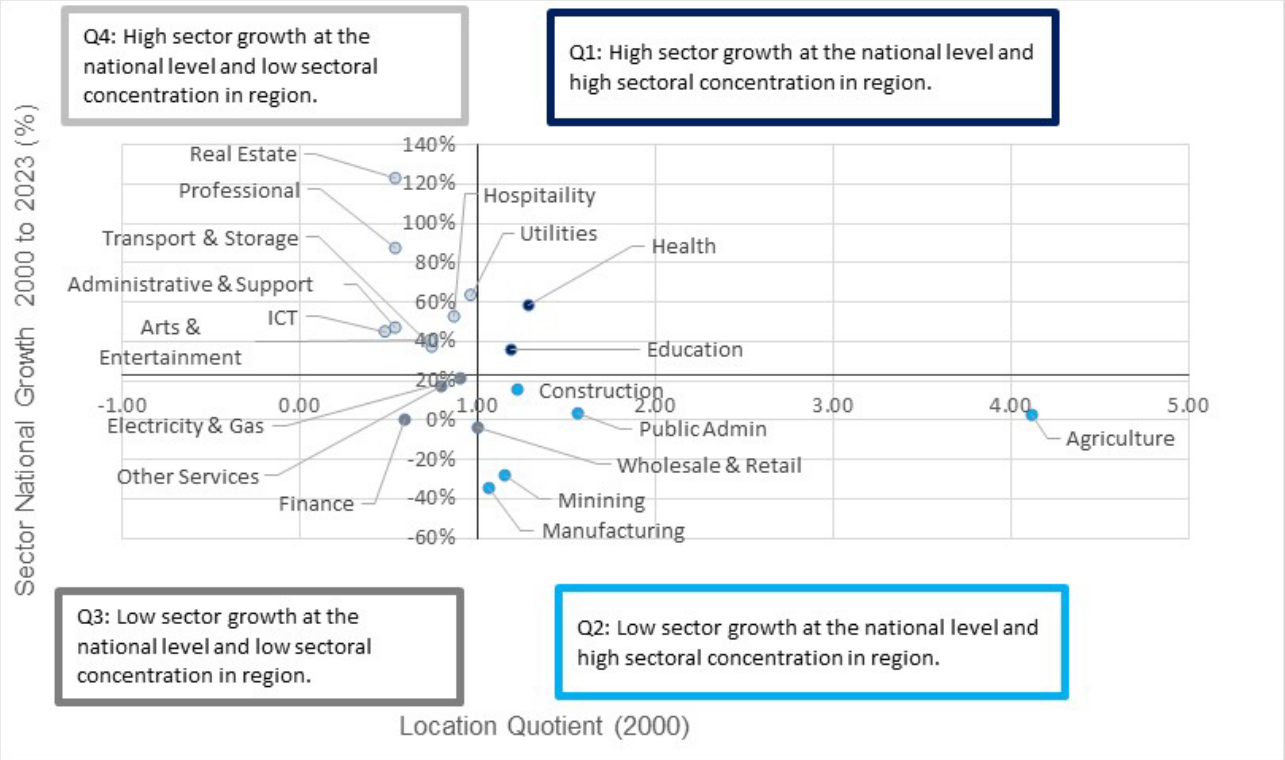


Note: Time series dynamics are based on annual differences, which are cumulated over time to yield cumulative differential growth rates.

2.11. The impact of ***placed based*** factors is mixed. On the one hand, NI benefitted from favourable **regional effects** that exerted a positive impact on NI employment growth. This indicates that all sectors in NI gained from an industry-wide boost due to the general performance of the region that enhanced regional competitiveness. The dynamics in Figure 5 indicate that the regional effect generally exhibited an upward trend between 2000 and 2010, before falling sharply as the impact of the housing market downfall worked its way through the economy. After a period of stagnation, the regional effect showed an upward trend between 2015 and 2020 but was disrupted following the outbreak of the pandemic.

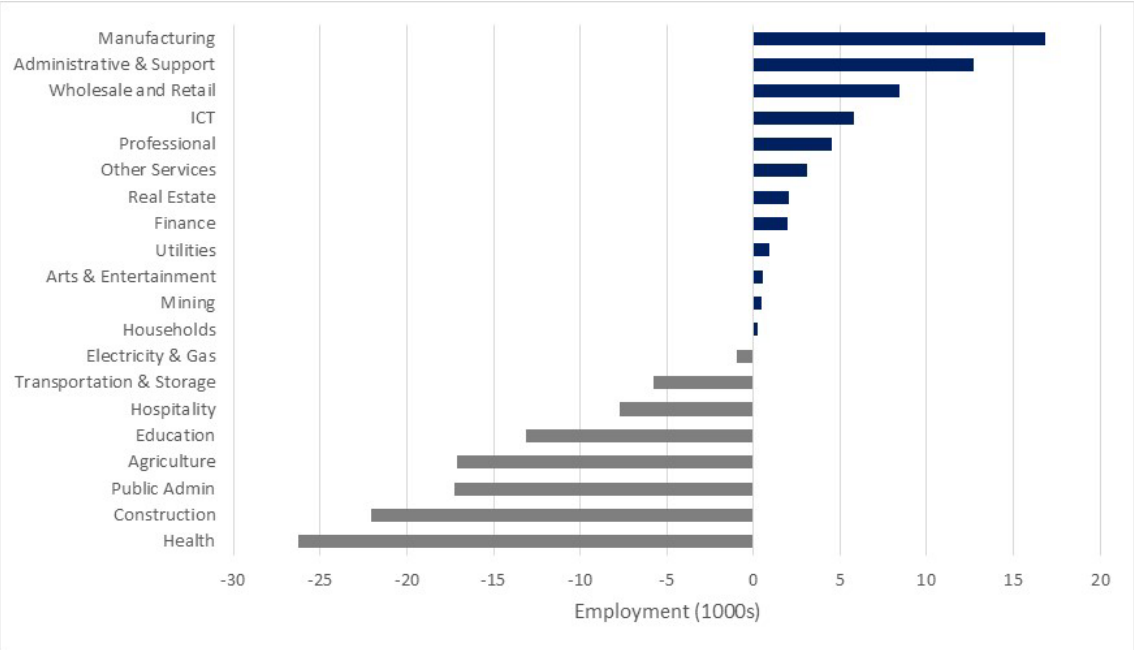
2.12. The contribution of the generic regional effect was offset by a negative **interaction effect**. This indicates that although NI benefitted from general place-based effects, specific sectors underperformed within the local region. This partly reflected the contribution of the Health, Construction and Public Administration sectors (Figure 7). Note, however, the manufacturing sector exerted a substantial positive impact on the industry-place interaction component, highlighting the important contribution of this sector within the NI economy. While NI manufacturing employment fell over the period of analysis, NI exhibited the lowest decline across the 12 regions, with further sub-division by sectors indicating that the manufacturing of food products has displayed positive growth in recent years.

Figure 6: NI sectoral concentration combined with national growth rates



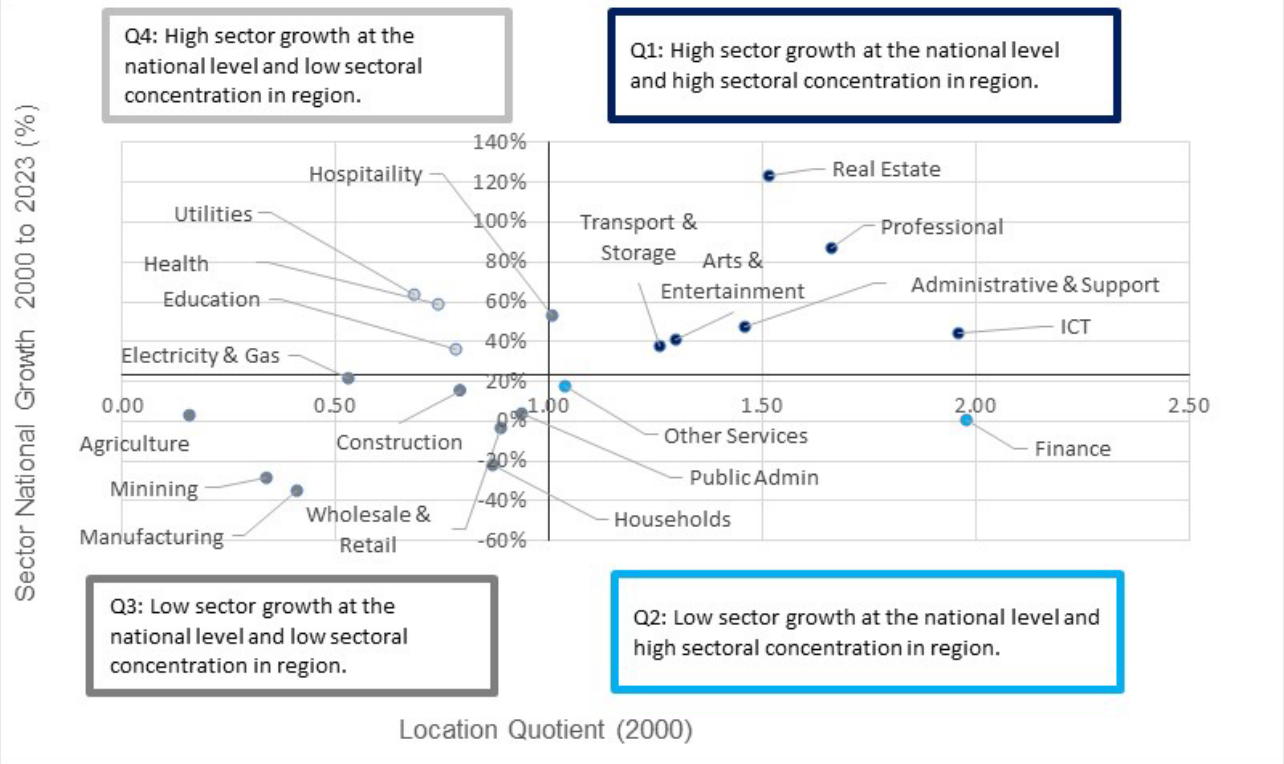
X-axis: Location Quotient (LQ) at beginning of period of analysis (2000). LQs are used to represent employment concentration, with a value greater than one indicating that NI is more specialised in an economic sector compared to the UK as a whole, while a value less than one indicating that NI is less specialised compared to the UK.
Y-axis: Sectoral national growth rate 2000 to 2023.
Employment for the national economy as a whole grew by 23%, which marks the threshold between the bottom and top quadrants.

Figure 7: Sector contribution to NI interaction effect



2.13. Elsewhere, employment within three regions grew at a faster rate than the UK as a whole over the period 2000 to 2022, namely **London**, **South West** and **East Midlands** (Table 3). The positive differential is particularly marked for London. London would have gained 813,000 fewer jobs over the period 2000 to 2022 had it grown at the same rate as the UK. London benefitted from positive contributions from all three main components, with the industry-mix effect exerting the largest impact. The positive contribution of industrial mix effects reflects London's high concentration in high growth sectors that performed strongly at the national level. As shown in Figure 8, London has particularly high levels of concentration (location quotient greater than 1) in sectors such as Professional Services and ICT, which grew strongly at the national level reflecting the ongoing structural transition from goods-oriented businesses towards service-oriented businesses, particularly Knowledge Intensive Business Services. In addition, it is under-represented in sectors such as manufacturing that performed poorly in terms of employment growth at the national level.

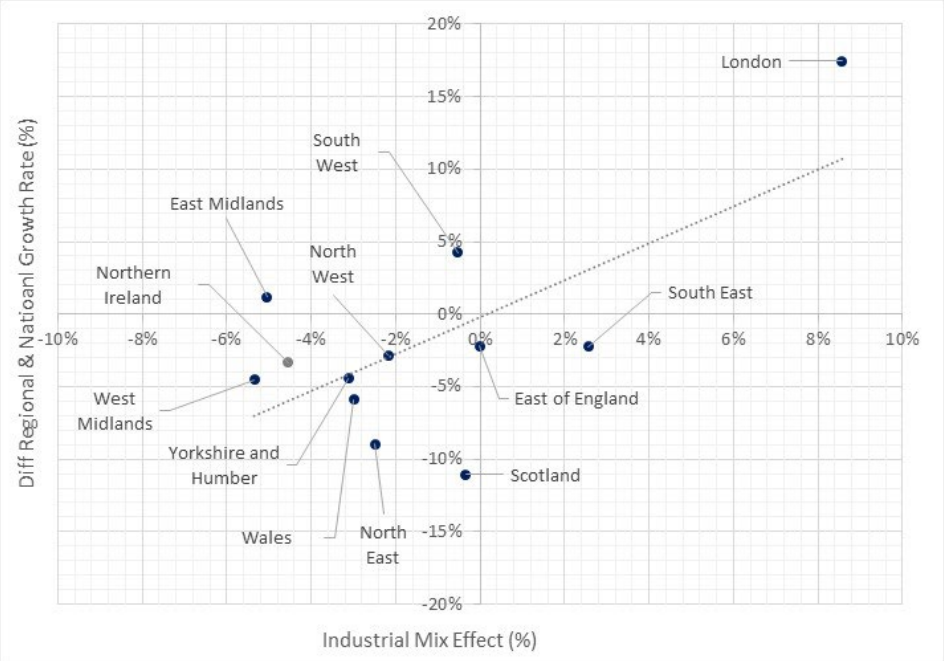
Figure 8: London sectoral concentration combined with national growth rates



X-axis: Location Quotient (LQ) at beginning of period of analysis (2000). LQs are used to represent employment concentration, with a value greater than one indicating that London is more specialised in an economic sector compared to the UK as a whole, while a value less than one indicating that London is less specialised compared to the UK.
Y-axis: Sectoral national growth rate 2000 to 2023.
Employment for the national economy as a whole grew by 23%, which marks the threshold between the bottom and top quadrants.

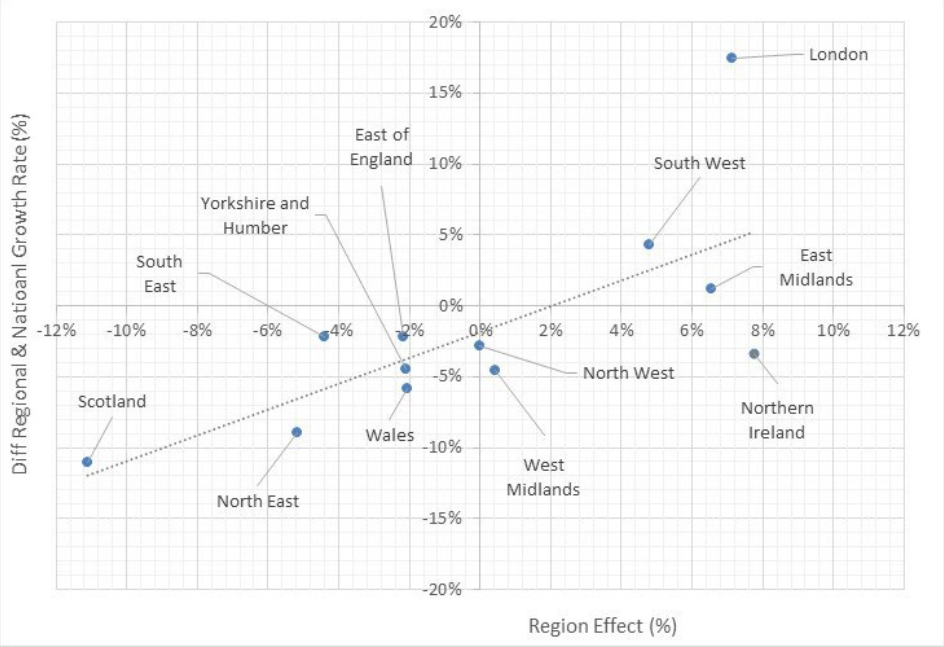
2.14. Similar to NI, the other eight regions experienced a decline in employment relative to the UK as a whole. Of these **Wales**, **North West**, **North East**, **Yorkshire and Humber** and **West Midlands** experienced negative industrial mix effects (Figure 9). These regions share a high concentration in manufacturing, which performed poorly at the national level, as well as low concentrations in Professional Services and ICT sectors, which performed strongly. In contrast, the South East benefitted from a positive industry-mix effect, which is partly attributable to its disproportionate specialisation in the Professional Services, ICT and Admin & Support sectors.

Figure 9: Relationship between industry mix effect and employment growth, 2000 to 2022



2.15. **Scotland** displayed the largest decline in employment relative to the UK. This is primarily attributable to the negative regional effect. As shown in Figure 10, there is a strong positive correlation between regional effects and overall employment growth, highlighting the importance of place based-factors in driving economic growth.

Figure 10: Relationship between region effect and employment growth, 2000 to 2022



Shift Share Analysis Summary

2.16. Overall, the decomposition using the SSA shows the extent to which regional employment growth was driven by place-based factors and nationwide industry trends. It is useful to quantify the influence of these effects separately as they capture differential impacts, with the former reflecting underlying local attributes and the latter broader national industrial trends, and imply distinctly tailored policy responses[5] (Visagie *et al.*, 2021).

2.17. The NI economy has been held back by legacy effects due to the initial industrial composition. The local economy has adapted through strong place-based factors. However, the boost due to industry-wide regional factors were offset by the underperformance of specific sectors at the regional level such as Health and Construction. In contrast, it is evident that relative to elsewhere the Manufacturing sector has made a significant contribution to the NI economy. Potential sources of regional competitiveness are explored in Section 4.

[5] Visagie *et al.* (2021).

3. Assessing the Impact of Structural Change on Aggregate Productivity

Decomposition of Aggregate Productivity into Within and Between Sector Effects

3.1. As highlighted in Section 1, NI has displayed weak economy-wide labour productivity growth over the last two decades. This below par performance is a major area of policy concern as productivity is fundamental in driving income growth and living standards in the long-term[6]. The contribution of individual sectors to aggregate NI labour productivity is explored further to provide a deeper understanding of the evolution of labour productivity at the economy-wide level overtime.

3.2. Aggregate productivity growth partly reflects the *within-sector* performance of specific industries, i.e. the extent to which productivity of individual sectors has increased. The impact of growth within a particular sector on aggregate productivity depends on the relative size of that sector. However, it is insufficient to compute the weighted sum of productivity growth of each sector. Changes in aggregate productivity may also reflect shifts in economic structure due to labour reallocation *between sectors* with different productivity levels and growth rates. All other things equal, aggregate productivity growth will diminish over time if there is a shift towards sectors with lower levels of productivity[7].

3.3 Using the decomposition approach set out in Appendix 3, the following analysis quantifies the contribution of these two components. In particular, **aggregate labour productivity growth is expressed as a sum of *within sector* effects and *between sector* effects**:

3.4. **Within Sector Effects:** Captures the impact of intra-sector productivity growth by quantifying the weighted sum of productivity growth in each individual sector. The weights are based on the output share of sectors at the beginning period.

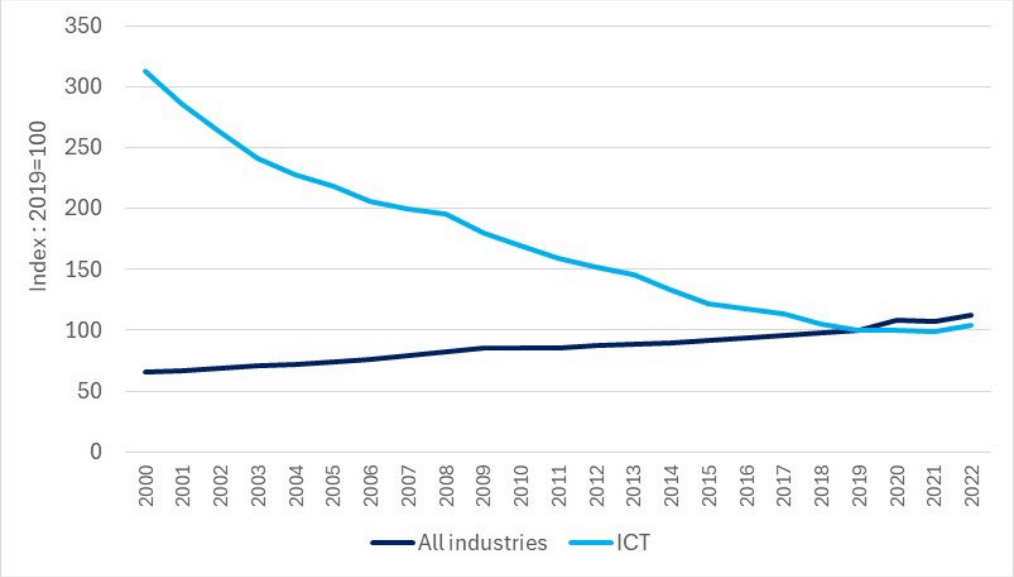
3.5. **Between Sector Effects:** Quantifies the impact of shifts in the industrial composition of the economy by measuring the effect of changes in the relative size of each sector on aggregate labour productivity growth. The overall *between sector* effect is negative (positive) if structural change results in a shift of labour from high (low) productivity sectors to low (high) productivity sectors[8].

3.6. GVA and price indices are based on ONS Regional Accounts data, while employment numbers are sourced from ONS workforce jobs data. In line with Section 1, Labour Productivity is measured in terms of jobs, i.e. Real GVA per worker. While Output per hour data is available at the regional level, the latest available year is 2019 and hence, does not capture recent changes.

[6] Krugman (1994).
[7] Riley *et al.* (2018) and Coyle and Mei (2023).
[8] Riley *et al.* (2018).

3.7. Note, the methodology also accounts for changes in sector relative price effects. Accounting for relative price effects is particularly important for the ICT sector, which in contrast to other sectors experienced a substantial decline in output price over the last two decades (Figure 11). Sub-sector data indicates that this is primarily attributable to the telecommunications sector and is consistent with the technological advances in this sector which had a downward impact on prices[9]. A decline in price over time has an upward impact on real productivity for a particular sector as captured by the within sector effect, but also has a downward impact on the *between sector* effect.

Figure 11: NI price indices, ICT and All Industries, 2000 to 2022



Source: ONS Regional Accounts

3.8. The analysis covers the period from 2000 to 2022, reflecting the availability of regional GVA data broken down by industry. To provide deeper insights, the period is divided into several sub-periods. These divisions are partly informed by trends in manufacturing employment, as previous UK-based studies have identified the contraction of the manufacturing sector as a key driver of negative *between sector effects*. The first sub-period, 2000 to 2012, is examined separately due to the consistent decline in the share of total employment in manufacturing in Northern Ireland, which stabilised around 2012. The subsequent years are further divided into two periods: 2012 to 2019 and 2019 to 2022. This allows the analysis to reflect labour market shifts in the economy, including those associated with the Covid-19 pandemic.

[9] Coyle and Mei (2023).

Decomposition of Aggregate Productivity Results

Within Sector Effect

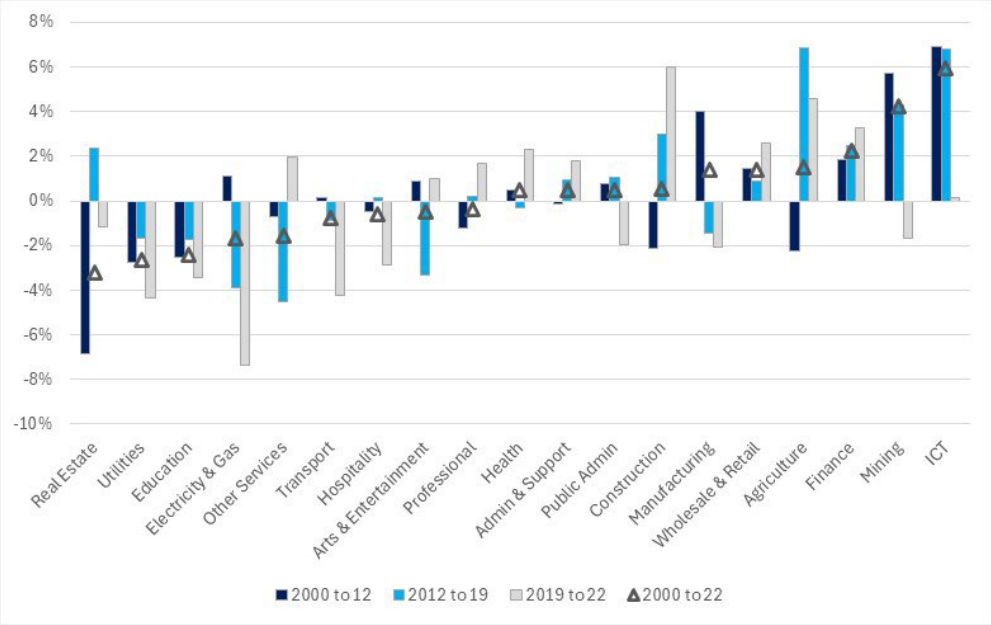
3.9. The application of this decomposition method to NI labour productivity is shown in Table 3. The decomposition shows that the total *within sector effect* for the period 2000 to 2022 is positive, reflecting the impact of productivity growth within individual sectors. The ICT (5.9%), Mining (4.2%), Finance (2.2), Agriculture (1.5%), Retail (1.4%) and Manufacturing (1.4%) sectors exhibited the largest annual growth rates during this period (Figure 12).

3.10. As shown by the sectoral contributions to the *within sector effect* in Table 4, upon taking account of the relative size of sectors the main contributors to the positive *within sector effect* were ICT, Manufacturing and Retail. This was partially offset by reductions in other sectors, with the Real Estate, Education, Transport, Utilities and Other Service sectors exerting the largest downward impact on the *within sector effect* over this period.

Table 4: Decomposition of change in labour productivity

	2000 to 2022	2000 to 2012	2012 to 2019	2019 to 2022
Within				
Agriculture	1.2%	-0.7%	0.9%	0.2%
Mining	0.3%	0.2%	0.1%	0.0%
Manufacturing	6.5%	11.0%	-1.5%	-0.9%
Electricity & Gas	-0.4%	0.2%	-0.3%	-0.3%
Utilities	-0.5%	-0.3%	-0.2%	-0.2%
Construction	1.0%	-1.7%	1.3%	1.5%
Wholesale & Retail	4.6%	2.4%	0.9%	1.1%
Transportation & storage	-0.6%	0.1%	-0.2%	-0.5%
Hospitality	-0.3%	-0.1%	0.0%	-0.2%
ICT	8.6%	4.2%	1.9%	0.0%
Finance	1.6%	0.6%	0.7%	0.4%
Real Estate	-7.2%	-8.0%	1.9%	-0.4%
Professional	-0.3%	-0.4%	0.1%	0.2%
Admin Support	0.2%	0.0%	0.2%	0.2%
Public Admin	1.0%	0.8%	0.7%	-0.4%
Education	-2.7%	-1.7%	-0.8%	-0.5%
Health	0.8%	0.4%	-0.3%	0.8%
Arts & Entertainment	-0.1%	0.1%	-0.3%	0.0%
Other Services	-0.4%	-0.1%	-0.5%	0.1%
Households	-0.1%	0.0%	0.0%	0.0%
Total Within	13.4%	6.7%	4.7%	1.1%
Between	-2.6%	-1.6%	-1.1%	0.7%
Total	10.8%	5.2%	3.6%	1.8%

Figure 12: Annual real productivity growth within sectors: 2000 to 2012, 2012 to 2019, 2019 to 2022 and 2000 to 2022



Source: ONS Regional Accounts, workforce Jobs and UUEPC calculations

3.11. Subdividing the analysis into different time periods, Manufacturing made the largest positive contribution to the *within sector effect* during the first period (2000 to 2012), but this shifted to a downward impact during the two subsequent periods. This partly reflects the closure of the JTI Gallaher tobacco plant in 2017, which accounted for a large proportion of Manufacturing output. Real productivity in the Manufacturing sector showed signs of recovery after 2017, although this was disrupted during the Covid period.

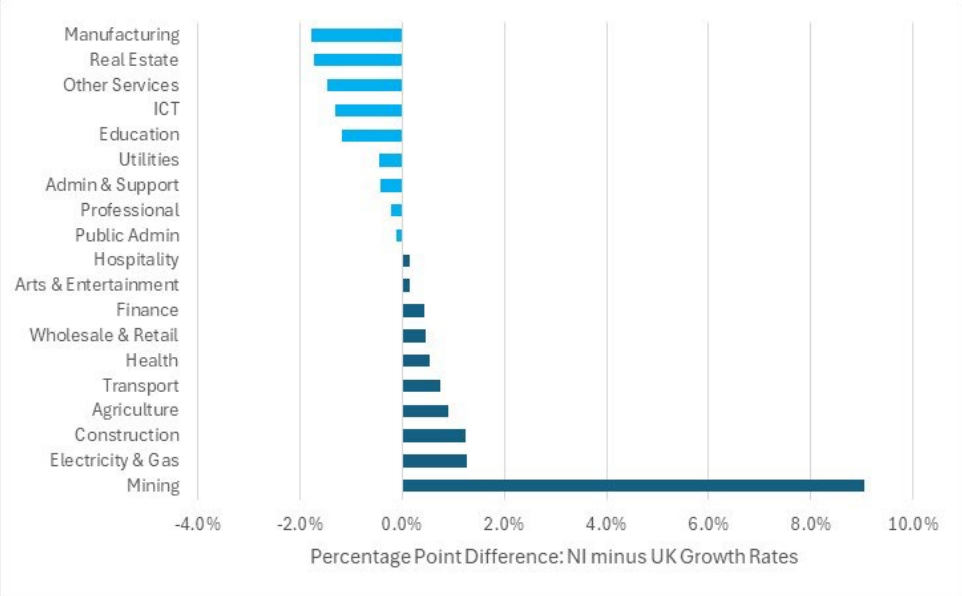
3.12. The ICT sector made the second largest contribution to the *within sector effect* during the 2000 to 2012 period and continued to make a substantial contribution during the 2012 to 2019 period. However, its contribution was negligible in the most recent period. The Retail sector ranked third in its contribution during 2000 to 2012, with a slightly smaller impact between 2012 and 2019. Notably, its contribution increased in the most recent period. Productivity in the Construction sector also rose markedly in this later period, reflecting the growing impact of large-scale infrastructure projects on construction output.

3.13. The Real Estate sector exhibited markedly different trends during the period of analysis, but should be treated with caution due to difficulties in measuring GVA in this sector as this involves including imputed rents on owner-occupied dwellings.

3.14. While the *within sector effect* exerted a positive effect on aggregate productivity, the overall contribution is modest. The 13.4% within sector over the 2000 to 2022 period equates to just 0.57% per annum. The limited contribution of the *within sector effect* is further evident through comparing the NI and UK productivity growth rates of each

individual sector. Although the UK also experienced modest productivity growth over the last two decades, NI experienced lower growth rates in key specific sectors (Figure 13). The lower sectoral growth rates for Manufacturing, Education and Administration & Support are particularly concerning given the relatively large size of these sectors within the local economy (respectively these sectors contributed 10%, 9% and 7% to total NI employment in 2022).

Figure 13: Sector specific annual productivity growth between 2000 and 2022. Differential between NI and the UK (NI minus UK annual productivity growth).



Source: ONS Regional Accounts, workforce Jobs and UUEPC calculations

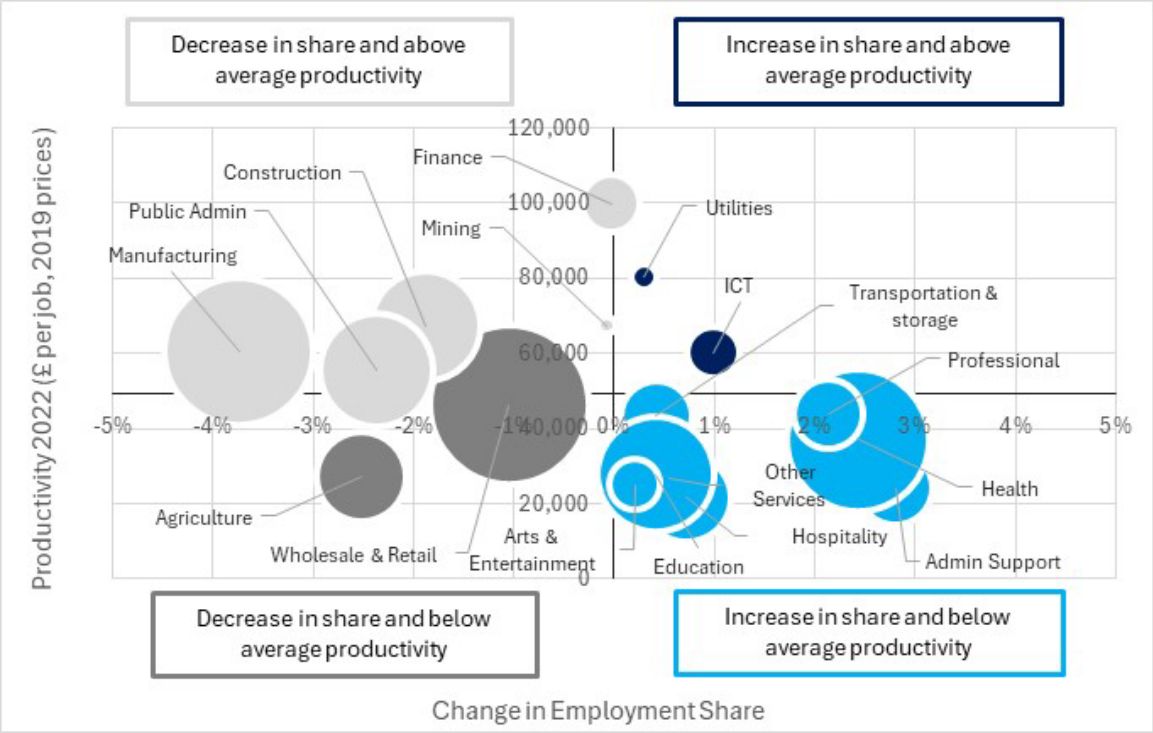
Between Sector Effect

3.15. The *between sector effect* is negative over the period 2000 to 2022, indicating that changes in the structural composition of the economy have had a downward impact on aggregate labour productivity (Table 4). This predominantly reflects ongoing changes in employment from more productive to less productive sectors. As shown in Figure 14, large sectors such as Manufacturing and Public Administration with above average productivity experienced large declines in the share of total employment between2000 to 2022 (-3.7% and -2.4% respectively). Over the same period, the biggest gainers in employment share were the Administration & Support and Health sectors (2.8% and 2.4% respectively), which have below average productivity. This change in industrial mix resulted in a reallocation of labour from above average to below average productivity sectors.

3.16. In addition, the expansion in employment in the Professional Services sector had a negative impact on the *between sector effect*. Even though this sector involves the provision of specialist knowledge by experts in the fields of science, engineering,

accountancy and management consultancy the overall productivity of this sector is below the average for the economy as a whole.

Figure 14: Change in Employment Share and Productivity: 2000 to 2022[10]



X-axis refers to change in employment share between 2000 and 2022; Y-axis is Labour Productivity 2022 and bubble size is employment 2000. Observations above the X-axis have above average productivity, while those beneath the X-axis have below average productivity.

3.17. Analysing the sub-periods (Table 4), the decline in the share of employment in the Manufacturing sector exerted a marked negative impact on the *between sector effect* during the 2000 to 2012 period. Growth in below average productivity sectors, including Health, Administration Support, Hospitality and Retail, also contributed to the negative *between sectors effect* during this early period.

3.18. In contrast, the Manufacturing sector had a positive impact on the *between sector effect* during the 2012 to 2019 period, reflecting a modest rebound in employment. However, this was more than offset by continued growth in labour-intensive services with below-average productivity, such as Administration and Support, Hospitality and Other Services, as well as Professional Services. Additionally, the contraction of the Public Sector during this period had a negative impact on the *between sector effect*, due to its above-average productivity.

3.19. The positive *between sector effect* observed in the most recent period suggests that the Covid-19 pandemic disrupted long-term labour market trends. The positive

[10] Real Estate and Electricity & Gas sectors are not shown in the figure due to their high values which affects the interpretation of the majority of observations.

impact partly reflected a slight rebound in employment in the Public sector, as well as declines in labour shares in labour-intensive sectors with below average productivity, namely Retail, Other Services and Administration Support. It will be important to monitor future employment trends in these sectors to assess the extent to which the recent changes reflect short-term disruptions caused by the pandemic.

Decomposition of Aggregate Productivity Summary

3.20. While key individual sectors in NI increased in terms of productivity over the last two decades, resulting in a positive *within sector* effect, the overall contribution of this component to aggregate productivity is modest.

3.21. Moreover, computation of the *between sector* effect demonstrates that changes in the industrial composition of the NI economy have generally had a downward impact on aggregate productivity due to a shift in labour from above average to below average productivity sectors.

3.22. In the earlier years, the decline in aggregate productivity due to the *between sector effect* was primarily driven by a falling employment share in the Manufacturing sector. Over time, however, this trend has increasingly been influenced by a shift toward service sectors with below-average productivity, which has acted as a drag on overall productivity growth.

3.23. While labour reallocation contributed positively to aggregate productivity in the most recent period, this may reflect a temporary effect, largely due to the disproportionate impact of the pandemic on low-productivity sectors in the service sector.

4. Underlying Drivers of Regional Competitiveness

Introduction

4.1. The preceding sections highlighted the important roles of regional competitiveness and productivity growth in explaining spatial differences in economic performance. The two concepts are interrelated, with more competitive regions tending to experience higher productivity growth as businesses in these locations benefit from faster growth in demand, leading to economies of scale. In turn, the resulting increase in productivity gives rise to improvements in competitiveness[11].

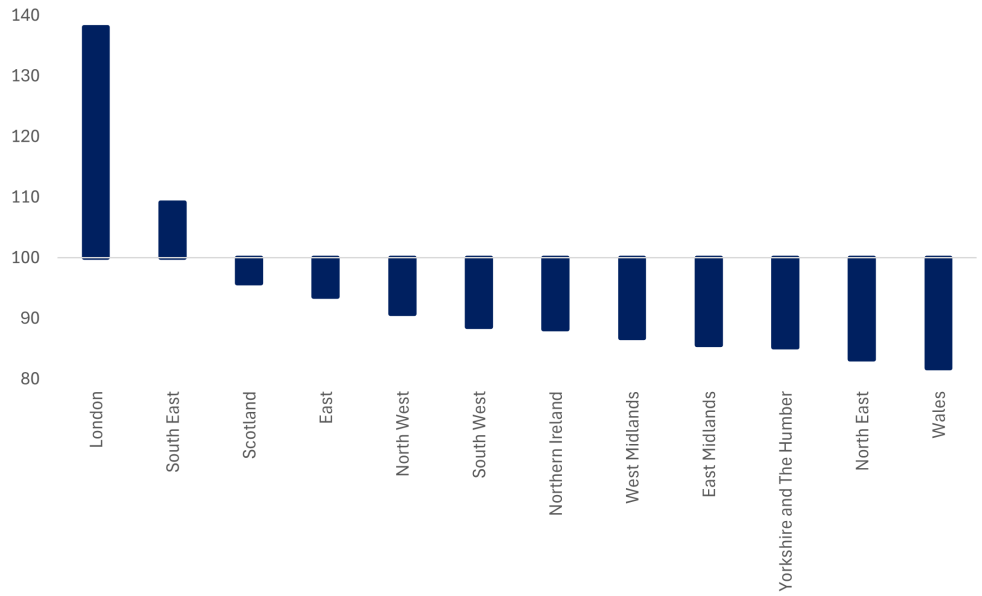
4.2. Competitiveness is difficult to define from a regional perspective due to the mix of businesses which vary in terms of export orientation and competition with external competitors[12]. It is argued that productivity provides a measure of *revealed competitiveness* as factors that influence productivity affect the competitiveness of all businesses within the region regardless the degree of export orientation. The literature points to a range of factors that may impact productivity, including investment in research & development (R&D) and infrastructure, the business landscape and skills base of the workforce.

4.3. In developing a competitiveness index for EU regions the European Commission adopts a broader definition, which accounts for both firm and people based factors[13]. Under this approach regional competitiveness is defined as **the ability to offer an attractive and sustainable environment for firms and residents to live and work**. This definition not only captures firm related factors but also takes into the account the prosperity of residents and their ability to generate high incomes and achieve a more equitable distribution of wealth. The greater emphasis on people implies that long-term regional competitiveness is influenced by a region's capacity to create an area where people want to live and work. In addition to pure productivity related metrics, the European Commission's competitiveness index includes metrics on well-being such as household income. It also includes labour market conditions, which captures the strength of the labour market. Section four includes an evaluation of a number of metrics, some of which are included in the work of the Northern Ireland Productivity Forum's Productivity Dashboard[14].

4.4. The variability of potential drivers of regional competitiveness across the UK is explored below, encompassing both productivity specific factors, as well as broader societal well-being factors. Some of the broader factors also have implications on productivity. By way of context, consider the regional differences in labour productivity across the UK. Labour productivity is shown in terms of GVA per job filled and GVA per hour worked in Figures 15 and 16 respectively. London outperforms the rest of the UK using both measures, with regions such as Wales and the North East exhibiting lower productivity levels.

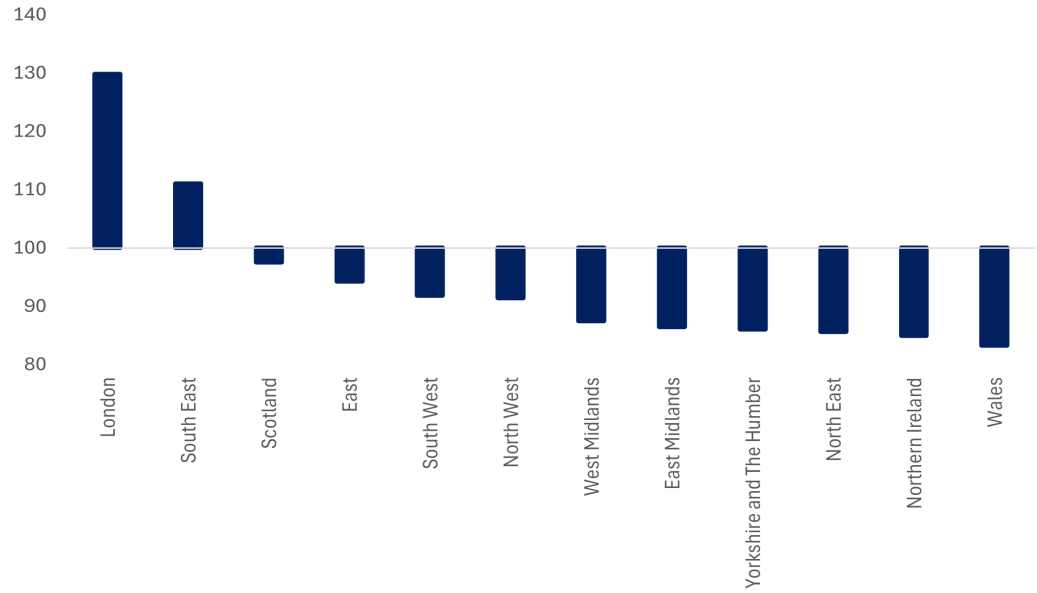
[11] Gardiner *et al.* (2013).
[12] Gardiner *et al.* (2004).
[13] Annoni *et al.* (2013).
[14] Donaldson *et al.* (2024).

Figure 15: GVA per job filled by UK region, average 2018-22 (UK =100), current prices, data unsmoothed



Source: ONS

Figure 16: GVA per hour worked by UK region, average 2018-22 (UK =100), current prices, data unsmoothed

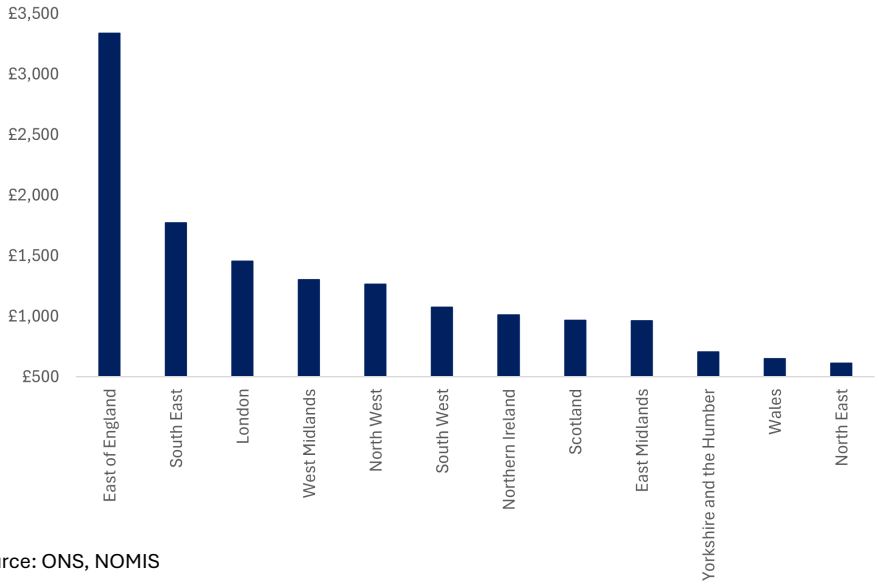


Source: ONS

R&D and Infrastructure Investment

4.5. Investment in R&D is widely regarded as a key means of stimulating economic growth by encouraging innovation and nurturing the development of new technologies, processes, products and services. An empirical study on UK data from 1992 to 2007 quantified the impact of an increase in public R&D on annual private-sector productivity, showing a 20% increase in the rate of return[15]. By way of clarity, public R&D describes R&D funded by government, research councils and higher education sectors and would include research publications funded by the Economic and Social Research Council for example. Conversely, private R&D is that funded by business, private non-profit and foreign sectors. More recent empirical evidence considering the period 1998-2019[16], quantifying the rate of return of public R&D investment on total factor productivity[17] growth in private sector industries suggests that an average rate of return of up to 40% could be gained six years after the investment is made. Public investment in R&D is also thought to "crowd in" private sector investment, with models suggesting a short-run leverage rate[18] of between 0.23% and 0.38% in the UK. Combining the computed short-run leverage rate with data on both public and private R&D support, Oxford Economics have derived estimations of the monetary impact of the leverage effect, suggesting each £1 of public R&D expenditure stimulates between £0.41 and £0.74 of private R&D expenditure in the same year. Whilst public investment in R&D is thought to yield larger impacts through spillover effects, private sector investment in R&D is still imperative in order to enhance productivity.

Figure 17: R&D expenditure per job, 2022



Source: ONS, NOMIS

[15] Haskel *et al.* (2015)
[16] Frontier Economics. (2024)
[17] Total Factor Productivity (TFP) is a measure of productivity. It is used to understand how efficiently one (e.g. an industry or a national economy) can generate outputs with a given level of input factors such as labour and capital.
[18] The increase in private R&D investment which results from each additional unit of public R&D Investment.

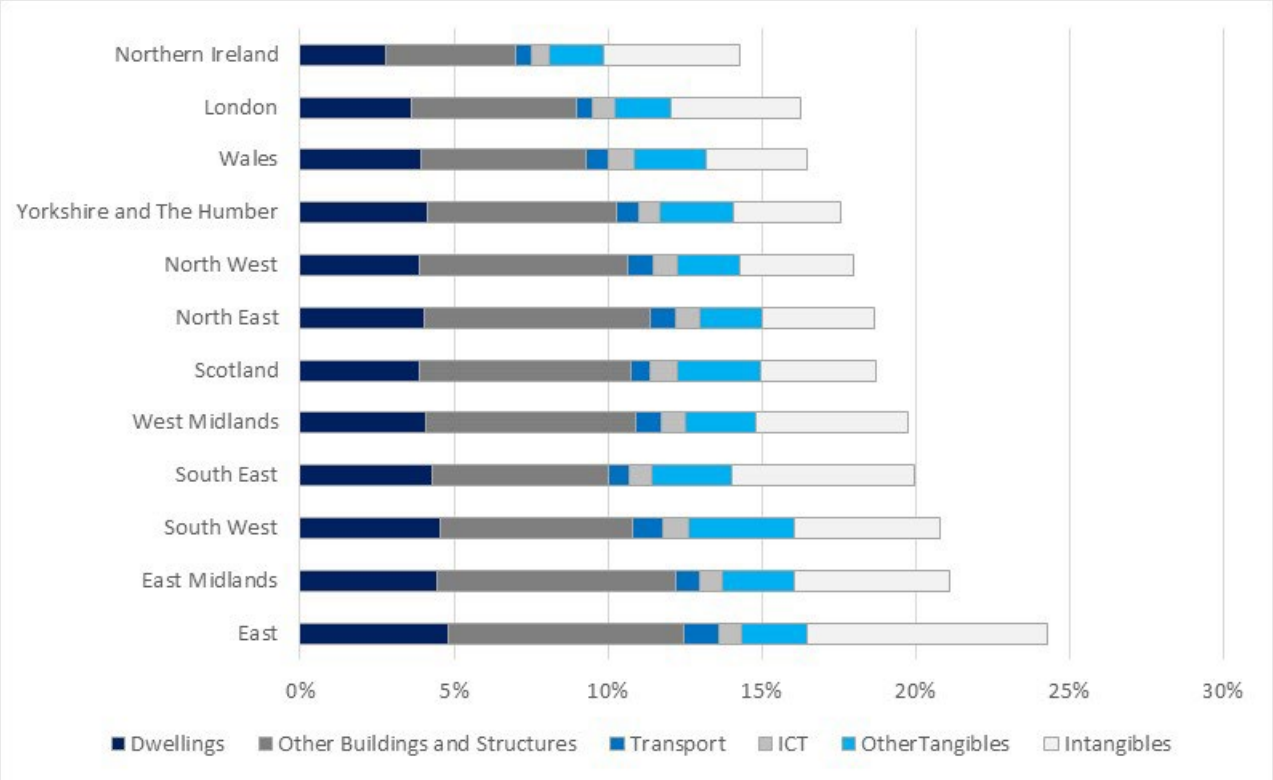
4.6. Figure 17 illustrates each UK region's level of **R&D per workforce job**. The East of England stands out as having a particularly large value of £3,300. This is largely attributable to the impact of England's "Golden Triangle", a region which encompasses Oxford, Cambridge and London and is home to world-leading educational institutions, life science and biotech firms which invest heavily in R&D. These regions aside, there is still considerable disparity across the remaining regions which impacts heavily on productivity and accordingly, the competitiveness of the regions. Northern Ireland ranks 7th across the 12 regions, with R&D per job exceeding the likes of Scotland and the East Midlands, but falling below levels seen in the South West and North West.

4.7. **Gross Fixed Capital Formation (GFCF)** is defined as the acquisition of assets including the production of assets by producers for their own use, minus disposals[19]. GFCF may be used interchangeably with "investment". GFCF contributes to the level of capital stock within regions. By increasing the level of capital per head of population, a process known as capital deepening, GFCF leads to productivity growth. Whilst the Solow Model of long-run economic growth predicts that the rate of growth will return to the level it was prior to the increase in GFCF, output per capita will stabilise at a new, higher steady state. The implication is that not only does GFCF incite productivity enhancements, but it raises the overall living standards within a region and as such, differing levels of GFCF or investment can be a driver of spatial disparities.

4.8. Figure 18 depicts regional GFCF by asset type as a percentage of total GVA. Investment intensity (GFCF as a percent of GVA) allows for a more meaningful comparison across regions of a different size. The level of investment intensity in NI is notably smaller compared to other regions in the UK. This primarily reflects lower expenditure on investment on Dwellings and Other Buildings. London also performs poorly based on the investment intensity metric, reflecting its relatively large GVA. The high level of investment intensity in the East primarily reflects investment in intangible assets such as computer software and Research & Development activity. Intangible assets are regarded as particularly important for nurturing innovation activity and driving growth.

[19] OECD (2025)

Figure 18: Investment intensity, measured by GFCF by asset type as a percentage of GVA, 2020

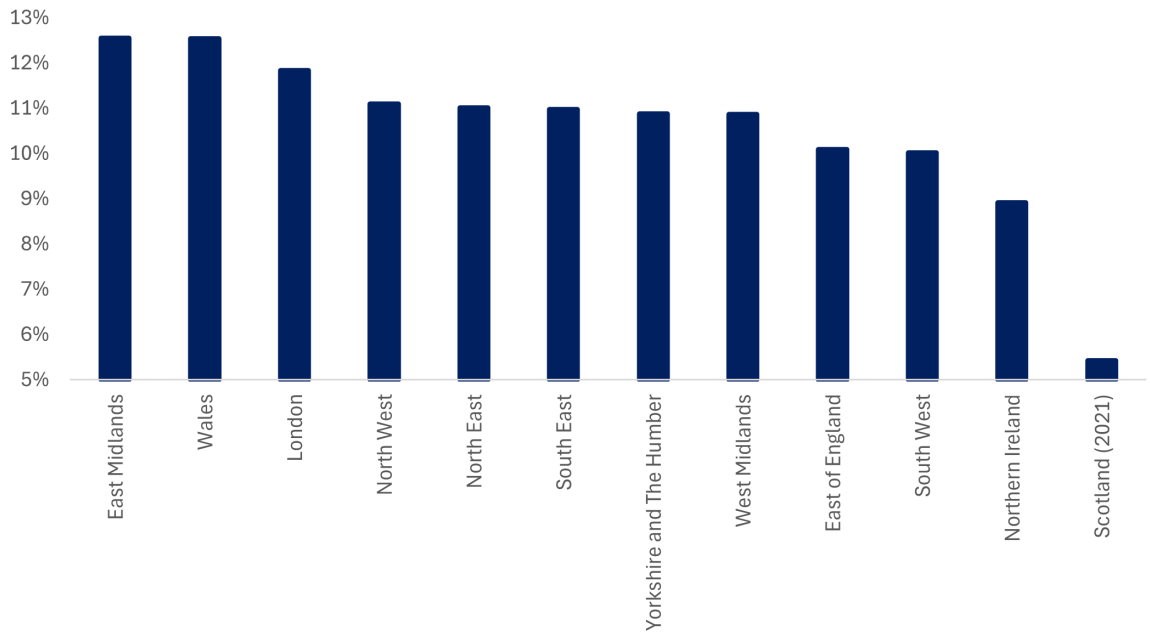


Source: ONS

4.9. Public investment in infrastructure may be used to enhance the productive capacity of the economy. This includes investment in 'hard' infrastructure such as transport, housing, utilities and digital infrastructure. **A-roads as a proportion of a region's total road network** provides a measure of transport infrastructure. A-roads are defined as "major roads intended to provide large-scale transport links within or between areas"[20]. The development of major road networks is believed to have a positive impact on productivity. Transport times fall and the associated reduction in a firm's costs increases its competitiveness in markets. However, the increase in economic output associated with investment in expanding road networks, or improving existing networks, may exhibit diminishing returns to scale depending on the starting point. Scotland has a significantly lower proportion of A-roads which is largely attributable to its large rural landscape (Figure 19), with only 17% of the total population living 'rural Scotland' while land mass of this category accounts for 98%[21]. Northern Ireland has the second lowest proportion, whilst the East Midlands, Wales and London have the largest shares.

[20] UK Department for Transport (2012)
[21] Scottish Government (2021)

Figure 19: A-Roads as a proportion of total road network, 2024

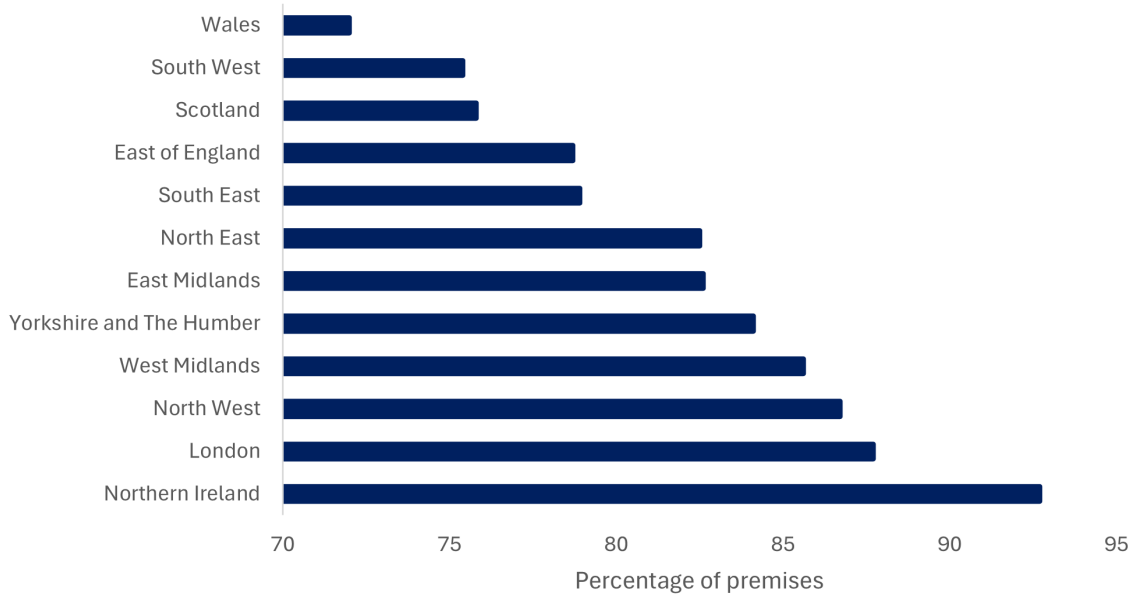


Source: Department for Transport, Department for Infrastructure NI, Transport Scotland, Welsh Government

4.10. The development of economic infrastructure underpinned by technology changes such as broadband also contributes to economic growth. Research prepared by Public First for the Digital, Culture, Media and Sport Select Committee's inquiry on the broadband suggested that a full rollout of **gigabit broadband** would provide a boost to the economy of circa 0.7% of GDP[22]. Through saving time and enabling innovation, enhanced internet services can boost productivity and hence, a region's competitiveness. Figure 20 depicts the disparities across UK regions with respect to gigabit-capable services. While some regions such as Northern Ireland are much closer to "global coverage", there are gains to be made for each region across the UK. Northern Ireland's notably strong performance may be attributable to extensive public funding through both Project Stratum and Project Gigabit, as well as having a relatively smaller landmass on which to deliver gigabit-capable services.

[22] UK Parliament (2020)

Figure 20: Percentage of premises with coverage from a gigabit-capable service, 2024



Business Landscape

4.11. **Foreign Direct Investment** (FDI) is widely regarded as a key driver of competitiveness and economic development. Evaluating ONS data between 2016 and 2019[23], there appears to be a high degree of positive correlation between FDI inflows and productivity. London, the South East and the East of England received the largest net inflows of FDI, whilst regions such as Northern Ireland, Wales and the North East typically had low net FDI flows per workforce job. Efficiency gains through increased competition, knowledge spillovers and investment in training and skills resulting in human capital development are all mechanisms through which FDI can operate to increase productivity and accordingly, a region's economic output.

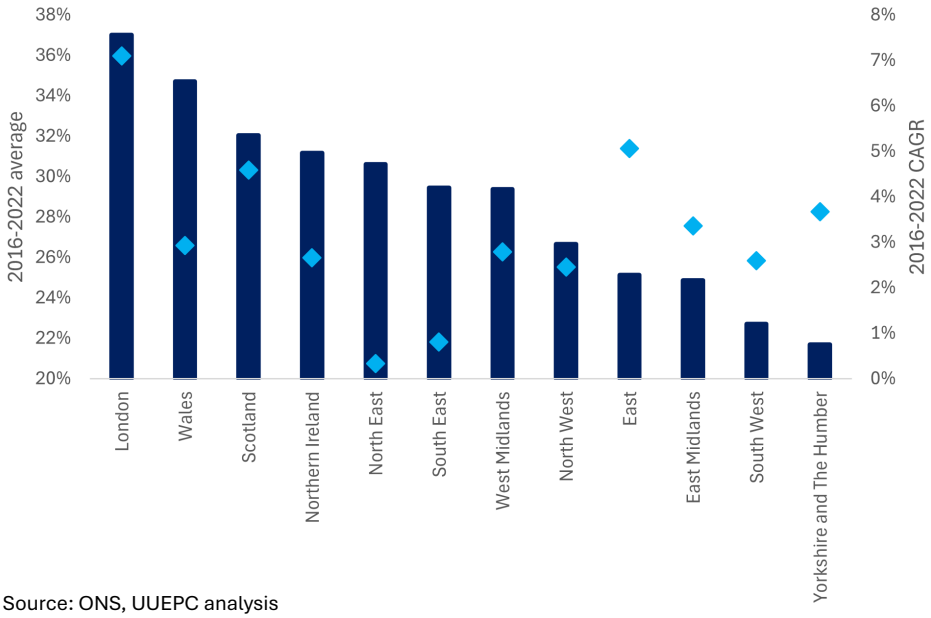
4.12. **Innovation active businesses** within a region can boost overall productivity through similar mechanisms to FDI. In terms of innovation by region, the East of England had the highest percentage of businesses investing in "Internal R&D" between 2020 and 2022, whilst also ranking highly in terms of investment in "Total machinery and equipment, computer hardware or software" and "Training for innovative activities". London ranked highly in terms of "Internal R&D" and "Computer software" but ranked last in the percentage of businesses investing in machinery and equipment, illustrating the region's relative concentration in service sectors such as Finance and Professional Services. Whilst investment in innovation can take place through various mediums and often depends on a region's sectoral portfolio, an overarching theme emerges of regions which invest in innovation enhancing practices tend to benefit from productivity gains. Innovation also tends to differ by firm size, with Small

[23] 2020 and the latest data year available, 2021, have been ignored due to the disproportionate impact of the Covid-19 pandemic on regional FDI flows.

and Medium-sized Enterprises (SME's) and businesses with 10-49 employees having the lowest proportion of overall innovation activity.

4.13. Figure 21 illustrates **exports as a percentage of total GDP.** In addition to recent disparities in this metric, it is evident that the annual growth rate is variable across regions. With the exception of London which had the highest rate in 2022 and the highest growth rate over the past seven years, there is no recognisable pattern between current performance and historical growth rates. Some regions with a low export to total GDP ratio such as Yorkshire and the Humber have a relatively high annual growth rate, providing optimism for future regional convergence. Nonetheless, export intensive regions tend to be relatively more productive. Engagement with competitive, free markets not only incentivises firms to reduce costs, but also encourages innovation and adoption of progressive technologies, boosting productivity and economic output. Furthermore, after controlling for firm size, industry and ownership status, firms which declare goods exports have a labour productivity premium of 21%[24]. The ability to produce more output with the same inputs, or the ability to produce the same volume of output with fewer inputs allows for numerous benefits. Firms can lower costs, thus increasing their competitiveness in international markets. Firms may also increase wages, allowing for the attraction of more skilled and productive labour. These notions may partially explain how the initially cited premium of 21% is thought to increase as the length of time a firm has been exporting increases.[25]

Figure 21: Exports as a percentage of GDP by UK region, 2016-2022 average and 2016-2022 CAGR



Source: ONS, UUEPC analysis

[24] Office for National Statistics (2018)
[25] Berthou *et al.* (2015)

4.14. **Business births as a share of all active enterprises** is a metric which offers insight into the levels of entrepreneurial activity within a region. In 2023, London had the highest rate at 12.6%, whilst Northern Ireland had the lowest at 8.3%. The notion of "creative destruction" introduced by Joseph Schumpeter describes how innovative entrepreneurship challenges incumbent firms and renders current technologies or products obsolete.[26] The process of replacing old processes, mechanisms and products with new, more innovative ones boosts productivity and as such, more entrepreneurial regions such as London benefit from relative productivity advantages. Business births as a share of active enterprises as a metric does however fail to account for obstacles and challenges faced by businesses. Increasing costs for example were perceived as an obstacle to running the business in the next twelve months to 38% of SMEs in London, whereas this figure exceeded 40% for regions such as Northern Ireland, Wales, Scotland and the North East. Similarly, a relatively low proportion (13%) cited supply chain issues as an obstacle, whereas this was the case for 20% and 17% of firms in Northern Ireland and Scotland respectively. Interestingly, London ranked second only behind Northern Ireland in terms of the proportion of businesses struggling to access finance, a rate which is likely to have increased across the board as banks introduced cautious lending policies following the financial crisis. Whilst access to finance in this survey was assessed as an obstacle to running existing businesses, Jonek-Kowalska *et al.* (2021)[27] determined that access to financial and human resources are the most important factors in the creation of start-ups, providing empirical evidence of the importance of the local economic landscape in firm creation.

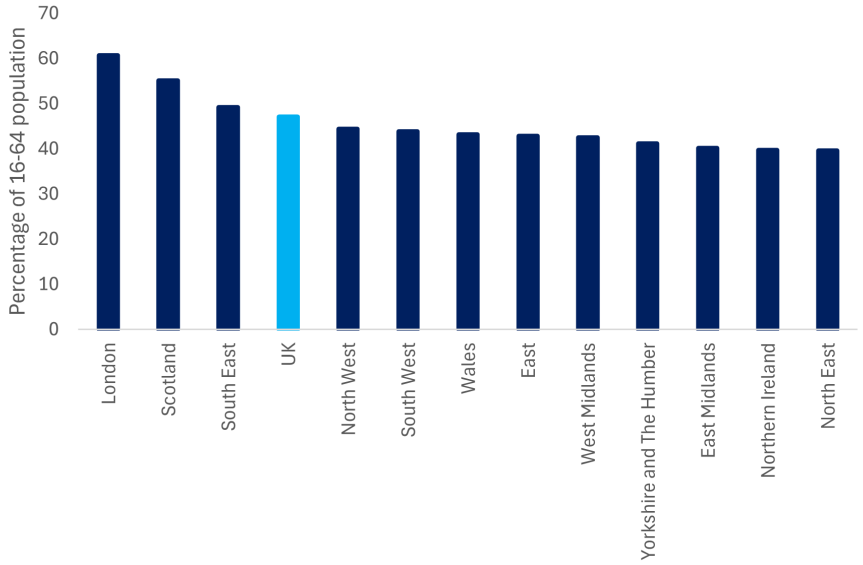
Skills and Qualifications

4.15. Education is linked to economic growth through human capital and the quality of the labour force. **RQF level** 4 in the UK's Regulated Qualifications Framework corresponds to the first year of a bachelor's degree. Advancing to tertiary education is intuitively the first step to obtaining an undergraduate degree, a qualification which literature associates with a wage premium of circa 24%[28]. This figure can vary significantly depending on the gender of the graduate, the institute they graduate from and the discipline in which the degree is obtained[29]. Human capital explanations suggest that the correlation between education and earnings is attributable to education's role in enhancing productivity[30]. Thus, it follows that if a region has a higher proportion of individuals who are qualified to at least RQF level 4, the workforce will be more productive and economic output will be higher. Figure 22 illustrates the regional disparities in RQF level 4+ attainment as a proportion of the working age population. In accordance with theory, regions such as London and the

[26] Carree *et al.*(2002)
[27] Jonek-Kowalska et al. (2021)
[28] Blundell *et al.* (2003)
[29] Social Mobility Commission (2023)
[30] Becker (1962) and Schultz (1963)

South East, which have high levels of productivity, have above average proportions of the working age population educated to RQF level 4+. Similarly, regions such as Northern Ireland and the North East have a proportion of RQF 4+ qualified individuals that is lower than the UK average.

Figure 22: Percentage of the working age population with RQF 4+ by UK region, 2023

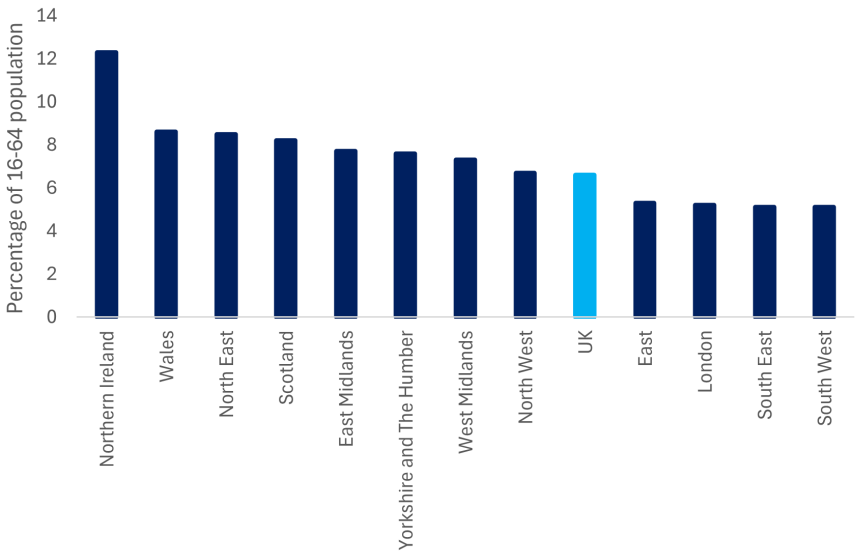


Source: ONS

4.16. Figure 23 illustrates further regional disparities, this time considering the proportion of the working age population with **no qualifications** in accordance with the RQF framework. Similar to above, regions with strong levels of productivity typically have a below average proportion of unqualified labour, whilst regions with a high proportion of unqualified labour have low levels of productivity. Whilst a lack of skills leads to a range of issues at an individual level such as limited job opportunities and low social mobility, it also negatively impacts the economy at a macro level. A low or unskilled workforce will lack an ability to contribute to aggregate productivity growth, with research outlining that low-skilled workers made a negative contribution to UK productivity growth in the three decades ending 2007[31].

[31] Zwart *et al.* (2018)

Figure 23: Percentage of the working age population with no qualifications (RQF) by UK region, 2023



Source: ONS

Housing and Societal Well-Being

4.17. Increased house building may contribute to improved housing affordability by increasing supply and potentially easing price pressures. However, the impact varies by location, depending on the level of demand and other factors such as local amenities. In addition, the provision of additional housing may lead to productivity gains by increasing the effective supply of labour within a region, thereby enabling employer to improve the matching of demand for and supply of specific labour skills[32]. In 2023/24, the East Midlands had the highest number of net additions to housing stock per 1,000 dwellings of any English region (equivalent data for the remaining UK regions was unavailable). The rest of the top ranking regions in terms of net additions to housing stock also ranked highly in terms of productivity, i.e. the East of England, the South East and London[33].

4.18. Recent empirical analysis undertaken in the East of England, the South East and London indicates that declining housing affordability has a negative impact on productivity[34]. In particular, it is estimated that a 1% increase in the house price to wage ratio (implying housing is less affordable) is associated with a 0.14% reduction in productivity per job within the local area.

4.19. Of all UK boroughs, the ten with the highest rental market share were all situated in London. Excluding London, seven of the top ten were located in either the East, South East or East Midlands regions. The issue of affordability aside, the increased

[32] Randolph *et al.* (2019)
[33] These regions also ranked the highest in terms of net additions to housing stocks in 2021/22 and 2022/23.
[34] London City Hall. (2024)

residential mobility offered by rental properties enhances a region's ability to attract appropriate, high-skilled labour to vacancies.

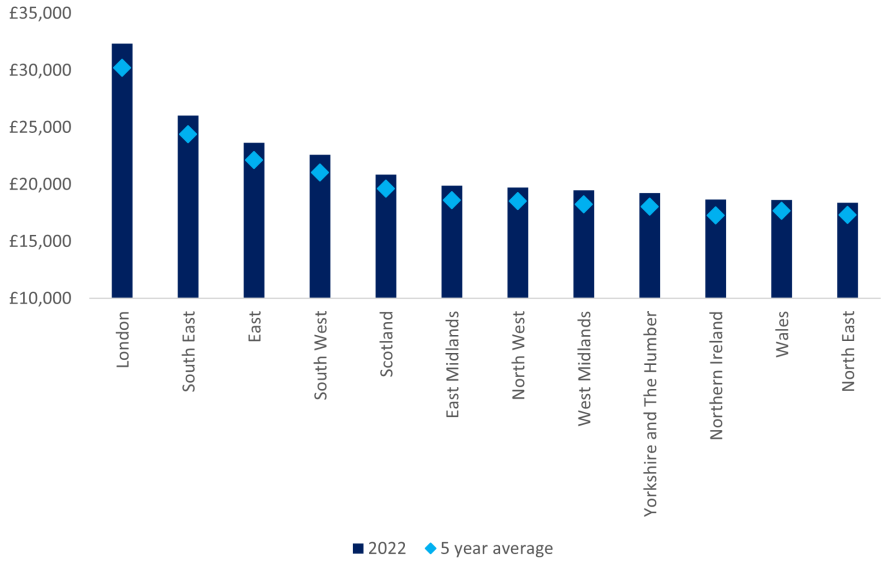
4.20. However, in England house prices and rents are highest in the areas with the highest levels of productivity[24]. Workers facing increased costs of buying and selling property are less likely to enhance their productivity by relocating to regions with the best job opportunities[35]. This reduced labour market dynamism, illustrated by the fact that in 2018, young private renters were one-third as likely to move job and home as 20 years prior[36], impedes productivity growth as workers stay in less productive jobs for longer.

4.21. From a wellbeing perspective, a lack of affordable housing is positively correlated with instances of homelessness[37]. Homelessness in turn has detrimental impacts on the physical and mental health of individuals, increases vulnerability to violence and impedes access to employment and education[38].

4.22. **Gross disposable household income (GDHI) per head** is the amount of money that individuals in the household sector can spend or save after income distribution measures[39], and provides a measure of social welfare. Figure 24 illustrates the regional disparities in this metric within the UK. Despite the 2022 (latest data) figures exceeding the 5 year average in all regions, the regional disparities are large, with highest ranked London exceeding lowest ranked North East by circa £12,875 per head. While it is worth acknowledging that this metric fails to account for cost of living differences, GDHI allows for comparisons of regional prosperity. With larger disposable incomes evident in London, the East and the South East of England, regions that perform strongly in terms of productivity and economic output, a link can be drawn between the social welfare of individuals through stronger household finances and the economic performance of a region.

[35] Maclennan *et al* (2023)
[36]
[37] Quigley *et al.* (2001)
[38] Tony Blair Institute for Global Change (2024).
[39] Office for National Statistics (2022).

Figure 24: Gross Disposable Household Income by UK region, 2022 and 5 year (2018-2022) average



Source: ONS, UUEPC analysis

Labour Market Conditions

4.23. A dynamic, flexible labour market potentially enhances regional competitiveness by enabling firms to respond quickly to fluctuating market conditions. This process of matching the supply and demand for labour leads to the more efficient allocation of resources, promotes risk taking by entrepreneurial firms and productivity growth[40]. Employment, unemployment and inactivity rates provide metrics that capture the strength of the labour market and the pool of available labour. High unemployment and inactivity levels may signal structural problems within the labour market. Note, however, economic growth may be achieved through expanding the labour supply without an accompanying increase in productivity. As a result, labour market conditions may influence regional competitiveness but be uncorrelated with productivity[41].

4.24. 2023 mid-year population estimates (NOMIS) show that London had the highest **proportion of the population who were of working age (16-64)** of any UK region at 68.9%, with the second placed region, Scotland (63.4%) 5.5% lower. At 60.5%, the South West had the lowest proportion of the total population who were of working age. The demographic profile of the UK's regions is relevant due to the impact it has on labour markets and the workforce. An aging population constrains growth by putting a squeeze on the pool of available labour, and hence economic output.

4.25. The economically inactive are a subset of the population who are not available to start, nor actively seeking employment. Unless increased levels of **economic inactivity** are offset by productivity gains, there will be a negative impact on

[40] Henrekson, M., (2020).
[41] Dijkstra *et al.* (2011).

economic growth. During the period January 2025 – March 2025 (latest ONS data) the South West had an economic inactivity rate of 17.3% (inactive as a proportion of the working age population), the lowest of any UK region, whilst the North East exhibited the highest rate (28.4%). Considering an average of the past five full years (2020 to 2024 inclusive), the South East (18.6%) and NI (27.1%) ranked first and last respectively. Again, by constraining the available pool of labour, economic inactivity negatively impacts output, with the rate of economic output negatively correlated with rates of inactivity.

4.26. The ONS also provides data on **economic inactivity by reason**. Those involved in full-time study or education are considered economically inactive, although this subset is less of a concern to policymakers as these individuals are making an investment in their future career opportunities and are likely to join the workforce. This subset aside, the largest group of economically inactive individuals are those who are **long-term sick**. Northern Ireland has the highest rate of inactivity for this reason (37.1% in the period October-September 2024), which operates in tandem with an aging population to apply pressure to healthcare services. London and the South East had the two lowest proportions of any UK region. A healthier workforce with fewer sickness related absences allows for an increased labour pool from which employers can pull in order to optimise economic output.

4.27. In respect of productivity, presenteeism, the productivity loss associated with impaired workforce function due to illness, is often greater than the productivity loss associated with total absenteeism or the direct cost of medical treatment[42] and so employer programmes to maximise the all-round wellbeing of employees are imperative to boost productivity and consequentially, economic output.

4.28. Supporting evidence can be drawn from the European Commission's Regional Competitiveness Index (RCI)[43], which evaluates eleven key inputs and outputs of regional competitiveness. The RCI allows for comparison between Northern Ireland and UK NUTS2 regions. Details of Northern Ireland's performance relative to other UK regions across the main European Commission regional competitiveness parameters are provided in Appendix 4. Northern Ireland ranked third last in the Infrastructure pillar for example (only behind the Highlands and Islands and Cornwall and Isles of Scilly), which considered accessibility to motorways, railways and passenger flights. In relation to the Higher Education and Lifelong Learning pillar, Northern Ireland again ranks low compared to other UK regions. This pillar incorporates higher educational attainment, lifelong learning, early school leavers, access to universities and gender balance on tertiary education, with NI's low score at least partially attributable to the region consistently lagging behind the UK average with respect to lifelong learning[44]

[42] Hemp (2004).
[43] European Commission (2013).
[44] NISRA (2023).

Drivers of Regional Competitiveness Summary

4.29. Regional competitiveness and productivity are closely linked, with more competitive regions typically experiencing greater productivity growth. Private and public Investment, the business landscape, the skills base of the workforce and quality of life factors all play important roles in impacting regional competitiveness and by extension productivity.

4.30. Using a range of metrics encompassing productivity specific and societal well-being factors, Northern Ireland performs relatively unfavourably compared to other UK regions across most of the metrics evaluated. The main findings replicate the European Commission's Regional Competitiveness Index, i.e. Northern Ireland performs poorly relative to other basic regions across the UK.

5. Summary of Findings

5.1 The evolution of employment and productivity growth over the last two decades were explored with a view to gaining further insights into Northern Ireland's relatively low levels of economic growth. Shift Share Analysis was used to quantify the contribution of place-based and nationwide industry factors to employment growth, while the impact of structural changes in the composition of the economy on productivity was assessed by decomposing aggregate productivity into within sector and between sector effects. Additional analysis was undertaken on the regional variability of underlying drivers of regional competitiveness, highlighting NI's relative performance and areas for improvement.

Impact of Legacy Industry-Mix effects on Employment Growth

5.2. Northern Ireland displayed average employment growth compared to other regions in the UK over the last two decades. By decomposing employment growth into different components, the Shift Share Analysis indicates that local employment growth was partly inhibited by legacy effects associated with the past industrial composition of the economy. Historically, NI had a high concentration in industries that experienced low growth at the overall UK level, such as Agriculture and Public Administration, and a low concentration in industries that experienced rapid national growth, such as Professional Services and ICT. These legacy industry-mix effects are diminishing over time due to the ongoing transition to a more service based economy. In particular, the Professional Services and ICT sectors are increasing in terms of concentration and given the low base have the potential to continue to contribute to local economic growth.

Contribution of Place-Based Specific Factors to Employment Growth

5.3. It is also evident from the Shift Share Analysis that the local context matters. As shown by the sector specific placed-based interaction effects, some sectors in NI lagged in terms of employment growth relative to the UK as a whole, including the Health & Social Care and Construction sectors. While the NI Health & Social Care sector share of total employment increased over the last two decades, it has lagged behind the overall employment growth in the Health sector at the UK level. Nevertheless, the Health & Social Care sector in Northern Ireland continues to account for a greater share of total employment compared to the UK average (15.6% compared to 13.2% in 2023). Demographic trends indicate that there is a growing need to manage an aging population and consequently this sector is expected to continue to expand.

5.4. The slower growth of the construction sector in NI compared to the UK average partly reflected the severe impact of the 2008 global financial crisis on the housing market in Northern Ireland, as well as the contraction of construction activity following the

2020 pandemic. The strong emphasis on infrastructure investments and housing development projects announced in the Westminster Autumn Budget should boost the UK construction industry in the medium term. The impact on the construction sector at the regional level depends on the ability of both the public and private sector to implement their investment plans.

5.5. Conversely, some NI sectors performed stronger in terms of employment change compared to the UK as a whole. This includes the Professional Services and ICT sectors, which as noted above are starting from a lower base. Separately, Manufacturing also 'over-performed' even though employment fell between 2000 and 2023 by 13%. This was significantly less than the 35% decline of overall UK Manufacturing employment. Moreover, Manufacturing employment in NI has exhibited an upward trend in recent years, partly due to the contribution of the Manufacturing of Food Products subsector. It is important to build on the strengths of the local manufacturing sector to ensure it remains competitive and continues to exhibit growth.

5.6. In addition to sector specific place-based effects for some industries, the positive regional effect shift share component indicates that NI benefitted from favourable industry-wide regional effects that provided a boost to the whole NI economy. The growth in NI employment has been accompanied with a rise in the employment rate, while inactivity and unemployment rates have fallen. Given the already low level of unemployment and greater constraints on immigration, going forward, continued employment growth will require further progress in reallocating individuals out of economic inactivity and into the workforce.

Impact of Structural Changes on Aggregate Productivity

5.7. The growth in NI GVA over the last two decades is largely attributable to the expansion in the labour force alongside weak productivity growth. Given future constraints on employment growth in NI, it will be necessary to overcome the anaemic productivity growth as a means to boost economic growth. The decomposition of aggregate productivity growth into *within* and *between sector* effects indicates that shifts in the industrial composition of the economy (between sector effects) have had a downward impact on aggregate productivity over the period 2000 to 2022. This negative impact due to structural changes in the economy partly reflects the decline in manufacturing employment as this sector generates above average productivity. However, the NI manufacturing sector has manged to reverse the downward trend in recent years From a productivity perspective, it is advantageous to continue to grow employment in this sector as well as facilitate the growth of other high productivity sectors such as ICT and construction.

5.8. Structural shifts towards a more service based economy have generally had a downward impact on aggregate productivity due to a reallocation of labour from above average to below average productivity sectors. This includes the shift to labour intensive services such as Hospitality and Administrative Support. By definition, it is challenging to increase the productivity of labour intensive sectors due to the reliance on labour and limited potential for productivity gains through

technology. Although these long-term trends were disrupted by the Covid-19 pandemic, they are expected to reemerge over time.

5.9. The expansion of the Professional Services sector has also had a downward impact on aggregate productivity as it has below average productivity. Concerningly, the productivity of the Professional Services sector relative to the economy as a whole has deteriorated over the last two decades. Measured in terms of jobs, Professional Services productivity was 7% higher than average NI productivity in 2000, compared to 11% lower in 2022. Going forward, the Professional Services sector is expected to expand in terms of employment in line with the transition to a more knowledge based economy and consequently, it is strategically important to strive to increase the value of activities in this sector. The reasons underlying the below average productivity of this sector and decline over time warrants further research. The productivity of the Professional Service sector in NI lags that of the UK, with an average 15 percentage point differential over the last three years. This differential may reflect regional differences in the functional nature of jobs in the Professional sector as relatively few headquarters of national or major international businesses in this sector are based in Northern Ireland. As a result, it is likely that branches of national or major international businesses based in NI conduct lower-value back office type activities to a greater extent, while there is more emphasis on higher-value head-office type activities elsewhere. In addition, the productivity differential between NI and the UK as a whole may reflect the relatively high proportion of SMEs in Northern Ireland as many face constraints that impact productivity such as gaining access to finance [45].

Impact of Within Sector Effects on Aggregate Productivity

5.10. While changes in the industrial composition of the economy have played a role in reducing productivity growth, the decomposition results indicate that the weak growth in aggregate productivity primarily reflects limited productivity growth within individual sectors. Accordingly, in addition to facilitating employment growth of sectors with above average productivity (such as Manufacturing and ICT), there is a need to improve the competitiveness of individual sectors of the economy, including Manufacturing and ICT. Given the large size of the public sector in NI, this includes raising the productivity of the Public Administration, Education and Health sectors. This necessitates sustained policy efforts in multiple areas, including investment in R&D and infrastructure, ensuring connectivity to wider markets, promoting entrepreneurship and innovation and developing the skills and productivity of the local workforce by boosting investment in education and training[46].

[45] North (2019).
[46] Visagie and Turok (2022), Gardiner *et al.* (2013) and Martin *et al.* (2019).

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Appendix 1: Decomposition of GVA Growth

GVA growth is decomposed into different components through transforming the data into logarithms. Consider two time periods *t* and *t-1*.

GVA Growth $= \ln(Prod_t * Emp_t) - \ln(Prod_{t-1} * Emp_{t-1})$

Applying the product rule for logarithms, this can be expressed as:

$$= [\ln(Prod_t) + \ln(Emp_t)] - [\ln(Prod_{t-1}) + \ln(Emp_{t-1})]$$

Rearranging the terms, this yields:

$$= [\ln(Prod_t) - \ln(Prod_{t-1})] + [\ln(Emp_t) - \ln(Emp_{t-1})]$$

i.e. GVA growth equals the sum of productivity growth and employment growth.

Appendix 2: Multi-Factor Partitioning Methodology

Following the methodology set out by Ray *et al*. (2012) and empirical applications by Gardiner *et al*. (2013) and Visagie and Turok (2021), the difference between total employment growth in the region and national employment growth is decomposed into four components: Industry Mix effect, Region effect, Interaction effect and Allocation effect. Let *E* be the employment in industry *i*, region *j* and time *t*, then:

(i) Industry Mix effect

$$\sum_i E_{ij}^t \, (\hat{g}_{in} - \hat{g}_n)$$

Difference between the standardised industry growth rate and the standardised national growth rate. This effect quantifies the growth that a region would have experienced had employment in each sector grown at the national rate and captures the effect of the mix of industries in the region based on national industry trends.

(ii) Region Effect

$$\sum_i E_{ij}^t \, (\hat{g}_j - \hat{g}_n)$$

Difference between the standardised region growth rate and the standardised national growth rate. This component captures a general regional competitiveness effect that affects all industries equally.

(iii) Interaction Effect

$$\sum_i E_{ij}^t \, (g_{ij} - \hat{g}_{in} - \hat{g}_j + \hat{g}_n)$$

Deducts the standardised industry growth rate and the standardised regional growth rate from the actual (non-standardised) regional growth rate of each industry and adds the standardised national growth rate. It captures the net effect of all the interactions for each region (Lamarche et al, 2003) and varies by industry, thereby quantifying industry-specific regional effects that are in addition to the general regional competitiveness effect and national industry trends (Visagie and Turok, 2021).

(iv) Allocation Effect

$$\sum_i E_{ij}^t \, (\hat{g}_n - g_n)$$

Difference between the standardised national growth rate and the actual national growth rate. This component is used for balancing purposes.

where $\hat{g}_{in}$ is the standardised industry growth rate, $\hat{g}_j$ is the standardised regional growth rate and $\hat{g}_n$ is the standardised national growth rate. Standardised rates are used to remove industrial composition effects from the regional effects, which is a shortcoming of the traditional shift share method (Ray, 1990).

Appendix 3: Decomposing Aggregate Productivity Growth

Following the methodology developed by Tang and Wang (2004) and application by Riley *et al.* (2018), aggregate labour productivity is expressed as the sum of the following two components:

Within Effect

$$\sum_i \frac{Q_{it-1}}{Q_{t-1}} g_{it}$$

where Q_{it-1} is the nominal output of a specific sector in the beginning period Q_{t-1} is the nominal output of the economy as a whole at the beginning period and g_{it} is the sector *i* labour productivity growth rate.

This term measures the productivity growth rate of each sector, weighted by the output share in the beginning period.

Between Effect

$$\sum_i (1 + g_{it}) \frac{LP_{it-1}}{LP_{t-1}} \left(\frac{P_{it} L_{it}}{P_t L_t} - \frac{P_{it-1} L_{it-1}}{P_{t-1} L_{t-1}} \right)$$

where LP_{it-1} is the labour productivity of sector *i* in the beginning period, LP_{t-1} is the labour productivity of the economy as a whole, $\frac{P_{it}}{P_t}$ is the price of sector *i* relative to the whole economy in the ending period, $\frac{L_{it}}{L_t}$ is the employment share of sector *I* in the ending period, $\frac{P_{it-1}}{P_t - 1}$ is the price of sector *i* relative to the whole economy in the beginning period and $\frac{L_{it-1}}{L_{t-1}}$ is the employment share of sector *I* in the beginning period.

This effect measures the impact of changes in the relative size of sectors, accounting for changes in the employment share of sector *i* (adjusted by prices) and the productivity growth rate of sector *i*. The impact of a change in the relative size of a sector is proportional to its relative productivity.

Appendix 4: EU Regional Competitiveness Index RCI 2013 – UK NUTS2 Regions by pillar

Basic pillars:

Figure 25: Institution pillar

Figure 26: Infrastructure pillar

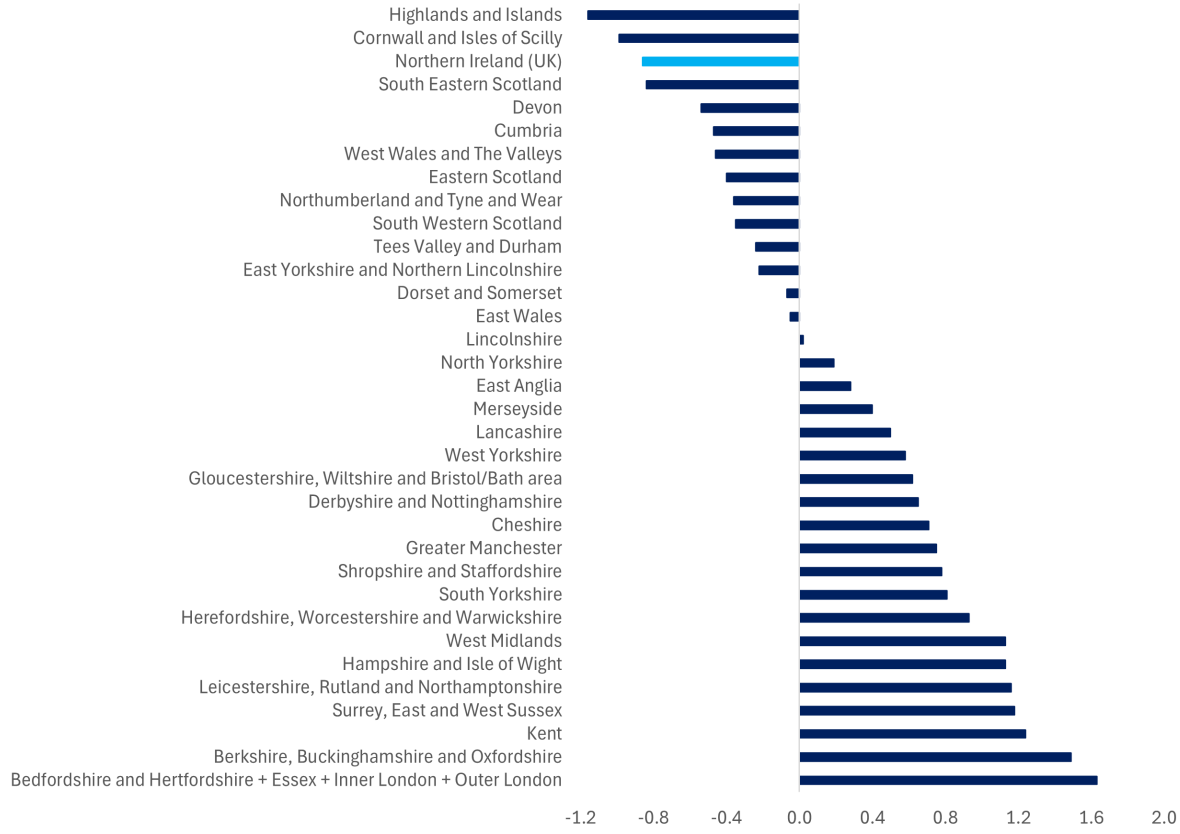
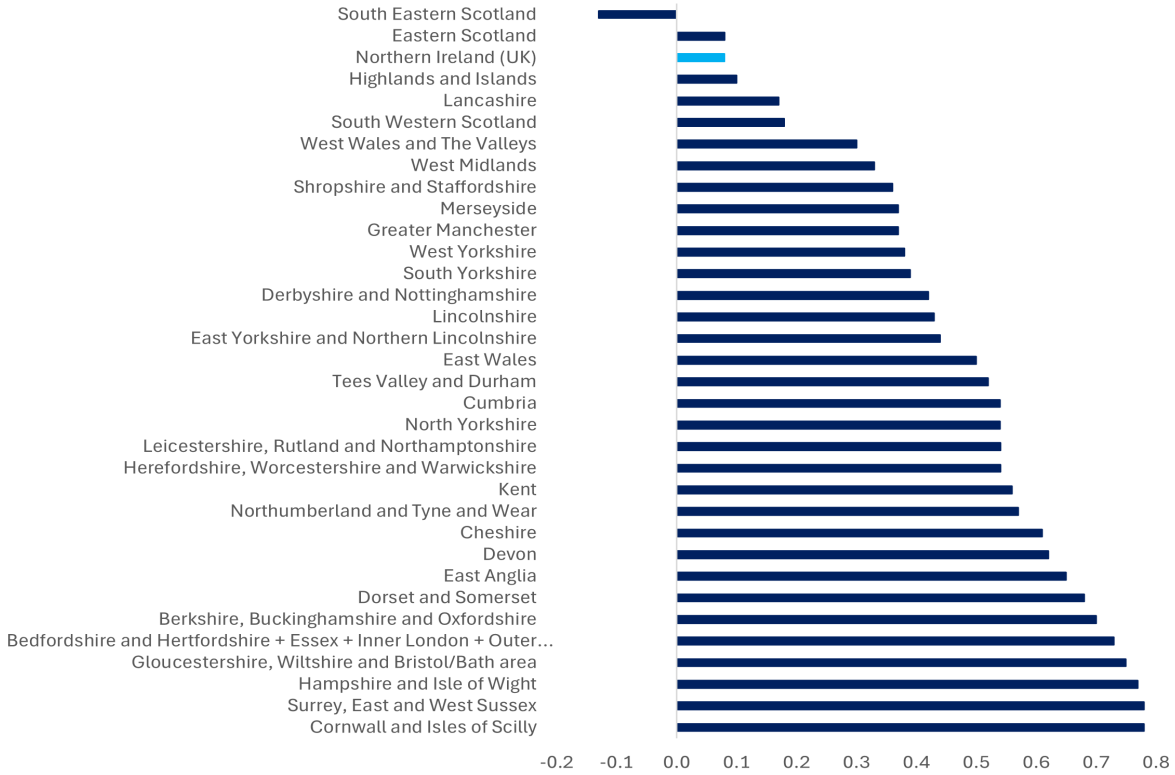


Figure 27: Health pillar



Efficiency pillars:

Figure 28: Higher Education and Lifelong Learning pillar

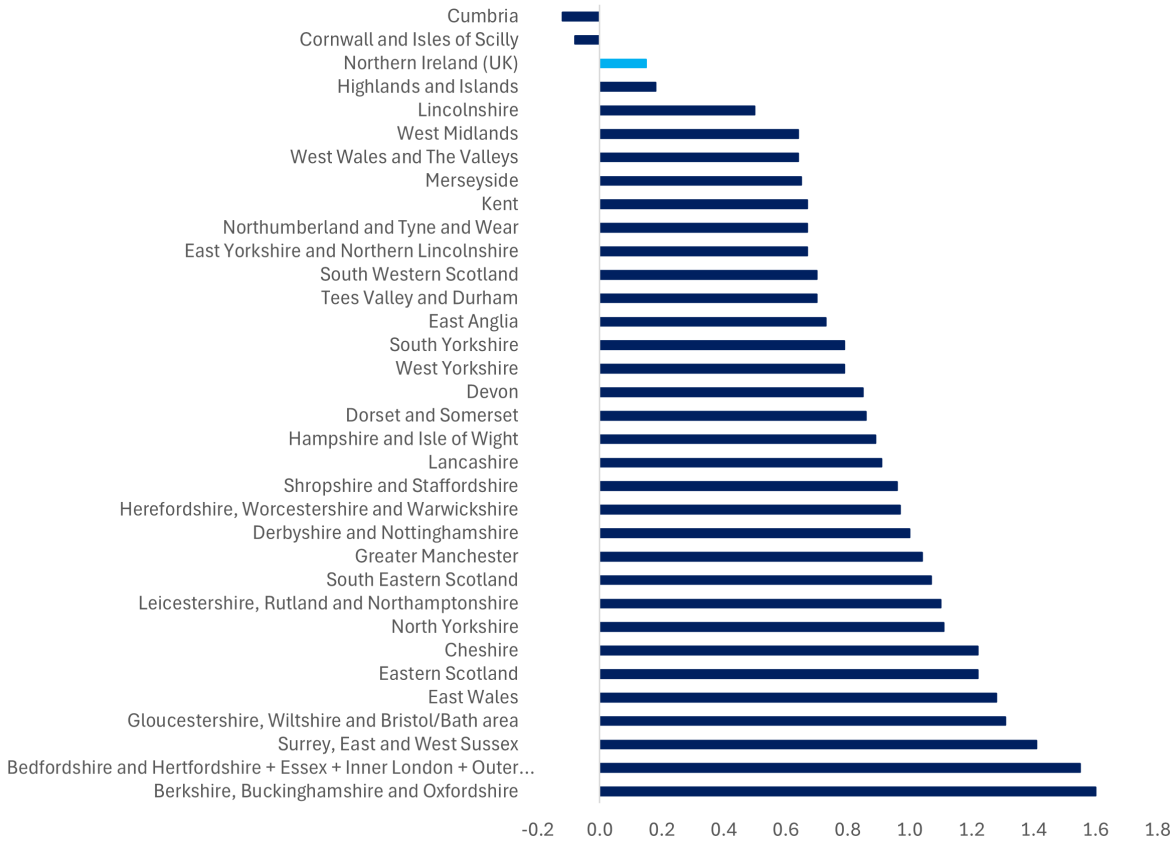
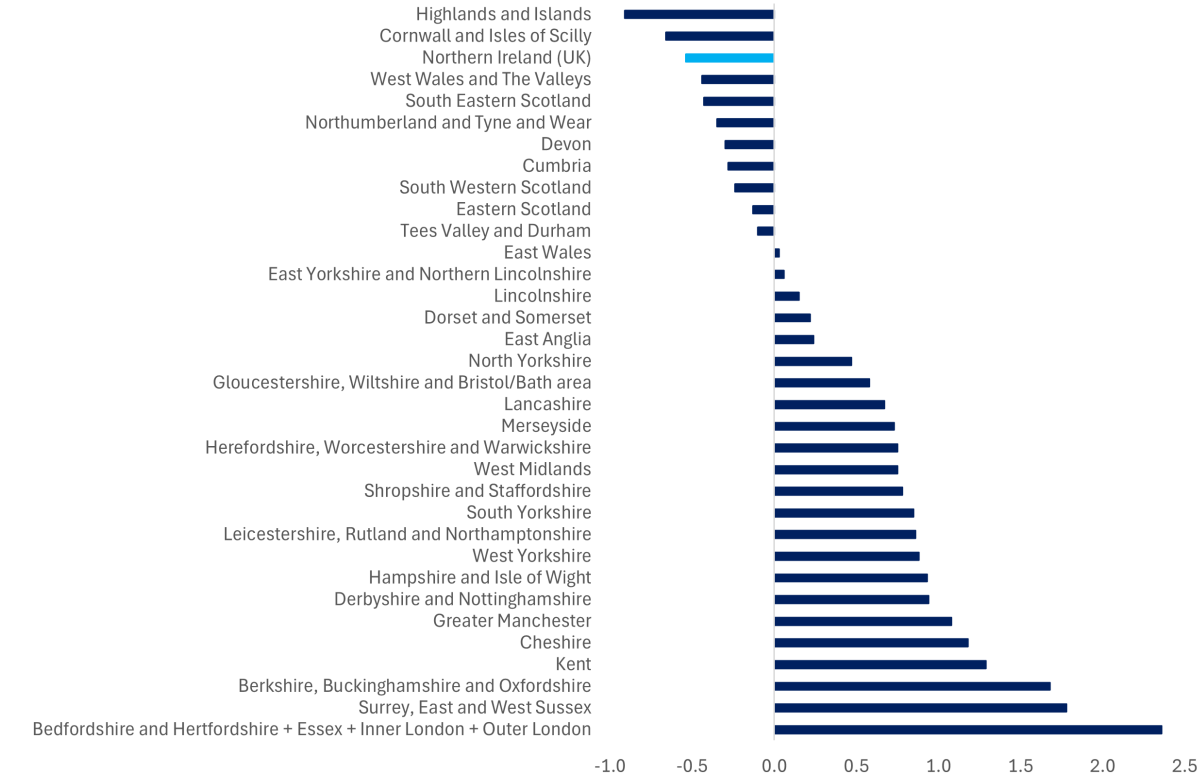


Figure 29: Higher Education and Lifelong Learning pillar

Figure 30: Market Size pillar



Innovation Pillars:

Figure 31: Technological Readiness pillar

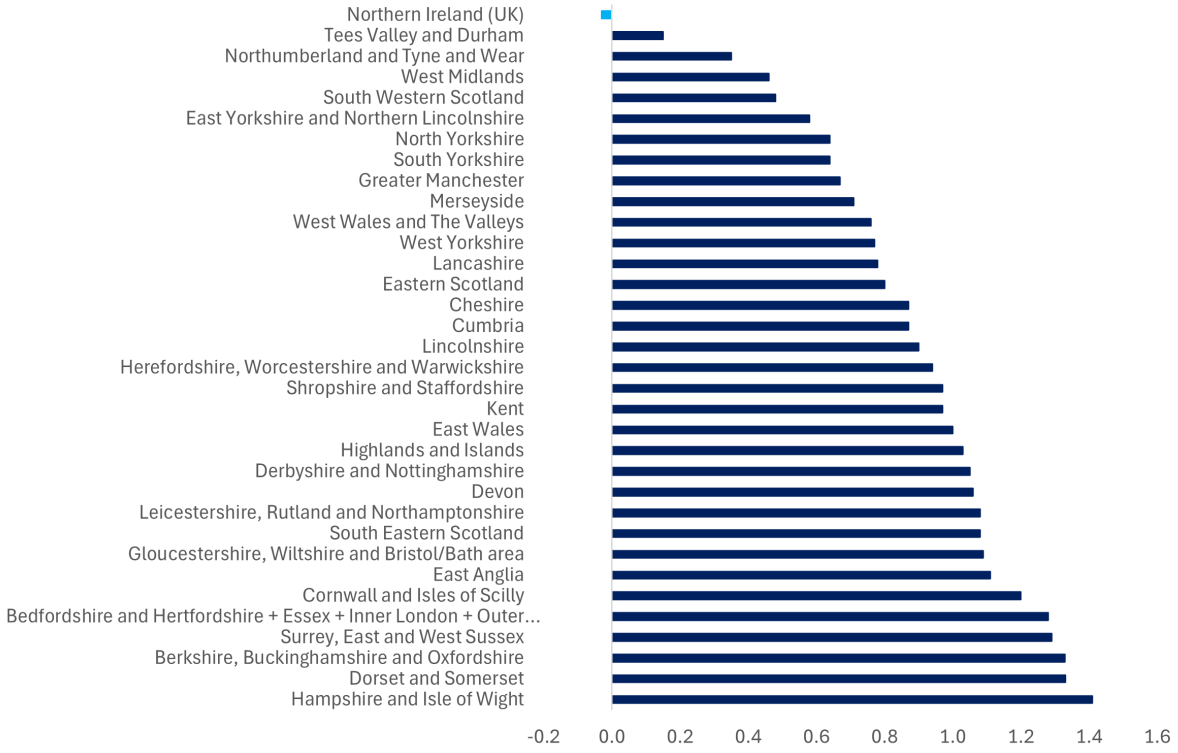


Figure 32: Business Sophistication pillar

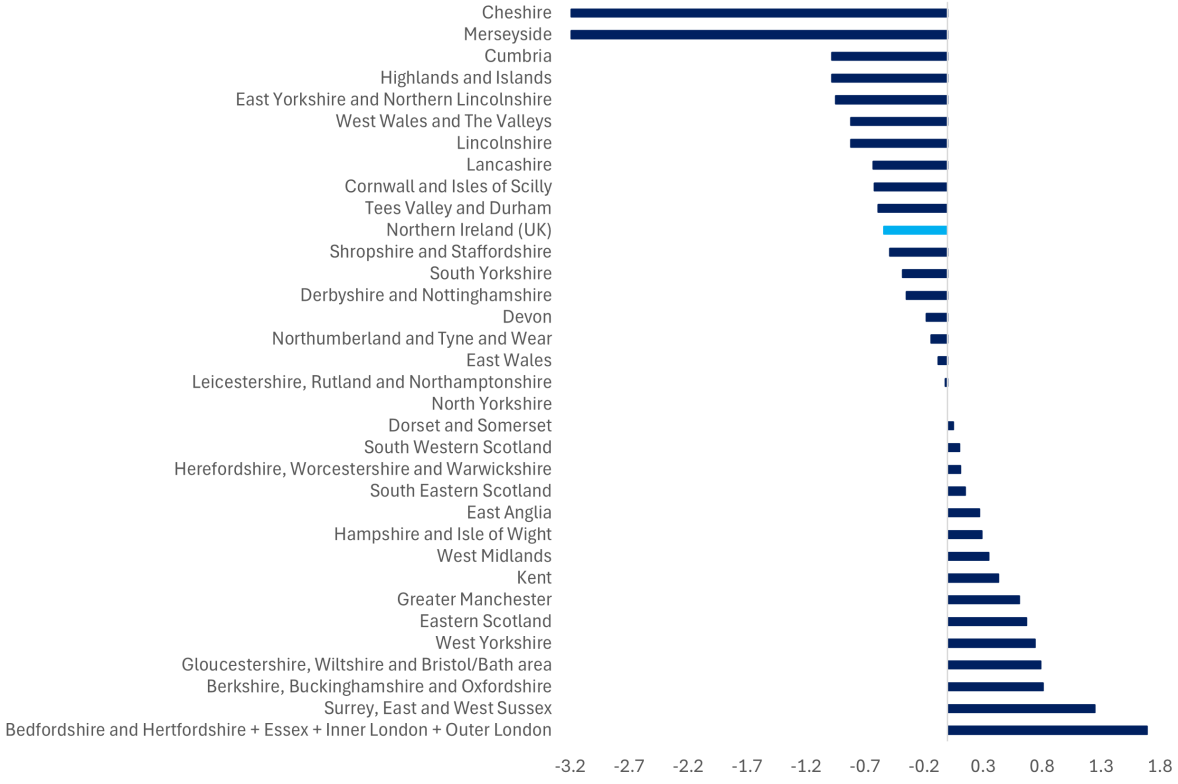


Figure 33: Innovation pillar